

Quality assurance of data from the number of previous children question at birth registrations, England and Wales: 2016

Assessing the impact that a change to the Population Statistics Act has had on birth registrations in England and Wales.

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1 . Main points

- The accuracy of responses to the number of previous children question asked at birth registration declined following a change to the Population Statistics Act in 2012.
- Since then, the accuracy of responses has improved, and this is particularly notable since changes were made to the question wording on the Registration Online (RON) system in 2016.
- There is a high match rate between number of previous births recorded in the Office for National Statistics (ONS) Longitudinal Study and the number stated at birth registration.
- The number of teenagers reporting a previous birth has decreased but remains higher than expected, suggesting that further work could be done to improve the accuracy of responses to the previous children question for those aged under 20 years.

2 . Introduction

Reporting against the number of previous children question asked at birth registration has long been thought to have issues with misreporting. This is mainly understood to be surrounding the inclusion of the current birth registration when answering the question. As a result, this impacts upon “true birth order ¹” calculations, which feed into numerous fertility publications produced by Office for National Statistics (ONS). The issue has been extensively assessed and [documented previously](#).

This article assesses and quality assures the births data (2014 to 2016) to understand the current extent of the issue and to decide if there is still an issue with the accuracy of the information collected and consequently with the calculations based on these data. The article starts by describing the changes that have occurred to birth statistics as a result of improvements to the statistical information collected at birth registration under the Population (Statistics) Act 1938.

Changes to the Population (Statistics) Act 1938

In 2012, ONS initiated a legislative change to improve the statistical information collected at birth registration in England and Wales. Two amendments have been made to the Population (Statistics) Act 1938, the legislation which requires registrars to collect confidential information for statistical purposes. The changes were made within the Welfare Reform Act 2009 and were implemented by the Identity and Passport Service in May 2012.

Until May 2012, information on the following two aspects was only collected for births occurring within marriage:

- number of previous children with a current or former husband
- whether the mother had previously been married

When the Population (Statistics) Act came into force in 1938, only 4% of live births in England and Wales occurred outside marriage so the information required was collected for nearly all mothers. However, by 2011 nearly half of births (47%) took place outside marriage or civil partnership and so the legislation no longer reflected the reality of modern society.

The two amendments made to the Population (Statistics) Act mean that information is now collected at all birth registrations on the total numbers of previous live births and previous stillbirths that the mother has had (not just those with any current or former husband). This has simplified the question asked by registrars and will provide improved coverage.

Information is also now collected at all birth registrations on either:

- whether the mother has been previously married or in a civil partnership (if she is currently married or in a civil partnership)
- whether the mother has ever been married or in a civil partnership (if she is not currently married or in a civil partnership)

This brings the birth registration process more in line with equality legislation.

This information is collected at birth registration and is treated as confidential by registrars. The data are passed to ONS for statistical purposes, and registrars make the informant aware of this at the time of registration.

Statistical benefits from this change

We have previously published births tables covering number of previous children for married women only. Following implementation of the changes to the Population Statistics Act, it is now possible to publish births tables that represent the characteristics of all births rather than just births to married women. An example of this can be seen in the [Births by parents' characteristics in England and Wales](#) release, published in November 2017.

It is now possible to cross-tabulate number of previous children with variables other than age for the first time, enabling new analyses on health and demographic topics – for example, number of previous children by mother's country of birth.

Before 2012 we estimated “true birth order” for all women by combining the partial information available for married women from birth registration with social survey data. “True birth order” no longer needs to be estimated, as full information on number of previous children is now collected from all women. This should improve the quality of birth order data used in fertility analysis such as the [Childbearing for women born in different years](#) release. Since birth order data are also used in the fertility component of national population projections, there should be a similar improvement in the quality of the fertility assumptions that feed into the population projections.

Further changes to the previous children question – January 2016

Having raised some concerns over the quality of the data being collected on number of previous children following the amendment to the Population Statistics Act in 2012, we have worked with registrars to improve awareness of the use of the data from this question and to ensure that the question is being asked correctly. Furthermore, in January 2016 a change was made to the wording of the question in the Registration Online (RON) system (software used to record information at registration) so that women are clearly asked about the number of previous children they have had, rather than number of children.

