

PREVALENCE OF SELECTED BIRTH DEFECTS FROM POPULATION-BASED BIRTH DEFECTS SURVEILLANCE PROGRAMS IN THE UNITED STATES, 2018-2022

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EXECUTIVE SUMMARY

Major structural birth defects collectively affect 3 to 5% of births in the United States and contribute substantially to mortality and morbidity.^{1,2} Since 2000, the National Birth Defects Prevention Network (NBDPN) has collected and published data for selected major birth defects affecting a range of systems including central nervous, eye, ear, cardiovascular, orofacial, gastrointestinal, genitourinary, and musculoskeletal systems, as well as chromosomal defects.³⁻⁷ Here we present updated prevalence estimates for major birth defects in the United States based upon data collected by NBDPN.

In 2025, 39 US-based birth defects surveillance programs submitted data to NBDPN for birth defects among deliveries from 2018 through 2022. Because variations in surveillance methodologies can significantly impact prevalence estimates,⁸ the following analyses were limited to data reported from 11 birth defects programs that ascertained all pregnancy outcomes and conducted medical record abstractions. One additional program met these criteria but was not included due to low prevalence across defects compared to other programs suggesting systematic under ascertainment.

Infants with multiple birth defects were included in each applicable birth defect category. Data were pooled across the 11 included programs for 33 defects. These 11 programs encompassed 4,231,701 live births from 2018 to 2022, accounting for 23% of all US births during those years.

In this document, prevalence estimates are presented by year, maternal race/ethnicity, and maternal age for each defect. Estimates are presented both in figures and in table format, organized by body system, including central nervous (anencephaly, encephalocele, spina bifida without anencephaly), eye (anophthalmia/microphthalmia), cardiovascular (atrioventricular septal defect, coarctation of the aorta, common truncus, double outlet right ventricle, Ebstein anomaly, hypoplastic left heart syndrome, interrupted aortic arch, pulmonary valve atresia and stenosis, pulmonary valve atresia, single ventricle, Tetralogy of Fallot, total anomalous pulmonary venous connection, transposition of the great arteries, dextro-transposition of the great arteries, tricuspid valve atresia and stenosis, tricuspid valve atresia), gastrointestinal (esophageal atresia/ tracheoesophageal fistula, rectal and large intestinal atresia and stenosis), musculoskeletal (clubfoot, diaphragmatic hernia, gastroschisis, limb deficiencies, omphalocele), orofacial (cleft lip with cleft palate, cleft lip alone, cleft palate alone), and chromosomal defects (trisomies 13, 18, 21). Although data are presented by year and maternal characteristics, in this document we do not present any significance testing to identify statistical differences.

KEY FINDINGS

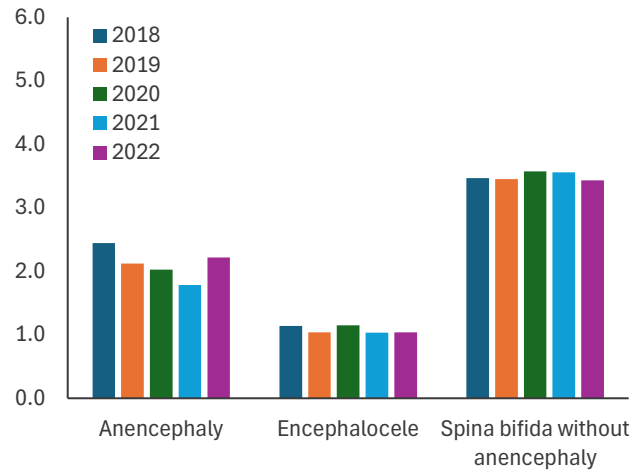
- Among the 33 included defects, those with the highest prevalence were clubfoot, Trisomy 21 (Down syndrome), and pulmonary valve atresia and stenosis.
- Prevalence was stable over the 5-year period for most defects. For pulmonary valve atresia and stenosis the highest prevalence was in 2022 and for gastroschisis and Trisomy 21 the lowest prevalence was in 2022.
- For 20 of the 33 included defects, births to non-Hispanic American Indian/Alaska Native mothers had the highest prevalence, including all musculoskeletal and gastrointestinal defects.
- In contrast, births to non-Hispanic Asian/Pacific Islander mothers had the lowest prevalence for 20 defects, notably all central nervous system defects, 13 of 16 cardiovascular system defects, and 4 of 5 musculoskeletal defects.
- Mothers ≥ 40 years of age had the highest prevalence for almost all defects, with the most notable increased risk among chromosomal defects.
- For three defects (anencephaly, encephalocele, and gastroschisis), the highest prevalence was among mothers aged < 20 years. Births among the youngest mothers also had relatively high prevalence of other musculoskeletal defects (clubfoot and limb deficiencies).

BIRTH DEFECTS PREVALENCE ESTIMATES (PER 10,000 LIVE BIRTHS) UNITED STATES, 2018-2022

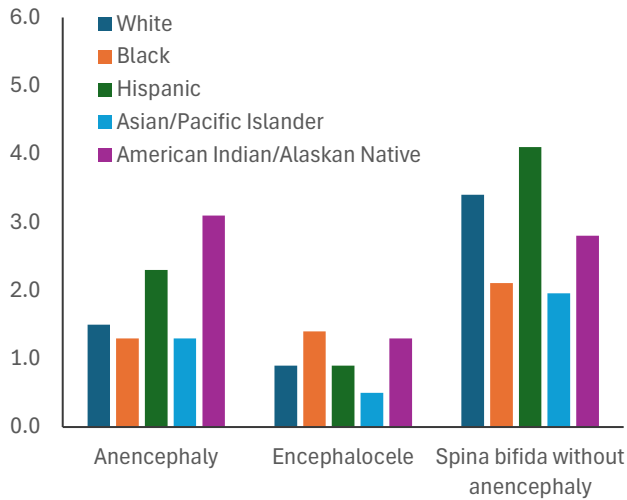
CLUBFOOT	17.6
TRISOMY 21	16.1
PULMONARY VALVE ATRESIA AND STENOSIS	11.3
CLEFT LIP WITH CLEFT PALATE	6.5
CLEFT PALATE ALONE	6.4
ATRIOVENTRICULAR SEPTAL DEFECT	6.3
COARCTATION OF THE AORTA	5.8
LIMB DEFICIENCIES (REDUCTION DEFECTS)	5.4
TETRALOGY OF FALLOT	4.9
RECTAL AND LARGE INTESTINAL ATRESIA/STENOSIS	4.8
GASTROSCHISIS	3.9
SPINA BIFIDA WITHOUT ANENCEPHALY	3.5
CLEFT LIP ALONE	3.5
DIAPHRAGMATIC HERNIA	3.3
TRISOMY 18	3.2
TRANSPOSITION OF THE GREAT ARTERIES	3.1
OMPHALOCELE	2.7
HYPOPLASTIC LEFT HEART SYNDROME	2.6
DOUBLE OUTLET RIGHT VENTRICLE	2.6
DEXTRO-TRANSPOSITION OF THE GREAT ARTERIES	2.6
ESOPHAGEAL ATRESIA/TRACHEOESOPHAGEAL FISTULA	2.4
ANOPHTHALMIA/MICROPHthalmIA	2.1
ANENCEPHALY	2.1
TRICUSPID VALVE ATRESIA AND STENOSIS	1.8
TRISOMY 13	1.5
TOTAL ANOMALOUS PULMONARY VENOUS CONNECTION	1.5
PULMONARY VALVE ATRESIA	1.2
INTERRUPTED AORTIC ARCH	1.13
ENCEPHALOCELE	1.1
TRICUSPID VALVE ATRESIA	0.8
EBSTEIN ANOMALY	0.8
SINGLE VENTRICLE	0.7
COMMON TRUNCUS	0.7

