Regional Differences

Table 5 shows the birth prevalence of selected birth defects in the regions of Texas covered by the registry in 1996 and 1997 (see Figure 12). We conducted birth defects surveillance activities in Region 11 during both 1996 and 1997; findings for the two years are shown in separate columns in the table. Other regions were covered by the registry during one year only.

Nine birth defects showed statistically significant differences in occurrence between regions. These are marked with an asterisk in the table and graphed in Figures 13 through 16.

Four of the birth defects with statistically significant variation between regions were heart defects, and for all four, Region 11 had higher rates. These defects were ventricular septal defect; atrial septal defect; pulmonary valve atresia or stenosis; and patent ductus arteriosus. The higher rates observed in Region 11 for these heart defects of lesser severity may result from differences between regions in the use of diagnostic tests and procedures, differences in reporting in medical records, or true higher rates in Region 11. Further analyses are underway to assess what may be contributing to these observations.

Other birth defects with statistically significant differences between regions were microphthalmia (the highest rate was in Region 8); pyloric stenosis (the highest rate was in Region 2); hypospadias or epispadias (the highest rate was in Region 3); obstructive genitourinary defect (the highest rate was in Region 3); and congenital hip dislocation (the highest rate was in Region 9).

Anencephaly, spina bifida, and encephalocele (the neural tube defects) did not show statistically significant variation between regions.

Data for Region 11 in 1996 shown in this report may differ from data shown in the special report "Birth Defects in the Lower Rio Grande Valley" (published December 1998). This is because registry records may be added, removed, or changed as additional information becomes available. Furthermore, for some birth defects, the group of BPA codes used to define the defect differs slightly in this report compared to previous reports. (See Appendix B for the BPA codes that define the birth defects shown in this report.)

Figure 12: Regions of data collection, Texas Birth Defects Registry, 1996 and 1997

Region	1996	1997
1		
2		✔
3		✔
4		
5		
6	✔	
7		
8		✔
9		✔
10		✔
11	✔	✔

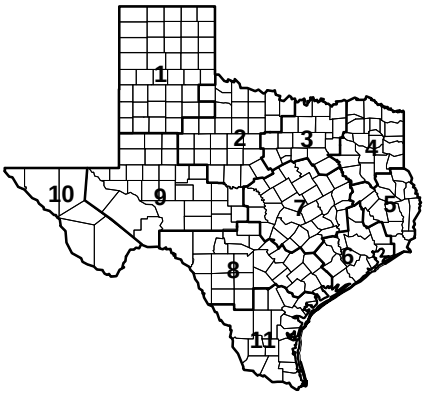

Figure 14: Cardiovascular birth defects with significant variation among regions/time periods, Texas, 1996-1997

Cases per 10,000 live births

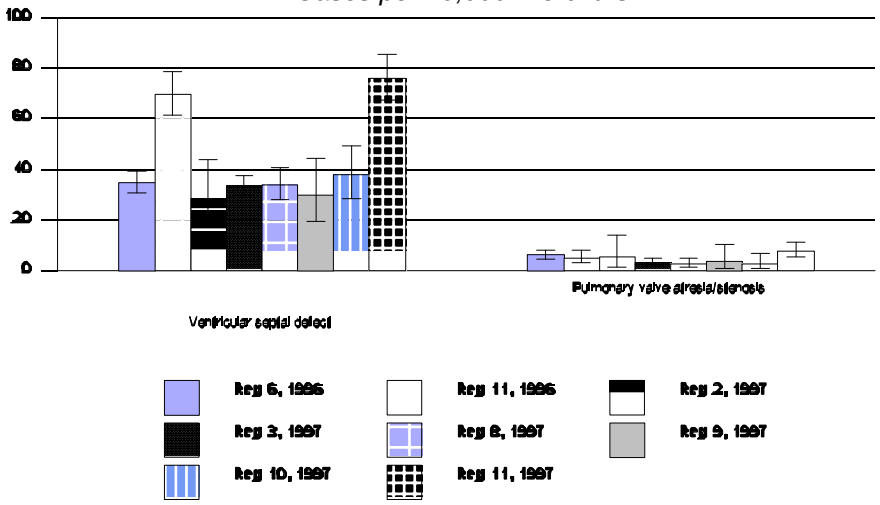

Figure 13: Cardiovascular birth defects with significant variation among regions/time periods, Texas, 1996-1997

