

**Progress on the Implementation of IC 16-38-4-7 (Birth Problems Registry) as amended in First Regular
Session 112th General Assembly (2001)
Reporting Period: July 2007 – June 2008**

The Indiana Birth Defects and Problems Registry is a population-based surveillance system that seeks to promote fetal, infant, and child health. The purpose of the Registry is to prevent birth defects and childhood developmental disabilities and to enhance the quality of life of affected Indiana residents.

Birth defects are conditions present at birth that affect the structure or function of an infant's body. They can cause physical, mental, or medical problems. Approximately 1 in 33 babies is born with a major birth defect each year in the United States. Birth defects are the leading cause of death in infants. Two separate government reports (HCUP Statistical Brief #23 and Morbidity and Mortality Weekly Report Vol.56, No.2) published in January 2007 highlight the economic costs of birth defects, focusing on the need for prevention. According to these reports, the average length of hospital stays for children with birth defects was 6.3 days, with an average cost of \$18,600, compared to 4.9 days with an average cost of \$8,200 for all admissions in all age groups in 2004.

The 1986 Indiana General Assembly enacted a law (IC 16-4-10-6) to establish the Birth Problems Registry by January 1, 1987. In 2001, the Indiana Birth Problems Registry law (IC 16-38-4-7; 410 IAC 21-3) was amended to allow additional data sources to be used to improve the quality of the data. Data from the Indiana Birth Problems Registry will be used to detect trends in birth defects and suggest areas for further study; to identify epidemiological factors associated with birth defects; to address community concerns about the environmental effects on birth outcomes; to evaluate education, screening, and prevention programs; and to establish efficient referral systems that provide special services for the children with identified birth defects and their families.

Indiana State Department of Health staff obtained a three-year CDC Cooperative Agreement, a four-year Health Resource Service Administration (HRSA) Genetics Implementation Grant, a HRSA State Systems Development Initiative (SSDI), and HRSA's Title V Block Grant to fund the development of the enhanced IBDPR both programmatically and technically.

Case Ascertainment

The Indiana Birth Defects and Problems Registry (IBDPR) is considered a "passive" system because initial case ascertainment is through the electronic submission of hospital discharge data (HDD), with defined ICD-9-CM codes that identify birth defects and problems. However, in the early stages of program development, it was determined that up to 25% of the HDD was invalid. Therefore, the program protocol includes completing chart audits (which is indicative of an "active" birth defects registry) on the 44 CDC-targeted conditions to ensure the data submitted to the CDC is as valid as possible and to ensure that appropriate information is sent to families of children reported with at least one birth defect.

Hospital Reporting:

All 112 reporting hospitals are now submitting their monthly discharge data using the Indiana Health Data Center Gateway web portal. By the end of July 2008, 74 hospitals had completed reporting up to June 2008, 11 hospitals had reported up to May 2008, 15 hospitals up to March 2008, 7 hospitals up to December 2007, and 5 hospitals up to October 2007. Hospitals are required to report birth defects data to the IBDPR when they finish coding hospital discharge records for each month. The changes in data collection and recording systems and lack of resources, such as medical records or information technology staff, have been presented as reasons for the delays or irregularities in data reporting.

Physician Reporting:

The IBDPR uses physician reporting to identify children with birth defects that may not be diagnosed at birth and may, therefore, be diagnosed in a doctor's office rather than a hospital. The IBDPR staff considers a physician's submission to be confirmation of a diagnosis. No chart auditing is done on charts in a physician's office. If the

IBDPR has received duplicate information from a hospital and no chart audit has been completed, the physician's report will be confirmation of that birth defect and no chart audit will be done at the hospital. IBDPR staff expects that reports of children with autism and fetal alcohol spectrum disorder will be ascertained primarily from physician reporting, as the diagnostic criteria for both conditions include developmental delays that are not detectable at birth.

In February 2008, IBDPR staff mailed information packets to Indiana physicians and psychologists to acknowledge Birth Defects Awareness Month and to remind these providers about the legal requirements for reporting to the IBDPR. These packets included a letter from the Health Commissioner, a Physician Reporting Form, a list of all reportable conditions, an instruction sheet, an IBDPR facts sheet, and an informative flyer about newborn screening. In addition to these documents, a Sunny Start developmental calendar (an educational piece for parents with children from birth to age five years) was included in the packets mailed to family practice or general practice physicians and pediatricians.

A total of 702 submissions have been reported by 33 health care providers from July 2007 through June 2008. A total of 67 health care providers have reported since the implementation of the physician reporting system in January 2004. There are 12 health care providers who report regularly, an increase of 5 since last year.

Application Development

In the spring of 2008, the Integrated Data System (IDS) was developed to improve the data quality and integrity of the Operational Data Store (ODS). The IDS also provides data auditing capabilities and enhanced data management. A new web portal application, the Health Data Center Gateway, was designed to manage all applications and provide all users with a single log-on point to access their individual web applications.

Information from health care providers is essential to the validity of the IBDPR prevalence data. Some conditions, such as autism and fetal alcohol syndrome (FAS), require provider reporting since they are not usually diagnosed at birth and have been severely under-reported to date. In an effort to improve physician reporting, a web-based application was developed in the Health Data Center Gateway. In March 2008, five physicians registered and participated in a pilot evaluation of the new application. Initial implementation of the Health Data Center Gateway application has been very successful, and IBDPR staff intends to expand the web-based reporting system to providers statewide by December 2008.

IBDPR staff is now finalizing development of an electronic application which will allow IBDPR staff members to send educational information and resource packets to parents or guardians of children with certain confirmed birth defects. This application is expected to be implemented by January 2009.

Program Development

The goals of the program are to improve the quality of the data available on birth defects in Indiana and to provide information related to understanding the birth defect(s) and available resources to families of children with confirmed birth defects, as well as their health care providers.

Each time a change occurs within the rules regarding case ascertainment, IBDPR staff has ensured that all appropriate personnel, including health care providers and birthing facility staff, have received notification of the legislative change.

When the electronic application to send educational information and resource packets to parents or guardians is implemented, IBDPR staff will begin mailing packets to the families of children with at least one confirmed birth defect who were born in 2007 or later. The effectiveness of these mailings will be evaluated once the program is fully functioning.

National Meetings Attended

In February 2008, the Genomics Program Director attended the 11th annual meeting of the National Birth Defects Prevention Network (NBDPN) in Washington, DC, titled “Advances and Opportunities for Birth Defects Surveillance, Research, and Prevention.” Attendance at the conference was funded by the Centers for Disease Control and Prevention (CDC). It was designed to enhance relationships between federal, state, and professional organizations that are working towards common goals. The conference also provided an opportunity to discuss successful efforts related to reducing and preventing birth defects.

