Office for National Statistics

Statistical bulletin

The impact of motherhood on monthly employee earnings and employment status, England: April 2014 to December 2022

The change in employee earnings and employment after having a first, second and third child, for people with children.

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1 . Main points

- Having children leads to a substantial and long-lasting reduction in mothers' earnings; five years after the birth of a first child (Quarter 20), monthly earnings were reduced on average by 42%, or £1,051 per month, compared with earnings one year before the birth.
- The total earnings loss over five years amounts to an average of £65,618 following the birth of a first child, £26,317 following the birth of a second child and £32,456 following the birth of a third child.
- Part of this reduction in earnings is the result of a reduction in employment; the probability of paid employment was significantly reduced for five years after the birth of a first child, compared with one year before birth, with a peak reduction of 15.0 percentage points one and a half years after having a child.
- The probability of paid employment was also significantly reduced after a second and third child for five years, compared with one year before birth, with a maximum reduction of 10.5 percentage points almost two years after the second birth and 10.5 percentage points two and a half years after the third birth.
- Earnings among those who were in paid employment followed a similar pattern to earnings overall, with the biggest loss in earnings after the first birth, and sustained reductions in earnings for five years after each birth.

All the datasets used for this analysis have been de-identified in a secure virtual environment before they are combined and analysed. In line with the Code of Practice for Statistics, the de-identified linked data will only be used for statistical production and research. Read more in Section 5: Data sources and quality.

This project was funded by the UK government's Labour Markets Evaluation and Pilots Fund (2024 to 2025).

2 . Results of the analysis

We used fixed effects regression modelling to estimate average changes in monthly employee earnings and probability of being a paid employee that are attributable to having one, two or three children. For definitions of fixed effect modelling see Section 4: Glossary.

We estimated the average change in monthly employee earnings for everyone, including individuals who may not be in work (with a pay of £0 in a month). As any changes from this model may be affected by changes in whether individuals are employed or not, or in changes in earnings among those people who are employed (where pay is greater than £0 in a month), we also estimated average changes in probability of paid employment and monthly employee earnings among those in paid employment.

For all analyses, pay and probability of paid employment in a quarter used a reference quarter of one year before the birth (Quarter minus 4), while estimating earnings and probability of paid employment across people who had a birth, and the control cohort. The effect of first, second and third births was estimated in the same model. As a result, the change in earnings and probability of paid employment following each birth can be interpreted as the effect of that birth, independently of the effect of the other two births in the model.

Further analysis including descriptive statistics, breakdowns by sociodemographic characteristics and age groups, and data up to eight years after the first birth and seven years after the second birth can be found in our accompanying dataset.

This release uses data from between 2014 and 2022. The effects estimated using these data may not be applicable to births that happen in more recent periods, as the policy and economic landscape is different. The data used cannot distinguish changes in hours worked or non-regular pay, including maternity pay. See Section 5: Data sources and quality for further information.

Effects of having children on earnings

The main results for earnings following the birth of a first, second and third child are shown in Figure 1.

Figure 1: Earnings were consistently lower after having a child compared with the year before having that child

Average changes in monthly employee earnings, England, 1 April 2014 and 31 December 2022

Notes:

1. Data include individuals who had a child between 1 April 2014 and 31 December 2022, aged between 18 and 60 years when they had their first child, aged between 21 to 60 years in a quarter, and ordinarily resident in England.
2. Outcomes for each Quarter are compared with one year before the birth (quarter minus 4), including the quarter when the birth occurred.
3. The error bars are 95% confidence limits.
4. Pay is gross monthly earnings paid to employees, in 2023 equivalent values.
5. Being a paid employee is defined as receiving a monthly pay greater than £0.

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Average monthly earnings were lower following a first, second and third birth, each compared with one year before the respective births.

The average total loss in earnings was:

- for a first birth, £65,618 over five years (41.6% relative reduction)
- for a second birth, £26,317 over five years (21.5% relative reduction)
- for a third birth, £32,456 over five years (26.8% relative reduction)

Across those in the study population, monthly earnings were reduced across the entire follow-up period after birth, but were most strongly affected in the first year, with maximum losses in the first year (in Quarter 2) of:

- £1,553 per month following a first birth
- £965 per month following a second birth
- £665 per month following a third birth

During this first year, women are most likely to take parental leave of some duration.

For all births, the decrease in earnings began to stabilise from one year after the birth onwards, and this decrease is less likely to be affected by parental leave. For first births, this was a loss of between £948 (Quarter 5) and £1,051 (Quarter 20) compared with the year before. This equates to a relative reduction of between 37.9% and 42.0% loss in earnings per month between one and five years after the birth of a first child.

After the birth of a second child, the earnings reduction stabilised between Quarters 5 and 20, with an average monthly loss of £348, equating to an average relative reduction of 17.9%.

After the birth of a third child, between Quarters 5 and 20, there was a slow increase in the average monthly reduction in earnings, from £365 per month in Quarter 5 to £689 in Quarter 20, equating to relative reductions in earnings of 19.0% to 35.8%.

