



Statistical Notes

From the CENTERS FOR DISEASE CONTROL AND PREVENTION/National Center for Health Statistics

Operational Definitions for Year 2000 Objectives: Priority Area 14, Maternal and Infant Health

Katherine E. Heck and Richard J. Klein

Introduction

Healthy People 2000, with its Midcourse Revisions, presents 319 objectives to improve the health of Americans by the year 2000 (1,2). Because these objectives are national, not solely Federal, the achievement of these objectives is dependent in part on the ability of health agencies at all levels of government to assess objective progress. To permit comparison of local and State health data with national data and that of other States and localities, *Healthy People 2000* objective 22.3 targets the development, dissemination, and use of collection methods that improve comparability among data collected by all levels of government. The objective states:

Develop and disseminate among Federal, State, and local agencies procedures for collecting comparable data for each of the year 2000 national health objectives and incorporate these into Public Health Service data collection systems.

Achieving this objective entails determining and defining the information needed to measure progress toward each national health objective. The purpose of this Statistical Note is to provide definitions and data collection specifications for objectives in Priority Area 14: Maternal and Infant Health, one of 22 priority areas of *Healthy People 2000*. In this publication the text ([appendix A](#)) and operational definitions of the objectives are presented, important data issues are discussed, and references are cited

for expanded discussions of the data systems ([appendix B](#)) that provide data for the national objectives. When appropriate, the text of questionnaire items used to measure the objectives is also provided.

[Table 1](#) is a data comparability worktable with objective definitions, data sources and issues. This table presents the short text of each objective, the measure, the operational definition (numerator and denominator where applicable), national data source, and a brief description of data issues. The data issues for each objective are discussed in greater detail below.

Objective 14.1: Infant mortality

Infant mortality is a period rate measured as the number of infant deaths (deaths before one year of age) occurring during a year per 1,000 live births occurring in the same year. Three data sets within the National Vital Statistics System (NVSS, which encompasses mortality, natality, and linked birth and infant death files) contribute to the calculation of infant mortality rates. Infant mortality for the total population (14.1, 14.1d, 14.1g), whites, and blacks (14.1a, 14.1e, 14.1h) is computed by dividing the number of infant deaths during a given year from the mortality file by the number of live births during the same year from the natality file and multiplying by 1,000.

Because of inconsistencies in reporting of race and Hispanic-origin data between birth and death certificates (3), the cohort-linked birth/infant death data are used to calculate infant mortality rates for Hispanic-origin groups and for race



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics



Table 1. Objective definitions, data sources, and issues for *Healthy People 2000* Priority Area 14

Objective	Measure	Operational definition		Healthy People 2000 data source	Data issues
		Numerator	Denominator		
14.1 Infant mortality Special populations: a. Blacks b. American Indians/ Alaska Natives c. Puerto Ricans d. Neonatal mortality Special populations: e. Blacks f. Puerto Ricans g. Postneonatal mortality Special populations: h. Blacks i. American Indians/ Alaska Natives j. Puerto Ricans	Infant mortality rate per 1,000 live births Neonatal mortality rate per 1,000 live births Postneonatal mortality rate per 1,000 live births	Number of deaths under one year of age Number of deaths in the first 28 days of life Number of deaths from day 29 through day 364	Number of live births Number of live births Number of live births	NVSS, CDC, NCHS NVSS, CDC, NCHS NVSS, CDC, NCHS	Prior to 1995, rates for total and black were calculated from unlinked <i>period</i> files and rates for Puerto Rican and American Indian/Alaska Native infants were calculated using a <i>cohort</i> linked infant birth and death file. Beginning with 1995 data, all infant mortality rates for Puerto Rican and American Indian/Alaska Natives are based on an annual <i>period</i> file of infant deaths linked with the corresponding birth certificate. Data are available for Hispanic women (14.1c,f,j) for varying numbers of States in different years.
14.2 Fetal mortality Special populations: a. Blacks	Fetal death rate per 1,000 live births plus fetal deaths	Number of fetal deaths of at least 20 weeks of gestational age	Number of live births plus fetal deaths of at least 20 weeks gestational age	NVSS, CDC, NCHS	Fetal deaths may be underreported. Reporting requirements vary by State.
14.3 Maternal mortality Special populations: a. Blacks	Maternal mortality rate per 100,000 live births	Deaths due to obstetric causes (ICD-9 codes 630 to 676) within 42 days of a pregnancy	Number of live births	NVSS, CDC, NCHS	Because other definitions are used, use caution when comparing rates within the U.S. and internationally.
14.4 Fetal alcohol syndrome Special populations: a. American Indians/ Alaska Natives b. Blacks	Rate per 1,000 live births	Number of infants with fetal alcohol syndrome If measured using hospital discharge data, use infant discharges with ICD-9 code 760.71	Number of live births	BDMP through 1993; pilot State-level programs for future estimates, CDC, NCEH	Fetal alcohol syndrome may be difficult to detect at birth, so is not well reported on birth certificates or hospital discharge records.

Table 1. Objective definitions, data sources, and issues for *Healthy People 2000* Priority Area 14 — Con.

Objective	Measure	Operational definition		Healthy People 2000 data source	Data issues
		Numerator	Denominator		
14.5 Low birthweight and very low birthweight				NVSS, CDC, NCHS	
- Low birthweight	Percent	Number of infants less than 2,500 grams at birth (about 5.5 pounds)	Number of live births		Low birthweight is considered to be very well reported. Missing values are subtracted from the denominator before calculating the percentage.
Special populations: a. Blacks c. Puerto Ricans					
- Very low birthweight	Percent	Number of infants less than 1,500 grams at birth (about 3 pounds, 5 ounces)	Number of live births		Data are available for Hispanic women (14.5c,d) in varying numbers of States in different years.
Special populations: b. Blacks d. Puerto Ricans					
14.6 Weight gain in pregnancy	Percent	Number of mothers who achieve the minimum recommended weight gain	Number of women delivering live births	1980 baseline: National Natality Survey, CDC, NCHS 1988 update: NMHS, CDC, NCHS Proxy measure: NVSS, CDC, NCHS	The Institute of Medicine guidelines are used to determine the recommended weight gain. The calculation is based on pre-pregnancy height and weight. The number of pounds gained can be obtained from the birth certificate, but this measure provides only a weak proxy of appropriateness of weight gained because there is no information on pre-pregnancy height and weight.
		The minimum recommended weight gain is based on body mass index (BMI): (weight (kg)/height (m) ²)			
		Recommendation: BMI less than 19.8: gain 12.5-18 kg. (28-40 lbs.) BMI 19.8-26.0: 11.5-16 kg. (25-35 lbs.) BMI 26.1-29: 7-11.5 kg. (15-25 lbs.) BMI over 29.0: at least 6.8 kg. (15 lbs.)			
14.7 Severe complications of pregnancy	Percent	Number of hospitalizations due to maternal causes (ICD-9 codes 630-676, excluding 635 and 650)	Number of deliveries (ICD-9 procedure code V27)	NHDS, CDC, NCHS	NHDS includes a sample of U.S. hospitals. The outcome may vary with changes in criteria for hospitalization.
Special populations: a. Blacks					

