MISSISSIPPI STATE DEPARTMENT OF HEALTH

Birth Defects Surveillance Report 2000 – 2007

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EXECUTIVE SUMMARY

This is the second population-based statewide report produced by the Mississippi Birth Defects Surveillance Registry (MBDSR) since 2003. Its purpose is to inform providers about birth defects in Mississippi. This report details the prevalence of major birth defects of children reported to the registry from 2000 through 2007 and is an extension of the 2003 report that described birth defects for the year 2000.

This report contains birth defects by category and by cases. The birth defect diagnoses comprise a list of birth defects compiled by the National Birth Defects Prevention Network (NBDPN) and the Centers for Disease Control and Prevention (CDC).

The overall 2000-2007 rate of birth defects in Mississippi is 2.16 birth defects per 100 live births. In Mississippi and across the nation, male infants and infants born to older mothers are associated with higher rates of birth defects. All of the efforts of the Birth Defects Surveillance Registry and its collaborations with the Genetics Advisory Committee, National Birth Defects Prevention Network and the Centers for Disease Control and Prevention focus on effective prevention that will ultimately diminish the burden of birth defects in Mississippi.

INTRODUCTION

The Mississippi State Department of Health (MSDH) developed this report to help health care providers and families learn more about birth defects in Mississippi. This report contains information on the state's children with birth defects for the years 2000-2007 and describes certain defects and groups of defects. This information can help maternal and child health workers determine interventions to improve health outcomes.

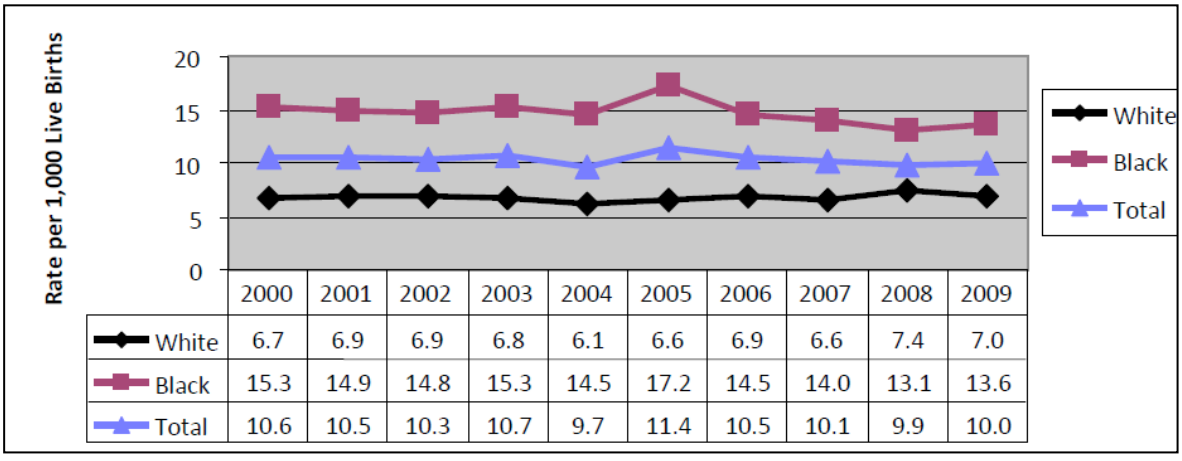
WHAT ARE BIRTH DEFECTS?

Birth defects are an abnormality of structure, function, or metabolism, whether genetically caused or a result of outside factors during a child's developmental or fetal life. A birth defect may not become evident until later in the child's life. While the significant impact of birth defects is well recognized, the underlying causes of individual birth defects are largely unknown. Many questions remain unanswered with regard to the causes of birth defects.

INFANT MORTALITY TREND

The infant mortality rate for Mississippi has remained relatively unchanged from 2000 to 2009 (Figure 1). Over the past ten years, the rate of Mississippi infants dying in the first year of life ranged from a low of 9.7 deaths per 1,000 live births in 2004 to a high of 11.4 in 2005. During 2000-2009, the average infant mortality rate was 10.4 infant deaths per 1,000 live births. The 10-year average infant mortality rate was 6.8 for whites and 14.7 for blacks, with a difference of 7.9 deaths per 1,000 live births.

Figure 1: Infant Mortality Rate, Mississippi, 2000-2009



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
White	6.7	6.9	6.9	6.8	6.1	6.6	6.9	6.6	7.4	7.0
Black	15.3	14.9	14.8	15.3	14.5	17.2	14.5	14.0	13.1	13.6
Total	10.6	10.5	10.3	10.7	9.7	11.4	10.5	10.1	9.9	10.0

2010 Mississippi Infant Mortality Report. Wesley, Graham, Johnson, & Zhang, 2010

MISSISSIPPI BIRTH DEFECTS SURVEILLANCE REGISTRY

Section 41-21-205 of the Mississippi Code of 1972 established a birth defects surveillance registry in the Mississippi State Department of Health (MSDH). The law authorizes the MSDH to adopt rules to govern the operation of the registry. The MSDH specifies the type of information provided to the birth defects registry and the persons and entities that are required to provide information to the Registry. All hospitals, clinics, and other healthcare facilities personnel that serve patients from birth to 21 years of age should report birth defects to the Registry.

According to the Centers for Disease Control and Prevention (CDC), birth defects are the leading cause of infant mortality in the United States and account for more than 20% of all infant deaths. The causes for many birth defects are uncertain; however, environmental factors, medications, diet, and personal behaviors have been identified as possible contributors to birth defects. While much remains unknown concerning the causes of birth defects, there is a growing amount of information regarding the measures that can be used to prevent them.

