

Article

# Changes to how we estimate the number of people in employment on zero-hours contracts

An article describing a change to the way estimates of the number of people on zero-hours contracts are calculated using the Labour Force Survey and assessing the impact of this change on estimates published in dataset EMP17.

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# 1 . Main points

- Comparisons between zero-hours contracts (ZHC) estimates produced using the new and current methodologies for three periods (January to March 2020, April to June 2020 and July to September 2020) suggest the change in methodology has had little impact on the total number of people on ZHC.
- The comparisons suggest the current methodology is consistently overestimating the number of people aged 50 years and older on ZHC but consistently underestimating the number of people aged under 35 years on ZHC.
- On the whole, the impact of the change in methodology across the countries and regions of the UK is fairly small; there is some evidence of the current methodology consistently overestimating the number of people on ZHC in Northern Ireland but this is based on small sample sizes.
- For other breakdowns of people on ZHC, the impacts were generally found to be smaller or not consistently biased over the periods analysed.

## 2 . Overview

Estimates for the number of people on zero-hours contracts in the UK are sourced from the Labour Force Survey (LFS). The LFS asks people in employment if their main job has flexible working and, if so, to choose from a list of employment patterns those which best describe their situation.

People who state “zero-hours contract” are included in the estimates published in [dataset EMP17](#). Up until the end of 2019 the flexible working question was only asked in the LFS twice a year, which necessitated an adjustment to be made to the estimates for non-response because of a lack of valid responses being rolled forward from the previous quarter (when the question was not asked). From January 2020, respondents were asked about flexible working in all quarters, meaning that the adjustment is no longer necessary as non-response can be handled by rolling forward cases from the previous quarter in-line with standard LFS imputation methodology.

This article assesses the impact of this change in methodology on published zero-hours contracts estimates. In the article we refer to the methodology where an adjustment is required as the current methodology and the methodology where no adjustment is required as the new methodology.

## 3 . Description of the methodology change

As the Labour Force Survey (LFS) is a panel survey, with households remaining in the sample for five consecutive quarters, responses from the previous quarter can be rolled forward to the current quarter in order to minimise non-response in the LFS dataset. Respondents who were not successfully contacted in the current quarter but were interviewed successfully in the previous quarter can have their previous-quarter responses used in the current quarter. These previous-quarter responses are referred to as imputations. The imputation procedure is standard LFS methodology and is only conducted on non-response for a single consecutive quarter, as a respondent's circumstances are unlikely to change considerably between quarters.

Before January to March 2020 the LFS question to determine whether a respondent was on a zero-hours contract (ZHC) was asked just twice a year (in April to June and October to December). This question (LFS variable FLEX10) asks respondents who are in employment about their type of agreed working arrangement. There are nine options – a zero-hours contract being one of them – and respondents can choose up to three. The variable FLEXW7 is derived from FLEX10, with FLEXW7=1 identifying if a respondent has stated ZHC as one of their working arrangement options. [More details on the ZHC question](#) are available.

Since only data from the previous quarter can be imputed (for example, only data from the January to March quarter can be rolled forward to the April to June quarter) and FLEX10 was only asked in April to June and October to December, the estimates of people on ZHCs had to be adjusted as there were no responses from the previous quarter available for imputation.

The adjustment for the lack of imputation is based on an aggregated UK-level adjustment factor, which is multiplied by the raw ZHC estimate (that is, with no imputation applied) to produce the published ZHC estimate. The adjustment factor is calculated as:

$$\frac{\text{total people in employment in the UK}}{\text{total people in employment in the UK} - \text{total people in employment in the UK brought forward from previous quarter}}$$

More details about the adjustment can be found [in the National Archives](#) and in section 12 of the [LFS User Guide, Volume 1: Background and Methodology](#).

The two main issues with the adjustment factor approach are:

- the adjustment factor does not vary with the breakdowns it is applied to (that is, region, industry, age, and so on);
- the implicit assumption that the proportion of imputations for those in employment is the same as for those on ZHC may be too simplistic.

