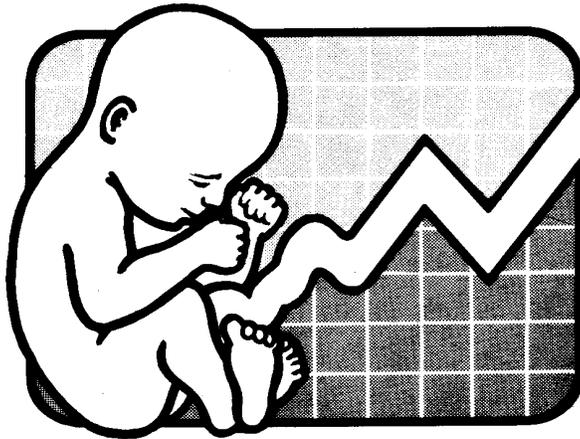
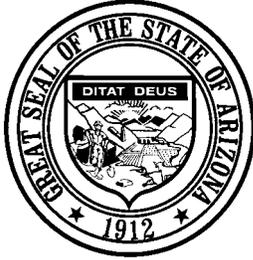




**1996
Arizona Birth Defects
Monitoring Program Report**





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Governor
State of Arizona

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1996 ARIZONA BIRTH DEFECTS MONITORING PROGRAM REPORT

**Arizona Birth Defects Monitoring Program
Office of Health Registries
Bureau of Public Health Statistics
Arizona Department of Health Services**

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April 16, 2001

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TABLE OF CONTENTS

	Page
Executive Summary	1
The Importance of Arizona's Birth Defects Registry	2
Methods	4
Case Definition	5
Interpreting the Data	6
State Profile of Defects	8
Race/Ethnicity	27
Maternal Age	32
County Profiles	34
Sentinel Defects	37

List of Tables

Table 1. Congenital Anomalies by Race/Ethnicity - Arizona 1996	9
Table 2. Birth Defects Totals by County of Residence, 1996	11
Table 3. Congenital Anomalies by Year, 1986 - 1993, 1995-1996	12
Table 4. Birth Defect Rates by County, 1986 - 1993, 1995-1996	35
Table 5. Birth Defects Rates by Race/Ethnicity by County, 1986 - 1993, 1995-1996	36
Table 6. Chromosomal Defects - Rates by County, 1986 - 1993,1995-1996	39
Table 7. Oral Clefts - Rates by County, 1986 -1993, 1995-1996	40
Table 8. Neural Tube Defects - Rates by County, 1986 - 1993, 1995-1996	41
Table 9. Abdominal Wall Defects - Rates by County, 1986 - 1993, 1995-1996	42
Table 10. Heart Defects - Rates by County, 1986 - 1993, 1995-1996	43

TABLE OF CONTENTS

List of Figures

Figure 1. Leading Causes of Infant Mortality in Arizona, 1989-1999	2
Figure 2. Trends for Congenital Anomalies, 1986 - 1993, 1995-1996	19
Figure 3. Spina Bifida Incidence Rates by Race/Ethnicity, 1996	28
Figure 4. Abdominal Wall Defect Incidence Rates by Race/Ethnicity, 1996	28
Figure 5. Down Syndrome Incidence Rates by Race/Ethnicity, 1996	29
Figure 6. Microcephaly Incidence Rates by Race/Ethnicity, 1996	29
Figure 7. Pyloric Stenosis Incidence Rates by Race/Ethnicity, 1996	30
Figure 8. Cleft Lip with and without Cleft Palate Rates by Race/Ethnicity, 1996.....	30
Figure 9. Fetal Alcohol Syndrome Rates by Race/Ethnicity, 1996.....	31
Figure 10. Birth Defects Rates by Maternal Age	32
Figure 11. Down Syndrome (Trisomy 21) by Maternal Age	33
Figure 12. Gastroschisis by Maternal Age	33

Appendices

Appendix 1. Conditions Included in Figures	44
Appendix 2. Conditions Shown in Tables	45
Appendix 3. Precision of Diagnosis codes	49
Appendix 4. Abbreviations	50
Appendix 5. Exclusion list	51
Appendix 6: Definitions.....	52
Appendix 7. References	53
Appendix 8. Birth Weight	56
Appendix 9. Other Birth Defects Collected, Arizona, 1996	57

EXECUTIVE SUMMARY

In 1996, there were 1,402 infants with a reportable birth defect, occurring among 75,094 live births and 483 still births in Arizona. This report presents the rates for 44 composite categories of birth defects developed by the Centers for Disease Control and Prevention (CDC). These categories represent the most serious defects. Of the 1,402 children, 1,013 are included in this report of these 44 categories. Arizona's overall birth defect rate is 18.6 cases per 1,000 births in 1996, which is lower than the 1995 birth defect rate of 19.0 cases per 1,000 births. Pyloric stenosis (140 cases), oral clefts (128 cases), obstruction of kidney/ureter (115 cases), Down syndrome (95 cases), microcephaly and dislocation of hip (both with 67 cases) were the most common birth defects.

Race/Ethnicity Patterns

The rates of spina bifida was highest among Hispanics, followed by Native Americans, and Whites. Native Americans and Hispanics had the highest rates for microcephaly, followed by Whites and Blacks. Pyloric stenosis rates in 1996 was highest for Hispanics, which is higher than the overall state rate for pyloric stenosis. Hispanics exhibited statistically significantly higher rates for Down syndrome ($p < .01$), followed by Blacks and Whites. Cleft lip with and without cleft palate was found highest among Native Americans, followed by Hispanics and then, Whites. Fetal alcohol syndrome rates were statistically significantly higher ($p < .01$) among Native Americans.

Age Patterns

The rate for all birth defects was highest among women age 35 years and older. The incidence of Down syndrome (Trisomy 21) increased with maternal age and is significantly higher ($p < .01$) for mothers who are 35 years old and older. In contrast, gastroschisis rates decreased with maternal age.

County Patterns

The number of live-born infants with a reportable birth defect by county are aggregated for the years 1986 through 1993 and 1995 and 1996 to provide numbers large enough for analysis. Gila county had the highest rate of congenital anomalies, followed by Navajo, and Pinal counties. In contrast, Greenlee and Mohave counties had the lowest rates. Tests of significance show that there are no significant differences between the overall birth defect rate of the counties and the state rate.

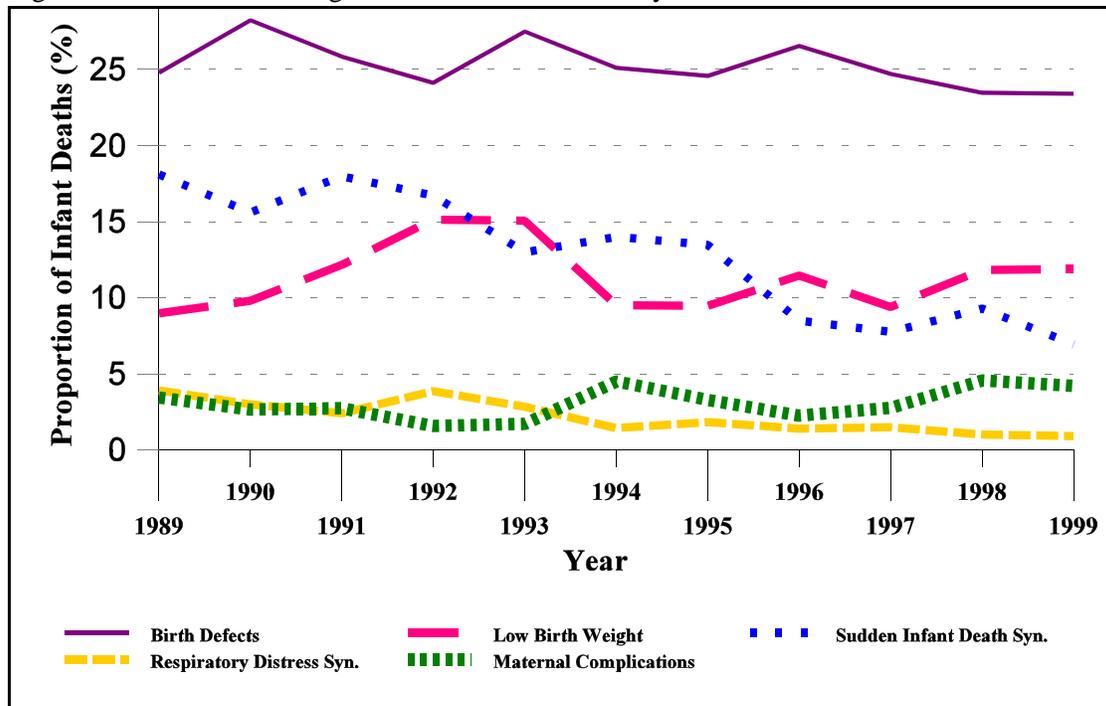
THE IMPORTANCE OF ARIZONA'S BIRTH DEFECTS REGISTRY

The Arizona Birth Defects Monitoring Program (ABDMP) is a population-based registry which provides information on the occurrence of birth defects. The registry provides for ongoing surveillance to monitor for trends and early detection of problems.^{1,2,3} The information is used to assist prevention efforts to targeted populations and in planning health services. Such a registry is necessary because other systems for reporting birth defects, including birth certificates and hospital discharge data are not accurate or complete due to under reporting in the number of cases, lack of specificity of birth defects, and incomplete recording of birth defects information.⁴

Economic Impact

Birth defects are the leading cause of infant mortality in both Arizona and the United States. Arizona data show that between 1989 and 1999, one out of four infant deaths was due to birth defects in contrast, only 1 out of 10 infants deaths was attributable to low birth weight or SIDS (see Figure 1).⁵ Birth defects are the fifth leading cause of years of potential life lost. With the advancement in technology, many infants born with birth defects survive beyond their first

Figure 1. Trends of Leading Causes of Infant Mortality in Arizona, 1989-1999



birthday. These children often require special medical services, education and rehabilitation services, vocational training and in some cases, custodial care, incurring a lifetime of costs and hardships for their families. An analysis of pediatric discharges from the Arizona Hospital Discharge Data Base (HDDDB), 1995-1999, for children 0-19 years of age, show that 10.3% of all pediatric hospitalizations are related to birth defects and genetic disorders. The mean length of hospital stay for birth defects or genetic disorders was 7.4 days, compared to 3.9 days for hospitalizations due to other causes. The average total cost of these hospitalizations was \$26,669. This is in contrast to \$10,068 for pediatric hospitalizations due to other causes.⁶

Human Cost

Estimating the societal cost of birth defects is more difficult than assessing its economic costs. This is usually reflected by the impact of birth defects on infant mortality and the number of years of potential life lost. It should also be pointed out that while infant mortality rates in the United States have declined over the years, decline in infant mortality due to birth defects has been slower.⁷ Intensive case ascertainment surveillance systems that use multiple data sources to document birth defects find that an estimated 3-5 percent of births have a serious birth defect.⁸ For Arizona, in 1996, there was a total of 1,402 live births and fetal deaths with a reportable birth defect (Table 2). From an economic perspective, there is a loss of contribution to the economic productivity of society from some of these children as well as from care-giving family members.

The cause of only a relatively small number of defects are known, i.e. maternal alcohol consumption causes fetal alcohol syndrome; German measles in early pregnancy causes congenital rubella syndrome. In recent years, there is substantial research that demonstrates the importance of the B vitamin folic acid in fetal development. It is expected that consumption of adequate folic acid (400 micrograms daily), primarily prior to conception and the first trimester will reduce the incidence of neural tube defects (NTDs) by at least 50%.⁹ There is also research that show folic acid may reduce the incidence of certain types of heart defects, urinary tract defects and oral clefts.^{10,11,12} Considerable amount of research still needs to be undertaken to augment our knowledge on birth defects, its etiology and its impact on different groups. If Arizona is to ensure the well-being of its children, it is essential that the surveillance and documentation of the occurrence of birth defects in the state be undertaken and made available to the public and researchers.

METHODS

Data Sources and Procedures

The ABDMP is a statewide, population-based, active ascertainment program, pursuant to ARS §36-133 which mandates the surveillance of chronic diseases, including birth defects. The funding for the ABDMP comes from the appropriations of the state legislature to the Arizona Department of Health Services. Trained ABDMP staff collect data from 64 reporting sources: 58 hospitals, including Phoenix Children's Hospital; 2 centers providing genetics services; 4 clinics of the state Children's Rehabilitative Services; and the state Office of Vital Records.

Ascertainment procedures used by the ABDMP are nearly identical to those used by the California Birth Defects Monitoring Program and the US Centers for Disease Control's Metropolitan Atlanta Congenital Defects Program (MACDP).

Hospital casefinding sources include the disease index, labor and delivery log, nursery log, newborn intensive care log, pediatric log, and pathology/autopsy log. Potential cases are also identified through a review of the Hospital Discharge Data Base, and Birth, Death and Fetal Death Certificates. All records that indicate a birth defect become part of this listing of possible cases. The medical records of possible cases are pulled and reviewed to determine which records meet the case definition. An abstract of the medical record is completed for each reportable case. In order to find the birth defect cases born in 1996, ABDMP staff reviewed more than 10,000 medical records, identified reportable cases, and excluded those not meeting the case definition. The abstracts of cases identified from multiple sources are compared, merged, and added to the registry.

If the nature of a defect diagnosed in the first year of life is more precisely diagnosed later in the child's life and this information is contained in the chart at the time of our review (which occurs 2-4 years after the child's birth or fetal death) then the more precise diagnosis is used.

ABDMP staff assign a six-digit classification code to each defect. The classification system is CDC's modification of the British Pediatric Association (BPA) Classification of Disease. This coding system is similar to the International Classification of Disease (ICD). The staff collect diagnostic information on birth defects that fall primarily within the range of ICD-9-CM Codes 740.00-759.99. The system of codes is hierarchical: the more digits in the code, the more precise the diagnosis. ABDMP staff always code the data at the most precise level possible.

Case Definition

The following are the criteria for inclusion in the Birth Defects Monitoring Program case file:

- A. The mother's place of residence at the time of birth must be in Arizona. (Charts of mothers or babies residing in Mexico are not abstracted).
- B. The child must have a structural, genetic, or biochemical birth defect, or other specified birth outcome that can adversely affect an infant's health and development (most, but not all, are listed in ICD-9-CM 740.0-759.9).
- C. The defect must be diagnosed, or signs and symptoms of a potential defect recognized, within the first year of life.
- D. Stillborn infants are included if they have a reportable birth defect.
- E. The date of birth (or delivery for stillbirths > 19 weeks of gestational age) is on or after January 1, 1986.

Due to the need to collect and report data on birth defects in a more timely manner, effective March, 1996, the ABDMP reduced the number of reportable conditions to include only the major congenital anomalies recommended by "The International Clearinghouse for Birth Defects Monitoring Systems" and recommended by CDC. The reduced list of reportable defects went into effect starting with births occurring in 1992. The retained, reportable defects still permit the ABDMP to compare its rates with other registries for the major birth defects categories. The number of reportable congenital anomalies was reduced from over 500 to 140 conditions.

INTERPRETING THE DATA

The tables and figures presented in this report represent data collected on birth defects in Arizona for the period 1986 to 1993 and 1995 - 1996. Each table presents the reported counts, rates and confidence intervals on selected congenital anomalies. Below is an explanation of how counts, rates, and confidence intervals were calculated.

Counts

The counts, sometimes called cases, represent the number of children who were diagnosed with a reportable birth defect within the first year of life. Children born with more than one reportable defect, as often occurs, may be part of the counts across the 44 composite categories.

Rates

Incidence rates of birth defects were calculated by dividing the number of children (cases) with a particular reportable defect by the total number of live births (and in some cases live births plus fetal deaths) for the specific year of interest and then multiplying by 10,000 or 1,000. In most tables and figures, we show rates that are calculated by including live births and fetal deaths in both the numerator and denominator. For example, there were 95 children (live born and still born infants ≥ 20 weeks of gestation) with Down Syndrome in 1996. There were 75,577 births (either live births or fetal deaths) in 1996. The rate is calculated as such: $(95/75,577) * 10,000 = 12.57$ cases of Down Syndrome per 10,000 live births and fetal deaths.