The goals of the Mississippi Birth Defects Surveillance Registry (Registry) are:

- to regularly and systematically monitor children with birth defects for changes in incidence or other unusual patterns suggesting preventable causes
- to increase reporting to the registry while ensuring long term follow up and delivery of service

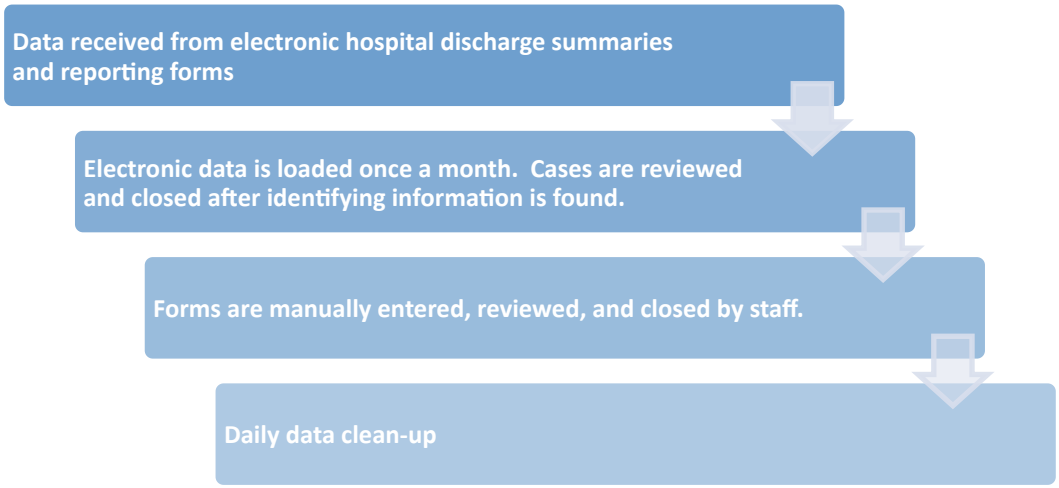
The Registry focuses primarily on live births and stillbirths within the state. Data contained in this registry are confidential. Reporting sources are not liable for providing required information to the Registry.

CRITERIA FOR CASES

The MSDH monitors all birth defects reported to the Registry on children born on or after January 1, 2000. The fetus/infant must have a reportable structural defect, newborn screening disorder, functional or metabolic disorder, genetically determined, or a defect resulting from an environmental influence during embryonic or fetal life. For the year 2007, the Mississippi Census Bureau estimated the state population to be 2,918,785 and Vital Statistics reported there were 46,455 live births.

Birth defects are reported on children and adolescents from birth through age 21 and on fetuses of at least 20 weeks gestation and above 350 grams. Birth defects are captured by ICD-9 codes (See Appendix A) obtained through discharge summaries from hospitals. MSDH registries such as the Newborn Screening Registry, Vital Records Birth and Death Registries, Newborn Hearing Registry, and providers report to the Birth Defects Registry. A manual reporting form is also available for reporting birth defects (see Appendix B and C).

MISSISSIPPI BIRTH DEFECTS SURVEILLANCE REGISTRY FLOW CHART



MISSISSIPPI BIRTH DEFECTS (2000-2007)

Among the 347,821 live births in Mississippi from 2000 to 2007, there were a total of 7,520 birth defect cases reported (Table 1). Some children were reported to have more than one major birth defect; therefore, the total number of children with birth defects was 6,086 (Table 1). Since birth defects are not always identified at birth, the data collected for this report include defects of children from birth to seven years old. Approximately 83% of the children had at least one major birth defect; 13% had two birth defects, while 4% had three or more types of birth defects as summarized in Table 1.

Table 1: Major Birth Defects Cases Reported by Number of Children in Mississippi, 2000-2007

Number of Children	Number of Birth Defects	Number of Cases	Percent
5,040	1	5,040	82.81
785	2	1,570	12.90
175	3	525	2.88
61	4	244	1.00
15	5	75	0.25
5	6	30	0.08
4	7	28	0.07
1	8	8	0.02
Total: 6,086		Total:7,520	100.00

BIRTH DEFECTS DATA SUMMARIZED BY CASES

The 2000-2007 report includes 6,086 children with 7,520 birth defects. Some children had multiple cases; therefore, the total number of defects reported is more than the total number of children with birth defects. There were 347,821 live births in Mississippi during 2000-2007; of that total, 7,520 were major birth defects cases (see Table 2).

Table 2: Data Summarized by Birth Defects Cases and Race/Ethnicity, Mississippi, 2000-2007

