Tennessee Birth Defects

2000-2002

State of Tennessee
Department of Health
Office of Policy, Planning and Assessment
Tennessee Birth Defects Registry

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Acknowledgements

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Executive Summary

This is the first population-based statewide report produced and published by the Tennessee Birth Defects Registry (TBDR). It details the birth prevalence of 44 major birth defects for Tennessee infants born in the years 2000 through 2002. The report contains sections detailing overall statewide birth defects counts and rates for each of the 44 diagnoses, and counts and rates broken down by infant sex, race/ethnicity and region. The overall state rate during the three year period was 274.68 per 10,000 live births. Unfortunately, birth defects remain the leading cause of infant mortality both in Tennessee and the United States. In addition to providing an accounting of the 44 major birth defects the report provides a brief description of the TBDR, its purpose, methods, and organization.

The birth defects data contained in this report provide baseline estimates of the birth prevalence of the 44 birth defects. Generally, birth defects rates were highest in the Northeast and declined as one moved through the East, Southeast, Middle and Western regions. The TBDR is currently attempting to evaluate the factors that may have affected the regional as well as the racial/ethnic and sex-related birth defects rates. At the same time the TBDR is in the process of compiling counts and rates for infants born in 1999 and 2003. All of this is done with the hope that these efforts will lead to more focused and effective prevention and treatment programs, which will ultimately diminish the burden of birth defects in Tennessee and elsewhere.

Introduction

The Tennessee Birth Defects Registry (TBDR) was established in law (TCA 68-5-506) by the Tennessee State Legislature in June 2000. The TBDR was initially enacted as a pilot program, conducting birth defects surveillance in Northeast Tennessee. Since then the program has been expanded to provide population-based birth defects surveillance for the entire state of Tennessee. Overall, the mission of the TBDR is to: 1) provide annual information on birth defects prevalence and trends; 2) provide information on the possible association of environmental hazards and other potential causes of birth defects; 3) evaluate current birth-defects prevention initiatives, providing guidance and strategies for improving those initiatives; and 4) provide families of children with birth defects information on public services available to children with birth defects.

This is the first detailed report to be publicly issued and widely distributed by the TBDR. Previously, the TBDR has shared birth defects statistics and related information with public interest groups such as the March of Dimes, the Tennessee Perinatal Association and the Tennessee Folic Acid Council. The TBDR has also made presentations regarding its methodology and findings at both local and national public health meetings. Additionally, the TBDR has collaborated in annual state birth defects surveillance reports compiled by the Centers for Disease Control and Prevention (CDC) and the National Birth Defects Prevention Network (NBDPN), and published in the journals, Teratology and Birth Defects Research: Part A. However, this report is broader and more detailed and marks the beginning of a tradition of an annual TBDR report on birth defects in Tennessee. In the near future, the TBDR will also begin producing single issue reports focusing on specific birth-defects related issues.

The TBDR is housed within the Office of Policy, Planning and Assessment (PPA) in the Tennessee Department of Health. The primary data sources in compiling this report are the Hospital Discharge Data System (HDDS) and the Birth, Death

and Fetal Death Statistical Data Systems, which are compiled, processed and stored by the Vital Records and Health Statistics sections of PPA. The HDDS contains admission-level records for all patients treated in licensed Tennessee hospitals and their outpatient treatment and rehabilitation centers. The TBDR uses these records to track 44 major birth defects recommended by the CDC and NBDPN. Infants' HDDS records containing diagnostic codes corresponding to the tracked birth defects are extracted, compiled and linked with the other data sources. The linkages provide validity checks and add information such as maternal risk factors, demographics and geography that are not available in the HDDS.

The TBDR also recently initiated a program that involves public health nurses going to hospitals and reviewing infant medical records. The active review of medical records provides a depth of information not available in the administrative data sets as well as an additional check on the accuracy of the data. Additionally, it allows for the review of potential cases not identified in the HDDS and creates a system that can potentially monitor birth defects in real time. This would be especially helpful in evaluating potential birth defect clusters, allowing for timely targeted surveillance in the suspected areas. Nonetheless, the HDDS-based system provides statewide population-based coverage, a goal that is currently beyond the resources of the active review program.

This report details the birth prevalence of 44 major birth defects for Tennessee infants born to resident mothers in 2000, 2001, and 2002. These birth defects are classified as major birth defects because they require medical or surgical treatment, have serious adverse effects on health and development, or have a significant cosmetic impact.[1] Additionally, the 44 birth defects can be organized within eight diagnostic categories plus fetal alcohol syndrome:

- Central Nervous System
- Eye and Ear
- Cardiovascular

- Orofacial
- Gastrointestinal
- Genitourinary
- Musculoskeletal
- Chromosomal

Individual birth defect counts and rates are presented for the state as a whole and broken down by infant sex, race/ethnicity and five designated perinatal regions, as are the overall number and rate of affected infants in each of the diagnostic categories. Additionally, individual birth defects counts and rates for each of Tennessee's 95 counties are presented in Appendix B. Birth defect counts include: 1) live-born infants diagnosed with a birth defect during the first year of life; and 2) diagnosed fetal-death cases that were at least 500 grams in weight or in the absence of weight at least 22 weeks gestation. However, the denominators for calculating rates include only live births and birth defect rates are reported per 10,000 live births.

One source of information unavailable to the TBDR that may cause systematic undercounts of some birth defects are prenatal diagnoses related to elective terminations of pregnancies. Research indicates that the birth defects most likely to result in elective terminations include: 1) the neural tube defects (NTDs) anencephalus, spina bifida and encephalocele; 2) the abdominal wall defect omphalocele; and 3) the chromosomal anomalies, trisomy 13 (Patau syndrome), and trisomy 18 (Edwards syndrome).[2 3 4 5] Anencephalus is an especially severe birth defect that occurs when the cephalic end of the neural tube fails to close, resulting in the absence of major portions of the brain, skull and scalp. Anencephalus is incompatible with life and infants born alive generally die within hours or days of their birth. Estimated proportions of anencephalus cases prenatally diagnosed and electively terminated range as high as 69 percent.[2] To evaluate the effect of this omission, birth defects rates obtained by the TBDR were compared with rates obtained by registries in North Carolina and Arkansas,

two established programs on the eastern and western borders of Tennessee that have access to and include elective termination data in their reports. The results of these analyses are presented in the section containing overall birth defects counts and rates.

Anencephalus and spina bifida are especially tragic birth defects, because it is estimated that up to 70 percent of cases would be avoided by the daily ingestion of 400 micrograms of folic acid. Folic acid is a B vitamin available in most multivitamin supplements and the TBDR suggests that all maternal-age sexually-active women take at least 400 micrograms of folic acid everyday. The TBDR has worked with the Tennessee Folic Acid Council in promoting this message and will continue to do so. Also, it should be noted that beginning taking folic acid once one becomes pregnant may be too late, as the damage that causes NTDs occurs within the first four to five weeks of pregnancy, which is often before one knows they are pregnant. Folic acid may also reduce the incidence of other birth defects such as cleft lip and cleft palate and supports a healthy adult body as well. Simply put, everyone should have their folic acid everyday. In addition to taking folic acid, the TBDR urges potential and expectant mothers to refrain from smoking cigarettes, drinking alcohol and taking illicit drugs. Expectant mothers should also eat a balanced diet and seek professional prenatal care as early in their pregnancies as is possible.

The overall state and regional rates provide baseline estimates of the birth prevalence of 44 major birth defects in Tennessee. Nationwide major birth defects affect approximately three percent of all births. Unfortunately, major birth defects are likely to continue occurring at an approximate three percent rate for the foreseeable future. Around the baseline rate there is random variation that cannot be accounted for and systematic variation that may be accounted for. Analyzing the systematic variation may help us to understand what causes birth defects and why some birth defect rates become elevated. Analyses of geographic and demographic variables such as regional differences, infant sex,

maternal age, race/ethnicity and the correlates of these variables, as well as risk factors such as folic acid deficits, plurality, maternal diabetes, hypertension, smoking, alcohol consumption and exposure to environmental pollutants may all provide clues to the origin or etiology of birth defects. Understanding these variables and their relationships to birth defects will also help in the development and targeting of prevention initiatives and services for affected infants and their families. The collection of the data presented in this report and the ongoing collection, updating and analyses of these data are just the beginning of an effort to understand birth defects in Tennessee. The overall number of Tennessee infants affected by the birth defects covered in this report was 6,463 or 274.68 per 10,000 live births or 2.75 percent. The overall number of birth defects was 8,186 or 347.91 per 10,000 live births or 3.48 percent. The overall number of birth defects is larger than the number of affected infants due to some infants having multiple birth defects.

One of the roles of the TBDR is to help recognize and investigate birth defects clusters, that is, when, where and why birth defect rates become elevated above the baseline. Establishing reliable state and local baseline rates for each of the tracked birth defects is the first step in being able to accomplish that task. For example, in 2000 the CDC and the Communicable and Environmental Disease Surveillance (CEDS) section in the Tennessee Department of Health were called to investigate a potential cluster of orofacial clefts in Dickson County. One of the problems faced by investigators was that no reliable baseline data existed for either Tennessee or Dickson County. Consequently, they were forced to use data from the Metropolitan Atlanta Congenital Defects Program (MACDP), a five-county Atlanta-area birth defects surveillance system operated by the CDC. Although MACDP is the original and one of the most respected birth defects programs in the United States, there were questions regarding whether the demographics, historical trends or baseline rates for cleft lip and cleft palate in Dickson County and Metro Atlanta were sufficiently similar to support the comparison. Regardless, the investigation confirmed the cluster, finding 18 cleft

lip/cleft palate cases in Dickson County from 1997 through October of 2000 and demonstrated a statistically significant difference from the MACDP rates. However, the investigation was unable to determine what factor or factors caused the cluster to occur, or to eliminate the possibility the cluster was a statistical anomaly.

The county-level counts and rates presented in Appendix B show that the Dickson County cleft lip and cleft palate counts and rates for 2000 to 2002, were 5 cases of cleft lip with or without cleft palate (CL), corresponding to a rate of 26.40 per 10,000 live births (95% CI = 8.57 to 61.61), and 3 cases of cleft palate without cleft lip (CPO), corresponding to a rate of 15.84 per 10,000 live births (95% CI = 3.27 to 46.29). Though these rates appear high, the difference from the overall Tennessee rate was no longer statistically significant. Further, the extent to which the counts were high was due largely to cases observed in 2000, which was the final year of the Dickson County cluster. Over the subsequent two year period there was one CPO case in 2001 and one CL case in 2002. Thus, these data show that the Dickson County cluster has likely subsided and that the normal baseline rate for Dickson County appears to be much lower than was observed in the period of 1997 through 2000. At the same time, however, there were a number of counties and regions showing elevated birth-defects rates between 2000 and 2002. In particular, the Northeast Perinatal Region, which includes Carter, Greene, Hancock, Hawkins, Johnson, Sullivan, Washington and Unicoi Counties, showed significantly elevated rates in a number of birth defects categories, especially cardiovascular birth defects. The counts and rates for the Northeast Perinatal Region and the individual counties are presented in the Perinatal Region Section and the County Table in Appendix B, respectively. These findings are currently under review by the TBDR and will be described in detail in an upcoming special report. Until those analyses are complete, it is important to consider the possibility that the elevated rates observed in the Northeast may be attributable, at least in part, to regional differences in case ascertainment (i.e. regional differences in the diagnosis and coding of a birth

defect). However, it seems unlikely that these differences can be fully attributed to case ascertainment.

As this report is being written the TBDR is compiling and preparing to analyze birth defects data from 1999 and 2003. Accomplishing this will provide a full five-year data set that will support more stable baseline estimates and be more suited to evaluating birth defects trends. Though it would be optimal to also have data for infants born in 2004, compiling birth defects diagnoses through infancy for the 2004 birth cohort requires data through the entire 2005 calendar year. The TBDR also recently completed geocoding the entire Birth Certificate Data System for 2000 through 2002. This will allow for the conduct of geospatial statistical analyses of the more common birth defects, which may provide insights that are not apparent in analyses of tabular data organized by regions or counties. In the coming year the TBDR also has plans to expand the diagnoses tracked, adding birth defects that have a significant impact on the lives and well being of infants.

The TBDR welcomes inquiries about birth defects and reports of suspected birth defects clusters from professionals and the public. However in responding to inquiries, the TBDR will not provide any information that could compromise the confidentiality of infants or their families. Researchers who wish to conduct birth defects research and are affiliated with accredited research institutions are also welcome to propose collaborative projects.

Overall Birth Defects Counts and Rates

2000 – 2002

Table 1 presents the overall birth defects diagnosis counts and rates for 44 major birth defects, individual case counts and rates for eight diagnostic categories and the total birth defects case count and rate. Brief definitions for each of the birth defects and other birth and other related terms are presented in a glossary in Appendix A.

Individual infants may have multiple birth defects within and across categories. Thus, the sum of birth defects diagnoses within a category is generally greater than the corresponding case counts and the sum of the category case counts is greater than the total case count. Each rate estimate is accompanied by a 95 percent confidence interval, which is the range that should contain the true rate 95 percent of the time. Overall a total of 6,425 infants and 38 fetal deaths were affected by the tracked birth defects, which corresponds to a rate of 274.68 per 10,000 live births (95% CI = 268.02 to 281.46). The overall number of birth defects was 8,186, corresponding to a rate of 347.91 per 10,000 live births (95% CI = 340.41 to 355.53).

Narrower confidence intervals support greater certainty regarding an estimated rate, whereas wider confidence intervals support less certainty. The width of a confidence interval is primarily dependent on the size of the sample on which it is based with larger samples supporting greater confidence. Thus, the overall state estimates presented in Table 1 have the narrowest confidence intervals and are the estimates in which the greatest confidence is warranted. Confidence intervals for the rates will become increasingly wider progressing through the tables with smaller subgroups: infant sex, race/ethnicity, regions and counties. In some counties with small birth populations a small number of birth defects may lead to a very high rate estimate. However, rate estimates based on small numbers are inherently unstable and will have wide confidence intervals. That is not to say rate estimates based on small numbers are invalid, but they should be taken in context and evaluated with caution.

Among the birth defects tracked in this report cardiovascular diagnoses were the most common, occurring at a rate of 111.48 per 10,000 live births, (95% CI = 107.25-115.83), followed by genitourinary diagnoses, 72.04 per 10,000 live births (95% CI = 68.65-75.55) and gastrointestinal diagnoses, 37.40 per 10,000 live births (95% CI = 34.97-39.95). Among the cardiovascular diagnoses patent ductus arteriosus, ventricular septal defects and atrial septal defects were the most common with rates of 42.16, (95% CI = 39.58-44.86), 39.78, (95% CI = 37.27-42.41) and 38.93, (95% CI = 36.45-41.53), per 10,000 live births respectively. Among the genitourinary diagnoses hypospadias was the most common, occurring at a rate of 46.33 per 10,000 live births (95% CI = 43.62-49.16). Among the gastrointestinal diagnoses pyloric stenosis was the most common, occurring at a rate of 26.44 per 10,000 live births (95% CI = 24.40-28.60). Overall these were the most prevalent birth defects in Tennessee during the 2000 to 2002 period.

Table 1: Overall Birth Defects Counts and Rates 2000-2002

Birth Defect Category	Count [1]	Rate[2]	95% Confidence Interval[3]
Central Nervous System			
Anencephalus	30	1.28	0.86-1.83
Spina bifida without anencephalus	77	3.27	2.58-4.09
Hydrocephalus without spina bifida	186	7.91	6.81-9.13
Encephalocele	26	1.11	0.73-1.63
Microcephalus	122	5.19	4.31-6.19
Total Central Nervous System Cases	419	17.81	16.15-19.60
Eye/Ear			
Aniridia	3	0.13	0.03-0.38
Anophthalmia/microthalmia	26	1.11	0.73-1.63
Congenital cataract	56	2.38	1.80-3.09
Anotia/microtia	12	0.51	0.26-0.89
Total Eye/Ear Cases	93	3.95	3.19-4.84
Cardiovascular			
Common truncus	20	0.85	0.52-1.31
Transposition of great arteries	107	4.55	3.73-5.50
Tetralogy of Fallot	119	5.06	4.19-6.05
Ventricular septal defect	936	39.78	37.27-42.41
Atrial septal defect	916	38.93	36.45-41.54
Endocardial cushion defect	76	3.23	2.54-4.04
Pulmonary valve atresia and stenosis	194	8.25	7.13-9.49
Tricuspid valve atresia and stenosis	29	1.23	0.82-1.77
Ebstein's anomaly	25	1.06	0.69-1.56

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Table 1: Overall Birth Defects Counts and Rates 2000-2002

Birth Defect Category	Count [1]	Rate[2]	95% Confidence Interval[3]
Aortic valve stenosis	41	1.74	1.25-2.36
Hypoplastic left heart syndrome	84	3.57	2.85-4.42
Patent ductus arteriosus[4]	992	42.16	39.58-44.87
Coarctation of aorta	140	5.95	5.01-7.02
Total Cardiovascular Cases	2,623	111.48	107.25-115.83
Orofacial			
Cleft palate without cleft lip	149	6.33	5.35-7.44
Cleft lip with or without cleft palate	271	11.52	10.19-12.97
Choanal atresia	43	1.83	1.32-2.47
Total Orofacial Cases	461	19.59	17.84-21.47
Gastrointestinal			
Esophageal atresia/tracheoesophageal fistula	64	2.72	2.09-3.47
Rectal & large intestinal atresia/stenosis	122	5.19	4.31-6.19
Pyloric stenosis	622	26.44	24.40-28.60
Hirschprung's disease	67	2.85	2.21-3.62
Biliary atresia	12	0.51	0.26-0.89
Total Gastrointestinal Cases	880	37.40	34.97-39.96
Genitourinary			
Bladder exstrophy	9	0.38	0.17-0.72
Hypospadias and epispadias	1,090	46.33	43.62-49.16
Obstructive genitourinary defect	530	22.53	20.65-24.53

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Table 1: Overall Birth Defects Counts and Rates 2000-2002

Birth Defect Category	Count [1]	Rate[2]	95% Confidence Interval[3]
Renal agenesis/hypoplasia	87	3.70	2.96-4.56
Total Genitourinary Cases	1,695	72.04	68.65-75.55
Musculoskeletal			
Reduction deformity (upper limbs)	50	2.13	1.58-2.81
Reduction deformity (lower limbs)	19	0.81	0.49-1.26
Gastroschisis	102	4.34	3.54-5.26
Omphalocele	50	2.13	1.58-2.81
Diaphragmatic hernia	79	3.36	2.66-4.19
Congenital hip dislocation	186	7.91	6.81-9.13
Total Musculoskeletal Cases	480	20.40	18.62-22.31
Chromosomal			
Trisomy 13	23	0.98	0.62-1.47
Down syndrome	280	11.90	10.55-13.38
Trisomy 18	48	2.04	1.50-2.70
Total Chromosomal Cases	347	14.75	13.24-16.38
Other			
Fetal alcohol syndrome	66	2.81	2.17-3.57
Total Cases	6,463	274.68	268.02-281.46
Total Live Births	235,290		

[1]Counts include live births and fetal deaths.
[2]Rates per 10,000 live births.
[3]Confidence intervals for 100 or less cases are exact Poisson; otherwise confidence intervals are based on the normal approximation.
[4]Patent ductus arteriosus is counted as a birth defect only for birth weights of 2500 grams or more.

Diagnostic data were derived from the Tennessee Hospital Discharge Data System (2000-2003), the Tennessee Death Statistical System (2000-2003) and the Tennessee Fetal Death Statistical System (2000-2002).
Total live births and birth weight are from the Tennessee Birth Statistical System (2000-2002).

As previously noted there was concern that a number of birth defects might be systematically undercounted due to a lack of information regarding prenatal diagnoses and intentional terminations. The birth defects most likely to be affected were: 1) the neural tube defects (NTDs): anencephalus, spina bifida and encephalocele; 2) the abdominal wall defect omphalocele; and 3) the chromosomal anomalies, trisomy 13 (Patau syndrome), and trisomy 18 (Edwards syndrome). To evaluate the potential deficit a comparison was conducted with rates obtained by the Arkansas and North Carolina birth defects registries.[6] Arkansas and North Carolina border Tennessee on the west and east, respectively, and both states maintain long-established and respected birth defects registries with access to prenatal diagnostic data. The results of these analyses are presented in Table 2. The table contains counts, rates and rate ratios for the hypothesized birth defects in which there were statistically significant differences ($p < .05$).

Among the hypothesized differences due to prenatal diagnoses, Arkansas obtained higher rates for anencephalus and spina bifida, but not for encephalocele, omphalocele or the trisomies. North Carolina had higher rates for anencephalus, spina bifida and trisomy 13. Thus, the common differences among the two states and Tennessee were anencephalus and spina bifida. Given the expected deficit in anencephalus counts of approximately 50%, the North Carolina and Arkansas rate estimates would be expected to be two times as high as Tennessee's. The rate ratios for anencephalus were 3.18 and 1.54 for Arkansas and North Carolina, respectively. Averaging the two ratios provides a mean rate ratio of 2.34. Thus, together the rate ratios approximate the hypothesized value of 2.00. This suggests that the true prevalence of anencephalus in Tennessee may be twice as high as that obtained through case counts based exclusively on live births and fetal deaths. That the rate ratios for spina bifida were lower, 1.62 and 1.51, is consistent with the literature that suggests spina bifida is less affected by intentional terminations. It also suggests that the true prevalence of spina bifida may be 1.5 times the rate obtained for live

births and fetal deaths. That there were no significant differences obtained for encephalocele, omphalocele and trisomy 18 suggests that these defects may be affected less by intentional terminations in our region than has been suggested in the literature. No doubt there are other factors that could account for the differences in the observed rates. However, in the context of the scientific literature and the hypotheses based on that literature, the findings support the idea that the true prevalence of anencephalus and spina bifida in Tennessee are higher than the tabled rates in this report.

Table 2: Interstate Comparisons

Birth Defects Where Arkansas Rate Was Higher

	Tennessee		Arkansas		Rate
Birth Defect	Count	Rate	Count	Rate	Ratio
Anencephalus	30	1.28	75	4.06	3.18
Spina bifida without anencephalus	77	3.27	98	5.31	1.62
Total Births	235,290		184,731		

Birth Defects Where North Carolina Rate Was Higher

	Tennessee		North Carolina		Rate
Birth Defect	Count	Rate	Count	Rate	Ratio
Anencephalus	30	1.28	89	1.97	1.54
Spina bifida without anencephalus	77	3.27	224	4.95	1.51
Trisomy 13	23	0.98	84	1.86	1.90
Total Births	235,290		452,582		

Note: Arkansas and North Carolina birth defects counts and rates were obtained from the 2004 NBDPN Congenital Malformations Surveillance Report.[6]

Birth Defects Counts and Rates by Infant Sex

2000 – 2002

The birth defects counts, rates and confidence intervals by infant sex for 44 major birth defects are presented in Table 3. In all there were 5,127 birth defects affecting male infants and 3,056 birth defects affecting female infants for a total of 8,183 birth defects. This is three less than the total in the overall counts, as there were three birth defects associated with two fetal deaths of undetermined sex. Overall there were 4,169 male infants affected by birth defects, which corresponds to a rate of 346.29 per 10,000 live births (95% CI = 335.86-356.96), and 2,292 female infants for a rate of 199.48 per 10,000 live births (95% CI = 191.40-207.82). Thus, male infants were 74% more likely than females to be affected by birth defects (RR = 1.74; 95% CI = 1.65-1.82).[a] However, when hypospadias, a highly prevalent and exclusively male birth defect, was removed from the analysis male infants were only 31% more likely to be affected by birth defects (RR = 1.31; 95% CI = 1.24-1.38). In addition to showing the differential burden of birth defects experienced by male and female infants, reviewing differences in sex prevalence may provide insight into the etiology of some birth defects. For example, birth defects showing associations with infant sex may be linked to defects on the sex chromosomes or to differences in the prenatal hormone exposures of male and female fetuses.

Neither male infants nor female infants were more likely to be affected by CNS birth defects overall. However, male infants were approximately one third as likely as female infants to be affected by anencephalus (RR = 0.36; 95% CI = 0.16-0.82), and 44% more likely to be affected by hydrocephalus (RR = 1.44; 95% CI = 1.08-1.94).

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[a] The relative risk ratio (RR) describes the risk of male infants relative to female infants of being affected by a birth defect. That is, female infants were the reference group to whom male infants were compared. In this case male infants were 1.74 times as likely or 74% more likely to be affected by a birth defect. Similarly, a RR less than 1.00 with confidence intervals that do not include 1.00 would indicate male infants were at less risk than female infants. All of the RR estimates presented in this report were associated with a statistically significant Chi-square or Fisher Exact test statistic ($p < .05$). However, given the large number of comparisons and the probability that 5 in 100 tests may be false, these tests should be taken simply as descriptive indicators of the magnitude of the differences among groups.

Among the eye and ear birth defects aniridia was exclusively male with a total of three male cases and no female cases. None of the other eye and ear defects showed a relationship with infant sex.

The overall cardiovascular birth defects rate did not show a statistically significant association with infant sex. However, transposition of the great arteries (RR = 1.66; 95% CI = 1.12-2.47), aortic valve stenosis (RR = 2.31; 95% CI = 1.18-4.52), patent ductus arteriosus (RR = 1.18; 95% CI = 1.04-1.34) and coarctation of the aorta (RR = 1.77; 95% CI = 1.25-2.51) all showed elevated rates for male infants.

Among orofacial diagnoses, male infants were more likely to be affected by cleft lip with or without cleft palate (RR = 1.68; 95% CI = 1.32-2.16), but there were no statistically significant differences associated with cleft palate without cleft lip or choanal atresia.

The overall rate of gastrointestinal birth defects was higher for male infants (RR = 3.10; 95% CI = 2.65-3.62). Among the gastrointestinal diagnoses, male infants were nearly five times as likely to be affected by pyloric stenosis (RR = 4.75; 95% CI = 3.85-5.87), and more than two and half times more likely to affected by Hirschsprung's disease (RR = 2.81; 95% CI = 1.62-4.87). The remaining gastrointestinal birth defects diagnoses did not show a statistically significant association with infant sex.