Statute Requisites

As the IBDPR collects data daily on children from birth to three or five years of age, the same report for the same time period, compiled on different dates, may indicate different values. The data for this report was compiled on 07/22/2008. Due to the small numbers of birth defects per year, data will be grouped in multiple years, as is required by CDC for the national publication. This report includes Indiana data available during the first three years (2003, 2004 and 2005). According to Vital Records data, there were 260,559 live births from 2003 through 2005.

1) The numbers and types of birth problems occurring in Indiana by county:

The data presented in Tables 1 – 3 were obtained by the data files submitted to the IBDPR by statewide hospitals as required by the Birth Problems Registry law (IC 16-38-4-7; 410 IAC 21-3). The hospitals extract this data from their hospital discharge (UB-92) records.

To verify the accuracy of hospital discharge data, the IBDPR targets 44 specific birth defects from the list of reported conditions for chart auditing by ISDH staff/contractors. These 44 defects are recommended by the National Birth Defects Prevention Network and are published for most states annually in *Birth Defects Research Part A: Clinical and Molecular Teratology*. IBDPR chart auditors visit hospitals and review the medical records of children that have been reported to the IBDPR with one or more targeted conditions in order to confirm the conditions or to determine them as probable (Table 5).

About 55% of the birth defects reported through hospital discharge data were determined to be confirmed conditions based on medical chart audits for 2003 – 2005 births. Of the targeted birth defects reported and confirmed, approximately 82% occurred in non-Hispanic white children, 9% in non-Hispanic black children, 6% in Hispanic children, <1% in children of Asian and American Indian descent, and 3% in children of other races/ethnicities.

The following explains the attached tables:

Table 1 shows the number of children reported by the hospitals through ICD-9-CM codes at discharge for each reportable condition category. These are unduplicated children for each condition category. However, many children with birth defects or problems have more than one defect, so some children may be included in multiple condition categories. These numbers do not reflect confirmation of the defect, merely hospital reporting.

Table 2 shows the number of children reported with only one reportable condition and Table 3 shows the number of children reported with more than one reportable condition; the count is unduplicated by condition category. These tables are subsets of Table 1 and, again, do not reflect whether there is a confirmed diagnosis that supports the discharge code.

Tables 4A and 4B reflects the sources of case ascertainment for the targeted conditions and non-targeted reportable conditions. According to these tables, 17% of occurrences of autism, 33% of fetal alcohol syndrome (FAS), and 34% of autism spectrum and other pervasive developmental disorders were reported to the IBDPR only via physician reporting. Therefore, direct physician reports are imperative for accurate reporting of the prevalence of these conditions, as they are not commonly diagnosed at hospitals.

Table 5 reflects the targeted condition categories reported to the IBDPR by hospital discharge date for children born in 2003 – 2005, where the condition was determined to to be confirmed or probable, based on information

obtained during the chart audit. A “probable” condition is one that has been audited, where the criteria for confirmation was adequate enough to determine the condition to be likely, but not enough to confidently confirm the condition. The percentage of confirmed vs. reported conditions reflects the validity of the hospital discharge data reported by the hospitals. Approximately 55% of all targeted conditions reported for live births during the three-year period were determined to be probable or confirmed based on information obtained during chart audits. This is a drop of 1% from last year’s value, which was the result from two years of available data.

Less than 50% of all reported cardiovascular and eye anomalies were confirmed. Once 4 – 5 years’ data is available for review, IBDPR staff will be able to identify the specific conditions that are accurately reported through hospital discharge. The ICD-9-CM codes listed on the hospital discharges often represent conditions that may possibly be present, but require additional testing or information to accurately confirm or rule out.

Table 6 provides the counts and rates (by race, per 10,000 births) of confirmed and probable targeted conditions for Indiana children born between 2003 and 2005 who have been reported to the IBDPR. Conditions determined to be “probable” are included with the confirmed conditions for counts and rates. The overall rate of 283 per 10,000 births is within national estimates.

Table 7 indicates trisomy counts and rates of infants born in 2003 – 2005 by maternal age. Children with trisomy conditions have three, rather than the expected two, copies of a chromosome—for example, children born with a third copy of chromosome 21 have Down syndrome, also called trisomy 21.

Table 8 shows the counts and rates per 10,000 births of confirmed and probable targeted birth defect conditions for Indiana children born between 2003 and 2005 for each county in Indiana. If the count is less than 5, it is indicated as “less than reportable numbers.”

2) The amount of use of the birth problems registry by researchers:

Annual Indiana data of the 2003 – 2005 births (Table 6) was submitted to the National Birth Defects Prevention Network (NBDPN) in August 2008; this data will be published in *Birth Defects Research Part A: Clinical and Molecular Teratology* in December 2008. The IBDPR did not receive any other data requests from researchers within this fiscal year. The data will be most useful for research and analysis when several years of data is available.

3) Proposals for the prevention of birth problems occurring in Indiana:

Currently, the IBDPR contains three years’ worth of information on birth defect rates within the state. This amount of information is not enough to allow IBDPR staff to accurately evaluate the presence of trends and/or clusters and, therefore, the need for specific prevention campaigns. A student intern performed an epidemiological study on the occurrence of omphaloceles throughout the state in 2007; however, she was unable to identify any rate changes (including trends and clusters) based on the amount of information available at that time. The IBDPR program has since obtained a full-time epidemiologist, in addition to more birth defects information; the ISDH plans to review the new data at the earliest opportunity.

Curricula related to education and prevention of fetal alcohol syndrome (FAS) and the benefits of folic acid were developed and distributed to middle school and high school consumer family sciences and biology teachers during this fiscal year. This information was presented at the annual Hoosier Association of Science Teachers, Inc. (HASTI) conference in February 2008; the ISDH intends to present this information again at the 2009 HASTI conference. IBDPR staff members are requesting and collecting feedback based on the teachers’ use of this information, and intends to evaluate the effectiveness of the curricula at the earliest opportunity.