Cases per 10,000 live births

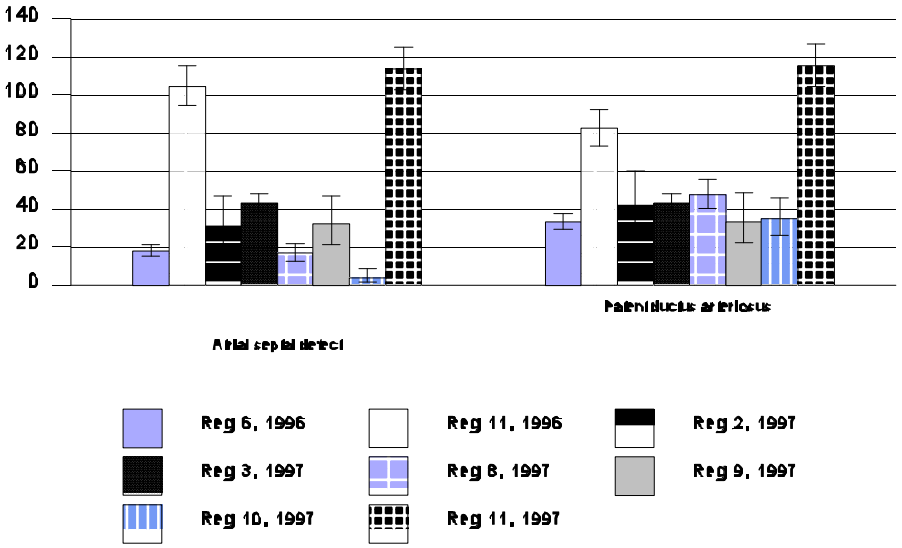

Figure 15: Non-cardiovascular birth defects with significant variation among regions/time periods, Texas, 1996-1997

Cases per 10,000 live births

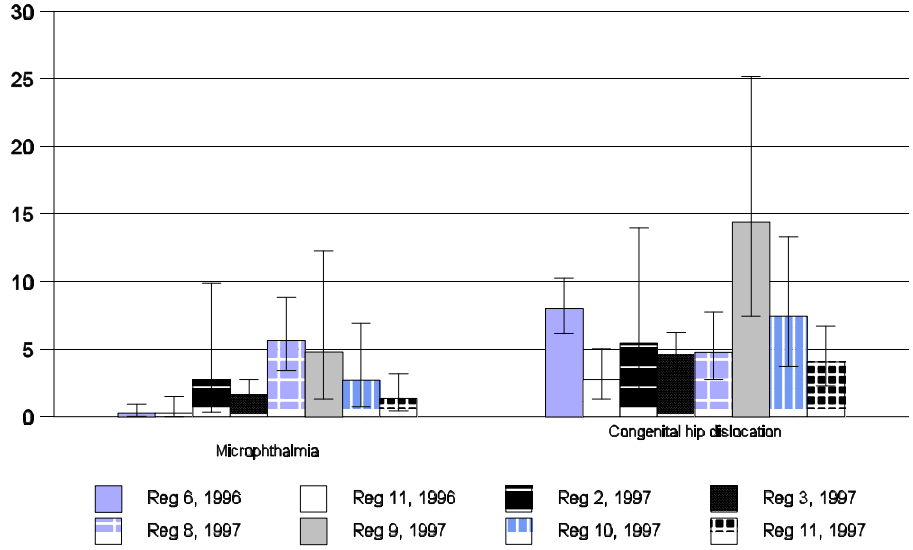

Figure 16: Non-cardiovascular birth defects with significant variation among regions/time periods, Texas, 1996-1997