Including hypospadias, male infants were more than seven times as likely to be affected by genitourinary birth defects (RR = 7.51; 95% CI = 6.46-8.73), but only two times as likely with hypospadias removed from the analyses (RR = 2.12; 95% CI = 1.79-2.52). Aside from hypospadias, male infants were differentially affected by renal agenesis/hypoplasia (RR = 2.09; 95% CI = 1.32-3.29) and obstructive genitourinary defect (RR = 2.19; 95% CI = 1.82-2.63).

Overall, female infants were 32% more likely to be affected by musculoskeletal birth defects than male infants (RR = 0.76; 95% CI = 0.63-0.90). Additionally, male infants were only one third as likely to be affected by congenital hip dislocation as female infants (RR = .34; 95% CI = 0.25-0.47). However, male infants were more than twice as likely to be affected by diaphragmatic hernia (RR = 2.32; 95% CI = 1.43-3.78). The remaining musculoskeletal birth defects did not show a statistically significant difference.

Female infants were nearly twice as likely to be affected by trisomy 18 (RR = 0.52; 95% CI = 0.29-0.95). However, there were no statistically significant sex differences in trisomy 13, Down syndrome or fetal alcohol syndrome rates.

Table 3: Birth Defects by Infant Sex 2000-2002

Birth Defect	Sex	Count	Rate	95% CI
Central Nervous System				
Anencephalus[1]	Male	8	*0.66*	0.28-1.30
	Female	21	*1.83*	1.13-2.80
Spina bifida without anencephalus	Male	46	*3.82*	2.80-5.10
	Female	31	*2.70*	1.83-3.83
Hydrocephalus without spina bifida	Male	112	*9.30*	7.66-11.19
	Female	74	*6.44*	5.06-8.08
Encephalocele	Male	14	*1.16*	0.63-1.95
	Female	12	*1.04*	0.54-1.82
Microcephalus	Male	60	*4.98*	3.80-6.41
	Female	62	*5.40*	4.14-6.92
Total Central Nervous System Cases	Male	228	*18.94*	16.56-21.56
	Female	190	*16.54*	14.27-19.06
Eye and Ear				
Aniridia	Male	3	*0.25*	0.05-0.73
	Female	0	--	--
Anophthalmia/microthalmia	Male	14	*1.16*	0.63-1.95
	Female	12	*1.04*	0.54-1.82
Congenital cataract	Male	30	*2.49*	1.68-3.55
	Female	26	*2.26*	1.48-3.31
Anotia/microtia	Male	7	*0.58*	0.23-1.20
	Female	5	*0.44*	0.14-1.03
Total Eye and Ear Cases	Male	51	*4.24*	3.16-5.57
	Female	42	*3.66*	2.64-4.95
Cardiovascular				
Common truncus	Male	9	*0.75*	0.34-1.42
	Female	11	*0.96*	0.48-1.72
Transpostion of great arteries	Male	68	*5.65*	4.39-7.16
	Female	39	*3.39*	2.41-4.63

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Table 3: Birth Defects by Infant Sex 2000-2002

Birth Defect	Sex	Count	Rate	95% CI
Tetralogy of fallot	Male	69	*5.73*	4.46-7.25
	Female	50	*4.35*	3.23-5.74
Ventricular septal defect	Male	464	*38.54*	35.11-42.21
	Female	472	*41.08*	37.46-44.96
Atrial septal defect	Male	458	*38.04*	34.64-41.69
	Female	458	*39.86*	36.29-43.68
Endocardial cushion defect	Male	39	*3.24*	2.30-4.43
	Female	37	*3.22*	2.27-4.44
Pulmonary valve atresia and stenosis	Male	97	*8.06*	6.54-9.83
	Female	97	*8.44*	6.84-10.30
Tricuspid valve atresia and stenosis	Male	17	*1.41*	0.82-2.26
	Female	12	*1.04*	0.54-1.82
Ebstein's anomaly	Male	14	*1.16*	0.63-1.95
	Female	11	*0.96*	0.48-1.72
Aortic valve stenosis	Male	29	*2.41*	1.61-3.46
	Female	12	*1.04*	0.54-1.82
Hypoplastic left heart syndrome	Male	50	*4.15*	3.08-5.47
	Female	34	*2.96*	2.05-4.14
Patent ductus arteriosus	Male	549	*45.60*	41.86-49.58
	Female	443	*38.56*	35.05-42.32
Coarctation of aorta	Male	91	*7.56*	6.09-9.28
	Female	49	*4.26*	3.15-5.63
Total Cardiovascular Cases	Male	1391	*115.54*	109.55-121.78
	Female	1232	*107.22*	101.32-113.38
Orofacial				
Cleft palate without cleft lip	Male	68	*5.65*	4.39-7.16
	Female	81	*7.05*	5.60-8.76
Cleft lip with or without cleft palate	Male	173	*14.37*	12.31-16.68
	Female	98	*8.53*	6.92-10.40

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Table 3: Birth Defects by Infant Sex 2000-2002

Birth Defect	Sex	Count	Rate	95% CI
Choanal atresia	Male	21	*1.74*	1.08-2.66
	Female	22	*1.91*	1.20-2.89
Total Orofacial Cases	Male	261	*21.68*	19.13-24.48
	Female	200	*17.41*	15.08-19.99
Gastrointestinal				
Esophageal atresia/tracheoesophageal fistula	Male	34	*2.82*	1.95-3.94
	Female	30	*2.61*	1.76-3.73
Rectal and large intestinal atresia/stenosis[2]	Male	69	*5.73*	4.46-7.25
	Female	52	*4.53*	3.38-5.94
Pyloric stenosis	Male	518	*43.03*	39.40-46.90
	Female	104	*9.05*	7.39-10.97
Hirschsprung's disease	Male	50	*4.15*	3.08-5.47
	Female	17	*1.48*	0.86-2.37
Biliary atresia	Male	5	*0.42*	0.14-0.98
	Female	7	*0.61*	0.25-1.26
Total Gastrointestinal Cases	Male	672	*55.82*	51.68-60.20
	Female	207	*18.02*	15.65-20.64
Genitourinary				
Bladder exstrophy	Male	2	*0.17*	0.02-0.61
	Female	7	*0.61*	0.25-1.26
Hypospadias and epispadias	Male	1,090	*90.54*	85.24-96.08
	Female	0	--	--
Obstructive genitourinary defect	Male	369	*30.65*	27.60-33.94
	Female	161	*14.01*	11.93-16.35
Renal agenesis/hypoplasia[2]	Male	59	*4.90*	3.73-6.32
	Female	27	*2.35*	1.55-3.42

Continued on next page

Table 3: Birth Defects by Infant Sex 2000-2002

Birth Defect	Sex	Count	Rate	95% CI
Total Genitourinary Cases	Male	1503	*124.84*	118.61-131.32
	Female	191	*16.62*	14.35-19.16
Musculoskeletal				
Reduction deformity (upper limbs)	Male	25	*2.08*	1.35-3.07
	Female	25	*2.18*	1.41-3.22
Reduction deformity (lower limbs)	Male	10	*0.83*	0.40-1.53
	Female	9	*0.78*	0.36-1.48
Gastroschisis	Male	51	*4.24*	3.16-5.57
	Female	51	*4.44*	3.31-5.84
Omphalocele	Male	24	*1.99*	1.27-2.96
	Female	26	*2.26*	1.48-3.31
Diaphragmatic hernia	Male	56	*4.65*	3.51-6.04
	Female	23	*2.00*	1.27-3.00
Congenital hip dislocation	Male	49	*4.07*	3.01-5.38
	Female	137	*11.92*	10.01-14.10
Total Musculoskeletal Cases	Male	212	*17.61*	15.32-20.15
	Female	268	*23.32*	20.61-26.29
Chromosomal				
Trisomy 13	Male	7	*0.58*	0.23-1.20
	Female	16	*1.39*	0.79-2.26
Down syndrome	Male	149	*12.38*	10.47-14.53
	Female	131	*11.40*	9.53-13.53
Trisomy 18	Male	17	*1.41*	0.82-2.26
	Female	31	*2.70*	1.83-3.83
Total Chromosomal Cases	Male	172	*14.29*	12.23-16.59
	Female	175	*15.23*	13.06-17.66

Continued on next page

Table 3: Birth Defects by Infant Sex 2000-2002

Birth Defect	Sex	Count	Rate	95% CI
Other				
Fetal alcohol syndrome	Male	33	*2.74*	1.89-3.85
	Female	33	*2.87*	1.98-4.03
Total Cases				
	Male	4,169	346.29	335.86-356.96
	Female	2,292	199.48	191.40-207.82
Total Births	Male	120,391		
	Female	114,899		

[1]The sex of one fetal death case affected by anencephalus was undetermined.
[2] The sex of one fetal death case affected by rectal atresia/stenosis and renal agenesis was undetermined.

Birth Defects Counts and Rates by Race/Ethnicity

2000-2002

Birth defects counts, rates and confidence intervals by infant race/ethnicity are presented in Table 4. Over the period 2000 to 2002 there were 235,290 live births in Tennessee. Of these: 161,976 (69%) were non-Hispanic whites; 53,556 (23%) were Non-Hispanic blacks or African Americans; 14,359 (6%) were Hispanics; and 5,399 (2%) were of other or unknown race/ethnicity. Overall, 4,745 non-Hispanic white infants were affected by birth defects, corresponding to a rate of 292.94 infants per 10,000 live births (95% CI = 284.66-301.40); as were 1,310 non-Hispanic black infants, corresponding to a rate of 244.60 per 10,000 live births (95% CI = 231.53-258.40); 294 Hispanic infants, corresponding to a rate of 204.75 per 10,000 live births (95% CI = 182.01-229.54); and 114 infants of other or unknown race/ethnicity, corresponding to a rate of 211.15 per 10,000 live births (95% CI = 174.17-253.66). Thus, non-Hispanic white infants experienced the highest birth defects rates followed by non-Hispanic black infants, infants of other or unknown race/ethnicity and Hispanic infants. Hereafter non-Hispanic white infants and non-Hispanic black infants are simply referred to as white infants and black infants.

Based on the relative numbers of births and infants with birth defects in each of the four groups, black infants were chosen to serve as the reference group in the analyses of race/ethnicity. That is, all of the following comparisons are relative to birth defects rates experienced by black infants. Thus, a RR of 1.50 for white infants means that white infants are 50% more likely to be affected than black infants, whereas a RR of .50 means that white infants are 50% as likely to be affected as black infants, or that black infants are 2 times more likely to be affected.

Overall, white infants were 20% (RR = 1.20; 95% CI = 1.13-1.27) more likely to be affected by one of the 44 major birth defects than black infants. However, white infants were 20% less likely to affected by central nervous system birth defects (RR = .80; 95% CI = 0.64-0.99). Otherwise, white infants were 38% more likely to be affected by orofacial birth defects (RR = 1.38; 95% CI = 1.09-1.76),

nearly twice as likely to be affected by gastrointestinal birth defects (RR = 1.95; 95% CI = 1.60-2.36), 40% more likely to be affected by genitourinary birth defects (RR = 1.40; 95% CI = 1.23-1.58) and 54% more likely to be affected by musculoskeletal birth defects (RR = 1.54; 95% CI = 1.21-1.96).

Among central nervous system birth defects, white infants were only 59% as likely to be affected by microcephalus as black infants (RR = 0.59; 95% CI = 0.40-0.87), which corresponds to black infants being 71% more likely to be affected by microcephalus.

Among cardiovascular birth defects, white infants were 29% more likely to be affected by ventricular septal defects (RR = 1.29; 95% CI = 1.09-1.52), 23% more likely to be affected by atrial septal defects (RR = 1.23; 95% CI = 1.04-1.44), 3.75 times more likely to be affected by aortic valve stenosis (RR = 3.75; 95% CI = 1.15-12.20), and 68% more likely to be affected by coarctation of the aorta (RR = 1.68; 95% CI = 1.06-2.69). However, white infants were only 66% as likely to be affected by pulmonary valve atresia/stenosis (RR = 0.66; 95% CI = 0.49-0.90), which corresponds to black infants being 51% more likely to be affected.

Among gastrointestinal birth defects, white infants were nearly 3 times as likely to be affected by pyloric stenosis (RR = 2.86; 95% CI = 2.19-3.74). Among genitourinary birth defects, white infants were twice as likely to be affected by obstructive genitourinary defects (RR = 2.18; 95% C.I. = 1.68-2.84) and 22% more likely to be affected by hypospadias (RR = 1.22; 95% CI = 1.05-1.41). Among musculoskeletal birth defects, white infants were more than 3 times as likely to be affected by congenital hip dislocation (RR = 3.39; 95% CI = 2.20-5.63).

However, among chromosomal birth defects, black infants were more than twice as likely to be affected by trisomy 18 (RR = 0.45; 95% CI = 0.25-0.80). Black

infants were also more than 3 times as likely to be affected by fetal alcohol syndrome (RR = 0.30; 95% CI = 0.19-0.49).

Overall, Hispanic infants were .84 times as likely to be affected by a birth defect (RR = 0.84; 95% CI = 0.74-0.95). Hispanic infants were also .73 times as likely to be affected by a cardiovascular birth defect (RR = 0.73; 95% CI = 0.60-0.89). Thus, black infants were 19% more likely to be affected by a birth defect and 37% more likely to be diagnosed with a cardiovascular birth defect than Hispanic infants.

Among cardiovascular birth defects, Hispanic infants were .69 times as likely to be affected by atrial septal defect (RR = 0.69; 95% CI = 0.48-0.99), .43 times as likely to be affected by pulmonary valve atresia/stenosis (RR = 0.43; 95% CI = 0.20-0.94), and .65 times as likely to be affected by patent ductus arteriosus as black infants (RR = 0.65; 95% CI = 0.47-0.89).

Among gastrointestinal birth defects, Hispanic infants were .24 times as likely to be affected by rectal and large intestinal atresia/stenosis (RR = 0.24: 95% CI = 0.03-0.95) and more than twice as likely to be affected by pyloric stenosis (RR = 2.11; 95% CI = 1.39-3.22).

Among genitourinary birth defects, Hispanic infants were 1.8 times as likely to be affected by obstructive genitourinary defects (RR = 1.81; 95% CI = 1.18-2.77), but only .42 times as likely to be affected by hypospadias (RR = 0.42; 95% CI = 0.28-0.63).

No Hispanic infants were affected by FAS.

Overall, infants of other or unknown race/ethnicity were .69 times as likely to be affected by cardiovascular birth defects (RR = 0.69; 95% CI = 0.50-0.94) and

twice as likely to be affected by obstructive genitourinary defects (RR = 2.02; 95% CI = 1.11-3.66).

Table 4: Birth Defects by Race/Ethnicity 2000-2002

Birth Defect	Non-Hispanic White	Non-Hispanic Black or African American	Hispanic	Other/ Unknown
Central Nervous System				
Anencephalus	20	7	3	0
Rate	***1.23***	***1.31***	***2.09***	***--***
95% Confidence Interval	0.75-1.90	0.53-2.70	0.43-6.11	--
Spina bifida without anencephalus	59	12	3	3
Rate	***3.64***	***2.24***	***2.09***	***5.56***
95% Confidence Interval	2.77-4.70	1.16-3.91	0.43-6.11	1.15-16.25
Hydrocephalus without spina bifida	120	52	9	5
Rate	***7.41***	***9.71***	***6.27***	***9.26***
95% Confidence Interval	6.14-8.86	7.25-12.73	2.87-11.90	3.01-21.61
Encephalocele	15	9	0	2
Rate	***0.93***	***1.68***	***--***	***3.70***
95% Confidence Interval	0.52-1.53	0.77-3.19	--	0.45-13.37
Microcephalus	69	39	13	1
Rate	***4.26***	***7.28***	***9.05***	***1.85***
95% Confidence Interval	3.31-5.39	5.18-9.95	4.82-15.48	0.05-10.31
Total Central Nervous System Cases	270	112	27	10
Rate	***16.67***	***20.91***	***18.80***	***18.52***
95% Confidence Interval	14.74-18.78	17.22-25.16	12.39-27.35	8.88-34.06
Eye and Ear				
Aniridia	2	1	0	0
Rate	***0.12***	***0.19***	***--***	***--***
95% Confidence Interval	0.01-0.43	0.00-1.06	--	--
Anophthalmia/microphthalmia	17	4	3	2
Rate	***1.05***	***0.75***	***2.09***	***3.70***
95% Confidence Interval	0.61-1.68	0.20-1.92	0.43-6.11	0.45-13.37
Congenital cataract	39	12	4	1
Rate	***2.41***	***2.24***	***2.79***	***1.85***
95% Confidence Interval	1.71-3.29	1.16-3.91	0.76-7.14	0.05-10.31
Anotia/microtia	8	3	1	0
Rate	***0.49***	***0.56***	***0.70***	***--***
95% Confidence Interval	0.21-0.97	0.12-1.64	0.02-3.90	--
Total Eye and Ear Cases	63	19	8	3
Rate	***3.89***	***3.55***	***5.57***	***5.56***
95% Confidence Interval	2.99-4.98	2.14-5.54	2.40-10.98	1.15-16.25

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Table 4: Birth Defects by Race/Ethnicity 2000-2002

Birth Defect	Non-Hispanic White	Non-Hispanic Black or African American	Hispanic	Other/ Unknown
Cardiovascular				
Common truncus	11	8	1	0
Rate	***0.68***	***1.49***	***0.70***	***--***
95% Confidence Interval	0.34-1.22	0.64-2.94	0.02-3.90	--
Transposition of great arteries	79	21	6	1
Rate	***4.88***	***3.92***	***4.18***	***1.85***
95% Confidence Interval	3.86-6.08	2.43-5.99	1.53-9.10	0.05-10.31
Tetralogy of Fallot	78	35	3	3
Rate	***4.82***	***6.54***	***2.09***	***5.56***
95% Confidence Interval	3.81-6.02	4.56-9.10	0.43-6.11	1.15-16.25
Ventricular septal defect	693	178	51	14
Rate	***42.78***	***33.24***	***35.52***	***25.93***
95% Confidence Interval	39.65-46.09	28.54-38.49	26.45-46.70	14.18-43.51
Atrial septal defect	682	184	34	16
Rate	***42.11***	***34.36***	***23.68***	***29.64***
95% Confidence Interval	39.01-45.39	29.57-39.70	16.40-33.09	16.94-48.13
Endocardial cushion defect	60	13	2	1
Rate	***3.70***	***2.43***	***1.39***	***1.85***
95% Confidence Interval	2.82-4.76	1.29-4.16	0.17-5.02	0.05-10.31
Pulmonary valve atresia and stenosis	122	61	7	4
Rate	***7.53***	***11.39***	***4.87***	***7.41***
95% Confidence Interval	6.25-8.99	8.71-14.63	1.96-10.03	2.02-18.97
Tricuspid valve atresia and stenosis	22	6	1	0
Rate	***1.36***	***1.12***	***0.70***	***--***
95% Confidence Interval	0.85-2.06	0.41-2.44	0.02-3.90	--
Ebstein's anomaly	19	3	2	1
Rate	***1.17***	***0.56***	***1.39***	***1.85***
95% Confidence Interval	0.70-1.83	0.12-1.64	0.17-5.02	0.05-10.31
Aortic valve stenosis	34	3	2	2
Rate	***2.10***	***0.56***	***1.39***	***3.70***
95% Confidence Interval	1.45-2.93	0.12-1.64	0.17-5.02	0.45-13.37
Hypoplastic left heart syndrome	59	18	7	0
Rate	***3.64***	***3.36***	***4.87***	***--***
95% Confidence Interval	2.77-4.70	1.99-5.31	1.96-10.03	--

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Table 4: Birth Defects by Race/Ethnicity 2000-2002

Birth Defect	Non-Hispanic White	Non-Hispanic Black or African American	Hispanic	Other/ Unknown
Patent ductus arteriosus	673	254	44	21
Rate	***41.55***	***47.43***	***30.64***	***38.90***
95% Confidence Interval	38.47-44.81	41.78-53.63	22.26-41.13	24.08-59.46
Coarctation of aorta	107	21	9	3
Rate	***6.61***	***3.92***	***6.27***	***5.56***
95% Confidence Interval	5.42-7.98	2.43-5.99	2.87-11.90	1.15-16.25
Total Cardiovascular Cases	1856	606	119	42
Rate	***114.58***	***113.15***	***82.87***	***77.79***
95% Confidence Interval	109.43-119.92	104.32-122.53	68.65-99.17	56.06-105.15
Orofacial				
Cleft palate without cleft lip	112	27	9	1
Rate	***6.91***	***5.04***	***6.27***	***1.85***
95% Confidence Interval	5.69-8.32	3.32-7.33	2.87-11.90	0.05-10.31
Cleft lip with and without cleft palate	202	50	15	4
Rate	***12.47***	***9.34***	***10.45***	***7.41***
95% Confidence Interval	10.81-14.31	6.93-12.31	5.85-17.24	2.02-18.97
Choanal Atresia	35	6	1	1
Rate	***2.16***	***1.12***	***0.70***	***1.85***
95% Confidence Interval	1.50-3.00	0.41-2.44	0.02-3.90	0.05-10.31
Total Orofacial Cases	347	83	25	6
Rate	***21.42***	***15.50***	***17.41***	***11.11***
95% Confidence Interval	19.23-23.80	12.35-19.22	11.27-25.70	4.08-24.18
Gastrointestinal				
Esophageal atresia/ tracheoesophageal fistula	45	16	3	0
Rate	***2.78***	***2.99***	***2.09***	***--***
95% Confidence Interval	2.03-3.72	1.71-4.86	0.43-6.11	--
Rectal and large intestinal atresia/stenosis	88	31	2	1
Rate	***5.43***	***5.79***	***1.39***	***1.85***
95% Confidence Interval	4.35-6.69	3.93-8.22	0.17-5.02	0.05-10.31
Pyloric Stenosis	519	60	34	9
Rate	***32.04***	***11.20***	***23.68***	***16.67***
95% Confidence Interval	29.34-34.92	8.55-14.42	16.40-33.09	7.62-31.64
Hirschsprung's disease	50	13	3	1
Rate	***3.09***	***2.43***	***2.09***	***1.85***
95% Confidence Interval	2.29-4.07	1.29-4.16	0.43-6.11	0.05-10.31

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Table 4: Birth Defects by Race/Ethnicity 2000-2002

Birth Defect	Non-Hispanic White	Non-Hispanic Black or African American	Hispanic	Other/ Unknown
Biliary Atresia	7	4	0	1
Rate	***0.43***	***0.75***	***--***	***1.85***
95% Confidence Interval	0.17-0.89	0.20-1.92	--	0.05-10.31
Total Gastrointestinal Cases	706	120	42	12
Rate	***43.59***	***22.41***	***29.25***	***22.23***
95% Confidence Interval	40.43-46.92	18.58-26.79	21.08-39.54	11.49-38.83
Genitourinary				
Bladder Exstrophy	9	0	0	0
Rate	***0.56***	***--***	***--***	***--***
95% Confidence Interval	0.26-1.06	--	--	--
Hypospadias and Epispadias	822	223	25	20
Rate	***50.75***	***41.64***	***17.41***	***37.04***
95% Confidence Interval	47.34-54.34	36.35-47.48	11.27-25.70	22.62-57.20
Obstructive genitourinary defect	422	64	31	13
Rate	***26.05***	***11.95***	***21.59***	***24.08***
95% Confidence Interval	23.62-28.66	9.20-15.26	14.67-30.64	12.82-41.18
Renal agenesis/hypoplasia	58	21	7	1
Rate	***3.58***	***3.92***	***4.87***	***1.85***
95% Confidence Interval	2.72-4.63	2.43-5.99	1.96-10.03	0.05-10.31
Total Genitourinary Cases	1292	306	63	34
Rate	***79.76***	***57.14***	***43.87***	***62.97***
95% Confidence Interval	75.47-84.24	50.92-63.91	33.71-56.13	43.61-87.99
Musculoskeletal				
Reduction deformity, upper limbs	36	9	4	1
Rate	***2.22***	***1.68***	***2.79***	***1.85***
95% Confidence Interval	1.55-3.07	0.77-3.19	0.76-7.14	0.05-10.31
Reduction deformity, lower limbs	13	4	2	0
Rate	***0.80***	***0.75***	***1.39***	***--***
95% Confidence Interval	0.43-1.37	0.20-1.92	0.17-5.02	--
Gastroschisis	75	19	3	5
Rate	***4.63***	***3.55***	***2.09***	***9.26***
95% Confidence Interval	3.64-5.80	2.14-5.54	0.43-6.11	3.01-21.61
Omphalocele	35	12	1	2
Rate	***2.16***	***2.24***	***0.70***	***3.70***
95% Confidence Interval	1.50-3.00	1.16-3.91	0.02-3.90	0.45-13.37

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Table 4: Birth Defects by Race/Ethnicity 2000-2002

Birth Defect	Non-Hispanic White	Non-Hispanic Black or African American	Hispanic	Other/ Unknown
Diaphragmatic hernia	50	20	6	3
Rate	***3.09***	***3.73***	***4.18***	***5.56***
95% Confidence Interval	2.29-4.07	2.28-5.76	1.53-9.10	1.15-16.25
Congenital hip dislocation	163	16	6	1
Rate	***10.06***	***2.99***	***4.18***	***1.85***
95% Confidence Interval	8.57-11.73	1.71-4.86	1.53-9.10	0.05-10.31
Total Musculoskeletal Cases	368	79	21	12
Rate	***22.72***	***14.75***	***14.62***	***22.23***
95% Confidence Interval	20.46-25.16	11.68-18.38	9.05-22.35	11.48-38.82
Chromosomal				
Trisomy 13	14	7	2	0
Rate	***0.86***	***1.31***	***1.39***	***--***
95% Confidence Interval	0.47-1.44	0.53-2.70	0.17-5.02	--
Down syndrome	202	56	17	5
Rate	***12.47***	***10.46***	***11.84***	***9.26***
95% Confidence Interval	10.81-14.31	7.90-13.58	6.90-18.96	3.01-21.61
Trisomy 18	27	20	1	0
Rate	***1.67***	***3.73***	***0.70***	***--***
95% Confidence Interval	1.10-2.43	2.28-5.76	0.02-3.90	--
Total Chromosomal Cases	239	83	20	5
Rate	***14.76***	***15.50***	***13.93***	***9.26***
95% Confidence Interval	12.95-16.75	12.35-19.22	8.51-21.51	3.01-21.61
Other				
Fetal alcohol syndrome	31	34	0	1
Rate	***1.91***	***6.35***	***--***	***1.85***
95% Confidence Interval	1.30-2.71	4.40-8.87	--	0.05-10.31
Total Cases	4,745	1,310	294	114
Rate	***292.94***	***244.60***	***204.75***	***211.15***
95% Confidence Interval	284.66-301.40	231.53-258.22	182.01-229.54	174.17-253.66
Total Live Births	161,976	53,556	14,359	5,399

Birth Defects Counts and Rates by Perinatal Region

2000-2002

Birth defects counts, rates and confidence intervals for the 44 major birth defects by perinatal region are presented in Table 5. In all there are five designated perinatal regions: Northeast, East, Southeast, Middle and West with corresponding Perinatal Center Hospitals in Johnson City, Knoxville, Chattanooga, Nashville and Memphis. A map depicting the five regions and the Perinatal Center Hospitals is shown in Figure 1. Figure 2 shows the overall county-level rates and rate quartiles of infants with birth defects diagnoses. County-level birth defects counts for all of the 44 major birth defects, their rates and rate confidence intervals are presented by county in Appendix B. The rates in Figure 2 will generally be lower than those in Appendix B, as the rates in Figure 2 represent infants affected by birth defects and the rates in Appendix B represent diagnoses. Infants with multiple diagnoses cause the Appendix B rates to be higher.

