

Youth and Cardiovascular Diseases — Statistics

Congenital Cardiovascular Defects (ICD/10 codes Q20-Q28) (ICD/9 codes 745-747)

Congenital cardiovascular defects, also known as congenital heart defects, are structural problems arising from abnormal formation of the heart or major blood vessels. At least 15 distinct types of congenital defects are recognized, with many additional anatomic variations.

- Defects range in severity from tiny pinholes between chambers that are nearly irrelevant and often resolve spontaneously, to major malformations that result in fetal loss or death in infancy or childhood. Common defects diagnosed in infancy include
 - tetralogy of Fallot (9-14 percent).
 - transposition of the great arteries (10-11 percent).
 - atrioventricular septal defect (4-10 percent).
 - coarctation of the aorta (8-11 percent).
 - hypoplastic left heart syndrome (4-8 percent).
 - ventricular septal defect (14-16 percent).

Most defects can be corrected or improved with surgery or catheter-based therapy.

Major defects are usually apparent in the neonatal period, but minor defects may not be detected until adulthood. Thus, true measures of incidence for congenital heart disease would need to record new cases of defects presenting anytime in fetal life through adulthood. However, estimates are only available for new cases detected between birth and 30 days of life, known as birth prevalence, or as new cases detected in the first year of life only. Both of these are typically reported as cases per 1,000 live births per year, and do not distinguish between tiny defects that resolve without treatment and major malformations. To distinguish more serious defects, some studies also report new cases of sufficient severity to undergo an invasive procedure or result in death within the first year of life. Despite the absence of true incidence figures, some data are available, as shown in the Table at the top of page 3.

- According to the CDC, one in every 110 babies in the metropolitan Atlanta area was born with a congenital heart defect, including some infants with tiny defects that resolved without treatment. Some defects occur more commonly in males or females, or in whites or blacks. (*Botto LD, et al. Racial and Temporal Variations in the Prevalence of Heart Defects. Pediatrics 2001;107(3):E32*)
- 9.0 defects per 1,000 live births are expected, or 36,000 babies per year in the United States. Of these, several studies suggest that 9,200, or 2.3 per 1,000 live births, require invasive treatment or result in death in the first year of life. (*Prevalance and incidence of cardiac malformations. In: Moller JH, ed. Surgery of Congenital Heart Disease Pediatric Cardiac Care Consortium 1984-1995. Armonk, NY: Futura Publishing Company, 1998:20. Vol. 6.*)
- Estimates are also available for bicommissural aortic valves, occurring in 13.7 per 1,000 people; these defects may not require treatment in infancy, but can cause problems later in adulthood. (*Hoffman JI, et al. The incidence of congenital heart disease. JACC 2002;39:1890-900; Larson EW, et al. Risk factors for aortic dissection: a necropsy study of 161 cases. AJC 1984;53:849-55*)
- Some studies suggest that as many as 5 percent of newborns, or 200,000 per year, are born with tiny muscular ventricular septal defects, almost all of which close spontaneously.

(Roguin N, et al. High prevalence of muscular ventricular septal defect in neonates. *JACC* 1995;26:1545-8; Sands AJ, et al. Incidence and risk factors for ventricular septal defect in “low-risk” neonates. *Arch Dis Child Fetal Neonatal Ed* 1999;81(1):F61–F63). These defects nearly never require treatment, so they aren’t included in the Table below.

Annual Incidence of Congenital Cardiovascular Defects

Type of Presentation	Rate per 1,000 Live Births	Number
Fetal loss	Unknown	Unknown
Invasive procedure during first year	2.3	9,200
Detected during first year *	9.0	36,000
Bicommissural aortic valve	13.7	54,800
Other defects detected after first year	Unknown	Unknown
Total	Unknown	Unknown

* Includes stillbirths and pregnancy termination less than 20 weeks gestation; includes some defects that resolve spontaneously or don’t require treatment.

