



UNIVERSITY OF MINNESOTA
TWIN CITIES

Division of Environmental
and Occupational Health
School of Public Health
Box 197 Mayo
420 Delaware Street S.E.
Minneapolis, Minnesota 55455

April 6, 1989

Larry R. Zobel, M.D.
Staff Physician
3M Center
Medical Department
220-2E-02
St. Paul, MN 55144-1000

Dear Larry;

Enclosed please find the tables containing the results of the comparison with the Minnesota population. As I mentioned on the telephone, these must be interpreted cautiously because of the uncertainty regarding the Minnesota rates prior to 1959. Deaths among the study cohort occurred in 41 states; therefore, the U.S. rates may be more appropriate.

As you will see from the tables, the results are similar to those presented previously which used the U.S. rates. The only consistent finding between the two comparisons is for prostatic cancer which we addressed in our initial report. For cancer of the digestive organs and peritoneum there was a statistically significant excess ($SMR=176$, $95\% C.L.=1.09, 2.69$) for the entire cohort. However, this was not found among the Clinical Division employees. Furthermore, no single site within the gastrointestinal tract was elevated suggesting that this was probably due to chance. Also worth noting is the fact that these are not sites typically associated with chemical exposures.

If you have any questions please feel free to call me at 626-4810.

Yours sincerely,

Jack S. Mandel, Ph.D.
Associate Professor

HEALTH SCIENCES

Exhibit
1357

State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862

3MA00632313

TABLE 5. OBSERVED AND EXPECTED DEATHS BY CAUSE, STANDARDIZED MORTALITY RATIO (SMR),
95 PERCENT CONFIDENCE LIMITS AND CHI SQUARE VALUES, MALES, CHEMICAL DIVISION
(COMPARED TO MINNESOTA DEATH RATES)

	OBSERVED	EXPECTED	OBS/EXP	LL	UL	CHISQ
0ALL CAUSES OF DEATH	100	89.79	1.11	0.91	1.35	1.05
1ALL MALIGNANT NEOPLASMS	23	16.39	1.40	0.89	2.11	2.27
2ALL INFECTIVE AND PARASITIC DISEASE	0	0.68	0.00	0.00	5.41	0.05
9ALL TUBERCULOSIS	0	0.20	0.00	0.00	18.48	0.46
140CANCER OF BUCCAL CAVITY AND PHARYNX	0	0.52	0.00	0.00	7.05	0.00
149CANCER OF DIGESTIVE ORGANS AND PERITONEUM (1925-APPROXIMATE)	6	4.23	1.42	0.52	3.09	0.38
150CANCER OF ESOPHAGUS (1925-APPROXIMATE)	1	0.40	2.49	0.03	13.83	0.02
151CANCER OF STOMACH	0	0.71	0.00	0.00	5.16	0.06
153CANCER OF LARGE INTESTINE (1925-APPROXIMATE)	3	1.40	2.14	0.43	6.25	0.86
154CANCER OF RECTUM (1925-APPROXIMATE)	0	0.45	0.00	0.00	8.23	0.01
155ALL CANCER OF LIVER (1925-APPROXIMATE) 1970 PLUS-PRIMARY ONLY	0	0.27	0.00	0.00	13.68	0.20
157CANCER OF PANCREAS (1925-APPROXIMATE)	2	0.88	2.28	0.26	8.23	0.44
160CANCER OF RESPIRATORY SYSTEM (1925-APPROXIMATE)	5	4.66	1.07	0.35	2.50	0.01
161CANCER OF LARYNX (1925-,1930- APPROXIMATE)	1	0.19	5.16	0.07	28.73	0.48
162ALL CANCER OF LUNG-PRIMARY AND SECONDARY (1925-,1930-APPROXIMATE)	4	4.41	0.91	0.24	2.32	0.00
170CANCER OF BOWEL (1925-,1930,1945-APPROXIMATE)	0	0.12	0.00	0.00	29.60	1.14
172CANCER OF SKIN	1	0.40	2.49	0.03	13.85	0.02
185CANCER OF PROSTATE (1925-APPROXIMATE)	4	0.51	7.80	2.10	19.96	17.39
186CANCER OF TESTIS (OTHER GENITAL ORGANS-1925-49) (1925-,1930-APPROXIMATE)	1	0.38	2.61	0.03	14.55	0.04
188CANCER OF BLADDER (1925-APPROXIMATE)	0	0.26	0.00	0.00	14.08	0.22
189CANCER OF KIDNEY (1925-APPROXIMATE)	0	0.53	0.00	0.00	6.91	0.00
190CANCER OF EYE (1950-1969 ONLY)	0	0.02	0.00	0.00	181.46	11.39
191CANCER OF BRAIN AND OTHER CENTRAL NERVOUS SYSTEM (1925-APPROXIMATE)	1	0.87	1.15	0.02	6.42	0.15
193CANCER OF THYROID (1950-1969 ONLY)	0	0.04	0.00	0.00	93.44	5.41
200LYMPHOSARCOMA AND RETICULOSARCOMA (1950-1969 ONLY)	0	0.52	0.00	0.00	7.04	0.00
201HODGKIN'S DISEASE (1940-,1945-APPROXIMATE)	0	0.55	0.00	0.00	6.62	0.01

