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Assessing the economic impact of tackling elective waiting times

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1. Executive Summary

For the first time, hospital and elective waiting time data has been linked with HMRC PAYE data by the Office for National Statistics (ONS). This creates a globally exceptional, rich pseudonymised dataset which covers approximately 30 million working-aged people in England – nearly 90% of the working-age population – which allows for granular and accurate analysis of health policies and interventions on labour market outcomes. Novel analysis using this linked dataset demonstrates there are multi-billion pound economic and fiscal benefits in achieving the Government's Plan for Change ambition to meet the referral-to-treatment standard for elective procedures with a follow-up work on the data already being explored. These findings highlight the strong relationship between NHS performance and economic outcomes but likely only reflect a fraction of the full effect of health on economic outcomes.

2. Background

Elective waiting times have been growing for over a decade and the Government's Plan for Change (PfC) committed to return elective waiting times to constitutional standards; that 92% of patients in England are waiting no longer than 18 weeks for elective treatment by the end of parliament. Meeting this target will significantly improve population health and wellbeing. Analysis carried out by NHS England using ONS estimates shows that meeting this ambitious target will also have a significant economic effect - at least £2.7 billion additional cumulative pay by 2030/31**.**

There is now wide clinical consensus that good work is good for your health, and good health is good for your work[1]. Keeping people healthier helps them to stay in work, which in turn supports their health and wellbeing. The number of people who are economically inactive primarily due to long-term sickness has grown substantially since 2019 and reached record highs of 2.8 million people across the UK in 2023[2], and there are likely millions more people with work-limiting health conditions.

As well as having negative impacts on health and wellbeing, economic inactivity due to health conditions comes with great costs; spending on health and disability benefits is expected to rise from £64.7bn in 2023-24 to £100.7bn in 2029-30[3]. The Government has committed to take action at scale to tackle the drivers of this rise by improving population health and improving core NHS performance.

There is a clear case for change, however the evidence base on the impact of health interventions on economic outcomes is limited. To build a more robust evidence base around health intervention on employment, the NHS Health and Growth Accelerators were launched

[1] 2025 Healthcare Professions' Consensus Statement for action on health and work | Academy of Medical Royal Collages
[2] Employment in the UK: September 2025
[3] Welfare trends report – October 2024 - Office for Budget Responsibility

in April 2025. The 10 Year Health Plan commits to all ICBs establishing specific and measurable outcome targets on their contribution to reducing economic inactivity and unemployment based on the Health and Growth Accelerator models. The findings outlined here show that the economic and fiscal benefits of cutting elective waiting times alone are significant; full improvements to both population health and economic outcomes from the three shifts to prevention, community and digital in the 10 Year Plan will likely be far greater.

3. Analysis

3.1 Key findings

Preliminary findings[4] indicate that reducing waiting times for all relevant elective activity under the PfC delivers significant economic and fiscal benefits:

- At least **£2.7 billion additional cumulative pay by 2030/31** (translates to 63,000 person-years of employment over the period),
- At least **£1.1 billion pay impact in 2030/31** (translates to approximately 26,000 person-years of employment over the period),
- We would also expect a fiscal upside to HMT of **more than £1 billion** over the period (cumulative).[5]

These findings are based on the modelling of around 40% of elective activity[6] and likely underestimate the true impact. We are only able to model about a quarter of all outpatient activity and cannot generalise to the full sample.

However, even a very conservative assumption of the remaining 75% of outpatient procedures having the same impact as the 25% modelled, would result in the **total cumulative pay impact of around £4.1 billion.**

3.2 A unique data set

The data for the analysis came from the ONS linked dataset. This links health data from NHSE and administrative data on monthly pay from HMRC at person level and is pseudonymised. The dataset is similar to what has been utilised in previous ONS research looking at the impact of interventions on labour market outcomes.[7] The dataset comprises the following:

- 2011 Census which is used as a spine and a source of demographic data;
- Hospital Episode Statistics (HES) Admitted Patient Care (APC) and Outpatients (OP) which is used to provide timing of procedure and treatment code for inpatients and outpatients;
- Waiting List Minimum Data Set (WLMDS) – not used in the Steps 1 and 2 of the methodology, used in Step 3;
- HMRC PAYE data which is used to provide monthly pay and employee status;
- ONS death registrations.

