

Technical Notes

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SOURCES OF DATA

Information on births, deaths and fetal deaths is compiled from the original documents filed with the Arizona Department of Health Services', Office of Vital Records and from transcripts of original birth and death certificates filed in other states but affecting Arizona residents. (Copies of certificates for births, deaths and fetal deaths occurring to Arizona residents outside the United States are not sent to Arizona).

Information on induced terminations of pregnancy (abortions) performed on Arizona women is compiled from reports sent to the Arizona Department of Health Services by facilities within but only rarely outside the state.

Pregnancies are the sum of live births, spontaneous terminations of pregnancy (fetal deaths or stillbirths) and induced terminations of pregnancy (abortions).

Arizona has no central registry for marriage and divorce records. Statistics are limited to counts of marriages and divorces reported monthly by the Clerk of the Superior Court in each county in which the marriage or divorce occurred. These reports contain no demographic data on the people marrying or divorcing.

Data on morbidity, levels of disease and disability in the population, are obtained for certain infectious diseases that must be reported by law. The ADHS Epidemiology and Disease Control Services conduct surveillance and monitoring of these reportable diseases and provided data for the morbidity sections in this report.

All short-stay nonfederal hospitals in Arizona are required to submit every six months uniform patient reports to the Arizona Department of Health Services. The Section of Cost Reporting and Discharge Data Review in the Bureau of Public Health Statistics collect the information about both hospital inpatient discharges and emergency room visits.

Population denominators for Arizona residents, used to calculate rates, are projections from the Population Statistics Unit in the Arizona Department of Economic Security (DES) (1995-1999) and census enumerations (data for 1980, 1990, and 2000 from the U.S. Census Bureau. In order to obtain the 2001 - 2005 population denominators, the 2000 percentages of population breakdowns (or census shares) by age group and gender were applied to total state and county annual population estimates released by the DES.

Two data sources were utilized in producing the 2007 population estimates. The totals for the State and each of its counties agree with the projections released by the Department of Economic Security (DES) on March 31, 2006 (<http://www.workforce.az.gov/?PAGEID=67&SUBID=138>). The percentages of population breakdowns by single-year of age, gender and race/ethnicity were derived from the "Bridged-Race Vintage 2006 Postcensal Population Estimates for Calculating Vital Rates", available from the National Center for Health Statistics (NCHS: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2006>). These percentages were then

applied to total state and county population projections for 2007 from DES. The 2006 and 2007 population estimates by race/ethnicity should not be compared with the previously published estimates for 2001-2005, which used the year 2000 census shares.

Requests for additional Arizona statistics on births, deaths, spontaneous and induced terminations of pregnancy, should be directed to the Bureau of Public Health Statistics of the Arizona Department of Health Services, 150 N. 18th Avenue, Suite 550, Phoenix, AZ 85007; Phone: (602) 542-7333; FAX: (602) 542-2940.

Some additional information on topics such as morbidity from certain diseases or population composition is available from the following sources:

Birth Defects - Arizona Birth Defects Monitoring Program, Bureau of Public Health Statistics, ADHS, (602) 542-7335
<http://www.azdhs.gov/phs/phstats/bdr/index.htm>

Cancer incidence - Arizona Cancer Registry, Bureau of Public Health Statistics, ADHS, (602) 542-7321
<http://www.azdhs.gov/phs/phstats/acr/>

Communicable diseases data – Office of Infectious Disease Services, ADHS (602) 364 - 3245
http://www.azdhs.gov/phs/oids/data_reports.htm

Drowning incidence in Maricopa County, Bureau of Public Health Statistics, ADHS, (602) 542-7333
<http://www.azdhs.gov/phs/phstats/meddir/>

Hospital inpatient discharge data - Cost Reporting and Discharge Data Review, Bureau of Public Health Statistics, ADHS, (602) 542-2960
<http://www.azdhs.gov/plan/crr/index.htm>

National health and vital statistics – National Center for Health Statistics
<http://www.cdc.gov/nchs/default.htm>

Smoking, binge drinking, physical inactivity and other behavioral risk factors - Behavioral Risk Factors Surveillance System, Bureau of Public Health Statistics, ADHS, (602) 364-2415
<http://www.azdhs.gov/plan/brfs/>

Population: census enumerations, estimates and projections - U.S. Bureau of the Census
<http://www.census.gov/>

Population estimates – Arizona Department of Commerce
<http://www.azcommerce.com/econinfo/demographics/Population%20Estimates.html>

Population projections–Arizona Department of Commerce
<http://www.azcommerce.com/econinfo/demographics/Population%20Projections.html>