Cases per 10,000 live births

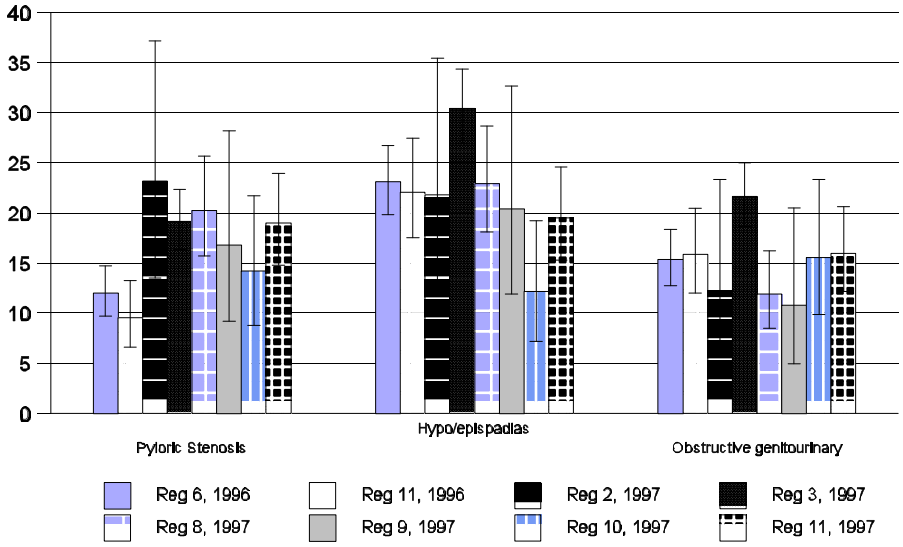

Table 5: Prevalence of Birth Defects by Year and Public Health Region, Texas, 1996-1997

