

MONITOR

A Semi-Annual Data and Research Update
Texas Department of Health, Bureau of Epidemiology



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FROM THE DIRECTOR

INTERACTIVE WEB PAGE ALLOWS EASY ACCESS TO TEXAS BIRTH DEFECTS DATA

In partnership with Texas Department of Health's Center for Health Statistics, birth defects data are now available on the Texas Health Data web site. Visitors to the site (<http://soup-fin.tdh.state.tx.us/>) will be able to query data from the Texas Birth Defects Registry.

The Registry uses active surveillance to collect information about infants and fetuses with birth defects, born to women residing in Texas. Data are presented for 49 defect categories, plus a category for "infants and fetuses with any monitored birth defect" beginning with deliveries in 1999, when the Texas Birth Defects Registry became statewide.

Birth defects data are available in 4 modules:

- *statewide
- *by public health region
- *by county
- *by border/nonborder residence (a Texas county that or does not border Mexico)

Using statewide data, tables of birth defect counts and rates can be created by year, maternal age group, maternal race-ethnicity, and infant sex. Additionally, statewide data tables can be restricted to a particular age group, race-ethnic group, and sex.

For public health region, county, and border/nonborder data, tables of birth defects can be produced by year and geographic area.

In all modules, available statistics include counts (cases or frequencies), rates (cases per 10,000 live births) and confidence intervals for the rate (either 95% or 99%). By the end of 2004, 2001 data will be added to the system.

The web site also has a useful glossary linked to risk factor summaries for a number of birth defects.

RESEARCH SYMPOSIUM

Birth defects data were recently highlighted at the Texas Birth Defects Research Symposium on April 9 in San Antonio. The following speakers provided insight into the causes of birth defects:

- ◆ Linking Birth Defects and the Environment, with Preliminary Findings from an Air Pollution Study in Texas (Peter Langlois, Ph.D., TBDMD and Suzanne Gilboa, M.H.S., U.S. Environmental Protection Agency)
- ◆ Neural Tube Defects: Multiple Risk Factors Among the Texas-Mexico Border Population (Lucina Suarez, Ph.D., Texas Department of Health)
- ◆ The Embryonic Consequences of Abnormal Folate Transport and Metabolism; (Rick Finnell, Ph.D., Texas A&M University Institute for Biomedical Research)
- ◆ Selected Contaminants and NTDs: Heavy Metals, Pesticides, and PCBs; (Jean Brender, Ph.D., Texas State University; Marilyn Felkner, Ph.D., Zunera Gilani, M.P.H., Texas Department of Health)

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FROM THE REGISTRY

REPORT TO INCLUDE BIRTH YEARS 1999-2001

The Report of Birth Defects Among 1999-2001 Deliveries (to be released in September 2004) will include combined data on three full years of deliveries for the entire state. Because this data set encompasses more than one million live births, it allows for more statistical power in identifying patterns of birth defects in Texas. The upcoming report will include rates of birth defects stratified by maternal age, sex of infant, maternal race/ethnicity, region of residence, and border/non-border residence. In addition, this report will include an examination of selected birth defects by maternal education (see below).

BIRTH DEFECTS AND MATERNAL EDUCATION

Although the underlying mechanisms are not well understood, many poor health outcomes have been linked with low education. The following charts present selected birth defects by maternal education as reported on birth and fetal death certificates (charts show those defects with statistically significant differences between one or more age groups). No clear pattern emerges for all defect categories; that is, some defects exhibit higher rates among mothers with less than high school education, while others show an opposite pattern.

Note: Mother's education is missing when a birth or fetal death certificate is not found for the case, or when education is missing from the certificate. Birth defects with maternal education information missing for more than 10% of the cases were not included.