Of the 235,290 live births to Tennessee residents during the 2000-2002 period: 16,025 (6.8%) resided in the Northeast; 41,259 (17.5%) resided in the East; 22,054 (9.4%) resided in the Southeast; 88,900 (37.8%) resided in the Middle; and 67,052 (28.5%) resided in the West. Of these, 769 Northeast infants were affected by at least one of the 44 major birth defects, corresponding to a rate of 479.88 per 10,000 live births (95% CI = 446.56-515.03); 1,340 East infants were diagnosed, corresponding to a rate of 324.78 per 10,000 live births (95% CI = 307.62-342.64); 603 infants were diagnosed in the Southeast, corresponding to a rate of 273.42 per 10,000 live births (95% CI = 252.03-296.14); 2,159 were diagnosed in the Middle Perinatal Region, corresponding to a rate of 242.86 per 10,000 live births (95% CI = 232.72-253.32); and 1,592 were diagnosed in the West Perinatal Region, corresponding to a rate of 237.43 per 10,000 live births (95% CI = 225.91-249.38). Thus, the highest birth defects rates were in the Northeast Perinatal Region, followed in order by the East, Southeast, Middle and West Perinatal Regions. In the rate comparisons that follow the West Perinatal Region served as the reference group.

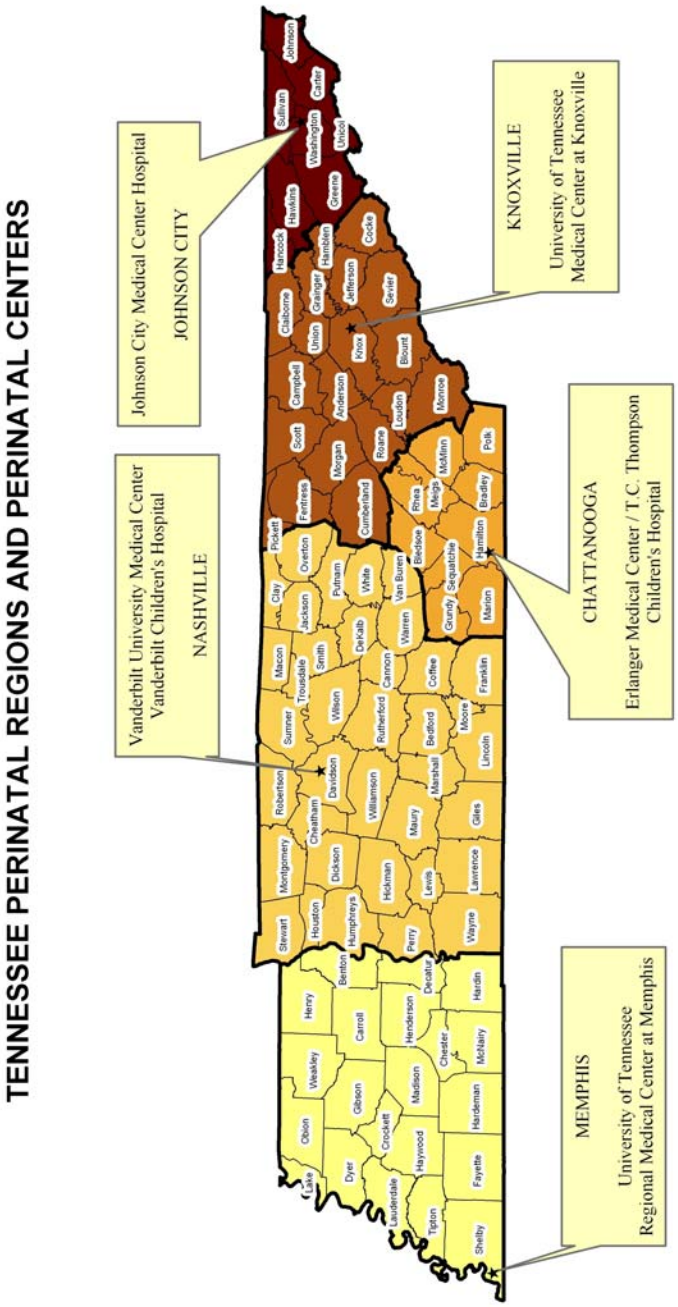

Figure 1. Tennessee's Five Perinatal Regions and Designated Perinatal Center Hospitals.

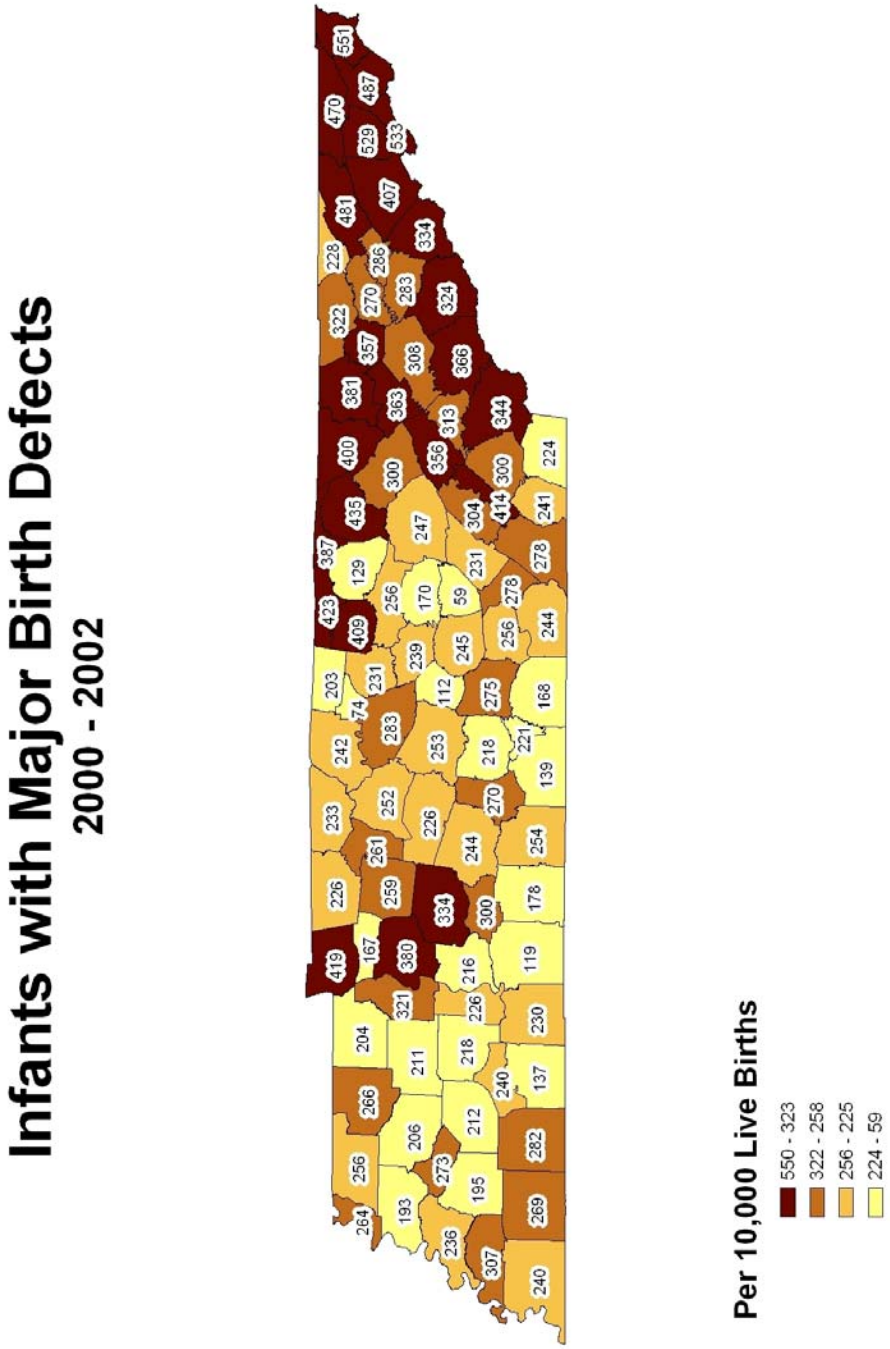

Figure 2. County-level infants with birth defects diagnoses: three-year rate quartiles and three-year rates per 10,000 live births.

Infants in the Northeast Perinatal region were twice as likely to be affected by a major birth defect than an infant residing in the West Perinatal Region (RR = 2.02; 95% CI = 1.86-2.20). Additionally, infants in the Northeast were three times as likely to be affected by a cardiovascular birth defect (RR = 3.09; 95% CI = 2.75-3.48), 59% more likely to be affected by a gastrointestinal birth defect (RR = 1.59; 95% CI = 1.22-2.09), and 56% more likely to be affected by a genitourinary birth defect (RR = 1.56; 95% CI = 1.29-1.89).

Among cardiovascular birth defects, infants in the Northeast Perinatal Region were nearly six times as likely to be affected by atrial septal defect (RR = 5.97; 95% CI = 4.99-7.14), more than four times as likely to be affected by tricuspid valve atresia/stenosis (RR= 4.18; 95% CI = 1.05-16.73) and nearly four times as likely to be affected by patent ductus arteriosus (RR = 3.83; 95% CI = 3.18-4.60). They were also 3.25 times as likely to be affected by aortic valve stenosis (RR = 3.25; 95% CI = 1.21-8.74), 1.69 times as likely to be affected by ventricular septal defect (RR = 1.69; 95% CI = 1.34-2.14) and 1.63 times as likely to be affected by pulmonary valve atresia/stenosis (RR = 1.63; 95% CI = 1.01-2.64).

Among gastrointestinal birth defects, infants in the Northeast Perinatal Region were more than twice as likely to be affected by pyloric stenosis (RR = 2.26; 95% CI = 1.65-3.11). Among genitourinary birth defects, infants in the Northeast Perinatal Region were twice as likely to be affected by obstructive genitourinary defects (RR = 2.07; 95% CI = 1.49-2.88) and 1.42 times as likely to be affected by hypospadias (RR = 1.42; 95% CI = 1.11-1.81). Among musculoskeletal birth defects, infants in the Northeast Perinatal Region were 2.69 times as likely to be affected by congenital hip dislocation (RR = 2.69; 95% CI = 1.49-4.86).

Infants in the East Perinatal Region were 37% more likely to be affected by one of the 44 major birth defects than an infant residing in the West Perinatal Region (RR = 1.37; 95% CI = 1.27-1.47). Additionally infants in the East were 19% more likely to be affected by cardiovascular birth defects (RR = 1.19; 95% CI = 1.06-

1.34), 34% more likely to be affected by orofacial birth defects (RR = 1.34; 95% CI = 1.03-1.76), 78% more likely to be affected by gastrointestinal birth defects (RR = 1.78; 95% CI = 1.46-2.17), 76% more likely to be affected by genitourinary defects (RR = 1.76; 95% CI = 1.53-2.02), and 34% more likely to be affected by musculoskeletal birth defects (RR = 1.34; 95% CI = 1.03-1.76).

Among cardiovascular birth defects, infants in the East Perinatal Region were 28% more likely to be affected by ventricular septal defect (RR = 1.28; 95% CI = 1.06-1.55), nearly 5 times more likely to be affected by Ebstein's anomaly (RR = 4.88; 95% CI = 1.32-18.01), 29% more likely to be affected by patent ductus arteriosus (RR = 1.29; 95% CI = 1.06-1.56), and 2 times as likely to be affected by coarctation of the aorta (RR = 2.00; 95% CI = 1.19-3.36).

Among gastrointestinal birth defects, infants in the East Perinatal Region were more than twice as likely to be affected by pyloric stenosis (RR = 2.33; 95% CI = 1.82-2.97). Among genitourinary birth defects, infants in the East Perinatal Region were 2.78 times as likely to be affected by obstructive genitourinary defects (RR = 2.78; 95% CI = 2.19-3.53) and 35% more likely to be affected by hypospadias (RR = 1.35; 95% CI = 1.13-1.62). Additionally, there were five bladder exstrophy cases in the East and none in the West. Among musculoskeletal birth defects, infants in the East Perinatal Region were 2.61 times as likely to be affected by congenital hip dislocation (RR = 2.61; 95% CI = 1.63-4.19).

Infants in the Southeast Perinatal Region were 15% more likely to be affected by one of the 44 major birth defects than infants residing in the West Perinatal Region (RR = 1.15; 1.05-1.26). Additionally, infants in the Southeast were 48% more likely to be affected by gastrointestinal birth defects (RR = 1.48; 95% CI = 1.15-1.90).

Among central nervous system birth defects, Southeast Perinatal Region infants were only 37% as likely to be diagnosed with anencephalus (RR = 0.37; 95% CI = 0.16-0.87). However among cardiovascular birth defects, Southeast infants were nearly four times as likely to be affected by tricuspid valve atresia/stenosis (RR = 3.80; 95% CI = 1.02-14.15). Southeast infants were also 81% more likely to be affected by pyloric stenosis (RR = 1.81; 95% CI = 1.33-2.46), 29% more likely to be affected by hypospadias (RR = 1.29; 95% CI = 1.03-1.61) and 2.5 times more likely to be affected by congenital hip dislocation (RR = 2.5; 95% CI = 1.44-4.33).

Infants in the Middle Perinatal Region were only 72% as likely to be affected by central nervous system birth defects as an infant residing in the West Perinatal Region (RR = 0.72; 95% CI = 0.57-0.91). Additionally, infants in the Middle Perinatal Region were 28% more likely to be affected by gastrointestinal birth defects (RR = 1.28; 95% CI = 1.07-1.53), 19% more likely to be affected by genitourinary birth defects (RR = 1.19; 95% CI = 1.05-1.35), and only 75% as likely to be affected by chromosomal birth defects (RR = 0.75; 95% CI = 0.58-0.98).

Among central nervous system birth defects, infants in the Middle Perinatal Region were 52% as likely to be affected by microcephalus (RR = 0.52; 95% CI = 0.34-0.81). Among cardiovascular birth defects, Middle infants were 46% as likely to be affected by endocardial cushion defects (RR = 0.46; 95% CI = 0.26-0.82), but 68% more likely to be affected by coarctation of the aorta (RR = 1.68; 95% CI = 1.06-2.67). Among gastrointestinal birth defects, Middle infants were 61% more likely to be affected by pyloric stenosis (RR = 1.61; 95% CI = 1.28-2.02). Among genitourinary birth defects, Middle infants were 24% more likely to be affected by hypospadias (RR = 1.24; 95% CI = 1.06-1.45). Among musculoskeletal birth defects, Middle infants were nearly twice as likely to be affected by congenital hip dislocation (RR = 1.94; 95% CI = 1.25-3.00). Finally,

Middle infants were only 32% as likely to be affected by fetal alcohol syndrome (RR = 0.32; 95% CI = 0.16-0.64).

Table 5: Birth Defects by Perinatal Region 2000-2002

Birth Defect	Northeast	East	Southeast	Middle	West
Central Nervous System					
Anencephalus	2	4	2	14	8
Rate	***1.25***	***0.97***	***0.91***	***1.57***	***1.19***
95% Confidence Interval	0.15-4.52	0.26-2.48	0.11-3.29	0.86-2.63	0.51-2.34
Spina bifida without anencephalus	2	11	10	29	25
Rate	***1.25***	***2.67***	***4.53***	***3.26***	***3.73***
95% Confidence Interval	0.15-4.52	1.33-4.78	2.17-8.33	2.18-4.68	2.41-5.51
Hydrocephalus without spina bifida	20	37	16	56	57
Rate	***12.48***	***8.97***	***7.25***	***6.30***	***8.50***
95% Confidence Interval	7.62-19.27	6.32-12.36	4.14-11.77	4.76-8.18	6.44-11.01
Encephalocele	0	2	2	10	12
Rate	***--***	***0.48***	***0.91***	***1.12***	***1.79***
95% Confidence Interval	--	0.06-1.73	0.11-3.29	0.54-2.06	0.92-3.13
Microcephalus	10	23	6	34	49
Rate	***6.24***	***5.57***	***2.72***	***3.82***	***7.31***
95% Confidence Interval	2.99-11.48	3.53-8.36	1.00-5.92	2.65-5.34	5.41-9.66
Total Central Nervous System Cases	34	73	36	135	142
Rate	***21.22***	***17.69***	***16.32***	***15.07***	***21.18***
95% Confidence Interval	14.69-29.65	13.87-22.24	11.43-22.59	12.63-17.97	17.84-24.96
Eye and Ear					
Aniridia	1	0	1	1	0
Rate	***0.62***	***--***	***0.45***	***0.11***	***--***
95% Confidence Interval	0.02-3.45	--	0.01-2.51	0.00-0.61	--
Anophthalmia/microphthalmia	4	4	2	8	8
Rate	***2.50***	***0.97***	***0.91***	***0.90***	***1.19***
95% Confidence Interval	0.68-6.40	0.26-2.48	0.11-3.29	0.39-1.77	0.51-2.34
Congenital cataract	4	8	8	19	17
Rate	***2.50***	***1.94***	***3.63***	***2.14***	***2.54***
95% Confidence Interval	0.68-6.40	0.84-3.82	1.57-7.15	1.29-3.34	1.48-4.07
Anotia/microtia	0	3	2	4	3
Rate	***--***	***0.73***	***0.91***	***0.45***	***0.45***
95% Confidence Interval	--	0.15-2.13	0.11-3.29	0.12-1.15	0.09-1.32
Total Eye and Ear Cases	9	15	11	31	27
Rate	***5.62***	***3.64***	***4.99***	***3.49***	***4.03***
95% Confidence Interval	2.57-10.67	2.04-6.00	2.49-8.93	2.37-4.95	2.66-5.86

Continued on next page

Table 5: Birth Defects by Perinatal Region 2000-2002

Birth Defect	Northeast	East	Southeast	Middle	West
Cardiovascular					
Common truncus	0	2	3	6	9
Rate	***--***	***0.48***	***1.36***	***0.67***	***1.34***
95% Confidence Interval	--	0.06-1.73	0.28-3.97	0.25-1.46	0.61-2.54
Transposition of great arteries	4	22	13	37	31
Rate	***2.50***	***5.33***	***5.89***	***4.16***	***4.62***
95% Confidence Interval	0.68-6.40	3.34-8.07	3.14-10.07	2.93-5.73	3.14-6.56
Tetralogy of Fallot	10	29	7	35	38
Rate	***6.24***	***7.03***	***3.17***	***3.94***	***5.67***
95% Confidence Interval	2.99-11.48	4.71-10.10	1.27-6.53	2.74-5.48	4.01-7.78
Ventricular septal defect	97	189	96	314	240
Rate	***60.53***	***45.81***	***43.53***	***35.32***	***35.79***
95% Confidence Interval	49.08-73.84	39.51-52.83	35.26-53.16	31.52-39.45	31.40-40.62
Atrial septal defect	288	124	62	240	202
Rate	***179.72***	***30.05***	***28.11***	***27.00***	***30.13***
95% Confidence Interval	159.56-201.72	24.99-35.83	21.55-36.04	23.69-30.64	26.12-34.58
Endocardial cushion defect	6	15	5	19	31
Rate	***3.74***	***3.64***	***2.27***	***2.14***	***4.62***
95% Confidence Interval	1.37-8.14	2.04-6.00	0.74-5.30	1.29-3.34	3.14-6.56
Pulmonary valve atresia and stenosis	23	28	21	63	59
Rate	***14.35***	***6.79***	***9.52***	***7.09***	***8.80***
95% Confidence Interval	9.10-21.53	4.51-9.81	5.89-14.55	5.45-9.07	6.70-11.35
Tricuspid valve atresia and stenosis	4	8	5	8	4
Rate	***2.50***	***1.94***	***2.27***	***0.90***	***0.60***
95% Confidence Interval	0.68-6.40	0.84-3.82	0.74-5.30	0.39-1.77	0.16-1.54
Ebstein's anomaly	1	9	2	10	3
Rate	***0.62***	***2.18***	***0.91***	***1.12***	***0.45***
95% Confidence Interval	0.02-3.45	1.00-4.14	0.11-3.29	0.54-2.06	0.09-1.32
Aortic valve stenosis	7	4	5	16	9
Rate	***4.37***	***0.97***	***2.27***	***1.80***	***1.34***
95% Confidence Interval	1.76-9.00	0.26-2.48	0.74-5.30	1.03-2.92	0.61-2.54
Hypoplastic left heart syndrome	5	11	9	35	24
Rate	***3.12***	***2.67***	***4.08***	***3.94***	***3.58***
95% Confidence Interval	1.01-7.28	1.33-4.78	1.87-7.75	2.74-5.48	2.29-5.33
Patent ductus arteriosus	215	186	81	275	235
Rate	***134.17***	***45.08***	***36.73***	***30.93***	***35.05***
95% Confidence Interval	116.83-153.35	38.83-52.05	29.17-45.65	27.38-34.81	30.71-39.83

Continued on next page

Table 5: Birth Defects by Perinatal Region 2000-2002

Birth Defect	Northeast	East	Southeast	Middle	West
Coarctation of aorta	8	32	16	58	26
Rate	***4.99***	***7.76***	***7.25***	***6.52***	***3.88***
95% Confidence Interval	2.15-9.83	5.31-10.95	4.14-11.77	4.95-8.43	2.53-5.68
Total Cardiovascular Cases	482	478	231	780	652
Rate	***300.78***	***115.85***	***104.74***	***87.74***	***97.24***
95% Confidence Interval	274.52-328.87	105.70-126.72	91.67-119.16	81.69-94.12	89.92-105.00
Orofacial					
Cleft palate without cleft lip	9	29	18	61	32
Rate	***5.62***	***7.03***	***8.16***	***6.86***	***4.77***
95% Confidence Interval	2.57-10.67	4.71-10.10	4.84-12.90	5.25-8.81	3.26-6.73
Cleft lip with and without cleft palate	18	61	28	91	73
Rate	***11.23***	***14.78***	***12.70***	***10.24***	***10.89***
95% Confidence Interval	6.66-17.75	11.31-18.98	8.44-18.36	8.24-12.57	8.54-13.69
Choanal Atresia	4	7	3	17	12
Rate	***2.50***	***1.70***	***1.36***	***1.91***	***1.79***
95% Confidence Interval	0.68-6.40	0.68-3.50	0.28-3.97	1.11-3.06	0.92-3.13
Total Orofacial Cases	31	96	49	169	116
Rate	***19.34***	***23.27***	***22.22***	***19.01***	***17.30***
95% Confidence Interval	13.14-27.45	18.85-28.42	16.44-29.38	16.25-22.10	14.30-20.75
Gastrointestinal					
Esophageal atresia/tracheoesophageal fistula	2	14	3	25	20
Rate	***1.25***	***3.39***	***1.36***	***2.81***	***2.98***
95% Confidence Interval	0.15-4.52	1.85-5.69	0.28-3.97	1.82-4.15	1.82-4.60
Rectal and large intestinal atresia/stenosis	7	20	11	42	42
Rate	***4.37***	***4.85***	***4.99***	***4.72***	***6.26***
95% Confidence Interval	1.76-9.00	2.96-7.49	2.49-8.93	3.40-6.38	4.51-8.46
Pyloric Stenosis	59	156	65	233	109
Rate	***36.82***	***37.81***	***29.47***	***26.21***	***16.26***
95% Confidence Interval	28.03-47.49	32.11-44.23	22.74-37.56	22.95-29.80	13.35-19.61
Hirschsprung's disease	4	13	11	21	18
Rate	***2.50***	***3.15***	***4.99***	***2.36***	***2.68***
95% Confidence Interval	0.68-6.40	1.68-5.39	2.49-8.93	1.46-3.61	1.59-4.24
Biliary Atresia	0	4	3	3	2
Rate	***--***	***0.97***	***1.36***	***0.34***	***0.30***
95% Confidence Interval	--	0.26-2.48	0.28-3.97	0.07-0.99	0.04-1.08

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Table 5: Birth Defects by Perinatal Region 2000-2002

