

Low Birthweight

The term “low birthweight” (LBW) is typically used for any infant weighing less than 2,500 grams (5 pounds, 8 ounces) at birth (HHS-HSRA, 2015). Weight is a critical health measure because LBW children are more prone to death and disability than their counterparts.

The etiology of LBW differs for full-term-LBW infants (born at and after 37 completed weeks of gestation) and preterm-LBW infants (born before 37 completed weeks of gestation), and is influenced by the duration of gestation and the rate of fetal growth (Kramer, 2013). Factors influencing an infant being small for his/her gestational age include maternal cigarette smoking and alcohol/drug use, maternal weight at conception, pregnancy-induced hypertension/pre-eclampsia, being the first-born, congenital anomalies, and other genetic factors (CDC, 1994; Kramer, 2013). Various exposures have been implicated as risk factors for full-term-LBW (e.g., maternal exposure to lead, diethylstilbestrol, and toxic substances in the workplace) (Kiely et al., 1994; Sram et al., 2005). The strength of the possible association between maternal exposure to air pollution (e.g., particulate matter, carbon monoxide, ozone) and LBW continues to be researched (Bosetti et al., 2010; Proietti et al., 2013; Sram et al., 2005).

This indicator presents the percentage of LBW infants born in the U.S. from 1995 to 2014 based on natality data reported to the National Vital Statistics System (NVSS), which is maintained by the Centers for Disease Control and Prevention’s (CDC’s) National Center for Health Statistics (NCHS). The NVSS registers virtually all deaths and births nationwide, with data coverage from 1933 to 2014 and from all 50 states and the District of Columbia.

The data presented are based on singleton births only. This was done to eliminate the effect of multiple births. The data are presented across three maternal age groups (under 20 years, 20-39 years, and 40 years and older). Additionally, the data are stratified and reported for preterm (less than 37 weeks) and full-term (37 weeks and over) births because of the strong association between birthweight and gestational age. Beginning in 2014, NCHS transitioned from using the last normal menses (LMP) for estimating newborn gestational age to the obstetric estimate of gestation at delivery (OE) due to increasing evidence showing that the OE measure has greater validity compared with the LMP-based measure (NCHS, 2015). Due to the change in the NCHS’s metric for assessing gestational age, data from 2014 are not directly comparable to data from 2013 and earlier, and are therefore, examined separately in this indicator.

What the Data Show

As expected, the percent of total LBW deliveries among preterm births is much higher than the percent of total LBW deliveries among full-term births across each of the three maternal age categories (Exhibits 1 and 2).

In general, small differences in the percent of singleton LBW babies among maternal age categories are evident for both preterm births (Exhibit 1) and full-term births (Exhibit 2). In 2014, the frequency of LBW babies among preterm births is highest for mothers less than 20 years old (58.2 percent), followed by mothers who are 40 years and older (54.6 percent), and lowest in mothers who are in the 20-39 age group (51.7 percent) (Exhibit 1). The frequency of LBW babies among full-term births in 2014 is also highest for mothers less than 20 years old (3.5 percent), followed by mothers who are 40 years and older (2.7 percent), and lowest in mothers who are in the 20-39 age group (2.3 percent) (Exhibit 2).

Among both the preterm and full-term births, black women had consistently higher frequencies of LBW babies compared to any of the other racial groups reported during the time period covered by this indicator. This racial pattern is evident in 2014 for all three maternal age groups, with one exception: American Indian mothers 40 years and older had a higher percentage of full-term LBW infants than black mothers. For preterm births in 2014, the difference is most apparent in the 20-39 age group, with 63.3 percent for blacks,

followed by 52.9 percent for Asians/Pacific Islanders, 48.0 percent for whites, and 47.0 percent for American Indians. This same racial pattern was seen with mothers less than 20 years old, but not for mothers 40 years and older, where American Indians had a higher percent of preterm births than whites (Exhibit 1). For full-term births, this racial pattern difference is most apparent for mothers less than 20 years old, with 5.4 percent for blacks followed by 3.8 percent for Asians/Pacific Islanders, 2.8 percent for whites, and 2.3 percent for American Indians (Exhibit 2). Different racial patterns were seen for mothers in the 20-39 and 40 and older age groups, which both reported the lowest percentages among whites. For mothers in the 20-39 age group, blacks were followed by Asian/Pacific Islanders and then American Indians, but for mothers in the 40 and older group, American Indians reported the highest percentage, followed by blacks and then Asian/Pacific Islanders.