Figure 1: Selected Birth Defects by Maternal Education among 1999-2001 Deliveries

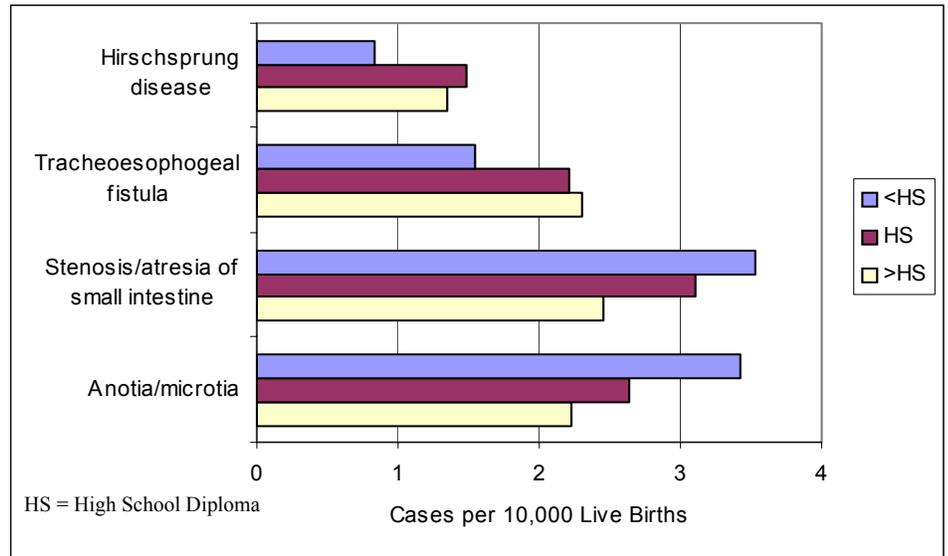


Figure 2: Selected Birth Defects by Maternal Education among 1999-2001 Deliveries

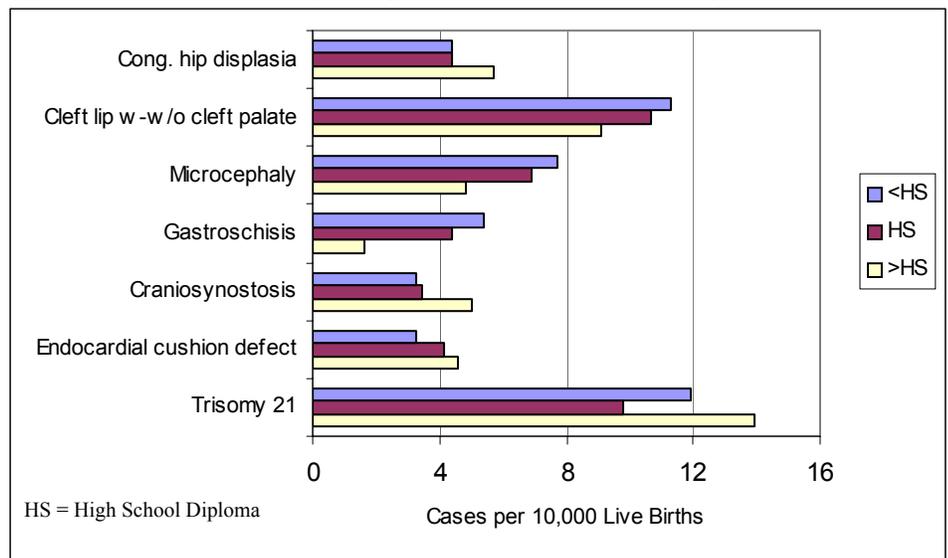
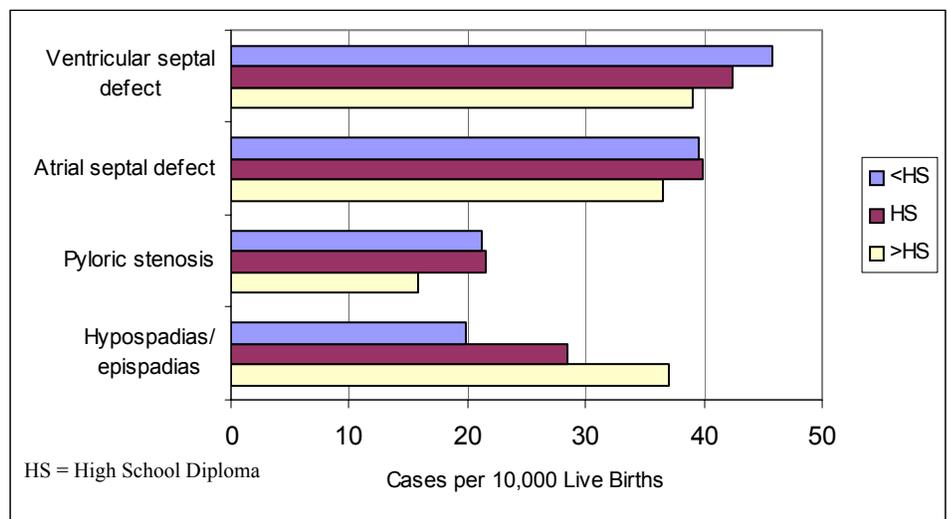