Table 1. Objective definitions, data sources, and issues for *Healthy People 2000* Priority Area 14 — Con.

Objective	Measure	Operational definition		Healthy People 2000 data source	Data issues
		Numerator	Denominator		
14.8 Cesarean delivery		Number of cesarean deliveries (ICD-9 code 74 except 74.3, 74.91)	Number of deliveries	NHDS, CDC, NCHS	Cesarean delivery data may be drawn from hospital discharge or birth certificate data. The two sources yield close, but not identical, estimates.
-Primary cesarean delivery	Percent	Number of cesarean deliveries to women without a previous uterine scar (ICD-9 code 74 except 74.3, 74.91 with no 654.2 on record)	Number of deliveries to women with no previous cesarean deliveries (ICD-9 V27 with no 654.2 on record)	Alternate estimates: NVSS, CDC, NCHS	
-Repeat cesarean delivery	Percent	Number of cesarean deliveries to women with a previous uterine scar (above ICD-9 codes plus 654.2)	Number of deliveries to women with a previous uterine scar (ICD-9 V27 with 654.2 on record)		
14.9 Breastfeeding				Ross Mothers Survey, Abbott Laboratories	For Abbott Laboratories, mothers are sampled from a list of over 80% of all U.S. births.
- Breastfeeding in the early postpartum period	Percent	Number of mothers breastfeeding in hospital	Number of mothers		
- Breastfeeding until the infant is 5 or 6 months old	Percent	Number of mothers breastfeeding at 6 months	Number of mothers	For American Indians/Alaska Natives (14.9d): PNSS, CDC, NCCDPHP	PNSS is based on a convenience sample of WIC and other program users.
Special populations:					
a. Low income (less than \$10,000)					
b. Blacks					
c. Hispanics					
d. American Indians/Alaska Natives					
14.10 Abstinence from tobacco, alcohol, cocaine, and marijuana during pregnancy	Percent	NHIS: women with a birth in the past 5 years who abstained from smoking during the pregnancy	Number of women who had a birth in the past 5 years (data are weighted)	1985 baseline for tobacco and 1990 and 1991 updates: NHIS, CDC, NCHS	Reporting of smoking on the birth certificate varies by State and year.
		NVSS: women delivering live births who abstained from smoking	Number of women delivering live births	Alternate estimates for tobacco, 1989 to present: NVSS, CDC, NCHS	The NMIHS was done in 1988 and has not been repeated.
		NMIHS: all women surveyed who abstained from a given substance	All women in the survey (data are weighted)	1988 data for all substances: NMIHS, CDC, NCHS	NPHS data are from 1993; there are no plans to repeat the survey. Women giving birth were sampled at delivery using questionnaires and laboratory tests of urine and hair.
		NPHS: all women surveyed who abstained from a given substance	All women in the survey (data are weighted)	1993 data for all substances: NPHS, NIH, NIDA	

Table 1. Objective definitions, data sources, and issues for *Healthy People 2000* Priority Area 14 — Con.

Objective	Measure	Operational definition		Healthy People 2000 data source	Data issues
		Numerator	Denominator		
<p>14.11 Prenatal care in the first trimester of pregnancy</p> <p>Special populations: a. Blacks b. American Indians/ Alaska Natives c. Hispanics</p>	Percent	Number of women receiving prenatal care in the first trimester (three months)	Number of live births	NVSS, CDC, NCHS	Missing values are subtracted from the denominator before calculating the percentage. Data are available for Hispanic women (14.11c) in varying numbers of States in different years.
14.12 Preconception care and counseling by primary care providers	Percent of primary care providers	Number of primary care providers who routinely provide preconception care and counseling to at least 81 percent of patients	Number of primary care providers	Primary Care Providers Survey, OASH, ODPHP	Construction of these data is complex; see text.
14.13 Screening of fetal abnormalities	Percent	Number of pregnant women screened for AFP weighted to U.S. total	Number of live births	College of American Pathologists, Foundation for Blood Research	Laboratories surveyed represent 63 percent of U.S. births. Testing rates vary by region (51-76% of births).
14.14 Risk-appropriate care among infants and pregnant women	Proportion of infants and pregnant women who receive risk-appropriate care	Cannot currently be measured.	Cannot currently be measured.	No data source	The original <i>Healthy People 2000</i> publication noted that this outcome would be measured by the proportion of very low birthweight infants who are born in a hospital containing a Neonatal Intensive Care Unit. No data source was ever located.
14.15 Newborn screening				Council of Regional Networks for Genetic Services (CORN)	CORN sponsors a survey of State and territorial health departments regarding the structure and function of newborn screening in the different geographic areas. State reporting has been incomplete in the past but currently all States participate.
- Screening for genetic disorders and disabling conditions	Percent	Number of newborns screened for sickle cell disease and galactosemia	Number of live births in the states reporting screening		
- Appropriate treatment for those testing positive	Percent	Number of newborns testing positive who receive a clinically confirmed diagnosis	Number of newborns who test positive		

Table 1. Objective definitions, data sources, and issues for *Healthy People 2000* Priority Area 14 — Con.

Objective	Measure	Operational definition		Healthy People 2000 data source	Data issues
		Numerator	Denominator		
14.16 Primary care services among babies 18 months and under	Proportion of babies who receive recommended primary care services at the appropriate intervals	Cannot currently be measured.	Cannot currently be measured.	No data source	The U.S. Clinical Preventive Services Task Force issued recommendations for appropriate primary care services, but no survey adequately measures this list of services. See text for the full list of recommendations.
14.17 Spina bifida and other neural tube defects (NTDs)	Rate per 10,000 live births	Number of infants born with NTDs	Number of live births	BDMP through 1993, now State-specific surveillance.	Currently about 20 States are able to monitor this problem.

