Standard Terminology for Reporting of Reproductive Health Statistics in the United States

HE DEFINITIONS, FORMULAE, and reporting requirements presented here were prepared, reviewed, and approved by representatives of the American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, the American Medical Association, the American Medical Record Association, the Association of Maternal and Child Health Programs, the Association for Vital Records and Health Statistics, the Centers for Disease Control, the National Center for Health Statistics, and the Office of Maternal and Child Health to promote uniform collection procedures and the proper use and interpretation of reproductive health statistics.

We believe that the adoption of these recommended definitions and reporting requirements will provide an improved basis for standardization and uniformity in the design, implementation, and evaluation of intervention strategies. The reduction of maternal and infant mortality and the improvement of the health of our nation's mothers and infants is our ultimate goal. The collection and analysis of reliable statistical data are an essential part of in-depth investigations which incorporate casefinding, individual review, and analysis of risk factors. These studies could then yield valuable clinical information for practitioners to aid them in improved case management for high risk patients, resulting in decreased morbidity and mortality.

This standardization represents an attempt to enhance communication between those in the medical community who provide the data, those who are responsible for collecting the data, and those who analyze and interpret the data to plan and evaluate perinatal programs.

Both collection and use of statistics have been hampered by lack of understanding of differences in *definitions, statistical tabulations,* and *reporting requirements* among State, national, and international bodies. Misapplication and misinterpretation of data may lead to erroneous comparisons and conclusions. For example, specific requirements for reporting of fetal deaths have frequently been misinterpreted as implying a weight or gestational This article is reprinted with permission from the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists from "Guidelines for Perinatal Care," Ed. 2, Washington, DC, ACOG, 1988, pages 308-324.

age for viability. Distinctions can and should be made among l) the definition of an event, 2) the reporting requirements for the event, and 3) the statistical tabulation and interpretation of the data. The definition indicates the meaning of a term (for example, live birth, fetal death, or maternal death). A reporting requirement is that part of the defined event for which reporting is mandatory or desired. Statistical tabulations connote the presentation of data for the purpose of analysis and interpretation of existing and future conditions. The data should be collected in a manner that will allow them to be presented in different ways for different users. Adjustments should be made for variations in reporting before comparisons among data are attempted.

If information is collected and presented in a standardized manner, comparisons between the new data and the data obtained by previous reporting requirements can be delineated clearly and can contribute to improved public understanding of reproductive health statistics.

For ease in assimilating this information, it is divided into three sections: definitions, statistical tabulations, and reporting requirements/recommendations. Some of the definitions and recommendations are a departure from those currently or historically accepted; however, these recommendations were agreed upon by the interorganizational group that was brought together to review terminology related to reproductive health issues.

Definitions

Live Birth: The complete expulsion or extraction from the mother of a product of human conception, irrespective of the duration of pregnancy, which, after such expulsion or extraction, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles whether or not the umbilical cord has been cut or the placenta is attached. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps.

Birth Weight: The weight of a neonate determined immediately after delivery or as soon thereafter as feasible. It should be expressed to the nearest gram.

Gestational Age: The number of completed weeks that have elapsed between the first day of the last normal menstrual period (not the presumed time of conception) and the date of delivery, irrespective of whether the gestation results in a live birth or a fetal death.

Neonate: These definitions are for statistical purposes and are not intended to affect clinical management. Appropriate assessment of fetal maturity for purposes of clinical management is delineated in chapter 4 of "Guidelines for Perinatal Care."

Statisticians making a determination of the status of a neonate, namely preterm or term, should define preterm as less than 259 days and term as 259 to less than 294 days in order to insure comparable calculations with the medical community. Statisticians, by formula, subtract the date of the first day of the last menstrual period from the date of birth, whereas physicians include the first day, thus accounting for the difference.

Low Birth Weight: Any neonate of gestational age whose weight at birth is less than 2,500 g.

Preterm: Any neonate whose birth occurs through the end of the last day of the 37th week (259th day), following onset of the last menstrual period.