Confidence Intervals

The confidence intervals shown in the tables and figures are provided to give information about the estimate of the rate. Confidence intervals presented in this report are 99 percent Poisson confidence intervals. The confidence intervals indicate that the true rate should be contained in this interval 99 percent of the time. For example, Down Syndrome in 1996 occurs at a rate of 12.57 per 10,000 births. The lower and upper bounds of the point estimate of this rate are 9.5 and 16.3, respectively. Thus, one can say that 99 percent of the time that the true rate of Down Syndrome is between 9.5 and 16.3 cases per 10,000 live births and fetal deaths.

Small Numbers and a Note Of Caution

While the intent of these data is to provide the reader with useful information on birth defects in Arizona, an equally important point is not to mislead data users. Therefore, it is important to stress

that rates, confidence intervals, or any other analysis based on fewer than 10 reported cases cannot be considered statistically reliable.

Tests of Significance

Z tests were used to determine whether there were statistically significant differences in the rates between groups and areas. The state rate was used as the standard rate in these tests.

STATE PROFILE OF DEFECTS

State Data

The Arizona Birth Defects Monitoring Program (ABDMP) has been in operation since 1986 and collected data since that time. This is the tenth annual report of data compiled by the ABDMP in its mission to collect and analyze information on children with birth defects and to provide data for the study of causes of birth defects in Arizona. Data for 1994 are not yet collected.

Tables and Figures

Table 1 presents data on 44 selected congenital anomalies among live born and still born by race for 1996. Table 2 displays the number of live born and stillborn infants with all reportable birth defects (140 conditions) by county, and the average number of defects among live born and stillborn infants. Fetal deaths include therapeutic abortions and still-born babies with a reportable congenital defect, if the estimated gestational age is greater than 19 weeks. Table 3 displays rates of the 44 selected congenital anomalies by year for 1986 through 1993 and 1995 - 1996. The series of graphs in Figure 2 display the trends for selected congenital anomalies.

Race/Ethnicity

A section on the rates of selected birth defects by race/ethnicity follows the section on state profile. Included in this section are Spina Bifida with and without Hydrocephaly, Abdominal Wall Defect, Down Syndrome, Microcephaly, Pyloric Stenosis, and Fetal Alcohol Syndrome.

Maternal Age

Figures 10 to 12 focus on the relationship of birth defects and maternal age. Figure 10 presents birth defects rate by maternal age groupings and the confidence interval of these rates for each of the age groups. Figures 11 and 12 display the rates for Down Syndrome and Gastroschisis by maternal age groupings.

County Profiles

The last section of the report presents aggregated data on the number of live-born infants with a reportable (as modified in 1996) birth defect between 1986 to 1993 and 1995 through 1996 by county and by race. Aggregated rates for selected birth defects among live-born infants by county are also shown.

Table 1
Arizona Birth Defects Monitoring Program
Congenital Anomalies - Arizona 1996
Incidence Rates^{a,b} per 10,000 Live Births and Fetal Deaths

<u>CODE</u>	<u>DEFECT GROUP</u> (Composite Category)	<u>TOTAL</u>	<u>RATE</u>	<u>WHITE</u> <u>NON-</u> <u>HISP.</u>	<u>RATE</u>	<u>HISP.</u>	<u>RATE</u>	<u>BLACK</u>	<u>RATE</u>	<u>NATIVE</u> <u>AMER.</u>	<u>RATE</u>	<u>OTHER</u>	<u>RATE</u>
A00	CENTRAL NERVOUS SYSTEM												
A01	Anencephaly	22	2.91	7	1.81	11	3.99	1	4.21	3	5.59	0	0.00
A02	Spina Bifida w/ Hydrocephaly	20	2.65	5	1.29	13	4.71	0	0.00	2	3.73	0	0.00
A03	Spina Bifida w/o Hydrocephaly	13	1.72	5	1.29	7	2.54	0	0.00	1	1.86	0	0.00
A13	Encephalocele	16	2.12	7	1.81	7	2.54	0	0.00	2	3.73	0	0.00
A15	Hydrocephaly	35	4.63	19	4.91	12	4.35	1	4.21	3	5.59	0	0.00
A16	Microcephaly	67	8.86	26	6.72	30	10.88	2	8.41	9	16.77	0	0.00
B00	EYE AND EAR												
B03	Glaucoma	5	0.66	3	0.78	2	0.73	0	0.00	0	0.00	0	0.00
B04	Cataract	9	1.19	5	1.29	3	1.09	0	0.00	1	1.86	0	0.00
B51	Anophthalmia	1	0.13	1	0.26	0	0.00	0	0.00	0	0.00	0	0.00
B52	Microphthalmia	19	2.51	7	1.81	10	3.63	0	0.00	2	3.73	0	0.00
B54	Ear Anomaly w/ hearing loss	34	4.50	17	4.39	12	4.35	0	0.00	5	9.31	0	0.00
D00	CARDIAC												
D01	Truncus Arteriosus	7	0.93	3	0.78	3	1.09	0	0.00	0	0.00	1	6.46
D02	Transposition of great vessels	34	4.50	18	4.65	12	4.35	1	4.21	2	3.73	1	6.46
D03	Tetralogy of Fallot	34	4.50	20	5.17	8	2.90	3	12.62	3	5.59	0	0.00
D04	Single ventricle	9	1.19	2	0.52	6	2.18	0	0.00	0	0.00	1	6.46
D51	Aortic stenosis	21	2.78	7	1.81	8	2.90	1	4.21	2	3.73	3	19.38
D52	Hypoplastic left heart	15	1.98	11	2.84	3	1.09	1	4.21	0	0.00	0	0.00
D53	Tot. anomal. pulm. ven. return	13	1.72	8	2.07	4	1.45	0	0.00	1	1.86	0	0.00
E00	RESPIRATORY												
E01	Choanal atresia	18	2.38	7	1.81	8	2.90	1	4.21	2	3.73	0	0.00
E06	Agenesis of lung	23	3.04	6	1.55	11	3.99	2	8.41	4	7.45	0	0.00
F00	OROFACIAL AND GASTROINTESTINAL												
F01	Cleft palate	41	5.42	14	3.62	21	7.61	0	0.00	5	9.31	1	6.46
F02	Cleft lip w&wo cleft palate	87	11.51	38	9.82	36	13.05	2	8.41	10	18.63	1	6.46
F08	Pyloric stenosis	140	18.52	68	17.57	61	22.11	0	0.00	11	20.49	0	0.00
F09	Tracheo-esophageal fistula	15	1.98	10	2.58	4	1.45	0	0.00	1	1.86	0	0.00

^a Incidence rates include live-born and still born cases. ^b Incidence rates based on counts of less than 10 events are not statistically reliable.

Table 1 Continued
 Arizona Birth Defects Monitoring Program
 Congenital Anomalies - Arizona 1996
 Incidence Rates^{a,b} per 10,000 Live Births and Fetal Deaths

<u>CODE</u>	<u>DEFECT GROUP</u> (Composite Category)	<u>TOTAL</u>	<u>RATE</u>	<u>WHITE</u> <u>NON-</u> <u>HISP.</u>	<u>RATE</u>	<u>HISP.</u>	<u>RATE</u>	<u>BLACK</u>	<u>RATE</u>	<u>NATIVE</u> <u>AMER.</u>	<u>RATE</u>	<u>OTHER</u>	<u>RATE</u>
F00	OROFACIAL AND GASTROINTESTINAL												
F14	Stenosis/atresia of duodenum	19	2.51	8	2.07	8	2.90	2	8.41	0	0.00	1	6.46
F15	Stenosis/atresia of sm. intest	20	2.65	7	1.81	8	2.90	2	8.41	2	3.73	1	6.46
F16	Stenosis/atresia of rectum	29	3.84	11	2.84	16	5.80	0	0.00	1	1.86	1	6.46
F17	Hirschsprung's disease	9	1.19	6	1.55	3	1.09	0	0.00	0	0.00	0	0.00
F18	Malrotation of intestine	22	2.91	11	2.84	8	2.90	1	4.21	1	1.86	1	6.46
F21	Biliary atresia	7	0.93	3	0.78	3	1.09	0	0.00	1	1.86	0	0.00
H00	GENITO-URINARY												
H01	Renal agenesis	39	5.16	19	4.91	15	5.44	0	0.00	4	7.45	1	6.46
H06	Obstruction of kidney/ureter	115	15.22	56	14.47	47	17.04	4	16.82	7	13.04	1	6.46
H09	Bladder or urethra obstruction	13	1.72	7	1.81	5	1.81	1	4.21	0	0.00	0	0.00
J00	MUSCULOSKELETAL												
J03	Dislocation of hip	67	8.87	28	7.24	29	10.51	0	0.00	10	18.63	0	0.00
J51	Complete absence upp/low limb	3	0.40	1	0.26	2	0.73	0	0.00	0	0.00	0	0.00
J52	Phocomelia of Limb	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
K05	Amniotic Bands	6	0.79	5	1.29	1	0.36	0	0.00	0	0.00	0	0.00
N01	Diaphragmatic hernia	15	1.98	8	2.07	5	1.81	1	4.21	1	1.86	0	0.00
N02	Omphalocele	20	2.65	9	2.33	6	2.18	0	0.00	3	5.59	2	12.92
N04	Gastroschisis	42	5.56	22	5.68	19	6.89	0	0.00	0	0.00	1	6.46
R00	SYNDROMES												
R01	Down Syndrome (Trisomy 21)	95	12.57	38	9.82	50	18.13	4	16.82	2	3.73	1	6.46
R02	Patau Syndrome (Trisomy 13)	13	1.72	6	1.55	4	1.45	1	4.21	1	1.86	1	6.46
R03	Edwards Syndrome (Trisomy 18)	16	2.12	9	2.33	4	1.45	1	4.21	2	3.73	0	0.00
S02	Fetal Alcohol Syndrome	10	1.32	1	0.26	2	0.73	0	0.00	7	13.04	0	0.00

^a Incidence rates include live born and still born cases. ^b Incidence rates based on counts of less than 10 events are not statistically reliable.

Table 2
 Arizona Birth Defects Monitoring Program ^{a, b}
 Birth Defects by County of Residence, 1996
 (140 Conditions Monitored)

STATE, COUNTY	LIVE BIRTHS (LB) W/DEFECTS		STILL BIRTHS (SB) W/ DEFECTS		LIVE AND S.TILL W/ DEFECTS		NUMBER OF DEFECTS OF LIVE BIRTHS		NUMBER OF DEFECTS OF STILL BIRTHS	
	Number	% OF LB	Number	% OF SB	Number	% TOT.	Number	AVG Number	Number	AVG Number
ARIZONA	1336	1.78	66	13.66	1402	1.86	2239	1.68	135	2.05
APACHE COUNTY	19	1.48	1	12.50	20	1.55	22	1.16	1	1.00
COCHISE COUNTY	23	1.33	1	10.00	24	1.38	43	1.87	2	2.00
COCONINO COUNTY	25	1.35	2	25.50	27	1.45	43	1.72	4	2.00
GILA COUNTY	22	3.28	1	16.67	23	3.40	39	1.77	3	3.00
GRAHAM COUNTY	8	1.70	0	0.00	8	1.69	18	2.25	0	0.00
GREENLEE COUNTY	3	1.83	0	0.00	3	1.82	3	1.00	0	0.00
LA PAZ COUNTY	2	1.32	1	50.00	3	1.95	2	1.00	1	1.00
MARICOPA COUNTY	872	1.87	35	11.67	907	1.94	1456	1.67	65	1.86
MOHAVE COUNTY	23	1.27	1	9.09	24	1.31	32	1.39	2	2.00
NAVAJO COUNTY	32	1.88	1	10.00	33	1.93	41	1.93	5	5.00
PIMA COUNTY	204	1.81	16	20.51	220	1.94	369	1.81	42	2.63
PINAL COUNTY	28	1.33	2	13.33	30	1.41	55	1.96	2	1.00
SANTA CRUZ COUNTY	14	1.76	3	100.00	17	2.13	23	1.64	6	2.00
YAVAPAI COUNTY	16	1.02	0	0.00	16	1.01	29	1.81	0	0.00
YUMA COUNTY	45	1.52	2	15.38	47	1.59	64	1.42	2	1.00

^aTotal number of live births in Arizona for 1996 = 75,094

^bTotal number of fetal deaths in Arizona for 1996 = 483

Table 3
Arizona Birth Defects Monitoring Program
Incidence Rates^a Per 1,000 Live Births and Fetal Deaths, Arizona

CODE/CONDITION (1)											
		1986	1987	1988	1989	1990	1991	1992	1993	1995	1996
A01 Anencephaly	Cases	22	17	18	18	16	17	21	15	18	22
	Rate	0.35	0.26	0.27	0.27	0.23	0.25	0.30	0.22	0.25	0.29
	CI	0.19-0.60	0.12-0.48	0.13-0.48	0.13-0.48	0.11-0.43	0.12-0.45	0.16-0.52	0.10-0.41	0.12-0.44	0.16-0.49
A02 S.B. with Hydrocephaly	Cases	26	24	19	22	23	21	26	21	24	20
	Rate	0.42	0.37	0.28	0.33	0.33	0.31	0.38	0.30	0.33	0.26
	CI	0.24-0.69	0.20-0.62	0.14-0.50	0.17-0.55	0.18-0.56	0.16-0.53	0.21-0.61	0.16-0.52	0.18-0.55	0.14-0.46
A03 S.B. without Hydrocephaly	Cases	10	11	6	16	16	13	12	14	10	13
	Rate	0.16	0.17	0.09	0.24	0.23	0.19	0.17	0.20	0.14	0.17
	CI	0.06-0.35	0.06-0.35	0.02-0.23	0.11-0.44	0.11-0.43	0.08-0.37	0.07-0.35	0.09-0.39	0.05-0.29	0.07-0.34
A13 Encephalocele	Cases	10	8	14	5	13	14	2	6	7	16
	Rate	0.16	0.12	0.21	0.07	0.19	0.20	0.03	0.09	0.10	0.21
	CI	0.06-0.35	0.03-0.29	0.09-0.40	0.02-0.21	0.08-0.37	0.09-0.39	0.00-0.13	0.02-0.23	0.03-0.24	0.10-0.39
A15 Hydrocephaly	Cases	34	41	48	44	52	46	34	28	40	35
	Rate	0.55	0.64	0.72	0.65	0.75	0.67	0.49	0.40	0.55	0.46
	CI	0.34-0.85	0.41-0.95	0.48-1.04	0.43-0.95	0.51-1.06	0.44-0.97	0.30-0.75	0.23-0.64	0.35-0.82	0.29-0.71
A16 Microcephaly	Cases	30	60	70	109	118	120	90	83	81	67
	Rate	0.49	0.94	1.06	1.61	1.70	1.75	1.30	1.19	1.11	0.89
	CI	0.29-0.77	0.65-1.30	0.76-1.43	1.17-1.96	1.33-2.15	1.37-2.21	0.97-1.70	0.88-1.57	0.82-1.47	0.63-1.21
B03 Glaucoma	Cases	2	7	4	5	4	2	1	3	5	5
	Rate	0.03	0.10	0.06	0.07	0.06	0.03	0.01	0.04	0.07	0.07
	CI	0.04-0.15	0.03-0.26	0.00-0.19	0.02-0.21	0.01-0.18	0.00-0.14	0.00-0.11	0.00-0.16	0.01-0.19	0.01-0.19

(1) See appendix for explanation of the codes/conditions

CI = Approximate 99% confidence intervals.

“Cases” are the number of live born and still born infants \geq 20 weeks gestation.