Effects of having children on probability of being in paid employment

The main results for the probability of being in paid employment following the birth of a first, second and third child are shown in Figure 2.

Figure 2: The probability of being in paid employment remained lower after having a child compared with the year before having that child

Average changes in the probability of being in paid employment, England, 1 April 2014 and 31 December 2022

Notes:

1. Data include individuals who had a child between 1 April 2014 and 31 December 2022, aged between 18 and 60 years when they had their first child, aged between 21 to 60 years in a quarter, and ordinarily resident in England.
2. Outcomes for each Quarter are compared with one year before the birth (quarter minus 4), including the quarter when the birth occurred.
3. The error bars are 95% confidence limits.
4. Being a paid employee is defined as receiving a monthly pay greater than £0.

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There was a significant drop in the probability of being in paid employment after the first, second and third births, respectively. We found a maximum reduction of:

- 15.0 percentage points (Quarter 6) after the first birth, with the probability still being 11.2 percentage points lower than baseline levels five years after (Quarter 20) the first birth
- 10.5 percentage points (Quarter 7) after the second birth, compared with a year before the second birth, and by Quarter 20 this reduction remained at 5.7 percentage points
- 10.5 percentage points (Quarter 11) after the third birth, compared with a year before the third birth, and by Quarter 20 this remained as a 7.8 percentage point reduction in paid employment

Effects of having children on earnings among those in paid employment

The main results for earnings among those in paid employment following the birth of a first, second and third child are shown in Figure 3.

Figure 3: Earnings among those in paid employment continued to be lower after having a child compared with the year before having that child

Average changes in earnings among those in paid employment, England, 1 April 2014 and 31 December 2022

Notes:

1. Data include individuals who had a child between 1 April 2014 and 31 December 2022, aged between 18 and 60 years when they had their first child, aged between 21 to 60 years in a Quarter, and ordinarily resident in England.

2. Outcomes for each quarter are compared with one year before the birth (quarter minus 4), including the Quarter when the birth occurred.

3. The error bars are 95% confidence limits.

4. Pay is gross monthly earnings paid to employees, in 2023 equivalent values.

5. Being a paid employee is defined as receiving a monthly pay greater than £0.

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Among those in paid employment, we found a similar pattern with earnings. Earnings were significantly reduced for first, second and third births, with average total losses of:

- for a first birth, £64,715 over five years
- for a second birth, £25,877 over five years
- for a third birth, £32,872 over five years

In the year after each of the births, earnings reduced by a maximum of £1,765, £1,270 and £1,042 (all occurred in Quarter 2) for first, second and third births, respectively.

Following the first year, for all births, earnings continued to be lower than baseline. For first births, earnings stabilised at £896 per month in Quarter 5 to £1,011 per month in Quarter 20. For second births, the loss in earnings stabilised between £293 per month (Quarter 5) to £264 per month by Quarter 20. Between one and five years after a third birth, the reduction in earnings slowly increased, reducing by £319 per month in Quarter 5 and £779 per month in Quarter 19.

While we cannot identify the reasons for this loss in earnings, these data suggest that the effect on total earnings is affected by both an effect on employment and among pay for those who are employed, potentially because of moving to part-time employment, or changing the type of employment.

3 . Data on the impact of motherhood on monthly employee earnings and employment status

The impact of motherhood on monthly employee earnings and employment status, England
Dataset | Released 3 October 2025
Estimates of changes in monthly employee pay and employment status after having children compared with one year before the event.

4 . Glossary

First births

We defined a first birth as the first recorded birth between 1 April 2014 and 31 December 2022, where no prior births had been registered and the mother had no previous births recorded since 2009 in birth registrations.

Second births

Second births were defined as a second recorded birth for a mother who had already had only one first birth during our study period.

Third births

Third births were defined as the third recorded birth for a mother who had already had two children during our study period.

Calendar quarters

Quarters are defined as periods of three calendar months. Each quarter covers the months January to March, or April to June, or July to September, or October to December.

Fixed effect regression

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

Relative reduction

The relative reduction is the proportion of the modelled loss in earnings compared with the average earnings at the reference point, for each birth across everyone in our births cohort.

5 . Data sources and quality

Linked datasets

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

- Census 2011
- Hospital Episode Statistics (HES) Admitted Patient Care and Outpatient records from the National Health Service (NHS) from 1 April 2009 to 31 December 2022
- HES accident and emergency records from the National Health Service (NHS) from 1 April 2009 to 31 March 2020
- 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
- ONS birth registrations, covering births registered from 1 April 2014 to 31 December 2023 and occurring up to 31 December 2022
- ONS deaths 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

We describe the data security processes we use in our National Statistical blog Using the power of linked data to understand factors preventing people from working. Information on how and why we de-identify the datasets used in this analysis is described in our previous analysis on bariatric surgery. Ethical approval for this work was provided by the National Statistician's Data Ethics Advisory Committee.