From January to March 2020 the question FLEX10 started to be asked every calendar quarter, eliminating the need to adjust for the lack of imputation as the standard imputation methodology can be used. We continued to publish estimates using the current methodology (that is, we ignored rolled-forward cases and applied the adjustment) for the August 2020 release of [dataset EMP17](#) (which included estimates for the period April to June 2020) to allow for sufficient time to assess the impact of imputation on ZHC estimates.

As there are now three quarters of ZHC data that benefit from rolled-forward cases, we are able to compare estimates produced using the current method with those produced using the new method. Such comparisons were carried out for three periods: January to March 2020, April to June 2020 and July to September 2020. Please note that the January to March 2020 and July to September 2020 estimates produced using the current methodology have been created specifically for this analysis and have not been previously published.

## 4 . Impact assessment

In this section we look at the impact of the methodology change on ZHC estimates for a number of different breakdowns. More detail is provided in the [accompanying dataset](#).

### Total number of people on a zero-hours contract

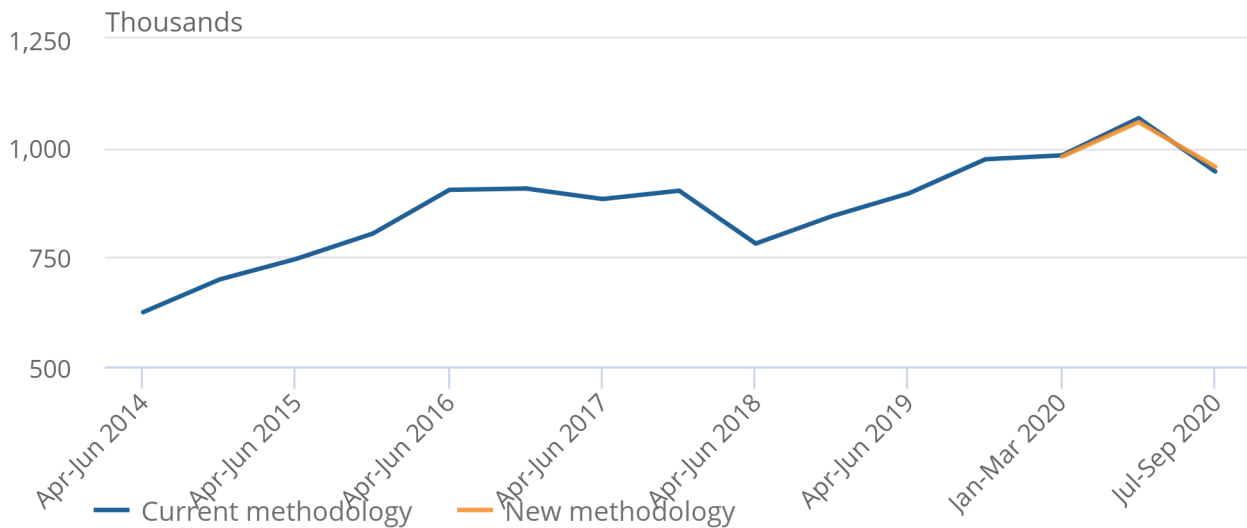
Little difference is found between ZHC estimates based on the current and new methodologies at the UK level. Moreover, the differences are not consistently biased in a particular direction over the three periods compared (Figure 1). For all three quarters the absolute difference between the ZHC estimate based on the new methodology and the one based on the current methodology is less than 1.3%.