Table 3 Continued
Arizona Birth Defects Monitoring Program
Incidence Rates^a Per 1,000 Live Births and Fetal Deaths, Arizona

CODE/CONDITION (1)											
		1986	1987	1988	1989	1990	1991	1992	1993	1995	1996
B04 Cataract	Cases	8	7	7	15	24	10	12	8	14	9
	Rate	0.13	0.10	0.10	0.22	0.35	0.15	0.17	0.11	0.19	0.12
	CI	0.04-0.30	0.03-0.26	0.03-0.26	0.10-0.42	0.19-0.57	0.05-0.31	0.07-0.35	0.04-0.27	0.09-0.37	0.04-0.027
B51 Anophthalmia	Cases	6	1	3	5	7	5	3	2	2	1
	Rate	0.09	0.01	0.04	0.07	0.10	0.07	0.04	0.03	0.03	0.01
	CI	0.02-0.25	0.00-0.11	0.00-0.16	0.02-0.21	0.03-0.25	0.02-0.21	0.00-0.16	0.00-0.13	0.00-0.13	0.00-0.10
B52 Microphthalmia	Cases	10	24	21	19	24	29	22	14	24	19
	Rate	0.16	0.37	0.31	0.28	0.35	0.42	0.32	0.20	0.33	0.25
	CI	0.06-0.35	0.20-0.62	0.16-0.54	0.14-0.50	0.19-0.57	0.25-0.67	0.17-0.54	0.09-0.39	0.18-0.55	0.13-0.44
B54 Hearing loss w/ear anomaly	Cases	33	59	34	50	59	65	41	42	44	34
	Rate	0.53	0.92	0.51	0.74	0.85	0.95	0.59	0.60	0.60	0.45
	CI	0.32-0.83	0.64-1.28	0.31-0.79	0.50-1.06	0.59-1.18	0.67-1.30	0.38-0.88	0.39-0.89	0.39-0.88	0.28-0.69
D01 Truncus Arteriosus	Cases	4	10	9	9	6	6	3	4	3	7
	Rate	0.06	0.15	0.13	0.13	0.09	0.09	0.04	0.06	0.04	0.09
	CI	0.01-0.20	0.05-0.33	0.04-0.30	0.05-0.30	0.02-0.23	0.02-0.23	0.00-0.16	0.01-0.18	0.00-0.15	0.03-0.23
D02 Transposition of Great Vessels	Cases	32	26	26	33	28	26	25	28	33	34
	Rate	0.52	0.40	0.39	0.49	0.40	0.38	0.36	0.40	0.45	0.45
	CI	0.31-0.81	0.23-0.66	0.22-0.64	0.30-0.75	0.23-0.65	0.21-0.62	0.20-0.59	0.23-0.64	0.28-0.70	0.28-0.69
D03 Tetralogy of Fallot	Cases	15	18	29	23	27	22	32	30	29	34
	Rate	0.24	0.28	0.43	0.34	0.39	0.32	0.46	0.43	0.40	0.45
	CI	0.11-0.46	0.13-0.50	0.25-0.69	0.19-0.57	0.22-0.63	0.17-0.54	0.28-0.72	0.25-0.68	0.23-0.63	0.28-0.69

(1) See appendix for explanation of the codes/conditions

CI = Approximate 99% confidence intervals.

“Cases” are the number of live born and still born infants \geq 20 weeks gestation.

Table 3 Continued
Arizona Birth Defects Monitoring Program
Incidence Rates^a Per 1,000 Live Births and Fetal Deaths, Arizona

CODE/CONDITION (1)											
		1986	1987	1988	1989	1990	1991	1992	1993	1995	1996
D04 Single Ventricle	Cases	2	4	5	4	6	1	3	8	5	9
	Rate	0.03	0.06	0.07	0.06	0.09	0.01	0.04	0.11	0.07	0.12
	CI	0.00-0.15	0.01-0.19	0.01-0.21	0.01-0.19	0.02-0.23	0.00-0.11	0.00-0.16	0.04-0.27	0.01-0.19	0.04-0.27
D51 Aortic Stenosis	Cases	8	15	17	25	17	17	23	15	30	21
	Rate	0.13	0.23	0.25	0.37	0.25	0.25	0.32	0.22	0.41	0.28
	CI	0.04-0.30	0.10-0.44	0.12-0.46	0.21-0.61	0.12-0.45	0.12-0.45	0.18-0.56	0.10-0.41	0.24-0.65	0.15-0.48
D52 Hypoplastic Left Heart	Cases	9	16	8	16	19	11	13	14	10	15
	Rate	0.14	0.25	0.12	0.24	0.28	0.16	0.19	0.20	0.14	0.20
	CI	0.05-0.32	0.11-0.46	0.03-0.28	0.11-0.44	0.14-0.48	0.06-0.33	0.08-0.37	0.09-0.39	0.05-0.29	0.09-0.37
D53 Total Anomalous Pulmonary Venous Return	Cases	5	5	13	17	13	11	11	11	12	13
	Rate	0.08	0.07	0.19	0.25	0.19	0.16	0.16	0.16	0.16	0.17
	CI	0.17-0.23	0.01-0.22	0.08-0.38	0.12-0.46	0.08-0.37	0.06-0.33	0.06-0.33	0.06-0.33	0.07-0.33	0.07-0.34
E01 Choanal Atresia	Cases	6	10	10	16	6	5	6	7	14	18
	Rate	0.09	0.15	0.15	0.24	0.09	0.07	0.09	0.10	0.19	0.24
	CI	0.24-0.25	0.05-0.33	0.05-0.32	0.11-0.44	0.02-0.23	0.02-0.21	0.02-0.23	0.03-0.25	0.09-0.37	0.12-0.43
E06 Agenesis of Lung	Cases	25	44	32	42	49	50	26	21	14	23
	Rate	0.40	0.69	0.48	0.62	0.71	0.73	0.38	0.30	0.19	0.30
	CI	0.22-0.67	0.45-1.00	0.29-0.75	0.40-0.92	0.47-1.01	0.49-1.04	0.21-0.61	0.16-0.52	0.09-0.37	0.17-0.51
F01 Cleft Palate	Cases	39	46	36	43	38	31	27	49	47	41
	Rate	0.63	0.72	0.54	0.64	0.55	0.45	0.39	0.70	0.64	0.54
	CI	0.40-0.95	0.47-1.04	0.33-0.82	0.41-0.93	0.35-0.82	0.27-0.71	0.22-0.63	0.47-1.01	0.43-0.93	0.35-0.80

(1) See appendix for explanation of the codes/conditions

CI = Approximate 99% confidence intervals.

“Cases” are the number of live born and still born infants \geq 20 weeks gestation.

Table 3 Continued
Arizona Birth Defects Monitoring Program
Incidence Rates^a Per 1,000 Live Births and Fetal Deaths, Arizona

CODE/CONDITION (1)											
		1986	1987	1988	1989	1990	1991	1992	1993	1995	1996
F02 Cleft Lip with and without Cleft Palate	Cases	77	80	91	90	97	80	74	91	94	87
	Rate	1.25	1.25	1.37	1.33	1.40	1.17	1.07	1.31	1.29	1.15
	CI	0.91-1.67	0.92-1.66	1.03-1.79	1.00-1.74	1.06-1.81	0.86-1.55	0.78-1.43	0.98-1.70	0.97-1.67	0.86-1.51
F08 Pyloric Stenosis	Cases	108	135	134	122	116	148	137	127	148	140
	Rate	1.76	2.11	2.03	1.81	1.68	2.16	1.98	1.82	2.03	1.85
	CI	1.35-2.25	1.67-2.63	1.60-2.52	1.41-2.27	1.30-2.12	1.73-2.66	1.57-2.46	1.43-2.29	1.63-2.50	1.47-2.30
F09 TE Fistula, or Esophageal Atresia, or both	Cases	19	16	19	18	19	15	14	13	18	15
	Rate	0.31	0.25	0.28	0.27	0.27	0.22	0.20	0.19	0.25	0.20
	CI	0.15-0.54	0.11-0.46	0.14-0.50	0.13-0.48	0.14-0.48	0.10-0.41	0.09-0.39	0.08-0.37	0.12-0.44	0.09-0.37
F14 Stenosis/Atresia of Duodenum	Cases	5	15	11	10	10	6	13	14	9	19
	Rate	0.08	0.07	0.16	0.15	0.14	0.09	0.19	0.20	0.12	0.25
	CI	0.01-0.23	0.01-0.22	0.06-0.34	0.05-0.32	0.05-0.31	0.02-0.23	0.08-0.37	0.09-0.39	0.04-0.28	0.13-0.44
F15 Stenosis/Atresia of Small Intestine	Cases	18	12	13	16	16	9	13	13	11	20
	Rate	0.29	0.18	0.19	0.24	0.23	0.13	0.19	0.19	0.15	0.26
	CI	0.14-0.52	0.07-0.37	0.08-0.38	0.11-0.44	0.11-0.43	0.05-0.29	0.08-0.37	0.08-0.37	0.06-0.31	0.14-0.46
F16 Stenosis/Atresia of Rectum or Anus	Cases	27	26	27	35	35	38	31	27	37	29
	Rate	0.44	0.40	0.40	0.52	0.51	0.56	0.45	0.39	0.51	0.38
	CI	0.25-0.71	0.23-0.66	0.23-0.66	0.32-0.79	0.31-0.78	0.35-0.83	0.27-0.70	0.22-0.63	0.32-0.77	0.22-0.61
F17 Hirschsprung's Disease	Cases	11	10	10	7	13	13	7	8	16	9
	Rate	0.17	0.15	0.15	0.03	0.19	0.19	0.10	0.11	0.22	0.12
	CI	0.07-0.37	0.05-0.33	0.05-0.32	0.03-0.25	0.08-0.37	0.08-0.37	0.03-0.25	0.04-0.27	0.10-0.41	0.04-0.27

(1) See appendix for explanation of the codes/conditions

CI = Approximate 99% confidence intervals.

“Cases” are the number of live born and still born infants \geq 20 weeks gestation.

Table 3 Continued
Arizona Birth Defects Monitoring Program
Incidence Rates^a Per 1,000 Live Births and Fetal Deaths, Arizona

CODE/CONDITION (1)											
		1986	1987	1988	1989	1990	1991	1992	1993	1995	1996
F18 Malrotation of Intestine	Cases	10	10	16	14	16	14	10	20	19	22
	Rate	0.16	0.15	0.24	0.21	0.23	0.20	0.14	0.29	0.26	0.29
	CI	0.06-0.35	0.05-0.33	0.11-0.44	0.09-0.40	0.11-0.43	0.09-0.39	0.05-0.31	0.15-0.50	0.13-0.46	0.16-0.49
F21 Biliary Atresia	Cases	2	1	3	5	4	6	4	8	3	7
	Rate	0.03	0.01	0.04	0.07	0.06	0.09	0.06	0.11	0.04	0.09
	CI	0.00-0.15	0.00-0.11	0.00-0.16	0.02-0.21	0.01-0.18	0.02-0.23	0.01-0.18	0.04-0.27	0.00-0.15	0.03-0.23
H01 Renal Agenesis	Cases	21	27	23	43	33	37	33	30	39	39
	Rate	0.34	0.42	0.34	0.64	0.48	0.54	0.48	0.43	0.54	0.52
	CI	0.18	0.24-0.68	0.18-0.58	0.41-0.93	0.29-0.74	0.34-0.82	0.29-0.74	0.25-0.68	0.34-0.80	0.33-0.77
H06 Obstruction Kidney/Ureter	Cases	37	71	64	90	94	103	73	73	108	115
	Rate	0.60	1.11	0.97	1.33	1.36	1.50	1.05	1.05	1.48	1.52
	CI	0.37-0.91	0.80-1.50	0.68-1.32	1.00-1.74	1.02-1.76	1.15-1.93	0.76-1.42	0.76-1.41	1.14-1.89	1.18-1.93
H09 Bladder or Urethra Obstruction	Cases	8	12	9	7	3	8	7	14	7	13
	Rate	0.13	0.18	0.13	0.10	0.04	0.12	0.10	0.20	0.10	0.17
	CI	0.04-0.30	0.07-0.37	0.04-0.30	0.03-0.25	0.00-0.16	0.04-0.27	0.03-0.25	0.09-0.39	0.03-0.24	0.07-0.34
J03 Dislocation of Hip	Cases	87	101	68	91	105	103	66	74	83	67
	Rate	1.42	1.58	1.03	1.35	1.52	1.50	0.95	1.06	1.14	0.89
	CI	1.05-1.86	1.20-2.03	1.20-2.03	1.01-1.76	1.16-1.76	1.15-1.93	0.68-1.30	0.77-1.43	0.84-1.50	0.63-1.21
J51 Complete absence of upper or lower limb	Cases	2	0	1	3	3	2	1	2	2	3
	Rate	0.03	0.00	0.01	0.04	0.04	0.03	0.01	0.03	0.03	0.04
	CI	0.00-0.15	0.00-0.00	0.00-0.11	0.00-0.16	0.00-0.16	0.00-0.14	0.00-0.11	0.00-0.13	0.00-0.13	0.00-0.15

(1) See appendix for explanation of the codes/conditions

CI = Approximate 99% confidence intervals.

“Cases” are the number of live born and still born infants \geq 20 weeks gestation.

Table 3 Continued
Arizona Birth Defects Monitoring Program
Incidence Rates^a Per 1,000 Live Births and Fetal Deaths, Arizona

CODE/CONDITION (1)											
		1986	1987	1988	1989	1990	1991	1992	1993	1995	1996
J52 Phocomelia of limb	Cases	3	2	2	1	1	1	0	1	0	0
	Rate	0.04	0.03	0.03	0.01	0.01	0.01	0.00	0.01	0.00	0.00
	CI	0.00-0.18	0.00-0.14	0.00-0.14	0.00-0.25	0.00-0.11	0.00-0.11	0.00-0.00	0.00-0.11	0.00-0.00	0.00-0.00
K05 Amniotic Bands	Cases	4	4	9	8	14	10	8	7	12	6
	Rate	0.06	0.06	0.14	0.11	0.20	0.15	0.12	0.10	0.16	0.08
	CI	0.01-0.20	0.01-0.19	0.05-0.32	0.04-0.28	0.09-0.39	0.05-0.31	0.04-0.27	0.03-0.25	0.07-0.33	0.02-0.21
N01 Diaphragmatic Hernia	Cases	13	18	20	23	28	23	13	18	20	15
	Rate	0.21	0.28	0.30	0.34	0.40	0.34	0.19	0.26	0.27	0.20
	CI	0.09-0.41	0.13-0.50	0.15-0.52	0.19-0.57	0.23-0.65	0.18-0.56	0.08-0.37	0.13-0.46	0.14-0.48	0.09-0.37
N02 Omphalocele	Cases	10	14	17	10	21	21	10	17	14	20
	Rate	0.16	0.21	0.25	0.15	0.30	0.31	0.14	0.24	0.19	0.26
	CI	0.06-0.35	0.09-0.42	0.12-0.46	0.05-0.32	0.16-0.52	0.16-0.53	0.05-0.31	0.12-0.44	0.09-0.37	0.14-0.46
N04 Gastroschisis	Cases	19	18	19	19	21	36	27	16	27	42
	Rate	0.31	0.28	0.28	0.28	0.30	0.53	0.39	0.23	0.37	0.56
	CI	0.15-0.54	0.13-0.50	0.14-0.50	0.14-0.50	0.16-0.52	0.33-0.80	0.22-0.63	0.11-0.42	0.21-0.60	0.36-0.82
R01 Down Syndrome (Trisomy 21)	Cases	64	61	74	66	73	84	87	80	90	95
	Rate	1.04	0.95	1.12	0.98	1.05	1.23	1.26	1.15	1.23	1.26
	CI	0.73-1.43	0.67-1.32	0.81-1.50	0.70-1.33	0.76-1.42	0.91-1.62	0.94-1.65	0.84-1.52	0.92-1.61	0.95-1.63
R02 Patau Syndrome (Trisomy 13)	Cases	9	4	3	4	11	6	15	9	8	13
	Rate	0.14	0.06	0.04	0.06	0.16	0.09	0.22	0.13	0.11	0.17
	CI	0.05-0.32	0.01-0.19	0.00-0.16	0.01-0.19	0.06-0.33	0.02-0.23	0.10-0.41	0.04-0.29	0.03-0.26	0.07-0.34

(1) See appendix for explanation of the codes/conditions

CI = Approximate 99% confidence intervals.