For preterm births, there was an increase in LBW for all races except blacks from 2012 to 2013 for mothers aged 20-39 years. Among mothers aged 40 years and older, there was an increase in LBW for whites and blacks and a decrease for American Indians and Asian/Pacific Islanders. There was a decrease in LBW for all races except whites for mothers less than 20 years (Exhibit 1). For full-term births, fluctuations in LBW from 2012 to 2013 also occurred. For mothers less than 20 years, there were increases for blacks and Asian/Pacific Islanders, but decreases for whites and American Indians. For mothers aged 20-39 years, there were increases for whites and Asian/Pacific Islanders, but decreases for blacks and American Indians. For mothers aged 40 years and older, a decrease in LBW was seen for all races (Exhibit 2).

Hispanic women and non-Hispanic women had similar frequencies of full-term LBW babies. For example, in 2014, the percent of full-term LBW babies for Hispanic women in the three maternal age groups ranged from 2.0 to 3.0 percent compared to a range of 2.4 to 3.7 percent for non-Hispanic women (Exhibit 2). A larger difference in frequencies was seen for Hispanic women and non-Hispanic women for preterm LBW babies. For example, in 2014, the percent of preterm LBW babies for Hispanic women in the three maternal age groups ranged from 49.4 to 53.5 percent compared to a range of 52.3 to 60.4 percent for non-Hispanic women (Exhibit 1).

Limitations

- Complete reporting of natality indicators such as LBW may vary due to differences in the reporting requirements established by each state. In some states, the number of LBW babies may be underreported.
- The primary measure used to determine the gestational age of the newborn from 1995 to 2013 is the interval between the first day of the mother's last normal menses (LMP) and the date of birth (CDC, 2013). This measurement is subject to error for reasons such as imperfect maternal recall or misidentification of the LMP because of postconception bleeding, delayed ovulation, or intervening early miscarriage. In 2014, the measure used to determine the gestational age of the newborn transitioned to the obstetric estimate of gestation at delivery (OE), which is also subject to uncertainty (e.g., a physician could over- or underestimate the gestational age). Problems with reporting gestational age persist and may occur more frequently among some subpopulations and among births with shorter gestations (CDC, 2014).
- To prevent confusion about the significance of any differences among data obtained using LMP- or OE-based measures, data queries for this indicator are separate for years 1995-2013 and 2014.

Data Sources

The data used for this indicator were public-use natality data (1995-2014) obtained from the CDC's National Vital Statistics System (CDC, 2015).

References

Bosetti, C., M.J. Nieuwenhuijsen, S. Gallus, S. Cipriani, C. La Vecchia, and F. Parazzini. 2010. Ambient particulate matter and preterm birth or birth weight: a review of the literature. *Arch. Toxicol.* 84:447–460.

CDC (Centers for Disease Control and Prevention). 2015. National Center for Health Statistics. National Vital Statistics System.

CDC. 2014. User guide to the 2014 natality public use file. Accessed November 24, 2015.

ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2014.pdf (PDF) (183 pp, 2.2MB).

CDC. 2013. User guide to the 2013 natality public use file. Accessed December 17, 2015.

ftp://ftp.cdc.gov/pub/health_statistics/nchs/Dataset_Documentation/DVS/natality/UserGuide2013.pdf (PDF) (159 pp, 1.4MB).

CDC. 1994. Increasing incidence of low birthweight—United States, 1981-1991. *MMWR* 43(18):335-339.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/00030918.htm>.

HHS-HSRA (U.S. Department of Health and Human Services, Health Resources and Services Administration). 2015. Child Health USA 2014. Maternal and Child Health Bureau. Rockville, MD. <http://mchb.hrsa.gov/chusa14/>.

Kiely, J.L., K.M. Brett, S. Yu, and D.L. Rowley. 1994. Low birthweight and intrauterine growth retardation. In: Wilcox, L.S., and J.S. Marks, eds. *From data to action: CDC's public health surveillance for women, infants, and children. CDC's maternal and child health monograph 1994.* Atlanta, GA: Centers for Disease Control and Prevention. <http://stacks.cdc.gov/view/cdc/11354>.

Kramer, M.S. 2013. The epidemiology of low birthweight. *Nestle Nutr Inst Workshop Ser* 74:1-10.

NCHS (National Center for Health Statistics). 2015. Measuring gestational age in vital statistics data: Transitioning to the obstetric estimate. *NVSR*, 64(5).

http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_05.pdf (PDF) (20 pp, 708K).

Proietti, E., M. Roosli, U. Frey, and P. Latzin. 2013. Air pollution during pregnancy and neonatal outcome: A review. *Journal of Aerosol Medicine and Pulmonary Drug Delivery* 26(1):9-23.