Data system acronyms:

BDMP	Birth Defects Monitoring Program
NHDS	National Hospital Discharge Survey
NHIS	National Health Interview Survey
NMIHS	National Maternal and Infant Health Survey
NPHS	National Pregnancy and Health Survey
NVSS	National Vital Statistics System
PNSS	Pediatric Nutrition Surveillance System

Agency acronyms:

CDC	Centers for Disease Control and Prevention
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NCEH	National Center for Environmental Health
NIH	National Institutes of Health
NIDA	National Institute on Drug Abuse
NCHS	National Center for Health Statistics
OASH	Office of the Assistant Secretary for Health
ODPHP	Office of Disease Prevention and Health Promotion

Other abbreviations:

ICD-9	International Classification of Diseases, 9th Revision
WIC	Women, Infants, and Children supplemental food program
AFP	Alphafetoprotein

groups other than white and black (14.1b, 14.1c, 14.1f, 14.1i, 14.1j). The linked birth/infant death file matches the death certificate to the corresponding birth certificate for each infant who dies in the United States. With this data set, race/ethnic-specific infant mortality rates can be calculated using the more accurate race and Hispanic-origin data from the birth certificate. However, because some infant deaths cannot be matched to their corresponding birth certificates, infant mortality rates from the linked file tend to underestimate the actual rates by 2 to 3 percent (4). Data for Puerto Rican subobjectives are based on States reporting Hispanic origin on the birth certificate. The number of States reporting Hispanic origin on the birth certificate increased from 23 States and the District of Columbia in 1984 to all States and the District of Columbia in 1993.

Baseline and subsequent data for 1983–91 for these special population subobjectives (14.1b, 14.1c, 14.1f, 14.1i, 14.1j) were generated from linked files produced on a birth cohort basis (that is, all deaths in the first year of life to members of a particular birth cohort, regardless of year of death). Beginning with 1995 data, linked files are being produced on a period basis. For example, all infant deaths occurring in 1995 were matched to their corresponding birth certificate (whether the birth occurred in 1995 or 1994), and this group of deaths is used to calculate the rate. The denominator of the period linked file is the births for the period (such as all births occurring in 1995). To adjust for unlinked records, the Division of Vital Statistics provides weights for the deaths from the period linked file to an independent total. Linked file data will not be produced for 1992–94.

Infant mortality is divided into neonatal and postneonatal mortality, according to when the infant dies; those dying in the first 28 days of life are regarded as neonatal, and those dying after 28 days but before their first birthday are regarded as postneonatal. The causes of death tend to differ between these groups; for example, birth trauma is a more common cause neonatally, while SIDS (Sudden Infant Death Syndrome) is more common postneonatally. The neonatal mortality rate is calculated by dividing the number of neonatal deaths by the number of live births times 1,000; the postneonatal mortality rate divides the number of postneonatal deaths by the number of live births times 1,000. The same denominator (the number of live births) is used for infant mortality, neonatal mortality, and postneonatal mortality rates and, therefore, the neonatal and postneonatal rates sum to the total infant mortality rate.

Objective 14.2: Fetal mortality

Fetal mortality is sometimes called stillbirth. Fetal deaths, defined according to World Health Organization guidelines, are those in which the fetus never draws a breath or shows other evidence of life; if the infant lives for any length of time it is classified as a live birth and an infant death. States are required to report fetal deaths if they occur in the 20th week of pregnancy or later, or if they weigh at least 350 grams (4). Some States report earlier fetal deaths,

but most official data (including the data used to measure this objective) are calculated using only deaths at 20 or more weeks. The week of pregnancy is dated from the first day of the last menstrual period. Fetal deaths may be underreported (4,5). The data source is the NVSS, using fetal death reports; the fetal death rate used to track this objective is calculated as the number of fetal deaths per 1,000 live births plus fetal deaths. Fetal deaths to blacks are tracked as a special population subgroup (14.2a).

Objective 14.3: Maternal mortality

Maternal mortality is measured as the rate of maternal deaths per 100,000 live births. To be included in this definition, a death must occur during pregnancy or within 42 days of termination of pregnancy, and must result from obstetric causes (ICD–9 codes 630 through 676). The data source for maternal mortality is the NVSS, using death certificate data for the numerator.

Maternal mortality rates are computed on the basis of the number of live births. The maternal mortality rate indicates the likelihood of a pregnant woman dying of maternal causes. The number of live births used in the denominator is an approximation of the population of all pregnant women who are at risk of a maternal death.

Caution should be used when comparing these rates with maternal mortality rates from other reports. NCHS uses the definition of maternal mortality and related coding conventions recommended in the International Classification of Diseases, Ninth Revision (ICD–9), by the World Health Organization. Other definitions may use a different time interval from pregnancy to death and may be more inclusive with regard to the cause of death. ICD–10, which will be implemented for mortality in the U.S. effective with 1999 data, uses the same definition of maternal mortality as ICD–9, but has provision for including late maternal deaths (more than 42 days but less than one year after termination of pregnancy, and for obstetric-related deaths occurring a year or more after the termination of pregnancy) and pregnancy-related deaths irrespective of the cause of death (6).

Maternal mortality to black mothers is tracked as a special population subgroup (14.3a).

Objective 14.4: Fetal Alcohol Syndrome

This objective measures the number of infants affected with fetal alcohol syndrome per 1,000 live births. Fetal alcohol syndrome (FAS) may not be immediately recognizable in the infant at birth, and as a result the magnitude of this problem is difficult to estimate. The Centers for Disease Control and Prevention (CDC) currently uses a variety of data sources to measure FAS. The Birth Defects Monitoring Program (BDMP) was the source for published *Healthy People 2000* data through 1993. However, the BDMP system of voluntary reporting by hospitals was unreliable and the system no longer exists. Hospital discharge data, using infants with the ICD–9 code of 760.71, may be used, but this method necessarily results in an

undercount, as not all FAS-affected babies are correctly diagnosed while in the hospital in order to receive this discharge code. CDC is sponsoring pilot programs in two States, Colorado and New Mexico (see [reference 7](#) for a description of the Colorado project), to improve the tracking of FAS. However, accurate national estimates of FAS rates are unlikely to be available soon. Objectives 14.4a and 14.4b track American Indians/Alaska Natives and blacks as special populations.

