

COMPARISON OF UNION CARBIDE - TEXAS CITY
DEATH RATES FROM MALIGNANT BRAIN TUMORS WITH
UNITED STATES COUNTY MORTALITY STATISTICS

Purpose

In conventional occupational cohort mortality studies it is usual to compare the mortality experience of a specific occupational population with that which would have been "expected" based on U. S. average mortality experience.

When the mortality experience in the study population is significantly greater than the U. S. average experience this is often interpreted as evidence of a "potential" occupational health problem. The possibility of a significant result based on "chance" is often not given sufficient recognition. That is, if a large population such as the U. S. were split into smaller parts, say counties, one would find that 50% of the counties may have mortality rates higher than the U. S. and 50% will be lower. Counties could then be "ranked" with respect to their mortality rate for a particular disease; the rank orders possibly having no real or intrinsic meaning other than chance. To illustrate this point, the UCC Texas City occupational cohorts' brain tumor mortality experience has been ranked with respect to county-wide mortality rates from this same cause.

Methods

Table 1 shows the calculation of Union Carbide - Texas City age standardized death rates. In this analysis the United States 1960 population was used as a reference population. Age specific

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death rates were determined for the Union Carbide population using the cohort mortality tape (UC-1) prepared for the NIOSH cohort study. For the age groups 0-4 years and 5-14 years the age specific death rates of the United States population between 1960 and 1964 were used. These rates were obtained from the Monson U. S. Death Rates tapes. The result of this analysis indicates that the age standardized death rate (for brain tumors) for the Union Carbide Texas City population is 9.53 deaths per 100,000 population.

Results

Table 2 indicates all counties in the United States which had an age standardized mortality rate for malignant brain tumors the same as or higher than that of the Union Carbide Texas City population. Counties are listed only if there were a minimum of 5 brain cancer deaths during the 20 year period. These rates are from: "Cancer Mortality by County: 1950-1969" by Mason and McKay. In all there were 20 counties with higher age standardized death rates for malignant brain tumors than that found in the Texas City population. One of these counties (Hamilton) was located in Texas. If counties with less than 5 deaths from brain tumors over this 20 year period are considered, there are a total of 47 counties with brain cancer mortality rates higher than a comparable rate for the Texas City population. This represents approximately 1.6% of all counties (2981) in the U. S.

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TABLE 1. CALCULATION OF UCC - TEXAS CITY AGE ADJUSTED (DIRECT METHOD)
DEATH RATE FROM PRIMARY MALIGNANT BRAIN TUMOR

<u>1960 Population Age Group</u>	<u>Standardized 1960 U. S. Population</u>	<u>UCC Death Rate* (deaths/100,000)</u>	<u>Exp. Deaths</u>
0-4	113,320	* 2.3	2.61
5-14	197,773	* 1.6	3.16
15-24	133,948	0.0	0
25-34	127,247	2.7	2.43
35-44	134,290	2.5	3.36
45-54	114,238	9.4	10.74
55-64	86,839	30.3	26.31
65-74	61,324	74.6	45.75
75-84	25,839	0	0
85+	5,182	0	0
Total	1,000,000		95.36

Age-adjusted death rate = 9.53 per 100,000 population

* Rates used for population under age 15 were those of the 1960-1964
U.S. population (Source: Monson Computerized U.S. Death Rate Tables).

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ABLE 2.

COUNTIES WITH HIGHER MORTALITY RATE FOR
MALIGNANT BRAIN TUMOR THAN UCC - TEXAS CITY

<u>State</u>	<u>County</u>	<u>(Population)</u>	<u>No. *</u>	<u>Rate Per 100,000 Population</u>
Alabama	Coosa	11,300	7	10.0
Georgia	Greene		6	9.8
Georgia	Heard	6,513	7	16.3
Georgia	White	8,900	7	12.0
Kansas	Ness	4,700	7	11.9
Michigan	Missaukee	9,997	6	10.0
Michigan	Menominee	26,224	6	10.7
Mississippi	Simpson	20,900	14	9.6
Mississippi	Greene		6	9.6
Nebraska	Brown	4,351	6	11.1
Nebraska	Cuming	11,900	15	11.5
Nebraska	Garden	2,806	5	11.6
Nebraska	Harlan	4,268	6	10.2
Nebraska	Sherman	4,219	7	12.3
North Carolina	Gates	8,300	5	11.9
South Carolina	Edgefield	16,700	7	10.2
Tennessee	Lake	7,100	7	10.0
Texas	Hamilton	7,500	10	10.8
Virginia	Susse X	10,900	5	10.4
West Virginia	Pleasants	8,245	7	11.0
UCC Texas City	(Galveston)	133,727	11	9.5

* Number of brain cancer deaths between 1950 and 1969 in county.

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