

Putting the vaccination triple-win at the heart of the new Government's policy agenda



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ABOUT THIS REPORT

This report was commissioned by Pfizer and independently researched and published by Future Health.

This report follows a previous Future Health report on vaccination commissioned by Pfizer *VacciNation and health inequalities: tackling variations in adult vaccination uptake in England* published in March 2022.¹

Data analysis for this report was completed in 2023. In certain cases more recent data on the uptake of individual vaccination programmes covered in Chapter 1 has been released.²

In completing the health system and economic analysis section (Chapter 2), Future Health has drawn on existing published studies and models to build estimates and projections for the health system and economic benefits accrued if vaccination rates in the COVID-19 and flu programmes were improved.

To estimate the health system benefits from improved COVID-19 and flu vaccination rates across England – in particular a reduction in variations in vaccination rates between Integrated Care Boards (ICBs) – Future Health used the methodology from the Neri et al study *Vaccine-Preventable Hospitalisations from Seasonal Respiratory Diseases: What Is Their True Value?*³

¹ https://www.futurehealth-research.com/future-health-publishes-new-study-on-adult-vaccination-rates-and-health-inequalities/

² For example new data on flu vaccination was published in March 2024: https://www.gov.uk/government/publications/pneumococcal-polysaccharide-vaccine-ppv-vaccine-coverage-estimates

³ https://pubmed.ncbi.nlm.nih.gov/37243048/

To estimate the economic benefits from improved COVID-19 and flu vaccination rates across England – again with a reduction in variations in vaccination rates between ICBs – Future Health applied – and in the case of COVID-19 adapted – the methodology from the Franklin and Hochlaf paper *An Economic Analysis of Flu Vaccination*.⁴

It is important to note that all calculations using these two studies are estimates and are presented as such. The analyses also cover different time periods for the two main vaccination programmes studied (COVID-19 2021-22; Flu 2018-19). This is based on the particular methodology and studies used to run the analysis and the data available at the time of carrying out the research.

Finally, drawing conclusions between the effectiveness of vaccine programmes between years has clear limitations based on the varying severity of the disease, prior exposure amongst populations, the variants and virulence of disease and the associated impact of the therapies.

⁴ https://ilcuk.org.uk/wp-content/uploads/2018/07/An_economic_analysis_of_flu_vaccination_-_ILC-UK.pdf; this methodology was adapted and applied to COVID-19 vaccination

EXECUTIVE SUMMARY

The importance of vaccines to protect public health was clearly demonstrated during the pandemic. The UK was the first country in the world to approve a COVID-19 vaccine and begin rollout.⁵ A 2022 report from the National Audit Office found that the 'collective efforts of many national and local public bodies, scientists, vaccine manufacturers, and individual staff and volunteers, as well as government's power as a coordinator and funder, (meant) that so many of the programme's objectives have been met and in some areas exceeded.⁶ Such unprecedented action reflected the UK's history as being a leading country for the development and rollout of vaccines.

Innovation is creating opportunities to use vaccines in the future to tackle a much wider variety of important conditions. In June 2024, the Government announced a new vaccination programme for respiratory syncytial virus (RSV) for older adults and pregnant women.⁷

However there are concerns that a health service under pressure in England is finding tackling variations in vaccination uptake challenging. Such signs were in evidence before the pandemic, where the UK had lost its 'measles-free' status.⁸ Parts of the country are not meeting WHO uptake targets in important programmes such as flu.⁹

Our research finds variation in uptake across each of the four adult vaccination programmes (COVID-19, flu, pneumococcal disease and shingles) analysed of between 10 and 20% across England. Seven of the ICBs with the highest uptake rates across the four programmes are in the South West and South East. All five London ICBs are in the bottom 10 for adult vaccination uptake. North Central London ICB is the lowest ranked overall. Eight of the bottom ten ICBs are based in and around major cities: the five London ICBs, plus the two Birmingham ICBs and Greater Manchester ICB. Whilst there is evidence that some progress in increasing vaccination rates has been made, these data reflect similar regional variations observed in our previous research from 2021/2022.¹⁰

The reasons for variations in vaccine uptake are multi-faceted and complex, including demographics, levels of deprivation, accessibility, convenience and public confidence.¹¹

⁵ https://publications.parliament.uk/pa/cm5803/cmselect/cmpubacc/258/report.html

⁶ https://www.nao.org.uk/reports/the-roll-out-of-the-covid-19-vaccine-in-england/

⁷ https://www.gov.uk/government/collections/respiratory-syncytial-virus-rsv-vaccination-programme#:~:text=All%20adults%20turning%2075%20years,undertaken%20at%20the%20earliest%20opportunity

⁸ https://ukhsa.blog.gov.uk/2019/08/19/measles-in-england/

⁹ https://www.nuffieldtrust.org.uk/resource/adult-flu-vaccination-coverage

¹⁰ https://www.futurehealth-research.com/future-health-publishes-new-study-on-adult-vaccination-rates-and-health-inequalities/

¹¹ https://www.futurehealth-research.com/future-health-publishes-new-study-on-adult-vaccination-rates-and-health-inequalities/

With the health system under significant strain, vaccination can help provide an important level of protection, particularly in reducing hospital admissions for the associated conditions during the busy winter months. More widely – and with persistent issues around the under-performance of the UK economy and growing numbers of people out of work due to illness – effective vaccination programmes can improve productivity and deliver economic returns on investments. Our research finds that if across two vaccination programmes – for flu and COVID-19 – variations in uptake could be addressed thousands of hospital admissions, sick days and premature deaths could be avoided.

NHS England published a welcome vaccination strategy in December 2023¹³ and vaccination is an embedded priority within important NHS policy frameworks, such as the Core20PLUS5 health inequalities scheme¹⁴, the Oversight Framework for NHS Integrated Care Boards¹⁵ and the Quality and Outcomes Framework (QOF).¹⁶ But improving vaccine uptake requires Government leadership, investment and action to really succeed and despite specific commitments such as those in the Life Sciences Vision, cross Government action and co-ordination remains piecemeal.¹⁷

A new Government creates a new opportunity for concerted action and the development of cross departmental Government 'missions' is a chance for a different policy approach. This report argues that improving vaccination uptake should be part of an NHS pivot to prevention; but also part of wider cross government plans both for reducing the gap in healthy life expectancy through the health mission; and improved economic growth through the economic mission and the work of the Industrial Strategy and Life Sciences Council. 18,19

In making improved vaccination uptake a Government mission priority for both improved health and wealth, the Government will be able to deliver a vaccination triple win of improved health outcomes, reduced NHS pressures and stronger economic growth.