Defect	Year		1996	1996	1997	1997	1997	1997	1997	1997
	Region		Reg 6	Reg 11	Reg 2	Reg 3	Reg 8	Reg 9	Reg 10	Reg 11
CENTRAL NERVOUS SYSTEM										
Anencephaly	Cases		22	13	2	18	5	4	4	15
	Rate†		2.84	3.55	2.73	2.11	1.49	4.80	2.70	4.07
	95% Confidence Interval for Rate‡	L	1.78	1.89	0.33	1.25	0.48	1.31	0.74	2.28
		U	4.30	6.07	9.86	3.33	3.48	12.29	6.92	6.71
Spina bifida without anence-phaly	Cases		33	22	5	37	9	2	6	20
	Rate†		4.26	6.00	6.83	4.33	2.68	2.40	4.06	5.42
	95% Confidence Interval for Rate‡	L	2.93	3.76	2.22	3.05	1.23	0.29	1.49	3.31
		U	5.99	9.09	15.93	5.97	5.09	8.67	8.83	8.38
Encephalocele	Cases		12	2	1	7	4	1	0	2
	Rate†		1.55	0.55	1.37	0.82	1.19	1.20	0.00	0.54
	95% Confidence Interval for Rate‡	L	0.80	0.07	0.03	0.33	0.32	0.03	0.00	0.07
		U	2.71	1.97	7.61	1.69	3.05	6.69	2.49	1.96
Microcephaly	Cases		50	15	4	60	13	6	9	14
	Rate†		6.46	4.09	5.46	7.02	3.87	7.20	6.08	3.80
	95% Confidence Interval for Rate‡	L	4.79	2.29	1.49	5.36	2.06	2.64	2.78	2.08
		U	8.51	6.75	13.98	9.04	6.62	15.68	11.55	6.37
Holoprosence-phaly	Cases		13	5	1	14	2	1	4	5
	Rate†		1.68	1.36	1.37	1.64	0.60	1.20	2.70	1.36
	95% Confidence Interval for Rate‡	L	0.89	0.44	0.03	0.90	0.07	0.03	0.74	0.44
		U	2.87	3.18	7.61	2.75	2.15	6.69	6.92	3.16
Hydrocephaly	Cases		47	29	8	70	17	5	18	27
	Rate†		6.07	7.97	10.92	8.19	5.07	6.00	12.17	7.32
	95% Confidence Interval for Rate‡	L	4.46	5.30	4.72	6.38	2.95	1.95	7.21	4.83
		U	8.07	11.36	21.52	10.35	8.11	14.01	19.23	10.65
EYE										
Anophthalmia	Cases		2	1	1	6	1	0	2	2
	Rate†		0.26	0.27	1.37	0.70	0.30	0.00	1.35	0.54
	95% Confidence Interval for Rate‡	L	0.03	0.01	0.03	0.26	0.01	0.00	0.16	0.07
		U	0.93	1.52	7.61	1.53	1.66	4.43	4.88	1.96
Micropthalmia*	Cases		16	6	2	14	19	4	4	5
	Rate†		2.07	1.64	2.73	1.64	5.66	4.80	2.70	1.36
	95% Confidence Interval for Rate‡	L	1.18	0.60	0.33	0.90	3.41	1.31	0.74	0.44
		U	3.36	3.56	9.86	2.75	8.84	12.29	6.92	3.16
Cataract	Cases		7	4	0	10	3	1	1	5
	Rate†		0.90	1.09	0.00	1.17	0.89	1.20	0.68	1.36
	95% Confidence Interval for Rate‡	L	0.36	0.30	0.00	0.56	0.18	0.03	0.02	0.44
		U	1.86	2.79	5.04	2.15	2.61	6.69	3.77	3.16
Aniridia	Cases		0	1	0	1	0	0	0	0
	Rate†		0.00	0.27	0.00	0.12	0.00	0.00	0.00	0.00
	95% Confidence Interval for Rate‡	L	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		U	0.48	1.52	5.04	0.65	1.10	4.43	2.49	1.00
Anotia or microtia	Cases		22	10	3	18	9	2	8	12
	Rate†		2.84	2.73	4.10	2.11	2.68	2.40	5.41	3.25
	95% Confidence Interval for Rate‡	L	1.78	1.31	0.84	1.25	1.23	0.29	2.33	1.68
		U	4.30	5.02	11.97	3.33	5.09	8.67	10.66	5.69

*Statistically significant difference among regions/time periods. †Cases per 10,000 live births.
‡L is the lower limit and U is the upper limit of the 95% confidence interval for the rate

Table 5: Prevalence of Birth Defects by Year and Public Health Region, Texas, 1996-1997