Term: Any neonate whose birth occurs from the beginning of the first day (260th day) of the 38th week, through the end of the last day of the 42nd week (294th day), following onset of the last menstrual period (fig 1).

Postterm: Any neonate whose birth occurs from the beginning of the first day (295th day) of the 43rd week following onset of the last menstrual period.

Fetal Death: Death prior to the complete expulsion or extraction from the mother of a product of human conception, fetus and placenta, irrespective of the duration of pregnancy; the death is indicated by the fact that, after such expulsion or extraction, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps. This definition excludes induced terminations of pregnancy.

Neonatal Death: Death of a liveborn neonate before the neonate becomes 28 days old (up to and including 27 days, 23 hours, 59 minutes from the moment of birth).

Infant Death: Any death at any time from birth up to, but not including, one year of age (364 days, 23 hours, 59 minutes from the moment of birth).

Maternal Death: The death of a woman from any cause related to or aggravated by pregnancy or its management (regardless of duration or site of pregnancy), but not from accidental or incidental causes.

Death occurring to a woman during pregnancy or after its termination from causes *not* related to the pregnancy nor to its complications or management is *not* to be considered a maternal death. Nonmaternal deaths may result from accidental causes (for example, auto accident or gunshot wound) or incidental causes (for example, concurrent malignancy).

Direct Obstetric Death: The death of a woman resulting from obstetric complications of pregnancy, labor, or the puerperium; from interventions, omissions, or treatment; or from a chain of events resulting from any of these.

Indirect Obstetric Death: The death of a woman resulting from a previously existing disease or a disease that developed during pregnancy, labor, or the puerperium that was not due to direct obstetric causes, although the physiologic effects of pregnancy were partially responsible for the death.

Induced Termination of Pregnancy: The purposeful interruption of an intrauterine pregnancy with the intention other than to produce a liveborn infant, and which does not result in a live birth. This definition excludes management of prolonged retention of products of conception following fetal death.

Statistical Tabulations

Statistical tabulations for vital events related to pregnancy provide the medical and statistical community with valuable information on reproductive health, as well as generating data on trends apparent in this country and worldwide. This information often is disaggregated and used to examine specific events over time or within selected geographic locations. In informing the public about



health issues, media sources often report various statistical measures. Heightened public interest in health related issues makes it essential that the medical community understand and have the capacity to interpret these statistics.

The following explanations of statistical tabulations provide the reader with a better understanding of measures used for events related to reproduction.

Rate is a measure of the frequency of some event in relation to a unit of population during a specified time period such as a year; events in the numerator of the rate occur to individuals in the denominator. Rates express the risk of the event in the specified population during a particular time. Rates are generally expressed as units of population in the denominator (per 1,000, per 100,000, and so forth). For example, the 1982 teenage birth rate was 52.9 live births per 1,000 women 15-19 years of age.

Ratios, on the other hand, express a *relationship* of one element to a *different* element (where the numerator is not necessarily a subset of the denominator). A ratio is generally expressed per 1,000 of the denominator element. For example, the sex ratio of live births for 1982 was 1,051 males per 1,000 females.

In the formulae that follow, "period" refers to a calendar year.

Live Birth Measures. These measures are designed to show the rate at which childbearing is occurring in the population. The crude birth rate, which relates the total number of births to the total population, gives an indication of the impact of fertility on population growth. The general fertility rate is a more specific measure of fertility since it relates the number of births to the population at risk, women in the childbearing ages (assumed to be ages 15-44 years). An even more specific set of rates, the age-specific birth rates, relates the number of births to women of a specific age directly to the total number of women in that age group. Formulae for these measures follow:

Crude Birth Rate	Number of live births to women of all ages = during a calendar year x 1,000 Total estimated mid-year
General Fertility Rate	Number of live births to women of all ages during a calendar year x 1,000 Estimated mid-year population of women 15–44 years of age
General Pregnancy Rate	Number of live births + number of fetal deaths + number of induced terminations of pregnancy during a calendar year x 1,000 Estimated mid-year population
Age-Specific Birth Rate	of women 15–44 years of age Number of live births to women in a specific age group during a calendar year x 1,000 Estimated mid-year population of women in the same age group
Total Fertility Rate	The sum of age-specific birth rates of women at each age group 10–14 through 45–49. Since 5-year age groups are used, the sum is multiplied by 5. This rate can also be computed by using single years of age.