Notes for: Introduction

1. True birth order is a measure of live births by birth order for women both within and outside marriage.

3 . Overall data findings

All birth registration data go through extensive quality assurance and error checking to ensure that they are of the highest possible quality. This occurs as part of the routine processing of registration data received. When the new data on previous children and previous marriages were received following the change to the legislation, more detailed analysis was, and continues to be, conducted to understand the quality and if there were any issues of which users should be aware.

Overall, the level of missingness¹ in the number of previous children variable is low. However, following the change to the Population Statistics Act in 2012, missingness for all women increased, reaching a peak of 0.67% in 2014, then dropping to 0.45% in 2015 before increasing again to 0.62% in 2016 (Table 1). Missingness is slightly higher for married women, but follows the same trend as seen for all women. In 2016, the level of missingness was 0.65% for married women.

We believe that the expansion of coverage has not caused substantial missingness in the main variables affected by the change, and therefore this level of missingness is not a cause for concern.

Table 1: Missingness in the previous children variable, 2011 to 2016, England and Wales

Year	Missingness ¹	
	Married women	All women
2011 ²	0.01%	-
2012 (Whole year - married women only until 28 May, then all women)	0.17%	-
2013	0.39%	0.33%
2014	0.75%	0.67%
2015	0.50%	0.45%
2016	0.65%	0.62%

Source: Birth Registrations, Office for National Statistics

Notes

1. Missingness relates to the proportion of records for which the response to the question was blank. [Back to table](#)
2. True missingness in the previous children variable is not possible to ascertain for 2011 and earlier. [Back to table](#)

Proportion of women reporting a previous live birth remained higher than before the change to the Act

The information provided by women on the number of previous live born children they have had when registering their most recent birth continues to show higher proportions of married women saying they have previous children than had been recorded prior to the change. It was anticipated that the question change would mean that some married women would now be reporting previous children who were born outside of marriage. The initial differences in the percentage of married women and all women reporting a previous birth (approximately 5 percentage points) was larger than expected purely from the question change.

In 2011, 42% of married women reported that they were previously childless. Following the change to the Act, this proportion dropped to 33.6% in 2012. It has since increased moderately and reached 37.4% in 2016. The proportion of unmarried-cohabiting women who reported they were previously childless is also lower following the change to the Act than was estimated prior to the change. In the following years, this proportion has also steadily increased reaching 46.7% in 2016.

Overall, an estimated 42.8% of all mothers reported that they were previously childless prior to the change to the Act. This proportion dropped to 37.4% in 2012. We hypothesised that the apparent decline in the number of women reporting themselves to be previously childless may have been due to women including their current birth when reporting the number of previous children. The latest data suggest that the quality of the information being collected on number of previous children has improved relative to 2012, with 40.9% of women reporting they were previously childless in 2016; this may be partially because of the further changes to the question wording in the Registration Online (RON) system in January 2016.

Table 2: Percentage of women reporting no previous live births at registration of most recent birth, 2011 to 2016, England and Wales

Year	Registration group				Total
	Married women	Sole registrations	Joint registration by cohabiting woman	Joint registration by non-cohabiting woman	
2011 (raw data) ¹	42.0	Not calculated
2011- estimated by ONS ²	38.0	48.0 ³			42.9
New 2012 data (28 May onwards)	33.6	41.3	42.1	40.5	37.4
2013	34.3	42.0	43.1	40.2	38.1
2014	34.8	41.9	43.4	39.0	38.3
2015	35.5	41.8	44.4	38.5	39.0
2016	37.4	42.8	46.7	39.2	40.9

Source: Birth registrations, Office for National Statistics

Notes

1. For 2011 and previous years data on previous children were not collected for unmarried women. [Back to table](#)
2. These 2011 figures represent ONS' estimates of true birth order distribution as used within cohort fertility releases, and projections. These figures have not previously been published. [Back to table](#)
3. Estimate for all unmarried women derived from GHS data. [Back to table](#)

Table 3 shows that immediately following the changes to the Act, the percentage of women reporting one or two previous births increased. This coincides with the decrease in the percentage of women reporting no previous live births (Table 2). The percentage of women reporting three or four or more previous births also increased but, due to the relatively smaller percentage of women reporting three or more previous births, is likely to have had a lesser effect on the quality of the data overall.