Figure 3: Selected Birth Defects by Maternal Education among 1999-2001 Deliveries



TEEN PREGNANCY AND BIRTH DEFECTS

While many birth defects are strongly associated with advanced maternal age, certain anomalies have been found to be associated with young maternal age. For example, the Texas Birth Defects Registry found significantly higher rates for the birth defects in the table (below) when mother's age was under 20 (compared to one or more older age groups):



Although teen birth rates in Texas have continued to fall over the past five years, the counties in the table (right) had 2002 rates well above the state rate of 28.5 per 1,000 women age 13-17.

Source:

Texas Bureau of Vital Statistics, Texas Department of Health, www.tdh.state.tx.us/chs/vstat/latest/t14b.HTM

Table 1: Births to Mothers Age 13-17, 2002

County	Total Births to mothers Age 13-17	Birth Rate per 1,000 Women
Brooks	323	74.3
Menard	88	68.2
Motley	46	65.2
Culberson	114	61.4
Foard	55	54.5
Cottle	74	54.1
Lipscomb	113	53.1
Zavala	548	52.9
Hudspeth	152	52.6
Terry	513	52.6
Webb	9,143	51.6
Starr	2,697	50.8
Terrell	40	50.0
Hale	1,452	46.8
Potter	4,089	46.7
Zapata	581	46.5
Camp	436	45.9
Wilbarger	573	45.4
Dawson	513	44.8
Sherman	136	44.1

Defect	Description	Rate for Births to Mothers <20 Years (per 10,000 live births)
Pyloric stenosis	A narrowing of the pyloric sphincter at the outlet of the stomach. This causes a blockage of food from the stomach into the small intestine. Usually treated surgically.	23.6 Significantly higher than for all age groups 25 and older, and more than twice the rate compared to births among mothers age 40 and older (10.9).
Stenosis or atresia of the small intestine	A narrowing or incomplete formation of the small intestine obstructing movement of food through the digestive tract.	4.9 Significantly higher than among births to mothers age 20-34. About twice as common among births to mothers under 20 as to those who were 20-24 (2.9) or 25-34 (2.3) at delivery.
Gastroschisis	A congenital opening of the abdominal wall with protrusion of the intestines. This condition is surgically treated.	11.9 Significantly higher among births to younger mothers than for all older age groups. This defect is more than twice as common among births to mothers under 20 than to those 20-24, and as much as 14 times as common than for mother ages 35-39.

ERRATA

Volume 9-2, Page 4, Differences in Defects between Male and Female Infants/Fetuses should read, "Certain defects show markedly different patterns between male and female offspring. While the reason for the differences is obvious in some cases (as with hypospadias among males, or X-linked

chromosomal syndromes for females), others are not so obvious and may help to generate hypotheses about the underlying causes of these defects." In addition, the printed version incorrectly included the following rows under Defects More Prevalent among Females than Males:

Trisomy 21 (Down syndrome) (p=0.0103)	Male	469	12.88	11.72 - 14.05
	Female	376	10.79	9.70 - 11.88

REGISTRY PUBLICATIONS

Langlois P, Driggers D, Phelps A. Applying statistical methods to improve the efficiency of case clues in an active birth defects surveillance system. *J Registry Management* 2004;31:19-26.

SPECIAL REPORT

MATERNAL VALPROIC ACID USE AND METOPIC CRANIOSYNOSTOSIS: The following article was submitted by Jared Willey, who will be a junior at Plano Senior High School in fall 2004. Jared has been doing a summer rotation with Dr. Angela Scheuerle, a clinical geneticist.

Valproic acid is a medication used to treat epilepsy. Valproic acid use during pregnancy has been known to cause some birth defects in infants. The purpose of this investigation was to determine if valproic acid use during pregnancy causes metopic craniosynostosis (premature closure of the metopic cranial suture) in offspring.