Because the birth weight of the infant is included on the birth certificate, it is possible to tabulate and focus an analysis on selected groups of live births, for example, those weighing 500 grams or more.

Births can be tabulated by where they occur. Thus, they can be shown by place of occurrence, by place of residence, and by kind of setting of delivery such as at a hospital or at home. Most vital statistics tabulations are routinely tabulated by place of residence of the mother but they could be tabulated on another basis as well. What is essential however, is that the classification be the same for all events under consideration for a specific measure.

Fetal Mortality Measures. The population at risk for fetal mortality is the number of live births plus the number of fetal deaths in a year. Alternatively, the number of live births alone is sometimes used as the population at risk. Fetal death indices indicate the likelihood that pregnancies in a population group would result in fetal death.

It is recognized that most States report fetal deaths based upon gestational age. However, birth weight can be more accurately measured than gestational age. Therefore, minimum reporting requirements of fetal deaths based upon and labeled as to specific birth weight rather than gestational age are recommended for adoption by States (see Fetal Death in "Reporting Requirements/Recommendations" page 469.). In addition, *statistical tabulations* of fetal deaths should include, at a minimum, fetal deaths of 500 grams or more.

		Number of fetal deaths (of weight or more) during a period x 1,000
Fetal Death Rate	=	Number of fetal deaths (of weight or more + number of live births during the same period
Fetal Death Ratio	=	Number of fetal deaths (of weight or more) during a period x 1,000
		Number of live births during the same period

It is recognized that States will not be able to translate data from gestational age to weight immediately, and, for comparative purposes, it may be desirable to know fetal death rates for varying gestational time periods. Therefore, the collection of both weight and gestational age is recommended to allow for these comparisons. When calculating fetal death rates based upon gestational age, the number of weeks or more of stated or presumed gestation can be substituted for weight in the above formulae.

Perinatal Mortality Measures. These indices combine fetal deaths and live births which survive only briefly (up to a few days or weeks) on the assumption that similar factors are associated with these losses. The population at risk is the total number of live births plus fetal deaths, or alternatively, the number of live births. Perinatal mortality indices can vary as to age of the fetus and the infant that is included in the particular tabulation. However, the concept itself cuts across all the calculations.

It is recommended that perinatal mortality measures be based upon and labeled as to specific weight rather than gestational age (see "Reporting Requirements/Recommendations" page 468.).

Perinatal Mortality Rate	Number of infant deaths of less than days + number of fetal deaths (with stated or presumed weight of or more) = during a period x 1,000
	Number of live births + number of fetal deaths (with stated or presumed weight of or more) during the same period
Perinatal Mortality Ratio	Number of infant deaths of less than days + number of fetal deaths (with stated or presumed weight of or more) during a period x 1,000
	Number of live births during the same period

It is recognized that States will not be able to translate data from gestational age to weight immediately, and, for purposes of comparability, knowledge of gestational age (based on last menstrual period) may be required and should be collected. When calculating perinatal death rates based upon gestational age, the number of weeks of a stated or presumed gestational age can be substituted for weight in the above formulae. When comparisons are desired based upon gestational age, the generally accepted breakdown is as follows: Perinatal Period I includes infant deaths of less than 7 days and fetal deaths with a stated or presumed period of gestation of 28 weeks or more; Perinatal Period II includes infant deaths of less than 28 days and fetal deaths with a stated or presumed period of gestation of 20 weeks or more; Perinatal Period III includes infant deaths of less than 7 days and fetal

Figure 2. Perinatal periods



Figure 3. Neonatal periods



deaths with a stated or presumed gestation of 20 weeks or more (fig 2).