CENTRAL NERVOUS SYSTEM DEFECTS

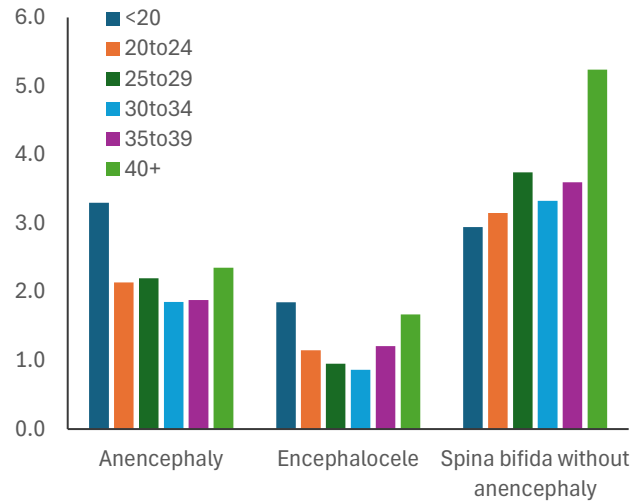
Among central nervous system defects, spina bifida without anencephaly had the highest prevalence at 3.5 cases per 10,000 live births. Prevalence was stable over the five-year period for encephalocele and spina bifida, but there were fluctuations in the prevalence of anencephaly, most notably in 2021. Births to Asian/Pacific Islanders had the lowest prevalence of these defects compared to births of other racial/ethnic groups. The prevalence of anencephaly and encephalocele were highest among mothers aged <20, while spina bifida prevalence was highest among births to mothers aged ≥40.



PREVALENCE OF CENTRAL NERVOUS SYSTEM DEFECTS BY YEAR, 2018-2022



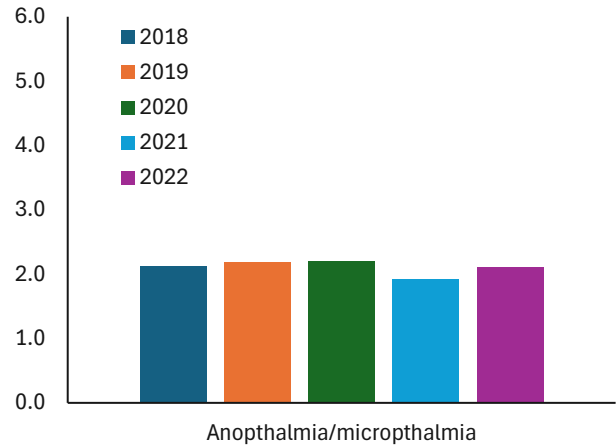
PREVALENCE OF CENTRAL NERVOUS SYSTEM DEFECTS BY RACE/ETHNICITY



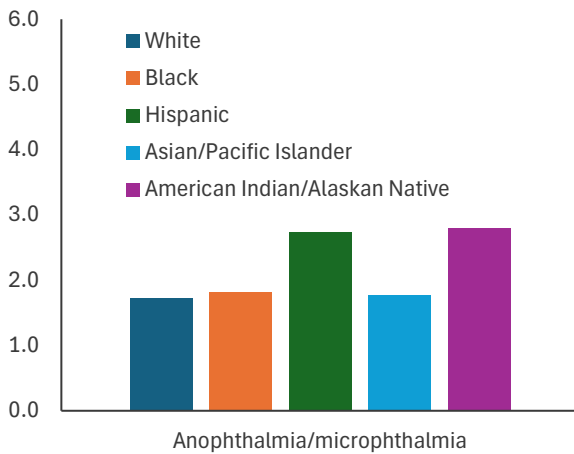
PREVALENCE OF CENTRAL NERVOUS SYSTEM DEFECTS BY MATERNAL AGE

EYE DEFECTS

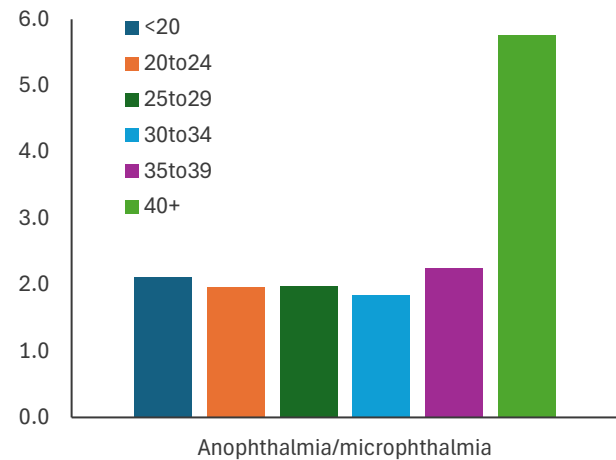
The only eye defect included in these analyses was anophthalmia/microphthalmia, with prevalence of 2.1 cases per 10,000 live births. The prevalence of this defect was stable over the five-year period. Births to Hispanic and American Indian/Alaskan native mothers had the highest prevalence. The prevalence of anophthalmia/microphthalmia was highest among mothers aged ≥ 40 compared to younger age groups.