¹² https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/economicinactivity/datasets/economicinactivitybyreasonseasonallyadjustedinac01sa

¹³ https://www.england.nhs.uk/long-read/nhs-vaccination-strategy/

¹⁴ https://www.england.nhs.uk/about/equality/equality-hub/national-healthcare-inequalities-improvement-programme/core20plus5/

^{15 &}lt;a href="https://www.england.nhs.uk/publication/nhs-oversight-framework-22-23/">https://www.england.nhs.uk/publication/nhs-oversight-framework-22-23/

¹⁶ https://digital.nhs.uk/data-and-information/data-tools-and-services/data-services/general-practice-data-hub/quality-outcomes-framework-qof

¹⁷ https://www.gov.uk/government/publications/life-sciences-vision

¹⁸ https://labour.org.uk/wp-content/uploads/2023/05/Mission-Public-Services.pdf

¹⁹ https://labour.org.uk/wp-content/uploads/2023/09/Mission-Economy.pdf

SUMMARY OF FINDINGS

There are widespread variations in the uptake of adult vaccinations

There is widespread variation in the uptake of adult vaccination programmes.
 The gap between the highest and lowest ICB uptakes rates for each of the vaccination programmes analysed is:

- COVID-19 20.6% gap between the ICB with the highest and lowest vaccine uptake rate²⁰
- Seasonal flu 17.8% gap between the ICB with the highest and lowest vaccine uptake rate²¹
- Pneumococcal disease (PD) 9.6% gap between the ICB with the highest and lowest vaccine uptake rate²²
- Shingles 12.3% gap between the ICB with the highest and lowest vaccine uptake rate ^{23,24}
- When assessed across each of the four programmes, four of the top ten ICBs for uptake are in the South West (Gloucestershire ICB, Bath, North East Somerset, Swindon and Wiltshire ICB, Bristol, North Somerset and South Gloucestershire ICB and Dorset ICB), with Gloucestershire ICB ranked as the best overall. There are three ICBs in the South East (Hampshire and Isle of Wight ICB, Buckinghamshire, Oxfordshire and Berkshire West ICB and Frimley ICB), two ICBs in the Midlands (Derby and Derbyshire ICB, Herefordshire and Worcestershire ICB) and one in the North East and Yorkshire (North East and North Cumbria ICB). There are no ICBs in the top 10 from London and the North West
- All five London ICBs are in the bottom 10 for adult vaccination uptake. North
 Central London ICB is the lowest ranked. Eight of the bottom ten ICBs are based
 in and around major cities: the five London ICBs, plus the two Birmingham ICBs
 and Greater Manchester ICB. The other ICBs with overall rankings in the bottom
 ten are Northamptonshire ICB and Mid and South Essex ICB

²⁰ https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-vaccinations/covid-19-vaccinations-archive/

²¹ https://www.gov.uk/government/statistics/seasonal-influenza-vaccine-uptake-in-gp-patients-monthly-data-2022-to-2023;

²² https://www.gov.uk/government/publications/pneumococcal-polysaccharide-vaccine-ppv-vaccine-coverage-estimates

²³ https://www.gov.uk/government/publications/herpes-zoster-shingles-immunisation-programme-2022-to-2023-evaluation-reports#full-publication-update-history

²⁴ Please note research for this paper was completed in 2023, and in certain cases more recent data has been released by NHS England across these programmes. Though initial analysis reveals similar levels of uptake and rankings across ICBs

• If ICBs with below average vaccination rates could reach the average rate for each of the four programmes, we estimate that an additional 907,142 people would be vaccinated. If all ICBs could deliver rates of adult vaccination at the rate of the top quintile, we estimate that 1,893,282 additional adult vaccinations would be delivered across the four programmes

Increasing vaccination rates delivers both health system and economic benefits

- If all health systems across England with below average COVID-19 vaccination rates had reached the average vaccination rate in 2021-22, an estimated 6,380 COVID-19 hospital admissions would have been avoided. This would have led to an estimated 28,518 fewer bed days and a related reduction in costs of £23.3 million²⁵
- The COVID-19 vaccination programme of 2021-22 resulted in an estimated 223,278 fewer sick days and an associated economic benefit of £26.3 million. Fewer deaths as a result of COVID-19 vaccination in 2021-22 saved an estimated £673.45 million in productivity costs amongst those of working age and £136.2 million in informal care provision from those over 65. The estimated economic benefit from the COVID-19 vaccination programme in 2021-22 including sick days averted, and reductions in premature mortality in over and under 65s was £836.4 million
- A modest improvement in COVID-19 vaccination rates achieving vaccination rates for both those over 65 and of working age to at least average health system rates across the country would have delivered an additional £162 million in economic benefits. ²⁶ Under a significant improvement scenario where vaccination rates for both groups reached the highest health system rate recorded across England, an additional £275.3 million in economic benefits would have been recorded
- If all ICBs had reached the WHO target for 75% flu vaccination coverage for eligible populations in 2018-19 an estimated 1,829 hospital admissions for flu and 7,278 bed days would have been avoided
- The flu vaccination programme resulted in an estimated 154,596 fewer sick days in 2018-19, translating into an economic benefit of £16.3 million. Fewer deaths as a result of flu vaccination saved £63 million in productivity costs amongst those of working age and £8.2 million in informal care provision from those over 65. The estimated economic benefit from the flu vaccination programme in 2018-19 including sick days averted, and reductions in premature mortality in over and under 65s was £87.5 million

²⁵ Future Health analysis using Neri et al model: https://pubmed.ncbi.nlm.nih.gov/37243048/; Data on vaccine uptake for 2021-22 is at Sustainability and Transformation Partnership (STP) level – these organisations were replaced by ICBs in July 2022. 'Health system' here refers to STPs

²⁶ https://www.england.nhs.uk/south/wp-content/uploads/sites/6/2019/09/seasonal-vaccination-flu-report-18-19-final.pdf

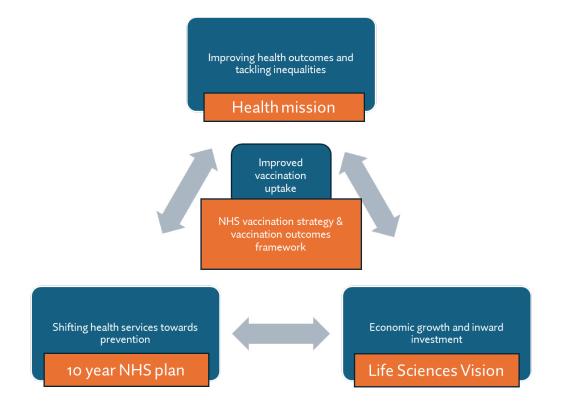
A modest improvement in flu vaccination rates, slightly above NHS targets (60% for working age, 85% for over 65s), would have delivered a further £9.8 million in economic benefits. Under a more substantial improvement scenario (75% for working age, 95% for over 65s) a further £21.7 million economic benefit could be realised

VACCINATION POLICY FRAMEWORK: DELIVERING THE VACCINATION TRIPLE WIN

A more ambitious cross Government policy framework for vaccination would seek to build from the NHS strategy published in December 2023.²⁷

This would see targets for reducing inequalities in vaccination uptake as part of the Government's health mission, improvements in access to vaccines as central to a shift to prevention within the ten year NHS plan and new efforts to accelerate action through the Life Sciences Vision on vaccine research and innovation to support economic growth and inward investment.

