

Kids Count

Voices for Virginia's Children



Infant Mortality

Understanding the complexities of death among Virginia's youngest children

The purpose of this data brief is to provide information to improve understanding of infant mortality in Virginia and to explore the complexities of infant mortality, including the causes of infant death and the risk factors. Virginia KIDS COUNT is particularly interested in the state's infant mortality rates because although Virginia ranks well among the states on most indicators of child well-being, Virginia ranks in the bottom third of states on infant mortality. Although the Virginia infant mortality rate has decreased over the past fifteen years, the rate has been stagnant for the past five years. Virginia's infant mortality rate has been similar to the U.S. rate over time, which is dismal when compared with the rates of other developed countries. In order to improve infant mortality rates, Virginia health professionals are working to decrease the causes of infant mortality which include prematurity, low-birthweight, SIDS (sudden infant death syndrome), and maternal complications.

Two infants die every day in Virginia.

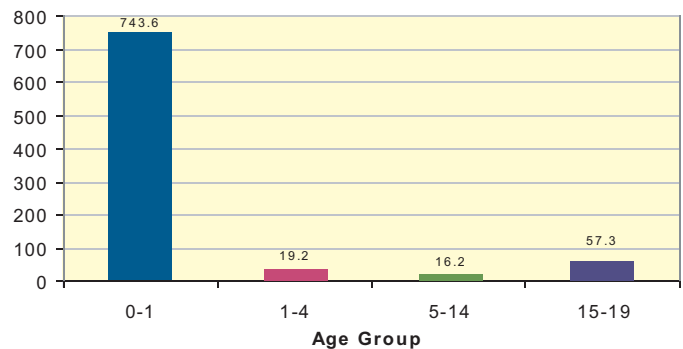
Despite the fact that Virginia ranked 9th in per capita income in 2006, the Commonwealth ranks 31st among states on the measure of infant mortality in the latest National KIDS COUNT online data.¹

Infant mortality is the death of an infant born alive, prior to one year of age. Infant mortality is often used to assess the health of a community since the measure typically reflects the access and availability of medical care for infants and mothers.² The rate of infant deaths (743.6 per 100,000 or 7.4 per 1,000 live births) is significantly higher than the rate of death for children in any other age grouping (Graph 1).

- The U.S. ranked 24th out of 25 industrialized countries in a comparison of infant mortality.³
- The U.S. infant mortality rate was 6.8 deaths per 1,000 live births in 2004.

- The Virginia infant mortality rate was 7.4 deaths per 1,000 live births in 2005, higher than the U.S. rate in 2004. (The 2005 U.S. rate is not available for comparison.)

Graph 1. Virginia Death Rates by Age Group 2005 (per 100,000)



Source: Virginia Department of Health

Virginia's infant mortality rates

The infant mortality rate in Virginia has improved to 7.4 deaths per 1,000 live births in 2005 from 10.2 deaths per 1,000 live births in 1990; however, the rate has ceased to improve in the past five years. The long-term reduction in the infant mortality rate is a result of medical advances rather than a reduction of preterm births and low-birthweight babies, both of which are rising in Virginia.⁴

The 5-year average infant mortality rates for the ten localities with the highest and ten localities with the lowest rates are shown in Table 1.⁵ Multi-year averages provide a better measure for locality data because the sample size is larger and the rates are not subject to random, single-year fluctuations. Rates were calculated for localities with at least 20 deaths over five years. The localities with the lowest infant mortality rates have lower percentages of families in poverty than do the localities with higher rates of infant mortality.⁶ However, even within localities, disparities exist among neighborhoods; researchers are mapping infant deaths to specific neighborhoods in order to better analyze the problem and to customize prevention programs.

Virginia ranks 31st among states on infant mortality.



Kids Count

Table 1. 5-Year Average Infant Mortality Rates (2001-2005) (per 1,000)

10 localities with the lowest rates		10 localities with the highest rates	
Arlington	3.6	Portsmouth	15.0
Loudoun	4.4	Richmond City	14.9
Fairfax County	4.5	Roanoke City	13.6
Albemarle	4.8	Hopewell	13.0
Alexandria	5.0	Fredericksburg	12.4
Hanover	5.2	Danville	12.4
Montgomery	5.4	Charlottesville	11.9
Stafford	5.8	Petersburg	11.7
Prince William	6.1	Newport News	11.6
Frederick	6.4	Hampton	11.3

Source: Virginia Department of Health

Causes of infant mortality and risk factors

The three leading causes of infant death in Virginia are birth defects, extreme immaturity (preterm birth and low-birthweight), and SIDS (sudden infant death syndrome), as shown in Table 2.⁷ The cause of death varies by race (Table 2). Although 39% of deaths can be categorized into these top three categories, there were over 400 uniquely coded causes of death during the five-year period of 2001-2005; varied strategies are needed to address infant death.