Perinatal measures can be specific for race and other characteristics. Perinatal events can be tabulated by where they occur. Thus, they can be shown by place of occurrence, by place of residence, and by place of delivery such as at a hospital or home. Most vital statistics tabulations are routinely tabulated by place of residence of the mother, but they could be tabulated by place of occurrence. What is essential, however, is that the classification be the same for all events under consideration for a specific measure.

Infant Mortality Measures. Indices of infant mortality are designed to show the likelihood that live births with certain characteristics will survive the first year of life, or, conversely, will die during the first year of life. For infant mortality, the "population at risk" is approximated by live births that occur in a calendar year. One can compare the infant mortality rate of different population groups, such as between white and black infants. Interest sometimes focuses on two different periods in the first year of an infant's life: the very early period before the infant becomes 28 days old (up through 27 days, 23 hours, 59 minutes from the moment of birth), called the "neonatal period," and the later period starting at the end of the 28th day up to but not including 1 year of age (364 days, 23 hours, 59 minutes), called the "postneonatal period." Accordingly, two indices reflect these differences, namely, the neonatal mortality rate and the postneonatal mortality rate. The neonatal period can be broken down further for statistical tabulations as follows: Neonatal Period I is from the moment of birth through 23 hours and 59 minutes; Neonatal Period II starts at the end of the 24th hour of life through 6 days, 23 hours, and 59 minutes; Neonatal Period III starts at the end of the 7th day of life through 27 days, 23 hours, and 59 minutes (fig 3).

Infant Mortality Rate	Number of infant deaths (neonatal + postneonatal = during a period x 1,000)
	Number of live births during the same period	
Neonatal Mortality Rate	Number of neonatal death during a period x 1,000	S
	Number of live births during the same period	
Postneonatal Mortality Rate	Number of postneonatal dea during a period x 1,000	iths
	= Number of live births during the same period	

The denominator for the postneonatal mortality rate can also be calculated by subtracting the number of neonatal deaths from the number of live births. This denominator more accurately defines the population at risk of dying in the neonatal period. In addition, it should be noted that infant deaths can be broken down into birth weight categories, if desired, for comparative purposes when birth and death records are linked (see "Reporting Requirements/Recommendations" page 469).

Maternal Mortality Measures. These measures are designed to indicate the likelihood that a pregnant woman will die from complications of pregnancy,

childbirth, or the puerperium. Accordingly, the population at risk is an approximation of the population of pregnant women in a year: the approximation is usually taken to be the number of live births. Maternal mortality can be examined in terms of characteristics of the woman such as age, race, and cause of death. The maternal mortality rate measures the risk of death from deliveries and complications of pregnancy, childbirth, and the puerperium.

The group exposed to risk consists of all women who have been pregnant at some time during the period. Thus, the population at risk should theoretically include all fetal deaths (reported and unreported), all induced terminations of pregnancy, and all live births. Because most States do not require the reporting of all fetal deaths and there are still a large number of States that do not require reporting of induced terminations of pregnancy, the entire population at risk can not be included in the denominator. Therefore, the total number of live births has become the generally accepted denominator. It is recommended that when complete ascertainment of the denominator (that is, the number of pregnant women) is achieved, that a modified maternal mortality rate be defined, in addition to the traditional rate.

The rate is most frequently expressed per 100,000 live births, as follows:

Maternal Mortality Rate		Number of deaths attributed to maternal conditions during a period x 100,000
	=	Number of live births during the same period

Cause of death rates for specified maternal causes are computed by restricting the numerator to the specified cause. The maternal mortality rates specific for race and age groups are computed by appropriately restricting both the numerator and denominator to the specified group. Caution should be used in interpreting rates in small geographic areas; it may not be possible to generate race- and age-specific rates.

For statistical comparisons with the World Health Organization, it is recommended that two tabulations of statistics be prepared: 1) maternal deaths within 42 days of the end of pregnancy (WHO) and 2) with no time limitation for comparison within the United States.