Table 1: Number of Children* Reported to IBDPR by Birth Year**

Condition Name / Category	ICD-9-CM Codes	2003	2004	2005	2006
Adenoma of lung bronchus	212.30		1	1	1
Anomalies of jaw	524.00-254.10	53	61	57	60
Anterior horn cell disease	335.00-335.99	4	8	1	2
Autism, childhood disintegrative disorder, Asperger's syndrome, Rett syndrome, and pervasive developmental disorders not otherwise specified	299.00-299.99	221	159	70	11
Cardiovascular anomalies	745.00-747.99	1,719	1,931	1,944	2,016
Central nervous system anomalies	740.00-742.99	352	322	337	356
Cerebral degenerations usually manifesting in childhood	330.00-330.99	10	7	5	3
Chromosomal anomalies	758.00-758.99	189	193	192	203
Cleft palate and cleft lip	749.00-749.99	140	171	145	149
Coagulation defects	286.00-286.50	32	27	17	25
Congenital anomalies of integument	757.00-757.99	349	693	1,051	1,535
Congenital nystagmus	379.51	6	3	9	5
Constitutional aplastic anemia	284.00	1	1	1	
Diabetes mellitus	250.00-250.99	171	156	110	123
Diseases of white blood cells	288.00-288.99	640	722	645	561
Disorders involving the immune mechanism	279.00-279.99	58	56	55	46
Dyshormonogenic goiter	246.10	2			
Ear, face and neck anomalies	744.00-744.99	196	200	183	197
Eye anomalies	743.00-743.99	239	210	189	189
Fetal alcohol syndrome	760.71	27	31	18	20
Gastrointestinal anomalies	750.30-751.99	349	451	442	500
Genitourinary anomalies	752.00-753.99	1,237	1,416	1,330	1,317
Hereditary hemolytic anemias	282.00-282.99	118	161	138	148
Hereditary retinal dystrophies	362.70			1	
Mesothelioma of peritoneum	211.80		1		
Muscular dystrophies and myopathies	359.00-359.99	16	24	27	17
Musculoskeletal anomalies	754.00-756.99	1,527	1,722	1,651	1,636
Neoplasms of lip	140.00-208.99	103	108	82	65
Neoplasms of skin	216.00-216.99	131	117	110	107
Neoplasms – other	230.00-239.99	69	46	76	86
Other congenital anomalies	759.00-759.99	206	203	207	215
Other testicular dysfunction	257.80		1	1	1
Primary thrombocytopenia	287.30	33	30	7	1
Respiratory system anomalies	748.00-748.99	293	346	337	399
Retrolental fibroplasia	362.21	155	149	142	178
Strabismus and other disorders of binocular eye movement	378.00-378.99	109	98	78	52
Upper alimentary tract anomalies	750.00-750.29	361	374	329	379
Waldenstrom's macroglobulinemia	273.30		1	1	1

*Whose mothers were Indiana residents at the time of child's birth

**Includes hospital discharge data and physician reports

Data compiled on 07/22/2008.

Table 2: Number of Children* Reported ** to IBDPR with Only One Reportable Condition by Birth Year

Condition Name / Category	ICD-9-CM Codes	2003	2004	2005	2006
Anomalies of jaw	524.00-254.10	9	15	6	11
Anterior horn cell disease	335.00-335.99	1	2	1	
Autism, childhood disintegrative disorder, Asperger's syndrome, Rett syndrome, and pervasive developmental disorders not otherwise specified	299.00-299.99	137	97	45	5
Cardiovascular anomalies	745.00-747.99	683	791	846	852
Central nervous system anomalies	740.00-742.99	116	131	133	142
Cerebral degenerations usually manifest in childhood	330.00-330.99	2	1	4	
Chromosomal anomalies	758.00-758.99	37	30	49	41
Cleft palate and cleft lip	749.00-749.99	48	48	40	56
Coagulation defects	286.00-286.50	18	15	4	11
Congenital anomalies of integument	757.00-757.99	275	572	911	1,280
Congenital nystagmus	379.51	3	1	5	2
Diabetes mellitus	250.00-250.99	117	96	82	85
Diseases of white blood cells	288.00-288.99	491	512	470	383
Disorders involving the immune mechanism	279.00-279.99	21	16	23	15
Dyshormonogenic goiter	246.10	2			
Ear, face and neck anomalies	744.00-744.99	113	111	101	93
Eye anomalies	743.00-743.99	172	155	124	127
Fetal alcohol syndrome	760.71	11	12	3	6
Gastrointestinal anomalies	750.30-751.99	236	300	272	327
Genitourinary anomalies	752.00-753.99	846	938	880	857
Hereditary hemolytic anemias	282.00-282.99	86	103	97	105
Mesothelioma of peritoneum	211.80		1		
Muscular dystrophies and myopathies	359.00-359.99	7	9	4	4
Musculoskeletal anomalies	754.00-756.99	1,020	1,121	1,081	1,045
Neoplasms of lip	140.00-208.99	35	33	28	19
Neoplasms of skin	216.00-216.99	99	90	84	75
Neoplasms – other	230.00-239.99	32	23	31	38
Other congenital anomalies	759.00-759.99	57	48	55	58
Other testicular dysfunction	257.80		1		1
Primary thrombocytopenia	287.30	14	11	3	
Respiratory system anomalies	748.00-748.99	119	137	124	186
Retrolental fibroplasia	362.21	45	54	45	70
Strabismus and other disorders of binocular eye movement	378.00-378.99	54	50	31	25
Upper alimentary tract anomalies	750.00-750.29	286	292	257	310
Waldenstrom's macroglobulinemia	273.30		1	1	1

*Whose mothers were Indiana residents at the time of child's birth

**Includes hospital discharge data and physician reports

Data compiled on 07/22/2008.

Table 3: Number of Children* Reported to IBDPR with More Than One Reportable Condition by Birth Year**

Condition Name / Category	ICD-9-CM Codes	2003	2004	2005	2006
Adenoma of lung bronchus	212.30		1	1	1
Anomalies of jaw	524.00-254.10	44	46	51	49
Anterior horn cell disease	335.00-335.99	3	6		2
Autism, childhood disintegrative disorder, Asperger's syndrome, Rett syndrome, and pervasive developmental disorders not otherwise specified	299.00-299.99	84	62	25	6
Cardiovascular anomalies	745.00-747.99	1,036	1,140	1,098	1,164
Central nervous system anomalies	740.00-742.99	236	191	204	214
Cerebral degenerations usually manifest in childhood	330.00-330.99	8	6	1	3
Chromosomal anomalies	758.00-758.99	152	163	143	162
Cleft palate and cleft lip	749.00-749.99	92	123	105	93
Coagulation defects	286.00-286.50	14	12	13	14
Congenital anomalies of integument	757.00-757.99	74	121	140	255
Congenital nystagmus	379.51	3	2	4	3
Constitutional aplastic anemia	284.00	1	1	1	
Diabetes mellitus	250.00-250.99	54	60	28	38
Diseases of white blood cells	288.00-288.99	149	210	175	178
Disorders involving the immune mechanism	279.00-279.99	37	40	32	31
Ear, face and neck anomalies	744.00-744.99	83	89	82	104
Eye anomalies	743.00-743.99	67	55	65	62
Fetal alcohol syndrome	760.71	16	19	15	14
Gastrointestinal anomalies	750.30-751.99	113	151	170	173
Genitourinary anomalies	752.00-753.99	391	478	450	460
Hereditary hemolytic anemias	282.00-282.99	32	58	41	43
Hereditary retinal dystrophies	362.70			1	
Muscular dystrophies and myopathies	359.00-359.99	9	15	23	13
Musculoskeletal anomalies	754.00-756.99	507	601	570	591
Neoplasms of lip	140.00-208.99	68	75	54	46
Neoplasms of skin	216.00-216.99	32	27	26	32
Neoplasms – other	230.00-239.99	37	23	45	48
Other congenital anomalies	759.00-759.99	149	155	152	157
Other testicular dysfunction	257.80			1	
Primary thrombocytopenia	287.30	19	19	4	1
Respiratory system anomalies	748.00-748.99	174	209	213	213
Retrolental fibroplasia	362.21	110	95	97	108
Strabismus and other disorders of binocular eye movement	378.00-378.99	55	48	47	27
Upper alimentary tract anomalies	750.00-750.29	75	82	72	69

*Whose mothers were Indiana residents at the time of child's birth

**Includes hospital discharge data and physician reports

Data compiled on 07/22/2008.