DEFINITIONS

Urban and Rural Areas

For the purpose of this report, the following are Arizona's **urban areas**: Phoenix-Scottsdale-Mesa Metropolitan Statistical Area (Maricopa and Pinal Counties), Tucson Metropolitan Statistical Area (Pima County), and Yuma Metropolitan Statistical Area (Yuma County). The remaining counties (Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Mohave, Navajo, Santa Cruz and Yavapai) comprise Arizona's **rural areas**. The 1994 list of Metropolitan Statistical Areas and their component counties for the United States is available at: <http://www.cdc.gov/nchs/data/dvs/mcd/geog94msa.txt>

Race/Ethnicity

Race/ethnic designations used in this report are White non-Hispanic, Hispanic or Latino, Black or African-American, American Indian or Alaska Native (including Aleut and Eskimo) and Asian or Pacific Islander (including Hawaiian). In some of the trend tables the designation "Other" includes Asian and Pacific Islanders. Non-White Hispanics are included in their appropriate race groups.

The American Indian figures include those living both on and off the reservation.

The race/ethnicity of mother, father or decedent is as stated on the certificate.

Implementation of the revised certificates of live birth, death and fetal death in Arizona is necessary in order to provide compatibility with the new federal standards for collecting and presenting data on race and Hispanic origin as established by the Office of Management and Budget (OMB) in October 1997. These federal standards require that when self-identification is used, a method for reporting more than one race should be adopted. In addition, the Asian or Pacific Islander category will be split into two categories – one called "Asian" and the other called "Native Hawaiian or Other Pacific Islander".

Rates

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 year occur to individuals in the denominator. Rates express the likelihood (or risk) of the event in the specified population during a particular time and are generally expressed as units of population in the denominator (per 1,000, 10,000, 100,000 and so forth).

Many rates shown in this report are based on a small population, a small number of events or both. Rates based on small numbers are unreliable and thus should be viewed with caution. Rates for many counties or Arizona's ethnic minorities also vary considerably from year to year due to small populations and few events.

Terms Related to Reproductive Health

Abortion Rate - Number of reported abortions to females of all ages during a calendar year per 1,000 females of childbearing age (15-44 years).

Abortion Ratio - Number of abortions reported during a period per 1,000 live births occurring during the same period.

Birth or Live Birth - The complete expulsion or extraction from its 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 rate - Number of live births during a calendar year per 1,000 population.

Birth weight - The weight of a neonate determined immediately after delivery or as soon thereafter as possible.

Fetal death - Death prior to the complete expulsion or extraction from its mother of a product of human conception, irrespective of the duration of pregnancy and which is not an induced termination 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.

Fetal death rate - Number of fetal deaths at 20 or more weeks of gestation per 1,000 live births + fetal deaths.

Fertility rate (general) - Total number of live births to women of all ages during a calendar year per 1,000 women of childbearing age (15-44 years old).

Fertility rate (total) - The sum of age-specific birth rates of women at each age group 10-14 through 45-49. Since five-year age groups are used, the sum is multiplied by five.

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

Infant mortality rate - Number of infant deaths per 1,000 live births.

Low-birthweight - Any neonate weighing less than 2,500 grams at birth (less than 5 pounds 8 ounces).

Maternal mortality rate - Number of deaths attributed to maternal conditions (i.e. related to or aggravated by pregnancy or its management) per 100,000 live births.

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

Neonatal mortality rate - Number of neonatal deaths per 1,000 live births.

Perinatal mortality rate - The sum of infant deaths of less than 7 days and fetal deaths with a stated or presumed period of gestation of 28 weeks or more per 1,000 live births + fetal deaths of 28 or more weeks of gestation..

Postneonatal death - Any death of a live born infant at least 28 days of age but less than one year of age.

Postneonatal mortality rate - Number of postneonatal deaths per 1,000 live births.

Post term - 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.

Pregnancy rate - The sum of live births, fetal deaths and induced terminations of pregnancy per 1,000 women of childbearing age (15-44 years old).

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 of the 42nd week (294th day), following onset of the last menstrual period.

Very Low-Birthweight - Any neonate whose weight at birth is 1,500 grams or less (less than 3 pounds 5 ounces).

Medical Terms Used on the Birth Certificate

Medical risk factors for this pregnancy

Anemia - Hemoglobin level of less than 10.0 g/dL during pregnancy, or hematocrit of less than 30 percent during pregnancy.

Cardiac disease - Disease of the heart.

Acute or chronic lung disease - Disease of the lungs during pregnancy.