Figure 1: A cross Government policy framework to deliver the vaccination triple-win



²⁷ https://www.england.nhs.uk/long-read/nhs-vaccination-strategy/



After clean water vaccination is the most effective public health intervention.²⁸ The WHO estimates that vaccination prevents between 3.5 million and 5 million deaths across the world annually.²⁹

The UK has been an established world leader in vaccination with some of the most extensive vaccination programmes globally and highest uptake rates.³⁰

The COVID-19 vaccination programme reflected this. The UK Health Security Agency (UKHSA) estimated that by the end of September 2021, vaccinations may have averted as many as 128,000 deaths and 262,000 hospitalisations.³¹ Subsequent analysis for the 2021/22 winter booster campaign estimated that around 186,600 hospitalisations in England had been averted with the majority being those aged 65 years and older.³² By the end of May 2022, 90% of the adult population had been vaccinated with two doses, well above the planning assumption of 75%.³³ The vaccination programme has continued for those 65 and over and those under 65 in clinical risk groups.³⁴

However the COVID-19 programme also highlighted the wider challenges in ensuring high uptake rates for vaccination across the whole population. A report by the House of Commons Public Accounts Committee in the summer of 2022 found that uptake amongst certain groups such as younger people, pregnant women and certain minority groups were all lower than the wider population.³⁵ A study by Figueiredo of COVID-19 vaccine acceptance found those in large urban areas including London and North West England, females, Black or Black British ethnicities, and Polish speakers were among the least likely to state an intent to vaccinate.³⁶ The National Audit Office in its assessment of the programme found that while the COVID-19 vaccine programme had had some success in tackling low uptake amongst vaccine hesitant communities through campaigns and targeted materials; it had "not yet identified how it can fully overcome persistent inequalities."³⁷

Previous research from Future Health, sponsored by Pfizer, found an 18% difference in the uptake of COVID-19 vaccines across England with parts of London having some of the lowest rates nationally.³⁸ Such variation was reflected across

²⁸ https://ukhsa.blog.gov.uk/2014/05/01/why-vaccinate/

²⁹ https://www.who.int/health-topics/vaccines-and-immunization

³⁰ https://committees.parliament.uk/publications/41050/documents/199887/default/

³¹ https://www.nao.org.uk/wp-content/uploads/2022/02/The-rollout-of-the-COVID-19-vaccination-programme-in-England-Summary.pdf

³² https://assets.publishing.service.gov.uk/media/62c6c2168fa8f54e855dfe29/Vaccine-surveillance-report-week-27.pdf

³³ https://committees.parliament.uk/publications/23019/documents/168825/default/

³⁴ https://www.england.nhs.uk/long-read/autumn-winter-aw-2023-24-flu-and-covid-19-seasonal-campaign/

³⁵ https://committees.parliament.uk/publications/23019/documents/168825/default/

³⁶ https://www.nature.com/articles/s41598-022-25354-4

³⁷ https://www.nao.org.uk/wp-content/uploads/2022/02/The-rollout-of-the-COVID-19-vaccination-programme-in-England-Summary.pdf

³⁸ https://www.pfizer.co.uk/files/Future-Health-Report.pdf

other major adult vaccination programmes including PD, influenza and shingles.³⁹ Lower uptake rates of childhood vaccines in the West Midlands and London has been linked to the resurgence of measles, while there has been an increase in diptheria cases amongst asylum seekers coming into the UK.^{40,41}

Such variation in uptake reflected the experience before the pandemic and concerns about a wider decline in the coverage of vaccinations. An NHS England and Improvement review in October 2019 noted that "there has been a small but steady decline (in vaccinations) in the last few years, meaning that we do not have a high enough coverage to prevent onward transmission of infections."⁴²

To provide an up to date assessment of the level of variation in the uptake of adult vaccinations across England, Future Health developed an uptake scorecard for four major adult vaccination programmes across ICBs in 2022-2023:

- COVID-19
- Seasonal flu
- PD
- Shingles

The analysis reveals significant variation in the uptake of vaccines across ICBs for different programmes:

- COVID-19 20.6% gap between the ICB with the highest and lowest vaccine uptake rate⁴³
- Seasonal flu 17.8% gap between the ICB with the highest and lowest vaccine uptake rate⁴⁴
- PD 9.6% gap between the ICB with the highest and lowest vaccine uptake ${\rm rate^{45}}$
- Shingles 12.3% gap between the ICB with the highest and lowest vaccine uptake rate 46,47

³⁹ https://www.pfizer.co.uk/files/Future-Health-Report.pdf

⁴⁰ https://www.gov.uk/government/publications/measles-epidemiology-2023/confirmed-cases-of-measles-inengland-by-month-age-and-region-2023

⁴¹ https://www.gov.uk/government/publications/diphtheria-cases-among-asylum-seekers-in-england-2022/diphtheria-cases-among-asylum-seekers-in-england-2022#:~:text=from%201%20January%20to%20 25,diphtheria%20anti%2Dtoxin%20and%20antibiotics

⁴² https://www.england.nhs.uk/wp-content/uploads/2019/10/interim-findings-of-the-vaccinations-and-immunisations-review-2019.pdf

⁴³ https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-vaccinations/covid-19-vaccinations-archive/

⁴⁴ https://www.gov.uk/government/statistics/seasonal-influenza-vaccine-uptake-in-gp-patients-monthly-data-2022-to-2023

⁴⁵ https://www.gov.uk/government/publications/pneumococcal-polysaccharide-vaccine-ppv-vaccine-coverage-estimates

⁴⁶ https://www.gov.uk/government/publications/herpes-zoster-shingles-immunisation-programme-2022-to-2023-evaluation-reports#full-publication-update-history

⁴⁷ Please note research for this paper was completed in 2023, and more recent data has been released by NHS England across these programmes.