Using data from the Texas Birth Defects Registry, a database of children with metopic craniosynostosis was created. Of the 188 cases found, two cases had maternal valproic acid monotherapy (use of only one rather than more than one drug) recorded in the database. This means that about 1% of children born with metopic craniosynostosis had mothers who used valproic acid. One study recorded 1,600 patients with metopic synostosis, 17 of whom had maternal valproic acid exposure. This also represents about 1%.

After examining this information, we looked at the Anti-Epileptic Drug Registry, which presented the information in a different way. They examined 149 patients with valproic acid monotherapy and found 1 with metopic synostosis in the child (0.75%).

Before a conclusion is made about valproic acid and metopic synostosis, several other factors must be considered. With each case, information such as when the fetus was exposed to the drug, the level of exposure, the metabolism of the baby and the mother, and the duration of the exposure, needs to be known. Based on the many variables that are needed for each patient, another full research project, in which every detail of the mother's pregnancy is recorded, would have to be completed in order to determine if valproic acid causes craniosynostosis.

RESEARCH CENTER

NEW PROJECT DIRECTOR

Peter DeForest began as Project Director in February 2004. During the past three years, Peter served as Epidemiology Project Director for the Nueces County Public Health District. During this time, he was awarded two TDH Innovation grants and conducted projects on infectious disease surveillance, vector borne disease, and public health policy improvement. He can be contacted at 512-458-7232, peter.deforest@tdh.state.tx.us.

RECENT PUBLICATIONS

The following studies were funded in part through the Texas Center for Birth Defects Research and Prevention, one of ten such programs in the U.S. funded by the National Center for Birth Defects and Developmental Disabilities:

◆ Brender JD et al. Dietary nitrites and nitrates, nitrosatable drugs, and neural tube defects. *Epidemiology* 2004;15:330-336. Researchers examined a proposed link between nitrosatable drugs and neural tube defects, taking into account dietary nitrite and total nitrite intake in a

case-control study of Mexican American women enrolled in the Texas Neural Tube Defect Study. Women who reported taking drugs classified as nitrosatable (this would include some antihistamines, antibiotics, and beta blockers which have been reported in the literature as being nitrosatable) were nearly three times more likely to have an NTD-affected pregnancy than women without this exposure. However, the effect of nitrosatable drugs was observed only in women with higher intakes of dietary nitrite and total nitrite (dietary nitrite + 5% dietary nitrate). The effect was also stronger in women whose water nitrate levels were higher. For more information on this study, contact Jean Brender, Ph.D., R.N., Texas State University at San Marcos, Department of Health Services Research, 512-245-9267, jb52@txstate.edu.

◆ Johnson KM et al. Prevalence of craniorachischisis in a Texas-Mexico border population. *Birth Def Res Part A* 2004;70:92-4. Craniorachischisis, a severe form of neural tube defect, exhibits both anencephaly and open spina bifida from the cervical to the lumbar region. This study describes the prevalence of craniorachischisis among the Texas-Mexico border population between 1993-1999. Data was collected through an active surveillance system that identified all clinically apparent NTD-affected fetuses and infants born to mothers residing and delivering in any of the 14 Texas-Mexico border counties, including live-born, stillborn, and therapeutic abortions. Sixteen craniorachischisis cases were identified for a total prevalence of 0.51 per 10,000 live births (Mexican American prevalence, 0.52 per 10,000) and a prevalence of 0.28 per 10,000 live births for cases of 20 weeks gestation or greater. The prevalence of craniorachischisis was higher than that reported in Atlanta (0.1 per 10,000

live births), but much lower than that reported in Northern China (10.7 per 10,000 births). For more information on this study, contact Lucina Suarez, Ph.D. Texas Department of Health, Epidemiology Research Service Branch, 512-458-7111, lucina.suarez@tdh.state.tx.us

- ◆ Volcik K et al. Evaluation of the Jumonji gene and risk for spina bifida and congenital heart defects. *Am J Med Genet* 2004;126A(2): 215-7.
- ◆ Volcik K et al. Evaluation of the cited2 Gene and risk for spina bifida and congenital heart defects. *Am J Med Genet* 2003;126A(3):324-5.
- ◆ Zhu H et al. Promoter haplotype combinations for the human PDG-FRA gene are associated with risk of neural tube defects. *Mol Genet Metab* 2004;81:127-32