**PREVALENCE OF ANOPHTHALMIA/
MICROPTHALMIA BY YEAR, 2018-2022**



**PREVALENCE OF ANOPHTHALMIA/
MICROPTHALMIA BY RACE/ETHNICITY**



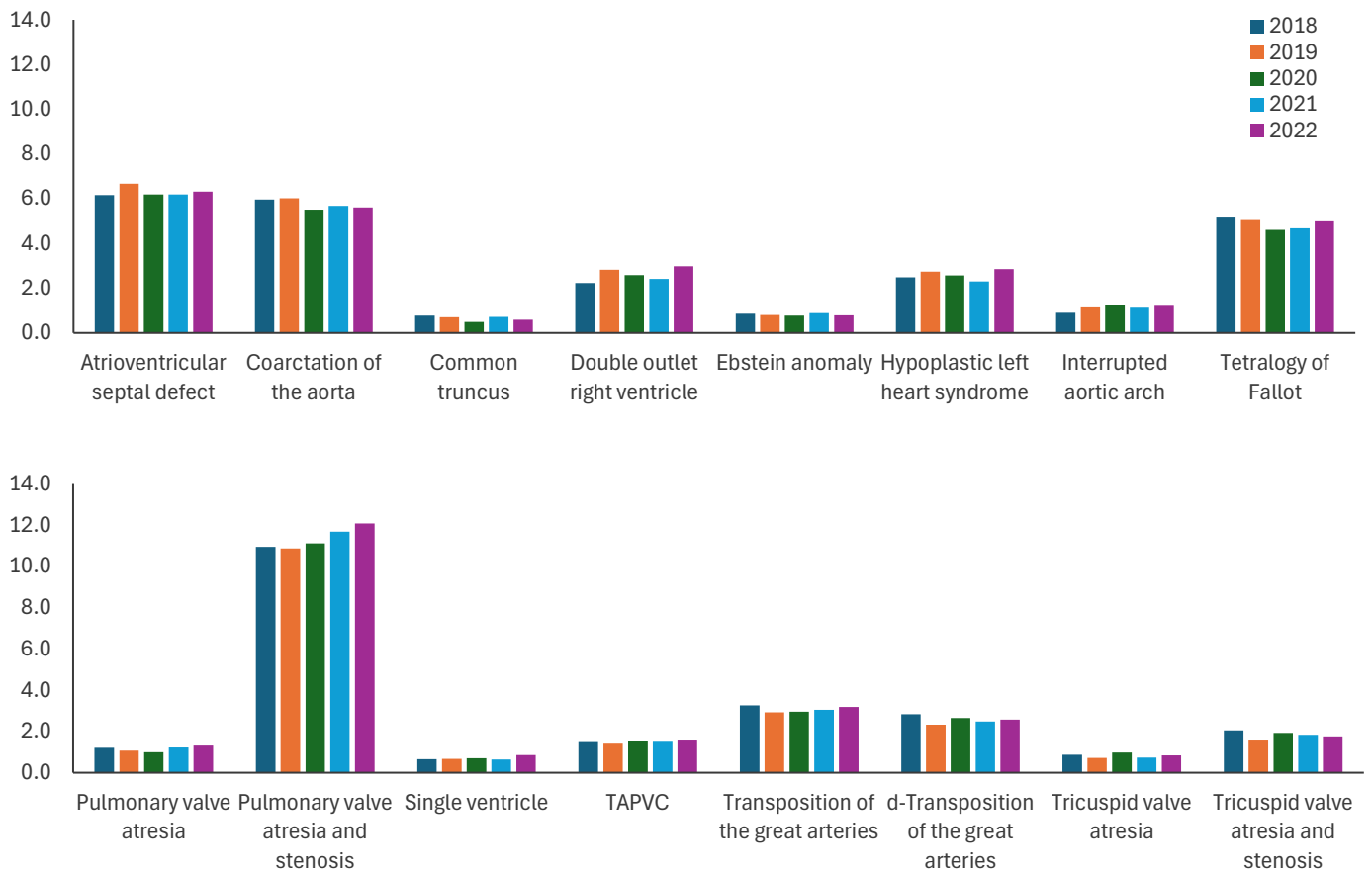
**PREVALENCE OF ANOPHTHALMIA/
MICROPTHALMIA BY MATERNAL AGE**

CARDIOVASCULAR SYSTEM DEFECTS

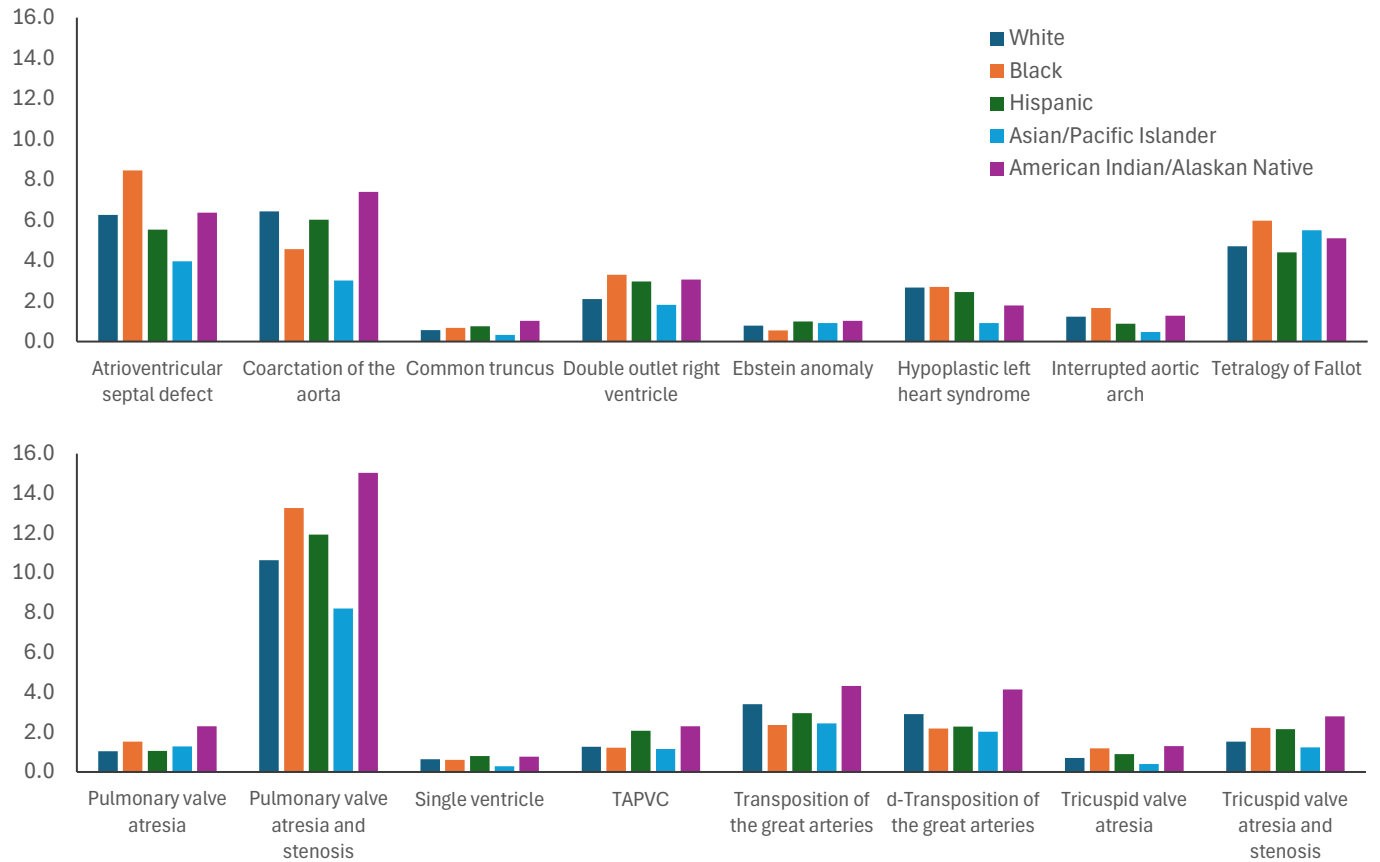
Among cardiovascular system defects, pulmonary valve atresia and stenosis had the highest prevalence at 11.3 cases per 10,000 live births. Prevalence was stable over the five-year period for most of these defects. There was a trend of increasing prevalence for pulmonary valve atresia and stenosis.

For 13 of the 16 cardiovascular defects, prevalence was lowest among births to Asian/Pacific Islanders. The highest prevalence rates for all these defects were among births to American Indian/Alaskan native or Black mothers. The prevalence of all cardiovascular defects was highest among mothers aged ≥ 40 .

