Office for National Statistics

Statistical bulletin

Relationship between the NHS Diabetes Prevention Programme and monthly earnings, employee status and unplanned hospital admissions, England: April 2014 to December 2022

Modelled estimates of the changes in monthly employee earnings, employee status and probability of unplanned hospital admissions before and after attending the NHS Diabetes Prevention Programme by sex, age group, ethnic group, area deprivation, and body mass index category.

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1 . Main points

- The NHS Diabetes Prevention Programme (DPP) is a nine-month, lifestyle-change programme aimed at reducing the risk of developing type 2 diabetes in people who have been identified as being at risk.
- Other studies have shown that the DPP leads to reductions in weight and risk of developing diabetes, however, the relationship between this intervention and labour market outcomes and unplanned hospital admissions is not well understood.
- Compared with the six-month period before the initial assessment for the DPP, we find no evidence of an increase in earnings or probability of employment among working-age individuals in England who complete the DPP, within five years of starting (end of follow-up time).
- We find some evidence of a decrease in unplanned hospital admissions four to five years after completing the DPP, compared with the six-month period before the initial assessment.
- By age band, younger participants show some recovery in earnings to above pre-DPP levels four to five years after the programme, while older participants show the greatest reduction in unplanned hospital admissions.

There are downward trends in earnings and probability of employment before initial assessment for the DPP that remain unaccounted for after model adjustments. These trends mean that we cannot precisely infer the extent to which the DPP caused subsequent changes in outcomes, particularly among older age groups, and all results should be interpreted with caution.

This project was funded by the UK government'sLabour Markets Evaluation and Pilots Fund (2024 to 2025) and is one of a series of studies looking at the impact of health conditions and interventions on labour market outcomes.

2 . Data on the relationship between the NHS Diabetes Prevention Programme and monthly earnings, employee status, and unplanned hospital admissions

Relationship between the NHS Diabetes Prevention Programme and monthly earnings, employee status and unplanned hospital admissions, England: April 2014 to December 2022
Dataset | Released 5 November 2025
Descriptive statistics and model estimates for the change in monthly employee earnings, employee status and probability of unplanned hospital admissions after participation in the NHS Diabetes Prevention Programme, compared with six months before the initial assessment. Includes breakdowns by sex, age group, ethnic group, area deprivation, and body mass index category.

3 . Glossary

Diabetes Prevention Programme

The Healthier You NHS Diabetes Prevention Programme is a nine-month lifestyle change programme aimed at individuals at risk of developing type 2 diabetes. It provides evidence-based support to help people manage their weight, eat more healthily, and increase physical activity - important factors proven to reduce the risk of developing the condition.

Participants can choose between a face-to-face group service or a digital version. The face-to-face option offers personalised guidance in a group setting, while the digital version provides personalised one-to-one coaching, in addition to tools such as fitness trackers, health coaching apps, and online peer support groups to help participants monitor and achieve their health goals.

Research shows that the DPP has reduced new cases of type 2 diabetes in England, and that completing the programme is linked to lower incidences of type 2 diabetes and other long-term conditions. Those who attend 60% or more of the 13 programme sessions reduce the risk of developing type 2 diabetes by almost a third.

Fixed effect regression

We have described the fixed effect regression we use in Section 4: Glossary of The impact of bariatric surgery on monthly employee pay and employee status, England: April 2014 to December 2022.

Inverse probability weighting

The type of inverse probability weights we use are described in Section 4: Glossary of The impact of NHS Talking Therapies on monthly employee pay and employment status, England: April 2014 to December 2022.

4 . Data sources and quality

Linked dataset

We used an extension of the Public Health Data Asset (PHDA) to include data on employee pay. The de-identified, linked dataset comprises:

- Census 2011
- Office for National Statistics (ONS) death registrations, covering deaths registered from 1 April 2014 to 31 December 2023 and occurring up to 31 December 2022
- Pay As You Earn (PAYE) Real-Time Information (RTI) records from HM Revenue and Customs (HMRC) covering 1 April 2014 to 31 December 2022
- NHS Diabetes Prevention Programme (DPP) dataset
- Hospital Episode Statistics (HES) Admitted Patient Care (APC) records from 1 April 2009 to 31 December 2022

We have previously described the data security processes we employ in our Using the power of linked data to understand factors preventing people from working blog post.

All the datasets used for this analysis have been de-identified. This means no individual's attribute information can ever be directly identified from the data held by the Office for National Statistics. This is because information that can be used to directly identify individuals such as names, addresses and NHS numbers have been removed in a secure virtual environment before the datasets are combined and analysed.

The de-identified linked data will only be used for statistical production and research, in line with the Code of Practice for Statistics. It cannot be used for operational purposes, such as making decisions over individuals' access to healthcare or benefits. More information on the use of data at the Office for National Statistics can be found on our Sources of Data page. Ethical approval for this work was provided by the National Statistician's Data Ethics Advisory Committee.

