Infant Mortality

Infant mortality is a particularly useful measure of health status because it both indicates current health status of the population and predicts the health of the next generation (NCHS, 2001). Infant mortality in the U.S. is defined as the death of an infant before his or her first birthday. It does not include still births. Infant mortality is composed of neonatal (less than 28 days after birth) and postneonatal (28 to 364 days after birth) deaths.

This indicator presents infant mortality for the U.S. based on mortality data from the National Vital Statistics System (NVSS) based on death certificate data. The NVSS registers virtually all deaths and births nationwide, with data coverage from 1940 to 2010 and from all 50 states and the District of Columbia.

What the Data Show

In 2010, a total of 24,572 deaths occurred in children under 1 year of age, 1,836 fewer deaths than were recorded in 2009 (NCHS, 2013a). Exhibit 1 presents the national trends in infant mortality between 1940 and 2010 for all infant deaths as well as infant deaths by sex and race (black and white). A striking decline has occurred during this time period, with total infant mortality rates dropping from nearly 50 deaths per 1,000 live births in 1940 to under seven deaths per 1,000 live births in 2010. Beginning around 1960, the infant mortality rate has decreased or remained generally level each successive year through 2010.

Infant mortality rates per 1,000 live births ranged from 6.8-7.0 from 2000 to 2005, were 6.7-6.8 from 2006-2007, and then decreased to 6.6 in 2008, 6.4 in 2009, and 6.2 in 2010. Infant mortality rates continue to be highest among males and highest among blacks. The infant mortality rate for blacks decreased from 14.1 per 1,000 live births in 2000 to 11.6 per 1,000 live births in 2010. However, this is still twice the rate compared to white infants, which ranged from 5.7 per 1,000 live births in 2000 to 5.2 per 1,000 live births in 2010.

Infant mortality rates among Hispanic infants have changed little since 2000. In 2010, the infant mortality rate was 5.3 per 1,000 live births for Hispanic infants, the same as observed in 2009. There was a decrease in the infant mortality rate for non-Hispanic white infants, with 5.3 per 1,000 live births in 2009 compared to 5.2 in 2010. A decrease in the mortality rate was also seen for non-Hispanic blacks, with a rate of 12.4 per 1,000 live births in 2009 compared to 11.5 in 2010 (NCHS, 2012, 2013a). (Data not shown.)

In 2010, the 10 leading causes of infant mortality in the U.S. accounted for about 70 percent of all infant deaths (Exhibit 2), with the subgroup consisting of congenital anomalies (i.e., congenital malformations, deformations, and chromosomal abnormalities) having the highest rate at 1.3 per 1,000 live births (NCHS, 2013a). This category alone accounts for 21 percent of all infant deaths in 2010 (Exhibit 2). In 2010, the top 10 leading causes and their ranks remained the same as those in 2009 except that the tenth leading cause was neonatal hemorrhage in 2009 compared to necrotizing enterocolitis of newborn in 2010 (CDC, 2014, NCHS, n.d., 2013a).

Congenital anomalies were ranked highest, followed by disorders related to short gestation and low birth weight, among the different racial and ethnic groups except for non-Hispanic blacks. The leading causes of infant mortality among non-Hispanic blacks was short gestation and low birthweight, followed by congenital anomalies. There were small differences in some of the other leading causes of infant mortality between racial and ethnic groups. For example, accidents (unintentional injuries) and placenta cord membranes were the fifth and sixth leading cause of infant death among non-Hispanic white and black infants, respectively; whereas these two causes of infant death were reversed (i.e., placenta cord membranes was fifth and unintentional injuries was sixth) among Hispanic infants (Exhibit 2).

In addition, the Centers for Disease Control and Prevention (CDC) report a substantial difference in the

leading causes of death during the neonatal versus the postneonatal periods. Disorders related to short gestation and low birthweight were the leading cause of death for neonates and sudden infant death syndrome was the leading cause of death for postneonates, based on 2010 data (NCHS, 2013b). (Data not shown.)

Limitations

- Cause of death rankings denote the most frequently occurring causes of death among those causes eligible to be ranked. The rankings do not necessarily denote the causes of death of greatest public health importance. Further, rankings of cause-specific death could change depending on the defined list of causes that are considered and, more specifically, the types of categories and subcategories that are used for such rankings (NCHS, 2005).
- Mortality rates are based on the underlying cause of death as entered on a death certificate by a physician. Incorrect coding and low rates of autopsies that confirm the cause of death may occur. Additionally, some individuals may have had competing causes of death. When more than one cause or condition is entered by the physician, the underlying cause is determined by the sequence of conditions on the certificate, provisions of the ICD [International Classification of Diseases], and associated selection rules and modifications (CDC, n.d.). Consequently, some misclassification of reported mortality might occur as a result of these uncertainties, as well as the underreporting of some causes of death.