Objective 14.5: Low birthweight and very low birthweight

Low and very low birthweight are measured by the percent of infants who are below a specified weight at birth, 2500 grams for low birthweight and 1500 grams for very low birthweight. This information is recorded on the birth certificate and thus the data are available through the NVSS. The data are considered to be very reliable. Very few births, about 0.1 percent in 1994, do not have weight recorded on the birth certificate. These missing records are subtracted from both numerator and denominator before calculating the percent. Data for subobjectives targeting Puerto Rican live births (14.5c-d) are based on States reporting Hispanic origin on the birth certificate. The number of States reporting Hispanic origin on the birth certificate increased from 23 States and the District of Columbia in 1987 to all 50 States and the District of Columbia in 1993. Subobjectives 14.5a-b track low and very low birthweight rates for black infants.

Objective 14.6: Weight gain in pregnancy

The Institute of Medicine (IOM) has made recommendations regarding the proper amount of weight to gain during pregnancy (8). This guideline varies according to the woman's body mass index (a measure of weight for height) before pregnancy. Body mass index (BMI) is measured as the person's weight in kilograms divided by the square of their height in meters. According to IOM guidelines, women in the thinnest group, those with a BMI of less than 19.8, should gain 12.5 to 18 kilograms. Those with a BMI of 19.8 to 26.0 should gain 11.5 to 16 kilograms. Those with a BMI of 26.1 to 29.0 should gain 7 to 11.5 kilograms. Women with a BMI of over 29.0 should gain at least 6.8 kilograms.

The baseline estimate for *Healthy People 2000* came from the National Natality Survey, fielded in 1980. The National Maternal and Infant Health Survey (NMIHS) was used for the 1988 estimate. The NMIHS has not been repeated; consequently, updates are not available.

Objective 14.7: Severe complications of pregnancy

This objective tracks the percent of pregnancies that have severe complications requiring hospitalization, such as ectopic pregnancy, pre-eclampsia, or birth trauma. Hospitalizations with ICD-9 codes 630 through 676 (excluding 635 and 650, legal abortion and uncomplicated

delivery) from the National Hospital Discharge Survey (NHDS) are divided by the total number of deliveries (ICD-9 procedure code V27). The rate for this objective has been declining and the target appears to have been met in 1993. However, hospitalization patterns have changed over the past several years, resulting in declining rates of hospitalization. Because the objective is measured by hospitalization rates, this change in the use of health services may influence the measurement of objective 14.7. The declines observed in severe pregnancy complications thus may reflect a true improvement in obstetric health, a decrease in the likelihood of being hospitalized for a given condition, or some combination of the two. Black mothers are tracked as a special population (14.7a).

Objective 14.8: Cesarean delivery

The estimates used to monitor this objective are the percent of deliveries that are cesarean (C-section), the percent of primary (first-time) cesarean deliveries (14.8a), and the percent of repeat cesarean deliveries among women who had a previous cesarean delivery (14.8b). The total C-section rate is computed by dividing the total number of cesarean deliveries (ICD-9 code 74, omitting 74.3 and 74.91) by the total number of deliveries (ICD-9 code V27). The primary C-section rate is computed by dividing the number of first cesareans (ICD-9 code 74, omitting 74.3 and 74.91, for women with no ICD-9 code 654.2 (uterine scar) on record) by the number of deliveries to women with no previous cesarean section deliveries (ICD-9 code V27 less women with ICD-9 code 654.2 on record). The repeat C-section rate, which is the complement of the Vaginal Birth After Cesarean (VBAC) rate, is calculated by dividing the number of women with a repeat cesarean section (ICD-9 code 74, omitting 74.3 and 74.91, for women with ICD-9 code 654.2 on record) by the total number of deliveries (ICD-9 code V27) for women with a uterine scar (ICD-9 code 654.2).

The data used to track this objective are based on deliveries (births as well as fetal deaths) recorded in hospital records from the NHDS. Information on cesarean delivery for live births only is also available from the NVSS (birth certificate) data using the question on method of delivery which asks for vaginal, VBAC, primary, and repeat C-sections. The two sources of data yield close, but not identical, estimates of the cesarean delivery rate.

Objective 14.9: Breastfeeding

This objective measures breastfeeding at two ages of the infant, the percent of all mothers who breastfed their infant during the early postpartum period (measured as breastfeeding in the hospital following delivery), and the percent of all mothers (including those who did not breastfeed in the hospital) who were breastfeeding 6 months following delivery. The data source for this objective is the Ross Mothers Survey (RMS) mailed to approximately 725,000 mothers annually, performed by Abbott Laboratories. The RMS is based on lists of new mothers

representing over 80 percent of U.S. births; however, these lists, which Abbott acquires from a marketing company, may not be representative of all women giving birth in the U.S. About 50 percent of women respond to the mail survey, though there are seasonal variations (for example, rates are lower in December), so the response rate may also influence the representativeness of this survey. The survey asks whether the woman was breastfeeding in the hospital and also asks about breastfeeding during several time periods until the infant is 6 months of age. The definition of breastfeeding includes exclusive breastfeeding or breastfeeding supplemented by bottle-feeding of formula or cow's milk. The questions asked are shown in [figure 1](#). Note: Time periods asked are: in the hospital; 1 week of age; 1 month of age; 2 months of age; 3 months of age; 4 months of age; 5 months of age; 6 months of age; yesterday. The "in the hospital" and "6 months of age" values are used to track the *Healthy People 2000* objective.