204LEUKEMIA AND ALEUKEMIA	0	2.63	0.00	0.00	1.40	1.72
208CANCER OF OTHER LYMPHATIC TISSUE (1950-1969 ONLY)	3	1.42	2.11	0.42	6.15	0.81
209ALL LYMPHOPOIETIC CANCER	6	6.69	0.90	0.33	1.95	0.01
210BENIGN NEOPLASMS (PLUS UNSPECIFIED)	0	0.49	0.00	0.00	7.50	0.00
240ALLERGIC, ENDOCRINE, METABOLIC, NUTRITIONAL DISEASES (1950-1969 ONLY)	4	4.74	0.84	0.23	2.16	0.01
250DIABETES MELLITUS	3	3.71	0.81	0.16	2.36	0.01
280ALL DISEASES OF BLOOD AND BLOOD-FORMING ORGANS (1925-, 1930-APPROXIMATE)	1	0.44	2.28	0.03	12.68	0.01
319MENTAL, PSYCHONEUROTIC, AND PERSONALITY DISORDERS (1950-1969 ONLY)	1	1.86	0.54	0.01	3.00	0.07
320ALL DISEASES OF NERVOUS SYSTEM AND SENSE ORGANS	3	3.21	0.94	0.19	2.73	0.03
390ALL DISEASES OF CIRCULATORY SYSTEM	104	96.73	1.08	0.88	1.30	0.47
393CHRONIC RHEUMATIC HEART DISEASE (1925-APPROXIMATE)	3	2.89	1.04	0.21	3.03	0.05
410ARTERIOSCLEROTIC HEART DISEASE, INCLUDING CHD (1925-APPROXIMATE)	84	72.88	1.15	0.92	1.43	1.55
430ALL VASCULAR LESIONS OF CNS	7	10.58	0.66	0.26	1.36	0.90
460ALL RESPIRATORY DISEASES (1925-, 1930-APPROXIMATE)	7	8.68	0.81	0.32	1.66	0.16
480ALL PNEUMONIA (1925-, 1930-APPROXIMATE)	3	3.09	0.97	0.20	2.84	0.05
492EMPHYSEMA (1950-, 1955 APPROXIMATE)	1	1.95	0.51	0.01	2.86	0.10
493ASTHMA (1925-, 1930-APPROXIMATE)	1	0.43	2.34	0.03	13.02	0.01
520ALL DISEASES OF DIGESTIVE SYSTEM	12	11.45	1.05	0.54	1.83	0.00
531ALL GASTRIC AND DUODENAL ULCER	2	1.12	1.78	0.20	6.44	0.13
571CIRRHOSIS OF LIVER	3	6.88	0.44	0.09	1.27	1.66
580ALL DISEASES OF GENITO-URINARY SYSTEM	0	2.16	0.00	0.00	1.70	1.27
582CHRONIC NEPHRITIS	0	0.91	0.00	0.00	4.04	0.18
709ALL DISEASES OF THE SKIN AND CELLULAR TISSUE	0	0.14	0.00	0.00	26.14	0.92
739ALL DISEASES OF THE BONES AND ORGANS OF MOVEMENT	1	0.52	1.94	0.03	10.78	0.00
799SYMPTOMS, SENILITY, AND ILL DEFINED CONDITIONS	1	1.66	0.60	0.01	3.36	0.01
800ALL EXTERNAL CAUSES OF DEATH	46	52.17	0.88	0.65	1.18	0.62
801ALL ACCIDENTS	34	38.27	0.89	0.62	1.24	0.37
810MOTOR VEHICLE ACCIDENTS	27	21.42	1.26	0.83	1.83	1.20
959SUICIDE	9	10.86	0.83	0.38	1.57	0.17
TOTAL RESIDUAL	1	-65.08	-0.02			

CANCER RESIDUAL

13

3.00

4.33

1357.0004

3MA00632316