Birth Defect	Northeast	East	Southeast	Middle	West
Total Gastrointestinal Cases	72	207	92	320	189
Rate	***44.93***	***50.17***	***41.72***	***36.00***	***28.19***
95% Confidence Interval	35.15-56.58	43.57-57.49	33.63-51.17	32.16-40.16	24.31-32.50
Genitourinary					
Bladder Exstrophy	0	5	1	3	0
Rate	***--***	***1.21***	***0.45***	***0.34***	***--***
95% Confidence Interval	--	0.39-2.82	0.01-2.51	0.07-0.99	--
Hypospadias and Epispadias	87	214	109	423	257
Rate	***54.29***	***51.87***	***49.42***	***47.58***	***38.33***
95% Confidence Interval	43.49-66.97	45.15-59.30	40.58-59.62	43.15-52.34	33.79-43.31
Obstructive genitourinary defect	53	183	*36*	*151*	*107*
Rate	***33.07***	***44.35***	***16.32***	***16.99***	***15.96***
95% Confidence Interval	24.77-43.26	38.16-51.27	11.43-22.59	14.39-19.92	13.08-19.28
Renal agenesis/hypoplasia	6	21	4	33	23
Rate	***3.74***	***5.09***	***1.81***	***3.71***	***3.43***
95% Confidence Interval	1.37-8.14	3.15-7.78	0.49-4.63	2.55-5.21	2.17-5.15
Total Genitourinary Cases	143	416	147	605	384
Rate	***89.24***	***100.83***	***66.65***	***68.05***	***57.27***
95% Confidence Interval	75.21-105.12	91.37-111.00	56.31-78.34	62.73-73.70	51.68-63.29
Musculoskeletal					
Reduction deformity, upper limbs	6	10	3	18	13
Rate	***3.74***	***2.42***	***1.36***	***2.02***	***1.94***
95% Confidence Interval	1.37-8.14	1.16-4.45	0.28-3.97	1.20-3.19	1.03-3.32
Reduction deformity, lower limbs	0	3	3	5	8
Rate	***--***	***0.73***	***1.36***	***0.56***	***1.19***
95% Confidence Interval	--	0.15-2.13	0.28-3.97	0.18-1.31	0.51-2.34
Gastroschisis	4	18	12	37	31
Rate	***2.50***	***4.36***	***5.44***	***4.16***	***4.62***
95% Confidence Interval	0.68-6.40	2.58-6.89	2.81-9.50	2.93-5.73	3.14-6.56
Omphalocele	1	8	9	17	15
Rate	***0.62***	***1.94***	***4.08***	***1.91***	***2.24***
95% Confidence Interval	0.02-3.45	0.84-3.82	1.87-7.75	1.11-3.06	1.25-3.69
Congenital hip dislocation	18	45	23	72	28
Rate	***11.23***	***10.91***	***10.43***	***8.10***	***4.18***
95% Confidence Interval	6.66-17.75	7.96-14.60	6.61-15.65	6.34-10.20	2.78-6.04

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Table 5: Birth Defects by Perinatal Region 2000-2002

Birth Defect	Northeast	East	Southeast	Middle	West
Diaphragmatic hernia	7	12	3	32	25
Rate	***4.37***	***2.91***	***1.36***	***3.60***	***3.73***
95% Confidence Interval	1.76-9.00	1.50-5.08	0.28-3.97	2.46-5.08	2.41-5.51
Total Musculoskeletal Cases	36	96	52	180	116
Rate	***22.46***	***23.27***	***23.58***	***20.25***	***17.30***
95% Confidence Interval	15.73-31.09	18.85-28.42	17.61-30.92	17.40-23.43	14.30-20.75
Chromosomal					
Trisomy 13	1	6	3	9	4
Rate	***0.62***	***1.45***	***1.36***	***1.01***	***0.60***
95% Confidence Interval	0.02-3.45	0.53-3.16	0.28-3.97	0.46-1.92	0.16-1.54
Down syndrome	22	54	21	91	92
Rate	***13.73***	***13.09***	***9.52***	***10.24***	***13.72***
95% Confidence Interval	8.60-20.79	9.83-17.08	5.89-14.55	8.24-12.57	11.06-16.83
Trisomy 18	2	13	2	13	18
Rate	***1.25***	***3.15***	***0.91***	***1.46***	***2.68***
95% Confidence Interval	0.15-4.52	1.68-5.39	0.11-3.29	0.78-2.50	1.59-4.24
Total Chromosomal Cases	25	70	26	113	113
Rate	***15.60***	***16.97***	***11.79***	***12.71***	***16.85***
95% Confidence Interval	10.09-23.03	13.23-21.44	7.70-17.27	10.47-15.28	13.89-20.26
Other					
Fetal alcohol syndrome	5	14	7	12	28
Rate	***3.12***	***3.39***	***3.17***	***1.35***	***4.18***
95% Confidence Interval	1.01-7.28	1.85-5.69	1.27-6.53	0.70-2.36	2.78-6.04
Total Cases	769	1340	603	2159	1592
	479.88	***324.78***	***273.42***	***242.86***	***237.43***
	446.56-515.03	307.62-342.64	252.03-296.14	232.72-253.32	225.91-249.38
Total Live Births	16,025	41,259	22,054	88,900	67,052

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Appendix A

Birth Defects Glossary

Agenesis	Absence of part(s) of the body. Lack of development or failure to develop part(s) of the body.
Anencephalus	Partial or complete absence of the brain and skull. Anencephalus is incompatible with life.
Aniridia	Hypoplasia of the iris of both eyes.
Anophthalmia	Congenital defect characterized by complete absence of the eyes, or by the presence of vestigial eyes.
Anotia	Congenital absence of one or both ears.
Aortic valve stenosis	Cardiac anomaly characterized by a narrowing or stricture of the aortic valve.
Aplasia	Absence of a tissue or organ due to lack of cell proliferation.
Atresia	Absence or closure of a normal opening.
Atrial septal defect	A congenital cardiac malformation in which there are one or several openings in the atrial septum. Most common type is called ostium secundum defect.
Biliary atresia	A congenital absence or underdevelopment of one or more of the ducts in the biliary tract.
Bladder exstrophy	Incomplete closure of the anterior wall of the bladder and the abdominal cavity. The upper urinary tract is generally normal. Often associated with anorectal and genital malformations.
Congenital cataract	An opacity of the lens of the eye that has its origin prenatally.
Choanal atresia or stenosis	A congenital anomaly in which a bony or membranous formation blocks the passage between the nose and the pharynx.

Chromosome	A molecule of DNA. Humans have twenty-three pairs of chromosomes twenty-two pairs of autosomes and one pair of sex chromosomes. Chromosomes are visible under a regular light microscope.
Chromosome abnormalities	A major group of genetic diseases caused by alterations in the number or structure of chromosomes.
Cleft lip	The congenital failure of the fetal components of the lip to fuse or join, forming a groove or fissure in the lip. Infants with this condition can have difficulty feeding and may use assistive devices for feeding. This condition is corrected when the infant can tolerate surgery.
Cleft palate	The congenital failure of the palate to fuse properly forming a grooved depression or fissure in the roof of the mouth. This defect varies in degree of severity. The fissure can extend into the hard and soft palate and into the nasal cavities. Infants with this condition have difficulty feeding, and may use assistive devices for feeding. Surgical correction is begun as soon as possible.
Coarctation of the aorta	Localized narrowing of the aorta. This condition can vary from mild to severe.
Common truncus arteriosus	A congenital heart defect in which the common arterial trunk fails to divide into the pulmonary artery and aorta.
Congenital	Existing at or dating from birth.
Congenital hip dislocation	Location of the head of the femur (bone of the upper leg) outside its normal location in the cup-shaped cavity formed by the hip bones (acetabulum).
Diaphragmatic hernia	Incomplete formation of the diaphragm through which a portion of the abdominal contents herniate into the thoracic cavity.

Down syndrome (Trisomy 21)	The presence of three copies of all or a large part of chromosome 21. Typical characteristics include moderate to severe mental retardation, sloping forehead, small ear canals, flat-bridge of the nose and short fingers and toes. Many Down syndrome infants also have congenital heart disease.
Dysgenesis	Anomalous or disorganized formation of an organ.
Dysplasia	Disorganized cell structure or arrangement within a tissue or organ.
Ebstein's anomaly	A congenital heart defect in which the tricuspid valve is displaced downward into the right ventricle.
Edwards syndrome	See Trisomy 18.
Embryonic period	The first eight weeks after fertilization, during which most, but not all, organs are formed.
Encephalocele	Herniation of the brain through a defect in the skull.
Endocardial cushion defect	In the complete form, a septal defect involving both the upper chambers (atria, atrial septal defect) and lower chambers (ventricles, ventricular septal defect) such that there is a single large atrioventricular septal defect. There are incomplete forms as well.
Epispadias	Displacement of the opening of the urethra (urethral meatus) dorsally and proximally (on top and closer to the body) in relation to the tip of the glans of the penis.
Esophageal stenosis or atresia	A narrowing or incomplete formation of the esophagus. Usually a surgical emergency. Often associated with a tracheoesophageal fistula.
Extremely low birth weight	Birth weight less than 1,000 grams.

Fetal alcohol syndrome	A constellation of physical abnormalities (including characteristic abnormal facial features and growth retardation), and problems of behavior and cognition in children born to mothers who drank alcohol during pregnancy.
Fetal death (stillborn)	Delivery of an infant or fetus weighing at least 500 grams, or in the absence of weight of 22 weeks or more gestation, that does not exhibit signs of life.
Fetal period	The period from the ninth week after fertilization through delivery.
Fistula	An abnormal passage from an internal organ to the body surface or between two internal organs or structures.
Folic acid deficiency	A lack of folic acid in the mother's diet leading to an increased risk for neural tube defects. Women who are or may become pregnant should take a folic acid supplement to decrease the risk of neural tube defects.
Gastroschisis	A congenital opening or fissure in the anterior abdominal wall lateral to the umbilicus, through which the small intestine, part of the large intestine, and sometimes the liver and spleen protrude.
Hirschsprung's disease	The congenital absence of autonomic ganglia (nerves controlling involuntary and reflexive movement) in the muscles of the colon. This results in immobility of the intestines and may cause obstruction or stretching of the intestines. This condition is repaired surgically in early childhood by the removal of the affected portion of the intestine.
Hydrocephalus	The abnormal accumulation of fluid within the skull.

Hypoplasia	A condition of arrested development in which an organ or part remains below the normal size or in an immature state.
Hypoplastic left heart syndrome	Atresia, or a marked hypoplasia, of the aortic valve, atresia or marked hypoplasia for the mitral valve, with hypoplasia of the ascending aorta and underdevelopment of the left ventricle.
Hypospadias	A congenital defect in which the urinary meatus (urinary outlet) is on the underside of the penis or on the perineum (area between the genitals and anus). The urinary sphincters are not defective so incontinence does not occur. The condition may be surgically corrected if needed for cosmetic, urologic, or reproductive reasons.
Infant death	Death of a live-born infant before 12 months of age.
Live birth	Complete expulsion or extraction of an infant, irrespective of the duration of the pregnancy that exhibits signs of life, including a heartbeat, spontaneous breathing, or movement of voluntary muscles. Transient cardiac contractions and fleeting respiratory efforts or gasps are not considered signs of life.
Low birth weight	Birth weight less than 2,500 grams, regardless of gestational age.
Microcephalus	Congenital smallness of the head, with corresponding smallness of the brain.
Microphthalmia	The congenital abnormal smallness of one or both eyes. Can occur in the presence of other ocular defects.
Microtia	A small or maldeveloped external ear and atretic or stenotic external auditory canal.

Neural tube defect (NTD)	A defect resulting from failure of the neural tube to close. NTDs include anencephaly, spina bifida, and encephalocele.
Obstructive genitourinary defect	Stenosis or atresia of the urinary tract at any level. Severity of the defect depends largely upon the level of the obstruction. Urine accumulates behind the obstruction.
Omphalocele	A defect in the anterior abdominal wall in which the umbilical ring is widened, allowing herniation of abdominal organs, including the small intestine, part of the large intestine and occasionally the liver and spleen into the umbilical cord.
Patau Syndrome	See Trisomy 13
Patent ductus arteriosus	The presence of a blood vessel between the pulmonary artery and the aorta. This is normal in fetal life, but can cause problems after birth.
Prenatal	Before birth.
Pulmonary valve atresia and stenosis	Failure of formation of the pulmonary valve or a narrowing or obstruction of the pulmonary valve, resulting in obstruction of blood flow from the right ventricle to the pulmonary artery.
Pyloric Stenosis	A narrowing of the outlet from the stomach to the small intestine resulting in complete or partial obstruction of the passage of food and gastric contents.
Rectal and large intestinal atresia/stenosis	Complete or partial occlusion of the lumen of one or more segments of the large intestine and/or rectum.

Reduction defects: lower and upper limbs	The congenital absence of a portion of the lower or upper limbs. There are two general types of defect, transverse and longitudinal. Transverse defects appear like amputations with the complete or partial absence of the arm or leg. Longitudinal defects are missing rays of the limb and may involve the preaxial (thumb or big toe side) postaxial (fifth finger or toe side) or central parts of the arm or leg.
Renal agenesis/hypoplasia	The complete absence or incomplete development of the kidney.
Spina bifida	An incomplete closure of the vertebral spine (usually posteriorly) through which spinal cord tissue or membranes (meninges) covering the spine herniate.
Stenosis	A narrowing or constriction the diameter of a bodily passage or orifice.
Syndrome	A pattern of multiple primary malformations or defects all due to a single underlying cause (for example, Down syndrome).
Teratogen	A substance in the environment that can cause a birth defect.
Tetralogy of Fallot	The simultaneous presence of a ventricular septal defect, pulmonic stenosis, a malpositioned aorta that overrides the ventricular septum, and a right ventricular hypertrophy.
Transposition of the great arteries	A malformation in which the aorta arises from the right ventricle and the pulmonary artery from the left ventricle (opposite of normal), so that the venous return from the peripheral circulation is recirculated without being oxygenated in the lungs.
Tricuspid valve atresia or stenosis	A congenital cardiac condition characterized by the absence or constriction of the tricuspid valve.

Trisomy	Having three copies of any particular chromosome instead of the normal two.
Trisomy 13 (Patau syndrome)	The chromosomal abnormality caused by an extra chromosome 13. Characterized by impaired midline facial development, cleft lip and palate, polydactyly and severe mental retardation. Most infants do not survive beyond 6 months of life.
Trisomy 18 (Edwards syndrome)	The chromosomal abnormality caused by an extra copy of chromosome 18. It is characterized by mental retardation, growth retardation, low-set ears, skull malformation and short digits. Survival for more than a few months is rare.
Ventricular septal defect	A congenital cardiac malformation in which there are one or several openings in the ventricular system (Muscular and fibrous wall between the right and left ventricle or right and left lower chambers of the heart).
Very low birth weight	Birth weight less than 1,500 grams.

Appendix B
County-level Counts and Rates

2000-2002 County Birth Defects

County	Diagnosis	Cases	Rate	95% Confidence Interval
Anderson				
	Anophthalmia / microphthalmia	1	4.22	0.11-23.50
	Atrial septal defect	5	21.09	6.85-49.21
	Bladder exstrophy	1	4.22	0.11-23.50
	Cleft lip with/without cleft palate	5	21.09	6.85-49.21
	Cleft palate without cleft lip	2	8.44	1.02-30.47
	Coarctation of aorta	1	4.22	0.11-23.5
	Congenital hip dislocation	3	12.65	2.61-36.98
	Down syndrome	6	25.31	9.29-55.08
	Encephalocele	1	4.22	0.11-23.50
	Esophageal atresia / tracheoesophageal fistula	1	4.22	0.11-23.50
	Fetal alcohol syndrome	3	12.65	2.61-36.98
	Hirschsprung's disease	2	8.44	1.02-30.47
	Hypospadias / epispadias	20	84.35	51.52-130.27
	Microcephalus	1	4.22	0.11-23.50
	Obstructive genitourinary defect	11	46.39	23.16-83.01
	Patent ductus arteriosus	6	25.31	9.29-55.08
	Pulmonary valve atresia	2	8.44	1.02-30.47
	Pyloric stenosis	12	50.61	26.15-88.41
	Rectal large intestinal atresia stenosis	1	4.22	0.11-23.50
	Reduction deformity, upper limbs	2	8.44	1.02-30.47
	Renal Agenesis / Hypoplasia	1	4.22	0.11-23.50
	Trisomy 13	1	4.22	0.11-23.50
	Trisomy 18	1	4.22	0.11-23.50
	Ventricular septal defect	8	33.74	14.57-66.48
	Births: 2371	97	409.11	331.75-499.07
Bedford				
	Aortic valve stenosis	1	5.60	0.14-31.20
	Atrial septal defect	5	28.00	9.09-65.33
	Cleft lip with/without cleft palate	2	11.20	1.36-40.45
	Cleft palate without cleft lip	1	5.60	0.14-31.20
	Coarctation of aorta	3	16.80	3.46-49.09
	Congenital hip dislocation	1	5.60	0.14-31.20
	Diaphragmatic hernia	1	5.60	0.14-31.20
	Hydrocephalus without spina bifida	2	11.20	1.36-40.45
	Hypoplastic left heart syndrome	1	5.60	0.14-31.20
	Hypospadias / epispadias	5	28.00	9.09-65.33
	Microcephalus	2	11.20	1.36-40.45
	Obstructive genitourinary defect	3	16.80	3.46-49.09

County	Diagnosis	Cases	Rate	95% Confidence Interval
Bedford				
	Omphalocele	3	16.80	3.46-49.09
	Patent ductus arteriosus	5	28.00	9.09-65.33
	Pyloric stenosis	7	39.19	15.76-80.75
	Rectal large intestinal atresia stenosis	2	11.20	1.36-40.45
	Renal agenesis / hypoplasia	2	11.20	1.36-40.45
	Transposition of great arteries	1	5.60	0.14-31.20
	Ventricular septal defect	4	22.40	6.10-57.34
	Births: 1786	51	285.55	212.62-375.45
Benton				
	Aortic valve stenosis	2	40.16	4.86-145.07
	Atrial septal defect	2	40.16	4.86-145.07
	Cleft lip with/without cleft palate	1	20.08	0.51-111.88
	Cleft palate without cleft lip	1	20.08	0.51-111.88
	Congenital hip dislocation	2	40.16	4.86-145.07
	Hypospadias / epispadias	2	40.16	4.86-145.07
	Patent ductus arteriosus	2	40.16	4.86-145.07
	Pulmonary valve atresia	1	20.08	0.51-111.88
	Pyloric stenosis	2	40.16	4.86-145.07
	Rectal large intestinal atresia stenosis	1	20.08	0.51-111.88
	Ventricular septal defect	1	20.08	0.51-111.88
	Births: 498	17	341.37	198.85-546.56
Bledsoe				
	Atrial septal defect	2	51.28	6.21-185.25
	Endocardial cushion	1	25.64	0.65-142.86
	Hypospadias / epispadias	1	25.64	0.65-142.86
	Pyloric stenosis	1	25.64	0.65-142.86
	Ventricular septal defect	5	128.21	41.63-299.19
	Births: 390	10	256.41	122.95-471.54
Blount				
	Anophthalmia / microphthalmia	1	2.58	0.07-14.36
	Aortic valve stenosis	1	2.58	0.07-14.36
	Atrial septal defect	14	36.09	19.73-60.55
	Cleft lip with/without cleft palate	5	12.89	4.19-30.08
	Cleft palate without cleft lip	2	5.16	0.62-18.62
	Coarctation of aorta	2	5.16	0.62-18.62
	Congenital hip dislocation	5	12.89	4.19-30.08
	Diaphragmatic hernia	2	5.16	0.62-18.62
	Down syndrome	5	12.89	4.19-30.08
	Endocardial cushion	2	5.16	0.62-18.62

County	Diagnosis	Cases	Rate	95% Confidence Interval
Blount				
	Esophageal atresia / tracheoesophageal fistula	2	5.16	0.62-18.62
	Fetal alcohol syndrome	2	5.16	0.62-18.62
	Gastroschisis	1	2.58	0.07-14.36
	Hydrocephalus without spina bifida	4	10.31	2.81-26.40
	Hypospadias / epispadias	23	59.29	37.59-88.97
	Microcephalus	1	2.58	0.07-14.36
	Obstructive genitourinary defect	25	64.45	41.71-95.14
	Omphalocele	2	5.16	0.62-18.62
	Patent ductus arteriosus	21	54.14	33.51-82.75
	Pyloric stenosis	13	33.51	17.85-57.31
	Rectal large intestinal atresia stenosis	2	5.16	0.62-18.62
	Reduction deformity, lower limbs	1	2.58	0.07-14.36
	Renal agenesis / hypoplasia	3	7.73	1.59-22.60
	Tetralogy of Fallot	3	7.73	1.59-22.60
	Transposition of great arteries	4	10.31	2.81-26.40
	Tricuspid valve atresia stenosis	1	2.58	0.07-14.36
	Trisomy 18	1	2.58	0.07-14.36
	Ventricular septal defect	24	61.87	39.64-92.06
	Births: 3879	172	443.41	379.62-514.86
Bradley				
	Anencephalus	1	2.83	0.07-15.77
	Anotia / microtia	1	2.83	0.07-15.77
	Atrial septal defect	7	19.81	7.96-40.81
	Biliary atresia	1	2.83	0.07-15.77
	Cleft lip with/without cleft palate	5	14.15	4.59-33.02
	Cleft palate without cleft lip	3	8.49	1.75-24.81
	Coarctation of aorta	1	2.83	0.07-15.77
	Congenital hip dislocation	2	5.66	0.69-20.44
	Diaphragmatic hernia	1	2.83	0.07-15.77
	Down syndrome	3	8.49	1.75-24.81
	Ebstein's anomaly	1	2.83	0.07-15.77
	Gastroschisis	4	11.32	3.08-28.98
	Hirschsprung's disease	1	2.83	0.07-15.77
	Hydrocephalus without spina bifida	4	11.32	3.08-28.98
	Hypoplastic left heart syndrome	1	2.83	0.07-15.77
	Hypospadias / epispadias	15	42.44	23.76-70.00
	Microcephalus	1	2.83	0.07-15.77
	Obstructive genitourinary defect	6	16.98	6.23-36.95
	Omphalocele	2	5.66	0.69-20.44
	Patent ductus arteriosus	11	31.13	15.54-55.69
	Pyloric stenosis	15	42.44	23.76-70.00

County	Diagnosis	Cases	Rate	95% Confidence Interval
Bradley				
	Rectal large intestinal atresia stenosis	1	2.83	0.07-15.77
	Reduction deformity, upper limbs	2	5.66	0.69-20.44
	Tricuspid valve atresia stenosis	1	2.83	0.07-15.77
	Trisomy 13	3	8.49	1.75-24.81
	Ventricular septal defect	9	25.47	11.65-48.34
	Births: 3534	102	288.62	235.33-350.38
Campbell				
	Atrial septal defect	2	14.10	1.71-50.95
	Bladder exstrophy	2	14.10	1.71-50.95
	Cleft lip with/without cleft palate	3	21.16	4.36-61.83
	Cleft palate without cleft lip	2	14.10	1.71-50.95
	Coarctation of aorta	2	14.10	1.71-50.95
	Congenital cataract	1	7.05	0.18-39.29
	Congenital hip dislocation	2	14.10	1.71-50.95
	Diaphragmatic hernia	1	7.05	0.18-39.29
	Down syndrome	1	7.05	0.18-39.29
	Ebstein's anomaly	1	7.05	0.18-39.29
	Esophageal atresia / tracheoesophageal fistula	1	7.05	0.18-39.29
	Hydrocephalus without spina bifida	2	14.10	1.71-50.95
	Hypospadias / epispadias	3	21.16	4.36-61.83
	Microcephalus	2	14.10	1.71-50.95
	Obstructive genitourinary defect	11	77.57	38.72-138.8
	Patent ductus arteriosus	12	84.63	43.73-147.83
	Pyloric stenosis	9	63.47	29.02-120.48
	Rectal large intestinal atresia stenosis	2	14.10	1.71-50.95
	Renal agenesis / hypoplasia	1	7.05	0.18-39.29
	Spina bifida without anencephalus	1	7.05	0.18-39.29
	Tetralogy of Fallot	1	7.05	0.18-39.29
	Transposition of great arteries	3	21.16	4.36-61.83
	Ventricular septal defect	6	42.31	15.53-92.1
	Births: 1418	71	500.71	391.05-631.59
Cannon				
	Cleft lip with/without cleft palate	1	22.47	0.57-125.2
	Obstructive genitourinary defect	2	44.94	5.44-162.35
	Pyloric stenosis	1	22.47	0.57-125.20
	Ventricular septal defect	1	22.47	0.57-125.20
	Births: 445	5	112.36	36.48-262.21
Carroll				
	Atrial septal defect	3	27.50	5.67-80.36
	Cleft palate without cleft lip	3	27.50	5.67-80.36
	Encephalocele	1	9.17	0.23-51.07

County	Diagnosis	Cases	Rate	95% Confidence Interval
Carroll				
	Endocardial cushion	1	9.17	0.23-51.07
	Esophageal atresia / tracheoesophageal fistula	1	9.17	0.23-51.07
	Hypoplastic left heart syndrome	1	9.17	0.23-51.07
	Hypospadias / epispadias	8	73.33	31.66-144.48
	Obstructive genitourinary defect	3	27.50	5.67-80.36
	Omphalocele	1	9.17	0.23-51.07
	Patent ductus arteriosus	4	36.66	9.99-93.87
	Renal agenesis / hypoplasia	1	9.17	0.23-51.07
	Ventricular septal defect	4	36.66	9.99-93.87
	Births: 1091	31	284.14	193.08-403.31
Carter				
	Anencephalus	1	5.73	0.14-31.91
	Aortic valve stenosis	1	5.73	0.14-31.91
	Atrial septal defect	27	154.64	101.91-224.98
	Cleft lip with/without cleft palate	1	5.73	0.14-31.91
	Coarctation of aorta	3	17.18	3.54-50.21
	Congenital hip dislocation	1	5.73	0.14-31.91
	Diaphragmatic hernia	1	5.73	0.14-31.91
	Down syndrome	4	22.91	6.24-58.66
	Ebstein's anomaly	1	5.73	0.14-31.91
	Hydrocephalus without spina bifida	5	28.64	9.30-66.83
	Hypoplastic left heart syndrome	1	5.73	0.14-31.91
	Hypospadias / epispadias	11	63.00	31.45-112.73
	Microcephalus	2	11.45	1.39-41.38
	Obstructive genitourinary defect	7	40.09	16.12-82.6
	Patent ductus arteriosus	30	171.82	115.93-245.29
	Pulmonary valve atresia	1	5.73	0.14-31.91
	Pyloric stenosis	3	17.18	3.54-50.21
	Rectal large intestinal atresia stenosis	2	11.45	1.39-41.38
	Reduction deformity, upper limbs	1	5.73	0.14-31.91
	Tetralogy of Fallot	1	5.73	0.14-31.91
	Transposition of great arteries	1	5.73	0.14-31.91
	Ventricular septal defect	10	57.27	27.46-105.33
	Births: 1746	115	658.65	543.77-790.62
Cheatham				
	Aortic valve stenosis	1	6.86	0.17-38.24
	Atrial septal defect	2	13.73	1.66-49.59
	Cleft lip with/without cleft palate	2	13.73	1.66-49.59
	Cleft palate without cleft lip	1	6.86	0.17-38.24
	Coarctation of aorta	1	6.86	0.17-38.24
	Congenital hip dislocation	1	6.86	0.17-38.24