Induced Termination of Pregnancy Measures. These measures parallel those of fetal deaths, but they refer to "induced" events. The population at risk for induced termination of pregnancy is taken to be live births in a year, which is used as a surrogate measure of pregnancies. Because this is not actually the total population at risk, this measure is generally considered a ratio.

Induced Termina- tion of Pregnancy Ratio I	Number of induced terminations occurring during a period x 1,000
	Number of live births occurring

Another measure (Induced Termination of Pregnancy Ratio II) is one which, by also including an estimate of pregnancies which do not result in live births, more closely approximates the population at risk.

Induced Termina-	Number of induced terminations occurring during a _ period x 1,000
tion of Pregnancy Ratio II	Number of induced terminations of pregnancies + live births + reported fetal deaths during the same period

Still a third measure is a rate which provides information on the *probability* that women of a certain age or race will have an induced termination of pregnancy.

Induced Termina-	Number of induced terminations occurring during a period x 1,000
Rate	= Female population age 15-44 years

Sometimes induced termination indices are specific for certain characteristics of the women: that is, they can refer to women of particular age or race groups.

Reporting Requirements/Recommendations

Reporting requirements for vital events related to reproductive health enable the collection of data essential to the calculation of statistical tabulations which look at trends and changes at the local, State, and national levels. The data which are used in statistical tabulations may only be a portion of those which are collected, due to the need for consistency in a tabulation, and the variations in reporting requirements from State to State. For instance, while a few States require that all fetal deaths, regardless of length of gestation, be reported, statistical tabulations of fetal death rates by the National Center for Health Statistics (NCHS) only utilize fetal deaths of 20 weeks or more gestation. Live Birth. It is generally recognized that all States report all live births as defined in the definitions section of this document. It is recommended that all live births be reported regardless of birth weight, length of gestation, or survival time.

Fetal Death. Reporting requirements for fetal deaths now vary from State to State. At present, most States require reporting of fetal deaths by gestational age. It is generally recognized that birth weight can be more accurately measured than gestational age.

It must be emphasized that a specific birth weight criterion for reporting of fetal deaths does not imply a point of viability and should be chosen instead for its feasibility in collecting useful data.

Current statistical tabulations of fetal deaths, include, at a minimum, fetal deaths of 500 grams or more. Furthermore, all but three States now require either reporting of all fetal deaths or reporting of some fetal deaths below 500 grams, for example, those which fall below 500 grams because of the variation in birth weights at a given required gestational age such as 20 weeks. Therefore, it is recommended that

• Statistical tabulations for comparisons of perinatal mortality rates within the United States exclude fetal deaths of less than 500 g.

• Each State adopt a specific birth weight criterion for reporting of fetal deaths which will result in continued collection of data on as close as possible to 100 percent of the population of fetal deaths currently reported in that State. When birth weight is unknown, an estimate of gestational age should be utilized to determine whether or not this event is required to be reported.

• All State fetal death report forms include birth weight and gestational age.

Perinatal Mortality. Perinatal mortality indices generally combine fetal deaths and live births which survive only briefly (up to a few days or weeks). Since reporting requirements on fetal deaths vary from State to State, perinatal mortality reporting will also vary (see previous section on Perinatal Periods).

As with fetal deaths, it is recommended that perinatal mortality be weight specific. However, for purposes of comparability, knowledge of gestational age (based on last menstrual period) should be collected.

Infant Mortality. All States require that all infant deaths (neonatal plus postneonatal) as defined in

the definitions section of this article be reported.

Infant deaths by birth weight are not routinely available for the U.S. as a whole since birth weight information is not collected on the death certificate. However, since birth weight is reported on the birth certificate, by linking together the birth certificate and the death certificate for the same infant, it is possible to obtain information on infant deaths by birth weight. At the present time, most States link birth and death certificates. It is recommended that this be encouraged to create a national data base for infant mortality by birth weight.

In addition, it is recommended that infant death reports include the exact interval from birth rather than categories such as neonatal or postneonatal. This too, will allow for more specific age-related death analyses.