The percentage of women reporting one or two previous births has declined for the last two years, which is in line with the percentage of women reporting no previous births increasing steadily back to levels seen in 2011 before the changes to the Act. This may be further evidence that some women were including the birth that they were currently registering when responding to the previous children question. The data in Table 3 suggest that the accuracy of reporting of the number of previous children has been improving.

Table 3: Number of previous children reported, for women registering a birth, 2011 to 2016, England and Wales
Percentage

Number of previous births	2011 (estimated by ONS) ¹	New 2012 data (28 May onwards)	2013	2014	2015	2016
0 previous births	42.8	37.4	38.1	38.3	39.0	41.1
1 previous birth	33.8	36.4	36.1	36.2	36.0	35.4
2 previous births	14.4	16.3	16.0	15.8	15.4	14.5
3 previous births	5.3	6.1	6.1	5.9	5.8	5.5
4 or more previous births	3.8	3.8	3.8	3.7	3.7	3.5

Source: Birth registrations, Office for National Statistics

Notes

1. These 2011 figures represent ONS' estimates of true birth order distribution as used within cohort fertility releases and projections. These figures have not previously been published. [Back to table](#)

Reported number of previous children at birth registration is now more consistent with information on births on the ONS Longitudinal Study

The [ONS Longitudinal Study](#) (ONS-LS) allows us to trace women included in the study to understand their parity progression². Previous analysis revealed that a substantial proportion of women did not appear to have consistency between the number of children they had given birth to according to historical birth registrations linked into the ONS-LS, and the number of previous children they reported when registering a birth in 2012.

There are a number of reasons why this could occur, which can be broken down into valid reasons and incorrect reporting at birth registration.

Valid reasons

- Women may have had previous births outside the UK, in which case these births would be untraceable in the ONS-LS; this would be the case for migrants who had children before migration.
- The current birth being registered is part of a multiple birth; the effect of this on the data being analysed is likely to be small.
- The reporting of stillbirths is different between the birth registrations and ONS-LS data; the effect of this on the analysis is minimal in the data, accounting for less than 1% of records.

Incorrect reporting

- Women may be being asked the question incorrectly or unclearly at registration, or are misunderstanding it and so are mistakenly including their current birth.
- Women may be reporting the number of previous births they have had incorrectly at registration for some other reason.

It is likely that all of these factors play a part, and it is important to note that the inconsistency seen existed before the change to the Population Statistics Act in May 2012.

Analysis of ONS-LS data from 2011 and 2012 showed that there was a substantial increase in the percentage of women incorrectly reporting their previous births by one (likely as a result of including the current birth in the number of previous births), at the same time as the changes to the Population Statistics Act came into force (in May 2012).

Figure 1 shows information for women in the ONS-LS having a baby between January 2011 and December 2012. The number of children they reported at birth registration (previous children reported, plus the current birth being registered) is compared with the total number of births linked into their ONS-LS history.

There are four possible results:

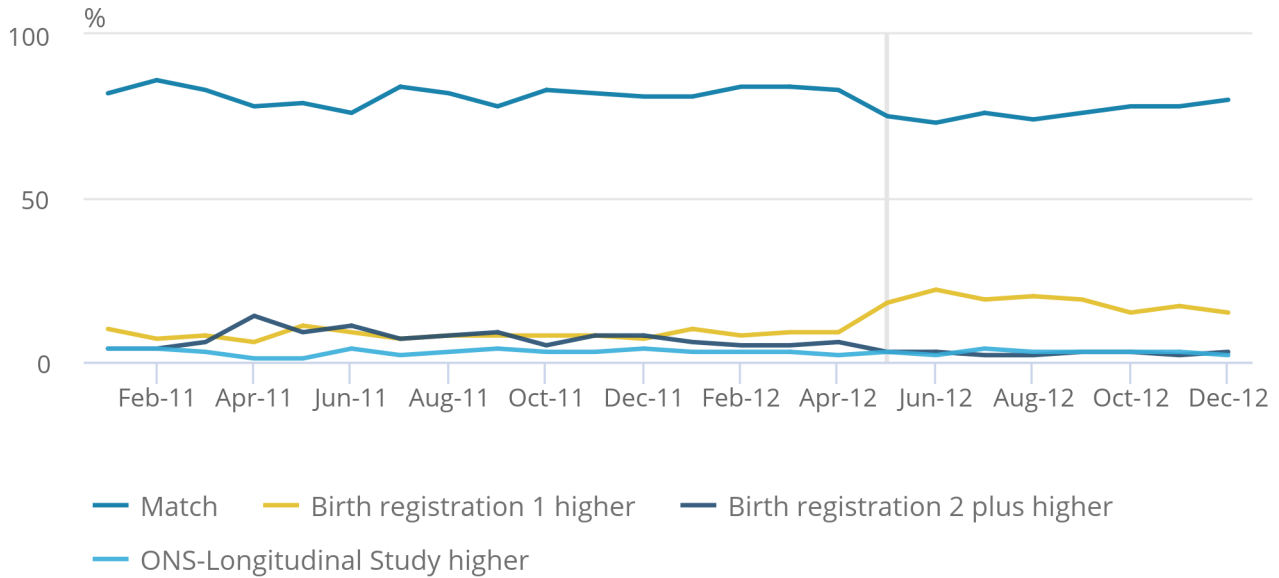
- match between the sources – the total number of births in the ONS-LS and birth registrations match, indicating correct information has been supplied at birth registration
- birth registration shows one more birth than the ONS-LS – the number of previous births reported at birth registration is one higher than the total number of births linked in the ONS-LS; this suggests that the mother has incorrectly included the current birth in their number of previous children, although this may also occur if the mother has had one previous birth overseas
- birth registration shows two or more extra births compared with the ONS-LS – the number of previous births reported at birth registration is two or more higher than the total number of births linked in the ONS-LS; this could be because some of the previous births have occurred overseas
- birth registration shows fewer births than the ONS-LS – the number of previous births plus the current birth reported at birth registration is lower than the total number of births linked in the ONS-LS; this could be caused by the current birth being a multiple birth, or other reporting error

Figure 1 shows the distribution of women in the ONS-LS who registered a birth in 2011 or 2012. The majority of women fell into the “Match” group, indicating that they reported consistent figures when asked for their number of previous children. The largest group of women reporting inconsistent figures were those in group B.

Figure 1: Proportion of ONS-Longitudinal Study women having a birth in 2011 to 2012 whose records fall into four groups, England and Wales

Figure 1: Proportion of ONS-Longitudinal Study women having a birth in 2011 to 2012 whose records fall into four groups, England and Wales