Table 2. Top Three Causes of Infant Death by Race in Virginia (5-year average 2001-2005)

Cause of Death	All Race/Ethnicity	White	African American
Congenital malformations, deformations and chromosomal abnormalities	17%	20%	11%
Extreme immaturity (caused by prematurity and/or low-birthweight)	12%	10%	16%
Sudden infant death syndrome	10%	12%	10%

Source: Virginia Department of Health

Maternal risk factors and populations most at risk for infant death include:

- being unmarried
- smoking during pregnancy
- having a low level of education
- being a teen mom or over age 40

- receiving little or no prenatal care
- being born in the U.S.⁸
- having a low income
- being African American
- having poor nutrition⁹

One study found that the risk of infant mortality for women with less than 12 years of education was 41% higher than women with more than 16 years of education.¹⁰

Preterm births and low-birthweight babies

Preterm births (birth at less than 37 weeks of gestation) are the cause in at least one third of infant deaths.¹¹ More than 1 in 10 births were premature in Virginia in 2005 (Graph 2). An increase in infertility treatments, which often result in multiple births, explains some of the rise in preterm births and subsequent infant mortality, but it does not explain Virginia's poor ranking among states, nor does it explain the disparity between white and African American infant mortality rates.¹² The infant mortality rate for multiple births was 30.46 deaths per 1,000 births in 2004 compared to 5.94 for singleton births.¹³ Increased medical intervention has also contributed to the increase in infant mortality rates since infants who would have previously died in utero live for a short period of time.¹⁴

The incidence of low-birthweight babies, those weighing less than 5 pounds, 8 ounces at birth, is increasing in Virginia. In 2005, 8.2% of all babies and 53% of premature babies¹⁵ were born low-birthweight (Graph 2).

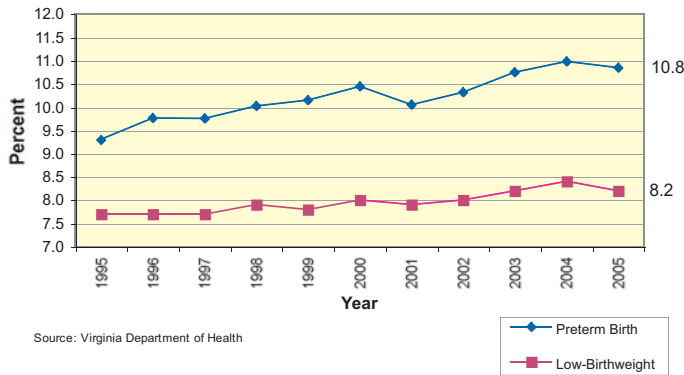
Demographic, behavioral, and medical risk factors for having a premature or low-birthweight infant include:¹⁶

- young age and advanced maternal age
- having a prior preterm birth
- medical risks predating the pregnancy, such as diabetes or hypertension
- short intervals between pregnancies
- medical risk during pregnancy due to multiple births
- inadequate or excessive weight gain
- maternal infection
- stress and depression
- substance abuse, smoking, and environmental toxins, including second-hand smoke





Graph 2. Virginia Preterm Births and Low-Birthweight Babies



Source: Virginia Department of Health

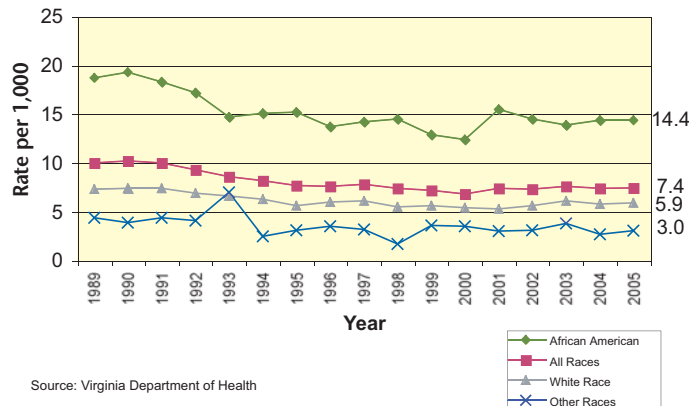
SIDS (sudden infant death syndrome)