Individuals' Census IDs were linked to an encrypted version of their National Insurance Numbers (NINo), which is the identifier used for HMRC records, via the Demographic Index, as described in our 2011 Census linkage to DWP master key and encrypted NINo methodology. Census ID was linked to the death registration datasets using the Patient Register 2011 to 2013.

The PAYE RTI data were calendarised to derive monthly employee pay (gross earnings), in line with the methods described in our Monthly earnings and employment estimates from Pay As You Earn Real Time Information (PAYE RTI) data methodology. Where an individual had a Census ID linking to multiple monthly PAYE RTI records, pay was summed across all matching records for each month.

Negative monthly pay records were imputed to be zero. Monthly pay above the 99.9% centile was set to the value at the 99.9% centile. Monthly pay was deflated to 2023 prices using the Consumer Price Index including owner occupier's housing costs (CPIH). Being a paid employee was defined as receiving any amount of pay in a month.

Unplanned hospital admissions, defined as an emergency admission, were identified using HES APC data. The unplanned hospital admissions variable was a binary variable based on whether someone had an unplanned hospital spell starting in that month.

Data inclusion criteria and follow up

For inclusion in the study dataset, individuals were required to have a 2011 Census record that could be linked to the NHS and HMRC information. Individuals were included if they had an initial assessment in the NHS DPP dataset between 1 June 2016 and 28 February 2022. Individuals were excluded if they:

- completed the programme with a provider who followed a different programme structure during Framework 1 (excluded because the NHS DPP dataset provided did not cover all the information we required for this provider in this framework)

- were referred via the Direct-to-Consumer scheme (excluded because these individuals were able to self-refer during the coronavirus (COVID-19) pandemic, meaning that they may not have had prediabetes)

- were referred for gestational diabetes but did not have prediabetes (excluded because they did not have prediabetes)

The sample was restricted to individuals resident in England, as recorded in the NHS DPP dataset if available and Census 2011 if not, and aged 25 to 59 years on the date of initial assessment.

Individuals were defined as treated if they had completed the DPP, defined as attending 60% of the intervention sessions, and untreated if they had an initial assessment but did not complete any intervention sessions. The resultant study population contained 39,542 treated individuals and 20,095 untreated individuals. Sociodemographic information on the cohorts of individuals are provided in our accompanying dataset.

To account for different trends between individuals who completed the programme and those who did not, we used inverse probability weights to improve comparability.

Individuals were followed up for a maximum of five years pre and post-initial assessment, between 1 April 2014 and 31 December 2022. Follow-up time was censored at death.

Modelling

We used fixed effects regression modelling to estimate average changes in monthly employee pay, employee status and unplanned hospital admissions that are attributable to having completed the DPP, among working-age individuals in England at different time periods after initial assessment compared with the six-month period before the initial assessment. We used a difference-in-difference approach, where changes in the outcomes are compared between treated and untreated individuals, to take into account natural recovery or progression of ill-health. We accounted for changes in background economic conditions and aging effects by including calendar time and age in the model.

We analysed the effect of completing the DPP on three outcomes:

- monthly earnings

- probability of being a paid employee

- probability of unplanned hospital admissions

We calculated the average change in monthly earnings first for all individuals in the sample (where earnings are zero for those not in employment), and second including only the months in which individuals were in paid employment.

Quality

The Public Health Data Asset (PHDA) is a population-level dataset for England. Of the 1,314,586 individuals in the DPP dataset with a non-imputed record in the 2011 Census, 98.6% (1,296,151) could be linked to both NHS and HMRC information.

The quality of Public Health Data Asset (PHDA) and HMRC PAYE datasets is described in Section 5: Data sources and quality of our article The impact of bariatric surgery on monthly employee pay and employee status, England: April 2014 to December 2022.

Acknowledgements

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- Imperial College London
- University of Leicester
- NHS England
- University of York

5 . Related links

2011 Census linkage to DWP master key and encrypted NINo
Methodology | Released 6 December 2024
Linkage methodology and quality information for 2011 Census linkage to DWP (Department for Work and Pensions) master key and encrypted NINo (National Insurance number).

Using the power of linked data to understand factors preventing people from working
Blog | Released 5 December 2023
Emma Rourke explains how linked, population-level data can improve our understanding of the interplay between health and work, with the goal of improving the well-being of individuals and the economy.

The impact of bariatric surgery on monthly employee pay and employee status, England: April 2014 to December 2022
Statistical Bulletin | 23 October 2024
The change in monthly employee pay and employee status attributable to having had bariatric surgery, in different time periods after surgery, compared with six months before surgery.

Impact of health conditions requiring hospitalisation on earnings, employment and benefits receipt, England: April 2014 to December 2022
Article | 25 June 2025
The change in earnings, probability of being a paid employee and probability of benefits receipt attributable to having a major condition requiring hospital admission, compared with a reference period before the hospital admission.

6 . Cite this statistical bulletin

Office for National Statistics (ONS), released 5 November 2025, ONS website, statistical bulletin, Relationship between the NHS Diabetes Prevention Programme and monthly earnings, employee status and unplanned hospital admissions, England: April 2014 to December 2022