Defect	Year		1996	1996	1997	1997	1997	1997	1997	1997
	Region		Reg 6	Reg 11	Reg 2	Reg 3	Reg 8	Reg 9	Reg 10	Reg 11
CARDIOVASCULAR AND RESPIRATORY										
Common truncus	Cases		2	1	0	10	4	0	1	1
	Rate†		0.26	0.27	0.00	1.17	1.19	0.00	0.68	0.27
	95% Confidence Interval for Rate‡	L	0.03	0.01	0.00	0.56	0.32	0.00	0.02	0.01
		U	0.93	1.52	5.04	2.15	3.05	4.43	3.77	1.51
Transposition of the great vessels	Cases		33	17	4	42	17	6	3	22
	Rate†		4.26	4.64	5.46	4.91	5.07	7.20	2.03	5.97
	95% Confidence Interval for Rate‡	L	2.93	2.70	1.49	3.54	2.95	2.64	0.42	3.74
		U	5.99	7.43	13.98	6.64	8.11	15.68	5.93	9.03
Tetralogy of Fallot	Cases		18	11	4	23	9	2	7	13
	Rate†		2.32	3.00	5.46	2.69	2.68	2.40	4.73	3.53
	95% Confidence Interval for Rate‡	L	1.38	1.50	1.49	1.71	1.23	0.29	1.90	1.88
		U	3.67	5.37	13.98	4.04	5.09	8.67	9.75	6.03
Ventricular septal defect*	Cases		271	256	21	286	114	25	56	280
	Rate†		35.00	69.85	28.67	33.46	33.97	30.01	37.86	75.94
	95% Confidence Interval for Rate‡	L	30.95	61.55	17.75	29.70	28.02	19.42	28.60	67.31
		U	39.42	78.95	43.82	37.57	40.81	44.30	49.16	85.38
Atrial septal defect*	Cases		139	383	23	370	56	27	6	419
	Rate†		17.95	104.50	31.40	43.29	16.69	32.41	4.06	113.64
	95% Confidence Interval for Rate‡	L	15.09	94.34	19.90	39.00	12.61	21.36	1.49	103.07
		U	21.20	115.44	47.11	47.92	21.67	47.15	8.83	124.99
Endocardial cushion defect	Cases		30	9	3	33	8	1	2	14
	Rate†		3.87	2.46	4.10	3.86	2.38	1.20	1.35	3.80
	95% Confidence Interval for Rate‡	L	2.61	1.12	0.84	2.66	1.03	0.03	0.16	2.08
		U	5.53	4.66	11.97	5.42	4.70	6.69	4.88	6.37
Pulmonary valve atresia or stenosis*	Cases		48	19	4	29	9	3	4	29
	Rate†		6.20	5.18	5.46	3.39	2.68	3.60	2.70	7.87
	95% Confidence Interval for Rate‡	L	4.57	3.12	1.49	2.27	1.23	0.74	0.74	5.27
		U	8.22	8.10	13.98	4.87	5.09	10.52	6.92	11.30
Tricuspid valve atresia or stenosis	Cases		24	8	3	22	9	1	2	3
	Rate†		3.10	2.18	4.10	2.57	2.68	1.20	1.35	0.81
	95% Confidence Interval for Rate‡	L	1.99	0.94	0.84	1.61	1.23	0.03	0.16	0.17
		U	4.61	4.30	11.97	3.90	5.09	6.69	4.88	2.38
Ebstein anomaly	Cases		1	0	0	7	1	0	2	2
	Rate†		0.13	0.00	0.00	0.82	0.30	0.00	1.35	0.54
	95% Confidence Interval for Rate‡	L	0.00	0.00	0.00	0.33	0.01	0.00	0.16	0.07
		U	0.72	1.01	5.04	1.69	1.66	4.43	4.88	1.96
Aortic valve stenosis	Cases		19	6	4	18	4	0	5	12
	Rate†		2.45	1.64	5.46	2.11	1.19	0.00	3.38	3.25
	95% Confidence Interval for Rate‡	L	1.48	0.60	1.49	1.25	0.32	0.00	1.10	1.68
		U	3.83	3.56	13.98	3.33	3.05	4.43	7.89	5.69
Hypoplastic left heart syndrome	Cases		18	8	4	17	4	4	3	12
	Rate†		2.32	2.18	5.46	1.99	1.19	4.80	2.03	3.25
	95% Confidence Interval for Rate‡	L	1.38	0.94	1.49	1.16	0.32	1.31	0.42	1.68
		U	3.67	4.30	13.98	3.18	3.05	12.29	5.93	5.69

*Statistically significant difference among regions/time periods. †Cases per 10,000 live births.
‡L is the lower limit and U is the upper limit of the 95% confidence interval for the rate

Table 5: Prevalence of Birth Defects by Year and Public Health Region, Texas, 1996-1997