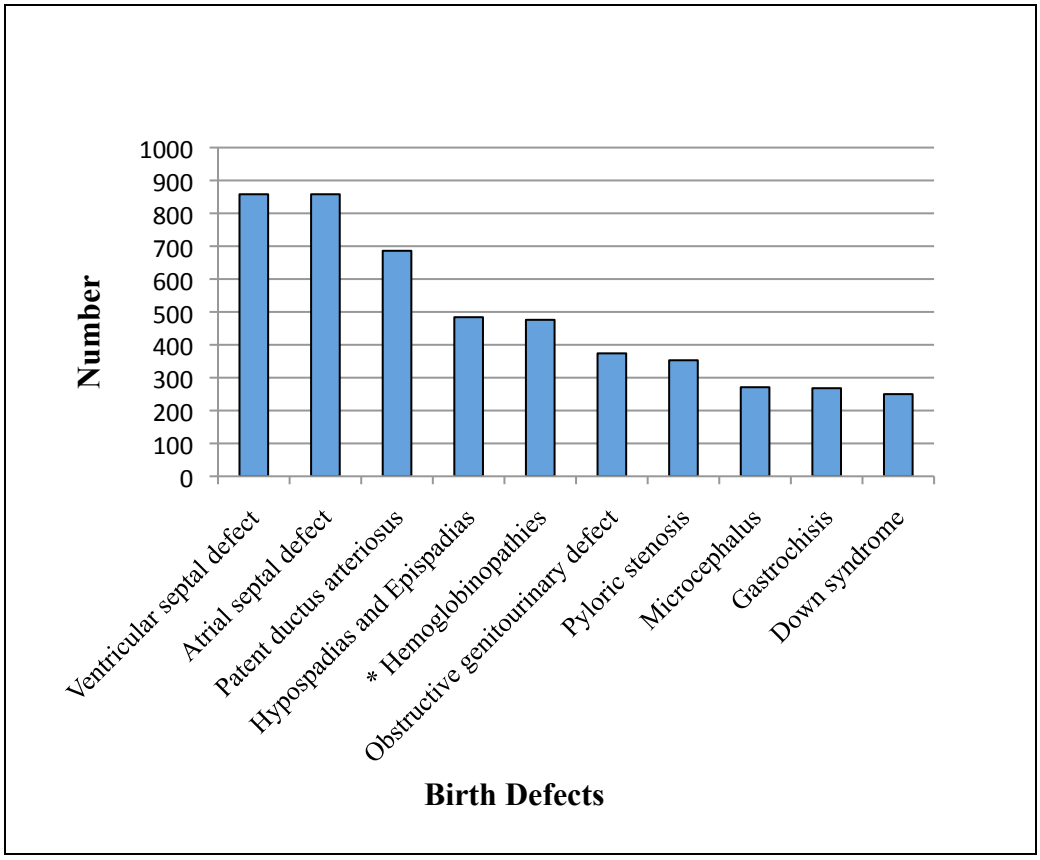
Birth Defects	White	Black	Hispanic	Asian	American Indian	Other	Grand Total
Anencephalus	12	7				1	20
Aniridia	3	1					4
Anophthalmia/Microphthalmia	14	12	1				27
Anotia/Microtia	6	8	1		3	1	19
Aortic Valve Stenosis	11	3					14
Atrial Septal Defect	323	503	8	6	11	7	858
Biliary Atresia	7	13					20
Bladder Exstrophy	3	2					5
Choanal Atresia	9	6			1		16
Cleft Lip with and without Cleft Palate	123	98	1	3	5	3	233
Cleft Palate without Cleft Lip	83	48	2		4	2	139
Coarctation of Aorta	50	39	1		1	3	94
Common Truncus	12	9					21
Congenital Cataract	15	13		2			30
Congenital Hip Dislocation	64	35	2	5	1	2	109
Diaphragmatic Hernia	24	46	3		1	3	77
Down Syndrome	137	100	1	4	3	5	250
Ebstein's Anomaly	6	8					14
Encephalocele	12	13					25
Endocardial Cushion Defect	23	41		2		1	67
Endocrine Disorders	111	84	4	5	1	5	210
Esophageal Atresia/Tracheoesophageal Fistula	27	27				2	56
Fatty Acid Oxidation Disorders	11	9					20
Fetus or Newborn Affected by Maternal Alcohol Use	6	6			2		14
Gastrochisis	95	166	1	1	1	4	268
Hirshsprung's Disease (Congenital Megacolon)	31	40			1	1	73
Hydrocephalus without Spina Bifida	81	125	6	1	3	4	220
Hypoplastic Left Heart Syndrome	30	30	1	1	1	4	67
Hypospadias and Epispadias	250	223	1		4	6	484
Metabolic	76	47				1	124
Metabolic, Organic Acid or Amino Acid	51	50					101
Microcephalus	73	185	3	2	4	4	271
Obstructive Genitourinary Defect	198	166	1	1	2	6	374
Patent Ductus Arteriosus	294	368	7	4	7	6	686
Pulmonary Valve Atresia and Stenosis	66	102		2	1	1	172
Pyloric Stenosis	264	80	5		1	3	353
Rectal and Large Intestinal Atresia/Stenosis	35	40		1	1	1	78
Reduction Deformity, Lower Limbs	10	17				1	28

Birth Defects	White	Black	Hispanic	Asian	American Indian	Other	Grand Total
Reduction Deformity, Upper Limbs	21	22			2	2	47
Renal Agenesis/Hypoplasia	45	42			1	2	90
*Hemoglobinopathies	11	463				2	476
Spina Bifida Without Anencephalus	60	39	3	1	2	1	106
Tetralogy of Fallot	51	49	1			2	103
Transposition of Great Arteries	59	52			1	3	115
Tricuspid Valve Atresia and Stenosis	8	17		1			26
Trisomy 13	6	14				1	21
Trisomy 18	13	24					37
Ventricular Septal Defect	421	401	7	9	10	10	858
Grand Total	3,341	3,893	60	51	75	100	7,520
Total Live Birth	179,430	154,426	8,240	3,422	2,290	13	347,821
Percent of Birth Defects (%)	1.86	2.52	0.73	1.49	3.30		2.16

THE 10 MOST COMMON BIRTH DEFECTS

In Mississippi, the most frequently occurring defects were ventricular septal defect, atrial septal defect, patent ductus arteriosus, hypospadias and epispadias, hemoglobinopathies, obstructive genitourinary defect, pyloric stenosis, microcephalus, gastrochisis, and Down Syndrome as summarized in Figure 2. The leading 10 Birth Defects account for approximately 65% of the cases among all major birth defects.

Figure 2: Ten Most Common Birth Defects in Mississippi, 2000-2007



*Hemoglobinopathies are not required to be reported as a birth defect to the National Birth Defects Prevention Network. Due to the large number of hemoglobinopathies identified by newborn screening in Mississippi, these diseases are reported to the Mississippi Birth Defects Surveillance Registry.