## Figure 1: The estimated number of people on zero-hours contracts based on the new methodology are very similar to those based on the current methodology

Current and new methodology estimates for people aged 16 years and over in employment on zero-hours contracts, UK, not seasonally adjusted

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Current and new methodology estimates for people aged 16 years and over in employment on zero-hours contracts, UK, not seasonally adjusted



Source: Office for National Statistics – Labour Force Survey

## Number of people on a zero-hours contract by sex

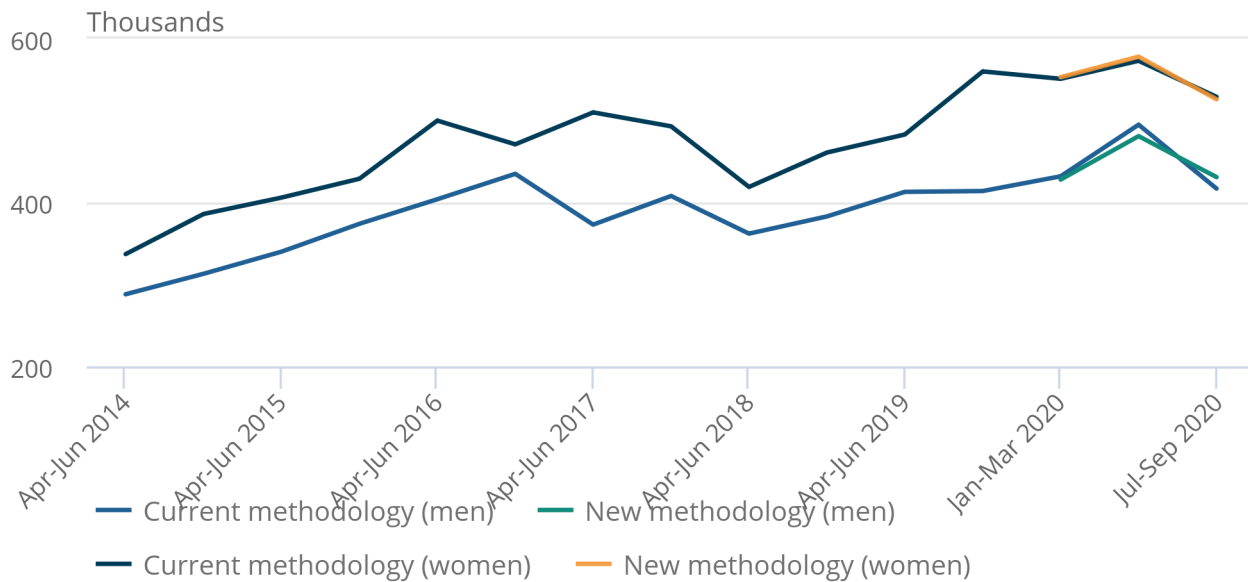
For both men and women there is little difference between ZHC estimates based on the current and the new methodology (Figure 2) and there is no consistent bias over the three periods observed. The absolute differences for men (less than 3.5% for each period) are slightly higher than those for women (less than 1.0% for each period) overall.

**Figure 2: The estimated number of men and women on zero-hours contracts based on the new methodology are very similar to those based on the current methodology**

Current and new methodology estimates for men and women aged 16 years and over in employment on zero-hours contracts, UK, not seasonally adjusted

Figure 2: The estimated number of men and women on zero-hours contracts based on the new methodology are very similar to those based on the current methodology

Current and new methodology estimates for men and women aged 16 years and over in employment on zero-hours contracts, UK, not seasonally adjusted



Source: Office for National Statistics – Labour Force Survey

**Number of people on a zero-hours contract by age group**

In the three periods analysed (January to March 2020, April to June 2020 and July to September 2020), the estimated number of people aged 65 years and older on ZHC based on the new methodology is consistently lower than the estimates based on the current methodology (Figure 3). For January to March 2020, the absolute percentage difference between the estimates based on the two different methodologies is 11.2%, for April to June 2020 it is 17.5%, and for July to September 2020 it is 14.8%.

**Figure 3: New estimates for the number of people aged 65 years and over on zero-hours contracts are consistently below current estimates**

Current and new methodology estimates for people aged 65 years and over in employment on zero-hours contracts, UK, not seasonally adjusted

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Current and new methodology estimates for people aged 65 years and over in employment on zero-hours contracts, UK, not seasonally adjusted



Source: Office for National Statistics – Labour Force Survey

New estimates for people aged between 50 and 64 years in employment on ZHC are also consistently lower than current estimates. However, the absolute percentage differences (5.8% in January to March 2020, 9.1% in April to June 2020 and 5.5% in July to September 2020) are not as large as the percentage differences seen for people aged 65 years and older.