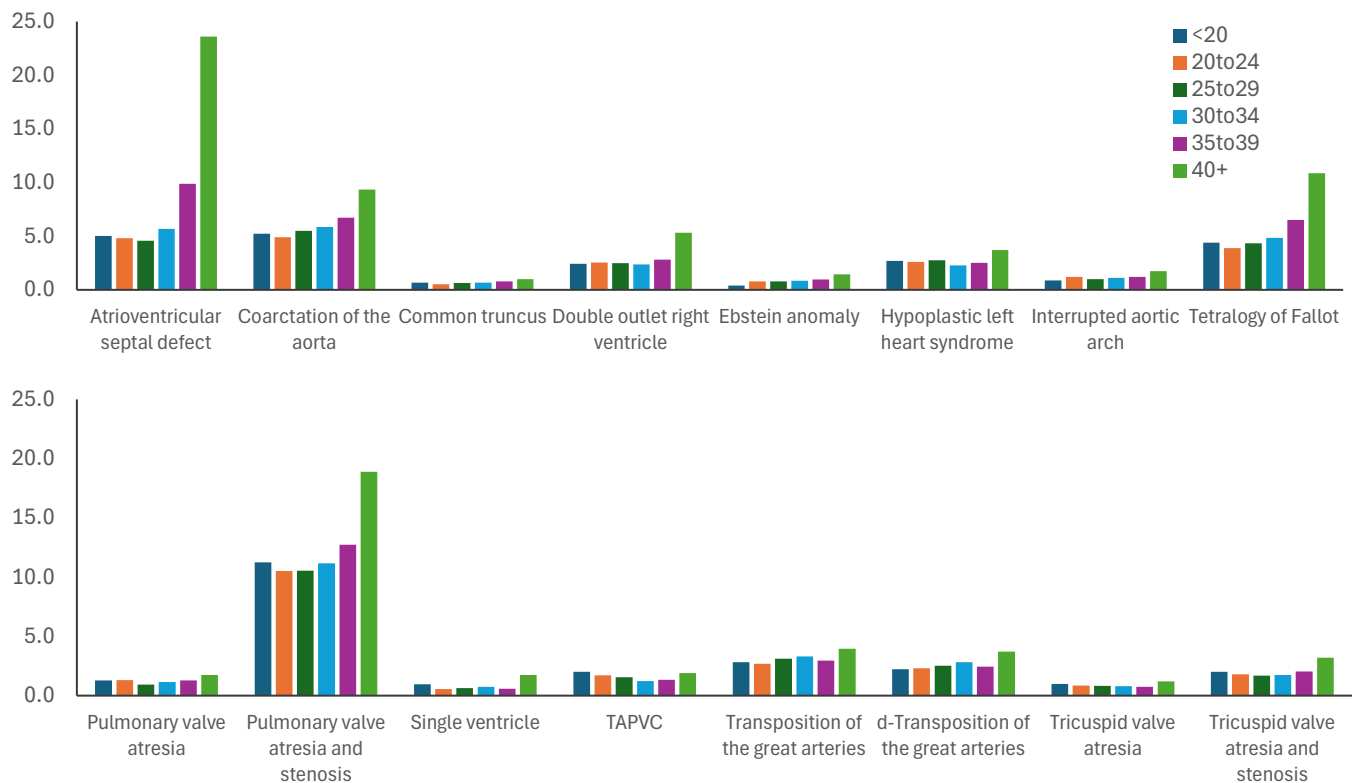
PREVALENCE OF CARDIOVASCULAR SYSTEM DEFECTS BY YEAR, 2018-2022



PREVALENCE OF CARDIOVASCULAR SYSTEM DEFECTS BY RACE/ETHNICITY

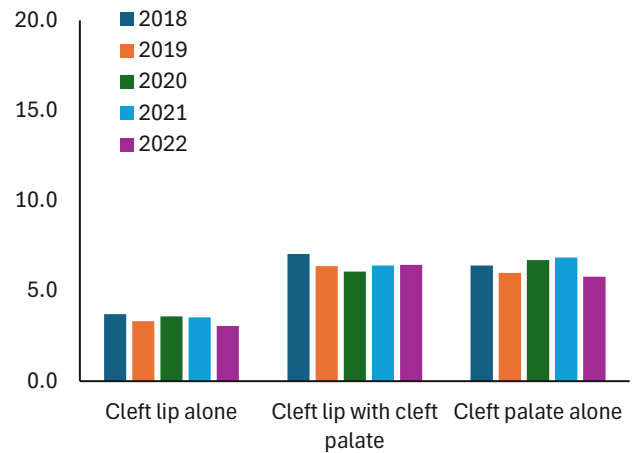


PREVALENCE OF CARDIOVASCULAR SYSTEM DEFECTS BY MATERNAL AGE GROUPS

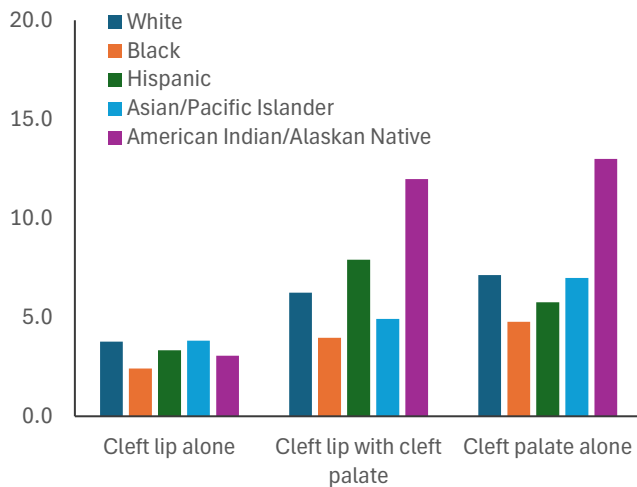


OROFACIAL CLEFTS

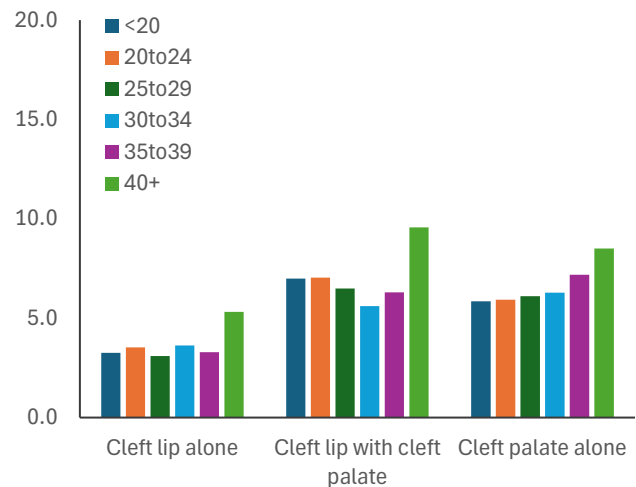
Among orofacial clefts, cleft lip with cleft palate had the highest prevalence at 6.5 cases per 10,000 live births. Prevalence was stable over the five-year period for these defects. Births to Black mothers had the lowest prevalence of these defects. The prevalence of cleft lip with cleft palate and cleft palate alone were highest among American Indian/Alaskan natives. For all three, the prevalence was highest among births to mothers aged ≥ 40 .