Diabetes - Metabolic disorder characterized by excessive discharge of urine and persistent thirst; includes juvenile onset, adult onset and gestational diabetes during pregnancy.

Genital herpes - Infection of the skin of the genital area by herpes simplex virus.

Hydramnios/Oligohydramnios - Any noticeable excess (hydramnios) or lack (oligohydramnios) of amniotic fluid.

Hemoglobinopathy - A blood disorder caused by alteration in the genetically determined molecular structure of hemoglobin (for example, sickle cell anemia).

Hypertension, chronic - Blood pressure persistently greater than 140/90, diagnosed prior to onset of pregnancy or before the 20th week of gestation.

Hypertension, pregnancy-associated - An increase in blood pressure of at least 30 mm hg systolic or 15 mm hg diastolic on two measurements taken 6 hours apart after the 20th week of gestation.

Eclampsia - The occurrence of convulsions and/or coma unrelated to other cerebral conditions in women with signs and symptoms of preeclampsia.

Incompetent cervix - Characterized by painless dilation of the cervix in the second trimester or early in the third trimester of pregnancy, with premature expulsion of membranes through cervix and ballooning of the membranes into vagina, followed by rupture of the membrane and subsequent expulsion of the fetus.

Previous infant 4,000+ grams - The birthweight of a previous live-born child was over 4,000 grams (8lbs.14oz.).

Previous preterm or small-for-gestational-age-infant - Previous birth of an infant prior to term (before 37 completed weeks of gestation) or of an infant weighing less than the 10th percentile for gestational age using a standard weight for age chart.

Renal disease - Kidney disease.

Rh Sensitization - The process or state of becoming sensitized to the Rh factor as when an Rh-negative woman is pregnant with an Rh-positive fetus.

Uterine bleeding - Any clinically significant bleeding during the pregnancy taking into consideration the stage of pregnancy; any second or third trimester

bleeding or third trimester bleeding of the uterus prior to the onset of labor.

Complications of labor and/or delivery

Febrile - A fever greater than 100 degrees F. or 38 degrees C. occurring during labor and/or delivery.

Meconium, moderate/heavy - Meconium consists of undigested debris from swallowed amniotic fluid, various products of secretion and shedding by the gastrointestinal tract, moderate to heavy amounts of meconium in the amniotic fluid noted during labor and/or delivery.

Premature rupture of membranes (more than 12 hours) - Rupture of membranes at any time during pregnancy and more than 12 hours before the onset of labor.

Abruptio placenta - Premature separation of normally implanted placenta from the uterus.

Placenta previa - Implantation of the placenta over or near the internal opening of the cervix.

Other excessive bleeding - The loss of significant amount of blood from conditions other than abruptio placenta or placenta previa.

Seizures during labor - Maternal seizures occurring during labor from any cause.

Precipitous labor (less than 3 hours) Extremely rapid labor and delivery lasting less than 3 hours.

Prolonged labor (more than 20 hours) - Abnormally slow progress of labor lasting more than 20 hours.

Dysfunctional labor - Failure to progress in a normal pattern of labor.

Breech/Malpresentation - At birth, the presentation of the fetal buttocks, rather than the head or other malpresentation.

Cephalopelvic disproportion - The relationship of the size, presentation and position of the fetal head to the maternal pelvis, which prevents dilation of the cervix and/or descent of the fetal head.

Cord prolapse - Premature expulsion of the umbilical cord in labor before the fetus is delivered.

Anesthetic complications - Any complication during labor and/or delivery brought on by an anesthetic agent or agents.

Fetal distress - Signs indicating fetal hypoxia (deficiency in amount of oxygen reaching fetal tissues).

Abnormal conditions of the newborn

Anemia - Hemoglobin level of less than 13.0 g/dL, or a hematocrit of less than 39 percent.

Birth injury - Impairment of the infant's body function or structure due to adverse influences that occurred at birth.

Fetal alcohol syndrome - A syndrome of altered prenatal growth and development occurring in infants born of women who consumed excessive amounts of alcohol during pregnancy.

Hyaline membrane disease/RDS - A disorder primarily of prematurity, manifested clinically by respiratory distress and pathologically by pulmonary hyaline membranes and incomplete expansion of the lungs at birth.

Meconium aspiration syndrome - Aspiration of meconium by the fetus or newborn, affecting the lower respiratory system.

Assisted ventilation (less than 30 minutes) - A mechanical method of assisting respiration for newborns with respiratory failure.

Assisted ventilation (30 minutes or more) - Newborn placed on assisted ventilation for 30 minutes or longer.

Seizures - A seizure of any etiology.