County	Diagnosis	Cases	Rate	95% Confidence Interval
Cheatham				
	Diaphragmatic hernia	2	13.73	1.66-49.59
	Down syndrome	1	6.86	0.17-38.24
	Endocardial cushion	1	6.86	0.17-38.24
	Gastroschisis	1	6.86	0.17-38.24
	Hypospadias / epispadias	6	41.18	15.11-89.63
	Obstructive genitourinary defect	2	13.73	1.66-49.59
	Patent ductus arteriosus	3	20.59	4.25-60.17
	Pulmonary valve atresia	2	13.73	1.66-49.59
	Pyloric stenosis	8	54.91	23.7-108.19
	Rectal large intestinal atresia stenosis	1	6.86	0.17-38.24
	Renal agenesis / hypoplasia	1	6.86	0.17-38.24
	Spina bifida without anencephalus	1	6.86	0.17-38.24
	Tetralogy of Fallot	1	6.86	0.17-38.24
	Trisomy 18	1	6.86	0.17-38.24
	Ventricular septal defect	7	48.04	19.32-98.99
	Births: 1457	46	315.72	231.14-421.14
Chester				
	Anencephalus	1	18.48	0.47-102.99
	Atrial septal defect	2	36.97	4.48-133.54
	Congenital hip dislocation	1	18.48	0.47-102.99
	Down syndrome	1	18.48	0.47-102.99
	Hypospadias / epispadias	1	18.48	0.47-102.99
	Microcephalus	1	18.48	0.47-102.99
	Obstructive genitourinary defect	2	36.97	4.48-133.54
	Omphalocele	1	18.48	0.47-102.99
	Pyloric stenosis	1	18.48	0.47-102.99
	Rectal large intestinal atresia stenosis	1	18.48	0.47-102.99
	Spina bifida without anencephalus	2	36.97	4.48-133.54
	Trisomy 13	1	18.48	0.47-102.99
	Ventricular septal defect	1	18.48	0.47-102.99
	Births: 541	16	295.75	169.05-480.27
Claiborne				
	Anencephalus	1	9.48	0.24-52.81
	Atrial septal defect	2	18.96	2.30-68.48
	Cleft lip with/without cleft palate	3	28.44	5.86-83.10
	Congenital hip dislocation	3	28.44	5.86-83.10
	Down syndrome	4	37.91	10.33-97.08
	Endocardial cushion	1	9.48	0.24-52.81
	Gastroschisis	2	18.96	2.30-68.48
	Hydrocephalus without spina bifida	2	18.96	2.30-68.48

County	Diagnosis	Cases	Rate	95% Confidence Interval
Claiborne				
	Hypospadias / epispadias	7	66.35	26.68-136.71
	Microcephalus	2	18.96	2.30-68.48
	Obstructive genitourinary defect	3	28.44	5.86-83.10
	Patent ductus arteriosus	5	47.39	15.39-110.60
	Pyloric stenosis	3	28.44	5.86-83.10
	Renal agenesis / hypoplasia	1	9.48	0.24-52.81
	Tetralogy of Fallot	2	18.96	2.30-68.48
	Trisomy 13	1	9.48	0.24-52.81
	Trisomy 18	1	9.48	0.24-52.81
	Ventricular septal defect	4	37.91	10.33-97.08
	Births: 1055	47	445.50	327.35-592.42
Clay				
	Anotia / microtia	1	38.46	0.97-214.29
	Atrial septal defect	1	38.46	0.97-214.29
	Cleft lip with/without cleft palate	1	38.46	0.97-214.29
	Hydrocephalus without spina bifida	1	38.46	0.97-214.29
	Hypospadias / epispadias	1	38.46	0.97-214.29
	Obstructive genitourinary defect	1	38.46	0.97-214.29
	Pyloric stenosis	3	115.38	23.79-337.2
	Rectal large intestinal atresia stenosis	1	38.46	0.97-214.29
	Reduction deformity, upper limbs	1	38.46	0.97-214.29
	Ventricular septal defect	1	38.46	0.97-214.29
	Births: 260	12	461.54	238.48-806.22
Cocke				
	Atrial septal defect	4	32.60	8.88-83.47
	Coarctation of aorta	1	8.15	0.21-45.41
	Congenital cataract	1	8.15	0.21-45.41
	Congenital hip dislocation	1	8.15	0.21-45.41
	Diaphragmatic hernia	1	8.15	0.21-45.41
	Fetal alcohol syndrome	1	8.15	0.21-45.41
	Hydrocephalus without spina bifida	3	24.45	5.04-71.45
	Hypoplastic left heart syndrome	1	8.15	0.21-45.41
	Hypospadias / epispadias	8	65.20	28.15-128.47
	Microcephalus	1	8.15	0.21-45.41
	Obstructive genitourinary defect	11	89.65	44.75-160.41
	Patent ductus arteriosus	6	48.90	17.95-106.44
	Reduction deformity, upper limbs	1	8.15	0.21-45.41
	Ventricular septal defect	5	40.75	13.23-95.1
	Births: 1227	45	366.75	267.51-490.75

County	Diagnosis	Cases	Rate	95% Confidence Interval
Coffee				
	Atrial septal defect	4	20.36	5.55-52.12
	Cleft lip with/without cleft palate	2	10.18	1.23-36.77
	Cleft palate without cleft lip	3	15.27	3.15-44.62
	Coarctation of aorta	2	10.18	1.23-36.77
	Congenital hip dislocation	1	5.09	0.13-28.35
	Diaphragmatic hernia	2	10.18	1.23-36.77
	Down syndrome	2	10.18	1.23-36.77
	Gastroschisis	3	15.27	3.15-44.62
	Hydrocephalus without spina bifida	4	20.36	5.55-52.12
	Hypoplastic left heart syndrome	2	10.18	1.23-36.77
	Hypospadias / epispadias	12	61.07	31.55-106.67
	Microcephalus	1	5.09	0.13-28.35
	Obstructive genitourinary defect	4	20.36	5.55-52.12
	Patent ductus arteriosus	2	10.18	1.23-36.77
	Pyloric stenosis	5	25.45	8.26-59.38
	Reduction deformity, upper limbs	1	5.09	0.13-28.35
	Renal agenesis / hypoplasia	2	10.18	1.23-36.77
	Spina bifida without anencephalus	5	25.45	8.26-59.38
	Trisomy 13	1	5.09	0.13-28.35
	Ventricular septal defect	7	35.62	14.32-73.4
	Births: 1965	65	330.79	255.30-421.62
Crockett				
	Atrial septal defect	1	17.06	0.43-95.08
	Cleft lip with/without cleft palate	2	34.13	4.13-123.29
	Cleft palate without cleft lip	1	17.06	0.43-95.08
	Congenital hip dislocation	1	17.06	0.43-95.08
	Down syndrome	1	17.06	0.43-95.08
	Hypoplastic left heart syndrome	1	17.06	0.43-95.08
	Hypospadias / epispadias	4	68.26	18.6-174.77
	Obstructive genitourinary defect	1	17.06	0.43-95.08
	Patent ductus arteriosus	3	51.19	10.56-149.61
	Pyloric stenosis	2	34.13	4.13-123.29
	Ventricular septal defect	1	17.06	0.43-95.08
	Births: 586	18	307.17	182.06-485.45
Cumberland				
	Atrial septal defect	4	26.70	7.28-68.37
	Choanal atresia	1	6.68	0.17-37.19
	Cleft lip with/without cleft palate	3	20.03	4.13-58.53
	Cleft palate without cleft lip	2	13.35	1.62-48.23
	Coarctation of aorta	1	6.68	0.17-37.19

County	Diagnosis	Cases	Rate	95% Confidence Interval
Cumberland				
	Down syndrome	1	6.68	0.17-37.19
	Esophageal atresia / tracheoesophageal fistula	1	6.68	0.17-37.19
	Hydrocephalus without spina bifida	3	20.03	4.13-58.53
	Hypospadias / epispadias	1	6.68	0.17-37.19
	Obstructive genitourinary defect	2	13.35	1.62-48.23
	Omphalocele	2	13.35	1.62-48.23
	Patent ductus arteriosus	10	66.76	32.01-122.76
	Pulmonary valve atresia	3	20.03	4.13-58.53
	Pyloric stenosis	5	33.38	10.84-77.89
	Rectal large intestinal atresia stenosis	1	6.68	0.17-37.19
	Renal agenesis / hypoplasia	1	6.68	0.17-37.19
	Transposition of great arteries	2	13.35	1.62-48.23
	Tricuspid valve atresia stenosis	2	13.35	1.62-48.23
	Ventricular septal defect	7	46.73	18.79-96.28
	Births: 1498	52	347.13	259.24-455.23
Davidson				
	Anencephalus	3	1.13	0.23-3.30
	Aniridia	1	0.38	0.01-2.10
	Anophthalmia / microphthalmia	5	1.88	0.61-4.40
	Anotia / microtia	1	0.38	0.01-2.10
	Aortic valve stenosis	2	0.75	0.09-2.72
	Atrial septal defect	76	28.64	22.57-35.85
	Biliary atresia	1	0.38	0.01-2.10
	Choanal atresia	5	1.88	0.61-4.40
	Cleft lip with/without cleft palate	24	9.05	5.8-13.46
	Cleft palate without cleft lip	11	4.15	2.07-7.42
	Coarctation of aorta	17	6.41	3.73-10.26
	Common truncus	3	1.13	0.23-3.30
	Congenital cataract	9	3.39	1.55-6.44
	Congenital hip dislocation	13	4.90	2.61-8.38
	Diaphragmatic hernia	12	4.52	2.34-7.90
	Down syndrome	29	10.93	7.32-15.69
	Ebstein's anomaly	2	0.75	0.09-2.72
	Encephalocele	5	1.88	0.61-4.4
	Endocardial cushion	4	1.51	0.41-3.86
	Esophageal atresia / tracheoesophageal fistula	9	3.39	1.55-6.44
	Fetal alcohol syndrome	4	1.51	0.41-3.86
	Gastroschisis	8	3.02	1.3-5.94
	Hirschsprung's disease	7	2.64	1.06-5.44
	Hydrocephalus without spina bifida	16	6.03	3.45-9.79
	Hypoplastic left heart syndrome	14	5.28	2.88-8.85

County	Diagnosis	Cases	Rate	95% Confidence Interval
Davidson				
	Hypospadias / epispadias	152	57.29	48.54-67.16
	Microcephalus	9	3.39	1.55-6.44
	Obstructive genitourinary defect	53	19.98	14.96-26.13
	Omphalocele	6	2.26	0.83-4.92
	Patent ductus arteriosus	107	40.33	33.05-48.73
	Pulmonary valve atresia	12	4.52	2.34-7.9
	Pyloric stenosis	49	18.47	13.66-24.42
	Rectal large intestinal atresia stenosis	11	4.15	2.07-7.42
	Reduction deformity, lower limbs	2	0.75	0.09-2.72
	Reduction deformity, upper limbs	4	1.51	0.41-3.86
	Renal agenesis / hypoplasia	14	5.28	2.88-8.85
	Spina bifida without anencephalus	8	3.02	1.30-5.94
	Tetralogy of Fallot	10	3.77	1.81-6.93
	Transposition of great arteries	14	5.28	2.88-8.85
	Tricuspid valve atresia stenosis	2	0.75	0.09-2.72
	Trisomy 13	3	1.13	0.23-3.30
	Trisomy 18	6	2.26	0.83-4.92
	Ventricular septal defect	97	36.56	29.65-44.6
	Births: 26532	840	316.60	295.55-338.75
Decatur				
	Anencephalus	1	25.06	0.63-139.64
	Gastroschisis	1	25.06	0.63-139.64
	Hydrocephalus without spina bifida	1	25.06	0.63-139.64
	Hypospadias / epispadias	1	25.06	0.63-139.64
	Microcephalus	1	25.06	0.63-139.64
	Pyloric stenosis	2	50.13	6.07-181.07
	Renal agenesis / hypoplasia	1	25.06	0.63-139.64
	Trisomy 18	1	25.06	0.63-139.64
	Births: 399	9	225.56	103.15-428.19
Dekalb				
	Atrial septal defect	2	31.90	3.86-115.22
	Cleft lip with/without cleft palate	1	15.95	0.40-88.86
	Cleft palate without cleft lip	1	15.95	0.40-88.86
	Congenital hip dislocation	1	15.95	0.40-88.86
	Diaphragmatic hernia	1	15.95	0.40-88.86
	Down syndrome	1	15.95	0.40-88.86
	Ebstein's anomaly	1	15.95	0.40-88.86
	Endocardial cushion	1	15.95	0.40-88.86
	Hydrocephalus without spina bifida	1	15.95	0.40-88.86
	Hypospadias / epispadias	3	47.85	9.87-139.83
	Obstructive genitourinary defect	1	15.95	0.40-88.86
	Patent ductus arteriosus	1	15.95	0.40-88.86

County	Diagnosis	Cases	Rate	95% Confidence Interval
Dekalb				
	Pulmonary valve atresia	1	15.95	0.40-88.86
	Pyloric stenosis	1	15.95	0.40-88.86
	Ventricular septal defect	2	31.90	3.86-115.22
	Births: 627	19	303.03	182.45-473.21
Dickson				
	Aortic valve stenosis	2	10.56	1.28-38.14
	Atrial septal defect	6	31.68	11.63-68.95
	Cleft lip with/without cleft palate	5	26.40	8.57-61.61
	Cleft palate without cleft lip	3	15.84	3.27-46.29
	Coarctation of aorta	2	10.56	1.28-38.14
	Congenital hip dislocation	1	5.28	0.13-29.42
	Endocardial cushion	1	5.28	0.13-29.42
	Hirschsprung's disease	1	5.28	0.13-29.42
	Hydrocephalus without spina bifida	1	5.28	0.13-29.42
	Hypospadias / epispadias	10	52.80	25.32-97.1
	Obstructive genitourinary defect	2	10.56	1.28-38.14
	Patent ductus arteriosus	4	21.12	5.76-54.07
	Pulmonary valve atresia	3	15.84	3.27-46.29
	Pyloric stenosis	9	47.52	21.73-90.2
	Trisomy 18	1	5.28	0.13-29.42
	Ventricular septal defect	10	52.80	25.32-97.1
	Births: 1894	61	322.07	246.35-413.70
Dyer				
	Anencephalus	1	6.44	0.16-35.90
	Atrial septal defect	3	19.33	3.99-56.49
	Cleft lip with/without cleft palate	1	6.44	0.16-35.90
	Cleft palate without cleft lip	3	19.33	3.99-56.49
	Coarctation of aorta	1	6.44	0.16-35.90
	Congenital hip dislocation	1	6.44	0.16-35.90
	Down syndrome	2	12.89	1.56-46.55
	Endocardial cushion	1	6.44	0.16-35.90
	Fetal alcohol syndrome	1	6.44	0.16-35.90
	Gastroschisis	1	6.44	0.16-35.90
	Hirschsprung's disease	2	12.89	1.56-46.55
	Hypospadias / epispadias	4	25.77	7.02-65.99
	Microcephalus	1	6.44	0.16-35.90
	Obstructive genitourinary defect	2	12.89	1.56-46.55
	Patent ductus arteriosus	3	19.33	3.99-56.49
	Pulmonary valve atresia	1	6.44	0.16-35.90
	Pyloric stenosis	1	6.44	0.16-35.90

County	Diagnosis	Cases	Rate	95% Confidence Interval
Dyer				
	Rectal large intestinal atresia stenosis	1	6.44	0.16-35.90
	Tetralogy of Fallot	1	6.44	0.16-35.90
	Transposition of great arteries	1	6.44	0.16-35.90
	Ventricular septal defect	6	38.66	14.19-84.15
	Births: 1552	38	244.85	173.28-336.07
Fayette				
	Atrial septal defect	3	25.19	5.19-73.61
	Cleft lip with/without cleft palate	1	8.40	0.21-46.78
	Diaphragmatic hernia	1	8.40	0.21-46.78
	Down syndrome	2	16.79	2.03-60.66
	Endocardial cushion	2	16.79	2.03-60.66
	Esophageal atresia / tracheoesophageal fistula	1	8.40	0.21-46.78
	Hirschsprung's disease	1	8.40	0.21-46.78
	Hydrocephalus without spina bifida	2	16.79	2.03-60.66
	Hypoplastic left heart syndrome	1	8.40	0.21-46.78
	Hypospadias / epispadias	4	33.59	9.15-85.99
	Obstructive genitourinary defect	1	8.40	0.21-46.78
	Patent ductus arteriosus	4	33.59	9.15-85.99
	Pulmonary valve atresia	2	16.79	2.03-60.66
	Pyloric stenosis	2	16.79	2.03-60.66
	Renal agenesis / hypoplasia	2	16.79	2.03-60.66
	Tetralogy of Fallot	2	16.79	2.03-60.66
	Transposition of great arteries	3	25.19	5.19-73.61
	Trisomy 18	3	25.19	5.19-73.61
	Ventricular septal defect	5	41.98	13.63-97.97
	Births: 1191	42	352.64	254.15-476.67
Fentress				
	Atrial septal defect	3	48.31	9.96-141.18
	Choanal atresia	2	32.21	3.90-116.34
	Cleft lip with/without cleft palate	1	16.10	0.41-89.72
	Coarctation of aorta	3	48.31	9.96-141.18
	Hydrocephalus without spina bifida	5	80.52	26.14-187.9
	Hypospadias / epispadias	1	16.10	0.41-89.72
	Obstructive genitourinary defect	6	96.62	35.46-210.3
	Patent ductus arteriosus	4	64.41	17.55-164.92
	Pyloric stenosis	5	80.52	26.14-187.9
	Transposition of great arteries	1	16.10	0.41-89.72
	Ventricular septal defect	6	96.62	35.46-210.30
	Births: 621	37	595.81	419.51-821.27

County	Diagnosis	Cases	Rate	95% Confidence Interval
Franklin				
	Atrial septal defect	1	7.30	0.18-40.67
	Choanal atresia	2	14.60	1.77-52.73
	Cleft lip with/without cleft palate	1	7.30	0.18-40.67
	Congenital hip dislocation	1	7.30	0.18-40.67
	Diaphragmatic hernia	1	7.30	0.18-40.67
	Down syndrome	3	21.90	4.52-63.99
	Fetal alcohol syndrome	1	7.30	0.18-40.67
	Hirschsprung's disease	1	7.30	0.18-40.67
	Hypospadias / epispadias	2	14.60	1.77-52.73
	Obstructive genitourinary defect	2	14.60	1.77-52.73
	Patent ductus arteriosus	4	29.20	7.96-74.76
	Pulmonary valve atresia	2	14.60	1.77-52.73
	Pyloric Stenosis	3	21.90	4.52-63.99
	Reduction deformity, upper limbs	1	7.30	0.18-40.67
	Tetralogy of Fallot	1	7.30	0.18-40.67
	Ventricular septal defect	3	21.90	4.52-63.99
	Births: 1370	29	211.68	141.76-304.01
Gibson				
	Anencephalus	1	5.27	0.13-29.37
	Atrial septal defect	6	31.63	11.61-68.84
	Cleft lip with/without cleft palate	3	15.81	3.26-46.22
	Cleft palate without cleft lip	2	10.54	1.28-38.08
	Coarctation of aorta	2	10.54	1.28-38.08
	Common truncus	1	5.27	0.13-29.37
	Congenital hip dislocation	1	5.27	0.13-29.37
	Diaphragmatic hernia	1	5.27	0.13-29.37
	Down syndrome	4	21.09	5.75-53.99
	Endocardial cushion	1	5.27	0.13-29.37
	Hydrocephalus without spina bifida	1	5.27	0.13-29.37
	Hypoplastic left heart syndrome	2	10.54	1.28-38.08
	Hypospadias / epispadias	9	47.44	21.7-90.06
	Obstructive genitourinary defect	2	10.54	1.28-38.08
	Patent ductus arteriosus	5	26.36	8.56-61.51
	Pulmonary valve atresia	3	15.81	3.26-46.22
	Pyloric stenosis	4	21.09	5.75-53.99
	Rectal large intestinal atresia stenosis	2	10.54	1.28-38.08
	Reduction deformity, lower limbs	1	5.27	0.13-29.37
	Tetralogy of Fallot	1	5.27	0.13-29.37
	Transposition of great arteries	2	10.54	1.28-38.08
	Tricuspid valve atresia stenosis	1	5.27	0.13-29.37

County	Diagnosis	Cases	Rate	95% Confidence Interval
Gibson				
	Ventricular septal defect	7	36.90	14.84-76.03
	Births: 1897	62	326.83	250.58-419.00
Giles				
	Atrial septal defect	2	19.55	2.37-70.62
	Cleft lip with/without cleft palate	1	9.78	0.25-54.46
	Cleft palate without cleft lip	2	19.55	2.37-70.62
	Coarctation of aorta	1	9.78	0.25-54.46
	Down syndrome	3	29.33	6.05-85.70
	Gastroschisis	1	9.78	0.25-54.46
	Hypospadias / epispadias	4	39.10	10.65-100.11
	Microcephalus	2	19.55	2.37-70.62
	Obstructive genitourinary defect	4	39.10	10.65-100.11
	Patent ductus arteriosus	1	9.78	0.25-54.46
	Pulmonary valve atresia	2	19.55	2.37-70.62
	Pyloric stenosis	1	9.78	0.25-54.46
	Reduction deformity, upper limbs	1	9.78	0.25-54.46
	Spina bifida without anencephalus	1	9.78	0.25-54.46
	Ventricular septal defect	6	58.65	21.52-127.66
	Births: 1023	32	312.81	213.96-441.59
Grainger				
	Atrial septal defect	1	12.84	0.32-71.52
	Choanal atresia	1	12.84	0.32-71.52
	Cleft lip with/without cleft palate	1	12.84	0.32-71.52
	Congenital hip dislocation	1	12.84	0.32-71.52
	Gastroschisis	1	12.84	0.32-71.52
	Hirschsprung's disease	1	12.84	0.32-71.52
	Hypoplastic left heart syndrome	1	12.84	0.32-71.52
	Hypospadias / epispadias	3	38.51	7.94-112.54
	Obstructive genitourinary defect	3	38.51	7.94-112.54
	Patent ductus arteriosus	3	38.51	7.94-112.54
	Pyloric stenosis	1	12.84	0.32-71.52
	Tetralogy of Fallot	1	12.84	0.32-71.52
	Tricuspid valve atresia stenosis	1	12.84	0.32-71.52
	Trisomy 18	1	12.84	0.32-71.52
	Ventricular septal defect	4	51.35	13.99-131.47
	Births: 779	24	308.09	197.39-458.40
Greene				
	Anophthalmia / microphthalmia	2	9.04	1.09-32.65
	Aortic valve stenosis	1	4.52	0.11-25.18
	Atrial septal defect	23	103.93	65.88-155.95
	Cleft lip with/without cleft palate	1	4.52	0.11-25.18

County	Diagnosis	Cases	Rate	95% Confidence Interval
Greene				
	Coarctation of aorta	1	4.52	0.11-25.18
	Congenital cataract	1	4.52	0.11-25.18
	Congenital hip dislocation	1	4.52	0.11-25.18
	Diaphragmatic hernia	2	9.04	1.09-32.65
	Down syndrome	4	18.08	4.93-46.28
	Endocardial cushion	1	4.52	0.11-25.18
	Gastroschisis	2	9.04	1.09-32.65
	Hypoplastic left heart syndrome	2	9.04	1.09-32.65
	Hypospadias / epispadias	15	67.78	37.94-111.79
	Microcephalus	1	4.52	0.11-25.18
	Obstructive genitourinary defect	4	18.08	4.93-46.28
	Patent ductus arteriosus	21	94.89	58.74-145.05
	Pulmonary valve atresia	1	4.52	0.11-25.18
	Pyloric stenosis	7	31.63	12.72-65.17
	Reduction deformity, upper limbs	1	4.52	0.11-25.18
	Tetralogy of Fallot	3	13.56	2.8-39.62
	Transposition of great arteries	1	4.52	0.11-25.18
	Tricuspid valve atresia stenosis	2	9.04	1.09-32.65
	Trisomy 18	1	4.52	0.11-25.18
	Ventricular septal defect	16	72.30	41.33-117.41
	Births: 2213	114	515.14	424.92-618.84
Grundy				
	Aortic valve stenosis	1	17.04	0.43-94.92
	Cleft lip with/without cleft palate	1	17.04	0.43-94.92
	Coarctation of aorta	1	17.04	0.43-94.92
	Gastroschisis	1	17.04	0.43-94.92
	Hydrocephalus without spina bifida	1	17.04	0.43-94.92
	Hypoplastic left heart syndrome	1	17.04	0.43-94.92
	Hypospadias / epispadias	1	17.04	0.43-94.92
	Obstructive genitourinary defect	2	34.07	4.13-123.08
	Patent ductus arteriosus	3	51.11	10.54-149.36
	Pyloric stenosis	3	51.11	10.54-149.36
	Ventricular septal defect	3	51.11	10.54-149.36
	Births: 587	18	306.64	181.75-484.62
Hamblen				
	Anencephalus	1	4.02	0.10-22.42
	Atrial septal defect	11	44.27	22.1-79.20
	Cleft lip with/without cleft palate	3	12.07	2.49-35.28
	Cleft palate without cleft lip	1	4.02	0.10-22.42
	Coarctation of aorta	3	12.07	2.49-35.28
	Common truncus	1	4.02	0.10-22.42