PREVALENCE OF OROFACIAL CLEFTS BY YEAR, 2018-2022



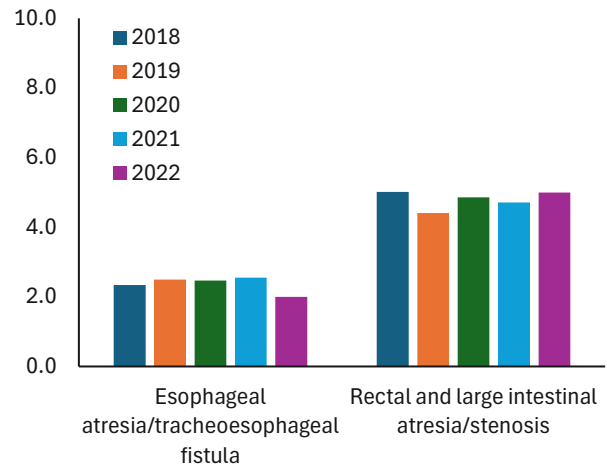
PREVALENCE OF OROFACIAL CLEFTS BY RACE/ETHNICITY



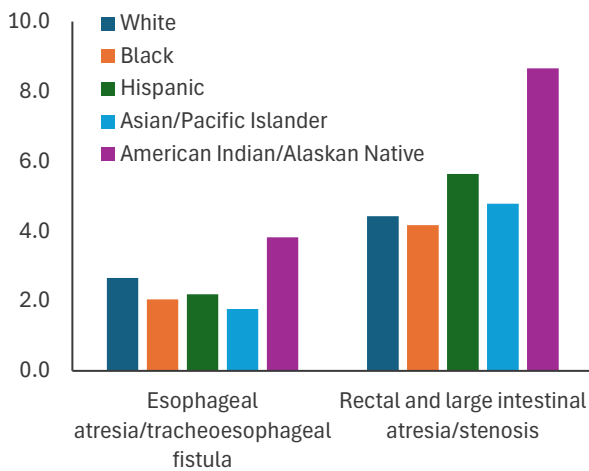
PREVALENCE OF OROFACIAL CLEFTS BY MATERNAL AGE

GASTROINTESTINAL DEFECTS

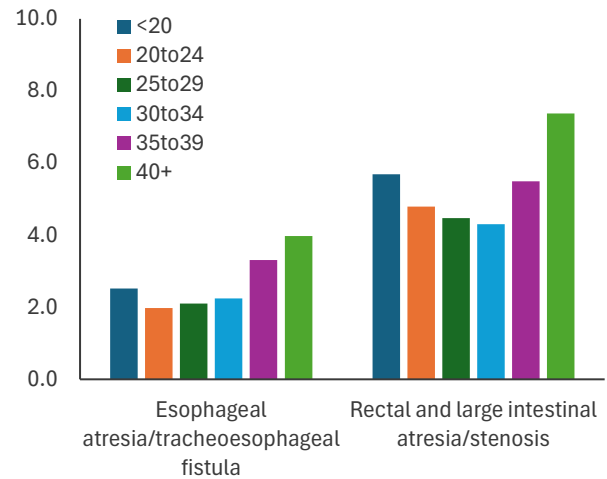
The prevalence of rectal and large intestinal atresia or stenosis and of esophageal atresia or tracheoesophageal fistula were 4.8 and 2.4 cases per 10,000 live births, respectively. Prevalence was stable over the five-year period for both defects. The prevalence was highest among births to American Indian/Alaskan native mothers, those among Black and Asian/Pacific Islander mothers had the lowest prevalence. For both gastrointestinal defects, the prevalence was highest among births to mothers aged ≥ 40 but was also high among mothers aged < 20 years.



PREVALENCE OF GASTROINTESTINAL SYSTEM DEFECTS BY YEAR, 2018-2022



PREVALENCE OF GASTROINTESTINAL SYSTEM DEFECTS BY RACE/ETHNICITY

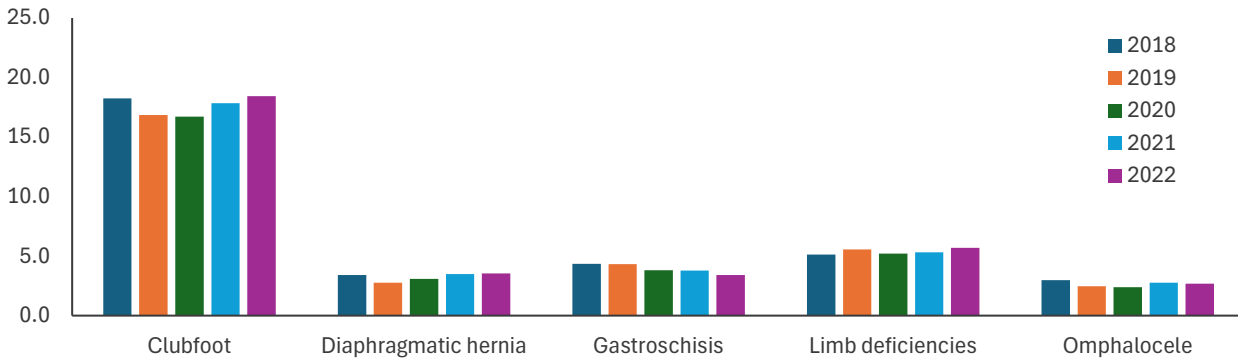


PREVALENCE OF GASTROINTESTINAL SYSTEM DEFECTS BY MATERNAL AGE

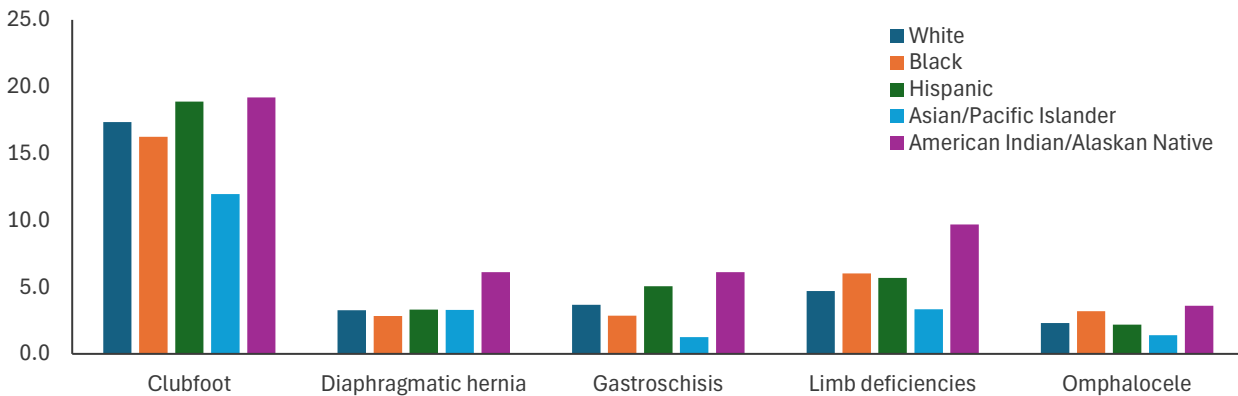
MUSCULOSKELETAL DEFECTS

Among musculoskeletal defects, clubfoot had the highest prevalence at 17.6 cases per 10,000 live births. Prevalence was stable over the five-year period for most of these defects, though the prevalence of gastroschisis decreased over the 5-year period. Births to American Indian/Alaskan native mothers had the highest prevalence for all five of these defects, while Asian/Pacific Islanders had the lowest prevalence for all but diaphragmatic hernia. The prevalence of gastroschisis was highest among mothers aged <20 years but for all the other defects in this group prevalence was highest among mothers aged ≥40 .