“Cases” are the number of live born and still born infants ≥ 20 weeks gestation.

Table 3 Continued
 Arizona Birth Defects Monitoring Program
 Incidence Rates Per 1,000 Live Births and Fetal Deaths¹, Arizona

CODE/CONDITION (1)											
		<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1995</u>	<u>1996</u>
R03 Edwards Syndrome (Trisomy 18)	Cases	11	17	13	10	15	13	12	14	18	16
	Rate	0.17	0.26	0.19	0.15	0.22	0.19	0.17	0.20	0.25	0.21
	CI	0.07-0.37	0.12-0.48	0.08-0.38	0.05-0.32	0.10-0.41	0.08-0.37	0.07-0.35	0.09-0.39	0.12-0.44	0.10-0.39
S02 Fetal Alcohol Syndrome	Cases	9	25	12	21	22	27	33	26	27	10
	Rate	0.14	0.39	0.18	0.31	0.32	0.39	0.48	0.37	0.37	0.13
	CI	0.05-0.32	0.21-0.64	0.07-0.36	0.16-0.53	0.17-0.54	0.23-0.64	0.29-0.74	0.21-0.61	0.21-0.60	0.05-0.28

(1) See appendix for explanation of the codes/conditions

CI = Approximate 99% confidence intervals.

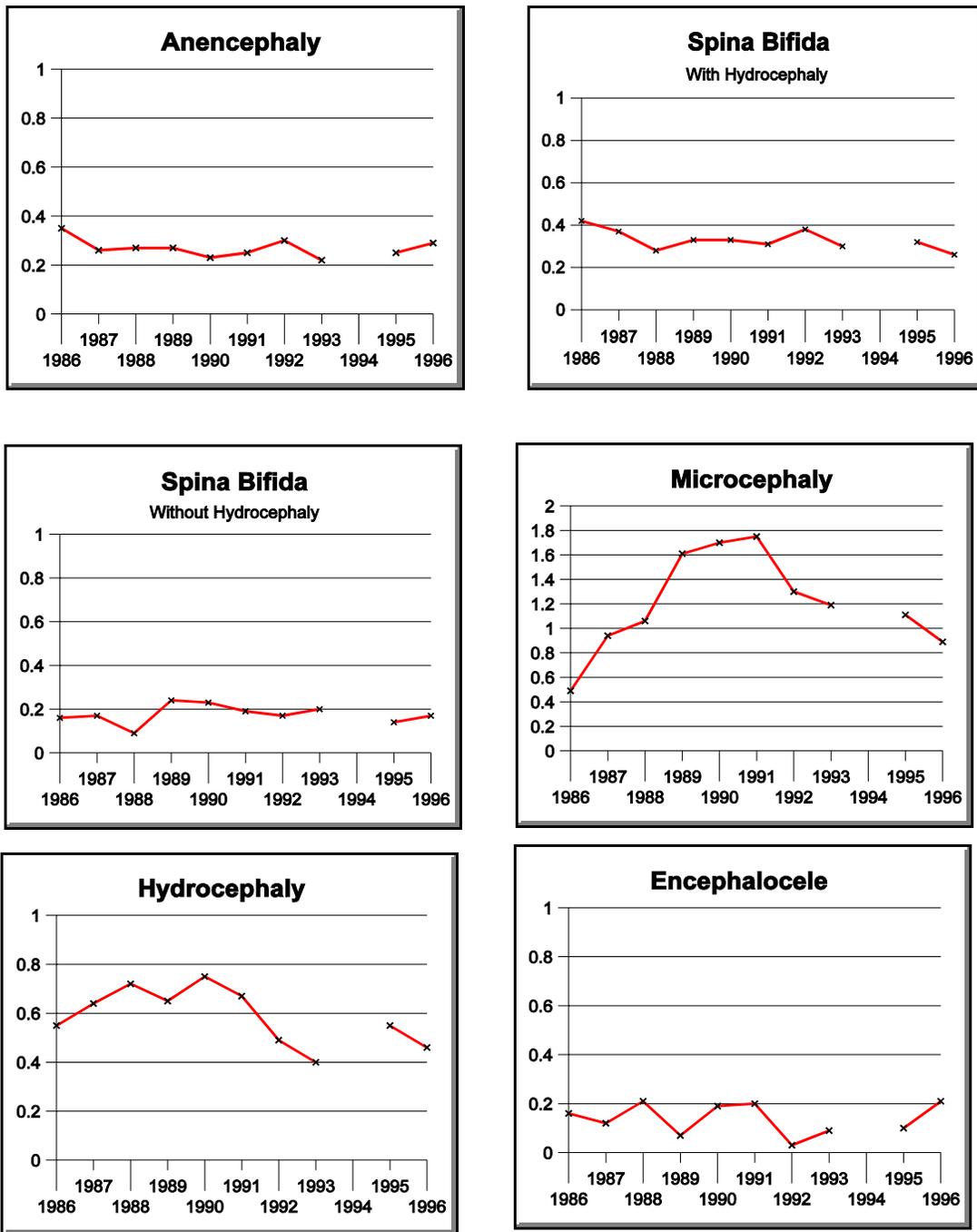
“Cases” are the number of live born and still born infants \geq 20 weeks.

^a The rates are calculated as the number of live born and still born cases of each defect divided by the denominators consisting of the total live births and still births as follows:

Denominators -

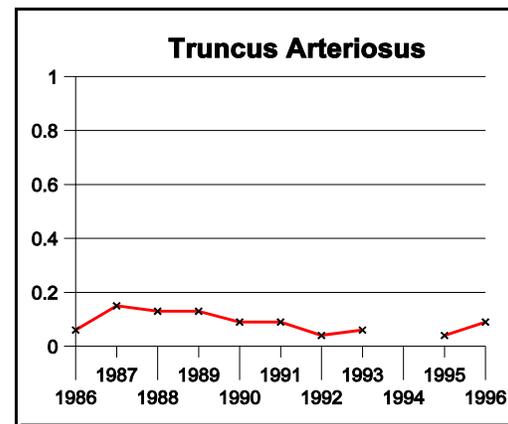
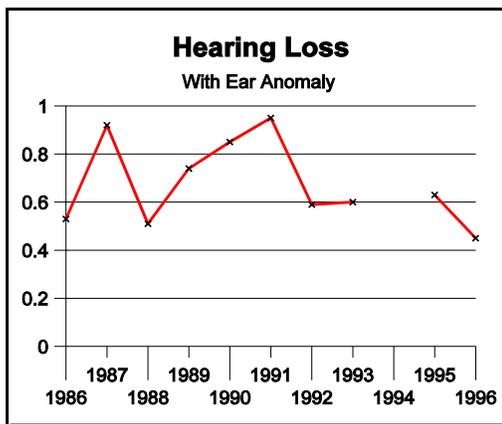
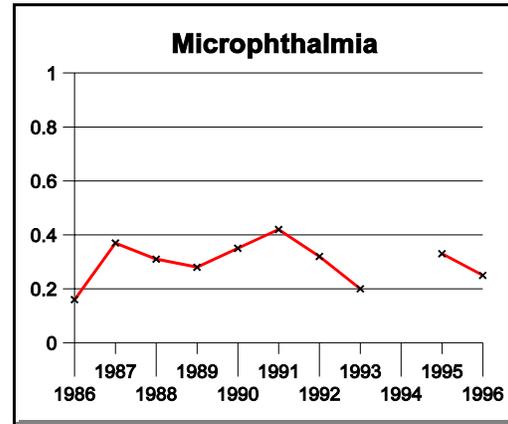
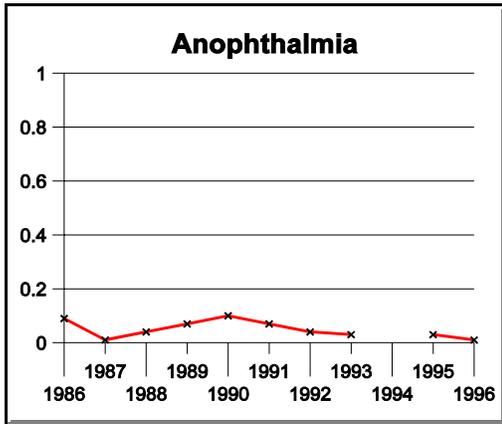
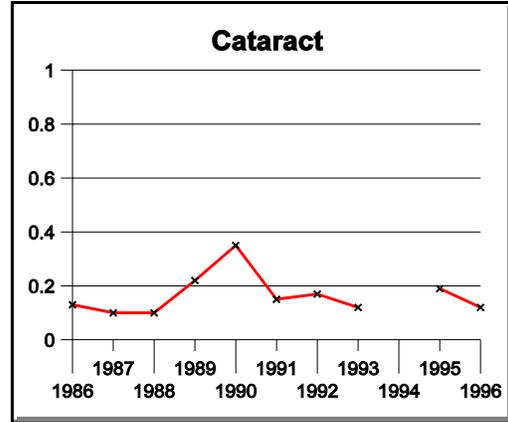
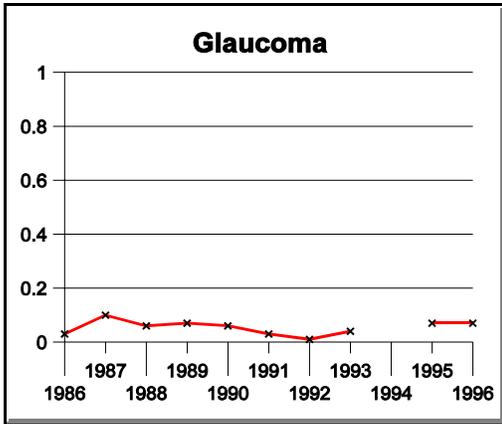
1986 = 61,203; 1987 = 63,742; 1988 = 65,981; 1989 = 67,498; 1990 = 69,245; 1991 = 68,449; 1992 = 69,202; 1993=69,593;
 1995 = 72,883; 1996=75,577.

Figure 2. Trends of Selected Congenital Anomalies: Incident Rates (Live Born and Still Born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



^a Data is not available for 1994.

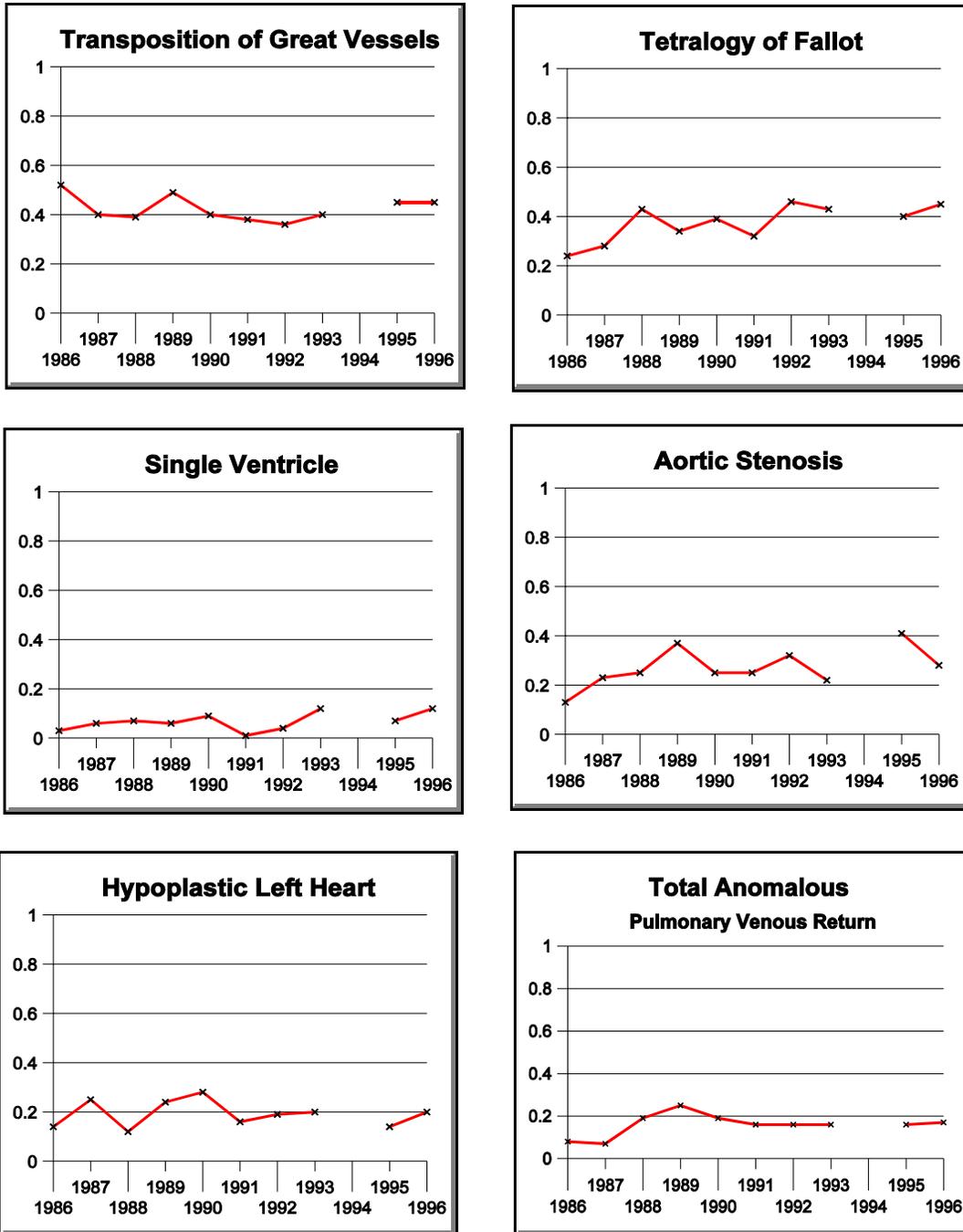
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 Trends of Selected Congenital Anomalies: Incidence Rates
 (Live Born and Still Born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



Data is not available for 1994.