Defect	Year		1996	1996	1997	1997	1997	1997	1997	1997
	Region		Reg 6	Reg 11	Reg 2	Reg 3	Reg 8	Reg 9	Reg 10	Reg 11
Gastroschisis	Cases		24	10	6	30	10	0	8	13
	Rate†		3.10	2.73	8.19	3.51	2.98	0.00	5.41	3.53
	95% Confidence Interval for Rate‡	L	1.99	1.31	3.01	2.37	1.43	0.00	2.33	1.88
		U	4.61	5.02	17.83	5.01	5.48	4.43	10.66	6.03
CHROMOSOMAL										
Down syndrome (includes trisomy 21, translocations, and mosaics)	Cases		79	46	8	112	37	6	25	42
	Rate†		10.20	12.55	10.92	13.10	11.03	7.20	16.90	11.39
	95% Confidence Interval for Rate‡	L	8.08	9.19	4.72	10.79	7.76	2.64	10.94	8.21
		U	12.72	16.74	21.52	15.77	15.20	15.68	24.95	15.40
Patau syndrome (includes trisomy 13, translocations, and mosaics)	Cases		7	2	0	7	4	1	2	4
	Rate†		0.90	0.55	0.00	0.82	1.19	1.20	1.35	1.08
	95% Confidence Interval for Rate‡	L	0.36	0.07	0.00	0.33	0.32	0.03	0.16	0.30
		U	1.86	1.97	5.04	1.69	3.05	6.69	4.88	2.78
Edwards syndrome (includes trisomy 18, translocations, and mosaics)	Cases		20	10	1	29	8	1	6	4
	Rate†		2.58	2.73	1.37	3.39	2.38	1.20	4.06	1.08
	95% Confidence Interval for Rate‡	L	1.58	1.31	0.03	2.27	1.03	0.03	1.49	0.30
		U	3.99	5.02	7.61	4.87	4.70	6.69	8.83	2.78
OTHER										
Fetal alcohol syndrome or other alcohol related birth defects	Cases		0	0	1	0	1	0	0	0
	Rate†		0.00	0.00	1.37	0.00	0.30	0.00	0.00	0.00
	95% Confidence Interval for Rate‡	L	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00
		U	0.48	1.01	7.61	0.43	1.66	4.43	2.49	1.00
Possible/ probable FAS or other alcohol related birth defects	Cases		2	7	0	2	1	0	2	4
	Rate†		0.26	1.91	0.00	0.23	0.30	0.00	1.35	1.08
	95% Confidence Interval for Rate‡	L	0.03	0.77	0.00	0.03	0.01	0.00	0.16	0.30
		U	0.93	3.94	5.04	0.85	1.66	4.43	4.88	2.78

*Statistically significant difference among regions/time periods. †Cases per 10,000 live births.
‡L is the lower limit and U is the upper limit of the 95% confidence interval for the rate

Table 5: Prevalence of Birth Defects by Year and Public Health Region, Texas, 1996-1997