[4] Findings are displayed in 2023 prices
[5] Estimated using the OBR "Fiscal Risks and sustainability" report (2023) looking at both tax and benefit receipts
[6] Excluding activity likely to be related to childbirth
[7] See examples of the studies on the impacts of Bariatric Surgery and Talking Therapies

The linked dataset is pseudonymised and contains the majority of patients in England, which is approximately 30 million people. It therefore allows for robust and accurate estimation of the impacts given the large sample of data even after splitting the data by the elective specialties.

3.3 Methodology

The modelling has 3 distinct steps:

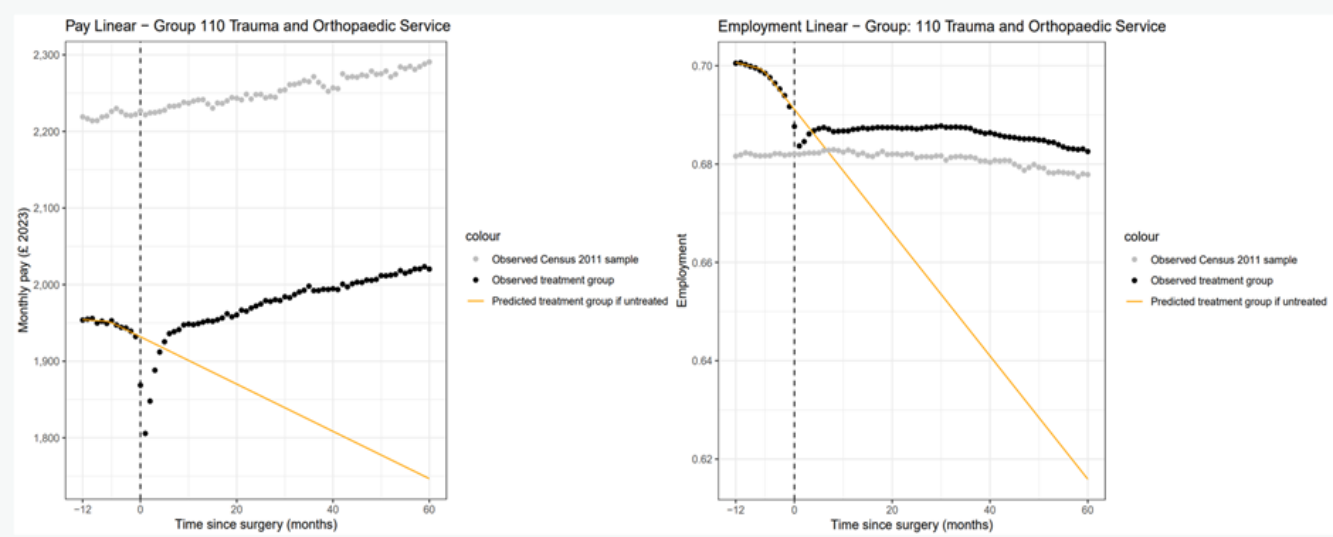
- Step 1 - modelling of the treatment effect of the elective procedure;
- Step 2 – conducting a "what-if" analysis to estimate the impact of reducing waiting times in 2023/24 back to their target levels;
- Step 3 – taking the per-person impacts from Step 2 the impact of the elective waiting time reduction due to PfC funding is modelled.