Figure 1. Ross Mothers Survey breastfeeding questions

As best you can remember, would you please check the milk your baby was fed at the following ages:

	In the hospital	6 months of age
<input type="checkbox"/> Breast milk	—	—
<input type="checkbox"/> Cow's milk (whole, 2%, skim, etc.)	—	—
<input type="checkbox"/> Similac (low iron or with iron)	—	—
<input type="checkbox"/> Similac Neocare	—	—
<input type="checkbox"/> Isomil	—	—
<input type="checkbox"/> Isomil DF	—	—
<input type="checkbox"/> Alimentum	—	—
<input type="checkbox"/> Enfamil (low iron or with iron)	—	—
<input type="checkbox"/> Lactofree	—	—
<input type="checkbox"/> Nutrami gen	—	—
<input type="checkbox"/> Prosobee	—	—
<input type="checkbox"/> Carnation Alsoy	—	—
<input type="checkbox"/> Carnation Follow-Up	—	—
<input type="checkbox"/> Carnation Follow-Up Soy	—	—
<input type="checkbox"/> Carnation Good Start	—	—
<input type="checkbox"/> Gerber (low iron or with iron) formula	—	—
<input type="checkbox"/> Gerber soy formula	—	—
<input type="checkbox"/> SMA (low iron or with iron)	—	—
<input type="checkbox"/> Nursoy	—	—
<input type="checkbox"/> Bonamil	—	—
<input type="checkbox"/> Next Step	—	—
<input type="checkbox"/> Next Step Soy	—	—
<input type="checkbox"/> Other (please specify) _____	—	—

SOURCE: Ross Mothers Survey, Abbott Laboratories.

Because the RMS does not make estimates for American Indians and Alaska Natives (AI/AN), the subobjective measuring breastfeeding rates among AI/AN (14.9d) is tracked by the Pediatric Nutrition Surveillance System (PNSS). This system, in operation since 1978, attempts to monitor the prevalence of nutrition-related problems and other risk factors related to infant mortality and low birthweight, among high-risk prenatal populations. Estimates from the PNSS are affected by variability in

participation, as well as the sampling frame, a convenience sample of participants in WIC, food stamps, and other such programs; 18 States as well as the District of Columbia and American Samoa participated in PNSS in 1990. This sample may not fully represent the AI/AN population.

Subobjectives 14.9a (mothers with annual family incomes of less than \$10,000), 14.9b (black mothers), and 14.9c (Hispanic mothers) are tracked with data from the Ross Mothers Survey.

Breastfeeding data are also available from several NCHS surveys, including the National Health and Nutrition Examination Survey (NHANES), the National Survey of Family Growth (NSFG), the NMIHS, and periodic supplements of the National Health Interview Survey (NHIS), and may be used to estimate the prevalence of breastfeeding. However, unlike the annual RMS, these surveys are fielded only periodically. Breastfeeding rates derived from the NCHS surveys are very similar to those produced by the Ross Mothers Survey.

This objective also appears as objective 2.11 in the *Healthy People 2000* Nutrition priority area.

Objective 14.10: Abstinence from tobacco, alcohol, cocaine, and marijuana during pregnancy

The goal of this objective is to increase abstinence during pregnancy from four substances: tobacco, alcohol, cocaine, and marijuana. The objective is measured by the proportion of women who do not use a given substance during pregnancy. However, accurate surveillance of this problem is difficult as women may be reluctant to divulge their use of substances, particularly illegal ones, during pregnancy.

The baseline data for the tobacco component of this objective were drawn from the 1985 NHIS. For the 1988 figures, the NMIHS was used to provide an update for tobacco and baseline estimates for alcohol, cocaine, and marijuana. Since 1989, annual updates on abstinence from tobacco are available from birth certificate data, and the NHIS was also used in 1990 and 1991. For 1993, data on all four substances were provided by the National Institute on Drug Abuse's National Pregnancy and Health Survey (NPHS) (9). No plans currently exist to replicate the NPHS or the NMIHS. Therefore, there are no data sources currently identified for updates to the alcohol, cocaine, and marijuana components of this objective.

Objective 14.11: Prenatal care use in the first trimester of pregnancy

This objective measures the percentage of women receiving prenatal care during the first trimester (three months) of pregnancy. Information on prenatal care is derived from the item on the birth certificate that asks for month of pregnancy that prenatal care began. The number of births with missing values is subtracted from the denominator population before calculating the percentage. Data for the Hispanic subobjective (14.11c) are based on

States reporting Hispanic origin on the birth certificate. The number of States reporting Hispanic origin on the birth certificate increased from 23 States and the District of Columbia in 1987 to all 50 States and the District of Columbia in 1993. Subobjectives 14.11a and 14.11b track the use of early prenatal care by black and American Indian/Alaska Native mothers.

Objective 14.12: Preconception care and counseling by primary care providers

Objective 14.12 measures the proportion of primary care providers who routinely provide age-appropriate preconception care and counseling to their patients who need the intervention. This objective is actually a set of measures calculated separately for each type of provider and for each type of service.

The Primary Care Provider Surveys, conducted by the Department of Health and Human Services Office of Disease Prevention and Health Promotion, are a set of national surveys of family physicians, pediatricians, nurse practitioners, obstetricians/gynecologists, and internists belonging to professional organizations. They include questions regarding preconception care and providers' counseling practices. However, results from the surveys may not be entirely reliable for several reasons. Response rates varied considerably by type of provider, from 50–80 percent. This measurement was constructed based on the two questions shown in figure 2. The data measure the percent of each different type of primary care provider who answered that 81–100 percent of their patients routinely receive information about family planning or preconception care, and the percent who said that 81–100 percent of their patients who need counseling for family planning receive it. The measure for those receiving preconception care was not asked separately as a specific question.

Figure 2. Primary Care Provider Surveys preconception care and counseling questions

For each of the following, the provider was asked to estimate [the] percentage of [their] patients routinely receiving this service. 0–20%; 21–40%; 41–60%; 61–80%; 81–100%; NA.

- Please [provide the] best estimate [of] the percentage of your current patients . . . who routinely receive each service.
Definition of "routinely": For the purpose of this survey, "routinely" means the receipt of services at regular intervals. Patients who receive a service only once in many years, in general, should not be included in your responses, because they are not provided with this service "routinely."
- Please answer the following questions about patients' receipt of counseling/treatment services in terms of the percentage of your patients who need the intervention, not the percentage of your total patient population. For example, only 20% of your total patient population may receive counseling about smoking; however, this 20% may represent 85% of your patients who smoke. Therefore, the proper answer would be 80–100% (based on 85%).

Type of service:

Counseling about family planning

SOURCE: Primary Care Provider Surveys, Office of the Assistant Secretary for Health, Office of Disease Prevention and Health Promotion.

This objective also appears as objective 5.12 in the *Healthy People 2000* Family Planning priority area.