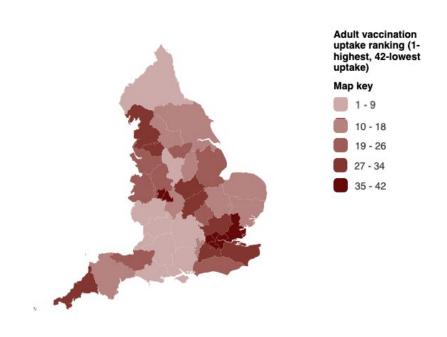
ICBs were then ranked on their uptake rates against each of the four adult vaccines analysed. A rank of 1 was given to the ICB with the highest vaccination uptake, with a rank of 42 given to the ICB with the lowest vaccination uptake. Ranks were then added across all four vaccination programmes into a 'rank of ranks' and then divided by four to determine an average ranking score. These average scores were then themselves ranked and used to develop a table of overall vaccination uptake performance (see table 1 and figure 2 below):

Table 1: ICB adult vaccination uptake (1 – highest average uptake rates, 42 – lowest average uptake rates)⁴⁸

ICB	Rank	ICB	Rank
Gloucestershire	1	Shropshire, Telford and Wrekin	22
Bath and North East Somerset, Swindon and Wiltshire	2	South Yorkshire	23
Derby and Derbyshire	3	Bedfordshire, Luton and Milton Keynes	24
Hampshire and Isle of Wight	4	Cheshire and Merseyside	25
Bristol, North Somerset and South Gloucestershire	5	Staffordshire and Stoke-on- Trent	26
Buckinghamshire, Oxfordshire and Berkshire West	6	Surrey Heartlands	27
Herefordshire and Worcestershire	7	Hertfordshire and West Essex	28
North East and North Cumbria	8	Cornwall and The Isles of Scilly	29
Dorset	9	Leicester, Leicestershire and Rutland	30
Frimley	10	Kent and Medway	31
Cambridgeshire and Peterborough	11	Lancashire and South Cumbria	32
Suffolk and North East Essex	12	Greater Manchester	33
Humber and North Yorkshire	13	Northamptonshire	34
Nottingham and Nottinghamshire	14	Mid and South Essex	35
Norfolk and Waveney	15	South West London	36
Coventry and Warwickshire	16	Birmingham and Solihull	37
Devon	17	Black Country	38
West Yorkshire	18	North East London	39
Lincolnshire	19	North West London	40
Somerset	20	South East London	41
Sussex	21	North Central London	42

⁴⁸ A headline assessment of the 2023-2024 flu data released while this research was being completed reveals a similar gap between the highest and lowest ICBs of 19.1%. All of the London ICBs, along with Black Country ICB and Birmingham and Solihull ICB are in the bottom quintile. Of the top six ICBs for vaccine uptake, five are the same as in 2022-2023.

Figure 2: Map of adult vaccination uptake rankings by ICB



Source: Office for National Statistics licensed under the Open Government Licence v.3.0 Contains OS data © Crown copyright and database right [2023]

The analysis highlights that the issues around variations in the uptake of vaccinations across England seen both pre and during the pandemic continue to persist.

Four of the top 10 ICBs for adult vaccination uptake are in the South West, with Gloucestershire ICB ranked as the best overall. There are three ICBs from the South East in the top 10 (Hampshire and Isle of Wight ICB, Buckinghamshire, Oxfordshire and Berkshire West ICB and Frimley ICB). There are also two ICBs from the Midlands (Derby and Derbyshire ICB, Herefordshire and Worcestershire ICB) and one from the North East and Yorkshire (North East and North Cumbria ICB). There are no ICBs in the top 10 from London and the North West. Across all four individual vaccination programmes, no ICB features in the top quintile for each programme. Bath and North East Somerset, Swindon and Wiltshire ICB, Buckinghamshire, Berkshire and Oxford West ICB, Dorset ICB, Gloucestershire ICB and Hampshire and Isle of Wight ICB feature in the top quintile for uptake across three of the four programmes.

All five London ICBs are in the bottom 10 for adult vaccination uptake. North Central London ICB is the lowest ranked. Eight of the bottom ten ICBs are based in and around major cities: the five London ICBs, plus the two Birmingham ICBs and

Greater Manchester ICB. The other ICBs with overall rankings in the bottom ten are Northamptonshire ICB and Mid and South Essex ICB.

Across the four individual programmes there is consistency of lower uptake in certain ICBs. Across all of the four programmes London ICBs come in the bottom quintile for uptake – the only exception is South West London ICB which is in the second bottom quintile for its shingles and PD programmes. Black Country ICB and Birmingham and Solihull ICB also feature in the bottom quintile across all programmes.

If all ICBs could deliver rates of adult vaccinations at the average recorded rate, we estimate that the following additional people would be vaccinated in each programme:

- 580,810 extra people would be vaccinated against COVID-19
- 177,263 extra people would be vaccinated against flu
- 96,173 extra people would receive the pneumococcal vaccine
- 52,896 extra people would be vaccinated against shingles

In total this would result in an extra 907,142 extra people receiving an adult vaccine than at present.

If all ICBs could deliver rates of adult vaccination at the rate of the top quintile for each programme, we estimate that 1,893,282 additional adult vaccinations would be delivered. This is broken down as follows:

- 1,160,917 extra people would be vaccinated against COVID-19
- 362,278 extra people would be vaccinated against flu
- 249,183 extra people would receive the pneumococcal vaccine
- 120,904 extra people would be vaccinated against shingles

For individual adult vaccination programmes it is also possible to estimate the increased uptake that would be delivered if national or international targets were met.

For example, the WHO sets a target of 75% of eligible adults being vaccinated against flu.⁴⁹ Seven ICBs did not reach this target (all five London ICBs along with Birmingham and Solihull ICB and Black Country ICB). If they had done so, an additional 83,602 people would have been vaccinated.

⁴⁹ https://www.nuffieldtrust.org.uk/resource/adult-flu-vaccination-coverage

A December 2022 study by the International Longevity Centre recommended a similar target to the one set for flu to be set for PD. Currently no ICBs in England are meeting this level of vaccination for PD. If all ICBs in England were to deliver a 75% vaccination rate for PD then an additional 368,666 vaccinations would be administered.⁵⁰

In some programmes adult vaccination rates are already well ahead of set targets. For example the QOF sets payments for primary care based on delivering the shingles vaccination to between 50-60% of 80 year olds. Whilst these financial payments will be delivered directly to primary care, when assessed at an ICB level, all ICBs are delivering against the 60% upper end of the target. Such performance is welcome, but also raises questions about whether the targets being set are stretching enough for health systems and need to be reviewed.

If improvements in vaccination uptake, such as those above, could be delivered there would be a range of health system and economic benefits realised. The next chapter seek to assess and estimate these benefits in more detail.

⁵⁰ https://ilcuk.org.uk/wp-content/uploads/2022/12/ILC-Moving-the-margins.pdf

⁵¹ https://www.england.nhs.uk/wp-content/uploads/2023/03/PRN00289-quality-and-outcomes-framework-guidance-for-2023-24.pdf



As set out in the previous chapter, vaccinations bring a wide range of health system benefits including reduced hospitalisations and bed days. Vaccine preventable diseases contribute to pressures on the NHS, particularly during the winter months.