Data Sources

Infant mortality data were obtained from a published report by CDC's National Center for Health Statistics (NCHS, 2010), which provides annual natality data from 1975 to 2007 and decadal data for 1940, 1950, 1960, and 1970, as well as 2008 to 2010 data from NCHS's annually published "deaths" reports (NCHS, 2011a,b, 2012, 2013c). Data in the NCHS reports are based in part on unpublished work tables, available on the NCHS website at http://www.cdc.gov/nchs/deaths.htm. Leading cause of infant death data were extracted from the Linked Birth/Infant Death Records on CDC's Wide-ranging Online Data for Epidemiologic Research (WONDER) Online Database (CDC, 2014) (http://wonder.cdc.gov/lbd.html). Supporting documentation for leading cause of infant data came from NVSS reports (NCHS, n.d., 2012, 2013a, 2013b).

References

CDC (Centers for Disease Control and Prevention). 2014. Linked birth/infant death records on CDC WONDER Online Database. Accessed July 8, 2014. http://wonder.cdc.gov/lbd.html.

CDC. n.d. CDC WONDER: Help page for compressed mortality file. Accessed November 2012. http://wonder.cdc.gov/wonder/help/cmf.html.

NCHS (National Center for Health Statistics). 2013a. Infant mortality statistics from the 2010 period linked birth/infant death data set. Table A and Table 5. National Vital Statistics Reports 62(8). http://www.cdc.gov/nchs/data/nvsr/nvsr62/nvsr62_08.pdf (PDF) (27 pp, 570.7KB).

NCHS. 2013b. Deaths: Leading causes for 2010. Table 3. National Vital Statistics Reports 62(6). http://www.cdc.gov/nchs/data/nvsr/nvsr62/nvsr62_06.pdf (PDF) (97 pp, 5.1MB).

NCHS. 2013c. Deaths: Final data for 2010. National Vital Statistics Reports 61(4). http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_04.pdf (PDF) (118 pp, 3.0MB).

NCHS. 2012. Infant mortality statistics from the 2009 period linked birth/infant death data set. Table A. National Vital Statistics Reports 61(8). http://www.cdc.gov/nchs/data/nvsr/nvsr61/nvsr61_08.pdf (PDF) (28 pp, 526.6KB).

NCHS. 2011a. Deaths: Final data for 2009. National Vital Statistics Reports 60(3). Table 20.

http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf (PDF) (167 pp, 2.1MB).

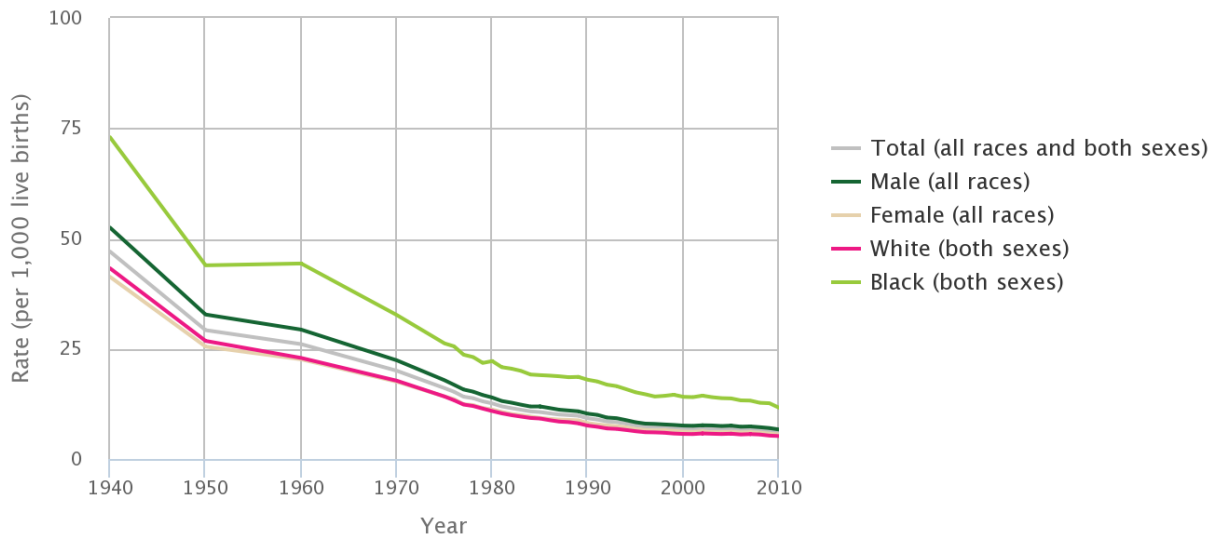
NCHS. 2011b. Deaths: Final data for 2008. National Vital Statistics Reports 59(10). Table 20. http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_10.pdf (PDF) (127 pp, 3.3MB).