Table 4A: Sources of Case Ascertainment Data for Targeted Conditions of 2003-2005 Births to Indiana Women

Defect	Reported by Physician Only	Reported by Hospital Only	Reported by Physician and Hospital	Total
Anencephalus	0	20	0	20
Aniridia	0	5	0	5
Anophthalmia / microphthalmia	1	45	0	46
Anotia / microtia	3	14	0	17
Aortic valve stenosis	0	86	0	86
Atrial septal defect	3	2,726	2	2,731
Autism	57	261	26	344
Biliary atresia	0	27	0	27
Bladder exstrophy	0	5	0	5
Choanal atresia	0	50	0	50
Cleft lip with and without cleft palate	6	408	6	420
Cleft palate without cleft lip	4	295	8	307
Coarctation of aorta	3	194	2	199
Common truncus	0	18	0	18
Congenital cataract	1	32	1	34
Congenital hip dislocation	0	352	0	352
Diaphragmatic hernia	3	86	0	89
Down syndrome	5	309	28	342
Ebstein anomaly	0	21	0	21
Encephalocele	1	24	0	25
Endocardial cushion defect	1	177	1	179
Esophageal atresia / tracheoesophageal fistula	0	62	0	62
Fetus or newborn affected by maternal alcohol use	25	40	11	76
Gastroschisis	0	106	0	106
Hirschsprung's disease (congenital megacolon)	1	71	1	73
Hydrocephalus without spina bifida	1	201	1	203
Hypoplastic left heart syndrome	0	73	0	73
Hypospadias and epispadias	4	1,012	4	1,020
Microcephalus	21	333	7	361
Obstructive genitourinary defect	0	884	0	884
Omphalocele	0	18	0	18
Patent ductus arteriosus	1	2,049	1	2,051
Pulmonary valve atresia and stenosis	0	390	1	391
Pyloric stenosis	0	688	0	688
Rectal and large intestinal atresia / stenosis	0	97	3	100
Reduction deformity, lower limbs	2	50	1	53
Reduction deformity, upper limbs	7	67	2	76
Renal agenesis / hypoplasia	1	90	3	94
Spina bifida without anencephalus	1	227	3	231
Tetralogy of Fallot	0	117	1	118
Transposition of great arteries	0	178	1	179
Tricuspid valve atresia and stenosis	0	27	0	27
Trisomy 13 (Patau syndrome)	2	27	2	31
Trisomy 18 (Edwards syndrome)	1	29	4	34
Ventricular septal defect	6	1,261	2	1,269

Data compiled on 07/22/2008.

Table 4B: Sources of Case Ascertainment Data for Reportable Conditions* of 2003-2005 Births to Indiana Women

Condition Name / Category	Reported by Physician Only	Reported by Hospital Only	Reported by Physician and Hospital	Total
Adenoma of lung bronchus	0	2	0	2
Anomalies of jaw	3	194	1	198
Anterior horn cell disease	0	14	0	14
Autism, childhood disintegrative disorder, Asperger's syndrome, Rett syndrome, and pervasive developmental disorders not otherwise specified	53	99	5	157
Cardiovascular anomalies	17	2,993	5	3,015
Central nervous system anomalies	5	465	2	472
Cerebral degenerations usually manifest in childhood	1	20	1	22
Chromosomal anomalies	26	227	7	260
Cleft palate and cleft lip	0	5	0	5
Coagulation defects	0	101	1	102
Congenital anomalies of integument	6	2,143	4	2,153
Congenital nystagmus	0	18	0	18
Constitutional aplastic anemia	0	3	0	3
Diabetes mellitus	1	533	0	534
Diseases of white blood cells	0	2,119	0	2,119
Disorders involving the immune mechanism	0	201	1	202
Dyshormonogenic goiter	0	2	0	2
Ear, face and neck anomalies	4	616	1	621
Eye anomalies	2	590	0	592
Gastrointestinal anomalies	0	390	0	390
Genitourinary anomalies	6	2,807	2	2,815
Hereditary hemolytic anemias	0	489	0	489
Hereditary retinal dystrophies	0	1	0	1
Mesothelioma of peritoneum	0	1	0	1
Muscular dystrophies and myopathies	3	78	0	81
Musculoskeletal anomalies	72	5,109	28	5,209
Neoplasms of lip	3	563	0	566
Neoplasms of skin	0	381	0	381
Neoplasms – other	0	213	1	214
Other congenital anomalies	33	620	11	664
Other testicular dysfunction	0	2	0	2
Primary thrombocytopenia	0	71	0	71
Respiratory system anomalies	8	970	2	980
Retrolental fibroplasia	0	446	0	446
Strabismus and other disorders of binocular eye movement	5	315	0	320
Upper alimentary tract anomalies	7	1,064	0	1,071
Waldenstrom's macroglobulinemia	0	2	0	2

*Excludes targeted conditions
Data compiled on 07/22/2008.

Table 5: Targeted Conditions Reported to IBDPR via Hospital Discharge Data for Children Born in 2003-2005 which are Confirmed or Determined as Probable by Medical Chart Audits or Physician Reports

Condition Name / Category	ICD-9-CM Codes	Number of Children Reported	Targeted Conditions Reported	Conditions per Child	Conditions Confirmed / Probable	Confirmed / Probable Percentage
Autism, childhood disintegrative disorder, Asperger's syndrome, Rett syndrome, and pervasive developmental disorders not otherwise specified	299.00-299.99	284	287	1	148	51.6%
Cardiovascular anomalies	745.00-747.99	4,675	7328	2	3345	45.6%
Central nervous system anomalies	740.00-742.99	691	816	1	478	58.6%
Chromosomal anomalies	758.00-758.99	393	399	1	317	79.4%
Cleft palate and cleft lip	749.00-749.99	455	717	2	431	60.1%
Ear, face and neck anomalies	744.00-744.99	14	14	1	8	57.1%
Eye anomalies	743.00-743.99	77	83	1	40	48.2%
Fetal alcohol syndrome	760.71	51	51	1	36	70.6%
Gastrointestinal anomalies	750.30-751.99	927	949	1	752	79.2%
Genitourinary anomalies	752.00-753.99	1,833	1998	1	1357	67.9%
Musculoskeletal anomalies	754.00-756.99	628	682	1	394	57.8%
Respiratory system anomalies	748.00-748.99	50	50	1	30	60.0%

Data compiled on 07/22/08.