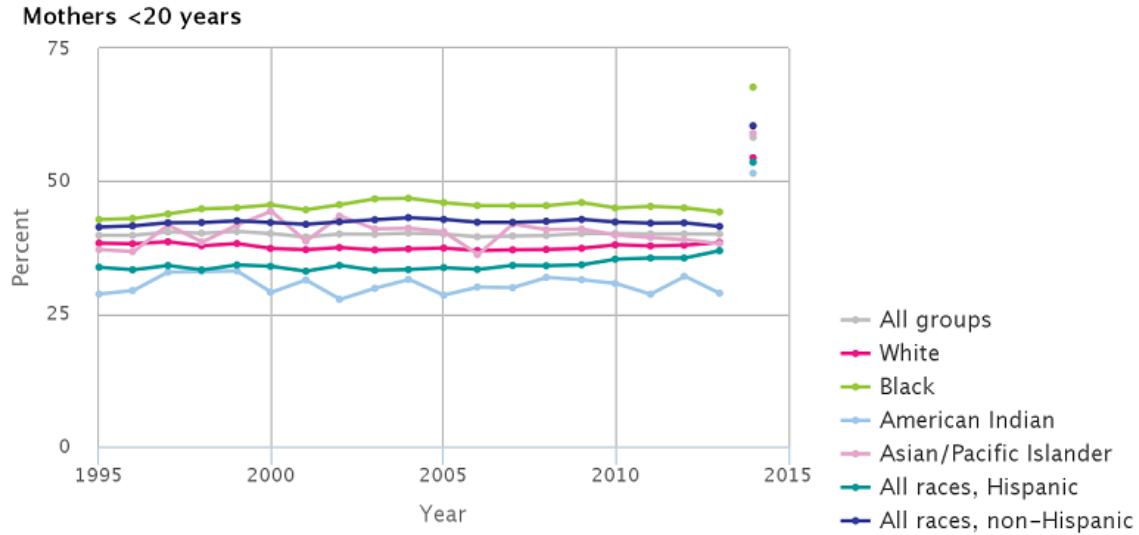
Sram R.J., B. Binkova, J. Dejmek, and M. Bobak. 2005. Ambient air pollution and pregnancy outcomes: A review of the literature. *Environ. Health Perspect.* 113(4):375-382.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1278474/pdf/ehp0113-000375.pdf> (PDF) (8 pp, 143K).

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Exhibit 1. Percent of low birthweight infants (<2,500 grams) among all preterm infants born in the U.S. by mother's age, race, and ethnicity, 1995–2014



Preterm deliveries are births occurring before 37 weeks gestation.

Data represent singleton births only.

Due to differences in estimating gestational age, data from 1995–2013 should not be directly compared with data from 2014.

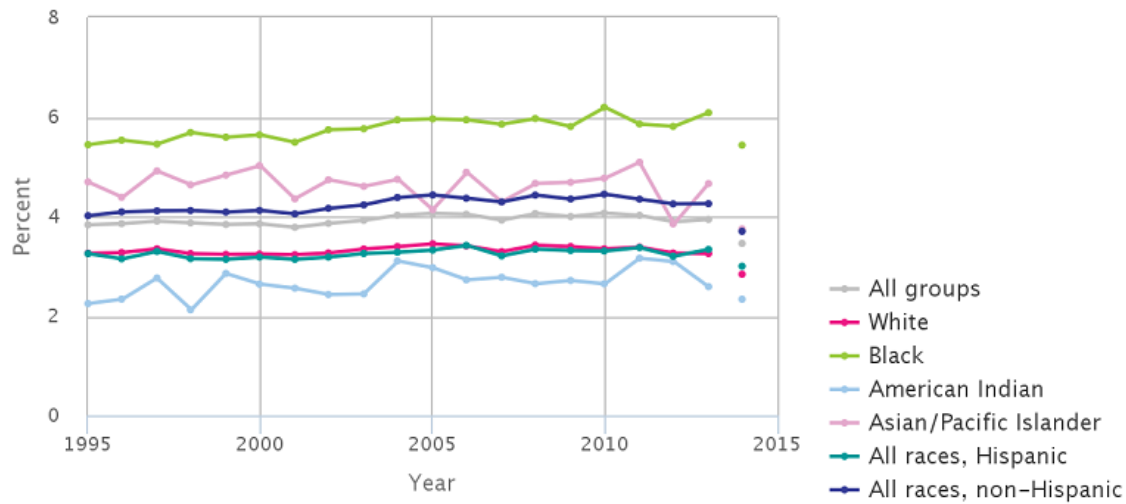
Information on the statistical significance of the trends in this exhibit is not presented here. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: CDC, 2015

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

Exhibit 2. Percent of low birthweight infants (<2,500 grams) among all full-term infants born in the U.S. by mother's age, race, and ethnicity, 1995–2014

Mothers <20 years



Full-term births are births occurring at or after 37 weeks gestation.

Data represent singleton births only.

Due to differences in estimating gestational age, data from 1995–2013 should not be directly compared with data from 2014.

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.

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