County	Diagnosis	Cases	Rate	95% Confidence Interval
Hamblen				
	Congenital cataract	1	4.02	0.1-22.42
	Congenital hip dislocation	3	12.07	2.49-35.28
	Diaphragmatic hernia	3	12.07	2.49-35.28
	Down syndrome	6	24.14	8.86-52.55
	Ebstein's anomaly	1	4.02	0.1-22.42
	Endocardial cushion	1	4.02	0.1-22.42
	Gastroschisis	1	4.02	0.1-22.42
	Hydrocephalus without spina bifida	1	4.02	0.1-22.42
	Hypoplastic left heart syndrome	1	4.02	0.1-22.42
	Hypospadias / epispadias	9	36.22	16.56-68.75
	Microcephalus	3	12.07	2.49-35.28
	Obstructive genitourinary defect	5	20.12	6.53-46.96
	Patent ductus arteriosus	8	32.19	13.9-63.43
	Pulmonary valve atresia	2	8.05	0.97-29.07
	Pyloric stenosis	10	40.24	19.3-74.00
	Rectal large intestinal atresia stenosis	2	8.05	0.97-29.07
	Renal agenesis / hypoplasia	1	4.02	0.1-22.42
	Spina bifida without anencephalus	1	4.02	0.1-22.42
	Tetralogy of Fallot	3	12.07	2.49-35.28
	Transposition of great arteries	3	12.07	2.49-35.28
	Trisomy 13	1	4.02	0.1-22.42
	Ventricular septal defect	11	44.27	22.1-79.20
	Births: 2485	97	390.34	316.53-476.18
Hamilton				
	Anencephalus	1	0.84	0.02-4.66
	Aniridia	1	0.84	0.02-4.66
	Anophthalmia / microphthalmia	1	0.84	0.02-4.66
	Anotia / microtia	1	0.84	0.02-4.66
	Aortic valve stenosis	2	1.67	0.2-6.04
	Atrial septal defect	36	30.12	21.10-41.70
	Biliary atresia	2	1.67	0.20-6.04
	Choanal atresia	2	1.67	0.20-6.04
	Cleft lip with/without cleft palate	20	16.73	10.22-25.84
	Cleft palate without cleft lip	10	8.37	4.01-15.39
	Coarctation of aorta	11	9.20	4.59-16.47
	Common truncus	2	1.67	0.20-6.04
	Congenital cataract	5	4.18	1.36-9.76
	Congenital hip dislocation	13	10.88	5.79-18.6
	Diaphragmatic hernia	2	1.67	0.20-6.04
	Down syndrome	12	10.04	5.19-17.54
	Ebstein's anomaly	1	0.84	0.02-4.66

County	Diagnosis	Cases	Rate	95% Confidence Interval
Hamilton				
	Encephalocele	1	0.84	0.02-4.66
	Endocardial cushion	4	3.35	0.91-8.57
	Esophageal atresia / tracheoesophageal fistula	3	2.51	0.52-7.34
	Fetal alcohol syndrome	5	4.18	1.36-9.76
	Gastroschisis	6	5.02	1.84-10.93
	Hirschsprung's disease	5	4.18	1.36-9.76
	Hydrocephalus without spina bifida	5	4.18	1.36-9.76
	Hypoplastic left heart syndrome	6	5.02	1.84-10.93
	Hypospadias / epispadias	62	51.87	39.77-66.5
	Microcephalus	3	2.51	0.52-7.34
	Obstructive genitourinary defect	12	10.04	5.19-17.54
	Omphalocele	5	4.18	1.36-9.76
	Patent ductus arteriosus	45	37.65	27.46-50.38
	Pulmonary valve atresia	13	10.88	5.79-18.60
	Pyloric stenosis	25	20.92	13.54-30.88
	Rectal large intestinal atresia stenosis	8	6.69	2.89-13.19
	Reduction deformity, lower limbs	3	2.51	0.52-7.34
	Renal agenesis / hypoplasia	4	3.35	0.91-8.57
	Spina bifida without anencephalus	5	4.18	1.36-9.76
	Tetralogy of Fallot	7	5.86	2.36-12.07
	Transposition of great arteries	9	7.53	3.44-14.29
	Tricuspid valve atresia stenosis	3	2.51	0.52-7.34
	Trisomy 18	2	1.67	0.20-6.04
	Ventricular septal defect	57	47.69	36.12-61.79
	Births: 11952	420	351.41	318.60-386.68
Hancock				
	Congenital hip dislocation	1	45.66	1.16-254.41
	Patent ductus arteriosus	1	45.66	1.16-254.41
	Pyloric stenosis	1	45.66	1.16-254.41
	Ventricular septal defect	2	91.32	11.06-329.89
	Births: 219	5	228.31	74.13-532.81
Hardeman				
	Anophthalmia / microphthalmia	1	9.71	0.25-54.09
	Atrial septal defect	6	58.25	21.38-126.79
	Coarctation of aorta	2	19.42	2.35-70.14
	Down syndrome	1	9.71	0.25-54.09
	Hirschsprung's disease	1	9.71	0.25-54.09
	Hypospadias / epispadias	5	48.54	15.76-113.29
	Microcephalus	1	9.71	0.25-54.09
	Obstructive genitourinary defect	2	19.42	2.35-70.14
	Patent ductus arteriosus	5	48.54	15.76-113.29

County	Diagnosis	Cases	Rate	95% Confidence Interval
Hardeman				
	Pyloric stenosis	4	38.83	10.58-99.43
	Rectal large intestinal atresia stenosis	1	9.71	0.25-54.09
	Reduction deformity, lower limbs	1	9.71	0.25-54.09
	Transposition of great arteries	1	9.71	0.25-54.09
	Trisomy 13	1	9.71	0.25-54.09
	Ventricular septal defect	4	38.83	10.58-99.43
	Births: 1030	36	349.51	244.80-483.87
Hardin				
	Atrial septal defect	2	24.21	2.93-87.46
	Choanal atresia	1	12.11	0.31-67.45
	Cleft lip with/without cleft palate	2	24.21	2.93-87.46
	Cleft palate without cleft lip	1	12.11	0.31-67.45
	Down syndrome	1	12.11	0.31-67.45
	Gastroschisis	1	12.11	0.31-67.45
	Hypospadias / epispadias	5	60.53	19.65-141.27
	Microcephalus	2	24.21	2.93-87.46
	Obstructive genitourinary defect	2	24.21	2.93-87.46
	Patent ductus arteriosus	3	36.32	7.49-106.14
	Pyloric stenosis	1	12.11	0.31-67.45
	Rectal large intestinal atresia stenosis	1	12.11	0.31-67.45
	Spina bifida without anencephalus	1	12.11	0.31-67.45
	Ventricular septal defect	1	12.11	0.31-67.45
	Births: 826	24	290.56	186.16-432.32
Hawkins				
	Anencephalus	1	5.17	0.13-28.82
	Aortic valve stenosis	2	10.35	1.25-37.38
	Atrial septal defect	33	170.72	117.52-239.76
	Cleft lip with/without cleft palate	4	20.69	5.64-52.98
	Cleft palate without cleft lip	1	5.17	0.13-28.82
	Coarctation of aorta	2	10.35	1.25-37.38
	Congenital hip dislocation	4	20.69	5.64-52.98
	Diaphragmatic hernia	1	5.17	0.13-28.82
	Down syndrome	2	10.35	1.25-37.38
	Endocardial cushion	1	5.17	0.13-28.82
	Esophageal atresia / tracheoesophageal fistula	1	5.17	0.13-28.82
	Fetal alcohol syndrome	1	5.17	0.13-28.82
	Gastroschisis	1	5.17	0.13-28.82
	Hirschsprung's disease	1	5.17	0.13-28.82
	Hydrocephalus without spina bifida	3	15.52	3.20-45.36
	Hypospadias / epispadias	6	31.04	11.39-67.56
	Microcephalus	2	10.35	1.25-37.38

County	Diagnosis	Cases	Rate	95% Confidence Interval
Hawkins				
	Obstructive genitourinary defect	8	41.39	17.87-81.55
	Patent ductus arteriosus	23	118.99	75.43-178.54
	Pulmonary valve atresia	3	15.52	3.20-45.36
	Pyloric stenosis	10	51.73	24.81-95.14
	Reduction deformity, upper limbs	1	5.17	0.13-28.82
	Spina bifida without anencephalus	1	5.17	0.13-28.82
	Tetralogy of Fallot	1	5.17	0.13-28.82
	Transposition of great arteries	1	5.17	0.13-28.82
	Tricuspid valve atresia stenosis	1	5.17	0.13-28.82
	Trisomy 13	1	5.17	0.13-28.82
	Ventricular septal defect	24	124.16	79.55-184.74
	Births: 1933	140	724.26	609.25-854.67
Haywood				
	Atrial septal defect	2	22.99	2.78-83.04
	Choanal atresia	1	11.49	0.29-64.04
	Cleft lip with/without cleft palate	4	45.98	12.53-117.72
	Congenital hip dislocation	1	11.49	0.29-64.04
	Esophageal atresia / tracheoesophageal fistula	1	11.49	0.29-64.04
	Hypoplastic left heart syndrome	1	11.49	0.29-64.04
	Hypospadias / epispadias	4	45.98	12.53-117.72
	Obstructive genitourinary defect	1	11.49	0.29-64.04
	Omphalocele	1	11.49	0.29-64.04
	Patent ductus arteriosus	1	11.49	0.29-64.04
	Pyloric stenosis	1	11.49	0.29-64.04
	Rectal large intestinal atresia stenosis	1	11.49	0.29-64.04
	Ventricular septal defect	2	22.99	2.78-83.04
	Births: 870	21	241.38	149.41-368.97
Henderson				
	Atrial septal defect	5	47.48	15.42-110.81
	Biliary atresia	1	9.50	0.24-52.91
	Common truncus	1	9.50	0.24-52.91
	Congenital cataract	1	9.50	0.24-52.91
	Down syndrome	2	18.99	2.3-68.61
	Gastroschisis	1	9.50	0.24-52.91
	Hypospadias / epispadias	2	18.99	2.3-68.61
	Microcephalus	2	18.99	2.3-68.61
	Patent ductus arteriosus	2	18.99	2.3-68.61
	Pulmonary valve atresia	2	18.99	2.3-68.61
	Pyloric stenosis	3	28.49	5.87-83.26
	Rectal large intestinal atresia stenosis	1	9.50	0.24-52.91
	Reduction deformity, upper limbs	1	9.50	0.24-52.91

County	Diagnosis	Cases	Rate	95% Confidence Interval
Henderson				
	Ventricular septal defect	4	37.99	10.35-97.26
	Births: 1053	28	265.91	176.70-384.32
Henry				
	Choanal atresia	1	8.89	0.22-49.53
	Cleft lip with/without cleft palate	1	8.89	0.22-49.53
	Cleft palate without cleft lip	2	17.78	2.15-64.22
	Common truncus	1	8.89	0.22-49.53
	Congenital cataract	2	17.78	2.15-64.22
	Down syndrome	1	8.89	0.22-49.53
	Gastroschisis	1	8.89	0.22-49.53
	Hydrocephalus without spina bifida	1	8.89	0.22-49.53
	Microcephalus	1	8.89	0.22-49.53
	Obstructive genitourinary defect	2	17.78	2.15-64.22
	Pulmonary valve atresia	1	8.89	0.22-49.53
	Pyloric stenosis	7	62.22	25.02-128.2
	Rectal large intestinal atresia stenosis	1	8.89	0.22-49.53
	Renal agenesis / hypoplasia	2	17.78	2.15-64.22
	Transposition of great arteries	1	8.89	0.22-49.53
	Ventricular septal defect	2	17.78	2.15-64.22
	Births: 1125	27	240.00	158.16-349.18
Hickman				
	Atrial septal defect	3	34.52	7.12-100.89
	Cleft palate without cleft lip	2	23.01	2.79-83.14
	Common truncus	1	11.51	0.29-64.12
	Congenital hip dislocation	2	23.01	2.79-83.14
	Down syndrome	1	11.51	0.29-64.12
	Hypospadias / epispadias	6	69.04	25.34-150.28
	Obstructive genitourinary defect	1	11.51	0.29-64.12
	Patent ductus arteriosus	2	23.01	2.79-83.14
	Pyloric stenosis	9	103.57	47.36-196.6
	Spina bifida without anencephalus	1	11.51	0.29-64.12
	Ventricular septal defect	4	46.03	12.54-117.86
	Births: 869	32	368.24	251.88-519.84
Houston				
	Anencephalus	1	33.33	0.84-185.72
	Coarctation of aorta	1	33.33	0.84-185.72
	Hypoplastic left heart syndrome	1	33.33	0.84-185.72
	Hypospadias / epispadias	1	33.33	0.84-185.72
	Obstructive genitourinary defect	1	33.33	0.84-185.72
	Pyloric stenosis	1	33.33	0.84-185.72
	Births: 300	6	200.00	73.40-435.32

County	Diagnosis	Cases	Rate	95% Confidence Interval
Humphreys				
	Aortic valve stenosis	2	30.40	3.68-109.80
	Atrial septal defect	2	30.40	3.68-109.80
	Cleft lip with/without cleft palate	1	15.20	0.38-84.67
	Cleft palate without cleft lip	2	30.40	3.68-109.80
	Coarctation of aorta	1	15.20	0.38-84.67
	Congenital hip dislocation	2	30.40	3.68-109.80
	Down syndrome	2	30.40	3.68-109.80
	Encephalocele	1	15.20	0.38-84.67
	Endocardial cushion	1	15.20	0.38-84.67
	Esophageal atresia / tracheoesophageal fistula	1	15.20	0.38-84.67
	Hypospadias / epispadias	2	30.40	3.68-109.80
	Obstructive genitourinary defect	2	30.40	3.68-109.80
	Patent ductus arteriosus	4	60.79	16.57-155.65
	Pulmonary valve atresia	2	30.40	3.68-109.08
	Pyloric stenosis	4	60.79	16.57-155.65
	Rectal large intestinal atresia stenosis	2	30.40	3.68-109.80
	Renal agenesis / hypoplasia	1	15.20	0.38-84.67
	Transposition of great arteries	1	15.20	0.38-84.67
	Trisomy 18	1	15.20	0.38-84.67
	Ventricular septal defect	4	60.79	16.57-155.65
	Births: 658	38	577.51	408.70-792.69
Jackson				
	Cleft palate without cleft lip	1	31.45	0.80-175.21
	Congenital hip dislocation	1	31.45	0.80-175.21
	Down syndrome	1	31.45	0.80-175.21
	Esophageal atresia / Tracheoesophalgeal Fistula	1	31.45	0.80-175.21
	Hypospadias / epispadias	1	31.45	0.80-175.21
	Obstructive genitourinary defect	2	62.89	7.62-227.19
	Patent ductus arteriosus	4	125.79	34.28-322.06
	Pyloric stenosis	1	31.45	0.80-175.21
	Rectal large intestinal atresia stenosis	1	31.45	0.80-175.21
	Ventricular septal defect	2	62.89	7.62-227.19
	Births: 318	15	471.70	264.01-777.97
Jefferson				
	Atrial septal defect	2	12.57	1.52-45.41
	Cleft lip with/without cleft palate	2	12.57	1.52-45.41
	Cleft palate without cleft lip	1	6.29	0.16-35.02
	Coarctation of aorta	1	6.29	0.16-35.02
	Down syndrome	3	18.86	3.89-55.10

County	Diagnosis	Cases	Rate	95% Confidence Interval
Jefferson				
	Ebstein's anomaly	1	6.29	0.16-35.02
	Endocardial cushion	1	6.29	0.16-35.02
	Gastroschisis	1	6.29	0.16-35.02
	Hydrocephalus without spina bifida	3	18.86	3.89-55.10
	Hypospadias / epispadias	6	37.71	13.84-82.08
	Microcephalus	2	12.57	1.52-45.41
	Obstructive genitourinary defect	3	18.86	3.89-55.10
	Omphalocele	1	6.29	0.16-35.02
	Patent ductus arteriosus	6	37.71	13.84-82.08
	Pyloric stenosis	9	56.57	25.87-107.38
	Reduction deformity, upper limbs	2	12.57	1.52-45.41
	Tetralogy of Fallot	1	6.29	0.16-35.02
	Ventricular septal defect	7	44.00	17.69-90.65
	Births: 1591	52	326.84	244.08-428.62
Johnson				
	Atrial septal defect	7	154.19	62.00-317.68
	Choanal atresia	1	22.03	0.56-122.72
	Cleft lip with/without cleft palate	1	22.03	0.56-122.72
	Down syndrome	2	44.05	5.33-159.13
	Endocardial cushion	2	44.05	5.33-159.13
	Gastroschisis	1	22.03	0.56-122.72
	Hydrocephalus without spina bifida	1	22.03	0.56-122.72
	Hypospadias / epispadias	2	44.05	5.33-159.13
	Obstructive genitourinary defect	4	88.11	24.01-225.59
	Patent ductus arteriosus	4	88.11	24.01-225.59
	Pulmonary valve atresia	2	44.05	5.33-159.13
	Reduction deformity, upper limbs	1	22.03	0.56-122.72
	Renal agenesis / hypoplasia	2	44.05	5.33-159.13
	Spina bifida	1	22.03	0.56-122.72
	Tetralogy of Fallot	1	22.03	0.56-122.72
	Ventricular septal defect	4	88.11	24.01-225.59
	Births: 454	36	792.95	555.38-1097.76
Knox				
	Anophthalmia / microphthalmia	1	0.70	0.02-3.90
	Anotia/Microtia	3	2.10	0.43-6.13
	Aortic valve stenosis	1	0.70	0.02-3.90
	Atrial septal defect	43	30.06	21.76-40.50
	Biliary atresia	3	2.10	0.43-6.13
	Bladder exstrophy	1	0.70	0.02-3.90
	Choanal atresia	1	0.70	0.02-3.90
	Cleft lip with/without cleft palate	21	14.68	9.09-22.44
	Cleft palate without cleft lip	9	6.29	2.88-11.94

County	Diagnosis	Cases	Rate	95% Confidence Interval
Knox				
	Coarctation of aorta	10	6.99	3.35-12.86
	Common truncus	1	0.70	0.02-3.90
	Congenital cataract	2	1.40	0.17-5.05
	Congenital hip dislocation	14	9.79	5.35-16.42
	Diaphragmatic hernia	4	2.80	0.76-7.16
	Down syndrome	17	11.89	6.92-19.03
	Ebstein's anomaly	2	1.40	0.17-5.05
	Endocardial cushion	7	4.89	1.97-10.08
	Esophageal atresia / tracheoesophageal fistula	6	4.19	1.54-9.13
	Fetal alcohol syndrome	3	2.10	0.43-6.13
	Gastroschisis	7	4.89	1.97-10.08
	Hirschsprung's disease	4	2.80	0.76-7.16
	Hydrocephalus without spina bifida	9	6.29	2.88-11.94
	Hypoplastic left heart syndrome	5	3.50	1.14-8.16
	Hypospadias / epispadias	72	50.34	39.39-63.39
	Microcephalus	8	5.59	2.41-11.02
	Obstructive genitourinary defect	61	42.65	32.62-54.78
	Omphalocele	2	1.40	0.17-5.05
	Patent ductus arteriosus	57	39.85	30.18-51.63
	Pulmonary valve atresia	11	7.69	3.84-13.76
	Pyloric stenosis	46	32.16	23.55-42.90
	Rectal large intestinal atresia stenosis	6	4.19	1.54-9.13
	Reduction deformity, lower limbs	2	1.40	0.17-5.05
	Reduction deformity, upper limbs	3	2.10	0.43-6.13
	Renal agenesis / hypoplasia	10	6.99	3.35-12.86
	Spina bifida without anencephalus	5	3.50	1.14-8.16
	Tetralogy of Fallot	12	8.39	4.34-14.66
	Transposition of great arteries	7	4.89	1.97-10.08
	Tricuspid valve atresia stenosis	2	1.40	0.17-5.05
	Trisomy 13	2	1.40	0.17-5.05
	Trisomy 18	5	3.50	1.14-8.16
	Ventricular septal defect	60	41.95	32.01-54.00
	Births: 14303	545	381.04	349.71-414.42
Lake				
	Anophthalmia / microphthalmia	1	44.05	1.11-245.44
	Atrial septal defect	2	88.11	10.67-318.26
	Down syndrome	1	44.05	1.11-245.44
	Hirschsprung's disease	1	44.05	1.11-245.44
	Hypospadias / epispadias	2	88.11	10.67-318.26
	Patent ductus arteriosus	1	44.05	1.11-245.44
	Pulmonary valve atresia	1	44.05	1.11-245.44

County	Diagnosis	Cases	Rate	95% Confidence Interval
Lake				
	Pyloric stenosis	1	44.05	1.11-245.44
	Births: 227	10	440.53	211.23-810.13
Lauderdale				
	Aortic valve stenosis	2	16.27	1.97-58.78
	Atrial septal defect	3	24.41	5.03-71.34
	Congenital hip dislocation	1	8.14	0.21-45.33
	Diaphragmatic hernia	1	8.14	0.21-45.33
	Down syndrome	3	24.41	5.03-71.34
	Endocardial cushion	1	8.14	0.21-45.33
	Gastroschisis	1	8.14	0.21-45.33
	Hydrocephalus without spina bifida	4	32.55	8.87-83.33
	Hypospadias / epispadias	8	65.09	28.10-128.26
	Obstructive genitourinary defect	1	8.14	0.21-45.33
	Omphalocele	1	8.14	0.21-45.33
	Patent ductus arteriosus	1	8.14	0.21-45.33
	Pulmonary valve atresia	2	16.27	1.97-58.78
	Pyloric stenosis	1	8.14	0.21-45.33
	Rectal large intestinal atresia stenosis	1	8.14	0.21-45.33
	Tetralogy of Fallot	2	16.27	1.97-58.78
	Ventricular septal defect	4	32.55	8.87-83.33
	Births: 1229	37	301.06	211.97-414.98
Lawrence				
	Atrial septal defect	7	38.95	15.66-80.26
	Cleft lip with/without cleft palate	1	5.56	0.14-31.01
	Cleft palate without cleft lip	1	5.56	0.14-31.01
	Congenital hip dislocation	2	11.13	1.35-40.20
	Diaphragmatic hernia	1	5.56	0.14-31.01
	Down syndrome	2	11.13	1.35-40.20
	Endocardial cushion	2	11.13	1.35-40.20
	Gastroschisis	1	5.56	0.14-31.01
	Hydrocephalus without spina bifida	2	11.13	1.35-40.20
	Hypospadias / epispadias	4	22.26	6.07-56.99
	Obstructive genitourinary defect	3	16.69	3.44-48.79
	Patent ductus arteriosus	7	38.95	15.66-80.26
	Pyloric stenosis	4	22.26	6.07-56.99
	Rectal large intestinal atresia stenosis	1	5.56	0.14-31.01
	Reduction deformity, upper limbs	1	5.56	0.14-31.01
	Transposition of great arteries	1	5.56	0.14-31.01
	Ventricular septal defect	3	16.69	3.44-48.79
	Births: 1797	43	239.29	173.17-322.32

County	Diagnosis	Cases	Rate	95% Confidence Interval
Lewis				
	Atrial septal defect	1	25.00	0.63-139.29
	Choanal atresia	1	25.00	0.63-139.29
	Cleft lip with/without cleft palate	1	25.00	0.63-139.29
	Coarctation of aorta	1	25.00	0.63-139.29
	Ebstein's anomaly	1	25.00	0.63-139.29
	Hypospadias / epispadias	2	50.00	6.06-180.61
	Obstructive genitourinary defect	1	25.00	0.63-139.29
	Patent ductus arteriosus	3	75.00	15.46-219.18
	Pyloric stenosis	2	50.00	6.06-180.61
	Ventricular septal defect	2	50.00	6.06-180.61
	Births: 400	15	375.00	209.89-618.49
Lincoln				
	Anophthalmia / microphthalmia	1	8.70	0.22-48.45
	Atrial septal defect	1	8.70	0.22-48.45
	Cleft lip with/without cleft palate	1	8.70	0.22-48.45
	Congenital hip dislocation	1	8.70	0.22-48.45
	Down syndrome	1	8.70	0.22-48.45
	Gastroschisis	2	17.39	2.11-62.82
	Hypoplastic left heart syndrome	1	8.70	0.22-48.45
	Hypospadias / epispadias	1	8.70	0.22-48.45
	Obstructive genitourinary defect	1	8.70	0.22-48.45
	Patent ductus arteriosus	1	8.70	0.22-48.45
	Pulmonary valve atresia	1	8.70	0.22-48.45
	Pyloric stenosis	6	52.17	19.15-113.56
	Reduction deformity, lower limbs	1	8.70	0.22-48.45
	Trisomy 13	1	8.70	0.22-48.45
	Ventricular septal defect	1	8.70	0.22-48.45
	Births: 1150	21	182.61	113.03-279.14
Loudon				
	Anophthalmia / microphthalmia	1	6.95	0.18-38.75
	Atrial septal defect	4	27.82	7.58-71.22
	Bladder exstrophy	1	6.95	0.18-38.75
	Cleft lip with/without cleft palate	2	13.91	1.68-50.24
	Cleft palate without cleft lip	1	6.95	0.18-38.75
	Congenital hip dislocation	2	13.91	1.68-50.24
	Down syndrome	1	6.95	0.18-38.75
	Endocardial cushion	1	6.95	0.18-38.75
	Esophageal atresia / tracheoesophageal fistula	1	6.95	0.18-38.75
	Fetal alcohol syndrome	3	20.86	4.30-60.97
	Gastroschisis	1	6.95	0.18-38.75

County	Diagnosis	Cases	Rate	95% Confidence Interval
Loudon				
	Hypospadias / epispadias	9	62.59	28.62-118.81
	Microcephalus	1	6.95	0.18-38.75
	Obstructive genitourinary defect	5	34.77	11.29-81.14
	Omphalocele	1	6.95	0.18-38.75
	Patent ductus arteriosus	7	48.68	19.57-100.3
	Pulmonary valve atresia	1	6.95	0.18-38.75
	Pyloric stenosis	6	41.72	15.31-90.82
	Rectal large intestinal atresia stenosis	2	13.91	1.68-50.24
	Tetralogy of Fallot	2	13.91	1.68-50.24
	Trisomy 18	1	6.95	0.18-38.75
	Ventricular septal defect	4	27.82	7.58-71.22
	Births: 1438	57	396.38	300.22-513.55
Macon				
	Atrial septal defect	2	25.41	3.08-91.80
	Coarctation of aorta	1	12.71	0.32-70.80
	Congenital hip dislocation	1	12.71	0.32-70.80
	Gastroschisis	1	12.71	0.32-70.80
	Hypoplastic left heart syndrome	1	12.71	0.32-70.80
	Hypospadias / epispadias	1	12.71	0.32-70.80
	Obstructive genitourinary defect	1	12.71	0.32-70.80
	Patent ductus arteriosus	3	38.12	7.86-111.40
	Pulmonary valve atresia	1	12.71	0.32-70.80
	Pyloric stenosis	4	50.83	13.85-130.13
	Rectal large intestinal atresia stenosis	1	12.71	0.32-70.80
	Renal agenesis / hypoplasia	1	12.71	0.32-70.80
	Transposition of great arteries	2	25.41	3.08-91.80
	Ventricular septal defect	3	38.12	7.86-111.40
	Births: 787	23	292.25	185.26-438.52
Madison				
	Anophthalmia / microphthalmia	2	4.99	0.60-18.03
	Atrial septal defect	13	32.44	17.27-55.46
	Choanal atresia	2	4.99	0.60-18.03
	Cleft lip with/without cleft palate	1	2.50	0.06-13.90
	Cleft palate without cleft lip	2	4.99	0.60-18.03
	Coarctation of aorta	2	4.99	0.60-18.03
	Congenital cataract	1	2.50	0.06-13.90
	Congenital hip dislocation	2	4.99	0.60-18.03
	Diaphragmatic hernia	3	7.49	1.54-21.87
	Down syndrome	5	12.48	4.05-29.11
	Ebstein's anomaly	1	2.50	0.06-13.90
	Encephalocele	2	4.99	0.60-18.03