Objective 14.13: Screening for fetal abnormalities

This objective is tracked by the percent of pregnant women whose blood is screened for alpha-fetoprotein (AFP). A high value of AFP may indicate that the fetus has a neural tube defect or other health problem. The data source for this objective is the Foundation for Blood Research, located in Maine, which conducts a national survey of screening laboratories to gather this information. Laboratories surveyed represent 63 percent of U.S. births. The testing rates, however, vary by region. For the *Healthy People 2000* measure, the number of screening tests is weighted up to a U.S. total and divided by the total number of live births in the U.S.

Objective 14.14: Risk-appropriate care among infants and pregnant women

High-risk pregnancies and births should receive special interventions; this standard of medical care forms the basis of objective 14.14. The objective was originally planned to be measured by the proportion of very low birthweight infants born in tertiary level III hospitals (that is, a hospital with a Neonatal Intensive Care Unit). However, no data source has been found that can adequately measure this objective.

Objective 14.15: Newborn screening and follow-up

This objective seeks to increase the percent of newborns who are screened for genetic disorders; the two disorders tracked are sickle cell anemia and galactosemia. Also measured is the proportion of infants screened with a positive result who receive treatment. The Council of Regional Networks for Genetic Services (CORN) at Emory University tracks information on infant screening for genetic disorders. CORN gathers information from State health departments on the proportion of infants screened and the proportion who received a diagnosis. For the baseline (1987) measure, ten States and the District of Columbia reported sickle cell screening: AZ, CO, DC, GA, LA, MI, NY, NC, TX, WA, and WY. Thirty-five States and DC reported galactosemia at baseline: AL, AK, AZ, AR, CA, CO, CT, DC, FL, GA, HI, ID, IL, IN, IA, KS, KY, ME, MA, MI, MN, MT, NV, NJ, NM, NY, NC, OH, OR, RI, TX, UT, VT, WV, and WI. Beginning in 1990, every State and the District of Columbia reported both sickle cell and galactosemia screening.

The percent screened is tallied as the number of infants screened divided by the number of live births in the States reporting this information. Infants who test positive are then tracked until they begin receiving a doctor's care. The proportion who receive treatment is the percent of infants who had a clinically confirmed diagnosis of those who

initially tested positive. CORN makes the assumption that if a diagnosis was confirmed, then therapy was instituted. The phone number for CORN is (404) 727-1475.

Objective 14.16: Primary care for babies 18 months and under

The U.S. Clinical Preventive Services Task Force made recommendations for primary care among individuals in several different age groups (10). This set of recommendations is the prescribed set of primary care services that this objective should measure. No data source has been found that encompasses all aspects of this list of recommendations, shown in [figure 3](#). Thus, baseline data have not been produced for this objective.

Figure 3. U.S. Clinical Preventive Services Task Force recommendations for primary care for babies 18 months and under

- Screening:** height and weight, blood pressure, hemoglobinopathy screen at birth, phenylalanine level at birth, T4 and/or TSH (at birth) for thyroid
- Counseling parents:** injury prevention, child safety car seats, smoke detector, flame retardant sleepwear, hot water heater temperature <120–130 degrees F, window/stair guards, pool fence, safe storage of drugs, toxic substances, firearms, matches, syrup of ipecac, poison control phone number, effects of passive smoking, anti-tobacco message, advice about baby bottle tooth decay, cardiopulmonary resuscitation (CPR) training, breastfeeding, iron-enriched formula and foods
- Immunizations:** Diphtheria-tetanus-pertussis (DTP), oral poliovirus, measles-mumps-rubella (MMR), H. influenzae type b (Hib) conjugate, Hepatitis B, varicella
- Chemoprophylaxis:** Ocular prophylaxis at birth
- Special populations:**
 - *Preterm or low birth weight:* hemoglobin/hematocrit
 - *Infant of a mother at risk for HIV:* HIV testing
 - *Low income, immigrants:* Hemoglobin/hematocrit
 - *TB contacts:* PPD
 - *Native American/Alaska Native:* Hemoglobin/hematocrit, Hepatitis A vaccine, pneumococcal vaccine
 - *Travelers to developing countries:* Hepatitis A vaccine
 - *Increased individual or community lead exposure:* blood lead level
 - *Inadequate water fluoridation:* daily fluoride supplement
 - *Family history of skin cancer, nevi, fair skin, eyes, hair:* avoid excess/midday sun, use protective clothing

SOURCE: U.S. Clinical Preventive Services Task Force.

Objective 14.17: Spina bifida and other neural tube defects

Neural tube defects (NTDs) are readily noticed at the birth of a child; they include spina bifida and anencephaly. This objective is measured by the number of NTD-affected births per 10,000 live births. Surveillance systems for birth defects are not available nationally; although birth defect data are available on birth certificates, they are generally not well reported. The Birth Defects Monitoring Program, which entailed voluntary surveillance by hospitals, was used for *Healthy People 2000* data through 1993, when the program was discontinued. Since then, some States have been performing their own surveillance; currently about 20 States are able to measure the incidence of NTDs. CDC is working with States to improve the surveillance of this health problem.

Healthy People 2000 measures this objective by tracking births. However, because 30–40 percent of NTD-affected pregnancies are terminated, it is possible to create an adjusted prevalence of NTDs by adding NTD-affected terminated pregnancies and births, and dividing them by the total number of live births.

References

1. U.S. Department of Health and Human Services. *Healthy people 2000: National health promotion and disease prevention objectives*. Washington: Public Health Service. 1990.
2. U.S. Department of Health and Human Services. *Healthy people 2000 midcourse review and 1995 revisions*. Washington: Public Health Service. 1995.
3. Frost F, Shy KK. Racial differences between linked birth and infant death records in Washington State. *Am J Public Health* 70:974–6. 1980.
4. National Center for Health Statistics. *Vital statistics of the United States, 1992, vol II, mortality, part A*. Washington, D.C.: Public Health Service. 1996.
5. Goldhaber MK. Fetal death ratios in a prospective study compared to State fetal death certificate reporting. *Am J Public Health* 79:1268–70. 1989.
6. World Health Organization. *ICD-10: International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*. Geneva: WHO. 1992.
7. Miller LA, Shaik T, Stanton C, et al. Surveillance for fetal alcohol syndrome in Colorado. *Public Health Reports* 110:690–7. 1995.
8. Committee on Nutritional Status During Pregnancy and Lactation, Institute of Medicine, National Academy of Sciences. *Nutrition during pregnancy: Part I: Weight gain, Part II: Nutrient supplements*. National Academy Press. 1990.
9. National Institute on Drug Abuse. *National Pregnancy and Health Survey. Drug use among women delivering live births: 1992*. Rockville, MD: U.S. Department of Health and Human Services. 1996.
10. U.S. Preventive Services Task Force. *Guide to clinical preventive services, 2nd ed*. Baltimore: Williams & Wilkins. 1996.