Congenital anomalies of child

Anencephalus – Absence of the cerebral hemispheres.

Spina bifida/meningocele – Developmental anomaly characterized by defective closure of the bony encasement of the spinal cord, through which the cord and meninges may or may not protrude.

Hydrocephalus – Excessive accumulation of cerebrospinal fluid within the ventricles of the brain with consequent enlargement of cranium.

Microcephalus – A significantly small head.

Other central nervous system anomalies – Other specified anomalies of the brain, spinal cord, and nervous system.

Heart malformations – Congenital anomalies of heart.

Other circulatory/respiratory anomalies – Other specified anomalies of the circulatory and respiratory systems.

Rectal atresia/stenosis – Congenital absence, closure, or narrowing of the rectum.

Tracheo-esophageal fistula/Esophageal atresia – An abnormal passage between the trachea and the esophagus; esophageal atresia is the congenital absence or closure of the esophagus.

Omphalocele/Gastroschisis – An omphalocele is a protrusion of variable amounts of abdominal viscera from a midline defect at the base of the umbilicus. In gastroschisis, the abdominal viscera protrude through an abdominal wall defect, usually on the right side of the umbilical cord insertion.

Other gastrointestinal anomalies – Other specified congenital anomalies of the gastrointestinal system.

Malformed genitalia – Congenital anomalies of the reproductive organs.

Renal agenesis – One or both kidneys are completely absent.

Other urogenital anomalies – Other specified congenital anomalies of the organs concerned in the production and excretion of the urine, together with organs of reproduction.

Cleft lip/palate – Cleft lip is a fissure or elongated opening of the lip; cleft palate is a fissure in the roof of the mouth. These are failures of embryonic development.

Polydactyly/Syndactyly/Adactyly – Polydactyly is the presence of more than five digits on hands and/or feet; syndactyly is having fused or webbed fingers and/or toes; adactyly is the absence of fingers and/or toes.

Club foot – Deformities of the foot, which is twisted out of shape or position.

Diaphragmatic hernia – Herniation of the abdominal contents through the diaphragm into the thoracic cavity usually resulting in respiratory distress.

Down's syndrome – The most common chromosomal defect with most cases resulting from an extra chromosome (trisomy 21).

Diagnosis and Procedure Codes Used to Analyze the Hospital Discharge Data

Diagnostic groupings and code numbers used in Chapter 4 and Chapter 7 are based on the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM).

The tabulations of the hospital inpatient data by first-listed diagnosis and all-listed procedures are comparable to diagnostic categories used in the reports of the National Hospital Discharge Survey:

<http://www.cdc.gov/nchs/data/nhsr/nhsr005.pdf>

Listed below are the groupings of the ICD-9-CM codes used in Tables 4C-3 and 7C-3:

Unintentional injuries	E800–E869, E880–E929
Falls	E880.0–E886.9, E888
Motor vehicle traffic	E810–E819
Struck against or struck accidentally by objects or persons	E916–E917
Overexertion and strenuous movements	E927
Cutting or piercing instruments or objects	E920
Natural and environmental factors	E900–E909, E928.0–E928.2
Intent and mechanism of injury	Cause-of-injury code

Based on the "Supplementary Classification of External Causes of Injury and Poisoning," *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*. Source: Ambulatory Care Visits to Physician Offices, Hospital Outpatient Departments, and Emergency Departments: United States, 1999-2000. Vital and Health Statistics, Series 13, Number 157, September 2004. Available online at http://www.cdc.gov/nchs/data/series/sr_13/sr13_157.pdf

The ICD-9-CM diagnostic categories used to identify specific mental disorders are as follows:

Category	ICD-9-CM code
Mental disorders	290-319
Psychoses	290-299
Alcoholic psychoses	291
Drug psychoses	292
Schizophrenic disorders	295
Manic-depressive disorders	296
Neurotic disorders	300-316
Anxiety states	300
Depression	300.4, 311
Personality disorders	301
Drug dependence	304
Nondependent abuse of drugs	305
Alcohol dependence syndrome	303
Mental retardation	317-319

Terms Related to Mortality

The most common, and perhaps the most valuable measure of the likelihood (or risk) of death in the specified population during a particular time is the **crude death rate**. It is computed as the number of deaths per 1,000 or 100,000 population.