NCHS. 2010. Deaths: Final data for 2007. National Vital Statistics Reports 58(19). Table 30. http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_19.pdf (PDF) (135 pp, 3.4MB).

NCHS. 2001. Healthy people 2000 final review. Hyattsville, MD: Public Health Service. http://www.cdc.gov/nchs/data/hp2000/hp2k01-acc.pdf (PDF) (382 pp, 7.2MB).

NCHS. n.d. User guide to the 2009 period linked birth/infant death public use file. Documentation table 5. ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/periodlinked/LinkPE09Guide.pdf (PDF) (91 pp, 409.3KB).

Exhibit 1. Infant mortality rates in the U.S. by sex and race, 1940–2010



Race was reported based on the race of the child (1940–1979) or the race of the mother (since 1980).

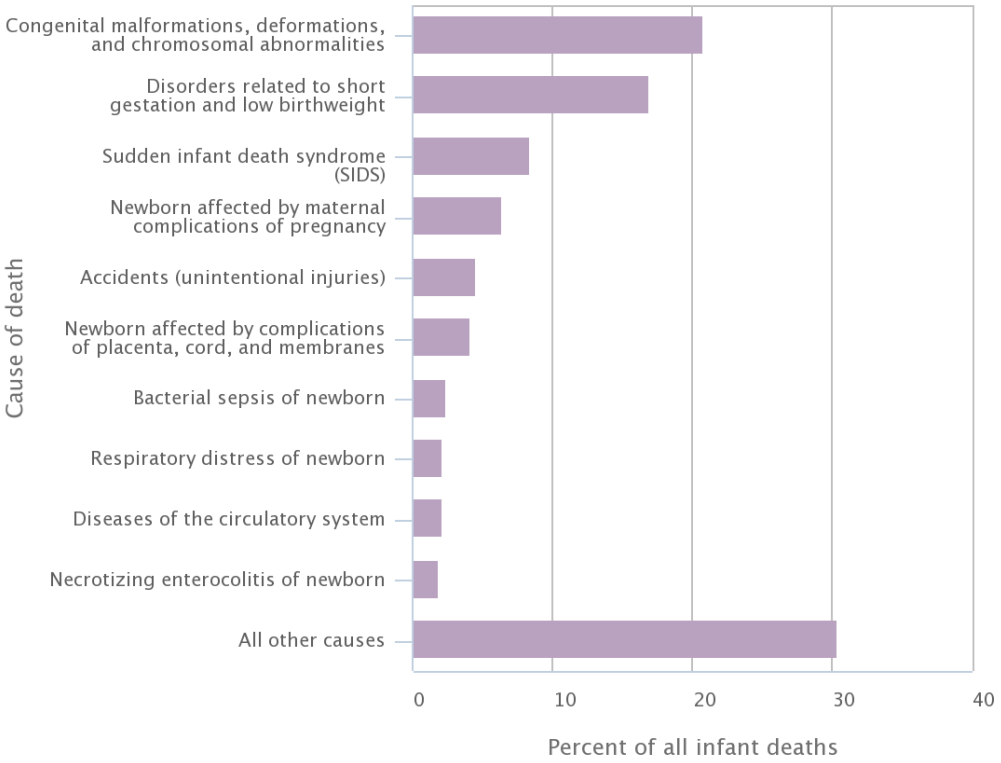
Annual infant mortality rates were not available prior to 1975. Data are presented in 10-year intervals between 1940 and 1970.

Information on the statistical significance of the trends in this exhibit is not presented here. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: NCHS, 2010, 2011a,b, 2013c

Exhibit 2. Leading causes of infant death in the U.S., 2010

All races



"Infant deaths" are those occurring before the age of 1.

Trend analysis has not been conducted because these data represent a single snapshot in time. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: CDC, 2014; NCHS, 2013a

Visit http://www.epa.gov/roe to see the full exhibit.