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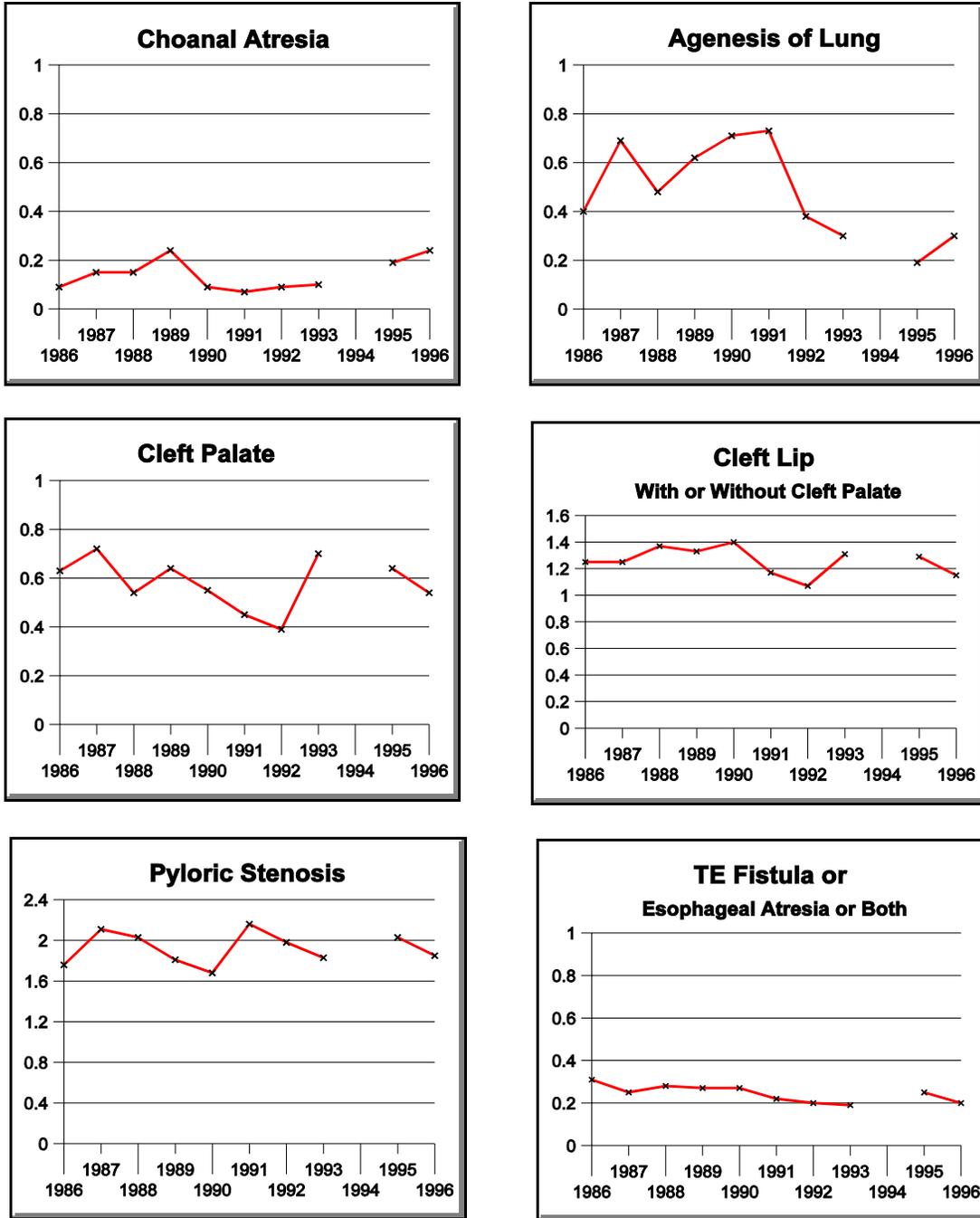
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 Trends of Selected Congenital Anomalies: Incidence Rates
 (Live Born and Still Born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



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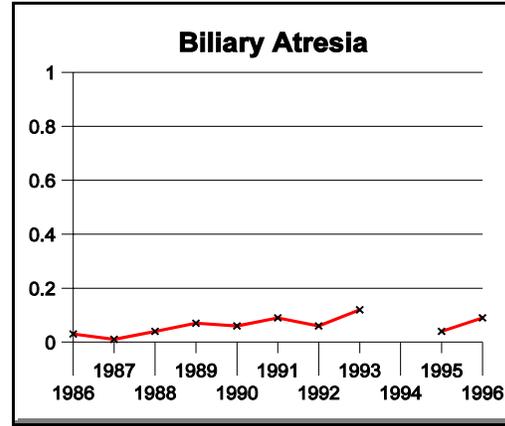
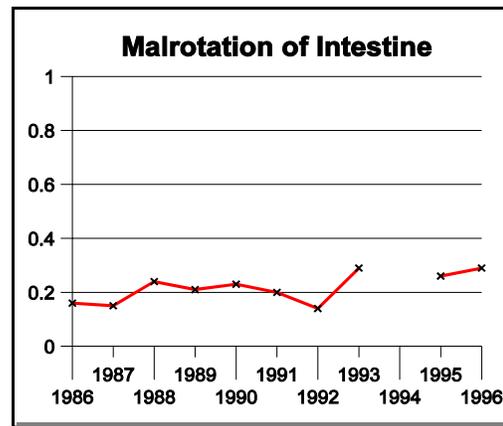
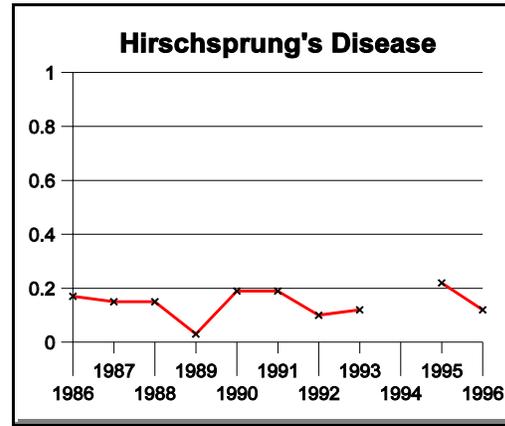
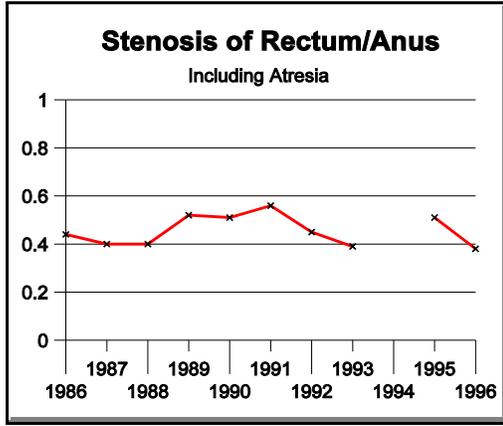
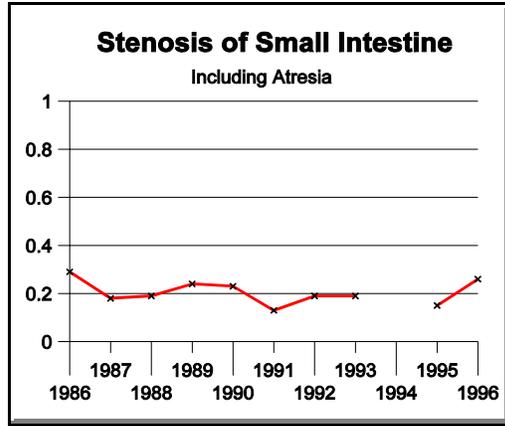
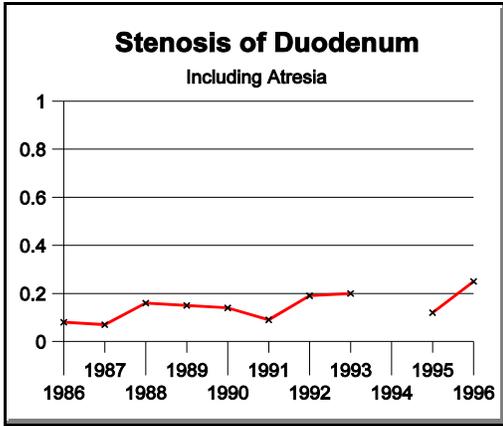
^a Data

Figure 2 Continued
 Trends of Selected Congenital Anomalies: Incidence Rates
 (Live Born and Still Born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



^a Data is not available for 1994.

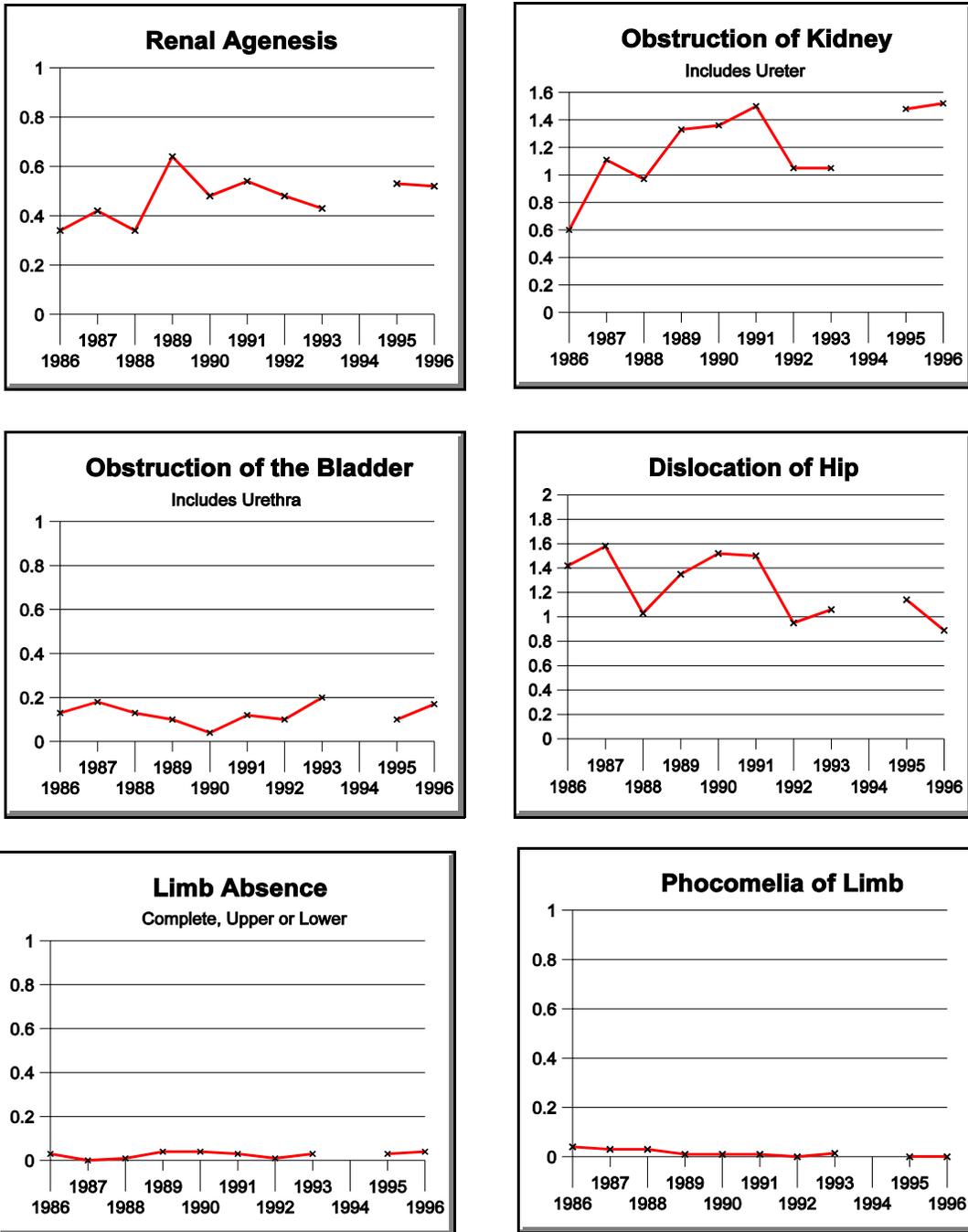
Figure 2 Continued
 Trends of Selected Congenital Anomalies: Incidence Rates
 (Live Born and Still Born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



is not available for 1994.

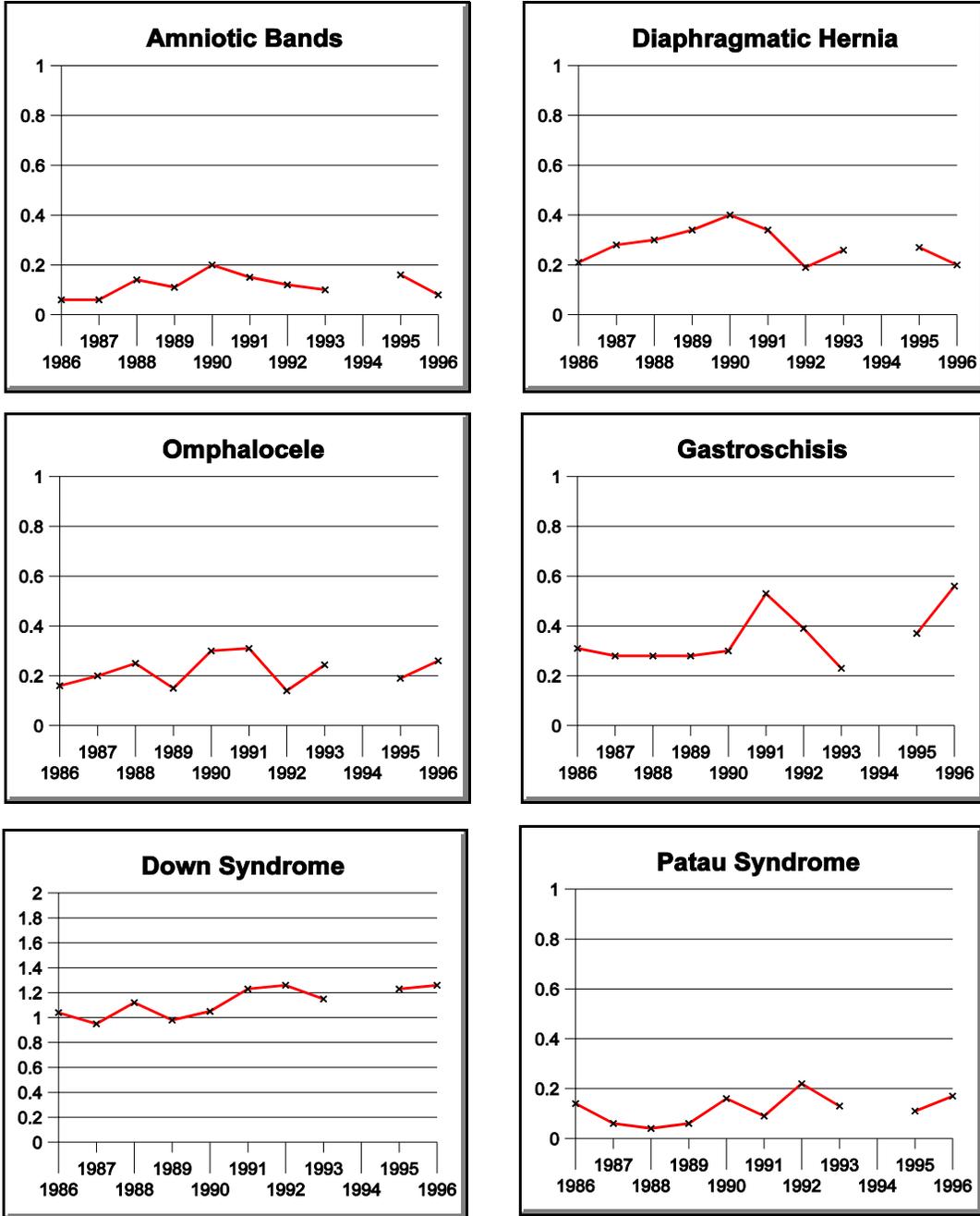
^a Data

Figure 2 Continued
 Trends of Selected Congenital Anomalies: Incidence Rates
 (Live Born and Still Born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



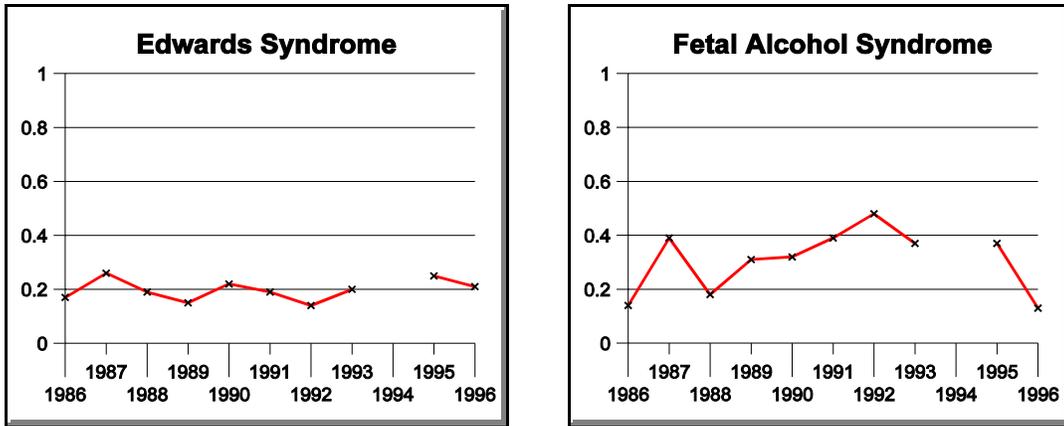
^a Data is not available for 1994.

Figure 2 Continued
 Trends of Selected Congenital Anomalies: Incidence Rates
 (Live Born and Still born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



^a Data is not available for 1994.

Figure 2 Continued
Trends of Selected Congenital Anomalies: Incidence Rates
(Live Born and Still Born Cases Per 1,000 Live Births & Fetal Deaths), Arizona^a



^aData is not available for 1994.