Age-adjusted mortality rates - Because mortality from most causes of death occurs predominately among the elderly, a population group with a larger proportion of older persons would have a higher mortality rate. The "age-adjustment" removes the effect of the age differences among sub-populations (or in the same population over time) by placing them all in a population with a standard age distribution. All age-adjusted mortality rates in this report were computed by the direct method, that is by weighting the age-specific rates for a given year by the age distribution of a standard population. The weighted age-specific rates are then added to produce the summary rate for all ages combined. Beginning with the 2000 data year, a new population standard for the age adjustment of mortality rates has replaced the standard based on the 1940 population and used since 1943. The new standard uses the age composition of the 2000 U.S. projected population. The standard is expressed in terms of a "standard million": the relative distribution of the 2000 population of the United States totaling 1 million in 10-year age groups:

Age group	2007 population	2007 deaths	Age-specific rates in 2007	2000 standard	Age-adjusted rate for 2007
A	B	C	D (C/B)*100000	E	F D*E
<1	102587	701	683.3	.013818	9.4
1-4	396458	111	28.0	.055317	1.5
5-14	913680	145	15.9	.145565	2.3
15-24	889177	853	95.9	.138646	13.3
25-34	930335	999	107.4	.135573	14.6
35-44	883484	1610	182.2	.162613	29.6
45-54	831302	3353	403.3	.134834	54.4
55-64	649212	5276	812.7	.087247	70.9
65-74	425190	7340	1726.3	.066037	114.0
75-84	302091	11950	3955.8	.044842	177.4
85+	108491	12292	11330.0	.015508	175.7
All ages	6432007	44640		TOTAL	663.2

The age-adjusted mortality rates should be viewed as relative indexes rather than as actual measures of mortality risk. It is also important to note that Age-adjusted rates can only be compared to other age-adjusted rates that use the same population standard.

In this report, all age-adjusted mortality rates (including those for 1980, 1990, and 1996-2006) are based on the (new) 2000 standard, and they CANNOT BE compared to rates using the 1940 standard population. This is because the age structures of the 1940 and year 2000 populations differ. From 1940 to 2000 the U.S. population "aged" considerably. The age-adjusted rates based on the year 2000 standard are different because the year 2000 population standard, which has an older age structure, gives more weight than the 1940 standard to death rates at older ages where mortality is higher.

Age-specific mortality - Number of deaths in a specific age group during a calendar year.

Alcohol-induced deaths - This category was expanded in 2003. Causes of death attributable to alcohol mortality include mental and behavioral disorders due to alcohol use, degeneration of nervous system due to alcohol use, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, alcoholic liver disease, finding of alcohol in blood, accidental poisoning by and exposure to alcohol, intentional self-poisoning by alcohol, poisoning by alcohol, undetermined intent.

Cause of death - For the purpose of national mortality statistics, every death is attributed to one underlying condition, based on information reported on the death certificate and utilizing the international rules for selecting the underlying cause of death from the reported conditions.

Cause-specific mortality - Number of deaths from a specified cause during a calendar year.

Classification of causes of death - The cause of death used in this report is the underlying cause classified according to the *International Classification of Diseases (ICD)*. Beginning with the 2000 data year in Arizona (1999 nationally), a new revision of the International Classification of Diseases was implemented. The Tenth Revision (ICD-10) has replaced the Ninth Revision (ICD-9), which was in effect since 1979.

Comparability ratios - Comparability ratios are measures of comparison between ICD-9 and ICD-10. Any comparison of causes of mortality in Arizona between 2000-2007 and previous years needs to take into account the changes in statistical trends that can be attributed to changes in the classification system alone. Comparability ratio of 1.0 indicates that the same number of deaths would be assigned to a cause-of-death when ICD-9 or ICD-10 was used. Comparability-modified number of deaths (in Table 2B-1) and mortality rates (in Table 2B-2) by year from 1997 to 1999 are shown for the four causes of death for which the discontinuity in trend (resulting from implementation of ICD-10) is substantial. The comparability-modified data present the annual number of deaths for 1997-1999 that would have been classified as influenza and pneumonia, Alzheimer's disease, nephritis, or septicemia had the ICD-10 classification system and coding rules been in place. For the remaining causes of death, little or no change occurred in the number of deaths assigned using the different coding revisions.

Drug-induced deaths - This category was expanded in 2003. Causes of death attributable to drug-related mortality include mental and behavioral disorders due to psychoactive substance use, accidental poisoning by and exposure to drugs, suicide by drugs, homicide by drugs and poisoning by drugs, undetermined intent

Firearm mortality - Causes of death attributable to firearm mortality include accidental discharge of firearms, suicide by firearms, homicide by firearms, legal intervention involving discharge of firearms, terrorism involving firearms and discharge of firearms, undetermined intent.

The following table provides comparable cause-of-death categories in ICD-9 and ICD-10 and shows comparability ratios for 113 selected causes of death.