- Thousands of babies are born each year with congenital heart defects.
- 50.9 percent of deaths from congenital cardiovascular defects in 2002 occurred in Americans under age 15. Crude infant death rates (under 1 year) were 41.5 for white babies and 51.7 for black babies.
- In 2000 over 25,000 cardiovascular operations for congenital heart disease were performed on children under age 20. 54 percent of operations were performed in males. (*HCUP KID2000*)
- Inpatient mortality after all types of cardiac surgery was 4.7 percent. However, mortality risk varies substantially for different defect types, from 0.3 percent for atrial septal defect repair to 20.1 percent for first stage palliation for hypoplastic left heart syndrome. In unadjusted analyses, mortality after cardiac surgery was somewhat higher for females than for males (4.8 percent vs. 4.6 percent). (*HCUP KID2000*)

End-Stage Renal Disease (ICD/10 code N18.0)

- The average incidence rates for pediatric ESRD are more than twice as high among children 15-19 years as for children 10-14 years. The rates are more than three times higher than those for children ages 0-4 and 5-9.
- Children with pediatric ESRD have high transplantation rates. More than 44 percent of children starting therapy received a transplant during the first year of therapy, compared with 10 percent of patients 20-64 years of age at ESRD incidence.

Cardiomyopathy (ICD/10 code I42) (ICD/9 code 425)

- Studies show that 36 percent of young athletes who die suddenly have probable or definite hypertrophic cardiomyopathy. (Maron BJ, et al. Sudden death in young competitive athletes: clinical, demographic, and pathological profiles. *JAMA* 1996;276:199–204)
- Since 1996 the NHLBI’s Pediatric Cardiomyopathy Registry has collected data on all children with newly diagnosed cardiomyopathy in New England and the Central Southwest (Texas, Oklahoma and Arkansas). The overall incidence of cardiomyopathy is — 1.13 cases per 100,000 in children younger than age 18.

- 8.34 per 100,000 in children under 1 year.
- 0.70 per 100,000 in children ages 1-18.

The annual incidence was lower in white than in black children; higher in boys than in girls; higher in New England (1.44 per 100,000) than in the Central Southwest (0.98 per 100,000).

(Lipschutz SE, et al. *The incidence of pediatric cardiomyopathy in two regions of the United States. NEJM* 2003;348:1647–55)

Kawasaki Disease (ICD/10 M30.3) (ICD/9 code 446.1)

- About 76 percent of patients with Kawasaki disease are under age five. Most are under age two. Children older than age eight are rarely affected. (Newberger JW, et al. *Diagnosis, treatment, and long-term management of Kawasaki disease. Circulation* 2004;110:2747-71)
- Up to 2,500 cases of Kawasaki disease are diagnosed yearly. It occurs more often among boys (63 percent) and among those of Asian ancestry. (Taubert K, et al. *Seven-year national survey of Kawasaki disease and acute rheumatic fever. Pediatr Infect Dis J* 1994;13:704-8)