Table 6: Confirmed and Probable Counts and Rates by Race of the Targeted Conditions for 2003-2005 Births to Indiana Women (Rates per 10,000 live births displayed in shaded area.)

Defect	Race/Ethnicity						Total
	Non-Hispanic White	Non-Hispanic Black	Hispanic	Asian or Pacific Islander	American Indian or Alaskan Native	Other / Unknown	
Anencephalus	8	1	2	0	0	0	11
	0.39	0.35	1.01	0	0	0	0.42
Aniridia	3	1	0	0	0	0	4
	0.15	0.35	0	0	0	0	0.15
Anophthalmia/microphthalmia	12	1	2	0	0	2	17
	0.59	0.35	1.01	0	0	0	0.65
Anotia/microtia	6	0	4	0	0	1	11
	0.29	0	2.02	0	0	0	0.42
Aortic valve stenosis	49	2	1	0	0	0	52
	2.40	0.71	0.51	0	0	0	2
Atrial septal defect	840	110	49	3	3	30	1035
	41.20	38.97	24.78	29.13	88.24	0	39.72
Autism	175	9	8	0	1	11	204
	8.58	3.19	4.05	0	29.41	0	7.83
Biliary atresia	14	4	3	0	0	1	22
	0.69	1.42	1.52	0	0	0	0.84
Bladder exstrophy	1	0	0	1	0	1	3
	0.05	0	0	9.71	0	0	0.12
Choanal atresia	25	3	2	0	0	0	30
	1.23	1.06	1.01	0	0	0	1.15
Cleft lip with and without cleft palate	196	11	18	0	0	7	232
	9.61	3.90	9.10	0	0	0	8.90
Cleft palate without cleft lip	146	11	5	0	0	4	166
	7.16	3.90	2.53	0	0	0	6.37
Coarctation of aorta	117	11	10	1	0	2	141
	5.74	3.90	5.06	9.71	0	0	5.41
Common truncus	10	2	1	0	0	1	14
	0.49	0.71	0.51	0	0	0	0.54
Congenital cataract	16	2	3	0	0	0	21
	0.78	0.71	1.52	0	0	0	0.81
Congenital hip dislocation	130	7	12	0	0	6	155
	6.38	2.48	6.07	0	0	0	5.95
Diaphragmatic hernia	59	4	4	1	0	3	71
	2.89	1.42	2.02	9.71	0	0	2.72
Down syndrome	233	24	15	2	0	6	280
	11.43	8.50	7.59	19.42	0	0	10.75
Ebstein anomaly	14	1	3	0	0	0	18
	0.69	0.35	1.52	0	0	0	0.69
Encephalocele	12	1	3	0	0	0	16
	0.59	0.35	1.52	0	0	0	0.61
Endocardial cushion defect	95	8	5	1	0	1	110
	4.66	2.83	2.53	9.71	0	0	4.22
Esophageal atresia/tracheoesophageal fistula	40	4	2	1	0	1	48
	1.96	1.42	1.01	9.71	0	0	1.84

Note 1—Rates based on fewer than 20 cases are unstable and are not comparable.

Note 2—Race is assigned to the child based on the mother's reporting about herself.

Data compiled on 07/22/2008.

Table 6: Confirmed and Probable Counts and Rates by Race of the Targeted Conditions for 2003-2005 Births to Indiana Women (Rates per 10,000 live births displayed in shaded area.)

Defect	Race/Ethnicity						Total
	Non-Hispanic White	Non-Hispanic Black	Hispanic	Asian or Pacific Islander	American Indian or Alaskan Native	Other / Unknown	
Fetus or newborn affected by maternal alcohol use	44	11	0	0	0	6	61
	2.16	3.90	0	0	0		2.34
Gastroschisis	62	2	8	0	0	2	74
	3.04	0.71	4.05	0	0		2.84
Hirschsprung's disease (congenital megacolon)	45	7	0	1	0	0	53
	2.21	2.48	0	9.71	0		2.03
Hydrocephalus without Spina Bifida	120	25	8	1	0	5	159
	5.89	8.86	4.05	9.71	0		6.10
Hypoplastic left heart syndrome	48	3	0	1	0	0	52
	2.35	1.06	0	9.71	0		2
Hypospadias and Epispadias	610	72	16	2	0	12	712
	29.92	25.51	8.09	19.42	0		27.33
Microcephalus	160	26	14	0	0	6	206
	7.85	9.21	7.08	0	0		7.91
Obstructive genitourinary defect	487	46	31	2	2	14	582
	23.88	16.30	15.68	19.42	58.82		22.34
Omphalocele	11	4	3	0	0	0	18
	0.54	1.42	1.52	0	0		0.69
Patent ductus arteriosus	406	72	33	2	0	17	530
	19.91	25.51	16.69	19.42	0		20.34
Pulmonary valve atresia and stenosis	181	24	11	2	1	11	230
	8.88	8.50	5.56	19.42	29.41		8.83
Pyloric stenosis	479	22	34	1	0	15	551
	23.49	7.79	17.19	9.71	0		21.15
Rectal and large intestinal atresia/stenosis	67	6	1	1	0	4	79
	3.29	2.13	0.51	9.71	0		3.03
Reduction deformity, lower limbs	21	5	2	0	0	0	28
	1.03	1.77	1.01	0	0		1.07
Reduction deformity, upper limbs	49	3	4	1	0	0	57
	2.40	1.06	2.02	9.71	0		2.19
Renal agenesis/hypoplasia	51	4	7	1	2	0	65
	2.50	1.42	3.54	9.71	58.82		2.49
Spina bifida without anencephalus	77	9	14	1	0	2	103
	3.78	3.19	7.08	9.71	0		3.95
Tetralogy of fallot	62	15	3	0	0	4	84
	3.04	5.31	1.52	0	0		3.22
Transposition of great arteries	97	9	9	1	0	4	120
	4.76	3.19	4.55	9.71	0		4.61
Tricuspid valve atresia and stenosis	20	1	0	0	0	0	21
	0.98	0.35	0	0	0		0.81
Trisomy 13 (Patau syndrome)	14	0	4	0	0	2	20
	0.69	0	2.02	0	0		0.77

Note 1—Rates based on fewer than 20 cases are unstable and are not comparable.