We linked Census IDs to HMRC records via the Demographic Index (PDF, 549KB). The approach to linkage and achieved linkage rates are available in our article 2011 Census linkage to DWP master key and encrypted NINo [PL1] . Census ID was linked to the HES, births and death registration datasets using the Patient Registers (PR) 2011 to 2013. For inclusion in the study dataset, individuals were required to have a census record in 2011 that could be linked to NHS and HMRC information.

The PAYE data were calendarised in line with the methods previously described to derive monthly employee earnings and more information can be found in our methodology Explaining income and earnings: important questions answered. Where an individual had a Census ID linking to multiple monthly PAYE records, earnings were summed across all matching records for each month.

Negative monthly employee earnings records were imputed to be zero. Monthly employee earnings above the 99% centile were set to the value at the 99% centile. Monthly employee earnings were deflated to 2023 prices using our Consumer Price Index including owner occupier's housing costs (CPIH) dataset. Being a paid employee was defined as receiving monthly earnings greater than £0.

Inclusion criteria

Individuals were included if they had a live birth recorded in ONS birth registrations data between 1 April 2014 and 31 December 2022. Individuals were excluded if they had a multiple birth (for example, twins), stillbirth, neonatal death, adverse pregnancy event (see our release describing The impact of adverse pregnancy events on earnings and employment for more details on what adverse events were included) or any hospital admission for a pregnancy-related complication.

For all individuals, earnings were aggregated from monthly-level to quarterly-level. Death registrations were linked to our individuals to infer whether the individual died during the study period, and any quarters after a date of death of an individual were removed.

Sociodemographic information was linked to these individuals from the 2011 Census. The cohort was restricted to people who reported sex as female, aged 18 to 60 years at the time of their first childbirth, who were ordinarily resident in England, and who were aged 21 to 60 years during the study period. We drew a representative 20% sample from our full cohort, totalling 249,480 individuals.

We included data from people who had not given birth nor experienced any adverse pregnancy event to account for changes in labour market outcomes over calendar time (reflecting changes in background economic conditions) and individuals' age (as individuals' earnings and likelihood of working tend to vary throughout their working lives). This cohort was restricted to females aged 21 to 60 years during the study period, who were ordinarily resident in England. We took a 10% representative sample of this cohort, which contained 113,542 people.

Quality

The quality of PHDA and HMRC PAYE datasets are described in Section 5: Data sources and quality of our The impact of bariatric surgery on monthly employee pay and employee status, England: April 2014 to December 2022 bulletin.

Strengths and limitations

The PHDA is a population-level dataset for England. Of the 50,585,645 individuals with a non-imputed record in the 2011 Census, and resident in England at the time of the 2011 Census, 94.4% (47,729,962) could be linked to both NHS and HMRC information.

The PAYE data cover employees only, therefore self-employed people are recorded as earning £0 and categorised as "not a paid employee" for the purposes of this analysis (approximately 13% of working people are self-employed rather than employees, as recorded in the Labour Force Survey). People who are employed but not currently earning (for example, on maternity leave and not receiving maternity pay) are also categorised as "not a paid employee".

We did not have reliable data on hours worked. Therefore, we were unable to distinguish changes in hours worked from changes in hourly pay. We were also not able to distinguish sick pay, or other non-regular pay including maternity pay, from regular pay, so we could not investigate the effects of having a child on changes to working hours or pay structures.

Acknowledgments

We thank Bristol University, the Leverhulme Centre for Demographic Science at the University of Oxford, CUNEF Universidad, and colleagues at the Department of Health and Social Care, and Cabinet Office for valuable feedback on this work via our expert review panel.

6 . Related links

Using the power of linked data to understand factors preventing people from working
Blog | Released 1 October 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 wellbeing of individuals and the economy.

Labour market overview, UK
Statistical bulletin | Released monthly
Estimates of employment, unemployment, economic inactivity and other employment-related statistics for the UK.

The impact of adverse pregnancy events on monthly employee earnings and employment, England: April 2014 to December 2022
Statistical bulletin | Released 11 June 2025
The change in employee earnings and employment after adverse pregnancy events, including miscarriages, ectopic pregnancies, molar pregnancies, stillbirths and neonatal deaths.

The impact of bariatric surgery on monthly employee pay and employee status, England: April 2014 to December 2022
Article | Released 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.

The impact of NHS Talking Therapies on monthly employee pay and employment status, England: April 2014 to December 2022
Statistical bulletin | Released 9 December 2024
The change in monthly employee pay and employee status attributable to completing NHS Talking Therapies treatment in different time periods after therapy, compared with one year before first therapy.

The impact of an endometriosis diagnosis on monthly employee pay and employee status, England: April 2016 to December 2022
Statistical bulletin | Released 5 February 2025
The change in monthly employee pay and employee status after an endometriosis diagnosis in an NHS hospital, compared with the two years prior to diagnosis.

7 . Cite this statistical bulletin

Office for National Statistics (ONS), released 3 October 2025, ONS website, statistical bulletin, The impact of motherhood on monthly employee earnings and employment status, England: April 2014 to December 2022