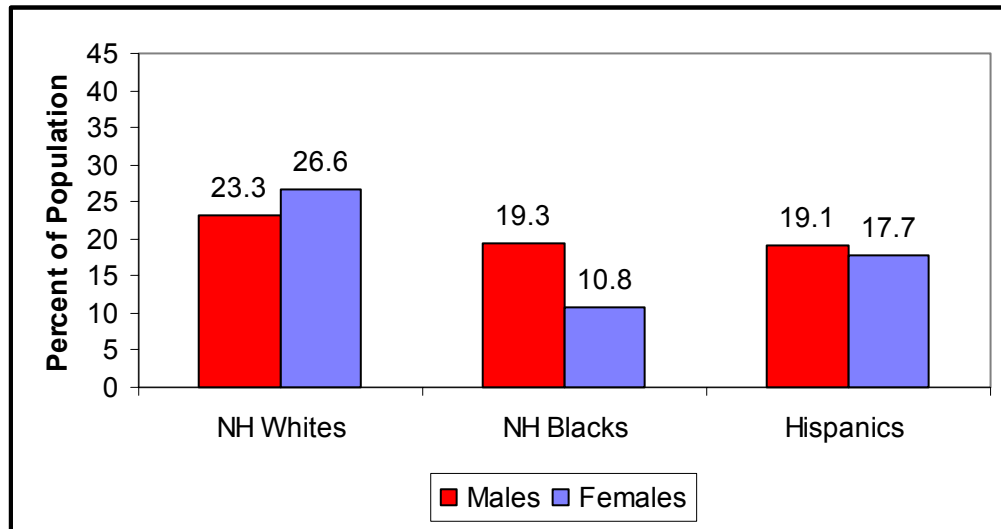
Tobacco

- According to a 2003 survey of students in grades 9-12,
 - 30.3 percent of males and 24.6 percent of females report current tobacco use.
 - 19.9 percent of males and 9.4 percent of females report current cigar use.
 - 11.0 percent of males and 2.2 percent of females report current smokeless tobacco use.
 (YRBS, *MMWR*, Vol. 53, No. SS-2, May 21, 2004, CDC)
- Children's exposure to secondhand smoke, as indicated by cotinine levels, dropped between 1988–94 and 1999–2002. Overall, 59 percent of children ages 4–11 had cotinine in their blood in 1999–2002, down from 88 percent in 1988–94. In 1999–2002, 84 percent of non-Hispanic black children ages 4–11 had cotinine in their blood compared to 58 percent of non-Hispanic white children and 47 percent of Mexican-American children. The percentage of homes with children under age 7 in which someone smokes on a regular basis decreased from 29 percent in 1994 to 11 percent in 2003. (*America's Children: Key National Indicators of Well-Being, 2005. Federal Interagency Forum on Child and Family Statistics, Washington, D.C.: U.S. Government Printing Office*)
- About 80 percent of people who use tobacco, begin before age 18, with the most common ages of initiation being 14 to 15. (*MMWR*, Vol. 48, No. 31, August 1999, CDC)
- From 1980 to 2003 the percentage of high school seniors who smoked in the past month decreased 20 percent.
 - For males it decreased 2.2 percent.
 - For females it decreased 23.7 percent.
 - For whites it decreased 9.0 percent.
 - For blacks or African Americans it decreased 64.3 percent.

(*Health, United States, 2004, CDC/NCHS*)

Prevalence of High School Students Reporting Current Cigarette Use within the Last 30 Days by Race/Ethnicity and Sex

YRBS, United States: 2003



Source: *MMWR*, Vol. 53, No.23:499-502, June 18, 2004, CDC.

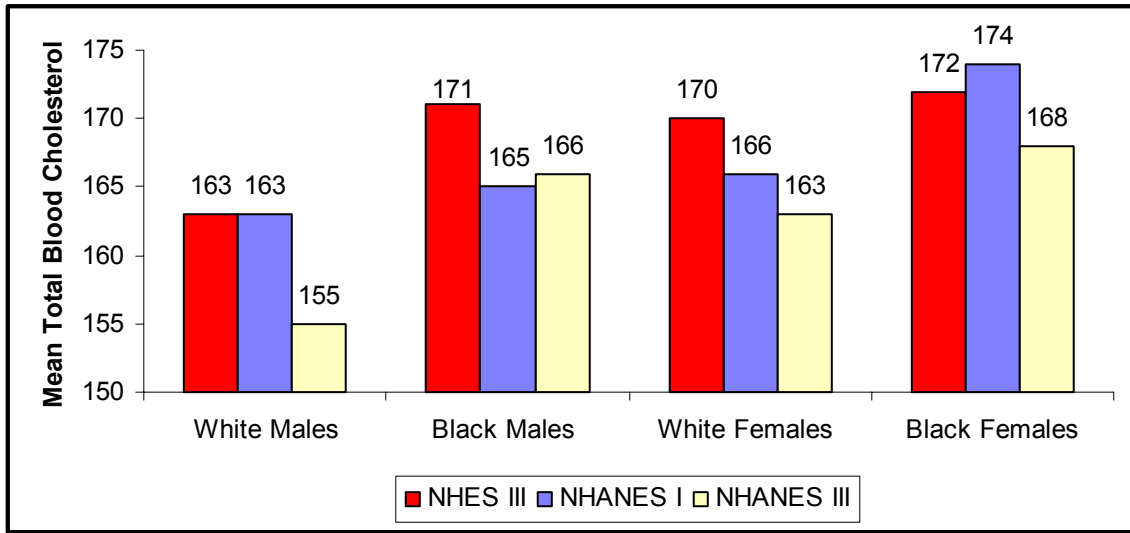
- An estimated 1.4 million Americans began smoking cigarettes daily in 2002. More than half of these new smokers were younger than age 18. This translates to more than 4,000 new regular smokers per day, including more than 2,000 youths. (*National Survey on Drug Use and Health*, <http://www.oas.samhsa.gov/nsduh.htm>)