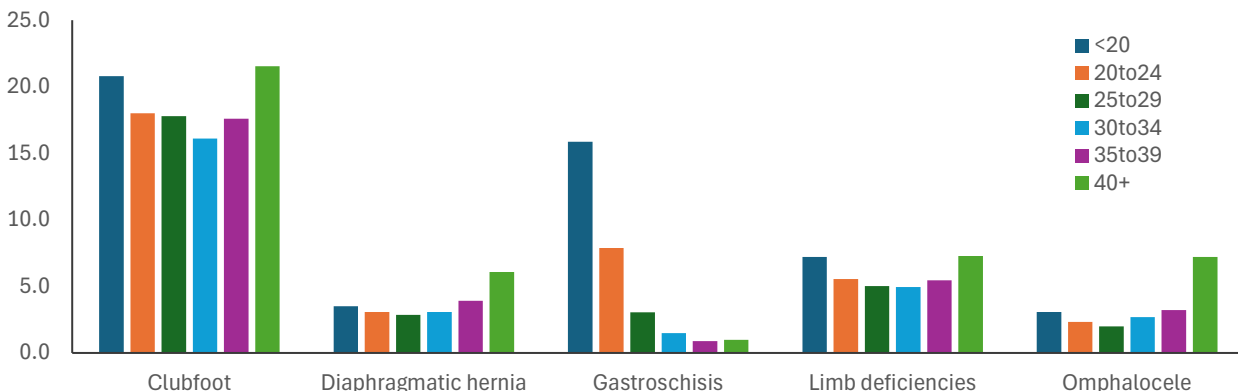
PREVALENCE OF MUSCULOSKELETAL DEFECTS BY YEAR, 2018-2022



PREVALENCE OF MUSCULOSKELETAL DEFECTS BY RACE/ETHNICITY

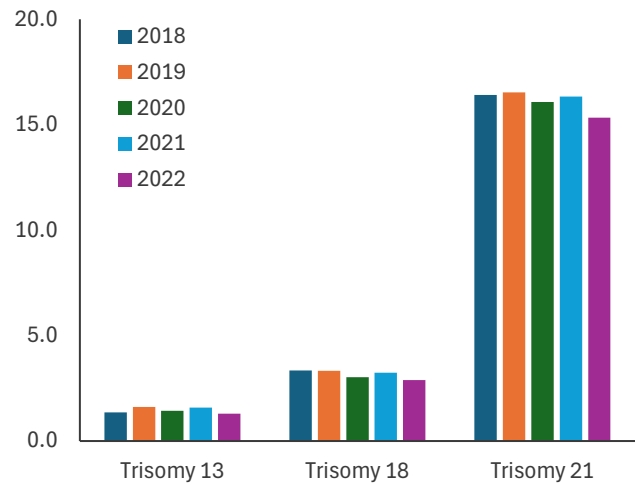


PREVALENCE OF MUSCULOSKELETAL DEFECTS BY MATERNAL AGE

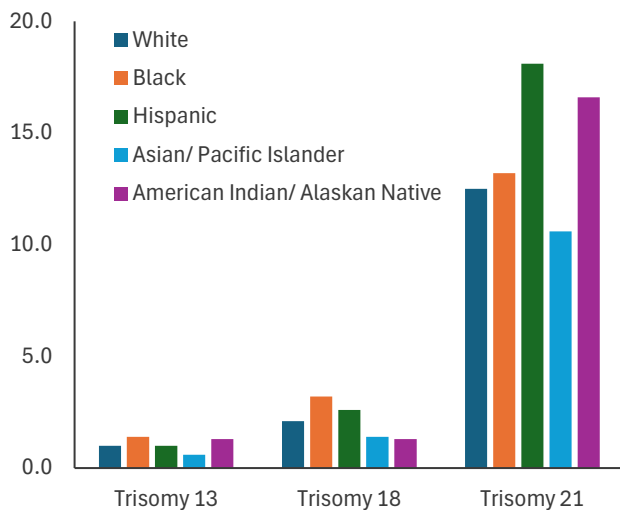


CHROMOSOMAL DEFECTS

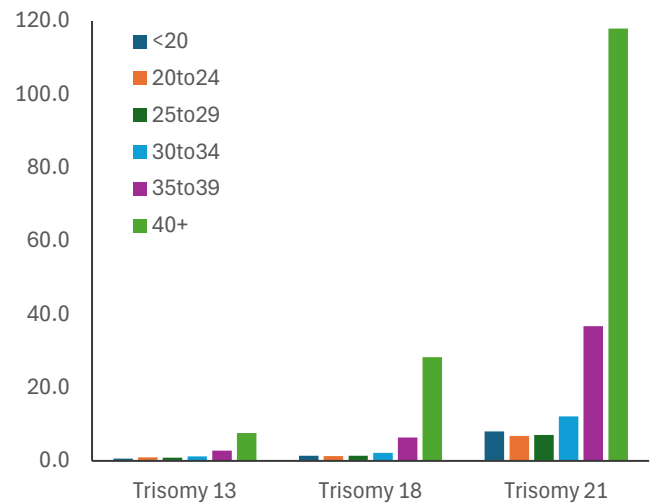
Among chromosomal defects, Trisomy 21 (Down syndrome) had the highest prevalence at 16.1 per 10,000 live births. The prevalence of Trisomies 13 and 18 were fairly stable over the five-year period. Trisomy 21 prevalence decreased over time. The prevalence of Trisomies 13 and 18 were highest among births to Black mothers. The prevalence of Trisomy 21 was highest among births to Hispanic and American Indian/Alaskan native mothers. Prevalence increased with increasing age for all three defects, with particularly for Trisomy 21.