Date changes to the Population Statistics Act came into effect

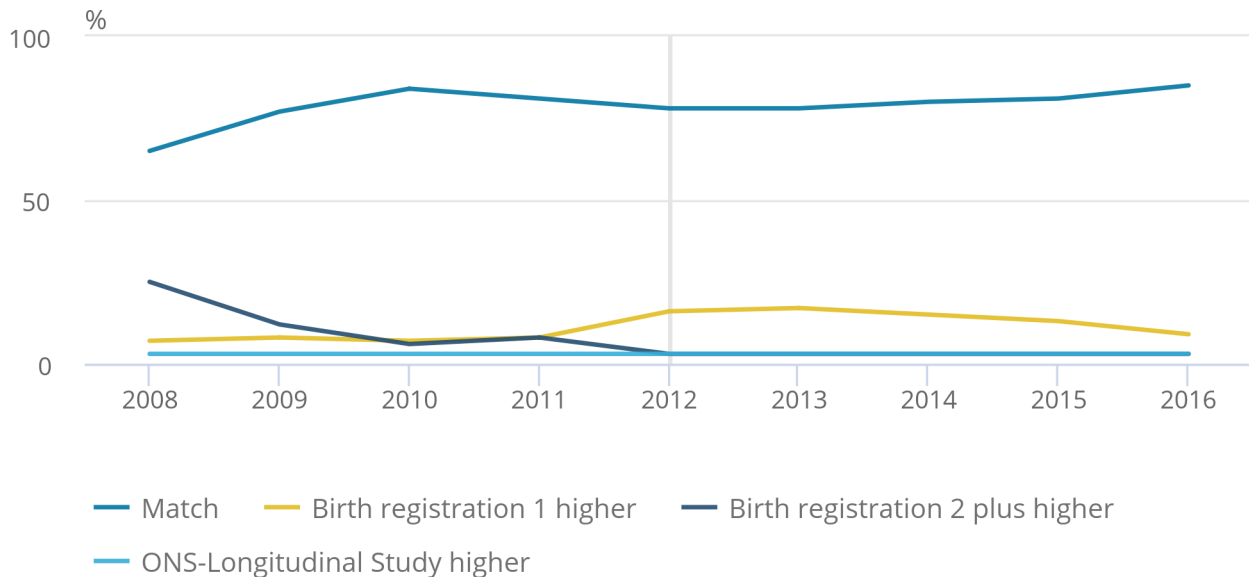


Source: Birth registrations and ONS-Longitudinal Study, Office for National Statistics

The rise in the proportion of women of type B (where the number of previous births reported at registration is one too high) since May 2012, suggested that the question on previous births was being misunderstood, and some women were including their current birth in the number of previous births.

Figure 2: Proportion of ONS-Longitudinal Study women having a birth in 2008 to 2016 whose records fall into four groups, England and Wales

Figure 2: Proportion of ONS-Longitudinal Study women having a birth in 2008 to 2016 whose records fall into four groups, England and Wales



Source: Birth registrations and ONS-Longitudinal Study, Office for National Statistics

Figure 2 shows information for women in the ONS-LS having a baby between 2008 and 2016. Following an initial decline in the percentage of women in the “Match” group immediately after the changes to the Population Statistics Act came into effect, the percentage where both sources match has subsequently increased. Conversely, the percentage of women where the number of previous births reported at registration is one too high has decreased. This suggests an improvement to the quality of the previous children data collected at birth registration in recent years.

The improvement in the quality of the previous children data at birth registration is most notable in 2016, with the highest percentage in the “Match” group (85%) since the start of the analysis in 2008. In 2016, only 9% of women were reporting one more birth than in the ONS-LS. This is similar to the levels seen prior to the changes to the Population Statistics Act coming into effect (8% in 2011). This can most likely be attributed to the change to the wording of the question in the Registration Online (RON) system in January 2016.

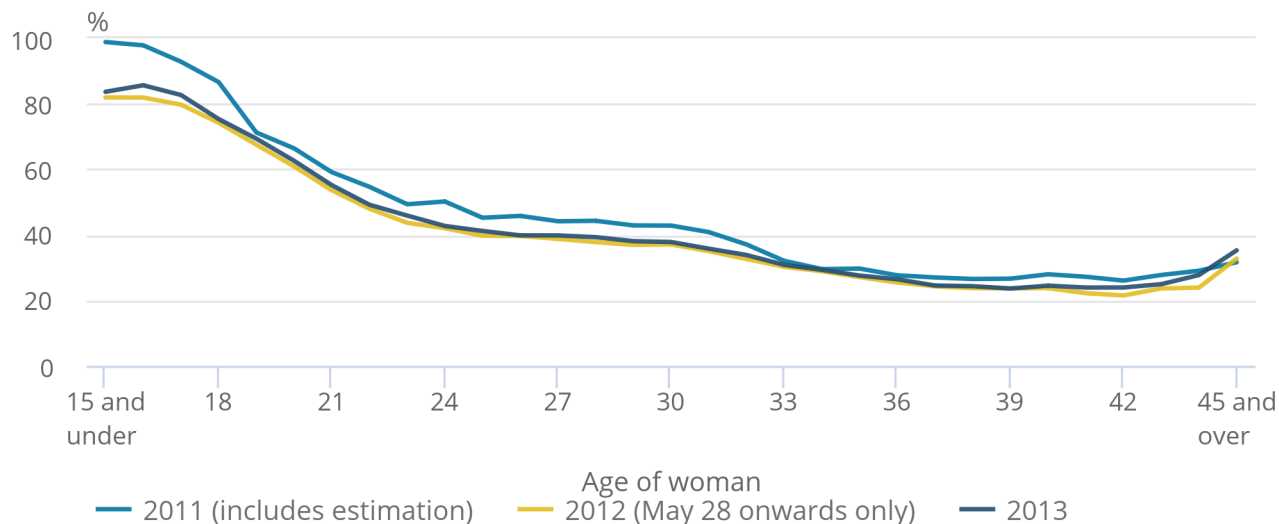
Analysis by age shows improvements in teenage reporting of previous births

Analysis was undertaken to establish whether the change in pattern of previous births was driven by any one maternal age group.