SYMPOSIUM, CONTINUED FROM PAGE 1

In addition, the following sessions focused on epidemiology and outcomes from TBDMD staff:

- ◆ Texas Patterns and Prevalence of Birth Defects in Texas (Mark Canfield, Ph.D.)
- ◆ Pregnancy Outcomes for Selected Birth Defects in Texas (Mary Ethen, M.P.H.)
- ◆ Update on Orofacial Clefting (Jacqueline Hecht, Ph.D., University of Texas-Houston School of Public Health)
- ◆ Finally, a clinical resident from University of Texas at El Paso presented an unusual case study, Balanced Maternal Chromosomal Translocation (3;22), resulting in partial Trisomy 3 and Monosomy 22 (Sridev Abboy, M.D.)

If you would like to contact any of these speakers about the topics covered, please send an email to amy.case@tdh.state.tx.us or call 512-458-7232.

PREVENTION

INCREASINGLY AVAILABLE HIGHLY FORTIFIED GRAIN PRODUCTS & NTD RATES

Mandatory fortification of cereal grain products by the U.S. Food and Drug Administration has proven to be a successful step in reducing the prevalence of babies born with neural tube defects (NTDs) in the United States. Although there is still much work to be done, recent research shows a significant drop in NTDs that can be chronologically linked with fortification of the food supply with folic acid.¹ Overall, the “estimated number of NTD-affected pregnancies in the United States declined from 4,000 in 1995-1996 to 3,000 in 1999-2000,” a 25% reduction. More specifically, a 23% decline in the birth prevalence of spina bifida and an 11% decline in the birth prevalence of anencephaly were observed from October 1998 through December 1999.² This decline in the prevalence of NTD-affected pregnancies can be significantly attributed to the regulation of folic acid fortification of the food supply.²

The regulation, which went into effect in January 1998, requires that all enriched cereal grains be fortified with 140 micrograms (μg) of folic acid per 100 grams of grain² or approximately 10% of the daily recommended value of folic acid per serving.³ Since 1998, many efforts

have been made to increase public awareness of the crucial role of folic acid in preventing NTDs. Together, the food industry and other public health institutes have worked diligently to introduce easily attainable sources of folic acid to help the public, specifically women of childbearing age, consume the 400 μg of folic acid daily, as recommended by the FDA.³

A stroll down the breakfast aisles of some local grocery stores reveals the concerted effort made by the cereal industry in increasing awareness and availability of folic acid-containing products. A large number of cereal manufacturers have fortified their products with even more than the FDA regulation requires, further ensuring that women of childbearing age can easily consume the needed amounts of folic acid each day. The list of fortified cereals has more than doubled just over the past few years, now totaling over 100 cereals from well-known brands including General Mills, Kellogg's, Malt-O-Meal, Post, and Quaker, that offer products containing at least 50% of the total daily-recommended amount of folic acid. Fifty-four of these cereals contain 100% of the daily requirement, providing the total suggested amount of folic acid in just one serving. Twenty-five of the cereals on this list are Women, Infants and Children (WIC) approved, offering attainable sources of folic acid to lower income women and their children. Local store brands, such as HEB and Randall's, have joined the folic acid campaign, providing over 30 highly fortified cereals at lower prices than name brands.

In addition to the growing list of highly fortified cereals, several nutrition bar manufacturers such as EAS Myoplex, Luna, and Power Bar now provide products containing at least 50% of the daily-recommended dose of folic acid, providing yet another



means of daily consumption. These findings are encouraging and prove that efforts are being made on several fronts to reduce the prevalence of NTDs by incorporating simple, affordable sources of folic acid into the daily diet.

Further, the National Council on Folic Acid (www.folicacidinfo.org) has made it a priority to encourage tortilla manufacturers to increase the amount of folic acid available to consumers through their products.

For more information or a copy of the cereal list containing brands specific to HEB and Randall's grocery store chains, contact Amy Case at the Texas Birth Defects Monitoring Division, 512-458-7232, amy.case@tdh.state.tx.us.

