Childbearing for women born in different years in England and Wales, QMI

Quality and Methodology Information for childbearing in England and Wales, detailing strengths and limitations of the data, methods used, and data uses and users.

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1 . Output information

- National Statistic: Yes

- Frequency: Annual

- How compiled: Based on third-party data

- Geographic coverage: England and Wales

- Last revised: Not applicable

2 . About this Quality and Methodology Information report

This Quality and Methodology Information report contains information on the quality characteristics of the data. This includes the European Statistical System five dimensions of quality as explained on Eurostat's website, as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data

- learn about existing uses and users of the data

- reduce the risk of misusing data

- help you to decide suitable uses for the data

- understand the methods used to create the data

3 . Important points

- Childbearing statistics use live-births data derived from information recorded when a live-birth is registered as part of a civil registration (a legal requirement); this is the same data source used to produce births statistics and more detailed information can be found in our Births QMI.

- Where relevant, birth registrations are linked to their corresponding NHS birth notification; this enables linkage of information where data are missing, for example the age of the mother.

- This release has been published under the current title of "Childbearing for women born in different years" since the 2013 publication; prior to this it was known as "Cohort fertility".

- Following changes to the Population Statistics Acts in 2012, all women are now asked how many previous live-born and stillborn children they have had at the point of registration; prior to this only women with a current or former husband were asked.

- Male cohort fertility rates cannot be calculated because different data are collected for women at birth registration.

4 . Quality summary

Overview

Childbearing statistics are based on birth statistics which represent births occurring in, and being registered in, England and Wales. Figures are compiled from information supplied when births are registered with the Local Registration Service in partnership with the General Register Office (GRO). This civil registration process is a legal requirement. Further information on the data source is available in our Births QMI.

Birth registration data are then supplemented by linking to the NHS birth notification when a birth is registered. This linkage is conducted by the Office for National Statistics (ONS) to obtain the age of the mother where this was missing on the birth registration.

To be able to analyse trends in the number of births a woman has, calculations are then made to obtain cumulative fertility data such as: the average number of live-born children by age of mother, the proportions of women who have had one or more live-born children, and the percentage distributions of women by the number of children they have had and age-specific fertility rates.

In this release, the number of children is based solely on the number of live-born children a woman has had. Stillbirths, adopted, fostered or stepchildren are not included as they are based on live-birth registration data.

We report on those women giving birth from the ages of 15 to 45 years. This is because, while some women do have children before the age of 15 years and after the age of 45 years, the numbers are small and do not affect the overall patterns.

Births to women aged 46 years and older are included in the completed family size statistics by using a proxy, based on the number of births to women aged 46 years and older born in previous years. While births to those women aged 46 years and above are increasing, these remain a small proportion of overall births, and do not affect the overall patterns.

A small number of women start their childbearing before the age of 15 years, but these do not affect the overall patterns. Births to women under the age of 15 years are included in the age 15 years statistics.

Uses and users of births data

Our data are used to inform expert panels when advising on the setting of fertility assumptions underlying the national population projections. More information can be found on our Population projections web page.

Users of our data also include academics, for projecting and modelling fertility trends, and demographers and health researchers for conducting research into characteristics and trends.

Organisations such asEurostat and the United Nations Statistics Divisionuse birth statistics to report on a range of indicators for international comparison purposes. Our data feed into the Human Fertility Database, which is a leading scientific data resource allowing access to detailed and high-quality cohort and period fertility data for international comparison.

The media also report on our statistics, informing public debate around childbearing.

5 . Quality characteristics of childbearing data

Relevance

The term "relevance" is defined as the degree to which statistical outputs meet users' needs

Childbearing statistics are derived from births that occurred in England and Wales in a calendar year but include a very small number of births because of late registrations from the previous year. Childbearing statistics do not include women usually resident in England or Wales who gave birth abroad. They do include women whose usual residence is outside England and Wales, where the birth occurred in England or Wales.

We produce annual childbearing data although publication times can vary depending on the timely release of data sources that feed into the statistics, such as population estimates. For example, the 2021 childbearing statistics were later than usual because of the time involved in producing the new census-based population data for 2012 to 2021.

Accuracy

The term "accuracy" is defined as the degree of closeness between an estimate and the true value.

In May 2012, changes were implemented to the Population (Statistics) Act 1938. These changes ensure that information is collected at all birth registrations based on the total number of previous live births and previous stillbirths that any mother has had (not just births to married mothers). This has simplified the question asked by registrars and provides improved coverage.

Information relating to whether the mother has been previously married, is also now collected at all birth registrations. Previously, these data items were only collected if the mother was married at the time of each birth. The changes improve the accuracy of childbearing statistics by birth order.

The difference in the proportion of married women reporting previous births was larger than expected, purely from the question change.