Figure 3 shows the proportion of women of each age reporting no previous births in 2011, before the change to the Act, compared with early post-change years, 2012 and 2013.

Figure 3: Percentage of births to women with no previous children for 2011 to 2013, England and Wales

Figure 3: Percentage of births to women with no previous children for 2011 to 2013, England and Wales



Source: Birth registrations, Office for National Statistics

The figures for 2011 are based on estimation and fluctuations in the 2011 values could be caused by a variety of factors, including the method used to estimate the true birth order distribution.

Figure 3 shows that as expected, the youngest women are most likely to be reporting no previous children when registering their birth; this decreases with age as women have further births. Around age 43 years the proportion increases slightly, reflecting those women who have delayed childbearing to older ages, possibly making use of reproductive technology. The difference between 2011 and subsequent years in the proportion of women reporting previous childlessness is fairly consistent across most of the age range from age 20 years onwards.

In 2011, the year before the change to the Act, the proportion of women reporting that they had no previous live born children when registering their most recent birth was highest for teenage women. Teenage women then saw the largest declines in the proportion reporting no previous live births for 2012 and 2013 following the changes to the question. This was concerning as we would have expected the proportions reporting no previous live births to be the largest for the youngest women. This evidence further suggested that women were including their current birth when responding to the question on the number of previous live births. Expert opinion³ and international comparisons suggested that it was unlikely that such high levels of teenage women would have had a previous live birth.

Based on this analysis, we were confident that there was no specific age group that was responsible for the change over time in the proportion reporting no previous birth, and that it occurred across the age range. However, the change over time is smaller at higher ages, as can be seen in Figure 3.

Table 4 shows how the proportion of teenagers reporting one or more previous births has changed since the change to the Act in 2012. After an initial rise in the percentage of births to teenagers who already have a child in 2012, percentages have subsequently declined.

The 2016 data show a substantial decrease in the level of women aged 15 years and under and aged 16 years reporting one or more previous births compared with 2012. Although the proportion of 17- to 20-year-olds reporting a previous birth has declined, the level of older teenagers reporting an existing child has not decreased as much as for younger teenagers. Some of the fall may be explained by the recent reported decline in [teenage conceptions](#).

Even though the percentage of births to teenagers who state that they have already had a child has fallen in recent years, expert opinion suggests that levels are still higher than expected and should be more in line with the levels estimated by ONS for 2011.

Table 4: Percentage of births to those who already have a child, England and Wales, 2012 to 2016 (missing included in the denominator)

Year	Age					
	15 and under	16	17	18	19	20
2011 (estimated by ONS) ¹	1.13%	2.14%	7.13%	13.37%	28.76%	33.61%
2012	18.10%	18.00%	20.10%	25.60%	32.20%	38.70%
2013	16.33%	14.31%	17.26%	24.59%	30.56%	37.31%
2014	16.19%	15.78%	17.32%	23.29%	29.11%	35.85%
2015	12.21%	13.03%	15.60%	19.87%	26.24%	33.26%
2016	4.72%	8.39%	11.86%	16.37%	23.09%	30.13%