PREVALENCE OF CHROMOSOMAL DEFECTS BY YEAR, 2018-2022



PREVALENCE OF CHROMOSOMAL DEFECTS BY RACE/ETHNICITY



PREVALENCE OF CHROMOSOMAL DEFECTS BY MATERNAL AGE

BIRTH DEFECTS PREVALENCE ESTIMATES (PER 10,000 LIVE BIRTHS) AND ESTIMATED U.S. ANNUAL CASES, 2018-2022

Birth defect	Prevalence (95% CI)	Cases per live births	Estimated U.S. annual cases (95% CI)
Central nervous system			
Anencephaly	2.1 (2.0-2.3)	1 in 4,762	776 (739-850)
Encephalocele	1.1 (1.0-1.2)	1 in 9,091	407 (370-444)
Spina bifida without anencephaly	3.5 (3.3-3.7)	1 in 2,857	1,294 (1,220-1,368)
Eye			
Anophthalmia/microphthalmia	2.1 (2.0-2.2)	1 in 4,762	776 (739-813)
Cardiovascular			
Atrioventricular septal defect	6.3 (6.1-6.6)	1 in 1,587	2,329 (2,255-2,440)
Coarctation of the aorta	5.8 (5.5-6)	1 in 1,724	2,144 (2,033-2,218)
Common truncus	0.7 (0.6-0.7)	1 in 14,286	259 (222-259)
Double outlet right ventricle	2.6 (2.5-2.8)	1 in 3,846	961 (924-1035)
Ebstein anomaly	0.8 (0.7-0.9)	1 in 12,500	296 (259-333)
Hypoplastic left heart syndrome	2.6 (2.4-2.7)	1 in 3,846	961 (887-998)
Interrupted aortic arch	1.1 (1.0-1.2)	1 in 9,091	407 (370-444)
Pulmonary valve atresia and stenosis	11.3 (11.0-11.7)	1 in 885	4,178 (4,067-4,325)
Pulmonary valve atresia	1.2 (1.1-1.3)	1 in 8,333	444 (407-481)
Single ventricle	0.7 (0.6-0.8)	1 in 14,286	259 (222-296)
Tetralogy of Fallot	4.9 (4.7-5.1)	1 in 2,041	1,812 (1,738-1,885)
Total anomalous pulmonary venous connection	1.5 (1.4-1.6)	1 in 6,667	555 (518-592)
Transposition of the great arteries	3.1 (2.9-3.2)	1 in 3,226	1,146 (1,072-1,183)
Dextro-transposition of the great arteries	2.6 (2.4-2.7)	1 in 3,846	961 (887-998)
Tricuspid valve atresia and stenosis	1.8 (1.7-2.0)	1 in 5,556	665 (628-739)
Tricuspid valve atresia	0.8 (0.7-0.9)	1 in 12,500	296 (259-333)
Orofacial			
Cleft lip with cleft palate	6.5 (6.2-6.7)	1 in 1,538	2,403 (2,292-2,477)
Cleft lip alone	3.4 (3.3-3.6)	1 in 2,941	1,257 (1,220-1,331)
Cleft palate alone	6.4 (6.1-6.6)	1 in 1,563	2,366 (2,255-2,440)
Gastrointestinal			
Esophageal atresia/tracheoesophageal fistula	2.4 (2.2-2.5)	1 in 4,167	887 (813-924)
Rectal and large intestinal atresia/stenosis	4.8 (4.6-5.0)	1 in 2,083	1,775 (1,701-1,848)
Musculoskeletal			
Clubfoot	17.6 (17.2-18.1)	1 in 568	6,507 (6,359-6,692)
Diaphragmatic hernia	3.3 (3.1-3.4)	1 in 3,030	1,220 (1,146-1,257)
Gastroschisis	3.9 (3.8-4.1)	1 in 2,564	1,442 (1,405-1,516)
Limb deficiencies (reduction defects)	5.4 (5.2-5.6)	1 in 1,852	1,996 (1,922-2,070)
Omphalocele	2.7 (2.5-2.8)	1 in 3,704	998 (924-1,035)
Chromosomal			
Trisomy 13	1.5 (1.3-1.6)	1 in 6,667	555 (481-592)
Trisomy 18	3.2 (3.0-3.3)	1 in 3,125	1,183 (1,109-1,220)
Trisomy 21	16.1 (15.8-16.5)	1 in 621	5,952 (5,841-6,100)

Program inclusion criteria: Collect all outcomes of pregnancy and perform medical record abstractions

Abbreviation: CI, confidence interval calculated using exact Poisson methodology

Prevalence: (Pooled case counts/Pooled live births)*10,000

Case per live births: 1 case in 10,000/prevalence

Estimated annual cases: Calculated by prevalence*average US live births 2018-2022 from National Center for Health Statistics (3,695,989 live births)⁹

Birth defect surveillance programs included: Arkansas, Delaware, Iowa, Massachusetts, metro Atlanta (3 counties), North Carolina, Oklahoma, Puerto Rico, South Carolina, Texas, Utah

BIRTH DEFECTS PREVALENCE ESTIMATES (PER 10,000 LIVE BIRTHS) BY YEAR

Birth defect	Year				
	2018	2019	2020	2021	2022
Central nervous system					
Anencephaly	2.4	2.1	2.0	1.8	2.2
Encephalocele	1.1	1.0	1.2	1.0	1.0
Spina bifida without anencephaly	3.5	3.5	3.6	3.6	3.4
Eye					
Anophthalmia/microphthalmia	2.1	2.2	2.2	1.9	2.1
Cardiovascular					
Atrioventricular septal defect	6.2	6.7	6.2	6.2	6.3
Coarctation of the aorta	6.0	6.0	5.5	5.7	5.6
Common truncus	0.8	0.7	0.5	0.7	0.6
Double outlet right ventricle	2.2	2.8	2.6	2.4	3.0
Ebstein anomaly	0.9	0.8	0.8	0.9	0.8
Hypoplastic left heart syndrome	2.5	2.7	2.6	2.3	2.9
Interrupted aortic arch	0.9	1.1	1.3	1.1	1.2
Pulmonary valve atresia and stenosis	11.0	10.9	11.1	11.7	12.1
Pulmonary valve atresia	1.2	1.1	1.0	1.2	1.3
Single ventricle	0.7	0.7	0.7	0.6	0.9
Tetralogy of Fallot	5.2	5.0	4.6	4.7	5.0
Total anomalous pulmonary venous connection	1.5	1.4	1.6	1.5	1.6
Transposition of the great arteries	3.3	2.9	3.0	3.0	3.2
Dextro-transposition of the great arteries	2.8	2.3	2.6	2.5	2.6
Tricuspid valve atresia and stenosis	2.1	1.6	1.9	1.8	1.8
Tricuspid valve atresia	0.9	0.7	1.0	0.7	0.8
Orofacial					
Cleft lip with cleft palate	7.1	6.4	6.1	6.4	6.4
Cleft lip alone	3.7	3.3	3.6	3.5	3.1
Cleft palate alone	6.4	6.0	6.7	6.9	5.8
Gastrointestinal					
Esophageal atresia/tracheoesophageal fistula	2.3	2.5	2.5	2.5	2.0
Rectal and large intestinal atresia/stenosis	5.0	4.4	4.9	4.7	5.0
Musculoskeletal					
Clubfoot	18.3	16.9	16.7	17.9	18.4
Diaphragmatic hernia	3.4	2.8	3.1	3.5	3.5
Gastroschisis	4.4	4.3	3.8	3.8	3.4
Limb deficiencies (reduction defects)	5.1	5.6	5.2	5.3	5.7
Omphalocele	3.0	2.5	2.4	2.8	2.7
Chromosomal					
Trisomy 13	1.4	1.6	1.4	1.6	1.3
Trisomy 18	3.3	3.3	3.0	3.2	2.9
Trisomy 21	16.4	16.5	16.1	16.3	15.3

Program inclusion criteria: Collect all outcomes of pregnancy and perform medical record abstractions