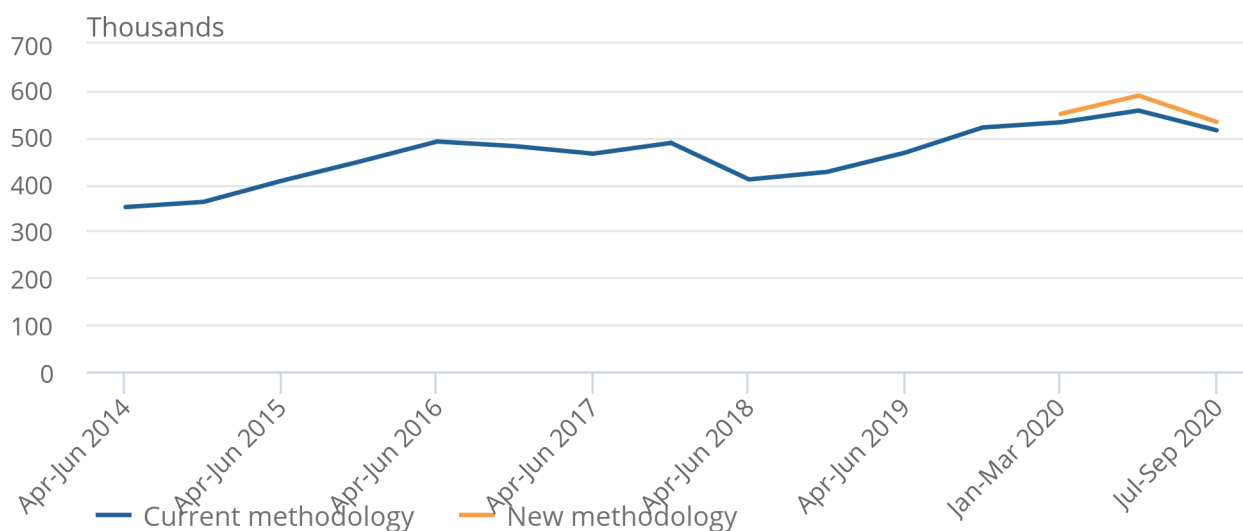
In contrast, the number of people aged 16 to 34 years on ZHC estimated using the new method is consistently higher than using the current method over the three quarters considered. However, the percentage differences (3.2%, 5.8% and 3.3% for January to March 2020, April to June 2020 and July to September 2020 respectively) are smaller than the differences for people aged 65 years and older (Figure 4).

**Figure 4: New estimates for the number of people aged between 16 and 34 years on zero-hours contracts are consistently above current estimates but the differences are fairly small**

Current and new estimates for people aged between 16 and 34 years in employment on zero-hours contracts, UK, not seasonally adjusted

Figure 4: New estimates for the number of people aged between 16 and 34 years on zero-hours contracts are consistently above current estimates but the differences are fairly small

Current and new estimates for people aged between 16 and 34 years in employment on zero-hours contracts, UK, not seasonally adjusted



Source: Office for National Statistics – Labour Force Survey

The results suggest that there are fewer people aged 50 years and older on ZHC in the labour market than estimated by the current methodology, indicating that applying the adjustment factor caused an upward bias to the estimates for this age group. This bias is in the opposite direction for those aged under 35 years, but generally of smaller magnitude in percentage terms.

**Number of people on a zero-hours contract by region of residence**

Across the countries and regions of the UK, percentage differences between ZHC estimates based on the current and new methodologies are generally small and, in most cases, not consistently positive or negative, suggesting little evidence of bias. Large percentage differences exist for Yorkshire and The Humber (37.9%) and for Wales (16.6%) for the July to September 2020 period. However, the latter, in particular, is based on a fairly small sample and there is no strong evidence of consistent bias across the three periods analysed in either case.