Defect	Year / Region		1996 Reg 6	1996 Reg 11	1997 Reg 2	1997 Reg 3	1997 Reg 8	1997 Reg 9	1997 Reg 10	1997 Reg 11
Patent ductus arteriosus*	Cases		259	302	31	371	160	28	52	425
	Rate†		33.45	82.40	42.32	43.41	47.68	33.61	35.15	115.27
	95% Confidence Interval for Rate‡	L	29.50	73.40	28.75	39.11	40.58	22.33	26.25	104.62
		U	37.78	92.19	60.07	48.05	55.66	48.57	46.10	126.69
Coarctation of the aorta	Cases		36	24	6	47	8	2	4	18
	Rate†		4.65	6.55	8.19	5.50	2.38	2.40	2.70	4.88
	95% Confidence Interval for Rate‡	L	3.26	4.20	3.01	4.04	1.03	0.29	0.74	2.89
		U	6.44	9.74	17.83	7.31	4.70	8.67	6.92	7.72
Choanal atresia or stenosis	Cases		8	3	0	10	6	3	3	3
	Rate†		1.03	0.82	0.00	1.17	1.79	3.60	2.03	0.81
	95% Confidence Interval for Rate‡	L	0.45	0.17	0.00	0.56	0.66	0.74	0.42	0.17
		U	2.04	2.39	5.04	2.15	3.89	10.52	5.93	2.38
Agenesis, aplasia, or hypoplasia of the lung	Cases		36	16	2	38	15	7	4	16
	Rate†		4.65	4.37	2.73	4.45	4.47	8.40	2.70	4.34
	95% Confidence Interval for Rate‡	L	3.26	2.50	0.33	3.15	2.50	3.38	0.74	2.48
		U	6.44	7.09	9.86	6.10	7.37	17.31	6.92	7.05
ORAL CLEFTS										
Cleft palate alone (without cleft lip)	Cases		43	21	8	52	12	7	13	24
	Rate†		5.55	5.73	10.92	6.08	3.58	8.40	8.79	6.51
	95% Confidence Interval for Rate‡	L	4.02	3.55	4.72	4.54	1.85	3.38	4.68	4.17
		U	7.48	8.76	21.52	7.98	6.25	17.31	15.03	9.69
Cleft lip with or without cleft palate	Cases		73	43	10	99	39	13	22	47
	Rate†		9.43	11.73	13.65	11.58	11.62	15.60	14.87	12.75
	95% Confidence Interval for Rate‡	L	7.39	8.49	6.55	9.41	8.26	8.31	9.32	9.37
		U	11.85	15.80	25.11	14.10	15.89	26.68	22.52	16.95
GASTROINTESTINAL										
Tracheoesophageal fistula / esophageal atresia	Cases		17	6	1	23	7	2	7	7
	Rate†		2.20	1.64	1.37	2.69	2.09	2.40	4.73	1.90
	95% Confidence Interval for Rate‡	L	1.28	0.60	0.03	1.71	0.84	0.29	1.90	0.76
		U	3.52	3.56	7.61	4.04	4.30	8.67	9.75	3.91
Pyloric stenosis*	Cases		93	35	17	164	68	14	21	70
	Rate†		12.01	9.55	23.21	19.19	20.26	16.80	14.20	18.99
	95% Confidence Interval for Rate‡	L	9.69	6.65	13.52	16.36	15.73	9.19	8.79	14.80
		U	14.71	13.28	37.16	22.36	25.69	28.20	21.70	23.99
Stenosis or atresia of small intestine	Cases		30	10	1	27	8	0	6	13
	Rate†		3.87	2.73	1.37	3.16	2.38	0.00	4.06	3.53
	95% Confidence Interval for Rate‡	L	2.61	1.31	0.03	2.08	1.03	0.00	1.49	1.88
		U	5.53	5.02	7.61	4.60	4.70	4.43	8.83	6.03
Stenosis or atresia of large intestine, rectum, or anal canal	Cases		34	13	3	28	11	5	7	22
	Rate†		4.39	3.55	4.10	3.28	3.28	6.00	4.73	5.97
	95% Confidence Interval for Rate‡	L	3.04	1.89	0.84	2.18	1.64	1.95	1.90	3.74
		U	6.14	6.07	11.97	4.73	5.86	14.01	9.75	9.03
Hirschsprung disease	Cases		16	6	0	3	3	2	4	5
	Rate†		2.07	1.64	0.00	0.35	0.89	2.40	2.70	1.36
	95% Confidence Interval for Rate‡	L	1.18	0.60	0.00	0.07	0.18	0.29	0.74	0.44
		U	3.36	3.56	5.04	1.03	2.61	8.67	6.92	3.16

*Statistically significant difference among regions/time periods. †Cases per 10,000 live births.
‡L is the lower limit and U is the upper limit of the 95% confidence interval for the rate

Table 5: Prevalence of Birth Defects by Year and Public Health Region, Texas, 1996-1997