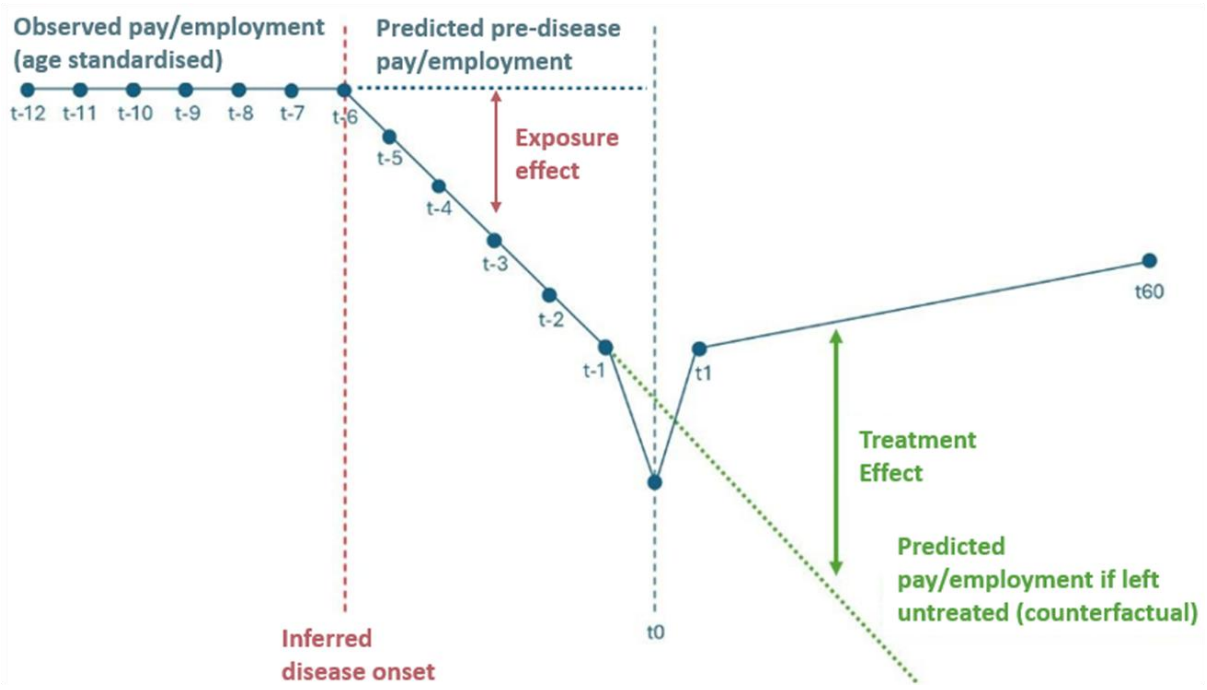
Step 1 – Estimating the treatment effect of elective procedures
The analysis focused on working-age adults aged 30 to 59 years who underwent elective procedures between April 2015 and March 2023. Treatment function codes were used to categorise elective procedures consistently across inpatient and outpatient settings, ensuring that patients were grouped according to the specialty of the consultant responsible for their care. Patients who had received inpatient care were removed from the outpatient cohort, to prevent contamination of inpatient treatment effects.

Monthly trajectories in average earnings and probability of employment before and after treatment were computed; these were standardised to the age distribution in the month of surgery, to account for the labour market effects of patients ageing over the study period. In order to estimate the treatment effect of the elective procedure a regression modelling approach was used to construct a counterfactual trend for the labour market outcomes – pay and employment – in the absence of an elective procedure. This 'interrupted time series' counterfactual approach has been chosen since everyone waiting for an elective procedure eventually gets a treatment and therefore there is no control group available for the modelling purposes.[8] This counterfactual represents what would have happened to monthly pay and employment had the elective procedure not taken place. This has been sense-checked with clinicians across 15 major specialties to ensure validity of this counterfactual approach, and specifically that the pre-procedure trends in pay and employment are due to deteriorating health and not due to any clinical advice to reduce or stop working.

The regression model was fitted to the period 12 months prior to treatment, with a breakpoint identified during this period to represent a downturn in the trajectory due to onset of illness. The model fitted to months after the breakpoint but before treatment was then used to extrapolate the trajectory over the five years after treatment. The approach is visualised below with the counterfactual trend depicted in yellow and the observed age-standardised trajectories depicted in black. This graph shows employment and income outcomes for patients treated in inpatient trauma and orthopaedic care.

[8] With it being hugely unethical to deny patients access to elective procedures for the purposes of building a randomly selected control group, as would be done in a randomised control trial.





Depicted above is the modelling framework used in the analysis: it shows observed pay and employment declining in the period before treatment, reflecting deteriorating health (exposure effect), compared with the predicted pre-disease trajectory. At the point of treatment (t0), outcomes diverge: the counterfactual line projects continued decline if untreated, while the observed post-treatment path reflects recovery. A linear model was developed, incorporating pre-procedure illness-related declines in pay and employment, in order to capture the labour market benefits of reduced waiting times.