Abbreviation: CI, confidence interval calculated using exact Poisson methodology

Birth defect surveillance programs included: Arkansas, Delaware, Iowa, Massachusetts, metro Atlanta (3 counties), North Carolina, Oklahoma, Puerto Rico, South Carolina, Texas, Utah

BIRTH DEFECTS PREVALENCE ESTIMATES (PER 10,000 LIVE BIRTHS) BY MATERNAL RACE/ETHNICITY

Birth defect	Maternal Race/Ethnicity				
	White	Black	Hispanic	Asian/Pacific Islander	American Indian/ Alaska Native
Central nervous system					
Anencephaly	1.5	1.3	2.3	1.3	3.1
Encephalocele	0.9	1.4	0.9	0.5	1.3
Spina bifida without anencephaly	3.4	2.1	4.1	2.0	2.8
Eye					
Anophthalmia/microphthalmia	1.7	1.8	2.7	1.8	2.8
Cardiovascular					
Atrioventricular septal defect	6.3	8.5	5.5	4.0	6.4
Coarctation of the aorta	6.4	4.6	6.0	3.0	7.4
Common truncus	0.6	0.7	0.8	0.3	1.0
Double outlet right ventricle	2.1	3.3	3.0	1.8	3.1
Ebstein anomaly	0.8	0.5	1.0	0.9	1.0
Hypoplastic left heart syndrome	2.7	2.7	2.5	0.9	1.8
Interrupted aortic arch	1.2	1.7	0.9	0.5	1.3
Pulmonary valve atresia and stenosis	10.6	13.3	11.9	8.2	15.0
Pulmonary valve atresia	1.0	1.5	1.1	1.3	2.3
Single ventricle	0.6	0.6	0.8	0.3	0.8
Tetralogy of Fallot	4.7	6.0	4.4	5.5	5.1
Total anomalous pulmonary venous connection	1.3	1.2	2.1	1.1	2.3
Transposition of the great arteries	3.4	2.4	3.0	2.4	4.3
Dextro-transposition of the great arteries	2.9	2.2	2.3	2.0	4.1
Tricuspid valve atresia and stenosis	1.5	2.2	2.2	1.2	2.8
Tricuspid valve atresia	0.7	1.2	0.9	0.4	1.3
Orofacial					
Cleft lip with cleft palate	6.2	4.0	7.9	4.9	12.0
Cleft lip alone	7.1	4.8	5.8	7.0	13.0
Cleft palate alone	3.8	2.4	3.3	3.8	3.1
Gastrointestinal					
Esophageal atresia/tracheoesophageal fistula	2.7	2.0	2.2	1.8	3.8
Rectal and large intestinal atresia/stenosis	4.4	4.2	5.6	4.8	8.7
Musculoskeletal					
Clubfoot	17.4	16.3	18.9	12.0	19.2
Diaphragmatic hernia	3.3	2.8	3.3	3.3	6.1
Gastroschisis	3.7	2.9	5.1	1.2	6.1
Limb deficiencies (reduction defects)	4.7	6.0	5.7	3.3	9.7
Omphalocele	2.3	3.2	2.2	1.4	3.6
Chromosomal					
Trisomy 13	1.0	1.4	1.0	0.6	1.3
Trisomy 18	2.1	3.2	2.6	1.4	1.3
Trisomy 21	12.5	13.2	18.1	10.6	16.6

Program inclusion criteria: Collect all outcomes of pregnancy and perform medical record abstractions

Birth defect surveillance programs included: Arkansas, Delaware, Iowa, Massachusetts, metro Atlanta (3 counties), North Carolina, Oklahoma, Puerto Rico, South Carolina, Texas, Utah

BIRTH DEFECTS PREVALENCE ESTIMATES (PER 10,000 LIVE BIRTHS) BY MATERNAL AGE

Birth defect	Maternal age group (in years)					
	<20	20-24	25-29	30-34	35-39	40+
Central nervous system						
Anencephaly	3.3	2.1	2.2	1.9	1.9	2.4
Encephalocele	1.8	1.2	1.0	0.9	1.2	1.7
Spina bifida without anencephaly	2.9	3.2	3.7	3.3	3.6	5.2
Eye						
Anophthalmia/microphthalmia	2.1	2.0	2.0	1.8	2.3	5.8
Cardiovascular						
Atrioventricular septal defect	5.0	4.8	4.6	5.7	9.9	23.6
Coarctation of the aorta	5.2	4.9	5.5	5.9	6.7	9.3
Common truncus	0.7	0.5	0.6	0.7	0.8	1.0
Double outlet right ventricle	2.4	2.5	2.5	2.4	2.8	5.3
Ebstein anomaly	0.4	0.8	0.8	0.9	1.0	1.5
Hypoplastic left heart syndrome	2.7	2.6	2.7	2.3	2.5	3.7
Interrupted aortic arch	0.9	1.2	1.0	1.1	1.2	1.7
Pulmonary valve atresia and stenosis	11.3	10.5	10.5	11.2	12.7	18.9
Pulmonary valve atresia	1.3	1.3	0.9	1.1	1.3	1.7
Single ventricle	1.0	0.6	0.6	0.7	0.6	1.7
Tetralogy of Fallot	4.4	3.9	4.3	4.9	6.5	10.9
Total anomalous pulmonary venous connection	2.0	1.7	1.6	1.2	1.3	1.9
Transposition of the great arteries	2.8	2.7	3.1	3.3	3.0	3.9
Dextro-transposition of the great arteries	2.2	2.3	2.5	2.8	2.4	3.7
Tricuspid valve atresia and stenosis	2.0	1.8	1.7	1.7	2.0	3.2
Tricuspid valve atresia	1.0	0.9	0.8	0.8	0.7	1.2
Orofacial						
Cleft lip with cleft palate	7.0	7.0	6.5	5.6	6.3	9.6
Cleft lip alone	3.3	3.5	3.1	3.6	3.3	5.3
Cleft palate alone	5.8	5.9	6.1	6.3	7.2	8.5
Gastrointestinal						
Esophageal atresia/tracheoesophageal fistula	2.5	2.0	2.1	2.2	3.3	4.0
Rectal and large intestinal atresia/stenosis	5.7	4.8	4.5	4.3	5.5	7.4
Musculoskeletal						
Clubfoot	20.8	18.0	17.8	16.1	17.6	21.5
Diaphragmatic hernia	3.5	3.1	2.9	3.1	3.9	6.1
Gastroschisis	15.9	7.9	3.1	1.5	0.9	1.0
Limb deficiencies (reduction defects)	7.2	5.6	5.0	4.9	5.4	7.3
Omphalocele	3.1	2.3	2.0	2.7	3.2	7.2
Chromosomal						
Trisomy 13	0.7	0.9	0.9	1.2	2.8	7.6
Trisomy 18	1.4	1.3	1.4	2.2	6.4	28.3
Trisomy 21	8.0	6.8	7.1	12.1	36.8	117.9

Program inclusion criteria: Collect all outcomes of pregnancy and perform medical record abstractions

Birth defect surveillance programs included: Arkansas, Delaware, Iowa, Massachusetts, metro Atlanta (3 counties), North Carolina, Oklahoma, Puerto Rico, South Carolina, Texas, Utah

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