Maternal Mortality. Every State is required to report all maternal deaths. Since annual deaths attributed to maternal mortality only approximate 300, emphasis must be placed on in-depth investigations. Case-finding, together with individual review and analysis of risk factors contributing to maternal deaths, is of the highest importance. Collection of data regarding these rare events is critical, when combined, as it should be, with educational review by those closest to the case, usually the obstetrician-gynecologists in the hospital and the surrounding region. Such analysis can yield clinical information about risk factors associated, for example, with detection and treatment of ectopic pregnancies, or with anesthesia. This clinical information can then be gathered and exchanged to help practitioners identify risk factors which contribute to maternal death and associated conditions.

Induced Termination of Pregnancy. The United States has no national system for reporting induced terminations of pregnancy. State health departments vary greatly in their approaches to the compilation of this data from compiling no data to 1) periodically requesting hospitals, clinics and/or physicians performing the procedures to voluntarily report total number of procedures performed; 2) requiring (by legislative or regulatory authority) hospitals, clinics and/or physicians to periodically report aggregate level data on number or number and characteristics of procedures; or, 3) requiring (by legal or regulatory authority) hospitals, clinics, and/or physicians to periodically report individual level data on each procedure performed.

Since 1969, the Division of Reproductive Health

(DRH), Centers for Disease Control (CDC), has published an annual Abortion Surveillance Report based upon data provided from State health departments, when available, and from data voluntarily provided to CDC from hospitals and clinics in States with no data available from health departments. In addition to information on the number and characteristics of induced terminations of pregnancy, the Abortion Surveillance Report contains information from CDC's abortion mortality surveillance, which was begun with the cooperation of State health departments in 1972. Investigation and review of each related death by DRH epidemiologists result in improved detailed nosological identification of abortion mortality by type of risk.

The CDC Abortion Surveillance Report includes information on events categorized by CDC as abortions (legal, illegal, and spontaneous). While this terminology preexisted the recommendations in this paper and is at variance with the definitions herein, it has been commonly used and understood to include induced termination of pregnancy.

Since 1977, the National Center for Health Statistics has analyzed the induced terminations of pregnancy occurring in up to 13 States in which individual reports of induced terminations are submitted to State vital registration offices. In addition, the Alan Guttmacher Institute, a private organization, publishes information on induced terminations that it obtains from a nationwide survey of induced termination providers.

Collecting information on the number of induced terminations of pregnancy, the characteristics of women having such procedures, and the number and characteristics of all deaths related to induced termination of pregnancy would be extremely valuable in identifying and evaluating risk factors for specific population groups and for the public in general. By gathering these data, studies could be instituted which would examine clinical issues and then results could be shared with practitioners. Knowing the outcomes could further the body of knowledge and ultimately reduce the risks.

Therefore, we urge State health departments that compile statistics on induced terminations of pregnancy to evaluate and improve the quality of their data. Furthermore, we urge State health departments that do not compile such statistics to explore mechanisms for initiating their collection.

Existing State Fetal Death Reporting. The following general fetal death reporting requirements, current as of January 1988, should be brought into conformity with recommendations in this report:

Nebraska
Nevada
New Jersey
North Carolina
North Dakota
Ohio
Oklahoma
Oregon*
Texas
Utah
Vermont*
Washington
West Virginia
Wyoming

20 weeks or more gestation or birth weight of 500 grams or more District of Columbia

20 weeks or more gestation or birth weight of 350 grams or more

Idaho	Missouri
Kentucky	New Hampshire
Louisiana	South Carolina
Massachusetts	Wisconsin
Mississippi	

Birth weight in excess of 350 grams Kansas

20 weeks or more gestation or birth weight of 400 grams or more Michigan

Birth weight of 500 grams or more New Mexico South Dakota

Tennessee*

5 months or more gestation Puerto Rico

16 weeks or more gestation Pennsylvania

All products of human conception

American SamoaNew York StateArkansasRhode IslandColoradoTrust Territory of theGeorgiaPacific IslandsHawaiiVirginiaMaineVirgin IslandsNew York CityVirgin Islands

*Specific modifiers apply.