Note 2—Race is assigned to the child based on the mother's reporting about herself.

Data compiled on 07/22/2008.

Table 7: Confirmed and Probable Counts and Rates of Trisomy by Maternal Age for 2003-2005 Births to Indiana Women (Rates per 10,000 live births displayed in the shaded area.)

Defect	Age		
	<35	35 and >	Total(**)
Down syndrome	165	115	280
	7.05	43.12	10.75
Trisomy 13 (Patau syndrome)	12	8	20
	0.51	3	0.77
Trisomy 18 (Edwards syndrome)	12	13	25
	0.51	4.87	0.96
Total Live Births	233,892	26,667	260,559

The counts and rates of occurrences of defects reflected in this report are based on the Indiana Birth Defects & Problems Registry Data. Only those conditions which have been confirmed or which have been determined to be highly probable by the Chart Audit Process are included in the data. This report is based on real time data and subject to change based on additions and corrections to the data.

** Total Includes Unknown Age

Note—Rates based on fewer than 20 cases are unstable and are not comparable.

Data compiled on 07/22/2008.

Indiana Confirmed and Probable Counts and Rates of the Targeted Conditions for 2003 - 2005 Births to Indiana Women by County (rates per 10,000 births)

County				County			
Defect	Live Births	Total	Rate	Defect	Live Births	Total	Rate
ADAMS	1717			CARROLL	615		
Atrial septal defect		10	58.24	All Defects		18	292.68
Ventricular septal defect		9	52.42	CASS	1340		
All Defects		47	273.73	All Defects		38	283.58
ALLEN	15112			CLARK	3071		
Aortic valve stenosis		7	4.63	Atrial septal defect		6	19.54
Atrial septal defect		177	117.13	Hypospadias and Epispadius		7	22.79
Autism		26	17.2	Pulmonary valve atresia and stenosis		6	19.54
Cleft lip with and without cleft palate		20	13.23	Ventricular septal defect		23	74.89
Cleft palate without cleft lip		15	9.93	All Defects		59	192.12
Coarctation of aorta		10	6.62	CLAY	826		
Congenital hip dislocation		5	3.31	All Defects		29	351.09
Down syndrome		11	7.28	CLINTON	1260		
Fetus or newborn affected by maternal alcohol use		13	8.6	Ventricular septal defect		5	39.68
Hydrocephalus without Spina Bifida		14	9.26	All Defects		27	214.29
Hypospadias and Epispadius		45	29.78	CRAWFORD	296		
Microcephalus		36	23.82	All Defects		*	
Obstructive genitourinary defect		14	9.26	DAVISS	857		
Patent ductus arteriosus		49	32.42	All Defects		17	198.37
Pulmonary valve atresia and stenosis		30	19.85	DEARBORN	1264		
Pyloric stenosis		37	24.48	All Defects		8	63.29
Rectal and large intestinal atresia/stenosis		7	4.63	DECATUR	988		
Spina bifida without anencephalus		7	4.63	Pyloric stenosis		6	60.73
Tetralogy of fallot		6	3.97	All Defects		21	212.55
Transposition of great arteries		8	5.29	DEKALB	1491		
Ventricular septal defect		85	56.25	Atrial septal defect		14	93.9
All Defects		659	436.08	Hypospadias and Epispadius		7	46.95
				Pulmonary valve atresia and stenosis		5	33.53
				Ventricular septal defect		10	67.07
				All Defects		61	409.12
BARTHOLOMEW	2755			DELAWARE	3701		
Atrial septal defect		8	29.04	Atrial septal defect		33	89.17
Microcephalus		5	18.15	Autism		7	18.91
Obstructive genitourinary defect		7	25.41	Congenital hip dislocation		5	13.51
Ventricular septal defect		6	21.78	Hypospadias and Epispadius		12	32.42
All Defects		54	196.01	Microcephalus		6	16.21
				Obstructive genitourinary defect		23	62.15
BENTON	316			Patent ductus arteriosus		13	35.13
All Defects		5	158.23	Pyloric stenosis		9	24.32
				Ventricular septal defect		29	78.36
BLACKFORD	409			All Defects		169	456.63
All Defects		16	391.2	DUBOIS	1396		
				Obstructive genitourinary defect		7	50.14
BOONE	1907			All Defects		31	222.06
Atrial septal defect		11	57.68				
Coarctation of aorta		6	31.46				
Hypospadias and Epispadius		5	26.22				
Obstructive genitourinary defect		10	52.44				
Ventricular septal defect		9	47.19				
All Defects		60	314.63				

BROWN	419			HANCOCK	2273		
All Defects		6	143.2	Atrial septal defect		10	43.99
ELKHART	9021			Autism		5	22
Atrial septal defect		51	56.53	Hypospadias and Epispadius		8	35.2
Autism		5	5.54	Obstructive genitourinary defect		9	39.6
Cleft lip with and without cleft palate		7	7.76	Patent ductus arteriosus		5	22
Congenital hip dislocation		10	11.09	Pyloric stenosis		7	30.8
Down syndrome		12	13.3	Ventricular septal defect		9	39.6
Hypospadias and Epispadius		10	11.09	All Defects		82	360.76
Microcephalus		10	11.09	HARRISON	971		
Obstructive genitourinary defect		15	16.63	All Defects		9	92.69
Patent ductus arteriosus		30	33.26	HENDRICKS	4746		
Pulmonary valve atresia and stenosis		10	11.09	Atrial septal defect		14	29.5
Pyloric stenosis		28	31.04	Congenital hip dislocation		5	10.54
Ventricular septal defect		36	39.91	Hypospadias and Epispadius		8	16.86
All Defects		292	323.69	Obstructive genitourinary defect		12	25.28
FAYETTE	777			Patent ductus arteriosus		14	29.5
All Defects		9	115.83	Pulmonary valve atresia and stenosis		5	10.54
FLOYD	1990			Pyloric stenosis		10	21.07
Hypospadias and Epispadius		6	30.15	Ventricular septal defect		13	27.39
Ventricular septal defect		11	55.28	All Defects		116	244.42
All Defects		32	160.8	HENRY	1387		
FOUNTAIN	481			All Defects		34	245.13
Atrial septal defect		5	103.95	HOWARD	3311		
All Defects		19	395.01	Atrial septal defect		11	33.22
FRANKLIN	608			Autism		5	15.1
All Defects		8	131.58	Cleft lip with and without cleft palate		8	24.16
FULTON	706			Down syndrome		6	18.12
All Defects		29	410.76	Hypospadias and Epispadius		11	33.22
GIBSON	766			Obstructive genitourinary defect		10	30.2
All Defects		12	156.66	Patent ductus arteriosus		6	18.12
GRANT	527			Pyloric stenosis		10	30.2
Obstructive genitourinary defect		5	94.88	Ventricular septal defect		9	27.18
All Defects		23	436.43	All Defects		108	326.19
GREENE	523			HUNTINGTON	1268		
All Defects		18	344.17	Atrial septal defect		32	252.37
HAMILTON	10706			Hypospadias and Epispadius		9	70.98
Atrial septal defect		27	25.22	Patent ductus arteriosus		6	47.32
Autism		9	8.41	Ventricular septal defect		6	47.32
Cleft lip with and without cleft palate		11	10.27	All Defects		84	662.46
Coarctation of aorta		9	8.41	JACKSON	1622		
Congenital hip dislocation		9	8.41	Atrial septal defect		14	86.31
Down syndrome		12	11.21	Patent ductus arteriosus		5	30.83
Endocardial cushion defect		5	4.67	Pyloric stenosis		8	49.32
Hirschsprung's disease (congenital megacolon)		6	5.6	All Defects		58	357.58
Hypospadias and Epispadius		53	49.5	JASPER	1106		
Obstructive genitourinary defect		58	54.18	All Defects		21	189.87
Patent ductus arteriosus		23	21.48	JAY	803		
Pyloric stenosis		21	19.62	Atrial septal defect		6	74.72
Renal agenesis/hypoplasia		5	4.67	JEFFERSON	933		
Ventricular septal defect		48	44.83	All Defects		16	171.49
All Defects		354	330.66				