APPENDIX A:

Maternal and Infant Health Objectives

14.1: Reduce the infant mortality rate to no more than 7 per 1,000 live births.

NOTE: Infant mortality is deaths of infants under 1 year; neonatal mortality is deaths of infants under 28 days; and postneonatal mortality is deaths of infants aged 28 days up to 1 year.

14.1a: Reduce the infant mortality rate among blacks to no more than 11 per 1,000 live births.

14.1b: Reduce the infant mortality rate among American Indians and Alaska Natives to no more than 8.5 per 1,000 live births.

14.1c: Reduce the infant mortality rate among Puerto Ricans to no more than 8 per 1,000 live births.

14.1d: Reduce the neonatal mortality rate to no more than 4.5 per 1,000 live births.

14.1e: Reduce the neonatal mortality rate among blacks to no more than 7 per 1,000 live births.

14.1f: Reduce the neonatal mortality rate among Puerto Ricans to no more than 5.2 per 1,000 live births.

14.1g: Reduce the postneonatal mortality rate to no more than 2.5 per 1,000 live births.

14.1h: Reduce the postneonatal mortality rate among blacks to no more than 4 per 1,000 live births.

14.1i: Reduce the postneonatal mortality rate among American Indians and Alaska Natives to no more than 4 per 1,000 live births.

14.1j: Reduce the postneonatal mortality rate among Puerto Ricans to no more than 2.8 per 1,000 live births.

14.2: Reduce the fetal death rate (20 or more weeks of gestation) to no more than 5 per 1,000 live births plus fetal deaths.

14.2a: Reduce the fetal death rate (20 or more weeks of gestation) among blacks to no more than 7.5 per 1,000 live births plus fetal deaths.

14.3: Reduce the maternal mortality rate to no more than 3.3 per 100,000 live births.

14.3a: Reduce the maternal mortality rate among black women to no more than 5 per 100,000 live births.

14.4: Reduce the incidence of fetal alcohol syndrome to no more than 0.12 per 1,000 live births.

14.4a: Reduce the incidence of fetal alcohol syndrome among American Indians and Alaska Natives to no more than 2 per 1,000 live births.

14.4b: Reduce the incidence of fetal alcohol syndrome among blacks to no more than 0.4 per 1,000 live births.

14.5: Reduce low birthweight to an incidence of no more than 5 percent of live births and very low birthweight to no more 1 percent of live births.

NOTE: Low birthweight is weight at birth of less than 2,500 grams; very low birth weight is weight at birth of less than 1,500 grams.

14.5a: Reduce low birthweight among blacks to an incidence of no more than 9 percent of live births.

14.5b: Reduce very low birthweight among blacks to no more 2 percent of live births.

14.5c: Reduce low birthweight among Puerto Ricans to an incidence of no more than 6 percent of live births.

14.5d: Reduce very low birthweight among Puerto Ricans to no more 1 percent of live births.

14.6: Increase to at least 85 percent the proportion of mothers who achieve the minimum recommended weight gain during their pregnancies.

NOTE: Recommended weight gain is pregnancy weight gain recommended in the 1990 National Academy of Science's report, Nutrition During Pregnancy.

14.7: Reduce severe complications of pregnancy to no more than 15 per 100 deliveries.

NOTE: Severe complications of pregnancy is measured using hospitalizations due to pregnancy-related complications.

14.7a: Reduce severe complications of pregnancy among blacks to no more than 16 per 100 deliveries.

14.8: Reduce the cesarean delivery rate to no more than 15 per 100 deliveries.

14.8a: Reduce the primary (first time) cesarean delivery rate to no more than 12 per 100 deliveries.

14.8b: Reduce the repeat cesarean delivery rate to no more than 65 per 100 deliveries among women who had a previous cesarean delivery.

14.9*: Increase to at least 75 percent the proportion of mothers who breastfeed their babies in the early postpartum period and to at least 50 percent the proportion who continue breastfeeding until their babies are 5 to 6 months old.

Duplicate objective: 2.11

14.9a*: Increase to at least 75 percent the proportion of low-income mothers who breastfeed their babies in the early postpartum period and to at least 50 percent the proportion who continue breastfeeding until their babies are 5 to 6 months old.

Duplicate objective: 2.11a

14.9b*: Increase to at least 75 percent the proportion of black mothers who breastfeed their babies in the early postpartum period and to at least 50 percent the proportion who continue breastfeeding until their babies are 5 to 6 months old.

Duplicate objective: 2.11b

14.9c*: Increase to at least 75 percent the proportion of Hispanic mothers who breastfeed their babies in the early postpartum period and to at least 50 percent the proportion who continue breastfeeding until their babies are 5 to 6 months old.

Duplicate objective: 2.11c

14.9d*: Increase to at least 75 percent the proportion of American Indian and Alaska Native mothers who breastfeed their babies in the early postpartum period and to at least 50 percent the proportion who continue breastfeeding until their babies are 5 to 6 months old.

Duplicate objective: 2.11d

14.10: Increase abstinence from tobacco use by pregnant women to at least 90 percent, increase abstinence from alcohol by pregnant women to at least 90 percent and increase abstinence from cocaine and marijuana to 100 percent.

14.11: Increase to at least 90 percent the proportion of all pregnant women who receive prenatal care in the first trimester of pregnancy.

14.11a: Increase to at least 90 percent the proportion of pregnant black women who receive prenatal care in the first trimester of pregnancy.

14.11b: Increase to at least 90 percent the proportion of pregnant American Indian and Alaska Native women who receive prenatal care in the first trimester of pregnancy.

14.11c: Increase to at least 90 percent the proportion of pregnant Hispanic women who receive prenatal care in the first trimester of pregnancy.