County	Diagnosis	Cases	Rate	95% Confidence Interval
Madison				
	Endocardial cushion	1	2.50	0.06-13.90
	Esophageal atresia / tracheoesophageal fistula	2	4.99	0.60-18.03
	Fetal alcohol syndrome	1	2.50	0.06-13.90
	Gastroschisis	1	2.50	0.06-13.90
	Hydrocephalus without spina bifida	5	12.48	4.05-29.11
	Hypospadias / epispadias	17	42.42	24.71-67.91
	Microcephalus	1	2.50	0.06-13.90
	Obstructive genitourinary defect	6	14.97	5.49-32.58
	Omphalocele	2	4.99	0.60-18.03
	Patent ductus arteriosus	12	29.94	15.47-52.30
	Pulmonary valve atresia	2	4.99	0.60-18.03
	Pyloric stenosis	6	14.97	5.49-32.58
	Rectal large intestinal atresia stenosis	1	2.50	0.06-13.90
	Renal agenesis / hypoplasia	1	2.50	0.06-13.90
	Spina bifida without anencephalus	1	2.50	0.06-13.90
	Tetralogy of Fallot	1	2.50	0.06-13.90
	Transposition of great arteries	1	2.50	0.06-13.90
	Tricuspid valve atresia stenosis	1	2.50	0.06-13.90
	Ventricular septal defect	15	37.43	20.95-61.73
	Births: 4008	113	281.94	232.35-338.97
Marion				
	Atrial septal defect	4	39.02	10.63-99.92
	Cleft palate without cleft lip	1	9.76	0.25-54.36
	Coarctation of aorta	1	9.76	0.25-54.36
	Down syndrome	1	9.76	0.25-54.36
	Gastroschisis	1	9.76	0.25-54.36
	Hirschsprung's disease	1	9.76	0.25-54.36
	Hypospadias / epispadias	4	39.02	10.63-99.92
	Obstructive genitourinary defect	4	39.02	10.63-99.92
	Patent ductus arteriosus	4	39.02	10.63-99.92
	Pulmonary valve atresia	1	9.76	0.25-54.36
	Pyloric stenosis	2	19.51	2.36-70.48
	Rectal large intestinal atresia stenosis	1	9.76	0.25-54.36
	Reduction deformity, upper limbs	1	9.76	0.25-54.36
	Spina bifida without anencephalus	1	9.76	0.25-54.36
	Transposition of great arteries	1	9.76	0.25-54.36
	Ventricular septal defect	3	29.27	6.04-85.53
	Births: 1025	31	302.44	205.51-429.28
Marshall				
	Atrial septal defect	5	44.92	14.59-104.84
	Cleft lip with/without cleft palate	2	17.97	2.18-64.91

County	Diagnosis	Cases	Rate	95% Confidence Interval
Marshall				
	Cleft palate without cleft lip	1	8.98	0.23-50.06
	Congenital hip dislocation	3	26.95	5.56-78.77
	Down syndrome	2	17.97	2.18-64.91
	Esophageal atresia / tracheoesophageal fistula	2	17.97	2.18-64.91
	Fetal alcohol syndrome	1	8.98	0.23-50.06
	Gastroschisis	2	17.97	2.18-64.91
	Hypospadias / epispadias	8	71.88	31.03-141.63
	Microcephalus	2	17.97	2.18-64.91
	Patent ductus arteriosus	4	35.94	9.79-92.02
	Pulmonary valve atresia	1	8.98	0.23-50.06
	Pyloric stenosis	2	17.97	2.18-64.91
	Tetralogy of Fallot	1	8.98	0.23-50.06
	Ventricular septal defect	3	26.95	5.56-78.77
	Births: 1113	39	350.40	249.17-479.00
Maury				
	Anencephalus	1	3.35	0.08-18.66
	Atrial septal defect	6	20.09	7.37-43.74
	Biliary atresia	1	3.35	0.08-18.66
	Choanal atresia	2	6.70	0.81-24.19
	Cleft lip with/without cleft palate	4	13.40	3.65-34.30
	Cleft palate without cleft lip	2	6.70	0.81-24.19
	Coarctation of aorta	1	3.35	0.08-18.66
	Congenital cataract	1	3.35	0.08-18.66
	Congenital hip dislocation	8	26.79	11.57-52.79
	Diaphragmatic hernia	2	6.70	0.81-24.19
	Down syndrome	4	13.40	3.65-34.30
	Encephalocele	1	3.35	0.08-18.66
	Fetal alcohol syndrome	1	3.35	0.08-18.66
	Gastroschisis	1	3.35	0.08-18.66
	Hirschsprung's disease	1	3.35	0.08-18.66
	Hydrocephalus without spina bifida	3	10.05	2.07-29.36
	Hypospadias / epispadias	11	36.84	18.39-65.92
	Microcephalus	1	3.35	0.08-18.66
	Obstructive genitourinary defect	8	26.79	11.57-52.79
	Patent ductus arteriosus	7	23.44	9.43-48.30
	Pyloric stenosis	7	23.44	9.43-48.30
	Rectal large intestinal atresia stenosis	3	10.05	2.07-29.36
	Renal Agenesis / Hypoplasia	1	3.35	0.08-18.66
	Tetralogy of Fallot	2	6.70	0.81-24.19
	Transposition of great arteries	2	6.70	0.81-24.19

County	Diagnosis	Cases	Rate	95% Confidence Interval
Maury				
	Ventricular septal defect	6	20.09	7.37-43.74
	Births: 2986	87	291.36	233.38-359.39
McMinn				
	Atrial septal defect	7	37.51	15.08-77.29
	Choanal atresia	1	5.36	0.14-29.86
	Cleft lip with/without cleft palate	1	5.36	0.14-29.86
	Cleft palate without cleft lip	2	10.72	1.30-38.72
	Coarctation of aorta	2	10.72	1.30-38.72
	Common truncus	1	5.36	0.14-29.86
	Congenital cataract	1	5.36	0.14-29.86
	Congenital hip dislocation	3	16.08	3.32-46.98
	Down syndrome	2	10.72	1.30-38.72
	Fetal alcohol syndrome	1	5.36	0.14-29.86
	Hydrocephalus without spina bifida	1	5.36	0.14-29.86
	Hypospadias / epispadias	16	85.74	49.01-139.24
	Microcephalus	1	5.36	0.14-29.86
	Obstructive genitourinary defect	2	10.72	1.30-38.72
	Omphalocele	1	5.36	0.14-29.86
	Patent ductus arteriosus	11	58.95	29.43-105.48
	Pulmonary valve atresia	2	10.72	1.30-38.72
	Pyloric stenosis	2	10.72	1.30-38.72
	Spina bifida	1	5.36	0.14-29.86
	Transposition of great arteries	1	5.36	0.14-29.86
	Ventricular septal defect	7	37.51	15.08-77.29
	Births: 1866	66	353.70	273.55-449.97
McNairy				
	Atrial septal defect	1	9.78	0.25-54.46
	Cleft lip with/without cleft palate	2	19.55	2.37-70.62
	Down syndrome	2	19.55	2.37-70.62
	Hydrocephalus without spina bifida	1	9.78	0.25-54.46
	Hypospadias / epispadias	2	19.55	2.37-70.62
	Obstructive genitourinary defect	1	9.78	0.25-54.46
	Patent ductus arteriosus	2	19.55	2.37-70.62
	Pyloric stenosis	1	9.78	0.25-54.46
	Rectal large intestinal atresia stenosis	1	9.78	0.25-54.46
	Transposition of great arteries	1	9.78	0.25-54.46
	Ventricular septal defect	4	39.10	10.65-100.11
	Births: 1023	18	175.95	104.29-278.08
Meigs				
	Aortic valve stenosis	1	21.79	0.55-121.39
	Atrial septal defect	1	21.79	0.55-121.39

County	Diagnosis	Cases	Rate	95% Confidence Interval
Meigs				
	Cleft palate without cleft lip	2	43.57	5.28-157.40
	Congenital hip dislocation	1	21.79	0.55-121.39
	Hydrocephalus without spina bifida	3	65.36	13.48-191.01
	Hypospadias / epispadias	1	21.79	0.55-121.39
	Obstructive genitourinary defect	2	43.57	5.28-157.40
	Pulmonary valve atresia	3	65.36	13.48-191.01
	Pyloric stenosis	3	65.36	13.48-191.01
	Ventricular septal defect	3	65.36	13.48-191.01
	Births: 459	20	435.73	266.14-672.94
Monroe				
	Anencephalus	1	6.26	0.16-34.89
	Atrial septal defect	3	18.79	3.87-54.90
	Biliary atresia	1	6.26	0.16-34.89
	Cleft lip with/without cleft palate	3	18.79	3.87-54.9
	Cleft palate without cleft lip	1	6.26	0.16-34.89
	Coarctation of aorta	1	6.26	0.16-34.89
	Congenital cataract	1	6.26	0.16-34.89
	Congenital hip dislocation	2	12.52	1.52-45.24
	Down syndrome	2	12.52	1.52-45.24
	Encephalocele	1	6.26	0.16-34.89
	Fetal alcohol syndrome	1	6.26	0.16-34.89
	Hirschsprung's disease	1	6.26	0.16-34.89
	Hydrocephalus without spina bifida	1	6.26	0.16-34.89
	Hypospadias / epispadias	9	56.36	25.77-106.98
	Microcephalus	2	12.52	1.52-45.24
	Obstructive genitourinary defect	6	37.57	13.79-81.78
	Patent ductus arteriosus	10	62.62	30.03-115.15
	Pulmonary valve atresia	2	12.52	1.52-45.24
	Pyloric stenosis	6	37.57	13.79-81.78
	Rectal large intestinal atresia stenosis	1	6.26	0.16-34.89
	Renal agenesis / hypoplasia	2	12.52	1.52-45.24
	Spina bifida without anencephalus	1	6.26	0.16-34.89
	Tetralogy of Fallot	1	6.26	0.16-34.89
	Trisomy 18	1	6.26	0.16-34.89
	Ventricular septal defect	4	25.05	6.83-64.13
	Births: 1597	64	400.75	308.62-511.76
Montgomery				
	Anophthalmia / microphthalmia	2	2.77	0.34-10.00
	Aortic valve stenosis	2	2.77	0.34-10.00
	Atrial septal defect	22	30.45	19.08-46.1
	Biliary atresia	1	1.38	0.04-7.71

County	Diagnosis	Cases	Rate	95% Confidence Interval
Montgomery				
	Cleft lip with/without cleft palate	4	5.54	1.51-14.18
	Cleft palate without cleft lip	3	4.15	0.86-12.13
	Coarctation of aorta	5	6.92	2.25-16.15
	Congenital hip dislocation	3	4.15	0.86-12.13
	Diaphragmatic hernia	3	4.15	0.86-12.13
	Down syndrome	6	8.30	3.05-18.08
	Endocardial cushion	2	2.77	0.34-10.00
	Fetal alcohol syndrome	1	1.38	0.04-7.71
	Gastroschisis	7	9.69	3.90-19.96
	Hirschsprung's disease	3	4.15	0.86-12.13
	Hydrocephalus without spina bifida	6	8.30	3.05-18.08
	Hypoplastic left heart syndrome	3	4.15	0.86-12.13
	Hypospadias / epispadias	27	37.37	24.63-54.37
	Microcephalus	2	2.77	0.34-10.00
	Obstructive genitourinary defect	9	12.46	5.70-23.65
	Omphalocele	1	1.38	0.04-7.71
	Patent ductus arteriosus	24	33.22	21.28-49.43
	Pulmonary valve atresia	12	16.61	8.58-29.01
	Pyloric stenosis	11	15.22	7.6-27.24
	Rectal large intestinal atresia stenosis	5	6.92	2.25-16.15
	Reduction deformity, lower limbs	1	1.38	0.04-7.71
	Reduction deformity, upper limbs	3	4.15	0.86-12.13
	Spina bifida without anencephalus	2	2.77	0.34-10.00
	Tetralogy of Fallot	6	8.30	3.05-18.08
	Transposition of great arteries	4	5.54	1.51-14.18
	Tricuspid valve atresia stenosis	1	1.38	0.04-7.71
	Trisomy 13	2	2.77	0.34-10.00
	Trisomy 18	1	1.38	0.04-7.71
	Ventricular septal defect	31	42.91	29.16-60.9
	Births: 7225	215	297.58	259.13-340.13
Moore				
	Atrial septal defect	1	55.25	1.40-307.82
	Coarctation of aorta	3	165.75	34.18-484.38
	Hirschsprung's disease	1	55.25	1.40-307.82
	Hypoplastic left heart syndrome	1	55.25	1.40-307.82
	Patent ductus arteriosus	1	55.25	1.40-307.82
	Transposition of great arteries	1	55.25	1.40-307.82
	Births: 181	8	441.99	190.81-870.90
Morgan				
	Atrial septal defect	1	14.99	0.38-83.53

County	Diagnosis	Cases	Rate	95% Confidence Interval
Morgan				
	Cleft palate without cleft lip	1	14.99	0.38-83.53
	Ebstein's anomaly	1	14.99	0.38-83.53
	Fetal alcohol syndrome	1	14.99	0.38-83.53
	Hirschsprung's disease	1	14.99	0.38-83.53
	Hypospadias / epispadias	5	74.96	24.34-174.94
	Obstructive genitourinary defect	5	74.96	24.34-174.94
	Patent ductus arteriosus	1	14.99	0.38-83.53
	Pulmonary valve atresia	1	14.99	0.38-83.53
	Pyloric stenosis	1	14.99	0.38-83.53
	Ventricular septal defect	2	29.99	3.63-108.31
	Births: 667	20	299.85	183.15-463.09
Obion				
	Atrial septal defect	4	31.97	8.71-81.87
	Cleft lip with/without cleft palate	2	15.99	1.94-57.75
	Cleft palate without cleft lip	1	7.99	0.20-44.54
	Congenital cataract	1	7.99	0.20-44.54
	Down syndrome	1	7.99	0.20-44.54
	Esophageal atresia / tracheoesophageal fistula	3	23.98	4.94-70.08
	Hydrocephalus without spina bifida	1	7.99	0.20-44.54
	Hypospadias / epispadias	6	47.96	17.60-104.39
	Obstructive genitourinary defect	7	55.96	22.50-115.29
	Pulmonary valve atresia	1	7.99	0.20-44.54
	Pyloric stenosis	4	31.97	8.71-81.87
	Rectal large intestinal atresia stenosis	1	7.99	0.20-44.54
	Reduction deformity, upper limbs	1	7.99	0.20-44.54
	Spina bifida without anencephalus	1	7.99	0.20-44.54
	Tetralogy of Fallot	2	15.99	1.94-57.75
	Transposition of great arteries	1	7.99	0.20-44.54
	Ventricular septal defect	2	15.99	1.94-57.75
	Births: 1251	39	311.75	221.69-426.16
Overton				
	Coarctation of aorta	1	14.39	0.36-80.17
	Down syndrome	1	14.39	0.36-80.17
	Esophageal atresia / tracheoesophageal fistula	1	14.39	0.36-80.17
	Hypospadias / epispadias	3	43.17	8.9-126.15
	Patent ductus arteriosus	4	57.55	15.68-147.36
	Pyloric stenosis	1	14.39	0.36-80.17
	Transposition of great arteries	1	14.39	0.36-80.17
	Ventricular septal defect	2	28.78	3.48-103.95
	Births: 695	14	201.44	110.13-337.97

County	Diagnosis	Cases	Rate	95% Confidence Interval
Perry				
	Atrial septal defect	1	35.97	0.91-200.42
	Cleft palate without cleft lip	1	35.97	0.91-200.42
	Congenital cataract	1	35.97	0.91-200.42
	Down syndrome	1	35.97	0.91-200.42
	Hypospadias / epispadias	1	35.97	0.91-200.42
	Patent ductus arteriosus	1	35.97	0.91-200.42
	Pyloric stenosis	2	71.94	8.71-259.88
	Renal agenesis / hypoplasia	1	35.97	0.91-200.42
	Ventricular septal defect	1	35.97	0.91-200.42
	Births: 278	10	359.71	172.48-661.51
Pickett				
	Hypospadias / epispadias	2	129.03	15.63-466.10
	Patent ductus arteriosus	2	129.03	15.63-466.10
	Pulmonary valve atresia	1	64.52	1.63-359.46
	Renal agenesis / hypoplasia	1	64.52	1.63-359.46
	Tetralogy of Fallot	1	64.52	1.63-359.46
	Ventricular septal defect	2	129.03	15.63-466.10
	Births: 155	9	580.65	265.53-1102.24
Polk				
	Atrial septal defect	2	32.05	3.88-115.78
	Down syndrome	2	32.05	3.88-115.78
	Hypospadias / epispadias	4	64.10	17.47-164.13
	Obstructive genitourinary defect	1	16.03	0.41-89.29
	Patent ductus arteriosus	1	16.03	0.41-89.29
	Pyloric stenosis	5	80.13	26.02-187.00
	Spina bifida without anencephalus	2	32.05	3.88-115.78
	Ventricular septal defect	3	48.08	9.91-140.50
	Births: 624	20	320.51	195.77-495.00
Putnam				
	Anencephalus	1	3.94	0.10-21.96
	Atrial septal defect	7	27.59	11.09-56.85
	Bladder exstrophy	1	3.94	0.10-21.96
	Cleft lip with/without cleft palate	2	7.88	0.95-28.48
	Cleft palate without cleft lip	2	7.88	0.95-28.48
	Coarctation of aorta	1	3.94	0.10-21.96
	Congenital cataract	1	3.94	0.10-21.96
	Congenital hip dislocation	2	7.88	0.95-28.48
	Down syndrome	3	11.82	2.44-34.56
	Esophageal atresia / tracheoesophageal fistula	1	3.94	0.10-21.96
	Gastroschisis	1	3.94	0.10-21.96

County	Diagnosis	Cases	Rate	95% Confidence Interval
Putnam				
	Hypoplastic left heart syndrome	2	7.88	0.95-28.48
	Hypospadias / epispadias	10	39.42	18.90-72.49
	Obstructive genitourinary defect	5	19.71	6.40-45.99
	Patent ductus arteriosus	4	15.77	4.3-40.37
	Pulmonary valve atresia	1	3.94	0.10-21.96
	Pyloric stenosis	10	39.42	18.90-72.49
	Rectal large intestinal atresia stenosis	1	3.94	0.10-21.96
	Reduction deformity, upper limbs	1	3.94	0.10-21.96
	Renal agenesis / hypoplasia	1	3.94	0.10-21.96
	Spina bifida without anencephalus	2	7.88	0.95-28.48
	Tetralogy of Fallot	2	7.88	0.95-28.48
	Trisomy 13	1	3.94	0.10-21.96
	Ventricular septal defect	11	43.36	21.64-77.58
	Births: 2537	73	287.74	225.53-361.78
Rhea				
	Anophthalmia / microphthalmia	1	8.43	0.21-46.98
	Atrial septal defect	3	25.30	5.22-73.92
	Congenital cataract	2	16.86	2.04-60.92
	Congenital hip dislocation	3	25.30	5.22-73.92
	Fetal alcohol syndrome	1	8.43	0.21-46.98
	Hirschsprung's disease	3	25.30	5.22-73.92
	Hydrocephalus without spina bifida	2	16.86	2.04-60.92
	Hypoplastic left heart syndrome	1	8.43	0.21-46.98
	Hypospadias / epispadias	5	42.16	13.69-98.39
	Microcephalus	1	8.43	0.21-46.98
	Obstructive genitourinary defect	5	42.16	13.69-98.39
	Patent ductus arteriosus	5	42.16	13.69-98.39
	Pulmonary valve atresia	2	16.86	2.04-60.92
	Pyloric stenosis	6	50.59	18.57-110.11
	Transposition of great arteries	2	16.86	2.04-60.92
	Tricuspid valve atresia stenosis	1	8.43	0.21-46.98
	Ventricular septal defect	5	42.16	13.69-98.39
	Births: 1186	48	404.72	298.40-536.62
Roane				
	Atrial septal defect	12	68.89	35.59-120.33
	Cleft lip with/without cleft palate	2	11.48	1.39-41.47
	Cleft palate without cleft lip	5	28.70	9.32-66.98
	Coarctation of aorta	2	11.48	1.39-41.47
	Congenital hip dislocation	3	17.22	3.55-50.33
	Down syndrome	2	11.48	1.39-41.47

County	Diagnosis	Cases	Rate	95% Confidence Interval
Roane				
	Ebstein's anomaly	3	17.22	3.55-50.33
	Esophageal atresia / tracheoesophageal fistula	1	5.74	0.15-31.98
	Hirschsprung's disease	1	5.74	0.15-31.98
	Hydrocephalus without spina bifida	2	11.48	1.39-41.47
	Hypoplastic left heart syndrome	1	5.74	0.15-31.98
	Hypospadias / epispadias	9	51.66	23.63-98.08
	Obstructive genitourinary defect	10	57.41	27.53-105.57
	Patent ductus arteriosus	7	40.18	16.16-82.79
	Pulmonary valve atresia	2	11.48	1.39-41.47
	Pyloric stenosis	5	28.70	9.32-66.98
	Rectal large intestinal atresia stenosis	2	11.48	1.39-41.47
	Spina bifida without anencephalus	1	5.74	0.15-31.98
	Tetralogy of Fallot	1	5.74	0.15-31.98
	Tricuspid valve atresia stenosis	1	5.74	0.15-31.98
	Trisomy 18	1	5.74	0.15-31.98
	Ventricular septal defect	8	45.92	19.83-90.49
	Births: 1742	81	464.98	369.24-577.93
Robertson				
	Anotia / microtia	1	3.89	0.10-21.68
	Atrial septal defect	4	15.56	4.24-39.85
	Cleft lip with/without cleft palate	4	15.56	4.24-39.85
	Cleft palate without cleft lip	1	3.89	0.10-21.68
	Coarctation of aorta	2	7.78	0.94-28.11
	Congenital hip dislocation	1	3.89	0.10-21.68
	Diaphragmatic hernia	1	3.89	0.10-21.68
	Esophageal atresia / tracheoesophageal fistula	2	7.78	0.94-28.11
	Gastroschisis	2	7.78	0.94-28.11
	Hydrocephalus without spina bifida	2	7.78	0.94-28.11
	Hypoplastic left heart syndrome	1	3.89	0.10-21.68
	Hypospadias / epispadias	19	73.93	44.51-115.45
	Microcephalus	3	11.67	2.41-34.11
	Obstructive genitourinary defect	5	19.46	6.32-45.40
	Patent ductus arteriosus	6	23.35	8.57-50.82
	Pulmonary valve atresia	2	7.78	0.94-28.11
	Pyloric stenosis	4	15.56	4.24-39.85
	Rectal large intestinal atresia stenosis	1	3.89	0.1-21.68
	Reduction deformity, upper limbs	1	3.89	0.1-21.68
	Renal agenesis / hypoplasia	1	3.89	0.1-21.68
	Transposition of great arteries	1	3.89	0.1-21.68
	Tricuspid valve atresia stenosis	1	3.89	0.10-21.68

County	Diagnosis	Cases	Rate	95% Confidence Interval
Robertson				
	Ventricular septal defect	5	19.46	6.32-45.40
	Births: 2570	70	272.37	212.32-344.12
Rutherford				
	Anencephalus	2	2.27	0.27-8.20
	Atrial septal defect	20	22.69	13.86-35.04
	Bladder exstrophy	1	1.13	0.03-6.32
	Choanal atresia	3	3.40	0.70-9.95
	Cleft lip with/without cleft palate	11	12.48	6.23-22.33
	Cleft palate without cleft lip	6	6.81	2.50-14.81
	Coarctation of aorta	4	4.54	1.24-11.62
	Common truncus	1	1.13	0.03-6.32
	Congenital cataract	4	4.54	1.24-11.62
	Congenital hip dislocation	11	12.48	6.23-22.33
	Diaphragmatic hernia	2	2.27	0.27-8.20
	Down syndrome	15	17.02	9.53-28.07
	Ebstein's anomaly	5	5.67	1.84-13.24
	Encephalocele	2	2.27	0.27-8.20
	Endocardial cushion	3	3.40	0.70-9.95
	Esophageal atresia / tracheoesophageal fistula	4	4.54	1.24-11.62
	Fetal alcohol syndrome	2	2.27	0.27-8.20
	Gastroschisis	3	3.40	0.70-9.95
	Hirschsprung’s disease	1	1.13	0.03-6.32
	Hydrocephalus without spina bifida	8	9.08	3.92-17.88
	Hypoplastic left heart syndrome	1	1.13	0.03-6.32
	Hypospadias / epispadias	49	55.59	41.13-73.5
	Microcephalus	5	5.67	1.84-13.24
	Obstructive genitourinary defect	11	12.48	6.23-22.33
	Omphalocele	4	4.54	1.24-11.62
	Patent ductus arteriosus	25	28.36	18.35-41.87
	Pulmonary valve atresia	2	2.27	0.27-8.20
	Pyloric stenosis	25	28.36	18.35-41.87
	Rectal large intestinal atresia stenosis	5	5.67	1.84-13.24
	Reduction deformity, upper limbs	3	3.40	0.70-9.95
	Renal agenesis / hypoplasia	5	5.67	1.84-13.24
	Spina bifida without anencephalus	2	2.27	0.27-8.20
	Tetralogy of Fallot	5	5.67	1.84-13.24
	Transposition of great arteries	2	2.27	0.27-8.20
	Tricuspid valve atresia stenosis	1	1.13	0.03-6.32
	Trisomy 13	1	1.13	0.03-6.32
	Ventricular septal defect	35	39.71	27.66-55.23
	Births: 8814	289	327.89	291.17-367.95