JENNINGS	1055			LAPORTE	3586		
Hypospadias and Epispadius		8	75.83	Atrial septal defect		23	64.14
All Defects		29	274.88	Coarctation of aorta		5	13.94
JOHNSON	4942			Hydrocephalus without Spina Bifida		9	25.1
Atrial septal defect		22	44.52	Hypospadias and Epispadius		13	36.25
Autism		7	14.16	Obstructive genitourinary defect		8	22.31
Cleft lip with and without cleft palate		5	10.12	Patent ductus arteriosus		17	47.41
Congenital hip dislocation		5	10.12	Pyloric stenosis		14	39.04
Down syndrome		10	20.23	Ventricular septal defect		17	47.41
Hypospadias and Epispadius		14	28.33	All Defects		138	384.83
Obstructive genitourinary defect		6	12.14	LAWRENCE	1488		
Patent ductus arteriosus		7	14.16	Obstructive genitourinary defect		9	60.48
Pyloric stenosis		10	20.23	All Defects		38	255.38
Tetralogy of fallot		5	10.12	MADISON	4580		
Ventricular septal defect		15	30.35	Atrial septal defect		8	17.47
All Defects		138	279.24	Cleft lip with and without cleft palate		5	10.92
KNOX	1251			Hydrocephalus without Spina Bifida		5	10.92
All Defects		26	207.83	Hypospadias and Epispadius		12	26.2
KOSCIUSKO	2921			Microcephalus		6	13.1
Atrial septal defect		21	71.89	Obstructive genitourinary defect		13	28.38
Hypospadias and Epispadius		9	30.81	Patent ductus arteriosus		7	15.28
Patent ductus arteriosus		5	17.12	Pyloric stenosis		7	15.28
Pyloric stenosis		11	37.66	Ventricular septal defect		9	19.65
Ventricular septal defect		8	27.39	All Defects		116	253.28
All Defects		85	291				
LAGRANGE	1760						
Atrial septal defect		6	34.09				
All Defects		42	238.64				
LAKE	18539						
Atrial septal defect		15	8.09				
Autism		15	8.09				
Cleft lip with and without cleft palate		8	4.32				
Cleft palate without cleft lip		12	6.47				
Congenital hip dislocation		10	5.39				
Down syndrome		21	11.33				
Hydrocephalus without Spina Bifida		13	7.01				
Hypospadias and Epispadius		44	23.73				
Microcephalus		9	4.85				
Obstructive genitourinary defect		27	14.56				
Patent ductus arteriosus		14	7.55				
Pulmonary valve atresia and stenosis		9	4.85				
Pyloric stenosis		32	17.26				
Renal agenesis/hypoplasia		5	2.7				
Tetralogy of fallot		5	2.7				
Ventricular septal defect		47	25.35				
All Defects		339	182.86				

MARION	41856			MONTGOMERY	1231		
Aortic valve stenosis		9	2.15	All Defects		20	162.47
Atrial septal defect		154	36.79	MORGAN	2439		
Autism		34	8.12	Atrial septal defect		7	28.7
Biliary atresia		6	1.43	Hypospadias and Epispadias		18	73.8
Choanal atresia		8	1.91	Obstructive genitourinary defect		6	24.6
Cleft lip with and without cleft palate		36	8.6	Pyloric stenosis		5	20.5
Cleft palate without cleft lip		34	8.12	Ventricular septal defect		7	28.7
Coarctation of aorta		15	3.58	All Defects		82	336.2
Congenital hip dislocation		24	5.73	NEWTON	365		
Diaphragmatic hernia		13	3.11	All Defects		9	246.58
Down syndrome		47	11.23	NOBLE	1816		
Endocardial cushion defect		17	4.06	Atrial septal defect		11	60.57
Esophageal atresia/tracheoesophageal fistula		11	2.63	Patent ductus arteriosus		5	27.53
Fetus or newborn affected by maternal alcohol use		11	2.63	Ventricular septal defect		9	49.56
Gastroschisis		15	3.58	All Defects		62	341.41
Hirschsprung's disease (congenital megacolon)		9	2.15	OHIO	152		
Hydrocephalus without Spina Bifida		31	7.41	All Defects		*	
Hypoplastic left heart syndrome		6	1.43	ORANGE	594		
Hypospadias and Epispadias		132	31.54	All Defects		16	269.36
Microcephalus		34	8.12	OWEN	662		
Obstructive genitourinary defect		112	26.76	Atrial septal defect		5	75.53
Patent ductus arteriosus		98	23.41	All Defects		23	347.43
Pulmonary valve atresia and stenosis		34	8.12	PARKE	411		
Pyloric stenosis		88	21.02	All Defects		5	121.65
Rectal and large intestinal atresia/stenosis		14	3.34	PERRY	537		
Reduction deformity, upper limbs		7	1.67	All Defects		9	167.6
Renal agenesis/hypoplasia		10	2.39	PIKE	389		
Spina bifida without anencephalus		13	3.11	All Defects		20	514.14
Tetralogy of fallot		16	3.82	PORTER	5152		
Transposition of great arteries		21	5.02	Atrial septal defect		7	13.59
Trisomy 13 (Patau syndrome)		6	1.43	Cleft palate without cleft lip		5	9.7
Ventricular septal defect		113	27	Coarctation of aorta		6	11.65
All Defects		1204	287.65	Down syndrome		10	19.41
MARSHALL	1796			Hypospadias and Epispadias		13	25.23
Pyloric stenosis		5	27.84	Obstructive genitourinary defect		9	17.47
All Defects		38	211.58	Patent ductus arteriosus		5	9.7
MARTIN	192			Pyloric stenosis		17	33
All Defects		8	416.67	Ventricular septal defect		19	36.88
MIAMI	1164			All Defects		133	258.15
Obstructive genitourinary defect		5	42.96	POSEY	761		
All Defects		27	231.96	All Defects		16	210.25
MONROE	3611			PULASKI	415		
Atrial septal defect		19	52.62	All Defects		8	192.77
Cleft palate without cleft lip		5	13.85	PUTNAM	1080		
Hypospadias and Epispadias		8	22.15	Atrial septal defect		5	46.3
Obstructive genitourinary defect		10	27.69	All Defects		38	351.85
Patent ductus arteriosus		15	41.54	RANDOLPH	737		
Pyloric stenosis		5	13.85	All Defects		15	203.53
Ventricular septal defect		12	33.23	RIPLEY	915		
All Defects		99	274.16	All Defects		13	142.08