More information can be found inour [Quality assurance of new data on birth registrations, as a result of changes to the Population Statistics Act - from May 2012 onwards document](#).

This article also provides background to the changes and provides high-level findings from the new data collected in 2012 and 2013. As a result of these findings, changes were made to the Registration Online (RON) system in January 2016 to ensure the birth being registered is excluded from the number of previous children born to the mother.

An assessment of the impact of this change on birth registrations in England and Wales was undertaken in 2016, results from which suggest that the change to the wording of the question on the Registration Online (RON) system is having a positive effect on the quality of the previous children data. More information can be found in our [Quality assurance of data from the number of previous children question at birth registrations, England and Wales: 2016 methodology](#).

Checks are carried out on births data at the point of registration.

Information supplied is believed to be correct since wilfully supplying false information may render the informant liable to prosecution for perjury. There are also some validation checks built into the Registration Online (RON) system. Checks by the Office for National Statistics (ONS) are more frequently on variables (such as the age of the mother and the age of the father), where poor data quality would have a greater effect on published tables.

When looking at multiple births, there are checks such as ensuring the number of triplets is divisible by three, and that there is one maternity recorded for each set of triplets. Any inconsistent birth records are queried with the General Register Office (GRO) monthly.

The annual births dataset used for the childbearing publication is a static file of birth registration records available at the time the dataset is taken. Revisions to records and late registrations can happen after the dataset has been finalised, but these will not be reflected in statistics. This is a trade-off with timeliness. If we waited for these late changes to come through, then the statistics would have to be published later.

Between 2001 and 2019, the annual births dataset included:

- births occurring in the reference year that were registered by 25 February the following year (parents are allowed 42 days to register a birth)

- births occurring in the year before the reference year but were registered late (after the previous 25 February cut-off) and therefore did not make it into the previous year's statistics

There were delays in birth registrations in 2020 because of the coronavirus (COVID-19) pandemic. To get a more representative dataset of the births in 2020, a later cut-off point was taken to include more late registrations. Registration delays and how it affects births statistics are discussed in more detail in our [Births in England and Wales explained: 2020 article](#).

In 2020, the annual dataset included:

- births occurring in 2020 that were registered by 12 August 2021

- births occurring in the year before the reference year but were registered late (after the previous 25 February 2020 cut-off) and therefore did not make it into the previous year's statistics

In 2021, the annual dataset included:

- births occurring in 2021 that were registered by 15 May 2022

- births occurring in the year before the reference year but were registered late (after the previous 12 August 2021 cut-off) and therefore did not make it into the previous year's statistics

In 2022, the annual dataset included:

- births occurring in 2022 that were registered by 18 March 2023

- births occurring in the year before the reference year but were registered late (after the previous 15 May 2022 cut-off) and therefore did not make it into the previous year's statistics

Any proposed changes to the recording and collection of birth registration data are carefully managed and involve the Office for National Statistics (ONS), GRO and other stakeholders. This ensures that any implications are considered before changes are made.

The population estimates used to calculate childbearing statistics are the most up to date when published. Occasionally population estimates are revised. Birth rates affected by these revisions are updated when the next annual publication is released, and tables are footnoted to alert users to any revisions.

Population estimates based on Census 2021 were used to calculate the 2021 childbearing statistics. Rebased population estimates were also calculated for 2012 to 2020 as a result of the intercensal differences highlighted between the rolled-forward 2021 population estimates and the Census 2021 based population. This process is carried out every 10 years following a census.

As a result, revisions were made to the 2012 to 2020 childbearing estimates published in the 2021 and 2022 combined release. The 2021 and 2022 data were combined and published for the first time because of delays receiving the rebased 2012 to 2021 population data that feed into them. More information can be found in our [Rebasing of mid-year population estimates following Census 2021, England and Wales bulletin.](#)

Before May 2012, missing data items collected under the Population (Statistics) Acts 1938 and 1960 required for the production of birth statistics, were imputed. These included the age of the mother, age of the father, number of previous children both live-born and stillborn, and duration of marriage or civil partnership.

Details on the method and level of imputation for each year is available in our [User guide to birth statistics](#).

As part of the childbearing statistics processing, missing values for the number of previous children are imputed using a random number generation method.

Since the introduction of RON, less than 1% of mothers' and fathers' ages are not available from the birth registration. As a result, imputation of these were also discontinued, in March 2018, to improve efficiency in processing, given there is negligible impact on accuracy. This affects birth statistics for the 2018 data year onwards.

With regards to a cohort year, this is approximate and based on the calendar year of occurrence and age of mother at childbirth. For instance, women aged 32 years giving birth in 2012 could have been born in 1979 or 1980, but are regarded as the 1980 cohort.

Output quality trade-offs

The term "trade-off" is defined as the extent to which different dimensions of quality are balanced against each other.