14.12*: Increase to at least 60 percent the proportion of primary care providers who provide age-appropriate preconception care and counseling.

Duplicate objective: 5.10

14.13: Increase to at least 90 percent the proportion of women enrolled in prenatal care who are offered screening and counseling on prenatal detection of fetal abnormalities.

14.14: Increase to at least 90 percent the proportion of pregnant women and infants who receive risk-appropriate care.

14.15: Increase to at least 95 percent the proportion of newborns screened by State-sponsored programs for genetic disorders and other disabling conditions and to 90 percent the proportion of newborns testing positive for disease who receive appropriate treatment.

14.16: Increase to at least 90 percent the proportion of babies aged 18 months and younger who receive recommended primary care services at the appropriate intervals.

14.17: Reduce the incidence of spina bifida and other neural tube defects to 3 per 10,000 live births.

***Duplicate objective.**

APPENDIX B:

Bibliography for major *Healthy People 2000* data systems

General:

- Kovar MG. Data Systems of the National Center for Health Statistics. *Vital Health Stat* 1(23). 1989.
- National Center for Health Statistics. *Health, United States, 1995*. Hyattsville, Maryland: Public Health Service. 1996. Appendix I.

National Health and Nutrition Examination Survey (including HHANES):

- McDowell A, et al. Plan and operation of the second National Health and Nutrition Examination Survey, 1976–80. National Center for Health Statistics. *Vital Health Stat* 1(15). 1981
- Maurer KR. Plan and operation of the Hispanic Health and Nutrition Examination Survey, 1982–84. *Vital Health Stat* 1(19). 1985.
- Plan and operation of the third National Health and Nutrition Examination Survey, 1988–94. National Center for Health Statistics. *Vital Health Stat* 1(32). 1994.
- Ezzati TM, et al. Sample design: Third National Health and Nutrition Examination Survey. National Center for Health Statistics. *Vital Health Stat* 2(113). 1992.

National Survey of Family Growth:

- Waksberg J, Sperry S, Judkins D, Smith V. National Survey of Family Growth, Cycle IV, evaluation of linked design. National Center for Health Statistics. *Vital Health Stat* 2(117). 1993.
- Judkins DR, Mosher WD, Botman S. National Survey of Family Growth: Design, estimation, and inference. National Center for Health Statistics. *Vital Health Stat* 2(109). 1991.
- Waksberg J and Northrup DR. Integration of sample design for the National Survey of Family Growth, cycle 4, with the National Health Interview Survey. *Vital Health Stat* 2(96). 1985.

National Health Interview Survey:

- Massey JT, Moore TF, Parsons VL, Tadros W. Design and estimation for the National Health Interview Survey, 1985–94. National Center for Health Statistics. *Vital Health Stat* 2(110). 1989.
- Questionnaires from the National Health Interview Survey, 1985–89. National Center for Health Statistics. *Vital Health Stat* 1(31). 1993.

- National Center for Health Statistics. Current estimates from the National Health Interview Survey. National Center for Health Statistics. *Vital Health Stat* 10. Published annually.

National Hospital Discharge Survey:

- Simmons WR and Schnack GA. Development of the design of the NCHS Hospital Discharge Survey. *Vital Health Stat* 2(39). 1970.
- Haupt BJ and Kozak LJ. Estimates from two survey designs: National Hospital Discharge Survey. National Center for Health Statistics. *Vital Health Stat* 13(111). 1992.
- National Center for Health Statistics. Detailed diagnoses and procedures, National Hospital Discharge Survey. National Center for Health Statistics. *Vital Health Stat* 13. Published annually.

National Vital Statistics System:

- National Center for Health Statistics. *Vital Statistics of the United States*. Volume I. *Natality*; and Volume II. *Mortality*. Hyattsville, Maryland: National Center for Health Statistics. Published annually.
- National Center for Health Statistics. Advanced report of final natality statistics; and Advanced report of final mortality statistics. *MVSR*, suppl. Hyattsville, Maryland: National Center for Health Statistics. Published annually.

National Notifiable Disease Surveillance System:

- Centers for Disease Control and Prevention. Summary of notifiable diseases, United States. *Morbidity and Mortality Weekly Report*. Published annually.

Youth Risk Behavior Survey:

- Kann L, Kolbe LJ, Collins JL (eds.). *Measuring the health behavior of adolescents: The Youth Risk Behavior Surveillance System and recent reports on high-risk adolescents*. *Public Health Reports* 108 (Suppl 1):1–67. 1993

School Health Policies and Programs Study:

- Errecart MT, Ross JG, Robb W, et al. *The School Health Policies and Programs Study (SHPPS): Methodology*. *J of School Health* 8(65):295–301. 1995.

Published issues of *Healthy People 2000 Statistical Notes*

Number	Title	Date of Issue
1	Health Status Indicators for the Year 2000	Fall 1991
2	Infant Mortality	Winter 1991
3	Health Status Indicators: Definitions and National Data	Spring 1992
4	Issues Related to Monitoring the Year 2000 Objectives	Summer 1993
5	Revisions to <i>Healthy People 2000</i> Baselines	July 1993
6	Direct Standardization (Age-Adjusted Death Rates)	March 1995
7	Years of Healthy Life	April 1995
8	Evaluating Public Health Data Systems: A Practical Approach	June 1995
9	Monitoring Air Quality in <i>Healthy People 2000</i>	September 1995
10	Health Status Indicators: Differentials by Race and Hispanic Origin	September 1995
11	Operational Definitions for Year 2000 Objectives: Priority Area 20, Immunization and Infectious Diseases	February 1997
12	Operational Definitions for Year 2000 Objectives: Priority Area 13, Oral Health	May 1997
13	<i>Healthy People 2000</i> Midcourse Revisions: A Compendium	August 1997

**DEPARTMENT OF
HEALTH & HUMAN SERVICES**

Centers for Disease Control and Prevention
National Center for Health Statistics
6525 Belcrest Road
Hyattsville, Maryland 20782-2003

**OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300**

To receive this publication regularly, contact
the National Center for Health Statistics by
calling 301-436-8500
E-mail: nchsquery@cdc.gov
Internet: <http://www.cdc.gov/nchswww/nchshome.htm>

**FIRST CLASS MAIL
POSTAGE & FEES PAID
PHS/NCHS
PERMIT NO. G-281**