RUSH	495			TIPPECANOE	5841		
All Defects		21	424.24	Atrial septal defect		22	37.66
SCOTT	749			Cleft lip with and without cleft palate		6	10.27
Atrial septal defect		6	80.11	Coarctation of aorta		6	10.27
Ventricular septal defect		5	66.76	Down syndrome		9	15.41
All Defects		21	280.37	Hypospadias and Epispadius		15	25.68
SHELBY	1448			Obstructive genitourinary defect		8	13.7
Atrial septal defect		10	69.06	Patent ductus arteriosus		11	18.83
Hypospadias and Epispadius		6	41.44	Pulmonary valve atresia and stenosis		8	13.7
Patent ductus arteriosus		5	34.53	Pyloric stenosis		10	17.12
Ventricular septal defect		8	55.25	Ventricular septal defect		27	46.22
All Defects		61	421.27	All Defects		160	273.93
SPENCER	510			TIPTON	521		
All Defects		14	274.51	All Defects		11	211.13
STARKE	760			UNION	108		
All Defects		20	263.16	All Defects		*	
STEUBEN	1026			VANDERBURGH	6777		
Atrial septal defect		8	77.97	Atrial septal defect		11	16.23
Pyloric stenosis		6	58.48	Coarctation of aorta		7	10.33
All Defects		39	380.12	Down syndrome		6	8.85
STJOSEPH	10364			Gastroschisis		6	8.85
Atrial septal defect		33	31.84	Hypospadias and Epispadius		18	26.56
Autism		6	5.79	Obstructive genitourinary defect		14	20.66
Cleft lip with and without cleft palate		9	8.68	Patent ductus arteriosus		10	14.76
Cleft palate without cleft lip		8	7.72	Pyloric stenosis		22	32.46
Congenital hip dislocation		8	7.72	Ventricular septal defect		23	33.94
Down syndrome		16	15.44	All Defects		166	244.95
Endocardial cushion defect		6	5.79	VERMILLION	467		
Gastroschisis		5	4.82	All Defects		18	385.44
Hydrocephalus without Spina Bifida		14	13.51	VIGO	3630		
Hypospadias and Epispadius		17	16.4	Atrial septal defect		8	22.04
Microcephalus		6	5.79	Autism		5	13.77
Obstructive genitourinary defect		13	12.54	Down syndrome		5	13.77
Patent ductus arteriosus		51	49.21	Endocardial cushion defect		5	13.77
Pulmonary valve atresia and stenosis		6	5.79	Hypospadias and Epispadius		6	16.53
Pyloric stenosis		12	11.58	Microcephalus		5	13.77
Rectal and large intestinal atresia/stenosis		5	4.82	Obstructive genitourinary defect		12	33.06
Renal agenesis/hypoplasia		6	5.79	Patent ductus arteriosus		8	22.04
Tetralogy of fallot		6	5.79	Pyloric stenosis		12	33.06
Transposition of great arteries		6	5.79	Ventricular septal defect		10	27.55
Trisomy 18 (Edwards syndrome)		5	4.82	All Defects		100	275.48
Ventricular septal defect		32	30.88	WABASH	1014		
All Defects		307	296.22	Atrial septal defect		9	88.76
SULLIVAN	539			Hypospadias and Epispadius		5	49.31
All Defects		14	259.74	Ventricular septal defect		9	88.76
SWITZERLAND	273			All Defects		52	512.82
All Defects		*		WARREN	228		
				All Defects		8	350.88

WARRICK	1836			UNKNOWN	27273		
Hypospadias and Epispadius		8	43.57	Aortic valve stenosis		7	2.57
Obstructive genitourinary defect		5	27.23	Atrial septal defect		80	29.33
Ventricular septal defect		7	38.13	Autism		16	5.87
All Defects		43	234.2	Cleft lip with and without cleft palate		18	6.6
WASHINGTON	861			Cleft palate without cleft lip		5	1.83
All Defects		9	104.53	Coarctation of aorta		9	3.3
WAYNE	2274			Congenital hip dislocation		17	6.23
Obstructive genitourinary defect		6	26.39	Diaphragmatic hernia		8	2.93
Ventricular septal defect		6	26.39	Down syndrome		24	8.8
All Defects		50	219.88	Endocardial cushion defect		10	3.67
WELLS	936			Esophageal atresia/tracheoesophageal fistula		5	1.83
Atrial septal defect		12	128.21	Fetus or newborn affected by maternal alcohol use		5	1.83
Ventricular septal defect		9	96.15	Gastroschisis		6	2.2
All Defects		45	480.77	Hirschsprung's disease (congenital megacolon)		5	1.83
WHITE	856			Hydrocephalus without Spina Bifida		8	2.93
Atrial septal defect		5	58.41	Hypoplastic left heart syndrome		7	2.57
All Defects		22	257.01	Hypospadias and Epispadius		60	22
WHITLEY	1111			Microcephalus		20	7.33
Hypospadias and Epispadius		6	54.01	Obstructive genitourinary defect		38	13.93
Ventricular septal defect		6	54.01	Patent ductus arteriosus		33	12.1
All Defects		39	351.04	Pulmonary valve atresia and stenosis		19	6.97
				Pyloric stenosis		53	19.43
				Rectal and large intestinal atresia/stenosis		7	2.57
				Renal agenesis/hypoplasia		6	2.2
				Spina bifida without anencephalus		10	3.67
				Tetralogy of fallot		6	2.2
				Transposition of great arteries		11	4.03
				Ventricular septal defect		77	28.23
				All Defects		590	216.33
				Total Live Births		260559	