SIDS is the sudden death of an infant less than one year of age that cannot be explained by information collected during a thorough death investigation.¹⁷ There is a theory that a critical development period, a vulnerable infant, and environmental stressors converge to place infants at greater risk for SIDS.¹⁸ Infants with abnormalities in brain stem nerve cells,¹⁹ as well as infants born preterm,²⁰ are more vulnerable to SIDS. Campaigns promoting placing infants on their backs to sleep and promoting safe sleep practices have improved the outcomes for infants;²¹ however, health officials believe that culturally sensitive campaigns can decrease SIDS as a cause of infant mortality even further.

Race and Ethnicity

The infant mortality rate for African American infants in Virginia in 2005 was 14.4 deaths per 1,000 live births compared to 5.9 for white infants, as shown

Graph 3. Virginia's Infant Mortality Rates by Race



Source: Virginia Department of Health

in Graph 3. The Hispanics rate (5.2) was similar to the rate for white infants.

Disproportionate infant mortality rates among African Americans can be attributed, in part, to a greater prevalence of risk factors in African American women, including lower socioeconomic status, which is related to poorer access to medical care. However, African Americans have higher infant mortality rates than non-Hispanic whites at all educational²² and socioeconomic levels.²³ African American women also have higher rates of preterm birth and low-birthweight than non-Hispanic white women, both of which are risks for infant mortality. Studies have suggested a genetic correlation; African American women were found to have a genetic deficiency in collagen, which could increase the likelihood of preterm birth.²⁴ Stress and racism have also been linked to preterm birth and low-birthweight, precursors of infant mortality.²⁵

Prenatal care and preconception care

Early prenatal care combined with the appropriate number of visits (14 visits for a low-risk pregnancy) is recommended to avoid behavioral and medical risks during the pregnancy.^{26,27} The U.S. infant mortality rate for women who received late or no prenatal care was 37% higher than the rate for women who received care in the first trimester in 2004.²⁸ Researchers have found that preterm birth decreases as the number of prenatal visits increase.²⁹

The percent of women in Virginia receiving prenatal care in the first trimester, 84%, has remained unchanged since 1996. Women who do not receive adequate and early prenatal care are often uninsured, Medicaid recipients, low income, African American, non-English speaking, and teens. Others not receiving appropriate care sometimes have mental health problems, substance abuse problems, lack of transportation, and/or have a rural residence.³⁰

Preconception health care is recommended as a more comprehensive approach to achieving the best outcomes for women, pregnancies, and babies.³¹ March of Dimes is working with partners to educate health providers and the public to recognize and reduce medical, behavioral and social health risks before pregnancy.³²

Efforts to address infant mortality in Virginia

Voices for Virginia's Children is working with the Virginia Poverty Law Center, the March of Dimes, and

Preconception health care is recommended as a more comprehensive approach to achieving the best outcomes for women, pregnancies, and babies.





other partners to increase eligibility for FAMIS (Family Access to Medical Insurance Security) Moms to 200% of the federal poverty level (FPL). FAMIS Moms provides prenatal coverage to women whose income exceeds the level to qualify for Medicaid (133% FPL) but is less than 185% of the FPL. The current eligibility level means that a mother in a family of four with an income up to \$38,202 can access care. In 2000, a mom in a family of four could not access care if the family income was above \$22,676 (133% FPL).

Virginia initiatives intended to address maternal health and infant mortality:

- March of Dimes Prematurity Prevention Campaign
- Regional Perinatal Councils
- Fetal-Infant Mortality Review Program, Maternal Mortality Review
- Pregnancy Risk Assessment Monitoring System (PRAMS)
- Department of Medical Assistance Services Baby Care program
- Community Service Boards substance abuse prevention programs, such as Project LINK

A list of additional Virginia initiatives to address infant mortality can be accessed at <http://www.vaperforms.virginia.gov/i-infantMortality.php>.

The risk factors for infant mortality are varied and complex and the data suggest that the major risk factors may occur well before the actual birth, or even pregnancy.