RACE/ETHNICITY

All race and ethnic groups experience birth defects, but the frequency and types of these vary by race and ethnicity.¹³ The race and ethnicity information collected in the Arizona Birth, Death and Fetal Death certificates allow for the analysis of birth defects by race and ethnicity (Appendix 6). The following figures display the rates of selected birth defects by race and ethnicity. However, due to the small number of cases of specific birth defects among the subgroups, the rates for all of the race/ethnic groups are not displayed. Table 1 shows the counts used for the calculation of the rates.

Spina Bifida, the most common neural tube defect (NTD) among all races, was highest among Hispanics, but is not statistically significant (Figure 3). This is in line with the literature that indicate that higher rates of spina bifida occur among Hispanics than Whites. A California study suggested that while the risk for a NTD-affected pregnancy was twice as high among women of Mexican descent than Whites, the risk was not substantially higher between U.S. born women of Mexican and other racial/ethnic descent and Whites.¹⁴ Due to small number of cases occurring among other races, rate comparisons of NTDs were limited to White and Hispanics.

Data in Table 1 show the rates of abdominal wall defects among Hispanics and Whites, with the higher rate found among Hispanics at 9.07 vs. 8.01 per 10,000 live and still births. An examination of the specific defects show that Omphalocele rates are found to be higher for Whites, relative to Hispanics. Gastroschisis rates are higher among Hispanics, relative to Whites (Figure 4). These patterns however, are not statistically significant. Again, rate comparisons among other races was not possible due to small numbers.

Down Syndrome (Trisomy 21) rates were significantly higher among Hispanics (18.13 per 10,000 live and still births) than the state rate (12.57 per 10,000 live and still births) at $p < .01$. This is followed by the rates among Blacks and Whites (Figure 5).

Microcephaly rates are highest among Native Americans, and Hispanics (Figure 6). Hispanics exhibited the highest rates of pyloric stenosis at 22.11 per 10,000 live born and still-born infants, which is 16.3% higher than the overall state rate. Native Americans and Whites had the next highest rates (Figure 7). Figure 8 show that Native Americans and Hispanics have the highest rates of oral clefts. Fetal Alcohol Syndrome rates are highest among Native Americans (Figure 9). Z-test results show a significant difference between the Native American Fetal Alcohol Syndrome rate and the state rate at $p < .01$.

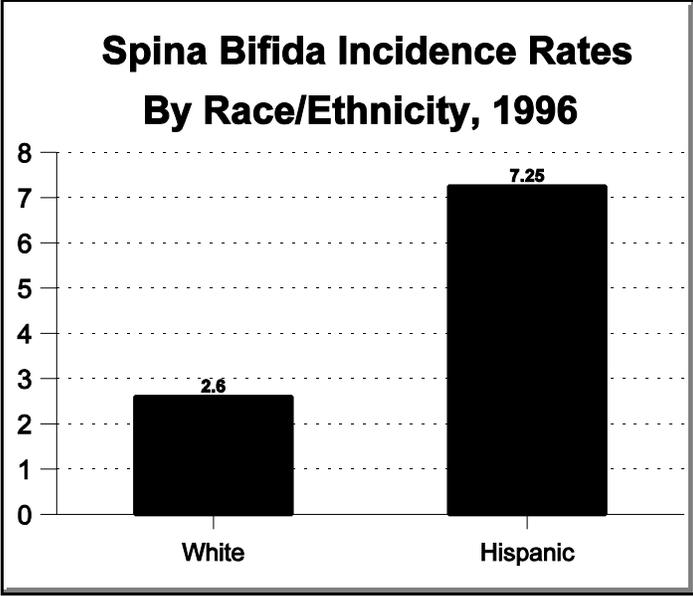


Figure 3. Spina Bifida Incidence Rates (Live Born and Still Born Cases Per 10,000 Live Births and Fetal Deaths) by Race/Ethnicity, 1996

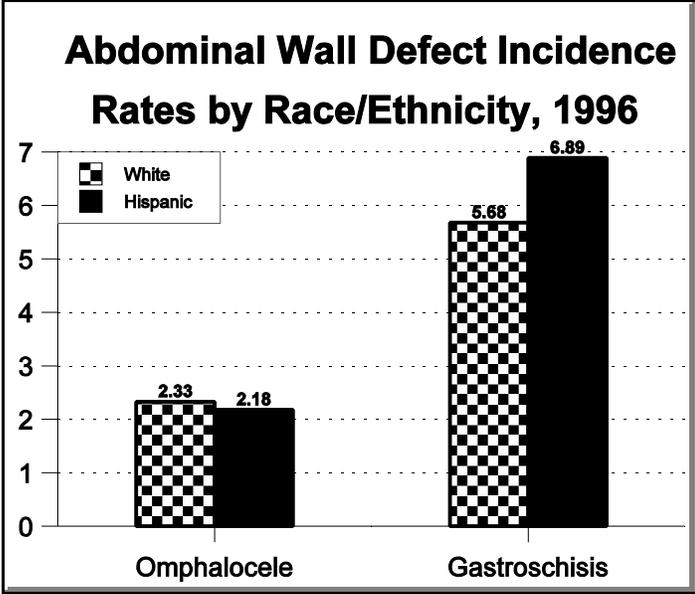


Figure 4. Abdominal Wall Defect Incidence Rates (Live Born and Still Born Cases Per 10,000 Live Births and Fetal Deaths) by Race/Ethnicity, 1996

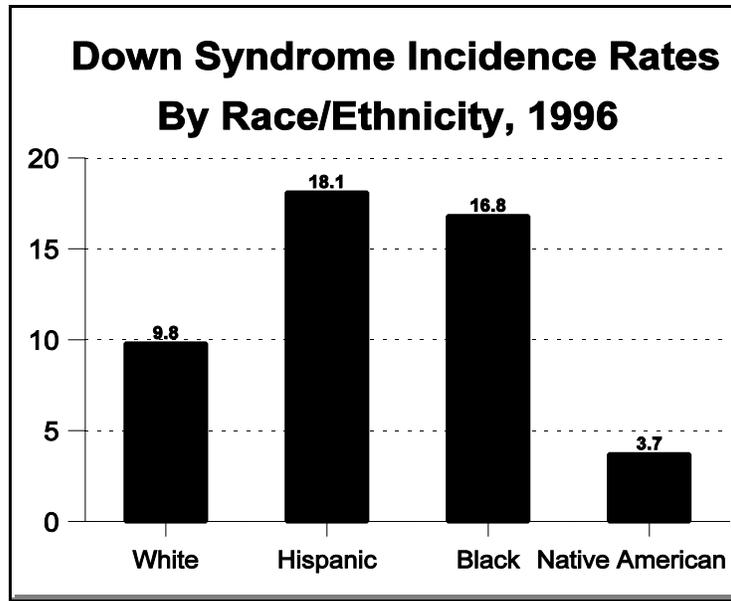


Figure 5. Down Syndrome Incidence Rates (Live Born and Still Born Cases Per 10,000 Live Births and Fetal Deaths) by Race/Ethnicity, 1996

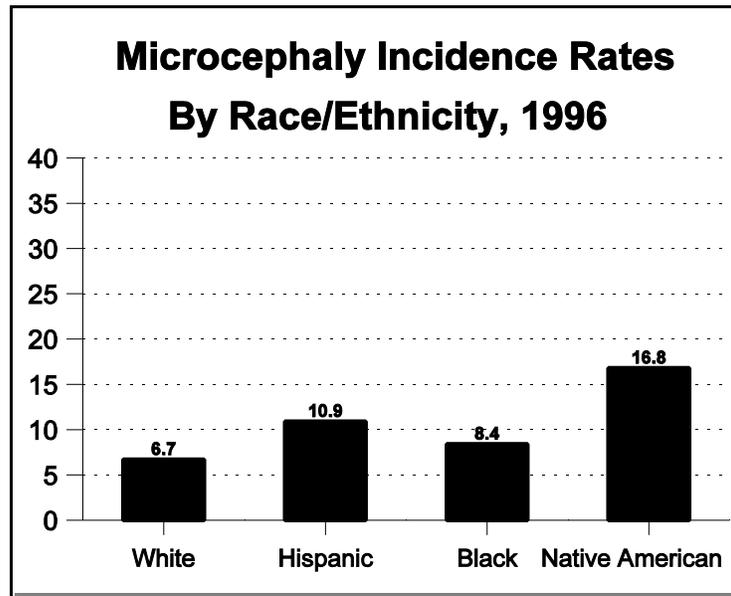


Figure 6. Microcephaly Incidence Rates (Live Born and Still Born Cases Per 10,000 Live Births and Fetal Deaths) by Race/Ethnicity, 1996

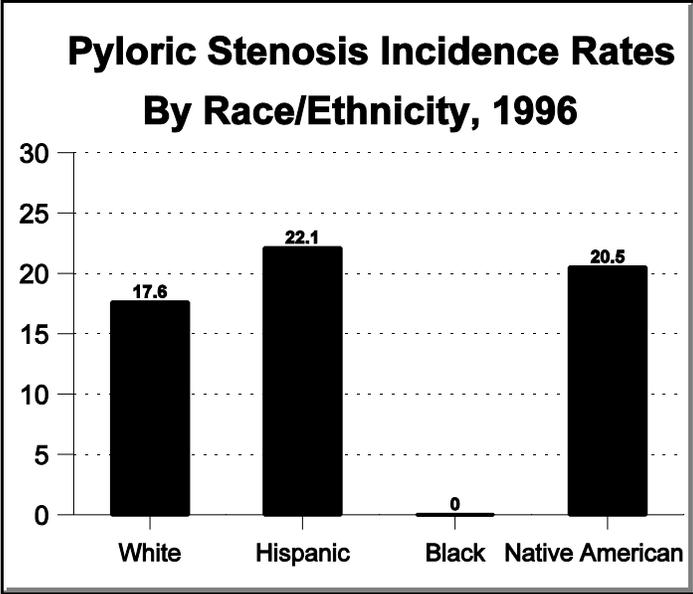


Figure 7. Pyloric Stenosis Incidence Rates (Live Born and Still Born Cases Per 10,000 Live Births and Fetal Deaths) by Race/Ethnicity, 1996

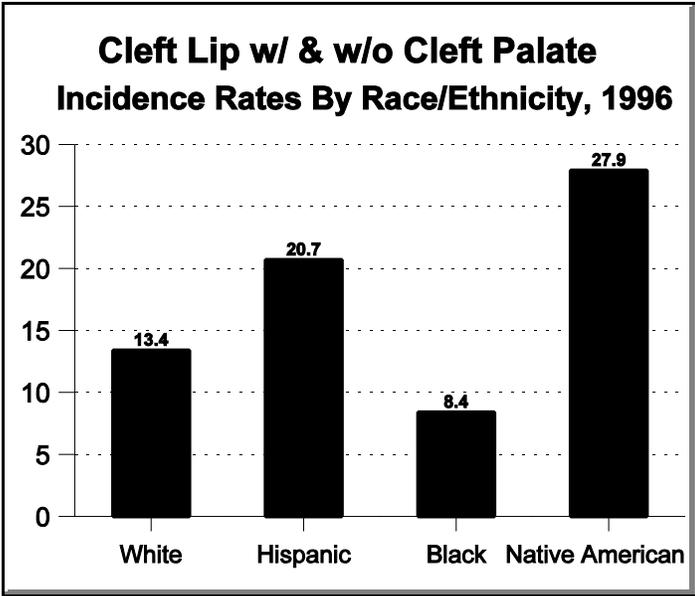


Figure 8. Cleft Lip with and without Cleft Palate Incidence Rates (Live Born and Still Born Cases Per 10,000 Live Births and Fetal Deaths) by Race/Ethnicity, 1996

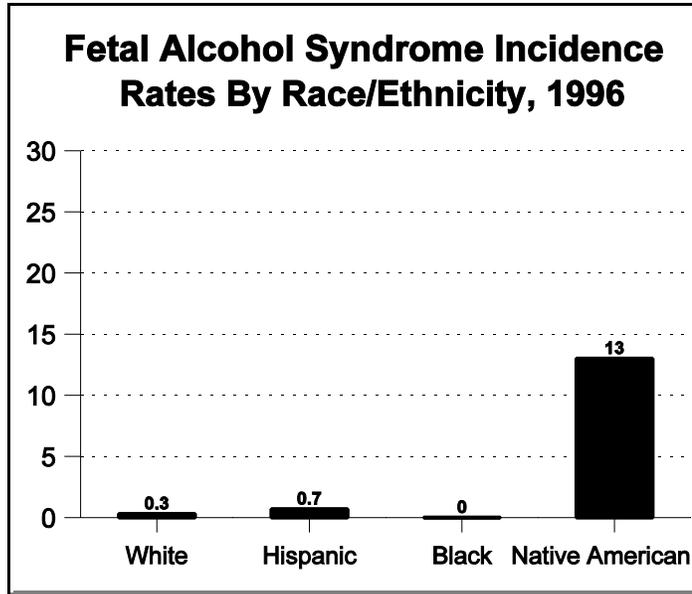


Figure 9. Fetal Alcohol Syndrome Incidence Rates (Live Born and Still Born Cases Per 10,000 Live Births and Fetal Deaths) by Race/Ethnicity, 1996

MATERNAL AGE

Maternal age was divided into five age groups. Observed rates of the “44 selected” congenital anomalies were highest among women 35 years of age and older, followed by the 20-24 years old age group and lowest among the 25-29 years maternal age group. Z test results show that birth defect rate for the 25-29 years old age group is statistically significantly lower than the state rate at $p < .01$. While Down syndrome (Trisomy 21) rates increased with maternal age (Figure 11), it is significantly higher for the over 35 years old age group. The Down Syndrome rate for the 25-29 years age group is also statistically significantly lower compared to the state Down syndrome rate. In contrast, rates for gastroschisis decreased as maternal age increased and was not found to be significantly different for any of the age groups (Figure 12).

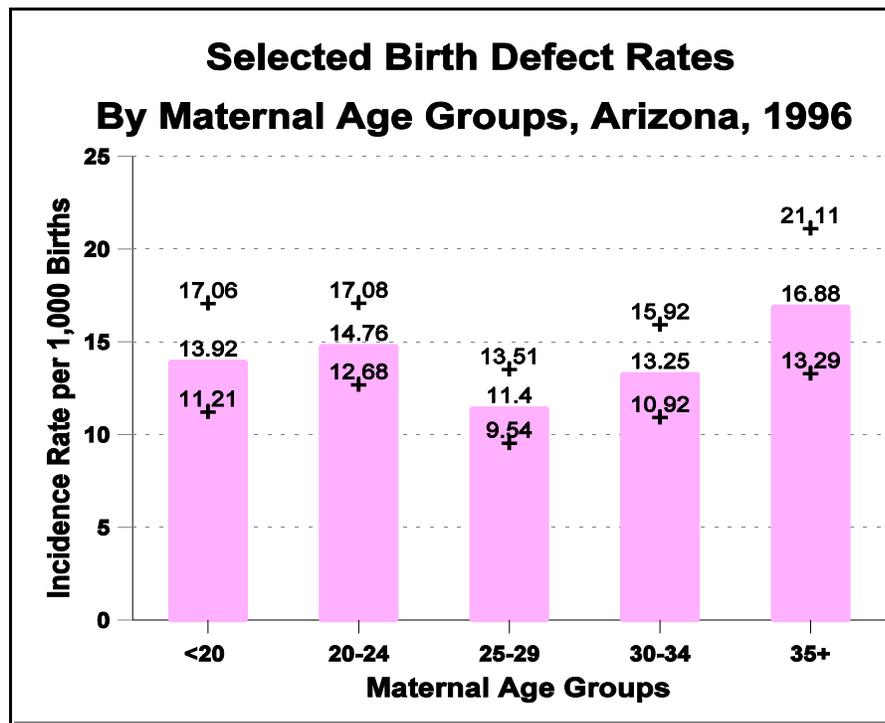


Figure 10. Incidence Rates (Live Born and Still Born Cases Per 1,000 Live Births and Fetal Deaths) for the 44 Selected Defects Listed on Table 1. The + sign indicates the 99% confidence bounds.