Until March 2018, any birth records that were still missing an age of the mother, age of the father, or duration of marriage after attempting to draw this information from the birth notification, were imputed.

The advantages of imputation are that all records can be published by these variables, while time and money is not spent trying to obtain missing information.

The disadvantage is that the data are not exact. However, imputation was discontinued in March 2018 as the number of missing values was negligible. This makes processing more efficient. Our User guide to birth statistics provides more information on the method used for imputation.

Each year a certain number of births are not included in the published figures because they have been registered later than the date on which the annual dataset is taken. Since 2001, the number of late registrations that miss the cut-off date and end up in the following year's statistics has been less than 400.

In 2021, the number of late registrations from the previous year included in the 2021 dataset was higher than usual, but still accounted for less than 1% of all births and does not affect the headline trends discussed. There are also some very late registrations that have still not been registered some 14 months after the end of the reference year. These records are not included in any birth statistic.

Since 2001, there have been fewer than 70 of these each year. Although this means that some births are not included in the statistics, it is a compromise that must be taken to publish timely data.

Coherence and comparability

The term "coherence" is defined as the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. "Comparability" is the degree to which data can be compared over time and domain, for example, a geographic level.

The Births and Deaths Registration Act 1836 made it a legal requirement for all births to be registered from 1 July 1837.

Registration requirements have changed over the years. For example, the introduction of the Population (Statistics) Acts 1938 and 1960 allowed for more detailed information to be requested from the informant.

For the purposes of our childbearing analysis, stillbirths are removed from the dataset, so only live births are reported on.

There is a large degree of comparability in birth statistics between countries within the UK; all figures are based on the details collected when births are registered.

We quality assure and publish birth statistics for England and Wales. Similarly, National Records of Scotland (NRS) and Northern Ireland Statistics and Research Agency (NISRA) quality assure and publish birth statistics for their own countries.

For England and Wales, the childbearing data are based on the number of live births occurring in the reference period. However, Scotland and Northern Ireland birth statistics relate to the number of live births registered in the reference period. In England and Wales, where a birth is registered too late to be included in the count for the year of occurrence, it will be included in the count for the following year.

For further information, National Records of Scotlandprovides more detailed birth statistics for Scotland including cumulative fertility by cohort.

TheNorthern Ireland Statistics and Research Agencyprovides more detailedbirth statisticsfor Northern Ireland, including cumulative fertility by cohort.

The differences between reporting occurrences and registrations are relatively minor and figures are broadly comparable. For example, in 2014 to 2017, the differences between registrations and occurrences of live births in England and Wales was less than 0.2% each year.

To aid comparison across the UK and internationally, annual birth statistics for the UK and its constituent countries, and the birth rates for international countries, are published in ourVital statistics in the UK: births, deaths and marriages dataset.

Internationally, we provide data to the Human Fertility Database each year to allow publication of UK birth figures alongside those for other European countries.

Concepts and definitions

The term "Concepts and definitions" describes the legislation governing the output and a description of the classifications used in the output.

Cohort

A group of women with the same year of birth.

Completed family size

The average number of live-born children for women, who are assumed to have completed their childbearing.

Our final "completed family size" rates include births to mothers up to and including the age of 45 years, and births occurring at those aged 46 years and above, for women born in earlier years. This means that births to mothers aged 46 years and above, in earlier cohorts are used as a proxy for births to be included in the final rates. Births to mothers aged 46 years and above, remain a small proportion of total births.

Completed childbearing

For this analysis we look at women aged 15 to 45 years. While some women have children before the age of 15 years, and after the age of 45 years, the numbers are small and do not affect the overall patterns. Births to younger women are included at the age of 15 years old. Births to women aged 46 years and older, are included by using a proxy based on the number of births to women aged 46 years and older, born in previous years.

Completed age

Where the ages of women are presented as "completed years'', fertility rates should be interpreted as the number of live births per 1,000 women at last their birthday. Rates for those women aged 40 years will include any births up to the day before they turn 41 years old.

Exact age

Where the ages of women are presented in "exact years", figures should be interpreted as the average number of children a woman has had up to that birthday. Childbearing up to the exact age of 30 years includes cumulative fertility through a woman's lifetime, up to the day before she turns 30 years old.

Parity

For the purposes of this dataset, the definition is the number of live births a woman has had. A woman who has one child has a parity of one. If a woman has had multiple births in one pregnancy, each child represents one parity.

Standardised mean age

The standardised mean (average) age is a measure that eliminates the impact of any changes in the distribution of the population by age, and therefore enables trends over time to be analysed. Standardised means are calculated using rates per 1,000 female population by single year of age of mother.

For definitions of terms relating to birth statistics and information on UK legislation please see ourUser guide to birth statistics.