Summary

On most indicators of child well-being tracked by Virginia KIDS COUNT, the state ranks high when compared to other states. Infant mortality is an outlier because Virginia is ranked in the bottom third of states. A deeper analysis points to significant variations in infant mortality rates by locality and among different racial and ethnic populations in Virginia. The risk factors for infant mortality are varied and complex and the data suggest that the major risk factors may occur well before the actual birth, or even pregnancy. As more data and research become available, thorough analyses will continue to inform efforts to reduce infant mortality in Virginia.

More information

- Locality specific data on prenatal care, infant mortality, and low-birthweight <http://www.vakids.org/work/kcdata.htm>
- Health statistics <http://www.vdh.state.va.us/healthstats/>
- Detailed perinatal data for Virginia <http://www.marchofdimes.com/peristats/>

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¹ www.aecf.org/KIDS_COUNT_Data. Annie E. Casey Foundation. Accessed online 5/10/2007. A rank of 1 is best and 50 is worst.

² Federal Interagency Forum on Child and Family Statistics. *America's Children: Key National Indicators of Well-Being*. Washington, DC: U.S. Government Printing Office. 2005

³ UNICEF, *Child poverty in perspective: An overview of child well-being in rich countries*. Innocenti Report Card 7, 2007.

⁴ Tavenner, Marilyn. "How Do We Keep Infants Healthy in Virginia?" March of Dimes Prematurity Summit, May 8, 2007.

⁵ Multi-year averages provide a better measure because the rates are not subject to random single year fluctuations. Rates were calculated for localities with at least 20 deaths over five years. ⁶ US Census Bureau. 2005 American Community Survey. S1702 Poverty Status in the Past 12 Months of Families

⁷ Virginia Department of Health. The 5-year infant mortality rate is an average rate over five years (2001-2005) for localities with at least 20 deaths. Rates are deaths per 1,000 births.

⁸ Mathews, MS, T.J., MacDorman, PhD, Marian F. Infant Mortality Statistics from the 2004 Period Linked Birth/Infant Death Data Set. National Vital Statistics Reports. Vol. 55 No. 14. Hyattsville, MD: National Center for Health Statistics. May 2, 2007.

⁹ Behrman, Richard E., Butler, Adrienne Stith, eds., *Preterm Birth: Causes, Consequences, and Prevention*, The National Academies. 2006. p.50.

¹⁰ Wang, Hongyan, Parry, Samuel, Macones, George et al., A functional SNP in the promoter of the SERPINH1 gene increases the risk of preterm rupture of the membranes in African Americans. Proceedings from the National Academy of Science U.S.A. 2006 September 5; 103 (36): 13463-13467.

¹¹ Behrman, Richard E., Butler, Adrienne Stith, eds., *Preterm Birth: Causes, Consequences, and Prevention*. The National Academies. 2006.

¹² Kirkham, MD, Colleen, Harris, MD, Susan, Grzybowski, MD, Stefan. Evidence-Based Prenatal Care: Part I. General Prenatal Care and Counseling Issues. *American Family Physician*, Vol. 71 No 7. April 1, 2005.

¹³ Evans, William N. & Lien, Diana S. The Benefits of Prenatal Care: Evidence from the PAT Bus Strike, March 2002.

¹⁴ Mathews, MS, T.J., MacDorman, Ph.D Marian F. Infant Mortality Statistics from the 2004 Period Linked Birth/Infant Death Data Set. National Vital Statistics Reports; Vol. 55 No. 14. Hyattsville, MD: National Center for Health Statistics. May 2, 2007.

¹⁵ Vintzileos, A.M., Anath, C.V., Smulian, J.C. et al., The impact of prenatal care in the United States on preterm births in the presence and absence of antenatal high-risk conditions. *American Journal of Obstetrics and Gynecology*. November 2002.

¹⁶ The Virginia Department of Health, Office of Family Health Services. *Maternal & Child Qualitative Health Needs Assessment*. June 2005. Accessed online 4/10/2007.

¹⁷ Merry-K. Moos RN, FNP, MPH, *Preconceptional Wellness as a Routine Objective for Women's Health Care: An Integrative Strategy*, *Journal of Obstetric, Gynecologic & Neonatal Nursing* 32 (4), 550-556.

¹⁸ <http://www.marchofdimes.com/professionals/preconception.asp> accessed online 6/5/2007.

