

## **AGE-SPECIFIC FERTILITY RATE, TOTAL FERTILITY AND MEAN AGE AT CHILDBEARING**

### **DEFINITIONS AND COMPUTATIONS**

The age-specific fertility rate measures the annual number of births to women of a specified age or age group per 1,000 women in that age group. An age-specific fertility rate is computed as a ratio. The numerator is the number of live births to women in a particular age group during a period of time, and the denominator an estimate of the number of person-years lived by women in that same age group during the same period of time. It is expressed as births per 1,000 women. The following seven five-year age groups by age of mother at time of birth are presented in the data base: 15 to 19; 20 to 24; 25 to 29; 30 to 34; 35 to 39; 40 to 44; and 45 to 49.

Total fertility is the mean number of children a woman would have by age 50 if she survived to age 50 and were subject, throughout her life, to the age-specific fertility rates observed in a given year. The total fertility is expressed as the number of children per woman. Total fertility (TF) is computed as the sum of age-specific fertility rates weighted by the number of years in each age group, divided by 1,000.

$$TF = \sum_{a=15-19}^{45-49} f_a / 1,000$$

Where  $f_a$  is the age-specific fertility rate for women whose age corresponds to the five-year age group  $a$ .

The mean age at childbearing is the mean age of mothers at the birth of their children if women were subject throughout their lives to the age-specific fertility rates observed in a given year. The mean age at childbearing (MAC) is computed as the sum of age-specific fertility rates weighted by the mid-point of each age group, divided by the sum of the age-specific rates.

$$MAC = \frac{\sum_a a f_a}{\sum_a f_a}$$

Where  $a$  is the mid-point for each age interval (17.5, 22.5, etc.) and  $f_a$  is the age-specific fertility rate for women whose age corresponds to the age group of which  $a$  is the mid-point.

Unless otherwise specified, the reference period for the age-specific fertility rates presented in *World Fertility Report 2012* is the calendar year.



## SOURCES OF THE DATA

Data on age-specific fertility rates can be obtained from three sources: civil registration systems, sample surveys and censuses. Civil registration systems are considered the best source of information on age-specific fertility rates. However, some countries, especially those in the less developed regions, either lack a civil registration system or have a registration system whose coverage is too incomplete to be utilized for statistical purposes. Civil registration systems are classified as “complete” if they cover 90 per cent or more of all live births taking place within a country or area.

In countries where civil registration systems are lacking, surveys and censuses can be utilized to estimate age-specific fertility rates. Such information is generally obtained from questions regarding the number of live births that occurred in the household in the 12 months preceding the census or survey enumeration, questions on the date of birth of the last child born alive in the household or, in the case of surveys, retrospective birth histories. Compared to data from complete civil registration, such direct retrospective questions tend to yield less reliable estimates since they rely on the ability of individuals to recall with accuracy an event that took place several months or years before. Furthermore, while civil registration systems tend to generate annual estimates, the availability of survey and census data depends on the existence of adequate survey or census programmes. Censuses are generally conducted every 10 years. Surveys are undertaken at different intervals in different countries. In developing countries they typically take place every three to five years.

Age-specific fertility rates derived from civil registration are calculated from country data on number of live births by age of mother and population by age and sex reported by national statistical offices to the United Nations Statistics Division. The data are also taken from data bases, reports and other analytical publications produced by national statistical systems or compiled by other international and regional statistical units. If country data on population by age and sex for the denominator are not available, estimates of population by age and sex from the *World Population Prospects: The 2010 Revision* are used.

When data are derived from surveys, the estimates are directly taken from the survey report when available. In other cases, if microdata are available, estimates are produced by the United Nations Population Division based on national data. The main surveys utilized are the Demographic and Health Surveys (DHS), the Reproductive Health Surveys (RHS), the World Fertility Survey (WFS), the Multiple Indicator Cluster Surveys (MICS), the Contraceptive Prevalence Surveys (CPS), and other nationally sponsored surveys.

If censuses are the data source then preference is given to data from census reports and other analytical publications produced by national statistics offices. Adjusted estimates are only used when reported by the national statistical office.

## **Criteria for data source selection**

Generally, only one source is provided per year. When more than one source is available for the same period, preference is given to estimates based on civil registration. However, where such estimates are unavailable or incomplete, survey or census estimates are used. Registration data regarded as less than 90 per cent complete are used for countries where alternative sources are either not available or present problems of comparability, and where registration data can provide an assessment of trends. In countries with multiple survey programmes, sample surveys conducted on an annual or biennial basis are used where they exist. When such surveys are not available, other surveys using retrospective birth histories, censuses and other surveys are selected, in that order.

For each data point, information is provided on the source type (registration, census, survey or sample registration system) and the source (usually denoted by an acronym). A description of each acronym is given in the table labeled "Sources". For surveys, the full name is provided in the field "Survey name". When the numerator and denominator come from different sources, a note is provided. Notes are also used to indicate adjusted estimates and estimates based on the own-children method. Start and end years for the reference period covered by the data are reported when they differ from the calendar year.

## **COMMENTS AND LIMITATIONS**

Limitations depend on the data source:

When data are derived from civil registration, estimates are subject to limitations that depend on the completeness of birth registration. Comparability of data is also affected by the treatment of infants born alive but who died before registration or within the first 24 hours of life, the quality of the reported information relating to age of the mother, and the inclusion of births from previous periods. The population estimates may suffer from limitations connected to age misreporting and coverage.

The main limitations of data derived from surveys and censuses concern age misreporting, birth omissions, misreporting of the date of birth of the child and, in the case of surveys, sampling variability.

Notes are used to indicate any differences between the data presented and the definition of age-specific fertility rate given above.

## **Discrepancies between data presented in *World Fertility Report 2012* and other estimates**

Generally, there is no discrepancy between data presented in *World Fertility Report 2012* and the age-specific fertility rates, total fertility and mean age at childbearing reported by national statistical systems. There is no attempt to provide estimates when country data are not available from published reports.

Data on age-specific fertility rates reported in *World Fertility Report 2012* differ from estimates produced by the United Nations Population Division and published in the *World Population Prospects*. The latter are best estimates based on all available demographic data and a cohort-component method used for estimation and projection. For further details on estimates of age-specific fertility rates, total fertility and mean age at childbearing from the *World Population Prospects*, see:

United Nations, Department of Economic and Social Affairs, Population Division (2011). *World Population Prospects: The 2010 Revision*. <http://esa.un.org/unpd/wpp/index.htm>

## **DATA COVERAGE AND REFERENCE YEARS FOR THE DATA REPORTED**

In *World Fertility Report 2012* data are provided, when available, for three reference dates: the closest years to 1970 (period 1965 to 1989), 1995 (period 1990 to 1999) and the most recent available year after 1999. Detailed distributions for each indicator by number of observations by reference dates are presented in the table labeled “Data availability”.

Data on the age-specific fertility rate are provided for 197 countries or areas of the world with a total population of 100,000 or more inhabitants in 2011. Data are available for all three reference dates for 178 countries or areas.

Data on total fertility are provided for 197 countries or areas of the world with a total population of 100,000 or more inhabitants in 2011. Data are available for all three reference dates for 188 countries or areas.

Data on the mean age at childbearing are provided for 196 countries or areas of the world with a total population of 100,000 or more inhabitants in 2011. Data are available for all three reference dates for 176 countries or areas.

Suggested citation:

United Nations, Department of Economic and Social Affairs, Population Division (2013). *World Fertility Report 2012* (United Nations publication).