Accessibility and clarity

The term "accessibility" is defined as the ease with which users can access the data, reflecting the format in which data are available and the availability of supporting information. "Clarity" refers to the quality and sufficiency of the release details, illustrations and accompanying advice.

Our recommended format for accessible content is a combination of HTML web pages for narrative, charts and graphs, with data being provided in usable formats such as Excel spreadsheets and comma-separated values (CSV) files. Our website also offers users the option to download the narrative in PDF format. In some instances, other software may be used, or may be available on request. Available formats for content published on our website that we do not produce, or that is referenced on our website but stored elsewhere, may vary.

For further information please refer to the contact details at the beginning of this report.

Following guidance from the Government Statistical Service (GSS) to improvedigital accessibility of statistical spreadsheets, our published datasets for childbearing statistics from the 2020 data now incorporate and adhere to this guidance. This is to help improve the usability, accessibility and machine readability of our statistical spreadsheets.

More information regarding conditions of access to data can be found in our Terms and conditions (for data on the website) web page and Accessibility statement.

Timeliness and punctuality

The term "timeliness" refers to the lapse of time between publication and the period to which the data refer. "Punctuality" refers to the gap between planned and actual publication dates.

We have published annual childbearing statistics for women born from 1920 onwards, since 2010. This publication was originally called "Cohort Fertility" data, however since the 2013 publication, they have been released under the current title of "Childbearing for women born in different years, England and Wales".

While we do aim to produce estimates around the same time each year, this is dependent on the availability of other data that feeds into the childbearing statistics. For example, the 2021 childbearing estimates were published later than usual because of the work involved in producing population estimates based on Census 2021.

The release of our childbearing publications are announced on the GOV.UK release calendar at least four weeks before publication and on our own release calendar.

6 . Methods used to produce the childbearing data

How the output is created

Birth statistics present data on births that have occurred and been registered in England and Wales. More detailed information on the production of birth statistics, can be found in our User guide to birth statistics and our flow chart (PDF, 70KB).

The childbearing statistics release, which uses birth data, shows cumulative fertility, percentage distributions and age-specific fertility rates. These are calculated using the most up-to-date, consistent mid-year estimates of the resident female population aged between 15 and 45 years. Our Population estimates web page provide further information.

Childbearing statistics are calculated on a cohort basis: by the year of birth of the mother, rather than the year of birth of the child. The year of birth of the mother is by necessity approximate because, prior to 1963, data are available only by calendar year of occurrence and the age of mother at childbirth. For instance, women aged 32 years who gave birth to children in 2012 could have been born in either 1979 or 1980. For convenience, such women are regarded as belonging to the 1980 cohort.

Where the number of previous children is missing, a random number is allocated to that record based on the average number of previous children 99% of women in the latest year's data, and of the same age, have had. This means that as age increases, the maximum number of previous children allocated to missing values also increases. If a mother's age is less than 15, the number of previous children is 0.

When calculating parity of birth, an adjustment is made to the tables for any multiple births to ensure the births are not treated as one parity.

Tables 1 to 3 refer to age in exact years and Table 4 refers to completed age.

Age-specific fertility rates

Age-specific fertility rates (ASFRs) are a measure of fertility specific to the age of the mother and are useful for comparing the reproductive behaviour of women at different ages. They are calculated by dividing the number of live births to mothers of each age, by the number of females in the population of that age, and then expressed per 1,000 women of that age.

7 . Other information

Assessment of user needs and perceptions

The term "assessment of user needs and perceptions" refers to the processes used for finding out about uses and users, and their views on the statistical products.

Following feedback from previous releases, we have reviewed the terminology used within the publication and communication around it. We specifically considered the use of the words "childless", "women" and phrases around "the assumption of the completion of childbearing". Our main conclusions were to:

- tailor the language used for different formats (for example bulletin versus social media accounts)

- reduce the use of the word "childless" where possible

- completely avoid the use of the phrase "remain childless"

- avoid the use of the phrase "assumed to have completed their childbearing years" where possible

- increase the visibility of the web link to the male period fertility data

We welcome feedback on the content, format and relevance of our releases and encourage users to send feedback via email to popinfo@ons.gov.uk.

Feedback is requested with all emails sent by our customer service teams.

Feedback is also received through our regular attendance at user group meetings and conferences.

Useful links

Information on data quality, legislation and procedures relating to birth statistics, as well as links to our statistical releases, can be found in our User guide to birth statistics and the Births Quality and Methodology Information (QMI).

For births and childbearing data for other UK countries, please see National Records of Scotland which provides more detailed birth statistics for Scotland, including cumulative fertility by cohort and the Northern Ireland Statistics and Research Agency provides more detailed birth statistics for Northern Ireland, including cumulative fertility by cohort.

8 . Cite this methodology

Office for National Statistics (ONS), released 1 February 2024, ONS website, methodology, Childbearing for women born in different years in England and Wales, QMI