GENERAL FERTILITY RATE

1. Definition:

GENERAL FERTILITY RATE is the number of resident live births for a specified geographic area (nation, state, county, etc.) during a specified period (usually a calendar year) divided by the female population age 15-44 years (usually estimated for a mid-year) for that area, and the resulting fraction multiplied by a 1,000.

2. Calculation:

(Number of resident live births / Number of females age 15-44 years) x 1,000

<u>Number of Resident Live Births</u> X 1,000 Number of Females Age 15-44 Years Population

3. Examples:

180,000 live births in calendar year 2008 among state residents 2,700,000 females age 15-44 years population estimated for 1 July, 2008 for state residents

180,000	Х	1,000 =	66.7 live births per 1,000 female
2,700,000			state residents age 15-44 years

4. Technical Notes:

- The General Fertility Rate (GFR) is perhaps the most commonly used overall fertility measure because it matches often readily available numerator and denominator data in a broad age range that covers most of the female reproductive years and thus representing the population at greatest risk of giving birth.
- The numerator includes all live births and not just those that occurred to women age 15 through 44 years of age. The use of age 15-44 years for fertility is a common convention because it represents the primary childbearing years. In addition, including younger or older age groups mainly would dilute the rate fraction. For example, only 0.3 percent of all births to U.S. resident women occurred to those younger than 15 years of age and older than 44, based on 2008 data.
- The GFR can be applied to subgroups of a population based on demographic characteristics other than age and sex. For example, the GFR could be particular to a race category, geographic area, marital status, etc., as long as both birth and population data can be obtained that match for that characteristic. For example, to calculate the GFR for Pacific Islanders for a given state, one would need birth data that classified mothers by age and Pacific Islander race category as well as population that classified women by age and Pacific Islander. In the case of race categories especially, care must be taken that the category definition(s) match for both the numerator and denominator data.

- The GFR, although an un-standardized measure, can be appropriate for synchronic or diachronic comparisons. However variations in population structure, especially for females age 20-29 years, can make comparisons between two GFRs less meaningful because some of such a comparison will be an artifact of the population differences rather than true fertility differences.
- Live births sometimes are misrepresented in the numerator. Live births can be mistakenly classified and registered as fetal deaths or stillbirths when the neonate briefly shows signs of life and subsequently dies. In some countries "live birth" may be defined differently than in the U.S. (or not applied to the same degree in practice), which follows the World Health Organization (WHO) definition. In the U.S., age of mother is often accurate to the single year of age.
- Sometimes live births do not become part of the official count of, say, a state's resident live birth total because:

a) the birth to a state resident occurred in a state for which the state does not have a vital records exchange agreement,

b) the birth to a state resident occurred in an area for which the state does have an exchange agreement but it arrived to the state's vital registration office too late for inclusion in the state's official count or

c) the live birth occurred in the state but simply was not registered in time (e.g., an at-home birth) for inclusion in the state's official count. Also note that a state's official count of resident live births may vary somewhat from that determined by National Center for Health Statistics for that state due to variations of the above reasons.

- A mid-year population number for females age 15-44 years, often derived as an estimate using a demographic method, best serves as the denominator. Decennial census counts sometimes are used, but in the U.S. they are for 1 April instead of the midyear 1 July date. For smaller geographic entities, decennial census counts might be used more commonly if population estimates by age and sex are unavailable.
- If the number of resident live births is less than 100, it sometimes is advisable to combine time (additional years of births) and/or geographic areas (e.g., additional counties' numbers of live births) to increase the stability of the rate, at the expense of its temporal or spatial specificity. (Please see issues of small event numbers in vital rates.)
- As with other vital rates, confidence intervals surrounding the GFR as a point estimate can be calculated. (Please see <u>calculating vital rate confidence intervals</u>.) Note that when the numerator or number of live births is less than 100, it is recommended confidence interval calculations be based on a Poisson distribution instead of a normal distribution.
- Similar but conceptually different rates to the GFR to consider are: crude birth rate, total fertility rate and pregnancy rate. (maf 12/2008)