--Contributed by Christine Creecy, Texas A&M Intern, Texas Birth Defects Monitoring Division

References

1. CDC. Spina Bifida and Anencephaly Before and After Folic Acid Mandate --- United States, 1995-1996 and 1999-2000 (May 7). *MMWR*. 2004; 53(17): 362-365.
2. Honein MA, Paulozzi LJ, Mathews TJ, Erickson JD, Wong LYC. Impact of Folic Acid Fortification of the US Food Supply on the Occurrence of Neural Tube Defects. *JAMA*. 2001; 285(23): 2981-2986.
3. Kurtzweil P. How Folate Can Help Prevent Birth Defects. *FDA Consumer*. 1999.

To be added to our mailing list and for other free publications from the Division, please contact us at 512-458-7232 or e-mail bobbie.mankowski@tdh.state.tx.us.

MORE INFORMATION CAN BE FOUND AT WWW.TDH.STATE.TX.US/TBDM/INDEX.HTM.

COUNTY CLERKS PARTICIPATE IN FOLIC ACID EDUCATION EFFORT

Nearly 170,000 marriage licenses each year are issued in Texas to couples with a bride under age 45-and each of those couples must go the their county clerk's office to obtain their license. That is why, in May 2004, the Texas Folic Acid Council mailed 254 packets of folic acid information to county clerks throughout the state. These packets, funded in part by the March of Dimes, included examples of free educational materials from the Centers for Disease Control and Prevention (CDC), order forms for these materials and sticky note and pen "reminders."

Because couples may be more likely to consider their potential for child-bearing when they are preparing to marry, they would at that time (at least temporarily) be considered "contemplators" rather than "precontemplators," making them much more open to a life-style change such as taking folic acid (Transtheoretical Model, Prochaska). Thus, it is hoped that the message about folic acid and the prevention of birth defects will find a more "fertile" ground in this initiative.

As of June 2004, 28 county clerk orders have been placed with the CDC for the materials-a response rate of more than 10%. The Texas Folic Acid Council greatly appreciates the participation of the Texas Department of Health's Bureau of Vital Statistics and each county worker who participates in the campaign.

For more information about the Texas Folic Acid Council, please contact Chan McDermott, Bureau of Women's Health, 512-458-7111 Ext. 6663, email chan.mcdermott@tdh.state.tx.us.

ANNOUNCEMENTS

HHSC CONSOLIDATION

NEW NAME: BIRTH DEFECTS

EPIDEMIOLOGY AND SURVEILLANCE: Pursuant to Texas House Bill 2292, which directed the consolidation of 12 Texas Health and Human Services agencies into four, the Texas Department of Health will be known by it's new name, the Department of State Health Services. The Texas Birth Defects Monitoring Division at that time will also take on a new name: Birth Defects Epidemiology and Surveillance Branch. Working within the Prevention and Preparedness Services Division, our mission and operation will remain essentially unchanged, as will our commitment to the prevention of birth defects.

More information about the HHSC consolidation process can be obtained at www.hhsc.state.tx.us/Consolidation/Consl_home.html or by calling 512-424-6500



Proposed New Logo

NATIONAL GROUP ACKNOWLEDGES TEXAS' LEADERSHIP ROLE

The National Birth Defects Prevention Network (NBDPN), a group of individuals involved in birth defects surveillance, research, and prevention, held its annual meeting in January in Salt Lake City. This year, the group presented Texas with its State Leadership Award. This prestigious award, established in 2001, honors the outstanding contribution (or leadership) by a state birth defects registry in the development or expansion of birth defects surveillance, or its use in the promotion of prevention services. The NBDPN is a vital

group with many opportunities for active participation and collaboration. Membership information can be obtained at www.nbdpn.org, or by contacting Member-at-Large Ruth Merz, hdpdp@crch.hawaii.edu, 808-587-4120.

MARCH OF DIMES ADVOCACY INITIATIVES FOR 2005

TEXAS BIRTH DEFECTS REGISTRY: After a cluster of babies were born with anencephaly in South Texas, the March of Dimes worked to help pass the Texas Birth Defects Act of 1993 which established the Texas Birth Defects Monitoring Division (BDMD) within the Texas Department of Health. The Texas Birth Defects Registry is the cornerstone of the BDMD.