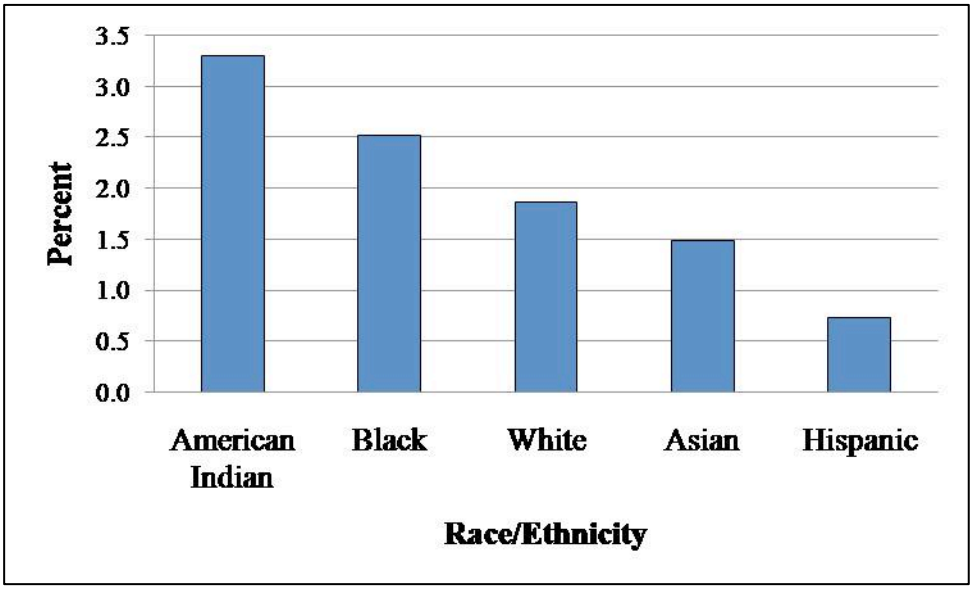
Table 3: Birth Defects Rate and 95% confidence interval (CI) by Race/Ethnicity in Mississippi, 2000-2007

Race/ Ethnicity	Cases	Number of Live Birth	Percentage (%)	95% CI
American Indians	75	2,290	3.30	2.58 - 4.11
Blacks	3,893	154,426	2.52	2.44 – 2.64
Whites	3,341	179,430	1.86	1.80 – 1.93
Asians	51	3,422	1.49	1.11 – 1.96
Hispanics	60	8,240	0.73	0.56 – 0.94

*Confidence Interval

American Indians had the highest birth defects percentage (3.3%) and the lowest number of live births, Blacks had 2.52%, Whites had 1.86%, Asians had 1.49%, and Hispanics had 0.73% as summarized in Table 3 and Figure 3. (For detailed Confidence Interval calculation, see Appendix D).

Figure 3: Birth Defects Cases by Race/Ethnicity in Mississippi, 2000-2007



The major birth defects percent among Mississippi males was statistically significantly higher than among females (2.38% versus 1.93%).

Figure 4: Birth Defects by Gender in Mississippi, 2000-2007

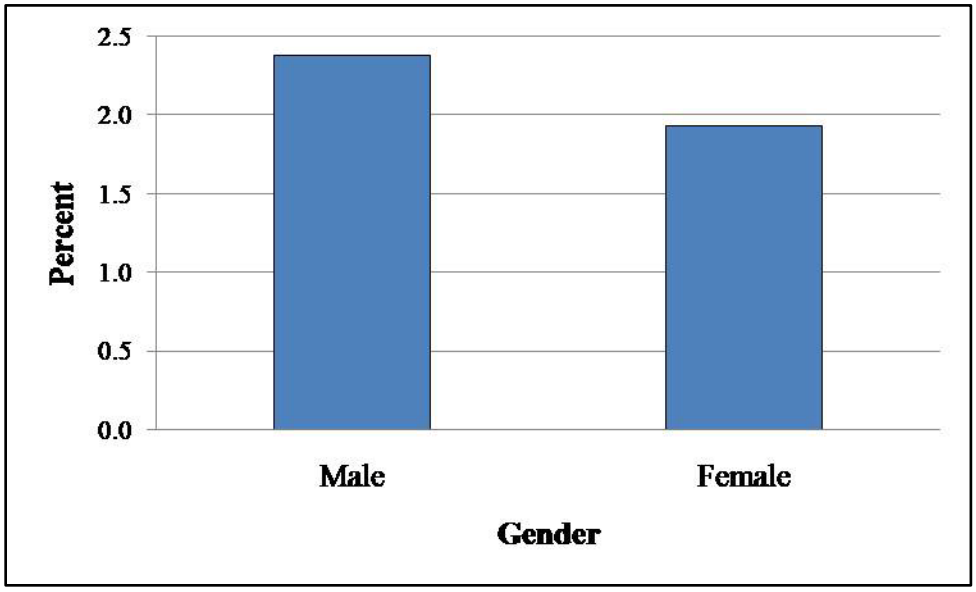
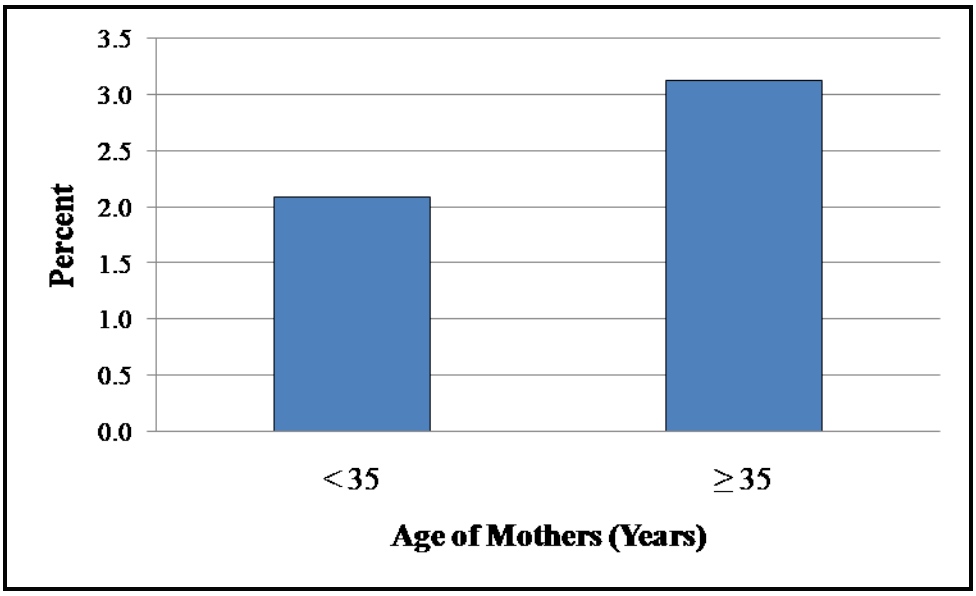