County	Diagnosis	Cases	Rate	95% Confidence Interval
Scott				
	Anencephalus	1	10.52	0.27-58.59
	Aortic valve stenosis	1	10.52	0.27-58.59
	Atrial septal defect	3	31.55	6.5-92.19
	Choanal atresia	2	21.03	2.55-75.97
	Cleft lip with/without cleft palate	2	21.03	2.55-75.97
	Coarctation of aorta	4	42.06	11.46-107.69
	Down syndrome	2	21.03	2.55-75.97
	Hypoplastic left heart syndrome	1	10.52	0.27-58.59
	Hypospadias / epispadias	6	63.09	23.15-137.32
	Obstructive genitourinary defect	4	42.06	11.46-107.69
	Omphalocele	1	10.52	0.27-58.59
	Patent ductus arteriosus	6	63.09	23.15-137.32
	Pulmonary valve atresia	1	10.52	0.27-58.59
	Pyloric stenosis	7	73.61	29.6-151.66
	Rectal large intestinal atresia stenosis	1	10.52	0.27-58.59
	Reduction deformity, upper limbs	1	10.52	0.27-58.59
	Transposition of great arteries	1	10.52	0.27-58.59
	Ventricular septal defect	6	63.09	23.15-137.32
	Births: 951	50	525.76	390.22-693.17
Sequatchie				
	Aortic valve stenosis	1	23.20	0.59-129.27
	Bladder exstrophy	1	23.20	0.59-129.27
	Cleft lip with/without cleft palate	1	23.20	0.59-129.27
	Congenital hip dislocation	1	23.20	0.59-129.27
	Down syndrome	1	23.20	0.59-129.27
	Encephalocele	1	23.20	0.59-129.27
	Hirschsprung's disease	1	23.20	0.59-129.27
	Obstructive genitourinary defect	2	46.40	5.62-167.62
	Omphalocele	1	23.20	0.59-129.27
	Patent ductus arteriosus	1	23.20	0.59-129.27
	Pyloric stenosis	3	69.61	14.35-203.42
	Rectal large intestinal atresia stenosis	1	23.20	0.59-129.27
	Spina bifida without anencephalus	1	23.20	0.59-129.27
	Ventricular septal defect	1	23.20	0.59-129.27
	Births: 431	17	394.43	229.76-631.52
Sevier				
	Aortic valve stenosis	1	3.59	0.09-20.03
	Atrial septal defect	8	28.76	12.41-56.66
	Cleft lip with/without cleft palate	3	10.78	2.22-31.51
	Cleft palate without cleft lip	2	7.19	0.87-25.97

County	Diagnosis	Cases	Rate	95% Confidence Interval
Sevier				
	Coarctation of aorta	1	3.59	0.09-20.03
	Congenital cataract	1	3.59	0.09-20.03
	Congenital hip dislocation	4	14.38	3.92-36.81
	Down syndrome	4	14.38	3.92-36.81
	Endocardial cushion	1	3.59	0.09-20.03
	Esophageal atresia / tracheoesophageal fistula	1	3.59	0.09-20.03
	Gastroschisis	3	10.78	2.22-31.51
	Hirschsprung's disease	3	10.78	2.22-31.51
	Hydrocephalus without spina bifida	2	7.19	0.87-25.97
	Hypoplastic left heart syndrome	1	3.59	0.09-20.03
	Hypospadias / epispadias	18	64.70	38.35-102.25
	Obstructive genitourinary defect	8	28.76	12.41-56.66
	Patent ductus arteriosus	13	46.73	24.88-79.91
	Pulmonary valve atresia	2	7.19	0.87-25.97
	Pyloric stenosis	13	46.73	24.88-79.91
	Reduction deformity, upper limbs	1	3.59	0.09-20.03
	Spina bifida without anencephalus	2	7.19	0.87-25.97
	Tetralogy of Fallot	1	3.59	0.09-20.03
	Transposition of great arteries	1	3.59	0.09-20.03
	Tricuspid valve atresia stenosis	1	3.59	0.09-20.03
	Trisomy 13	1	3.59	0.09-20.03
	Trisomy 18	1	3.59	0.09-20.03
	Ventricular septal defect	15	53.92	30.18-88.93
	Births: 2782	112	402.59	331.48-484.42
Shelby				
	Anencephalus	4	0.92	0.25-2.36
	Anophthalmia / microphthalmia	4	0.92	0.25-2.36
	Anotia / microtia	3	0.69	0.14-2.02
	Aortic valve stenosis	5	1.15	0.37-2.69
	Atrial septal defect	130	30.00	25.06-35.62
	Biliary atresia	1	0.23	0.01-1.29
	Choanal atresia	7	1.62	0.65-3.33
	Cleft lip with/without cleft palate	43	9.92	7.18-13.36
	Cleft palate without cleft lip	13	3.00	1.60-5.13
	Coarctation of aorta	19	4.38	2.64-6.85
	Common truncus	6	1.38	0.51-3.01
	Congenital cataract	11	2.54	1.27-4.54
	Congenital hip dislocation	18	4.15	2.46-6.56
	Diaphragmatic hernia	18	4.15	2.46-6.56
	Down syndrome	62	14.31	10.97-18.34
	Encephalocele	7	1.62	0.65-3.33

County	Diagnosis	Cases	Rate	95% Confidence Interval
Shelby				
	Endocardial cushion	22	5.08	3.18-7.69
	Esophageal atresia / tracheoesophageal fistula	11	2.54	1.27-4.54
	Fetal alcohol syndrome	25	5.77	3.73-8.52
	Gastroschisis	18	4.15	2.46-6.56
	Hirschsprung's disease	11	2.54	1.27-4.54
	Hydrocephalus without spina bifida	40	9.23	6.59-12.57
	Hypoplastic left heart syndrome	17	3.92	2.28-6.28
	Hypospadias / epispadias	154	35.53	30.14-41.61
	Microcephalus	38	8.77	6.21-12.04
	Obstructive genitourinary defect	68	15.69	12.18-19.89
	Omphalocele	7	1.62	0.65-3.33
	Patent ductus arteriosus	176	40.61	34.83-47.07
	Pulmonary valve atresia	42	9.69	6.98-13.10
	Pyloric stenosis	57	13.15	9.96-17.04
	Rectal large intestinal atresia stenosis	25	5.77	3.73-8.52
	Reduction deformity, lower limbs	5	1.15	0.37-2.69
	Reduction deformity, upper limbs	11	2.54	1.27-4.54
	Renal agenesis / hypoplasia	16	3.69	2.11-6.00
	Spina bifida without anencephalus	20	4.61	2.82-7.13
	Tetralogy of Fallot	26	6.00	3.92-8.79
	Transposition of great arteries	19	4.38	2.64-6.85
	Tricuspid valve atresia stenosis	2	0.46	0.06-1.67
	Trisomy 13	1	0.23	0.01-1.29
	Trisomy 18	13	3.00	1.60-5.13
	Ventricular septal defect	166	38.30	32.70-44.59
	Births: 43338	1341	309.43	293.09-326.44
Smith				
	Atrial septal defect	3	46.30	9.55-135.30
	Choanal atresia	1	15.43	0.39-85.98
	Cleft lip with/without cleft palate	1	15.43	0.39-85.98
	Down syndrome	1	15.43	0.39-85.98
	Endocardial cushion	1	15.43	0.39-85.98
	Hypoplastic left heart syndrome	1	15.43	0.39-85.98
	Hypospadias / epispadias	4	61.73	16.82-158.05
	Obstructive genitourinary defect	1	15.43	0.39-85.98
	Patent ductus arteriosus	2	30.86	3.74-111.49
	Pyloric stenosis	2	30.86	3.74-111.49
	Tetralogy of Fallot	1	15.43	0.39-85.98
	Ventricular septal defect	1	15.43	0.39-85.98
	Births: 648	19	293.21	176.54-457.88

County	Diagnosis	Cases	Rate	95% Confidence Interval
Stewart				
	Anencephalus	1	22.03	0.56-122.72
	Atrial septal defect	1	22.03	0.56-122.72
	Cleft palate without cleft lip	1	22.03	0.56-122.72
	Down syndrome	1	22.03	0.56-122.72
	Hypospadias / epispadias	1	22.03	0.56-122.72
	Microcephalus	1	22.03	0.56-122.72
	Patent ductus arteriosus	3	66.08	13.63-193.11
	Pulmonary valve atresia	4	88.11	24.01-225.59
	Pyloric stenosis	3	66.08	13.63-193.11
	Tetralogy of Fallot	1	22.03	0.56-122.72
	Ventricular septal defect	3	66.08	13.63-193.11
	Births: 454	20	440.53	269.07-680.35
Sullivan				
	Anophthalmia / microphthalmia	1	1.98	0.05-11.01
	Aortic valve stenosis	1	1.98	0.05-11.01
	Atrial septal defect	108	213.35	175.01-257.59
	Choanal atresia	3	5.93	1.22-17.32
	Cleft lip with/without cleft palate	6	11.85	4.35-25.8
	Cleft palate without cleft lip	5	9.88	3.21-23.05
	Congenital cataract	2	3.95	0.48-14.27
	Congenital hip dislocation	3	5.93	1.22-17.32
	Diaphragmatic hernia	2	3.95	0.48-14.27
	Down syndrome	7	13.83	5.56-28.49
	Endocardial cushion	2	3.95	0.48-14.27
	Esophageal atresia / tracheoesophageal fistula	1	1.98	0.05-11.01
	Fetal alcohol syndrome	2	3.95	0.48-14.27
	Hirschsprung's disease	1	1.98	0.05-11.01
	Hydrocephalus without spina bifida	5	9.88	3.21-23.05
	Hypospadias / epispadias	24	47.41	30.38-70.54
	Microcephalus	3	5.93	1.22-17.32
	Obstructive genitourinary defect	9	17.78	8.13-33.75
	Omphalocele	1	1.98	0.05-11.01
	Patent ductus arteriosus	69	136.31	106.06-172.51
	Pulmonary valve atresia	10	19.76	9.47-36.33
	Pyloric stenosis	19	37.53	22.6-58.61
	Rectal large intestinal atresia stenosis	2	3.95	0.48-14.27
	Renal agenesis / hypoplasia	1	1.98	0.05-11.01
	Tetralogy of Fallot	3	5.93	1.22-17.32
	Tricuspid valve atresia stenosis	1	1.98	0.05-11.01

County	Diagnosis	Cases	Rate	95% Confidence Interval
Sullivan				
	Trisomy 18	1	1.98	0.05-11.01
	Ventricular septal defect	21	41.49	25.68-63.41
	Births: 5062	313	618.33	551.72-690.77
Sumner				
	Anencephalus	2	3.72	0.45-13.45
	Atrial septal defect	22	40.95	25.66-61.99
	Choanal atresia	2	3.72	0.45-13.45
	Cleft lip with/without cleft palate	7	13.03	5.24-26.84
	Cleft palate without cleft lip	5	9.31	3.02-21.72
	Coarctation of aorta	2	3.72	0.45-13.45
	Common truncus	1	1.86	0.05-10.37
	Congenital hip dislocation	5	9.31	3.02-21.72
	Diaphragmatic hernia	1	1.86	0.05-10.37
	Down syndrome	2	3.72	0.45-13.45
	Encephalocele	1	1.86	0.05-10.37
	Endocardial cushion	1	1.86	0.05-10.37
	Esophageal atresia / tracheoesophageal fistula	2	3.72	0.45-13.45
	Fetal alcohol syndrome	1	1.86	0.05-10.37
	Gastroschisis	2	3.72	0.45-13.45
	Hirschsprung's disease	1	1.86	0.05-10.37
	Hydrocephalus without spina bifida	3	5.58	1.15-16.32
	Hypoplastic left heart syndrome	3	5.58	1.15-16.32
	Hypospadias / epispadias	25	46.53	30.11-68.69
	Microcephalus	2	3.72	0.45-13.45
	Obstructive genitourinary defect	5	9.31	3.02-21.72
	Omphalocele	2	3.72	0.45-13.45
	Patent ductus arteriosus	14	26.06	14.24-43.72
	Pulmonary valve atresia	6	11.17	4.10-24.31
	Pyloric stenosis	12	22.33	11.54-39.01
	Rectal large intestinal atresia stenosis	3	5.58	1.15-16.32
	Reduction deformity, upper limbs	1	1.86	0.05-10.37
	Spina bifida without anencephalus	2	3.72	0.45-13.45
	Tetralogy of Fallot	2	3.72	0.45-13.45
	Transposition of great arteries	3	5.58	1.15-16.32
	Tricuspid valve atresia stenosis	2	3.72	0.45-13.45
	Trisomy 18	1	1.86	0.05-10.37
	Ventricular septal defect	18	33.50	19.86-52.94
	Births: 5373	161	299.65	255.14-349.68

County	Diagnosis	Cases	Rate	95% Confidence Interval
Tipton				
	Atrial septal defect	12	55.74	28.80-97.36
	Cleft lip with/without cleft palate	7	32.51	13.07-66.99
	Cleft palate without cleft lip	2	9.29	1.12-33.56
	Diaphragmatic hernia	1	4.64	0.12-25.88
	Down syndrome	2	9.29	1.12-33.56
	Ebstein's anomaly	2	9.29	1.12-33.56
	Encephalocele	2	9.29	1.12-33.56
	Endocardial cushion	1	4.64	0.12-25.88
	Esophageal atresia / tracheoesophageal fistula	1	4.64	0.12-25.88
	Fetal alcohol syndrome	1	4.64	0.12-25.88
	Gastroschisis	5	23.22	7.54-54.20
	Hirschsprung's disease	2	9.29	1.12-33.56
	Hypoplastic left heart syndrome	1	4.64	0.12-25.88
	Hypospadias / epispadias	8	37.16	16.04-73.22
	Obstructive genitourinary defect	3	13.93	2.87-40.72
	Patent ductus arteriosus	11	51.09	25.5-91.42
	Pulmonary valve atresia	1	4.64	0.12-25.88
	Pyloric stenosis	5	23.22	7.54-54.2
	Rectal large intestinal atresia stenosis	3	13.93	2.87-40.72
	Tetralogy of Fallot	2	9.29	1.12-33.56
	Transposition of great arteries	1	4.64	0.12-25.88
	Trisomy 13	1	4.64	0.12-25.88
	Trisomy 18	1	4.64	0.12-25.88
	Ventricular septal defect	10	46.45	22.27-85.42
	Births: 2153	85	394.80	315.36-488.17
Trousdale				
	Cleft palate without cleft lip	1	37.17	0.94-207.12
	Hypospadias / epispadias	1	37.17	0.94-207.12
	Births: 269	2	74.35	9.00-268.57
Unicoi				
	Atrial septal defect	9	171.43	78.39-325.42
	Cleft lip with/without cleft palate	1	19.05	0.48-106.13
	Cleft palate without cleft lip	1	19.05	0.48-106.13
	Congenital hip dislocation	1	19.05	0.48-106.13
	Diaphragmatic hernia	1	19.05	0.48-106.13
	Hypospadias / epispadias	3	57.14	11.78-166.99
	Microcephalus	1	19.05	0.48-106.13
	Obstructive genitourinary defect	3	57.14	11.78-166.99
	Patent ductus arteriosus	7	133.33	53.61-274.72
	Pulmonary valve atresia	2	38.10	4.61-137.61
	Pyloric stenosis	5	95.24	30.92-222.26
	Transposition of great arteries	1	19.05	0.48-106.13

County	Diagnosis	Cases	Rate	95% Confidence Interval
Unicoi				
	Ventricular septal defect	2	38.10	4.61-137.61
	Births: 525	37	704.76	496.22-971.44
Union				
	Atrial septal defect	2	28.57	3.46-103.21
	Cleft lip with/without cleft palate	2	28.57	3.46-103.21
	Congenital cataract	1	14.29	0.36-79.59
	Congenital hip dislocation	2	28.57	3.46-103.21
	Diaphragmatic hernia	1	14.29	0.36-79.59
	Endocardial cushion	1	14.29	0.36-79.59
	Hypospadias / epispadias	3	42.86	8.84-125.25
	Obstructive genitourinary defect	4	57.14	15.57-146.31
	Patent ductus arteriosus	2	28.57	3.46-103.21
	Pyloric stenosis	5	71.43	23.19-166.69
	Ventricular septal defect	6	85.71	31.46-186.57
	Births: 700	29	414.29	277.45-595.00
Van Buren				
	Coarctation of aorta	1	59.17	1.50-329.68
	Births: 169	1	59.17	1.50-329.68
Warren				
	Anotia / microtia	1	5.82	0.15-32.45
	Aortic valve stenosis	1	5.82	0.15-32.45
	Atrial septal defect	5	29.12	9.46-67.96
	Cleft lip with/without cleft palate	2	11.65	1.41-42.08
	Cleft palate without cleft lip	3	17.47	3.6-51.06
	Coarctation of aorta	1	5.82	0.15-32.45
	Congenital cataract	2	11.65	1.41-42.08
	Congenital hip dislocation	1	5.82	0.15-32.45
	Diaphragmatic hernia	1	5.82	0.15-32.45
	Down syndrome	2	11.65	1.41-42.08
	Hirschsprung's disease	1	5.82	0.15-32.45
	Hydrocephalus without spina bifida	1	5.82	0.15-32.45
	Hypospadias / epispadias	8	46.59	20.11-91.81
	Microcephalus	1	5.82	0.15-32.45
	Obstructive genitourinary defect	1	5.82	0.15-32.45
	Patent ductus arteriosus	4	23.30	6.35-59.65
	Pulmonary valve atresia	2	11.65	1.41-42.08
	Pyloric stenosis	9	52.42	23.97-99.5
	Rectal and large intestinal atresia / Stenosis	1	5.82	0.15-32.45
	Ventricular septal defect	2	11.65	1.41-42.08
	Births: 1717	49	285.38	211.13-377.30

County	Diagnosis	Cases	Rate	95% Confidence Interval
Washington				
	Aniridia	1	2.58	0.07-14.39
	Anophthalmia / microphthalmia	1	2.58	0.07-14.39
	Aortic valve stenosis	2	5.16	0.63-18.65
	Atrial septal defect	81	209.14	166.08-259.94
	Cleft lip with/without cleft palate	4	10.33	2.81-26.44
	Cleft palate without cleft lip	2	5.16	0.63-18.65
	Coarctation of aorta	2	5.16	0.63-18.65
	Congenital cataract	1	2.58	0.07-14.39
	Congenital hip dislocation	7	18.07	7.27-37.24
	Down syndrome	3	7.75	1.60-22.64
	Fetal alcohol syndrome	2	5.16	0.63-18.65
	Hirschsprung's disease	2	5.16	0.63-18.65
	Hydrocephalus without spina bifida	6	15.49	5.69-33.72
	Hypoplastic left heart syndrome	2	5.16	0.63-18.65
	Hypospadias / epispadias	26	67.13	43.85-98.36
	Microcephalus	1	2.58	0.07-14.39
	Obstructive genitourinary defect	18	46.48	27.55-73.45
	Patent ductus arteriosus	60	154.92	118.22-199.41
	Pulmonary valve atresia	4	10.33	2.81-26.44
	Pyloric stenosis	14	36.15	19.76-60.65
	Rectal large intestinal atresia stenosis	3	7.75	1.60-22.64
	Reduction deformity, upper limbs	2	5.16	0.63-18.65
	Renal agenesis / hypoplasia	3	7.75	1.60-22.64
	Tetralogy of Fallot	1	2.58	0.07-14.39
	Ventricular septal defect	18	46.48	27.55-73.45
	Births: 3873	266	686.81	606.74-774.50
Wayne				
	Atrial septal defect	3	59.52	12.27-173.95
	Cleft palate without cleft lip	1	19.84	0.50-110.55
	Hydrocephalus without spina bifida	2	39.68	4.81-143.35
	Patent ductus arteriosus	1	19.84	0.50-110.55
	Pyloric stenosis	1	19.84	0.50-110.55
	Births: 504	8	158.73	68.52-312.76
Weakley				
	Atrial septal defect	2	17.18	2.08-62.07
	Cleft lip with/without cleft palate	3	25.77	5.31-75.32
	Cleft palate without cleft lip	1	8.59	0.22-47.87
	Congenital cataract	1	8.59	0.22-47.87
	Down syndrome	1	8.59	0.22-47.87

County	Diagnosis	Cases	Rate	95% Confidence Interval
Weakley				
	Endocardial cushion	1	8.59	0.22-47.87
	Gastroschisis	1	8.59	0.22-47.87
	Hydrocephalus without spina bifida	1	8.59	0.22-47.87
	Hypospadias / epispadias	11	94.50	47.18-169.09
	Microcephalus	1	8.59	0.22-47.87
	Obstructive genitourinary defect	3	25.77	5.31-75.32
	Omphalocele	2	17.18	2.08-62.07
	Pyloric stenosis	4	34.36	9.36-87.99
	Reduction deformity, lower limbs	1	8.59	0.22-47.87
	Tetralogy of Fallot	1	8.59	0.22-47.87
	Ventricular septal defect	1	8.59	0.22-47.87
	Births: 1164	35	300.69	209.43-418.20
White				
	Anencephalus	1	11.33	0.29-63.1
	Atrial septal defect	1	11.33	0.29-63.1
	Cleft lip with/without cleft palate	1	11.33	0.29-63.1
	Cleft palate without cleft lip	1	11.33	0.29-63.1
	Down syndrome	1	11.33	0.29-63.1
	Fetal alcohol syndrome	1	11.33	0.29-63.1
	Gastroschisis	1	11.33	0.29-63.1
	Hypoplastic left heart syndrome	1	11.33	0.29-63.1
	Hypospadias / epispadias	2	22.65	2.74-81.82
	Pulmonary valve atresia	1	11.33	0.29-63.1
	Pyloric stenosis	2	22.65	2.74-81.82
	Spina bifida without anencephalus	1	11.33	0.29-63.1
	Ventricular septal defect	1	11.33	0.29-63.1
	Births: 883	15	169.88	95.08-280.18
Williamson				
	Aortic valve stenosis	4	7.85	2.14-20.09
	Atrial septal defect	13	25.51	13.58-43.61
	Bladder exstrophy	1	1.96	0.05-10.93
	Cleft lip with/without cleft palate	4	7.85	2.14-20.09
	Cleft palate without cleft lip	3	5.89	1.21-17.20
	Coarctation of aorta	2	3.92	0.48-14.17
	Congenital hip dislocation	5	9.81	3.19-22.89
	Diaphragmatic hernia	1	1.96	0.05-10.93
	Down syndrome	5	9.81	3.19-22.89
	Esophageal atresia / tracheoesophageal fistula	1	1.96	0.05-10.93
	Hirschsprung's disease	2	3.92	0.48-14.17
	Hydrocephalus without spina bifida	3	5.89	1.21-17.20

County	Diagnosis	Cases	Rate	95% Confidence Interval
Williamson				
	Hypospadias / epispadias	19	37.28	22.44-58.21
	Obstructive genitourinary defect	15	29.43	16.47-48.54
	Patent ductus arteriosus	13	25.51	13.58-43.61
	Pulmonary valve atresia	3	5.89	1.21-17.2
	Pyloric stenosis	15	29.43	16.47-48.54
	Rectal large intestinal atresia stenosis	1	1.96	0.05-10.93
	Reduction deformity, lower limbs	1	1.96	0.05-10.93
	Tetralogy of Fallot	2	3.92	0.48-14.17
	Transposition of great arteries	2	3.92	0.48-14.17
	Trisomy 18	1	1.96	0.05-10.93
	Ventricular septal defect	18	35.31	20.93-55.81
	Births: 5097	134	262.90	220.27-311.37
Wilson				
	Anencephalus	2	5.33	0.65-19.27
	Aortic valve stenosis	1	2.67	0.07-14.86
	Atrial septal defect	11	29.34	14.65-52.5
	Choanal atresia	1	2.67	0.07-14.86
	Cleft lip with/without cleft palate	5	13.34	4.33-31.12
	Cleft palate without cleft lip	2	5.33	0.65-19.27
	Coarctation of aorta	5	13.34	4.33-31.12
	Congenital cataract	1	2.67	0.07-14.86
	Congenital hip dislocation	5	13.34	4.33-31.12
	Diaphragmatic hernia	1	2.67	0.07-14.86
	Down syndrome	1	2.67	0.07-14.86
	Ebstein's anomaly	1	2.67	0.07-14.86
	Endocardial cushion	2	5.33	0.65-19.27
	Esophageal atresia / tracheoesophageal fistula	1	2.67	0.07-14.86
	Gastroschisis	1	2.67	0.07-14.86
	Hirschsprung's disease	2	5.33	0.65-19.27
	Hydrocephalus without spina bifida	1	2.67	0.07-14.86
	Hypoplastic left heart syndrome	2	5.33	0.65-19.27
	Hypospadias / epispadias	22	58.68	36.78-88.85
	Microcephalus	3	8.00	1.65-23.39
	Obstructive genitourinary defect	5	13.34	4.33-31.12
	Omphalocele	1	2.67	0.07-14.86
	Patent ductus arteriosus	11	29.34	14.65-52.5
	Pulmonary valve atresia	3	8.00	1.65-23.39
	Pyloric stenosis	9	24.01	10.98-45.57
	Rectal large intestinal atresia stenosis	2	5.33	0.65-19.27
	Renal agenesis / hypoplasia	3	8.00	1.65-23.39
	Spina bifida without anencephalus	4	10.67	2.91-27.32

County	Diagnosis	Cases	Rate	95% Confidence Interval
Wilson				
	Tetralogy of Fallot	1	2.67	0.07-14.86
	Transposition of great arteries	2	5.33	0.65-19.27
	Tricuspid valve atresia stenosis	1	2.67	0.07-14.86
	Trisomy 18	1	2.67	0.07-14.86
	Ventricular septal defect	20	53.35	32.58-82.39
	Births: 3749	133	354.76	297.03-420.44