During the 2017-18 and 2018-19 winter seasons there were 46,215 and 39,670 influenza-related hospital admissions. This resulted in hospital costs of £128.2 million and £99.6 million. 52

An analysis by Brassel et al from four immunisation programs in England – the annual flu vaccination and vaccination against meningococcal type B disease, rotavirus, and PD – estimated that these vaccination programmes saved approximately £71 million in direct treatment costs. When factoring in additional demand from elective patients a £71 million to £86 million opportunity cost arises from foregone treatments.⁵³

A paper in May 2023 by Neri et al estimated the number of hospitalisations and bed days that vaccines against influenza, PD, COVID-19, and a hypothetical RSV vaccine, prevented in the winter among older adults in England.⁵⁴ For COVID-19 2021-22 hospitalisation patterns were used. For flu, pre-COVID-19 hospitalisation patterns from 2018-19 were used because non-pharmaceutical interventions (e.g. lockdowns and social distancing) also reduced the occurrence of other respiratory diseases.⁵⁵ The study found that nationally the influenza, PD and RSV vaccines could collectively prevent 72,813 bed days and save over £45 million in hospitalisation costs. The COVID-19 vaccine could prevent over 2 million bed days and save £1.3 billion.⁵⁶

Using the methodology within the Neri paper and flu and COVID-19 vaccine uptake rates at Sustainability and Transformation Partnership (STP) and CCG level from the relevant time periods, Future Health estimated the health system benefits that could be realised with improvements in vaccine uptake. To assess future scenarios of uptake improvement, uptake targets were drawn from those set by the WHO and NHS England for the relevant years.

⁵² https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09553-0

⁵³ https://www.sciencedirect.com/science/article/pii/S1098301522020964

⁵⁴ https://pubmed.ncbi.nlm.nih.gov/37243048/

⁵⁵ https://pubmed.ncbi.nlm.nih.gov/37243048/

⁵⁶ https://pubmed.ncbi.nlm.nih.gov/37243048/

⁵⁷ It is important to note that the 2018/19 and 2021/22 analyses took place before the establishment of ICBs. In the case of flu Future Health has amalgamated CCG level data to develop ICB geographic level analyses. Such mapping makes any projections approximations with limitations. In the case of COVID-19 STP level data was used (referred to subsequently in the text as health systems). Future Health developed an estimated per patient avoidable admission rate for each vaccine based on the Neri et al methodology and findings and then applied this across each CCG/STP and then mapped this across then to ICB level geographies to undertake the analysis

⁵⁸ Data sources for vaccine uptake: flu uptake rate data: https://www.gov.uk/government/statistics/seasonal-flu-vaccine-uptake-in-gp-patients-winter-2018-to-2019; (September-February) COVID_19 uptake rate data: https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-vaccinations/covid-19-vaccinations-archive/ (31 March 2022 data-set)

COVID-19

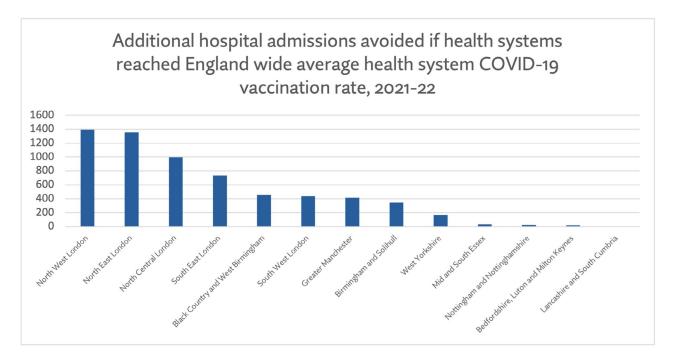
There were 193,359 total hospital admissions for COVID-19 in winter 2021-22 and 864,315 bed days of care.⁵⁹

NHS England guidance for the winter of 2021-22 set targets for the COVID-19 vaccine of 85% for over 65s and 75% for those between 50-64.60 Only two health systems failed to deliver the 50-64 target (North Central London and North East London). Three systems failed to deliver the target for those over 65 (North Central London, North East London and North West London).

With most systems reaching the targets set, Future Health instead sought to assess the benefits if systems with below average vaccination rates across all eligible age groups could be 'levelled-up' to the system average rate. The average rate of vaccination across eligible groups was 89.4%, with 13 systems recording rates below this level.

If systems with below average COVID-19 rates had reached the average rate, an estimated additional 6,380 COVID-19 related hospital admissions would have been avoided. This would have resulted in 28, 518 estimated fewer bed days and a reduction in health system costs of an estimated £23.3 million. Both North West London and North East London would have seen the highest increase in admissions avoided with over 1300 COVID-19 admissions avoided respectively.

Figure 3: Additional hospital admissions avoided if health systems reached the England wide average COVID-19 vaccination rate, 2021-22



⁵⁹ Using Neri et al methodology and U07.1 and U07.2 HES codes: https://digital.nhs.uk/data-and-information/publications/statistical/hospital-admitted-patient-care-activity/2021-22

⁶⁰ https://www.england.nhs.uk/south/wp-content/uploads/sites/6/2021/12/Ambition-targets-for-the-2021-22-Flu-Season.pdf

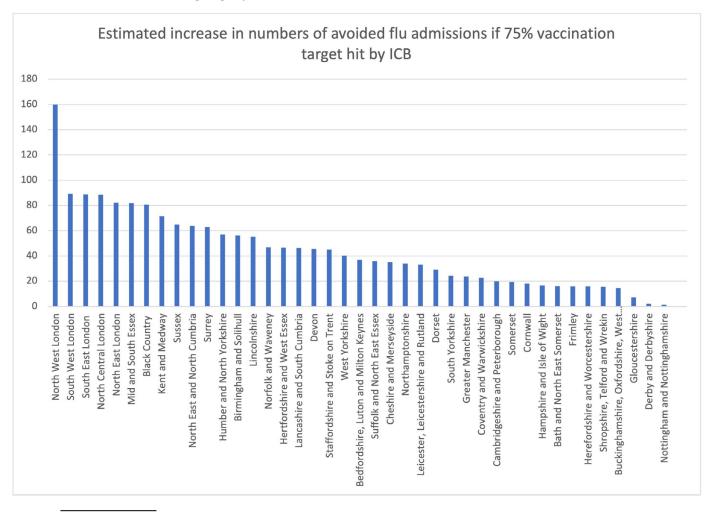
Flu

There were an estimated 42,669 hospital admissions for flu in the winter of 2018/19.⁶¹ In 2018 the WHO set a target for 75% of over 65s to be vaccinated.⁶² The average vaccination rate across CCGs was 71.4% in 2018-19 with only 30 CCGs meeting the 75% target.

If the 75% figure had been met by CCGs in England an estimated additional 1,829 hospital admissions for flu and 7,278 bed days would have been avoided.

When amalgamated to current ICB geographic level, all ICB geographies would have recorded vaccination rates of less than 75% – except Bristol, North East Somerset and South Gloucestershire – and would have seen a reduction in the number of hospital admissions for flu. The biggest gains would have been seen in the five London ICB geographies, with North West London seeing the largest reduction of an estimated 160 flu related hospital admissions.