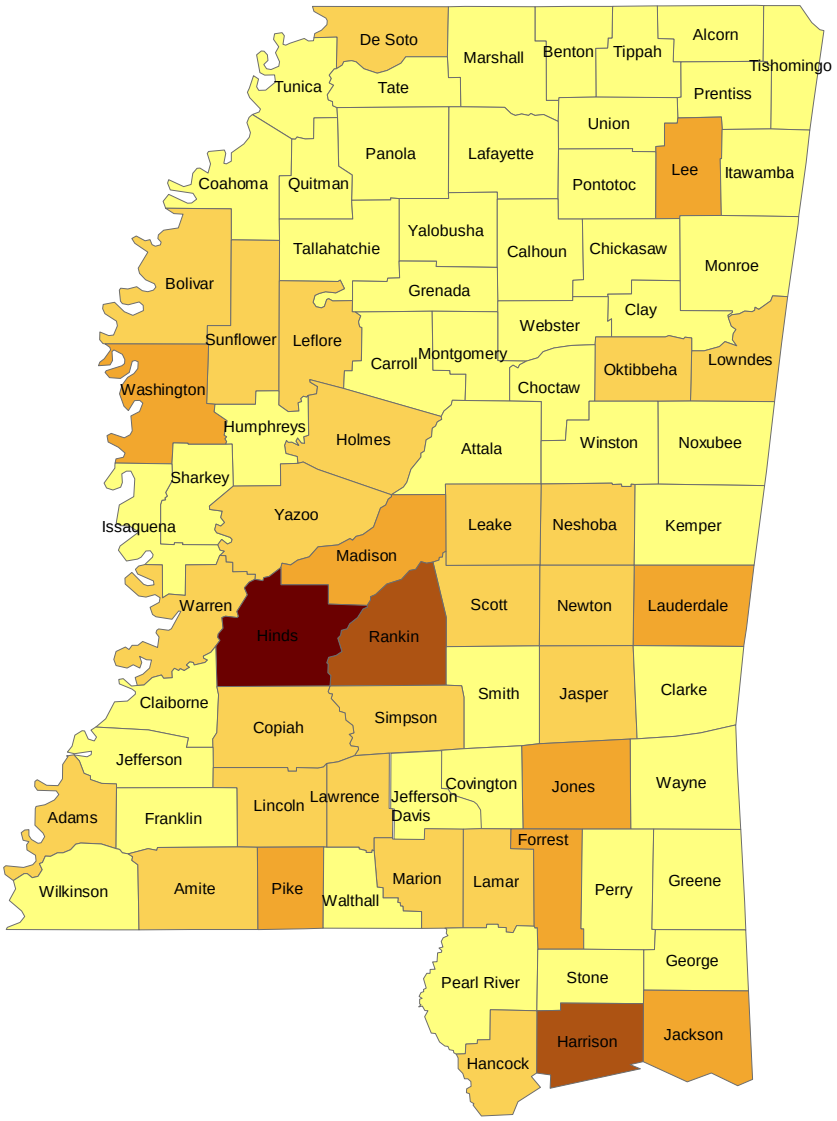
Figure 5: Birth Defects by Age of Mother in Mississippi, 2000-2007



*Confidence Interval

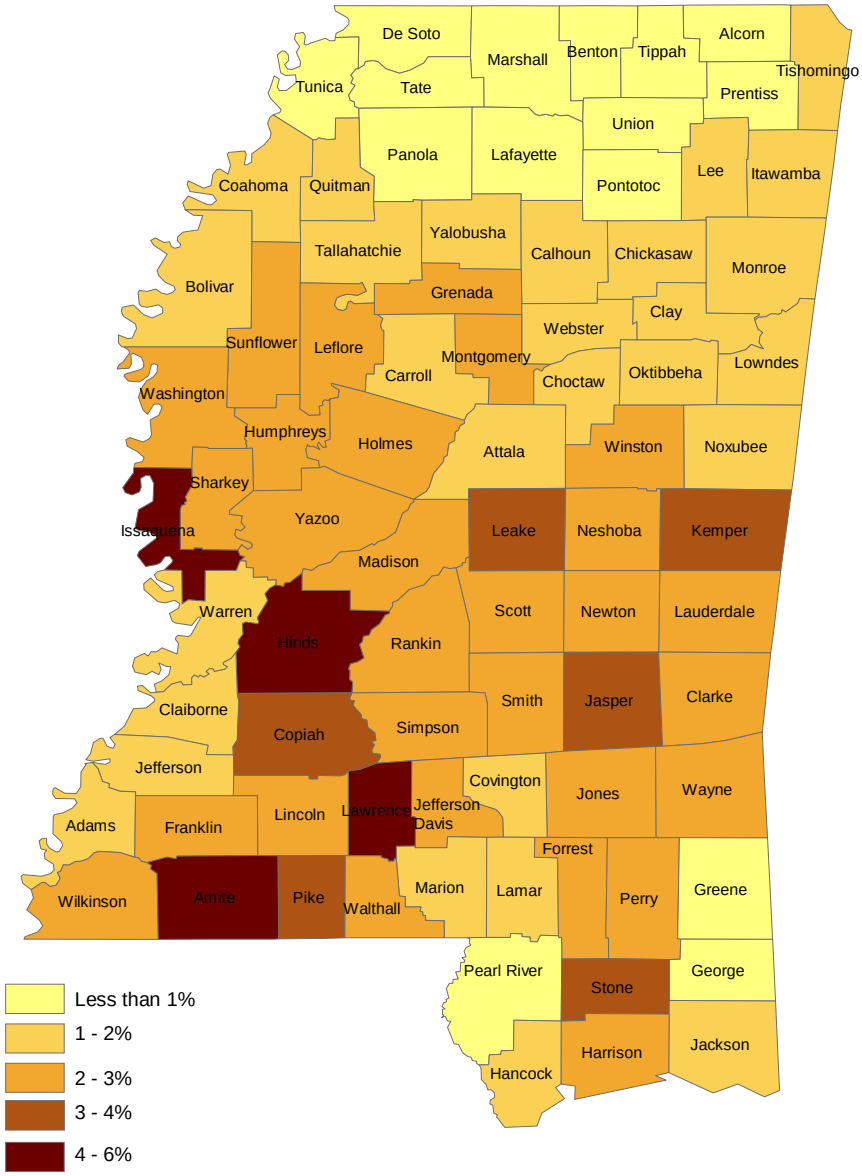
Mothers who were 35 years or older had a statistically significantly higher risk of birth defects than those who were less than 35 years old (3.12% versus 2.09%) in Mississippi, 2000-2007 (Figure 5; For detailed Confidence Interval calculation, see Appendix E).

