NCBDDDannualreport2011
National Center on Birth Defects and Developmental Disabilities • Centers for Disease Control and Prevention

Birth Defects

Preventing Major Birth Defects Associated with Maternal Risk Factors

What is the problem?

- Birth defects are structural changes in one or more parts of the body. They are present at birth. They can have a serious, negative effect on the health, development, or functional ability of the baby.
    - Congenital heart defects are conditions that are present at birth and can affect the structure of a baby's heart and the way it works. They can affect how blood flows through the heart and out to the rest of the body.
- About one in every 33 babies is born with a birth defect. Birth defects are a leading cause of infant death, accounting for more than 1 of every 5 infant deaths. In addition, babies born with birth defects have a greater chance of illness and long term disability than babies without birth defects.
- We do not know the risks to pregnant women and their babies for most of the medications available today. Only about 2% of the medications approved by the FDA from 2000 to 2010 have sufficient data on the risk when used during pregnancy. We need more information about the safety or risk of medications that are commonly used in pregnancy.

What do we know?

- Some birth defects can be prevented, and prevention begins with identifying causes and risk factors.
    - Taking certain medications just before or during pregnancy might cause serious birth defects, but the safety of many medications taken by pregnant women has been difficult to determine. The effects depend on many factors, such as:
        - How much medication was taken.
        - When during the pregnancy the medication was taken.
        - Other health conditions a woman might have.
        - Other medications a woman takes.
    - Smoking in the month before getting pregnant and throughout pregnancy increases the chance of premature birth, certain birth defects (such as cleft lip, cleft palate, or both), and infant death.

- Women who are obese when they get pregnant have a higher risk of having a baby with serious birth defects of the brain and spine (neural tube defects) and some heart defects.
- Poor control of diabetes in pregnant women increases the chance for birth defects, and might cause serious complications for the mother, too.
- Alcohol-exposed pregnancy remains a leading preventable cause of birth defects and developmental disabilities.
- Taking 400 micrograms of folic acid every day, starting at least one month before getting pregnant can help prevent neural tube defects, like spina bifida.

Did you know?

Congenital heart defects are:

- The most common type of birth defect.
- A leading cause of infant death.
- Present among nearly 40,000 births in the U. S. each year.

- The causes of congenital heart defects are mostly unknown. Some babies have heart defects because of changes in their genes or chromosomes. Congenital heart defects also are thought to be caused by a combination of genetic and other risk factors, such as exposures to things in the environment, maternal nutrition, or maternal medication use.

What can we do?

- As medical care and treatment have advanced, infants with congenital heart defects are living longer, healthier lives. This progress presents new challenges to families and the health care system to meet the special health needs of these individuals. We can improve monitoring and tracking of congenital heart defects in children and adults to get better estimates of the number of people affected, types of health services needed, and costs of such services.

  To improve knowledge about congenital heart defects, NCBDDD supports the Congenital Heart Public Health Consortium (CHPHC), a group of organizations uniting efforts to promote public health activities to prevent the occurrence of congenital heart defects and to enhance and prolong the lives of those with heart defects.

Accomplishments

- NCBDDD created a new initiative to improve the available information about the safety or risk of medication use in pregnancy—TR_xeating for Two. As part of this initiative, we are working to partner with relevant federal and external agencies to develop a formal review process to evaluate the quality and strength of evidence for safety or risks associated with the most commonly used medications during pregnancy. Better information on the safety or risk of specific medications will allow women and their doctors to make informed decisions about treatment during pregnancy.

- NCBDDD launched two websites on CDC.gov—one on Medications in Pregnancy and one on Congenital Heart Defects—to inform women, their health care providers, and families about important issues to consider related to these topics. These new websites contain easy-to-read, research-based

information. Specific topics featured on these websites include compilations of key publications as well as overviews of the work NCBDDD and partners are doing in these fields of research.

- In 2011, the American College of Obstetricians and Gynecologists' (ACOG) Committee on Obstetric Practice used data from the NCBDDD's National Birth Defects Prevention Study published in 2009 to inform their professional opinion on certain antibiotics, particularly sulfonamides and nitrofurantoin, and the risk of birth defects. This information will affect how women are treated for infections during pregnancy. ACOG concluded the following:

  "Prescribing sulfonamides or nitrofurantoin in the first trimester is still considered appropriate when no other suitable alternative antibiotics are available. Pregnant women should not be denied appropriate treatment for infections because untreated infections can commonly lead to serious maternal and fetal complications…It is reassuring that commonly used antibiotics, namely penicillins, erythromycin, cephalosporins, and a less commonly used group, the quinolones, were not associated with an increased risk of birth defects in the 2009 study."

- NCBDDD and other Congenital Heart Public Health Consortium members participated in a briefing on Capitol Hill entitled "Congenital Heart Defects: A Lifelong Disease," which was sponsored by the American Academy of Pediatrics. This briefing focused on understanding the public health impact of congenital heart defects across the lifespan and the next steps for congenital heart defects research, tracking, and prevention.