Defect	Year / Region		1996 Reg 6	1996 Reg 11	1997 Reg 2	1997 Reg 3	1997 Reg 8	1997 Reg 9	1997 Reg 10	1997 Reg 11
Biliary atresia	Cases		4	3	1	1	3	0	1	4
	Rate†		0.52	0.82	1.37	0.12	0.89	0.00	0.68	1.08
	95% Confidence Interval for Rate‡	L	0.14	0.17	0.03	0.00	0.18	0.00	0.02	0.30
		U	1.32	2.39	7.61	0.65	2.61	4.43	3.77	2.78
Genitourinary										
Hypospadias or epispadias*	Cases		179	81	16	260	77	17	18	72
	Rate†		23.12	22.10	21.84	30.42	22.94	20.41	12.17	19.53
	95% Confidence Interval for Rate‡	L	19.85	17.55	12.49	26.83	18.11	11.89	7.21	15.28
		U	26.76	27.47	35.47	34.35	28.68	32.67	19.23	24.59
Renal agenesis or dysgenesis	Cases		34	12	3	48	14	3	8	19
	Rate†		4.39	3.27	4.10	5.62	4.17	3.60	5.41	5.15
	95% Confidence Interval for Rate‡	L	3.04	1.69	0.84	4.14	2.28	0.74	2.33	3.10
		U	6.14	5.72	11.97	7.45	7.00	10.52	10.66	8.05
Obstructive genitourinary defect*	Cases		119	58	9	185	40	9	23	59
	Rate†		15.37	15.82	12.29	21.65	11.92	10.80	15.55	16.00
	95% Confidence Interval for Rate‡	L	12.73	12.02	5.62	18.64	8.52	4.94	9.86	12.18
		U	18.39	20.46	23.32	25.00	16.23	20.51	23.33	20.64
Bladder exstrophy	Cases		2	0	0	1	0	0	1	1
	Rate†		0.26	0.00	0.00	0.12	0.00	0.00	0.68	0.27
	95% Confidence Interval for Rate‡	L	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.01
		U	0.93	1.01	5.04	0.65	1.10	4.43	3.77	1.51
MUSCULOSKELETAL										
Congenital hip dislocation*	Cases		62	10	4	39	16	12	11	15
	Rate†		8.01	2.73	5.46	4.56	4.77	14.40	7.44	4.07
	95% Confidence Interval for Rate‡	L	6.14	1.31	1.49	3.24	2.73	7.44	3.71	2.28
		U	10.26	5.02	13.98	6.24	7.74	25.16	13.31	6.71
Reduction defects of the upper limbs	Cases		33	13	2	36	12	2	8	17
	Rate†		4.26	3.55	2.73	4.21	3.58	2.40	5.41	4.61
	95% Confidence Interval for Rate‡	L	2.93	1.89	0.33	2.95	1.85	0.29	2.33	2.69
		U	5.99	6.07	9.86	5.83	6.25	8.67	10.66	7.38
Reduction defects of the lower limbs	Cases		13	5	0	10	2	1	1	7
	Rate†		1.68	1.36	0.00	1.17	0.60	1.20	0.68	1.90
	95% Confidence Interval for Rate‡	L	0.89	0.44	0.00	0.56	0.07	0.03	0.02	0.76
		U	2.87	3.18	5.04	2.15	2.15	6.69	3.77	3.91
Craniosynostosis	Cases		18	13	2	22	7	2	11	6
	Rate†		2.32	3.55	2.73	2.57	2.09	2.40	7.44	1.63
	95% Confidence Interval for Rate‡	L	1.38	1.89	0.33	1.61	0.84	0.29	3.71	0.60
		U	3.67	6.07	9.86	3.90	4.30	8.67	13.31	3.54
Diaphragmatic hernia	Cases		22	6	1	18	7	2	2	8
	Rate†		2.84	1.64	1.37	2.11	2.09	2.40	1.35	2.17
	95% Confidence Interval for Rate‡	L	1.78	0.60	0.03	1.25	0.84	0.29	0.16	0.94
		U	4.30	3.56	7.61	3.33	4.30	8.67	4.88	4.28
Omphalocele	Cases		14	5	2	17	5	3	6	7
	Rate†		1.81	1.36	2.73	1.99	1.49	3.60	4.06	1.90
	95% Confidence Interval for Rate‡	L	0.99	0.44	0.33	1.16	0.48	0.74	1.49	0.76
		U	3.03	3.18	9.86	3.18	3.48	10.52	8.83	3.91

*Statistically significant difference among regions/time periods. †Cases per 10,000 live births.
‡L is the lower limit and U is the upper limit of the 95% confidence interval for the rate