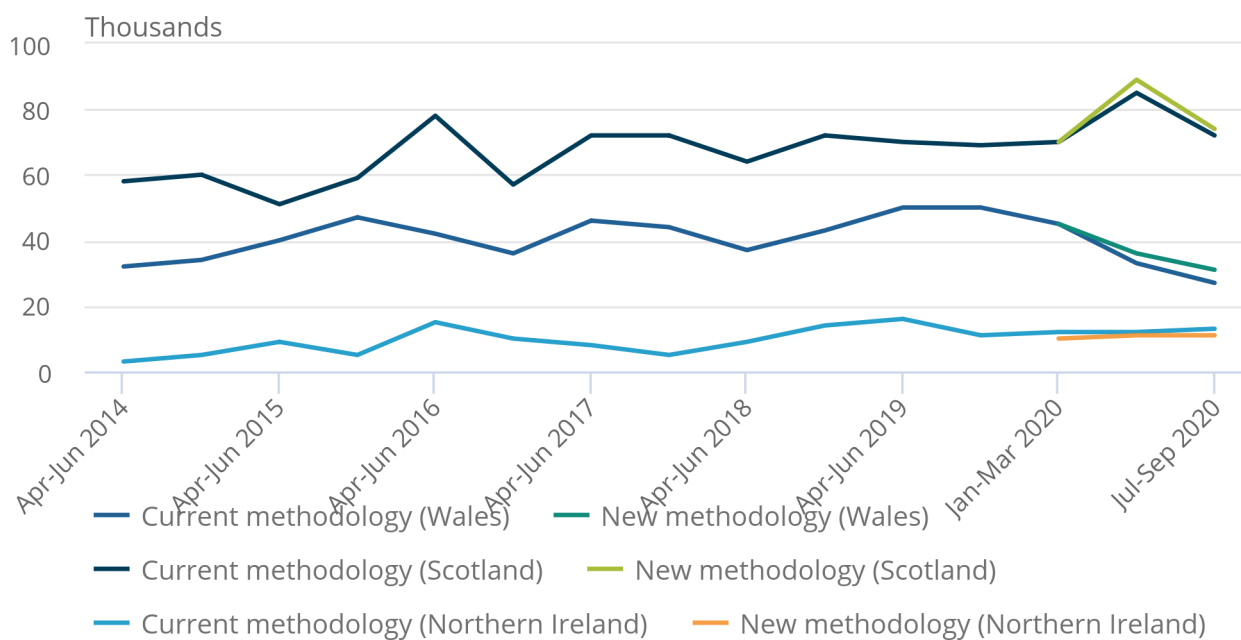
Comparisons between new and current estimates for people on ZHC in Northern Ireland show that the estimates based on the new methodology are consistently below those based on the current methodology (Figure 5). The absolute percentage differences between the estimates are 19.8% in January to March 2020, 9.3% in April to June 2020 and 19.5% in July to September 2020. The consistent difference between new and current estimates for Northern Ireland suggests the current methodology is causing an upward bias. It is important to note, however, that the sample size for the number of people on ZHC in Northern Ireland is one of the smallest of all UK countries and regions.

**Figure 5: New estimates for the number of people on zero-hours contracts in Northern Ireland are consistently below current estimates, although the numbers are small compared with other UK countries**

Current and new estimates for people in Wales, Scotland and Northern Ireland aged 16 years and over in employment on zero-hours contracts, UK, not seasonally adjusted

Figure 5: New estimates for the number of people on zero-hours contracts in Northern Ireland are consistently below current estimates, although the numbers are small compared with other UK countries

Current and new estimates for people in Wales, Scotland and Northern Ireland aged 16 years and over in employment on zero-hours contracts, UK, not seasonally adjusted



Source: Office for National Statistics – Labour Force Survey

## Number of people on a zero-hours contract by other breakdowns

### Full-time and part-time

For the most part there is little difference between new and current methodology estimates of the number of people working full-time on ZHCs. The highest percentage difference is for the July to September 2020 period (7.3%). For people working part-time on zero-hours contracts the absolute differences are below 1.7% for all three periods.

