

and costs normally incurred for housing and food, regardless of whether an individual required institutionalization. The study included additional anomalies along with hospital costs noted in diagnosis-related groups. These estimates do not include lost productivity costs, semi-independent support services (e.g., persons living in community settings with ambulatory care and special education services), or residential services due to mental retardation after age 21.

The higher set of cost estimates came from studies by Rice et al., Rice, Harwood et al., Harwood, and Harwood and Napolitano. Rice et al. estimated 1985 annual costs to be \$1.6 billion, using a prevalence rate of 1.9 per 1,000 live births. This cost included neonatal intensive care services and other treatment and care services up to age 21. The estimate was based on the Abel and Sokol approach used for their \$321 million estimate.

The 1985 estimate by Rice et al. also included residential care for mental retardation for persons over age 21, which accounted for 80 percent of the total annual costs. Later, Rice estimated that the total 1990 cost had risen to \$2.1 billion, based on the same prevalence rate and cost components. However, costs were adjusted based on socioeconomic indexes.

Another estimate comes from a National Institute on Drug Abuse/National Institute on Alcohol Abuse and Alcoholism (NIAAA) study by Harwood et al. They estimated the 1992 annual cost to be \$2.9 billion based on the approach used by Harwood and Napolitano. This was based on a prevalence rate of 2.0 per 1,000 live births. This cost estimate included several components:

- Treatment and care services to age 21
- Home and residential care services for moderate and severe cases of mental retardation to age 65
- Special education services
- Lost productivity

An extrapolation by Harwood of the 1992 NIAAA study estimated that costs had risen to \$4.022 billion by 1998. This updated estimate adjusted for the change in national health care expenditures and in the consumer price index for medical services. It also adjusted for changes in the adult population in the United States and in the hourly compensation index for lost productivity. No adjustment was made for FAS-specific trends.

Summary Table of Estimates of the Total U.S. Annual Cost of Fetal Alcohol Syndrome Ranked by Prevalence Rate

Source	Prevalence Rate (per 1,000)	Annual Cost	Year
Abel and Sokol	0.33	\$75 million	1984
Harwood and Napolitano	1.67	\$3.235 billion	1980
Abel and Sokol	1.9	\$321 million	1984
Abel and Sokol	1.9	\$250 million	1987
Rice, et al.	1.9	\$1.611 billion	1985
Rice; update of 1985 study	1.9	\$2.089 billion	1990
Harwood, et al.	2.0/1.0*	\$2.934 billion	1992
Harwood; update of 1992 study	2.0/1.0*	\$4.022 billion	1998