Figure 6: Birth Defect Cases Summarized by Number and County of Residence in Mississippi, 2000-2007



This map indicates the number of birth defect cases by county of maternal residence. Hinds County has the largest population in the state.

Figure 7: Birth Defects Percentage by County of Residence in Mississippi, 2000-2007



This map indicates the percentage (per 100 live births) of birth defect cases by county of residence. Hinds County had the highest rate of birth defect cases followed by Lawrence, Amite, and Issaquena counties.

APPENDIX

APPENDIX A - BIRTH DEFECTS INCLUDED IN THE CASE DEFINITION

Birth Defects Included in the Case Definition of the National Birth Defects Prevention Network

Birth Defects	*ICD-9-CM Codes*	*CDC/BPA Codes*
Central Nervous System		
Anencephalus	740.0 – 740.1	740.00 – 740.10
Spina bifida without anencephalus	741.0, 741.9 w/o 740.0 - 740.10	741.00 – 741.99 w/o 740.0 – 740.10
Hydrocephalus without Spina Bifida	742.3 w/o 741.0, 741.9	742.30 – 742.39 w/o 741.00 – 741.99
Encephalocele	742.0	742.00 – 742.09
Microcephalus	742.1	742.10
Eye		
Anophthalmia/microphthalmia	743.0, 743.1	743.00 – 743.10
Congenital cataract	743.30 – 743.34	743.32 – 743.326
Aniridia	743.45	743.42
Ear		
Anotia/microtia	744.01, 744.23	744.01, 744.21
Cardiovascular		
Common truncus	745.0	745.00 – 745.01
Transposition of great arteries	745.10, .11, .12, .19	745.10 – 745.19
Tetralogy of Fallot	745.2	745.20 – 745.21, 746.84
Ventricular septal defect	745.4	745.40 – 745.490 **(exclude 745.498)**
Atrial septal defect	745.5	745.51 – 745.59 **(exclude 745.50)**
Endocardial cushion defect	745.60, .61, .69	745.60 – 745.69
Pulmonary valve atresia and stenosis	746.01, 746.02	746.00 – 746.01
Tricuspid valve atresia and stenosis	746.1	746.10 **(exclude 746.105)**
Ebstein's anomaly	746.2	746.20
Aortic valve stenosis	746.3	746.30

Hypoplastic left heart syndrome	746.7	746.70
Patent ductus arteriosus	747.0	747.00
Coarctation of aorta	747.10	747.10 – 747.19
Orofacial		
Cleft palate without cleft lip	749.0	749.00 – 749.09
Cleft lip with and without cleft palate	749.1, 749.2	749.10 – 749.29
Choanal atresia	748.0	748.0
Gastrointestinal		
Esophageal atresia/tracheoesophageal fistula	750.3	750.30 – 750.35
Rectal and large intestinal atresia/stenosis	751.2	751.20 – 751.24
Pyloric stenosis	750.5	750.51
Hirshsprung's disease (congenital megacolon)	751.3	751.30 – 751.34
Biliary atresia	751.61	751.65
Genitourinary		
Renal agenesis/hypoplasia	753.0	753.00 – 753.01
Bladder exstrophy	753.5	753.50
Obstructive genitourinary defect	753.2, 753.6	753.20-29 – 753.60-69
Hypospadias and Epispadias	752.61, 752.62	752.600 – 752.627 (excluding 752.621)
Musculoskeletal		
Reduction deformity, upper limbs	755.20 – 755.29	755.20 – 755.29
Reduction deformity, lower limbs	755.30 – 755.39	755.30 – 755.39
Gastroschisis	756.79	756.71
Omphalocele	756.79	756.70
Congenital hip dislocation	754.30, .31, .35	754.30
Diaphragmatic hernia	756.6	756.610 – 756.617
Chromosomal		
Trisomy 13	758.1	758.10 – 758.19
Down syndrome	758.0	758.00 – 758.09

Trisomy 18	758.2	758.20 – 758.290
Other		
Fetus or newborn affected by maternal alcohol use	760.71	760.71
Amniotic bands	No code	658.80

APPENDIX B – REPORTING FORM

Mississippi State Department of Health

Birth Defects Registry Reporting Form
Genetics Services
Post Office Box 1700
Jackson, MS 39215-1700
Phone: 601-576-7619

The physician must report every birth defect case the first time the patient is seen, for individuals born on or after January 1, 2000. A reporting form is required when reporting a suspected or diagnosed birth defect. If the patient is seen for another birth defect on another occasion, that defect shall also be reported.

1. Patient's Information

Patient's name: _____ (Last) _____ (First) _____ (MI) _____ (Suffix) _____/_____/_____ (Date of Birth)

Sex: ___ Male ___ Female **Race:** ___ American Indian ___ Asian ___ Black ___ Hispanic ___ White ___ Other _____ (Specify)

Admission date: _____ **Discharge date:** _____ **Medical Record #:** _____

Mississippi Resident at Birth: _____ Yes _____ No

2. Birth Information (If Known)

Delivery status: ___ Fetal Death ____ Induced Term ____ Live Birth ____ Stillborn

Birth Multiplicity: ___ Single ___ Twin ___ More than two **Birth Weight** _____ (Grams)

Birth Facility: _____

Current Medical Provider: _____

3. Birth Mother (or Other Responsible Party if Mother Unknown)

Name: _____ (First) _____ (Middle) _____ (Last) _____ (Relationship to patient)

