

PERCENT of LIVE BIRTHS to MOTHERS WHO SMOKED DURING PREGNANCY

1. Definition:

Number of resident live births to mothers who smoked during pregnancy in a specified geographic area (country, state, county, etc.) divided by the total number of resident live births for the same geographic area (for a specified time period, usually a calendar year) and multiplied by 100.

2. Calculation:

(Number of resident live births to mothers who smoked during pregnancy/Number of resident live births) x 100

$$\frac{\text{Number of Resident Live Births to Mothers Who Smoked During Pregnancy}}{\text{Number of Total Resident Live Births}} \times 100$$

IMPORTANT: The variables from a birth database used to determine if the mother smoked during pregnancy may vary by state/registration area and may not be directly comparable. Please see Technical Notes below for more detailed information/discussion.

[Additional links to State/National websites with calculation and/or definition - National Center for Health Statistics: Natality Technical Notes](#)

3. Example:

31,234 = live births to mothers who smoked during pregnancy in 2008 among state residents
150,000 = total live births in 2008 to state residents

$(31,234/150,000) \times 100 = \underline{\mathbf{20.8\%}}$ of live births in 2008 among state residents were to mothers who smoked during pregnancy

4. Technical Notes:

- Collection, calculation and reporting of the information on the number/percent of mothers who smoked during pregnancy may vary by state/registration area (based on which certificate revision is used) and, therefore, may not be directly comparable. Prior to the 2003 birth certificate revision standards, most areas/states simply asked if the mother used tobacco during pregnancy (yes/no) and the average number of cigarettes smoked per day (during the entire pregnancy), according to the 1989 revision standards. However, those areas/states that have adopted the 2003 revision standards ask for the average numbers of cigarettes and/or packs smoked per day during each trimester. If any number of cigarettes and/or packs is indicated for any trimester then the birth is counted as one to a mother who smoked during pregnancy.
- NCHS reports state/area data separately based on which revision standard is used by the state/area since NCHS considers the data for the two standard revisions as not comparable.
- It is expected that the 2003 revision question results in higher (more reliable) rates of actual smoking during pregnancy since there are specific time references allowing for reporting of behavior changes.

- Trend analysis for this statistic is compromised by the revision changes and either should not be done or any trend data presented that includes data from both revisions should be clearly qualified.
- Unknowns are generally excluded from calculations (for both the numerator and denominator). Whether unknowns are excluded or not in the calculation should be documented in the statistical output.
- Smoking during pregnancy is an important indicator of potentially adverse pregnancy outcomes since it has been associated with low birth weight, infant mortality, and intrauterine growth retardation. The 2003 certificate revisions provide an opportunity to further study differences in low birth weight risk by trimester.
- If the number of resident live births to mothers who smoked during pregnancy is small (<10 or 20), 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. It is also advisable to calculate 95% confidence intervals for vital statistics, especially those based on smaller numbers of events to better define variability. Please see [North Carolina Statistical Primer, Problems with Rates Based on Small Numbers](#); [Pennsylvania: Technical Assistance – Small Area Analysis](#); [New York State: Rates Based on Small Numbers](#) or [Washington State: Guidelines for Working with Small Numbers](#)) or the link shown above for the NCHS Natality Technical Notes.

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