### Industry

New methodology estimates for people on ZHC in the accommodation and food services industry, which is the industry with the highest number of people on ZHC, are consistently above current methodology estimates over the three observed periods (although only slightly above for January to March 2020). The highest percentage difference is 5.2% in July to September 2020. Additionally, more younger people work in this industry, so the evidence of a small downward bias caused by the adjustment is consistent with the observation made for this age group previously in this article.



For the health and social work industry, which also accounts for a sizeable proportion of the total number of people on ZHC, there are small percentage differences between estimates based on the current and new methodologies, with no evidence of consistent bias. The largest absolute percentage difference is for the July to September 2020 period (2.2%).

The comparisons between new and current estimates of people on ZHC in the transport, arts and other services industries show evidence of consistent upwards bias in the current estimates. The absolute percentage differences over the three periods vary between 3.3% and 8.9%.

Estimates based on the new methodology for people in the education industry on ZHC are consistently lower than estimates based on the current methodology. The absolute percentage differences vary between 5.2% and 12.6% over the three periods and indicate an upward bias caused by the current methodology.

There are some large percentage differences for other industries, but this is mainly because of the relatively small numbers of people on ZHC working in these industries.

## Occupation

For caring, leisure and other services and elementary occupations – the occupations with the highest number of people on ZHC – there are small absolute percentage differences between new and current estimates for all the three periods observed. Absolute differences are less than 2.8% for caring, leisure and other services occupations and less than 3.3% for elementary occupations.

In professional occupations there are small absolute percentage differences between new and current estimates for the January and March 2020 and the July to September 2020 periods (less than 4.6%). There is an absolute difference of 12.4% for the April to June 2020 period, but no strong evidence of bias for these occupations.

There are some large percentage differences for other occupations, and some evidence of small biases but, again, this is mainly because of the smaller numbers of people on ZHC working in these occupations.

The impact of the change in methodology on other series included in [dataset EMP17](#) can be seen in the [accompanying dataset](#).

## 5 . Conclusion

The new methodology makes very little difference to our overall estimate of ZHCs, indicating that there is no consistent bias caused by the adjustment factor at the total UK level. Some of the largest percentage differences across all three periods analysed were found for people aged 65 years and older and people in Northern Ireland working on ZHC, indicating that we have been over-estimating the number of people on ZHCs in these cases. There is little evidence of large consistent bias for other breakdowns.

## 6 . Future developments

Because of the small impact of the change in methodology at the aggregate level and for most breakdowns, we plan to publish January to March 2020, April to June 2020, July to September 2020 and October to December 2020 estimates based on the new methodology in the labour market release on 23 February 2021. Thereafter we will be publishing [dataset EMP17](#) on a quarterly basis using the new methodology. Since it is not possible for us to revise the back-series prior to January to March 2020 on the new basis, users should be aware there will be a break in the series between October to December 2019 and January to March 2020.

The FLEX variable including brought forward cases has been withheld from the LFS microdata sent to the UK Data Service (UKDS) and Secure Research Service (SRS) while quality assurance took place. Now that quality assurance is complete, we plan to make the FLEX variable including brought forward cases available on all versions of LFS microdata from the October to December 2020 period onwards. The FLEX variable including brought-forward cases for the periods of January to March 2020, April to June 2020 and July to September 2020 will be made available to the UKDS and SRS at a later date. The FLEX variable excluding brought forward cases will no longer be included on any versions of the microdata.

We plan to add FLEX variables (including brought forward cases) to the Annual Population Survey (APS) microdata at some point during 2021.

## 7 . Related links

[EMP17: People in employment on zero hours contracts](#)

Dataset | Released 15 December 2020

Labour Force Survey estimates of people in work on zero hours contracts.