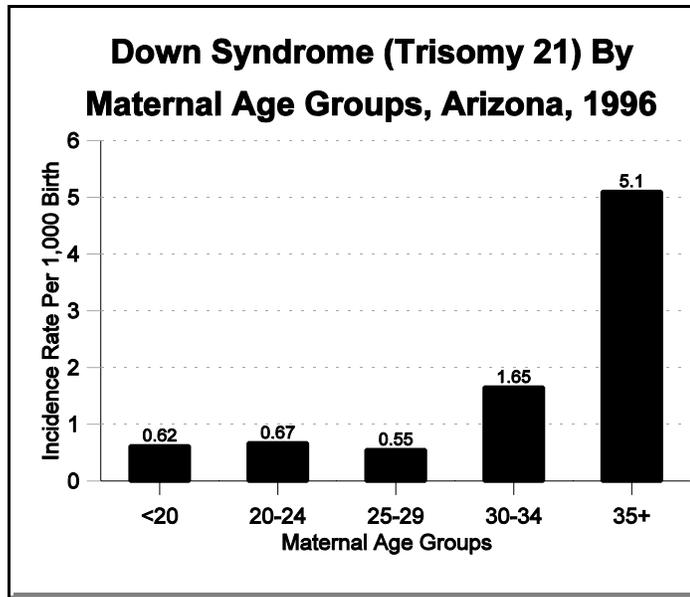


Figure 11. Down Syndrome (Trisomy 21) Rates (Live Born and Still Born Cases Per 1,000 Live Births and Fetal Deaths) by Maternal Age Groups

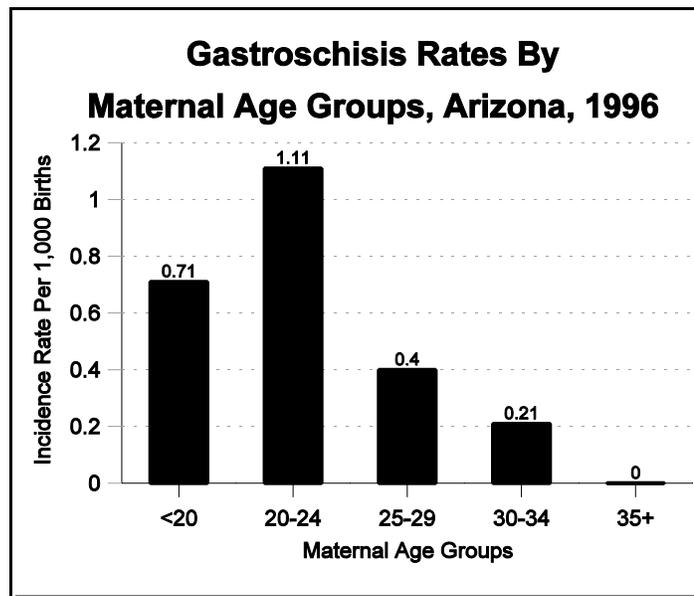


Figure 12. Gastroschisis Rates (Live Born and Still Born Cases Per 1,000 Live Births and Fetal Deaths) by Maternal Age Groups

COUNTY PROFILES

Using County Data

The Arizona Birth Defect Monitoring Program (ABDMP) collects birth defect information from all of Arizona's 15 counties. Multiple years are used to give sufficient data to derive statistically stable measures at the county level. Birth defect data from live births are analyzed in this section.

Dealing With Small Numbers

Analysis of county data is difficult because of normal fluctuations in rates seen in small populations. When dealing with small numbers, it is normal to see fluctuations over time. With rate fluctuations we may see the appearance of birth defects clusters. Most often this is a statistical anomaly. In the rare case that a cluster results from a teratogen a dramatic increase on the scale of 10-fold or greater is usually seen.¹⁵ Another concern with small numbers is protecting a person and their family's confidentiality. Thus, all county level data are aggregated. Incidence rates and confidence intervals are presented when there are 10 or more cases. Z-tests were used to test for the equivalence between the county rates with the state rate.

Birth Defects by County

The following tables present birth defects by county of mothers' residence. Cases were aggregated for the years 1986 through 1993 and 1995 through 1996 to provide numbers large enough for analysis. Table 4 shows the total cases and rates of 44 selected congenital anomalies for each Arizona county. Gila and Navajo counties had the highest rate of congenital anomalies at 17.25 and 15.44 per 1,000 live births. Statistical analysis indicate that county rates are not significantly different from the state rate of 13.20 per 1,000 live births. Table 5 examines the 44 selected anomalies by race and county. For Whites, Yavapai county has the highest rate, followed by Maricopa county. For Hispanics, Yuma county has the highest rate of congenital anomalies and Pima county has the highest rate for Blacks. Graham and Gila counties have the highest rates for Native Americans. The rate for each race/ethnicity group for each county is compared with that of the state rate to assess whether the county rates for each of the race/ethnic groups are significantly different from the state rate. The Z-test results indicate that Gila and Graham counties' Native American rates are significantly higher than the state rate at the 99 percent level. Other county rates for the other race/ethnic groupings were not significantly different from the state rate.

Table 4
 Selected Birth Defect Incidence Rates by County 1986-1993, 1995-1996
 Incidence Rates (Live Born Cases Per 1,000 Live Births)

COUNTY	CASES 1986-1993, 1995, 1996	RATE	99% CONFIDENCE INTERVAL
Arizona	8,962	13.20	12.88-13.57
Apache	221	13.27	11.08-15.75
Cochise	185	11.05	9.07-13.32
Coconino	257	13.46	11.39-15.78
Gila	114	17.25	13.37-21.88
Graham	62	14.33	10.07-19.73
Greenlee	8	-	-
Maricopa	5,297	13.22	12.76-13.70
Mohave	160	10.82	8.74-13.23
Navajo	289	15.44	13.20-17.94
Pima	1,458	13.03	12.17-13.94
Pinal	297	14.23	12.19-16.50
Santa Cruz	92	12.64	9.50-16.46
Yavapai	160	12.30	9.94-15.04
Yuma	344	13.72	11.88-15.74
La Paz	18	13.72	4.63-16.71

44 selected birth defects (see Table 1); - =Insufficient cases for rate and confidence interval calculations

Table 5
 Selected Birth Defects by Race/Ethnicity by County, 1986-1993, 1995-1996
 Incidence Rates (Live Born Cases Per 1,000 Live Births)

COUNTY	WHITE NON-HISP.	HISPANIC	BLACK	NATIVE AMERICAN	OTHER
	Rate 99% C.I.	Rate 99% C.I.	Rate 99% C.I.	Rate 99% C.I.	Rate 99% C.I.
Arizona	11.89 11.44-12.35	13.68 13.03-14.35	11.80 10.24-13.53	17.50 16.12-18.97	9.63 7.38-12.34
Apache	8.19 3.86-15.12	- -	- -	13.95 11.52-16.72	- -
Cochise	10.21 7.62-13.37	11.59 8.45-15.49	9.07 3.84-17.81	- -	- -
Coconino	9.90 7.26-13.16	12.55 7.19-20.24	- -	15.93 12.65-19.77	- -
Gila	10.65 6.52-16.34	12.61 6.38-22.18	- -	27.89 18.31-37.98	- -
Graham	11.36 6.50-18.32	12.29 5.94-22.30	- -	29.17 14.45-52.08	- -
Greenlee	- -	- -	- -	- -	- -
Maricopa	12.27 11.71-12.85	14.21 13.33-15.14	11.71 9.86-13.81	18.77 15.64-22.34	9.41 6.74-12.75
Mohave	10.51 8.27-13.14	11.15 5.86-19.11	- -	- -	- -
Navajo	10.52 7.25-14.72	12.31 5.63-23.16	- -	17.77 14.79-21.15	- -
Pima	11.75 10.64-12.96	12.99 11.64-14.14	13.93 9.98-18.87	18.82 14.05-24.65	11.56 6.46-18.98
Pinal	11.81 9.15-14.97	12.98 13.23-22.17	- -	23.87 17.15-32.26	- -
Santa Cruz	- -	13.11 9.73-17.24	- -	- -	- -
Yavapai	12.38 9.78-15.44	12.51 6.99-20.54	- -	- -	- -
Yuma	10.68 8.10-13.80	14.58 12.20-17.29	- -	32.47 11.96-69.62	- -
La Paz	- -	- -	- -	- -	- -

- =Insufficient cases for rate and confidence interval calculations.

SENTINEL DEFECTS

Tables 6-10 look at the following sentinel defects: chromosomal defects, oral clefts, neural tube defects, abdominal wall defects, and heart defects. These defects were chosen because of their significant public health impact.

Chromosomal Defects

Table 6 presents information on chromosomal defects that refers to Down Syndrome, Patau syndrome, and Edwards syndrome. Chromosomal abnormalities may arise from a deletion (monosomy) or an addition (trisomy) of genetic components that result in various levels of abnormal physical features, structural defects, mental retardation, fetal and infant death, and shortened life expectancy. The most common chromosomal defect is Down Syndrome. Research show that the risk of a trisomy affected pregnancy increases with maternal age; however, ethnic differences may impact this risk.¹⁶ There is also data indicating that about 20 percent of instances of Down Syndrome are paternal in origin. Table 6 shows that rates for chromosomal defects are highest for Gila county (1.82 per 1,000 live births), followed by Navajo county at 1.71 per 1,000 live births. A comparison of the county rates with the state rate (1.33 per 1,000 live births) for chromosomal defects indicate that there are no significant differences between the county rates and that of the state.

Oral Clefts

Cleft palate is a failure of the palate to fuse properly, forming a grooved fissure in the roof of the mouth. Cleft lip is a failure of the maxillary and median nasal processes to fuse, forming a fissure in the lip. This occurs between the fourth and eighth week of pregnancy. Babies born with oral clefts may experience problems with eating, drinking, hearing and speech development, requiring services such as surgery and speech therapy. There is evidence that indicate that prevalent environmental exposures such as maternal smoking and alcohol consumption during early pregnancy is associated with increasing the risk of having an infant with oral clefts.^{17,18} Table 7 shows that Gila county, followed by Graham and Apache counties have the highest rates for oral clefts at 3.03, 3.00 and 2.94 per 1,000 live births. Greenlee, La Paz, Maricopa and Mohave counties have the lowest rates. The state rate for oral clefts is 1.77 per 1,000 live births from 1986 to 1993 and 1995 to 1996. Z-tests results, comparing the oral clefts rates of the counties with the state show that there are no statistical differences between these rates.

Neural Tube Defects

Neural tube defects result from the failure of the neural tube to close properly. The two major NTDs are anencephaly and spina bifida. Anencephaly is an absence of the skull, with cerebral hemispheres reduced or completely missing. Spina bifida is a defective closure of the bony encasement of the spinal cord, through which the cord and meninges may or may not protrude. Research indicate that maternal obesity, socioeconomic status and neighborhood social conditions, and prior spontaneous and elective terminations, and short pregnancy interval are associated with the risk of a NTD affected pregnancy.^{19,20,21} There is however, epidemiologic evidence showing that intake of 400 mcg. of folic acid before conception and during the first trimester may significantly reduce the risk of preventable NTD affected pregnancy by at least 50 percent.^{22,23} The data show that rate for neural tube defect for the state is 0.70 per 1,000 live births (Table 8). A comparison between the county rates and the state rate indicate that Navajo county has the highest rate for neural tube defect at 1.17 per 1,000 live births, but is not statistically different from the state rate.

Abdominal Wall Defects

Abdominal wall defects include omphalocele and gastroschisis (Table 9). Gastroschisis is a congenital opening of the abdominal wall, often with protrusion of the intestines. Omphalocele is a membrane-covered protrusion of an abdominal organ through the abdominal wall at the umbilicus. According to a recent study, young mothers are 4 times as likely as women in their late 20s to have a child with gastroschisis.²⁴ Other risk factors for gastroschisis are maternal use of cocaine, aspirin, amphetamines, exposure to solvents, and maternal dietary inadequacy.²⁵ Table 9 presents the incidence rate for the state at 0.51 per 1,000 live births. Mohave county has the highest incidence rate for abdominal wall defects at 1.01 per 1,000 live births. There are no statistical differences between the county rates and the state rate for abdominal wall defects.

Heart Defects

This category includes truncus Arteriosus, transposition of great vessels, Tetralogy of Fallot, single ventricle, aortic stenosis, hypoplastic left heart, and total anomalous pulmonary venous (Table 10). Table 10 shows that the heart defect rate for Gila is 57% higher than the state rate for heart defects (2.27 vs. 1.45 per 1,000 live births). Navajo county have the second highest heart defects rate at 2.03 per 1,000 live births. The county rates for heart defects were found not to be statistically different from the rate at the state level.

Table 6
 Chromosomal Defects - Rates by County 1986-1993, 1995-1996
 Incidence Rate (Live Born Cases per 1,000 Live Births)

COUNTY	CASES 1986-1993, 1995,1996	RATE	99% CONFIDENCE INTERVAL
Arizona	903	1.33	1.22-1.45
Apache	27	1.62	0.93-2.61
Cochise	27	1.61	0.92-2.60
Coconino	28	1.47	0.85-2.35
Gila	12	1.82	0.74-3.66
Graham	8	-	-
Greenlee	1	-	-
Maricopa	525	1.31	1.17-1.47
Mohave	15	1.01	0.46-1.91
Navajo	32	1.71	1.03-2.66
Pima	142	1.27	1.01-1.57
Pinal	25	1.20	0.67-1.97
Santa Cruz	12	1.65	0.67-3.32
Yavapai	15	1.15	0.53-2.17
Yuma	31	1.24	0.74-1.93
La Paz	3	-	-

Chromosomal defects include three-digit codes R01, R02, R03 (see Table 1);
 - =Insufficient cases for rate and confidence interval calculations.

Table 7
 Oral Clefts - Rates by County 1986-1993, 1995-1996
 Incidence Rates (Live Born Cases Per 1,000 Live Births)

COUNTY	CASES 1986-1993 1995,1996	RATE	99% CONFIDENCE INTERVAL
Arizona	1199	1.77	1.64-1.90
Apache	49	2.94	1.97-4.21
Cochise	32	1.91	1.15-2.97
Coconino	41	2.15	1.38-3.17
Gila	20	3.03	1.56-5.25
Graham	13	3.00	1.28-5.90
Greenlee	0	-	-
Maricopa	641	1.60	1.44-1.77
Mohave	25	1.69	0.94-2.78
Navajo	51	2.72	1.84-3.87
Pima	195	1.74	1.44-2.09
Pinal	40	1.92	1.22-2.85
Santa Cruz	14	1.92	0.85-3.69
Yavapai	31	2.38	1.42-3.73
Yuma	45	1.79	1.18-2.61
La Paz	2	-	-

Oral Clefts include three-digit codes F01 & F02 (see Table 1); - =Insufficient cases for rate and confidence interval calculations.

Table 8
 Neural Tube Defects - Rates by County 1986-1993, 1995-1996
 Incidence Rates (Live Born Cases Per 1,000 Live Births)

COUNTY	CASES 1986-1993, 1995, 1996	RATE	99% CONFIDENCE INTERVAL
Arizona	474	0.70	0.62-0.79
Apache	9	-	-
Cochise	7	-	-
Coconino	8	-	-
Gila	8	-	-
Graham	4	-	-
Greenlee	0	-	-
Maricopa	288	0.72	0.61-0.84
Mohave	9	-	-
Navajo	22	1.17	0.63-1.99
Pima	66	0.59	0.42-0.80
Pinal	14	0.67	0.30-1.29
Santa Cruz	6	-	-
Yavapai	9	-	-
Yuma	21	0.84	0.44-1.44
La Paz	3	-	-

Neural Tube defects include three-digit codes A01, A02, A03 & A13.
 (see Table 1); - =Insufficient cases for rate and confidence interval calculations.