High Blood Cholesterol and Other Lipids

- Among children and adolescents ages 4-19, the mean total blood cholesterol level is 165 mg/dL. For boys it's 163 mg/dL and for girls it's 167 mg/dL. The racial/ethnic breakdown is
 - For NH whites, 162 mg/dL for boys and 166 mg/dL for girls.
 - For NH blacks, 168 mg/dL for boys and 171 mg/dL for girls.
 - For Mexican Americans, 163 mg/dL for boys and 165 for girls.(*NHANES III [1988-94]*, CDC/NCHS)
- About 10 percent of adolescents ages 12-19 have total cholesterol levels exceeding 200 mg/dL. (*NHANES III [1988-94]*, CDC/NCHS)
- For children and adolescents ages 12-19, mean LDL cholesterol levels are
 - Among NH whites, 91 mg/dL for boys and 100 mg/dL for girls.
 - Among NH blacks, 99 mg/dL for boys and 102 mg/dL for girls.
 - Among Mexican Americans, 93 mg/dL for boys and 92 mg/dL for girls.
- For children and adolescents ages 4-19, mean HDL cholesterol levels are
 - Among NH whites, 48 mg/dL for boys and 50 mg/dL for girls.
 - Among NH blacks, 55 mg/dL for boys and 56 mg/dL for girls.
 - Among Mexican Americans, 51 mg/dL for boys and 52 mg/dL for girls.

Trends in Mean Total Blood Cholesterol Among Adolescents Ages 12-17 by Sex, Race and Survey

NHES III, NHANES I & NHANES III: 1966-70, 1971-74, 1988-94



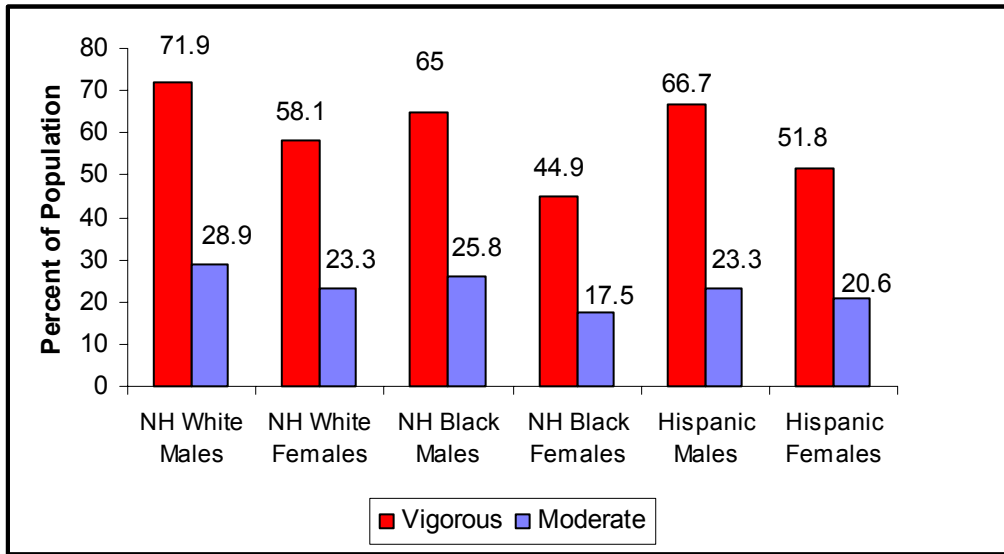
Source: CDC/NCHS. Hickman TB, et al. Distributions and trends of serum lipid levels among United States children and adolescents ages 4-19 years: Data from the third National Health and Nutrition Examination Survey. *Prev Med* 1998;27(6):879-890.

Physical Activity

- In 2003, 58.5 percent of male and 52.8 percent of female high school students, grades 9 – 12, were enrolled in physical education classes. 30.5 percent of males and 26.4 percent of females attended classes daily and 84.5 percent of males and 75.3 percent of females exercised or played sports during an average PE class. (*MMWR*, Vol. 53, No. SS-2, May 21, 2004, CDC)

Prevalence of Students in Grades 9-12 Who Participated in Sufficient Vigorous or Moderate Physical Activity During the Past 7 Days by Race/Ethnicity and Sex

YRBS, 2003



Note: "Vigorous activity" is defined as activity causing sweating and hard breathing for at least 20 minutes on 3 or more of the 7 days. "Moderate activity" is defined as activities such as walking or bicycling lasting for at least 30 minutes on 5 or more of the 7 days.

