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Trends in Spina Bifida and Anencephalus in the United States, 1991–2006

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In 1992, the U.S. Public Health Service recommended that women of childbearing age increase consumption of the vitamin folic acid to reduce spina bifida and anencephalus. In 1996, the U.S. Food and Drug Administration authorized that all enriched cereal grain products be fortified with folic acid. Optional fortification started in March 1996 and mandatory fortification in January 1998. Results from the National Health and Nutrition Examination Survey (NHANES) for 1999–2000 show that public health actions have been effective in increasing folate status among women of childbearing age. However, results from 2005–2006 NHANES show that folate status among women of childbearing age has only fluctuated slightly since 1999–2000 ([Blood folate levels: The latest NHANES results](#)).

Birth certificate data in the United States have been available for selected birth defects since 1989 from the National Vital Statistics System, a component of the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS). This Health E-Stat provides a 16-year trend for two neural tube defects, spina bifida and anencephalus.

After a significant increase in the spina bifida rate from 1992 to 1995, a significant decline occurred from 1995 to 1999. The rate continued an overall decrease from 2000 (20.85) to 2006 (17.99). The 2006 rate was nearly the same as that for 2005, the lowest ever reported (17.96).

After a decline in the early part of the decade, the anencephalus rate was stable during the mid-1990s (1994–1997). The rate was also stable, but generally lower than in earlier years, during 1998–2002 (9.97 for the period). The rate for 2003–2006 (10.96) was higher than for the 1998–2002 period.

Birth certificate data for 1991–2006 are final. For further information about the birth data file, see [Births: Final Data for 2006](#). The numbers and rates for all years exclude data for Maryland, New Mexico, and New York, which in various years had either incomplete reporting or did not report these neural tube defects. Both spina bifida and anencephalus are considered underreported on the birth certificate. CDC is continuing to monitor and analyze neural tube defect occurrence data.

References

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Tables

Table 1. Number of live births with spina bifida and rates per 100,000 live births: United States, 1991–2006

	Spina bifida cases	Total live births	Rate	95% confidence intervals for rate	
2006	700	3,890,949	17.99	16.66	19.32
2005	698	3,887,109	17.96	16.62	19.29
2004	755	3,860,720	19.56	18.16	20.95
2003	702	3,715,577	18.89	17.50	20.29
2002	734	3,645,770	20.13	18.68	21.59
2001	730	3,640,555	20.05	18.60	21.51
2000	759	3,640,376	20.85	19.37	22.33
1999	732	3,533,565	20.72	19.22	22.22
1998	790	3,519,240	22.45	20.88	24.01
1997	857	3,469,667	24.70	23.05	26.35
1996	917	3,478,723	26.36	24.65	28.07
1995	975	3,484,539	27.98	26.22	29.74
1994	900	3,527,482	25.51	23.85	27.18
1993	896	3,562,723	25.15	23.50	26.80
1992	816	3,572,890	22.84	21.27	24.41
1991	887	3,564,453	24.88	23.25	26.52

NOTE: Excludes data for Maryland, New Mexico, and New York, which did not require reporting for spina bifida for some years.

SOURCE: CDC/NCHS, National Vital Statistics System.

Table 2. Number of live births with anencephalus and rates per 100,000 live births: United States, 1991–2006

	Anencephalus cases	Total live births	Rate	95% confidence intervals for rate	
2006	436	3,890,949	11.21	10.15	12.26
2005	432	3,887,109	11.11	10.07	12.16
2004	401	3,860,720	10.39	9.37	11.40
2003	441	3,715,577	11.14	10.07	12.22
2002	348	3,645,770	9.55	8.54	10.55
2001	343	3,640,555	9.42	8.42	10.42
2000	376	3,640,376	10.33	9.28	11.37
1999	382	3,533,565	10.81	9.73	11.89
1998	349	3,519,240	9.92	8.88	10.96
1997	434	3,469,667	12.51	11.33	13.69
1996	416	3,478,723	11.96	10.81	13.11
1995	408	3,484,539	11.71	10.57	12.84
1994	387	3,527,482	10.97	9.88	12.06
1993	481	3,562,723	13.50	12.29	14.71
1992	457	3,572,890	12.79	11.62	13.96
1991	655	3,564,453	18.38	16.97	19.78

NOTE: Excludes data for Maryland, New Mexico, and New York, which did not require reporting for anencephalus for some years.

SOURCE: CDC/NCHS, National Vital Statistics System.

Figures