Address: _____

City, State, Zip: _____ **County:** _____

Date of Birth: _____/_____/_____

Caregiver Name: (If different from above) _____ (First) _____ (Middle) _____ (Last)

4. Diagnosis (ICD 9/ICD 10 and brief description)

5. Contact Information

Hospital: _____

Reporting Physician: _____

Date reported: _____

Submitter's name: _____

Submitter's phone #: _____

Hospital staff to contact if additional information is needed

Additional information

6. Death Information (If applicable)

Death Date: _____/_____/_____

MSDH Genetics Services use only

Received date: ____/____/____
Entered into BDRS: ____/____/____
By: _____
District: _____

Confidential Information

Mississippi State Department of Health Revised 09-07-07 Form 272

APPENDIX C – REPORTING FORM INSTRUCTIONS

BIRTH DEFECTS REGISTRY REPORTING FORM
FORM No. 272

PURPOSE

This form is designed for documentation and reporting of all infants and children with birth defects from birth to 21 years of age to the State's Birth Defects Registry.

INSTRUCTIONS

1. Patient's Information

Last - Enter last name at birth, along with new last name (if name has changed since birth).

First - Enter first name (if known).

Middle - Enter middle name (if known).

Suffix - Enter suffix (if known).

Date of Birth - Enter infant's date of birth.

Sex - Check Male or Female.

Race - Check race.

Admission Date - Enter month, day and year of hospital admission.

Discharge date - Enter month, day and year infant was discharged from hospital.

Medical Record - Enter number assigned to the record by the facility to track medical records.

Mississippi Resident Birth - Check whether infant's mother was a Mississippi resident at birth.

2. Birth Information (If Known)

Delivery Status - Check fetal delivery status.

Birth Multiplicity - Check if a single birth, a twin or more than two.

Birth Weight - Enter infant's weight at birth in grams.

Birth Facility - Enter name of hospital where infant was born.

Current Medical Provider - Enter name of pediatrician or primary care provider.

3. Birth Mother (or Other Responsible Party if Mother Unknown)

Name - Enter first name, middle name and last name.

Relationship to Patient - Enter relationship to infant.

Address - Enter address (street name and house or apartment number, or P.O. Box)

City/State/Zip - Enter city, state and zip code.

County - Enter county where mother lives.

Mother's Date of Birth - Enter month, day and year of mother's birth.

Caregiver Name - Enter name of caregiver if different from birth mother.

4. Diagnosis

Enter ICD 9/ICD 10 code that corresponds to the condition and a brief description of diagnosis/defect.

5. Contact Information

Hospital - Enter name of hospital submitting the report.

Reporting Physician - Enter name of the physician reporting birth defect.

Date reported - Enter date of report.

Submitted by Name/Phone - Enter name of person submitting report and complete telephone number.

6. Death Information

Date - Enter date of death (if applicable).

OFFICE MECHANICS AND FILING

The completed forms are sent to:

Genetics Services/ Mississippi Birth Defects Surveillance Registry (MBDSR)
Mississippi State Department of Health
P.O. Box 1700
Jackson, MS 39215-1700

The information is entered into the Birth Defects Surveillance Registry (BDSR) database.
The form is shredded after data is entered.

APPENDIX D – CONFIDENCE INTERVALS (RACE/ ETHNICITY)

For a prevalence based on a large number of cases (arbitrarily defined here as 30 cases or more), the formulae below are approximations for calculating 95% confidence intervals using the normal distribution (Rothman and Boice, 1982, p. 29, formula 19).

Race/ Ethnicity	Cases	Number of Live Births	Percentage (%)	95% CI
American Indian	75	2,290	3.30	2.58 - 4.11
Black	3,893	154,426	2.52	2.44 – 2.64
White	3,341	179,430	1.86	1.80 – 1.93
Asian	51	3,422	1.49	1.11 – 1.96
Hispanic	60	8,240	0.73	0.56 – 0.94

Let C = number of cases, B = number of live births

1). Calculate the lower confidence limit using the following:

$$\text{Lower 95\% CL for prevalence} = C \times \left(1 - \frac{1}{9C} - \frac{1.96}{3}\sqrt{\frac{1}{C}}\right)^3 / B$$

2). Calculate the upper confidence limit using the following

$$\text{Upper 95\% CL for prevalence} = (C+1) \times \left(1 - \frac{1}{9(C+1)} + \frac{1.96}{3}\sqrt{\frac{1}{C+1}}\right)^3 / B$$

APPENDIX E – CONFIDENCE INTERVALS (GENDER AND MOTHER'S AGE)

When both prevalence values are based on 30 or more events, then the approach is based on calculating the confidence interval for the difference between the two prevalence values. If this interval includes 0.00, then the difference in the values is not considered to be statistically significant. The approach uses the standard error for the difference between the two prevalence values (Rothman, 1986, p. 170, formulae 11-15).

Let RD = higher prevalence – lower prevalence

C_1 = Number of cases used to calculate the first prevalence

C_2 = Number of cases used to calculate the second prevalence

B_1 = Number of live births used to calculate the first prevalence

B_2 = Number of cases used to calculate the second prevalence

Calculate the lower confidence limit using the following:

$$\text{Lower 95\% CL for prevalence difference} = RD - \left(1.96\sqrt{\frac{C_1}{B_1^{\,2}} + \frac{C_2}{B_2^{\,2}}}\right)$$

Calculate the lower confidence limit using the following:

$$\text{Upper 95\% CL for prevalence difference} = RD + \left(1.96\sqrt{\frac{C_1}{B_1^{\,2}} + \frac{C_2}{B_2^{\,2}}}\right)$$

1). Using the above formula to test if male children have a statistically significant higher rate of major birth defects than female children, we found that the difference between the two prevalence values (2.38% versus 1.93%) is statistically significant.

Gender	Cases	Live Births	Prevalence (%)
Male	4,233	177,960	2.38
Female	3,286	169,861	1.93

2). Using the above formula to test if mothers who were 35 years or older had statistically significant higher risk than those who were less than 35 years old (3.12% versus 2.09%), we found that the difference between the two prevalence values is statistically significant.