Table 9
Abdominal Wall Defects - Rates by County 1986-1993, 1995-1996
Incidence Rates (Live Born Cases Per 1,000 Live Births)

COUNTY	CASES 1986-1993, 1995, 1996	RATE	99% CONFIDENCE INTERVAL
Arizona	346	0.51	0.44-0.58
Apache	4	-	-
Cochise	5	-	-
Coconino	10	0.52	0.19-1.12
Gila	4	-	-
Graham	2	-	-
Greenlee	0	-	-
Maricopa	196	0.49	0.40-0.59
Mohave	15	1.01	0.46-1.91
Navajo	9	-	-
Pima	70	0.63	0.45-0.85
Pinal	10	0.48	0.18-1.03
Santa Cruz	2	-	-
Yavapai	8	-	-
Yuma	11	0.44	0.17-0.91
La Paz	0	-	-

Abdominal Wall defects include three-digit codes N02 & N04 (see Table 1);
- =Insufficient cases for rate and confidence interval calculations.

Table 10
Heart Defects - Rates by County 1986-1993, 1995-1996
Incidence Rates (Live Born Cases Per 1,000 Live Births)

COUNTY	CASES 1986-1993, 1995, 1996	RATE	99% CONFIDENCE INTERVAL
Arizona	984	1.45	1.33-1.57
Apache	18	1.08	0.54-1.93
Cochise	22	1.31	0.70-2.23
Coconino	27	1.41	0.81-2.28
Gila	15	2.27	1.04-4.27
Graham	5	-	-
Greenlee	2	-	-
Maricopa	586	1.46	1.31-1.63
Mohave	14	0.95	0.42-1.82
Navajo	38	2.03	1.28-3.04
Pima	164	1.47	1.19-1.79
Pinal	26	1.24	0.70-2.03
Santa Cruz	8	-	-
Yavapai	23	1.77	0.96-2.96
Yuma	35	1.40	0.86-2.13
La Paz	1	-	-

Heart defects include three-digit codes D01, D02, D03, D04, D51, D52 & D53 (see Table 1); - =Insufficient cases for rate and confidence interval calculations.

APPENDIX 1

Conditions Included in the Figures

A general listing of all conditions used to establish the rates shown in the figures in this report is shown below. Some specific inclusions and exclusions are not listed. ABDMP collects data on 140 conditions or variations of conditions. The conditions listed below include over 99% of all cases reported through ABDMP.

<u>BPA 3-Digit Code*</u>	<u>General Code Descriptor</u>
740 - 759	“Congenital Anomalies” Including but not limited to:
740	Anencephaly and similar anomalies
741	Spina Bifida
742	Other Anomalies of the Nervous System
743	Anomalies of the eye
744	Anomalies of the ear, face, and neck
745	Certain anomalies of the heart
746	Other anomalies of the heart
747	Anomalies of the circulatory system
748	Anomalies of the respiratory system
749	Cleft palate and cleft lip
750	Other anomalies of the upper alimentary tract
751	Anomalies of the digestive system
752	Anomalies of the genital organs
753	Anomalies of the urinary system
754	Certain musculoskeletal deformities
755	Other anomalies of limbs
756	Other musculoskeletal anomalies
757	Congenital anomalies of the integument
758	Chromosomal anomalies
759	Other and unspecified anomalies
<u>ICD-9-CM Code**</u>	
658.80-658.83	Amniotic bands
760.71	Fetal alcohol syndrome

* British Pediatric Association Classification of Diseases

** International Classification of Disease - 9th Edition, Clinical Modification

APPENDIX 2
Conditions (Composite Categories) Shown in the Tables

A listing of the conditions analyzed in the Tables contained in this report is shown below.

The 44 conditions listed here can be described almost completely by codes created by the Centers for Disease Control's Metropolitan Atlanta Congenital Defects Program (MACDP). These codes are listed in the left below, with exceptions noted. On the right below are the corresponding British Pediatric Association (BPA) Classification of Diseases codes.

In the Tables, a case is listed only once in each MACDP code category, even when it has more than one diagnosis within the category.

MACDP	Condition	BPA Code		
<u>CENTRAL NERVOUS SYSTEM</u>				
A01	Anencephaly	740.00	740.02	740.03
		740.08	740.10	740.20
		740.21	740.29	
A02	Spina Bifida with Hydrocephaly	741.00	741.01	741.02
		741.03	741.04	741.05
		741.06	741.07	741.08
		741.09	741.085	741.086
		741.087		
A03	Spina Bifida without Hydrocephaly	741.90	741.91	741.92
		741.93	741.94	741.98
		741.985	741.99	
A13	Encephalocele	742.00	742.08	742.09
		742.085	742.086	
A15	Hydrocephaly	742.30	742.31	742.38
		742.39		
A16	Microcephaly	742.10		

EYE AND EAR

B03	Glaucoma	743.20	743.21	743.22
B04	Cataract	743.32	743.325	743.326
B51*	Anophthalmia	743.00		
B52*	Microphthalmia	743.10		
B54*	Ear anomaly with hearing loss	744.00	744.01	744.02
		744.03	744.09	744.21

CARDIAC

D01	Truncus Arteriosus	745.00	745.01	
D02	Transposition of great vessels	745.10	745.11	745.12
		745.18	745.19	
D03	Tetralogy of Fallot	745.20	745.21	746.84
D04	Single ventricle	745.30		
D51*	Aortic stenosis	746.30	746.31	
D52*	Hypoplastic left heart	746.70		
D53*	Total anomalous pulmonary venous	747.42		

RESPIRATORY

E01	Choanal atresia	748.00		
E06	Agenesis of lung	748.50	748.51	

OROFACIAL - GASTRO-INTESTINAL

F01	Cleft palate	749.00	749.01	749.02
		749.03	749.04	749.05
		749.06	749.07	749.09
F02	Cleft lip with or without cleft palate	749.10	749.11	749.12
		749.19	749.20	749.21
		749.22	749.29	
F08	Pyloric Stenosis	750.51		

F09	Tracheo-esophageal fistula /stenosis	750.30	750.31	750.32
		750.325	750.33	
F14	Stenosis or atresia of duodenum	751.10		
F15	Other stenosis/atresia of small intestine	751.11	751.12	751.19
F16	Stenosis or atresia of rectum or anus	751.21	751.22	751.23
		751.24		
F17	Hirschsprung's Disease	751.30	751.31	751.32
		751.33		
F18	Malrotation of intestine	751.40	751.41	751.42
		751.49	751.495	
F21	Biliary atresia	751.65		
<u>GENITO-URINARY</u>				
H01	Renal agenesis	753.00	753.01	
H06	Obstruction of kidney or ureter	753.20	753.21	753.22
		753.29	753.40	753.42
H09	Bladder or urethra obstruction	753.600	753.61	753.62
		753.63		
<u>MUSCULOSKELETAL</u>				
J03	Dislocation of hip	754.30		
J51*	Complete absence of upper/lower limb	755.20	755.30	755.40
J52*	Phocomelia of Limb	755.21	755.31	755.41
K05	Amniotic bands	658.80		
N01	Diaphragmatic hernia	756.61	756.615	756.616
		756.617		
N02	Omphalocele	756.70		
N04	Gastroschisis	756.71		

SYNDROMES

R01	Down Syndrome (Trisomy 21)	758.00	758.01	758.02
		758.03	758.04	758.09
R02	Patau Syndrome (Trisomy 13)	758.10	758.11	758.12
		758.13	758.19	
R03	Edwards Syndrome (Trisomy 18)	758.20	758.21	758.22
		758.23	758.29	758.295
S02	Fetal Alcohol Syndrome	760.71	760.718	

* Codes created by California BDMP

APPENDIX 3

PRECISION (of diagnosis)

Code

- 1 Not stated (For Mental Retardation and Cerebral Palsy Diagnoses ONLY - Form 03)
- 2 Probably not a birth defect (“Ruled out” included in this category), “NO”
- 3 “vs” (versus) or “or”
- 4 “Rule out” included in diagnosis (i.e., rule out anencephaly), “Doubtful,” “Equivocal”, “Questionable,” “R/O”
- 5 “Suggestive of”
- 6 “Suspected,” “suspicious”
- 7 “Possible,” “may have,” “could be,” “felt to be,” “Perhaps,” “consider”
- 8 “Consistent with,” “most likely”
- 9 "Compatible with,” “like,” “appears”
- 10 “Probable,” “presume”
- 11 -----
- 12 Precise diagnosis, “characteristic of”
- 13 Precise diagnosis with congestive heart failure or medicated with Digoxin, Drisdol, Chlorothiazide, Lasix, Lanoxin, Aldactone or diuretics (only for VSD, PDA, ASD, or Patent Foramen Ovale)

APPENDIX 4

Abbreviations

ABDMP	- Arizona Birth Defects Monitoring Program
ADHS	- Arizona Department of Health Services
BPA	- British Pediatric Association
CBDMP	- California Birth Defects Monitoring Program
CDC	- Centers for Disease Control and Prevention
CRS	- Children's Rehabilitative Services (ADHS)
ICD	- International Classification of Disease
MACDP	- Metropolitan Atlanta Congenital Defects Program

APPENDIX 5

Exclusion List - ABDMP Non-reportable Birth Defects Cases

The following potential cases are not included in the ABDMP report for 1996:

- Duplicate abstracts and/or duplicated anomalies (cases with multiple abstracts; child seen at more than one facility), i.e., duplicate cases are merged and counted once.
- “Possibles” abstracted for review and consideration and subsequently determined to have conditions or defects that were not reportable - referring to CDC and CBDMP list of “excludable conditions.”
- Babies born to mothers whose residence is out-of-state or out-of-country (i.e., nonresident cases).
- “Negatives,” that is, conditions that were ruled-out during case finding and medical record review.
- “No Match” cases: Birth Certificate was not on file and state of birth cannot be confirmed as Arizona.
- Cases among aborted fetuses less than 20 weeks gestation and weighing less than 500 grams. These cases were excluded because there is no reliable denominator that can be used to generate a birth defect rate.
- Prenatally diagnosed cases that have not resulted in a live birth or stillbirth are not included. The ABDMP is not currently visiting prenatal diagnostic centers to identify cases.
- Defects with a “precision of diagnosis” code 1-7 are excluded. Only those defects diagnosed at the higher levels of precision (8 or above) are included. Refer to Appendix 3 for list of Precision of Diagnosis codes.
- Cases only diagnosed outside of the hospital setting are not included in the ABDMP. At this time we do not ascertain cases from outpatient settings except for the Arizona Children’s Rehabilitative Services program.

APPENDIX 6

Definitions

Race and Ethnicity:

Arizona Birth, Death, and Fetal Death Certificates collect information on both race and ethnicity, allowing for the simultaneous classification/differentiation of persons classified as “Whites”, “Blacks”, “Native American”, and “Asian” as of Hispanic origin or non-Hispanic origin. The Hispanic category consists of mothers who answered ‘White’ to race and ‘Hispanic’ to the Hispanic origin question. In this report, the race and ethnic classification is as follows:

- White refers to White non-Hispanic
- Hispanic to White Hispanics
- Black include African Americans
- Native Americans are all Native American tribes, as well as Aleut and Eskimo
- Other include persons who are Asian, unclassified, or those whose vital certificate did not provide a response to race question.

Native Americans counts refer to all Native Americans living on and outside the reservations.

Since the Arizona Birth Defects Monitoring Program does not collect the race and ethnicity of the child nor its parents, race and ethnicity of the child and its parents are derived from the classification used by Vital Statistics, upon the merging of the ABDMP data records with the Birth, Death, and Fetal Death Certificates data.

APPENDIX 7

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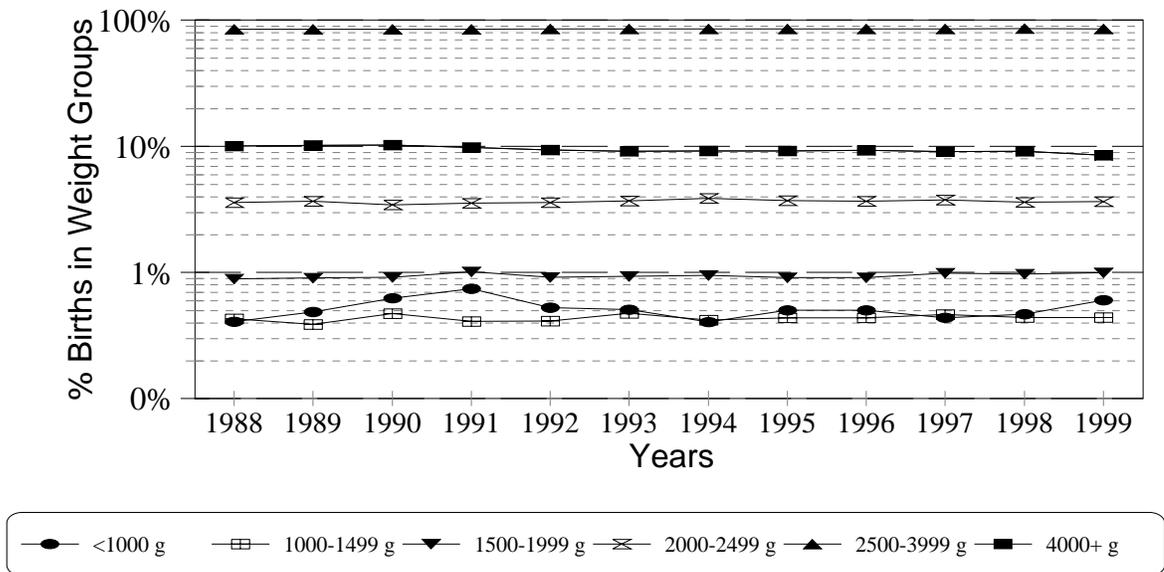
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APPENDIX 8

Birth Weight

The Arizona Birth Defects Monitoring Program monitors the distribution of birth weight. The data is obtainable from the birth certificate and may allow the detection of major shifts over time in the proportion of newborns with low birth weight.^{26,27}

Birth Weight of Arizona Singletons, 1988-1999 (Logarithmic Scale of Weight in Grams)



APPENDIX 9

Other Defects Collected by the ABDMP Incidence Rates Per 1,000 Live Births and Fetal Deaths, Arizona, 1996

<u>CODE</u>	<u>DEFECT GROUP</u>	<u>TOTAL</u>	<u>RATE</u>
A00 A17	CENTRAL NERVOUS SYSTEM Reduction Deformities of Brain	75	0.99
B00 B05 B06 B07	EYE AND EAR Coloboma of Iris Absence of Iris Other Anomalies of Iris	3 1 3	0.04 0.01 0.04
C00 C03	EAR, FACE, AND NECK Misplaced Ears	1	0.01
D00 D05 D06 D07 D08 D11 D12 D13 D18 D23 D26 D27 D28 D29 D33	CARDIAC Ventricular Septal Defect Ostium Secundum Type Atrial Septal Defect Endocardial Cushion Defect Cor Biloculare All Atrial Septal Defect Anomalies of Pulmonary Valve Tricuspid Atresia & Stenosis Congenital Mitral Stenosis Unspecified Anomalies of Heart Coarctation of Aorta Other Anomalies of Aorta Anomalies of Great Veins Eisenmenger's Syndrome Pulmonary Artery Atresia with Septal Defect	145 74 25 1 5 63 18 14 1 39 63 22 2 1	1.92 0.98 0.33 0.01 0.07 0.83 0.24 0.19 0.01 0.52 0.83 0.29 0.03 0.01
E00 E07	RESPIRATORY SYSTEM Agenesis or Aplasia of Lung	1	0.01
F00 F13	UPPER ALIMENTARY TRACT Persistent Omphalomesentric Duct	1	0.01
G00 G02 G03	GENITAL ORGANS Hypospadias Epispadias	198 1	2.62 0.01
H00 H08	URINARY BLADDER Exstrophy of the Urinary Bladder	1	0.01
K00 K01 K02 K03	ALL LIMB REDUCTIONS Absence/deformity of Upper Limb Absence/deformity of Lower Limb Reduction Defects, unspecified	26 16 1	0.34 0.21 0.01
L00 L03	Other Congenital Musculoskeletal Anomalies Anomalies of Spine	66	0.87
X00	MISCELLANEOUS DEFECTS	68	0.90

The data show that among the other defects collected by the ABDMP, the most frequent defects are hypospadias and ventricular septal defect.