Source: Birth Registrations, Office for National Statistics

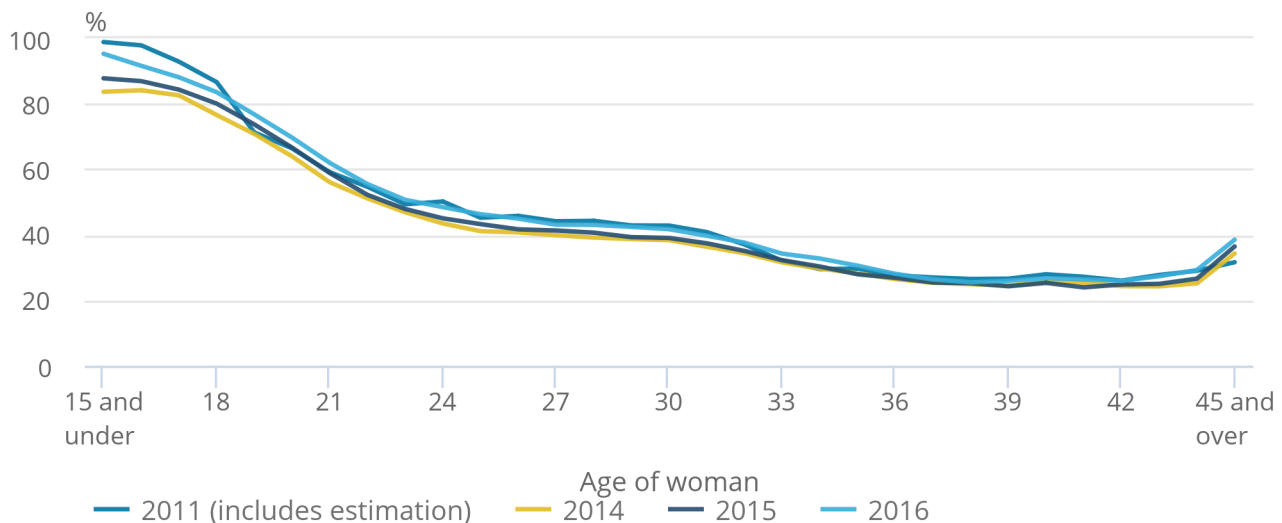
Notes

1. These 2011 figures represent ONS's estimates of true birth order distribution as used within cohort fertility releases and projections. These figures have not previously been published. [Back to table](#)

Figure 4 shows the proportion of women of each age reporting no previous births for 2014 to 2016, compared with estimated levels in 2011 before the change to legislation.

Figure 4: Percentage of births to women with no previous children for 2011, 2014 to 2016, England and Wales

Figure 4: Percentage of births to women with no previous children for 2011, 2014 to 2016, England and Wales



Source: Birth registrations, Office for National Statistics

It appears that the proportion of women at all ages reporting no previous live births continues to increase each year, towards the levels estimated for 2011 before the changes to the legislation occurred. This is a result of successive improvements to the administration of the previous children question.

Notes for: Overall data findings

1. Missingness relates to the proportion of records for which the response to the question was blank.
2. Parity progression is the number or proportion of women with a specified number of children who go on to have another child.
3. ONS consulted with academics, professionals in Public Health England and specialist teenage pregnancy midwives who agreed that levels of previous childlessness being reported seemed unlikely and at odds with their evidence.

4 . Conclusions

Following the changes to the Population Statistics Act in May 2012, there was evidence that women were over-reporting their number of previous children, possibly due to women including their current birth in the number they reported.

Since 2012, the evidence presented suggests that the quality of the previous children data collected at birth registration has been improving. From 2012 to 2016:

- the percentage of women with no previous children increased
- the percentage of women with one, two, three and four or more previous children declined
- there was a higher match rate between the number of births reported in the Office for National Statistics (ONS) Longitudinal Study and at birth registration
- the percentage of teenagers reporting one or more previous births decreased

The improvements are most notable in 2016, which suggests that the change to the wording of the question on the Registration Online (RON) system is having a positive impact on the quality of the previous children data.

It is difficult to determine what the true proportion of all women reporting zero, one, two, three or four or more previous births should be. This is because prior to the changes to the Population Statistics Act in 2012, information on the number of previous children was only collected for births occurring within marriage. For 2011, proportions for all women (including births both within and outside marriage) are based on estimates using survey data. The proportions for the most recent years are more in line with the estimated 2011 levels and are considered more plausible than the proportions seen immediately after the changes to the Act.

Although the percentage of teenagers reporting one or more previous births has decreased, expert opinion and international comparisons suggest that the percentages seen are still too high.

5 . Recommendations and next steps

We will continue to work with registrars to raise awareness of the use of the data from the previous children question, particularly highlighting concerns about the quality of the previous children data for women aged under 20 years.

We will continue to monitor trends in the number of previous children as more births registrations data become available, to ensure improvements are sustained.