Did you know?

- Most women (about 90%) take at least one medication during pregnancy and 70% take at least one *prescription* medication.
- Over the last 30 years, first trimester use of prescription medications has increased more than 60%.
- Before and during pregnancy, a woman should talk to her health care provider about any medications she is taking or planning to take, including prescription and over-the-counter medications and dietary or herbal supplements. Women should also talk to a doctor before stopping any medications that are needed to treat health conditions.
- We have identified some medications that might cause birth defects if a mother takes them during pregnancy. In 2011, our research found that treatment with prescription pain killer medications might increase the risk for certain birth defects. We will continue to work on identifying the medications most commonly used during pregnancy and determining the risks of using those medications during pregnancy.

Looking to the future

- In the next year, NCBDDD will estimate the medical costs of selected birth defects from infancy through childhood.

- NCBDDD researchers will conduct a cost-effectiveness analysis of universal screening for critical congenital heart defects in newborns using pulse oximetry.

- We will continue to research the impact of birth defects, including short- and long-term outcomes for affected individuals.

- We will enhance our communications plan for disseminating risk information on the most commonly used medications during pregnancy, focusing on increased accessibility to reliable information for women of reproductive age and their health care providers.

- As medical care and treatment have advanced, infants with congenital heart defects are living longer, healthier lives. This progress presents new challenges to families and the health care system to meet the special health needs of these individuals. We will improve monitoring and tracking of congenital heart defects in children and adults to get better estimates of the number of people affected, types of health services needed, and costs of such services.

- The Patient Protection and Affordable Care Act included language authorizing CDC to expand tracking activities to include all individuals living with a congenital heart defect. Congress has provided additional funding for CDC in Fiscal Year 12 to address these challenges.

Did you know?

- The hospital costs alone for individuals with congenital heart defects in the U.S. in 2004 were about $1.4 billion. Severe congenital heart defects accounted for about $511 million, or about 37%, of the hospital costs associated with congenital heart defects.

Notable 2011 NCBDDD Scientific Publications

- Gilboa, S. M., Broussard, C. S., Devine, O. J., Duwe, K. N., Flak, A. L., Boulet, S. L., et al. (2011). **Influencing clinical practice regarding the use of antiepileptic medications during pregnancy: Modeling the potential impact on the prevalences of spina bifida and cleft palate in the United States.** Am J Med Genet C Semin Med Genet, 157(3), 234-246.
- Broussard, C. S., Rasmussen, S. A., Reefhuis, J., Friedman, J. M., Jann, M. W., Riehle-Colarusso, T., et al. (2011). **Maternal treatment with opioid analgesics and risk for birth defects**. Am J Obstet Gynecol, 204(4), 314 e311-311.
- Mitchell, A. A., Gilboa, S. M., Werler, M. M., Kelley, K. E., Louik, C., & Hernandez-Diaz, S. (2011). **Medication use during pregnancy, with particular focus on prescription drugs: 1976-2008**. Am J Obstet Gynecol, 2011, 205(1): 51.e1-8.
- Alverson CJ, Strickland MJ, Gilboa SM, & Correa A. (2011). **Maternal smoking and congenital heart defects in the Baltimore-Washington Infant Study**. Pediatrics, 127(3), e647-53.
- Gilboa SM, Salemi JL, Nembhard WN, Fixler DE, Correa A. (2010) **Mortality resulting from congenital heart disease among children and adults in the United States, 1999 to 2006**. Circulation, 2010 122(22), 2254-63.
- Oster, M. E., Riehle-Colarusso, T., Alverson, C. J., & Correa, A. (2011). **Associations between maternal fever and influenza and congenital heart defects**. J Pediatr, 158(6), 990-995.
- Reefhuis, J., Honein, M. A., Schieve, L. A., & Rasmussen, S. A. (2011). **Use of clomiphene citrate and birth defects, National Birth Defects Prevention Study, 1997-2005**. Hum Reprod, 26(2), 451-457.
- Alwan, S., Reefhuis, J., Rasmussen, S. A., & Friedman, J. M. (2011). **Patterns of antidepressant medication use among pregnant women in a United States population**. J Clin Pharmacol, 51(2), 264-270.
- Boulet SL, Shin M, Kirby RS, Goodman D, Correa A. (2011) **Sensitivity of birth certificate reports of birth defects in Atlanta, 1995-2005: effects of maternal, infant, and hospital characteristics**. Public Health Rep, 2011 Mar-Apr,126(2):186-94.
- Flenady V, Middleton P, Smith GC, Duke W, Erwich JJ, Khong TY, et al. (2011). **Stillbirths: the way forward in high-income countries**. Lancet, 2011 377(9778, 1703-17.