Figure 4: Estimated hospital admissions for flu avoided if 75% vaccination target hit across ICB level geographies, 2018-19



⁶¹ Future Health analysis of Neri et al paper methodology of Hospital Episode Statistics; NHS source data available here: https://digital.nhs.uk/data-and-information/publications/statistical/hospital-admitted-patient-care-activity/2018-19

⁶² https://www.who.int/europe/news-room/fact-sheets/item/influenza-vaccination-coverage-and-effectiveness

Economic benefits of improved vaccination rates

The benefits of increased vaccination rates extend beyond health systems. Doherty et al note there are a much wider range of benefits from vaccination programmes: "these benefits can be expected to affect more than just the vaccinated person: improved quality of life in older adults will presumably also benefit their families and households, who often function as caregivers when older adults become ill or disabled. Extended healthy lifespans are also likely to provide broader economic benefits than just reduced medical costs, as healthy older people are more likely to remain engaged in the workplace and social activities."⁶³

Quilici et al similarly note the economic benefits of vaccination, in particular that 'a professionally active person who has an influenza-like illness will take, on average, 2 to 5 days of sick leave. When this is multiplied by the number of working individuals infected in different economic sectors, there is a substantial impact on the economic growth of a nation.'64

SAATI (Supporting Active Ageing Through Immunisation) a voluntary pan-European partnership conducted an extensive literature review which found that for four vaccines: herpes zoster, seasonal influenza, invasive PD and pneumonia, there were clear economic benefits around the implementation of the vaccines for adults over the age of 50, amongst high-income countries: UK, Germany, the Netherlands, Sweden, Belgium, France, Italy, Spain, Poland, Denmark, Finland, Slovakia and Czech Republic.⁶⁵

A study in the Netherlands found that for every one euro invested in adult vaccination for those over 50, over four euros is returned, through increased productivity, labour force participation and increased tax revenues.⁶⁶ An analysis of three vaccination programmes – HPV, shingles and PD – by the OHE similarly found a 2.18:1 return on investment from vaccinations.⁶⁷

Estimating the economic benefits of the flu and COVID-19 vaccination programme

Flu

A 2018 paper by Franklin and Hochlaf for the International Longevity Centre includes a methodology for estimating the economic benefits of flu vaccination. The paper uses a static model to estimate the number of flu cases averted as a result of vaccination. It uses cases averted to then projects the wider benefits these averted cases generate for the economy including reduced sick days and reductions in premature death amongst relevant groups (working age and over 65s). 69

⁶³ https://www.tandfonline.com/doi/full/10.1080/07853890.2019.1588470

⁶⁴ https://www.tandfonline.com/doi/full/10.3402/jmahp.v3.27044

⁶⁵ https://ilcuk.org.uk/immune-response-adult-immunisation-in-the-uk/

⁶⁶ https://ilcuk.org.uk/wp-content/uploads/2018/11/Adult-vaccination_a-key-component-of-health-ageing.pdf

⁶⁷ https://www.ohe.org/wp-content/uploads/2020/08/OHE-Vaccines-Report_2_finalv3.pdf

⁶⁸ https://ilcuk.org.uk/wp-content/uploads/2018/07/An_economic_analysis_of_flu_vaccination_-_ILC-UK.pdf

⁶⁹ https://ilcuk.org.uk/wp-content/uploads/2018/07/An_economic_analysis_of_flu_vaccination_-_ILC-UK.pdf

As Franklin and Hochlaf note "the efficacy of flu vaccination remains a big issue. With a new vaccine required each year, and the presence of different influenza strains, the efficacy of the flu vaccine can be precarious."⁷⁰

Future Health applied the Franklin and Hochlaf model to develop an estimate of the economic benefits of the flu vaccination programme in 2018-19. This found that:

- An estimated 154,596 sick days were averted as a result of the flu vaccination, with a saving to the economy of £16.3 million
- Lost productivity as a result of premature death was £63 million for those under 65 and £8.2 million for those over 65

Scenarios: economic benefits of improving vaccination rates

Future Health modelled the potential economic benefits that could be realised if flu vaccination rates were increased. Two scenarios were developed.

A modest improvement scenario sought to get vaccinations for both groups to 60% for under 65s and 85% for over 65s; both slightly above NHS annual targets.⁷¹

Under a significant improvement scenario, vaccination rates for the under 65s would reach 75% and the vaccination rate amongst those over 65 would reach 95%.

Using the Franklin and Hochlaf model and applying the modest improvement scenario, an estimated additional £9.8 million economic benefit would be realised as follows:

- £4.1 million more saved through reduced sick days
- £4.9 million less income lost from reduced mortality in working age adults
- £800,000 more informal care provided by those over 65 due to reductions in the mortality rate associated with increased vaccination

Using the Franklin and Hochlaf model and applying the significant improvement scenario, an additional £21.7 million economic benefit would be realised as follows:

- £9.1m more saved through reduced sick days
- £11.16m less income lost from reduced mortality in working age adults
- £1.46m more informal care provided through reduced mortality rate amongst over 65s

⁷⁰ https://ilcuk.org.uk/wp-content/uploads/2018/07/An_economic_analysis_of_flu_vaccination_-_ILC-UK.pdf

⁷¹ https://www.england.nhs.uk/south/wp-content/uploads/sites/6/2019/09/seasonal-vaccination-flu-report-18-19-final.pdf

COVID-19

Future Health used the same underlying methodology within the Franklin and Hochlaf model to develop an estimate of the economic benefits of the COVID-19 vaccination programme in 2021-22.⁷² This found that:

- An estimated 223,278 sick days were averted as a result of the COVID-19 2021-22 vaccination programme, with an economic benefit of £26.3 million 7374
- Lost productivity as a result of premature death was £673.45 million for those under 65 and £136.2 million for those over 65

Scenarios: economic benefits of improved COVID-19 vaccination rates

As with flu vaccination Future Health then modelled the potential economic benefits that could be realised if COVID-19 vaccination rates were improved. Two scenarios were developed:

- A modest improvement scenario sought to get vaccinations for both those over 65 and of working age to health system average rates (90.5% and 86.3% respectively) for those health systems with below average rates⁷⁵
- A significant improvement scenario where vaccination rates for both age groups would be at the highest health system rate recorded across all health systems (over 65s 95.7%, working age, 92%)

Using the Franklin and Hochlaf model and applying the modest improvement scenario, a £162.1 million economic benefit would be realised as follows:

- £662,000 more saved through reduced sick days
- £159 million less income lost from reduced mortality in working age adults
- £2.4 million more informal care provided by those over 65 due to reductions in the mortality rate associated with increased vaccination

Using the Franklin and Hochlaf model and applying the significant improvement scenario, a £293 million economic benefit would be realised as follows:

- £1.97 million more saved through reduced sick days
- £209.4 million less income lost from reduced mortality in working age adults
- £63.9 million more informal care provided through reduced mortality rate amongst over 65s

