Neural Tube Defects

Worldwide, more than 300,000 babies are born with neural tube defects each year, serious birth defects of the brain (anencephaly) and spine (spina bifida). Neural tube defects are a significant cause of infant death and lifelong disability, and most are preventable. Research has shown that taking 400 micrograms daily of folic acid, a B vitamin, before and during early pregnancy reduces the risk of neural tube defects.

NCBDDD's Division of Birth Defects and Developmental Disabilities has a global initiative to significantly reduce infant death and lifelong disability resulting from neural tube defects that occur worldwide each year. The initiative aims to increase folic acid intake among women of reproductive age through fortification and other means.

2012 Accomplishments

- Provided scientific and technical assistance to a partner group that submitted a petition to the U.S. Food and Drug Administration requesting regulations to allow fortification of corn masa flour with folic acid. Fortification of corn masa flour would selectively target Mexican Americans primarily and could help decrease ethnic disparities in the birth prevalence of neural tube defects.

- Partnered with the South-East Asia Regional Office of the World Health Organization to develop a Regional Strategic Framework for Preventing Birth Defects in the South-East Asia Region. Countries are developing plans and working to strengthen public health capacity for birth defects surveillance and prevention.

- Partnered with the World Health Organization to develop methods to determine the level of folate that should be in a woman's blood to optimize prevention of neural tube defects.

- Collaborated with partners to develop a birth defects surveillance manual aimed at increasing birth defects tracking capacity in low- and middle-resource countries.

2012 Accomplishments (continued)

- Collaborated with CDC's Field Epidemiology Training Program to develop and strengthen neural tube defects surveillance in Kenya, Mexico, and Colombia. Strong surveillance systems can help produce accurate, reliable data to support prevention efforts.

- Collaborated with CDC's Division of Global HIV/AIDS to build, strengthen, and expand neural tube defects surveillance in several African countries as part of their efforts to prevent mother-to-child transmission of HIV. These efforts can help produce reliable data on neural tube defects by integrating surveillance into existing infrastructures, and strengthen neural tube defects and birth defects surveillance workforce capacity at country and regional levels.

Anifa's Story

Anifa is an 18 month old boy who lives in Nigeria. Anifa was born with spina bifida.

To read Anifa's story, visit: www.cdc.gov/Features/FolicAcidStory/

Looking to the Future

NCBDDD's Division of Birth Defects and Developmental Disabilities is working with partners on a global initiative, *Birth Defects COUNT (Countries and Organizations United for Neural Tube Defects Prevention)*, to reduce infant death and lifelong disability worldwide by helping to prevent approximately 150,000-210,000 neural tube defects globally each year. Birth Defects COUNT aims to increase folic acid intake among women of reproductive age through fortification and other means.

Many countries, especially low- and middle-resource countries, do not have birth defects surveillance systems that accurately monitor the birth prevalence of neural tube defects or other observable birth defects. Further, laboratory capacity to measure biomarkers for optimal blood folate concentrations is not available in many countries. Birth Defects COUNT will continue to work with partners to develop and strengthen birth defects surveillance, epidemiology, and laboratory capacity for birth defects prevention.

Currently, only about 10% of neural tube defects worldwide are being prevented through folic acid fortification. The Birth Defects COUNT initiative aims to expand the reach of fortification by supporting the development of global fortification guidelines, increasing the number of countries with fortification policies that include folic acid, and determining a range of optimal blood folate concentrations that can be used for neural tube defects prevention globally.

Notable Scientific Publications

Hamner HC, Tinker SC, Flores AL, Mulinare J, Weakland AP, Dowling NF. Modeling fortification of corn masa flour with folic acid and the potential impact on Mexican-American women with lower acculturation. Public Health Nutrition. 2012 Nov. [Epub ahead of print]

Pfeiffer CM, Hughes JP, Lacher DA, Bailey RL, Berry RJ, Zhang M, Yetley EA, Rader JI, Sempos CT, Johnson CL. Trends of serum and red blood cell folate in the U.S. population from pre- to post-fortification: National Health and Nutrition Examination Survey 1988–2010. *J Nutr* 2012;142:894-900.

Tinker SC, Cogswell ME, Hamner HC, Berry RJ. Usual folic acid intakes: a modeling exercise assessing the impact of changes in the amount of folic acid in foods and supplements, NHANES, 2003–2008. Public Health Nutrition. 2012, ePub-doi:10.1017/S1368980012000638.

Correa A, Gilboa SM, Botto LD, et al. Lack of periconceptional vitamins or supplements that contain folic acid and diabetes mellitus–associated birth defects. Am J Obstet Gynecol 2012 [epub ahead of print].

Modell B, Berry RJ, Boyle C, Christianson A, Darlison MW, Dolk H, Howson C, Mastroiacovo P, Mossey P, Rankin J. Comment on estimates for congenital anomalies. - Liu et al. Global regional and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *Lancet* 2012;380:1557-8.

Did You Know?

- Since the beginning of fortification, about 1,000 more babies each year are born without a neural tube defect in the United States.
- The annual medical care and surgical costs for people with spina bifida in the U.S. exceed $200 million.
- The total lifetime cost of care for a child born with spina bifida is estimated to be $706,000.

To view the annual report online, visit:
www.cdc.gov/ncbddd/2012AnnualReport

For more information, visit:
www.cdc.gov/FolicAcid

www.cdc.gov/ncbddd/FolicAcid/Global.html