Age of Mother (years)	Cases	Live Births	Prevalence (%)
<35	6,705	321,014	2.09
>=35	806	25,864	3.12

3). In the top 10 birth defects, using the above formula to test if mothers who were 35 years or older had statistically significant higher risk than those who were less than 35 years old (1.87% versus 1.37%), we found that the difference between the two prevalence values is statistically significant.

Age of Mother (years)	Top 10 Cases	Live Births	Prevalence (%)
<35	4,395	321,014	1.37
>=35	483	25,864	1.87

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APPENDIX G – IMPORTANT INFORMATION FOR PROVIDERS

Preventing Birth Defects

Folic Acid

A Guide for Pediatric Health Practitioners and Educators

The U.S. Public Health Service recommends that all women who are capable of becoming pregnant consume folic acid every day to reduce their risk for having a pregnancy affected with spina bifida, anencephaly, or other neural tube defects (NTDs).

Taken periconceptionally, folic acid, a B vitamin, can prevent 50%-70% of NTDs. Folic acid also decreases blood homocysteine levels and may reduce the risk for cardiovascular disease and some cancers.

Did you know?

- **Only 10%-15% of women know that they need folic acid before and in the first weeks of pregnancy.**
- **Women report that they are more likely to consume folic acid if encouraged by their health care provider.**

Timing and Dosage

- **Every day!** NTDs occur approximately 3-4 weeks after conception, before most women realize they are pregnant.
- **Regardless of pregnancy intention:** About half of pregnancies are unplanned.
- **400 mcg (0.40 mg) of folic acid every day** for all women who are capable of becoming pregnant.
- **To prevent recurrence:** 4,000 mcg (4.0 mg) of folic acid. Women who have had a previous NTD-affected pregnancy should plan their pregnancies so they can get a prescription for 4,000 mcg every day before becoming pregnant.

Opportunities and Strategies For Your Practice:

The folic acid message is simple and effective and can take less than a minute: "Folic acid is a B vitamin that prevents certain birth defects and may reduce your risk for heart disease and certain cancers. Make sure you get enough folic acid every day through a multivitamin or folic acid pill and eat a healthy diet. Do you have any questions?"

Talk to patients during visits such as:

- Mothers at newborn and well-child exams
- Breastfeeding discussions
- Gynecologic and athletic exams for adolescent females
- New Patient interviews

For more information: Contact your local March of Dimes, Spina Bifida Association, Healthy Mothers, Healthy Babies chapters, or CDC at:

www.cdc.gov/ncbddd/folicacid
Flo@cdc.gov
1-800-232-4636 (CDC-INFO)

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APPENDIX H – WEBSITES FOR PROVIDERS

American Academy of Pediatrics
This organization is comprised of pediatricians committed to the health of infants, children, adolescents, and young adults. The website contains general information about children's health as well more specific information about guidelines, policies, and publications. This organization also host a website specifically for parents called HealthyChildren.org.
http://www.aap.org/

American College of Obstetrics and Gynecology
This organization is comprised of physicians committed to providing health care for women. Their website provides general information about women's health issues during pregnancy including educational pamphlets about birth defects.
http://www.acog.org/

American Pregnancy Association
The American Pregnancy Association is a national health organization focused on health during pregnancy through education, research, advocacy, and community awareness. The website also contains information on specific birth defects.
http://www.americanpregnancy.org/

HHS Women's Health Information Center
A website and toll-free call center that provides free, reliable health information for women everywhere. The site contains a database of resources and contains topic areas such as pregnancy and medications.
http://www.womenshealth.gov/

Healthfinder
The U.S. Department of Health and Human Services has resources on a wide range of health topics selected from over 1,600 government and nonprofit groups.
http://www.healthfinder.gov/

Healthy Mothers Healthy Babies
Healthy Mothers Healthy Babies strives to improve the health and safety of mothers, babies and families through educational materials and collaborative partnerships.
http://www.hmhb.org

International Clearinghouse for Birth Defects Surveillance and Research (ICBDSR)
The mission of the ICBDSR is to bring together birth defect programs from around the world with the aim of conducting worldwide surveillance and research to prevent birth defects and to ameliorate their consequences. Resources include annual reports, collaborative study publications, various presentations and the Problem Solving Electronic Manual.
http://www.icbdsr.org

March of Dimes
The March of Dimes is dedicated to improving the health of babies by preventing birth defects, premature birth, and infant mortality. Find information, resources, tools, and fact sheets about pregnancy, folic acid, prematurity, genetic disorders, birth defects, and much more.
http://www.marchofdimes.com/

Medline Plus
Medline Plus has information available about pregnancy. Searching this website provides information on many different types of birth defects. It includes information on prevention and screening, research, organizations, and more.
http://www.nlm.nih.gov

National Birth Defects Prevention Network (NBDPN)
The mission of the NBDPN is to establish and maintain a national network of state and population-based programs for birth defects. Tools and resources include birth defects prevention month packets, surveillance guidelines, and folic acid information.
http://www.nbdpn.org

National Birth Defects Prevention Study
The National Birth Defects Prevention Study (NBDPS) looks at risk factors and potential causes of birth defects. Understanding the potential causes of birth defects can lead to recommendations, policy planning, and services to help prevent them.
http://www.nbdps.org/

National Environmental Public Health Tracking
The goal of the environmental public health tracking is to protect communities by providing information to federal, state, and local agencies. Find a communications library, data resources, and publications about a population's health status with respect to environmental factors.
http://ephtracking.cdc.gov

Organization for Teratology Information Specialists
This website focuses on medications and other exposures during pregnancy. They have a toll-free number (866-626-OTIS or 866-626-6847) that families and health care professionals can call to speak with one of the specialists. The calls are free of charge and confidential.
https://www.otispregnancy.org/

Content source: Division of Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention

Comments, suggestions or requests for further information may be addressed to:

Mississippi Birth Defects Surveillance Registry (MBDSR)
570 E. Woodrow Wilson Ave.
Jackson, MS 39215