Source: *Source: MMWR, Vol. 53, No. SS-2, May 21, 2004, CDC.*

Overweight and Obesity

- Among American children ages 6-11, using the 95th percentile of body mass index (BMI) values on the CDC 2000 growth chart, the following are overweight:
 - For NH whites, 14.0 percent of boys and 13.1 percent of girls.
 - For NH blacks, 17.0 percent of boys and 22.8 percent of girls.
 - For Mexican Americans, 26.5 percent of boys and 17.1 percent of girls.

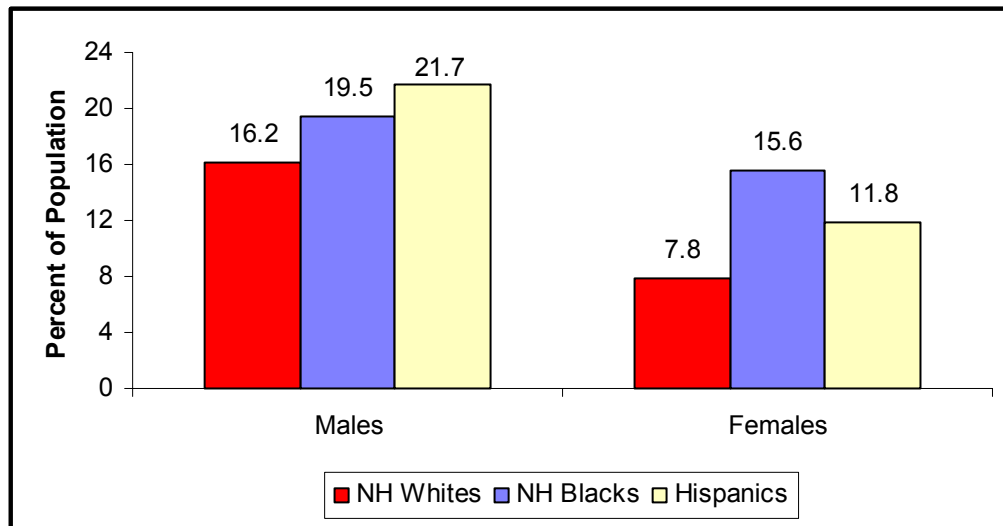
(NHANES [1999-2002], CDC/NCHS)

- Among American adolescents ages 12-19, using the 95th percentile of BMI values on the CDC 2000 growth chart, the following are overweight:
 - For NH whites, 14.6 percent of boys and 12.7 percent of girls.
 - For NH blacks, 18.7 percent of boys and 23.6 percent of girls.
 - For Mexican Americans, 24.7 percent of boys and 19.9 percent of girls.

(NHANES [1999-2002], CDC/NCHS)

Prevalence of Overweight Among Students in Grades 9-12 by Sex and Race/Ethnicity

YRBS: 2003



Note: Overweight is defined as BMI 95th percentile or higher by age and sex of the CDC 2000 growth chart.

Source: BMI 95th percentile or higher by age and sex of the CDC 2000 growth chart. *MMWR*, Vol. 53, No. SS-2, May 21, 2004, CDC.

Surgery

- An estimated 229,000 cardiovascular procedures were performed on youth age 15 and younger in 2003.

Source Footnotes

AJC – *American Journal of Cardiology*

BWIS – Baltimore-Washington Infant Study

CDC/NCHS – Centers for Disease Control and Prevention/National Center for Health Statistics

HCUP – Healthcare Cost and Utilization Project

JACC – *Journal of the American College of Cardiology*

MACDP – Metropolitan Atlanta Congenital Defects Program

MMWR – *Morbidity and Mortality Weekly Report*

NH – non-Hispanic

NHANES – National Health and Nutrition Examination Survey

NHES – National Health Examination Survey

YRBS – Youth Risk Behavior Surveillance