Step 2 – conducting a "what-if" analysis to estimate the impact of reducing waiting times in 2023/24 back to their target levels

In order to assign each patient in 2023/24 a “target” waiting time, we assumed they would remain on their observed percentile of the waiting time distribution, but the shape of the distribution looked like it did in 2015/16 – the last year when the statutory target was met.

We then evaluated the impact of patients’ waiting times moving from their observed to their target levels in terms of three components:

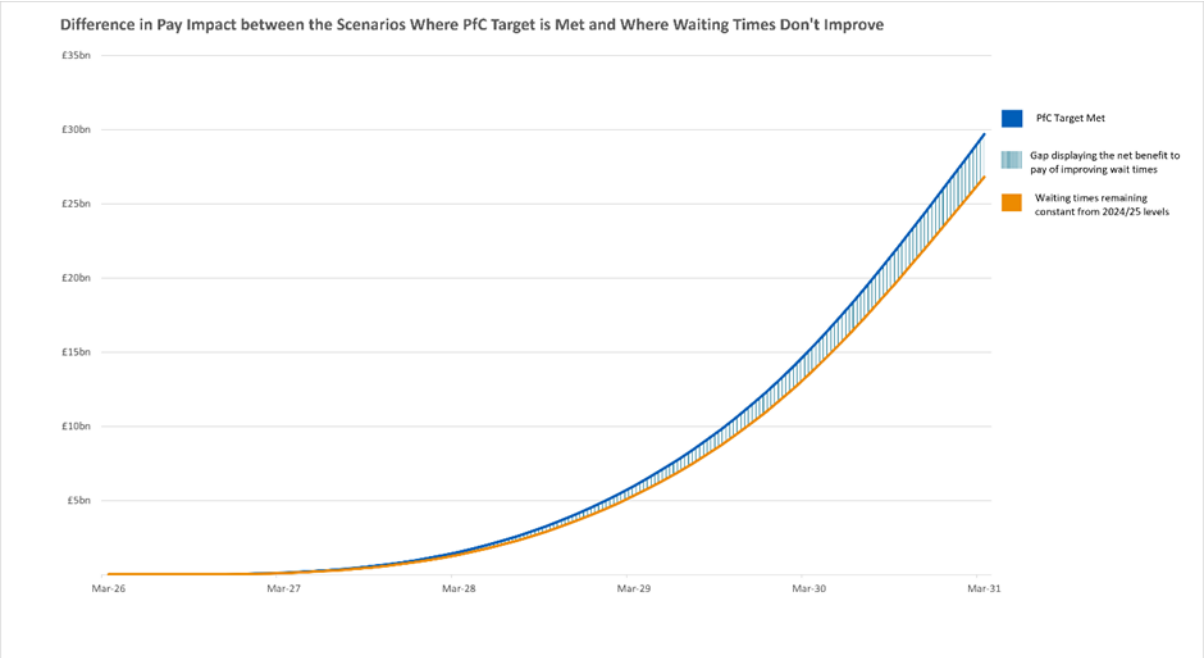
1. The additional treatment effect, as described in Step 1, that would be accrued over the period five years after decision-to-admit (inpatients) or referral (outpatients)
2. The reduction in the loss of pay/employment accrued whilst exposed to illness before treatment
3. The fact that had patients been treated earlier, the post-treatment turning point in their pay/employment trajectory would have occurred earlier, so their observed pay/employment over the post-treatment period would have remained at a higher level

Step 3 – Scenario modelling of PfC impacts

Using the per-person estimates from Steps 1 and 2, along with estimates for the number of patients treated during the scorecard period (defined as 2025/26 through 2028/29, when the PfC target is due to be achieved), we modelled the impact of reductions in elective waiting times. We considered two scenarios: one in which the PfC target was met, and one in which waiting times remained constant. The scenario where the target was met made two changes compared to the no-improvement scenario.