⁷² This estimate used the efficacy of the vaccine as set out in the Neri et al paper (90%) and NHS uptake rates of the vaccine amongst working age people (50-64) at ICB level to estimate the numbers protected by the vaccine. UKHSA incidence data was used to look at cases averted. This was then mapped to ONS economic and employment data to develop the estimated economic benefits such as sick days averted. Main Sources: https://www.gov.uk/government/statistics/national-flu-and-covid-19-surveillance-reports-2021-to-2022-season, https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/uklabourmarket/april2022, https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/averageweeklyearningsearn01/curren

⁷³ https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/uklabourmarket/april2022

⁷⁴ https://blog.goodshape.com/insights/nhs-mental-health-absences-last-three-times-longer-than-covid-absences

⁷⁵ https://www.england.nhs.uk/statistics/statistical-work-areas/covid-19-vaccinations/covid-19-vaccinations-archive/ (31 March 2022 data-set); health system refers to STPs



Against a backdrop of falling vaccination rates across certain programmes and the loss of WHO Measles free status in 2019 the UK Government committed to the publication of a vaccination strategy in the Prevention Green Paper. The strategy was set to deliver increased uptake of existing vaccinations, ensure new approved vaccinations were publicly available and that local immunisation coordinators and primary care networks were empowered to support community engagement.

The COVID-19 pandemic placed such policy work on hold as the NHS re-geared its operational focus to deliver the largest vaccination roll-out in history. The lessons and learnings from this exercise have been taken forward in the NHS vaccination strategy published in December 2023 which has three priorities:

- Improving access to vaccination including through online services
- Ensuring vaccines are available in more convenient places, with targeted outreach to support improved uptake amongst underserved populations
- A more joined-up prevention and vaccination offer⁷⁹

The strategy aims to focus on outcomes, through reducing morbidity and mortality as a result of improved vaccination uptake and coverage. A central role in the strategy is given to integrated neighbourhood teams working across Integrated Care Systems (ICSs). The strategy has 42 agreed actions across a set of strategic pillars including:

- Delivering a simple and efficient service front door
- Targeting under-served populations
- Strong system leadership
- Integrated multi-disciplinary teams
- A new commissioning and financial framework
- An integrated and flexible vaccination workforce
- Efficient and responsive vaccines supply
- Outbreak response capability⁸⁰

As part of the shift to outcomes, the Strategy commits to develop a vaccination outcomes framework. The vaccination outcomes framework aims to 'support maximum uptake and coverage in the overall eligible population by setting

⁷⁶ https://ukhsa.blog.gov.uk/2019/08/19/measles-in-england/

⁷⁷ https://www.gov.uk/government/consultations/advancing-our-health-prevention-in-the-2020s/advancing-our-health-prevention-in-the-2020s-consultation-document

⁷⁸ https://www.england.nhs.uk/wp-content/uploads/2023/12/PRN00339-nhs-vaccination-strategy.pdf

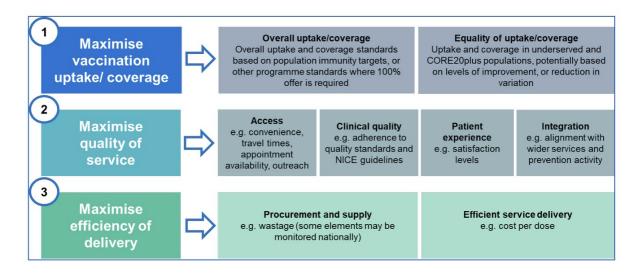
⁷⁹ https://www.england.nhs.uk/wp-content/uploads/2023/12/PRN00339-nhs-vaccination-strategy.pdf

⁸⁰ https://www.england.nhs.uk/wp-content/uploads/2023/12/PRN00339-nhs-vaccination-strategy.pdf

ambitious overarching targets for every system, as recommended by WHO.'81 The framework will also give systems the ability to set dynamic, improvement-based uptake and coverage trajectories for specific populations that are currently underserved. NHS England regional teams will work in partnership with systems to set stretching improvement targets based on the best available data and insight.

Figure 4: Draft vaccination outcomes framework

Annex A: Draft vaccination outcomes framework



The case for a cross government vaccination strategy and action plan

The publication of the NHS vaccination strategy is highly welcome and it will be important that the new Government – through the Department of Health and Social Care – holds the NHS and ICBs to account for the set of deliverables and targets included within the finalised vaccination outcomes framework.

However, by housing the strategy within the NHS there is a danger that the wider ambitions and benefits of improved vaccination, including the economic and societal benefits, are not realised. The NHS strategy itself is clear that delivering on the goals within it requires a wide array of partners across local government, communities, the public and industry with ICSs and the neighbourhood teams within them as the delivery vehicle for improvements.⁸²

The new Government has set out the importance of moving towards more of a preventative approach to health as part of both its health mission and manifesto. The manifesto notes that "we must change the NHS so that it becomes not just a sickness service, but able to prevent ill heath in the first place. It must also reflect the change in the nature of disease, with a greater focus on the management of chronic, long-term conditions."⁸³

⁸¹ https://www.england.nhs.uk/wp-content/uploads/2023/12/PRN00339-nhs-vaccination-strategy.pdf

⁸² https://www.england.nhs.uk/wp-content/uploads/2023/12/PRN00339-nhs-vaccination-strategy.pdf

⁸³ https://labour.org.uk/change/build-an-nhs-fit-for-the-future/

In the health mission Labour is clear that a shift to prevention will not be achieved 'by one department, the department of health, working on it – it will require cross-Whitehall joined-up government and a proper partnership with local communities.'84

However there are only two references to vaccination within the Labour health mission and manifesto respectively. The health mission focuses on the importance of vaccination as part of efforts to deliver more clinical trials and innovation; whilst the references within the manifesto focus on making booking vaccination appointments easier and using health visitors to improve uptake amongst vulnerable and at risk children (this pledge is repeated in the Child Health Action Plan).⁸⁵⁸⁶

The triple-win opportunity of vaccination for the new Government

An ambitious and broader Government plan for vaccination provides the opportunity for a triple-win that the new Government should seek to deliver on. This should build out from the platform produced by the NHS strategy and vaccination outcomes framework as follows.

Opportunity 1: Population health: improving health outcomes and tackling inequalities

The objective of Labour's health mission is to halve the gap in healthy life expectancy between the richest and poorest regions in England. This is an ambitious target and will need to be underpinned by a series of areas of focus that improve public health.⁸⁷ The previous administration had a similar target of improving healthy life expectancy by five years by 2035; but was well off track to achieving it.⁸⁸ Analysis from the Health Foundation found that it would take 192 years to meet the target on current progress.⁸⁹

The effectiveness of vaccines and inequalities in access and uptake, should make closing the variation in vaccine uptake rates, a priority for the new Government's health mission. Including vaccination as part of the health mission should help bring together relevant agencies and departments beyond the DHSC who can contribute to the goal of reducing variations in vaccine uptake and co-ordinating activity, such as MHCLG, DfE and DWP. Figure 5 sets out how such a cross Government approach could deliver improved vaccination uptake rates.