The Texas Birth Defects Registry exists to identify and describe patterns of birth defects in Texas and collaborate with others in finding causes of birth defects, working towards prevention, and linking families with services. In 2002, Trust for America's Health, a Washington, D.C.-based nonprofit organization gave Texas an "A" for its birth defects surveillance system. In 2003, the National Birth Defects Prevention Network presented Texas with the prestigious State Leadership Award, which honors the outstanding contribution and leadership by a state birth defects registry. In addition, Texas receives almost a million dollars in funding each year from the Centers for Disease Control and Prevention to operate the Texas Center for Birth Defects Research and Prevention. Texas is one of only ten states to receive this funding. The March of Dimes continues to advocate for full funding for the Texas

Birth Defects Registry and for related prevention initiatives.

NEWBORN SCREENING: Screening infants at birth for early detection of serious, inherited disorders plays an integral part in helping babies live healthier lives. The March of Dimes recommends that all states screen newborns for a core group of disorders. These disorders have no immediate, visible effects on a baby; however, unless they are detected and treated early, they can cause physical problems, mental retardation and even death. Texas currently screens newborns for six disorders, which falls short of the March of Dimes testing threshold. The March of Dimes supports funding to purchase technology needed to expand newborn screening in Texas.

ACCESS TO HEALTHCARE COVERAGE:

The Children's Health Insurance Program (CHIP) benefits working families whose income is too high to qualify for Medicaid, but not enough to purchase private health insurance for their children. The March of Dimes supports restoration of CHIP funding cut during the 78th Regular Session of the Texas Legislature, specifically cuts affecting newborns. In addition, the March of Dimes recommends restoration of funding for prenatal care for pregnant women on Medicaid, restoring eligibility to 185% of the Federal Poverty Level. Women who receive prenatal care are more likely to have access to services that identify problems early and may help improve the health of mothers and infants.

IMMUNIZATION: Vaccines are one of the most cost effective means to prevent infectious diseases. Historically, the March of Dimes has been involved in vaccine issues, beginning with the founding mission to prevent polio. The March of Dimes supports efforts to increase immunization coverage

so that children are protected from preventable diseases and opposes exemptions from immunizations, except in the case of a conflict in religious beliefs or due to a medical condition.

SMOKING CESSATION: Women who smoke during pregnancy are twice as likely as nonsmokers to give birth to a low birthweight baby. Women under the age of 20 are almost twice as likely to smoke during pregnancy than those over age 25. The March of Dimes supports efforts to educate women on the dangers of smoking during pregnancy, including the risk of premature birth.

For more information, contact Jorey Berry, Texas Chapter of the March of Dimes, 512-477-3221, JBerry@marchofdimes.com.

MARCH OF DIMES LICENSE PLATES AVAILABLE

On June 22, 2003, Governor Perry signed House Bill 2971 into law. Among other things, the legislation allowed for the production of March of Dimes specialty license plates. The license plates will cost an additional \$30 above a normal renewal or purchase price, of which \$8 will go towards administrative costs and \$22 will support the Texas Birth Defects Registry. Support of the Texas Birth Defects Registry is a March of Dimes public affairs priority. The design can be seen at the Texas Department of Transportation's web site at www.txdot.state.tx.us/vtr/spplates/allplates.htm.



CALENDAR

2004

JULY 26-28: National Center on Birth Defects and Developmental Disabilities Conference, Washington, D.C. www.cdc.gov/ncbddd/conference.htm Contact: bddi@cdc.gov.

SEPTEMBER 9: National Fetal Alcohol Spectrum Disorders Day.

SEPTEMBER 23-25: Texas AWHONN Annual Meeting & Conference, San Antonio, Texas Contact: Sylvia_Ellington@srhc.iwhs.org

OCTOBER: National Down Syndrome Awareness Month; National Spina Bifida Awareness Month

SEPTEMBER 24-25: Biennial Scientific Symposium on Children's Health as Impacted by Environmental Contaminants, Austin. Contact: Sarah Jones, sarah.jones@cehi.org, 512-657-7405.

2005

JANUARY 24-26: National Birth Defects Prevention Network Annual Meeting, Phoenix, AZ. Contact: Cara Mai, 404-498-3918, cwm7@cdc.gov.

FEBRUARY 13-17: Healthcare Information and Management Systems Society Annual Conference & Exhibition Dallas. Contact: Melvina Ivy, 312-915-9221, mivy@himss.org

APRIL 8-9: Texas Association of Obstetricians and Gynecologists, Austin. Contact: Karen O'Briant, 866-935-1959.

The *Monitor* is published twice a year by the Texas Birth Defects Monitoring Division, Texas Department of Health.

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