- The per person effects for each specialty gradually improved within the scorecard period from observed impacts which are taken as the baseline, calculated in step 1, to target per person effects detailed in step 2. Whereas the scenario which saw no improvement had per person effects remain constant at baseline levels.
- The scenario where waiting times improved also assumed more patients would be treated in order to reduce waiting times and meet demand in the scorecard period.

The difference in pay and employment impact in the two scenarios was calculated for each specialty up until 2030/31 to give an estimate of the benefit of improving waiting times to constitutional standards. This difference is detailed in the graph below which shows the net benefit increase year on year.



4. Discussion

This analysis is unique as the dataset it draws on allows a very rich and accurate understanding of the impact of both the elective procedures and reduction in the elective waiting times, and is the first of its kind to utilise such an extensive data linkage at person level. The analysis is further assured by engagement with clinicians in the top 15 specialties modelled who reviewed the counterfactual modelling approach outlined above in Step 1.

The findings show significant benefits of the elective waiting time improvement, however the findings presented here are conservative and are likely to underestimate the true impact of the reduction in elective procedure waiting times. This is for several reasons:

- Firstly, the analysis currently assumes that treatment effects are independent of waiting times. Clinical input suggests earlier treatment may lead to greater benefits, especially for progressive conditions where delays can worsen health outcomes and people may experience prolonged detachment from the labour market. This is being explored in the next stage of the analysis.
- Secondly, due to a limitation of the HMRC PAYE data self-employed people are treated as earing £0 and therefore would be captured as not working in this analysis. In the study period, self-employed people made up on average 14.2% of the workforce, so the preliminary pay and employment results could be increased by further to generalise to the working population.
- Thirdly, whilst we are able to estimate the full impact for the inpatient procedures, the outpatient procedures modelled cover about 25% of all the outpatient procedures (due to modelling feasibility). It is not a straightforward process to estimate the impact of the remaining 75% of the outpatient procedures which is why the findings above reflect the impact of the 25% of the outpatient procedures. Even at a very conservative assumption of the 75% of the outpatient procedures having the same impact as the 25% modelled, the total cumulative pay impact may be expected to be over £4 billion.

It is important to note a few caveats to the analysis:

- The impacts of the elective waiting time reduction across specialties are not strictly additive as the study populations are not mutually exclusive. Step 3 of the modelling has accounted for this to an extent but there remains a possibility of some degree of double-counting if estimates are summed across treatment specialties[9].
- Modelling for inpatient procedures was carried out across around 96% of all the inpatient procedures. To arrive at the full impact for the inpatient procedures an uplift factor was used to generalise the impact to all the inpatient procedures using a minimum number of assumptions.
- Finally, the study period covers the COVID-19 pandemic which has not been separately controlled for.

This analysis is the most comprehensive to date, developed by a rich, novel dataset that will provide the foundation for deeper understanding of the fiscal impact of breaches of the referral-to-treatment standard for elective procedures. The IFS published analysis earlier this year that considered the relationship between NHS waiting times and health-related benefit claims[10]. While no strong or consistent relationship was found, the methodology used aggregate data to analyse the relationship between NHS waiting times and health-related benefit claims, including Personal Independence Payment (PIP) and the health-related element of Universal Credit (UC), as opposed to HMRC PAYE data. These findings are not comparable with our own due to differences in scope, data sources and methodology.

Other evidence has previously suggested a stronger relationship between waiting times and economic outcomes. For example, a Norwegian study of how waiting times for non-emergency orthopaedic surgery affect health and labour market outcomes utilised similar linked administrative datasets to those in this paper. They found persistent effects on the labour market, including increased waits to be associated with reduced earnings, increased sickness absence and increased benefit claims over the 5-years following treatment[11].

5. Conclusion

The Government has committed to tackling the crisis of health-related economic inactivity. This will be key to improving population health, strengthening our communities and growing the economy, both now and in the future. We also know that by tackling demand, reducing economic inactivity will also support improving NHS performance. This analysis has not considered the extent to which rising elective waiting times have contributed to the post-pandemic rise in economic inactivity.

[9] Over the study period, 12% of inpatients and 30% of outpatients belonged to multiple treatment specialties.
[10] The relationship between NHS waiting list and health-related benefit claims
[11] Impacts of Hospital Wait Time on Health and Labour Supply