⁸⁴ https://labour.org.uk/wp-content/uploads/2023/05/Mission-Public-Services.pdf

⁸⁵ https://labour.org.uk/wp-content/uploads/2023/05/Mission-Public-Services.pdf

⁸⁶ https://labour.org.uk/updates/stories/labours-child-health-action-plan-will-create-the-healthiest-generation-of-children-ever/

⁸⁷ https://labour.org.uk/wp-content/uploads/2023/05/Mission-Public-Services.pdf

⁸⁸ https://assets-global.website-files.com/5da42e2cae7ebd3f8bde353c/5dda924905da587992a064ba_ Conservative%202019%20Manifesto.pdf

⁸⁹ https://www.health.org.uk/news-and-comment/charts-and-infographics/healthy-life-expectancy-target-the-scale-of-the-challenge

Figure 5: How a cross Government approach to vaccination can help deliver a healthier and wealthier nation

Department	Role in vaccination
Number 10	Setting priorities for mission based Government – including delivering economic growth and reductions in health inequalities
НМТ	Focused on delivering the growth within the economic mission. Investing in vaccination programmes as part of supporting a health service shift to prevention, and maximising the wider benefits of health system investment
DHSC (including, NHS, OHID and UKHSA)	Accountability for the performance of the NHS in England and the NHS vaccination strategy. Joint oversight of the Office for Life Sciences with ambitions for implementing the great health challenges within the Life Sciences Vision, which includes vaccination. DHSC includes those working in the Office for Health Improvement and Disparities (OHID) and the UK Health Security Agency (UKHSA) supporting efforts to improve public health and health protection
DSIT	Joint oversight of the Office for Life Sciences with ambitions for implementing the great health challenges within the Life Sciences Vision, which includes vaccination. Focused on increasing inward investment from life sciences companies into the UK
DBT	Driving forward Labour's Industrial Strategy with life sciences an identified priority sector
MHCLG	Overseeing and supporting the work of local authorities – important partners in the effective local delivery of vaccination programmes
DWP	Growing concern at the rise in the number of people out of work due to ill health and collaborating with the DHSC on initiatives and policies to tackle this
DfE	Important partner in supporting the delivery of the childhood vaccination programmes
DCMS	Can work with broadcasters and others to promote vaccination programmes, tackle anti-vaccination sentiment and build public confidence in vaccination

Opportunity 2: Health services: shifting health services towards prevention

One of the strategic shifts Labour has said it wants to deliver in health services is a greater shift to prevention. This has been a long standing policy goal which has been difficult in practice to realise. ICSs, bringing together relevant partners in the delivery of vaccination programmes creates a new opportunity to deliver this shift. ICSs can help tackle inequalities in vaccine uptake across communities, particularly through working with local integrated neighbourhood teams. NHS England's Core20PLUS5 framework to tackle health inequalities includes improved uptake of vaccination programmes as one of its five clinical areas. In the deliver in health services is a greater shift to prevent a service in the deliver in health services in the deliver of vaccination programmes as one of its five clinical areas.

Any new Government ten year healthcare plan with a pivot to prevention should include vaccination as a priority. If as part of the pivot, funding for prevention is to be ring-fenced and more transparent – as recommended in the Hewitt Review – vaccination funding should be included within this.⁹²

It will be important that ICSs are both resourced to deliver the ambitions set out in the NHS vaccination strategy and are clearly accountable for progress on performance.

Opportunity 3: Economic growth: driving inward investment in vaccine research and innovation

The success of the COVID-19 response and the UK's leadership role in vaccine research and innovation creates opportunities for life sciences inward investment, scientific innovation and economic growth.

The UK's COVID-19 vaccine development and roll out show what is possible when all parts of the system are aligned and move at pace; and demonstrated the potential of its scientific system to support innovation. From discovery and clinical trials through to licencing and generation of post-approval real-world effectiveness data, the UK has the potential to maintain this leadership to accelerate access to novel vaccine technology for the benefit of the population, NHS, and economy.

The life sciences sector is working to advance vaccine innovation into new therapeutic areas and extending applications to greater numbers of people. This includes new and updated vaccines in PD, influenza, RSV and C. difficile. The development of new technologies can also help better match the vaccine to viruses in circulation.

Doing so will require a continued focus on improving and modernising the systems that support vaccine innovation – learning from COVID-19 – and fully resourcing capabilities within Government and regulators such as the Joint Committee on Vaccination and Immunisation (JCVI) and Medicines and Healthcare Regulatory Authority (MHRA) to enable this. The work of the Life Sciences Council should

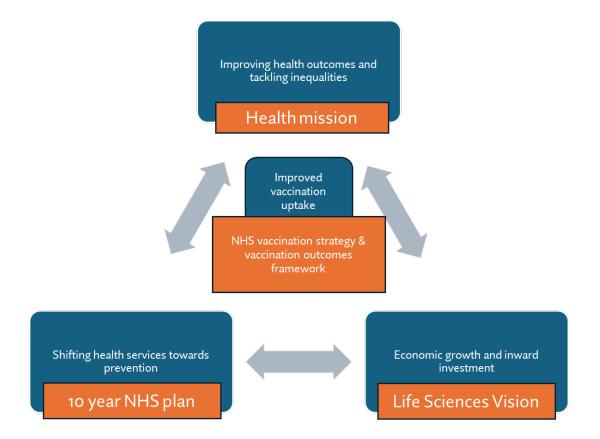
⁹⁰ https://labour.org.uk/wp-content/uploads/2023/05/Mission-Public-Services.pdf

⁹¹ https://www.england.nhs.uk/about/equality/equality-hub/national-healthcare-inequalities-improvement-programme/core20plus5/

⁹² https://www.gov.uk/government/publications/the-hewitt-review-an-independent-review-of-integrated-care-systems

be set-up to deliver this, putting new energy behind the Life Sciences Vision and feeding into the Industry Strategy Council and Labour's wider economic mission.

Figure 6: A cross Government policy framework to deliver the vaccination triple-win



CONCLUSION

Vaccinations save lives, reduce pressures on stretched health services and can help support wider Government goals for improved public health and economic growth.

For the new Government the opportunity exists to embed vaccination as a priority within its public health, economic and NHS agendas to deliver a healthier and wealthier nation. To do so will require greater Government ambition on vaccination to join-up and co-ordinate the actions of departments and agencies to build a policy framework that improves access to vaccination, tackles health inequalities and delivers economic growth.

The development of health and economic missions central to the new Government's agenda provides a potential approach to deliver on this higher level of ambition and ensure that the legacy of the pandemic for vaccine innovation and delivery is both embedded and expanded to deliver improved public health both this winter and beyond.



