

2684 COMPETITIVE PROBLEMS IN THE DRUG INDUSTRY

TABLE 1.—DEATHS FROM APLASTIC ANEMIA, CALIFORNIA, 1949-61, UNITED STATES, 1949-60 AND CANADA, 1950-60

Year	California		United States		Canada	
	Number	Rate	Number	Rate	Number	Rate
1949.....	63	5.9	638	4.3	(1)	(1)
1950.....	64	6.0	610	4.0	73	5.3
1951.....	61	5.5	671	4.4	73	5.2
1952.....	54	4.6	828	5.3	73	5.1
1953.....	70	5.8	774	4.9	66	4.5
1954.....	50	4.0	681	4.2	64	4.2
1955.....	53	4.1	633	3.9	55	3.5
1956.....	53	3.9	656	3.9	69	4.3
1957.....	59	4.2	669	3.9	64	3.9
1958.....	59	4.0	843	4.9	87	5.1
1959.....	61	4.0	² 921	5.2	91	5.2
1960.....	81	5.2	³ 971	5.4	75	4.2
1961.....	86	5.2	(1)	(1)	(1)	(1)

¹ Not available.² Includes Alaska.³ Includes Alaska and Hawaii.

Note: Rates are per 1,000,000 population.

Sources: National Office of Vital Statistics; Dominion of Canada, Bureau of Statistics; and State of California, Department of Public Health.

TABLE 2.—APLASTIC ANEMIA DEATH RATES BY AGE AND SEX, CALIFORNIA, 1960

Total	Age groups						
	<15	15-24	25-34	35-44	45-54	55-64	>64
California popula- tion.....	15,717,000	4,764,000	2,080,000	2,130,000	2,278,000	1,793,000	1,296,000
All deaths.....	¹ 135,334	11,201	2,221	2,932	6,383	12,965	20,949
Aplastic anemia deaths.....	81	14	9	3	6	3	9
Male.....	36	4	5	1	2	0	4
Female.....	45	10	4	2	4	3	5
Death rates per 1,000,000 population							
All deaths.....	8,610.7	2,351.2	1,067.8	1,376.5	2,802.0	7,230.8	16,164.4
Aplastic anemia deaths.....	5.2	2.9	4.3	1.4	2.6	1.7	6.9

¹ Includes 40 cases age not stated.

Source: State of California, Department of Public Health.

CORRELATION BETWEEN DEATHS AND SALES

If chloramphenicol is responsible for a substantial proportion of aplastic anemia deaths and the pattern of prescriptions is more or less constant over time then fluctuations in the number of deaths might be expected to correlate with fluctuations in the volume of sales of chloramphenicol. In connection with the present study, an effort was made to determine if there was a statistical association in time between the volume of chloramphenicol sales and the number of deaths from aplastic anemia. The mortality and sales data for California, the United States and Canada were charted on a population ratio basis as shown in Figs. 1-3.¹⁷ Sales reached a peak in 1951, dropped off precipitously during the early 1950's and then increased again during the late 1950's. A time lag occurs between sales by the manufacturer and deaths from aplastic anemia because of the normal lapse of time until the drug is actually taken and aplastic anemia develops. To test the hypothesis that sales of chloramphenicol and deaths from aplastic anemia are associated, Kendall partial rank correlation coefficients (τ) were computed with the effect of population held constant.

¹⁷ Manufacturer's sales data provided by Parke, Davis & Co.