p-3 Epidemiology

THE EPPLEY INSTITUTE
for
RESEARCH IN CANCER

October 17, 1975

Frederick R. Johannsen, Ph.D.
Toxicologist
Monsanto Company
800 N. Lindberg Blvd.
St. Louis, MO 63166

Dear Dr. Johannsen:

I received your letter of October 10th and the enclosures on Tuesday afternoon, October 14th. I realize the urgency and therefore as per your request, I adjusted my schedule as well as my biostatistician colleague's schedule to make the project our number one priority. We have accordingly spent almost the entire portion of this week on the project. Despite this fact, we were unable to arrange for analysis of the data via computer to ensure total correctness of the findings and to complete the entire analysis. However, because of the urgency of this matter, we have arrived at a few conclusions from the analysis which we performed by hand. These analyses need to be refined and may contain unavoidable human error although we did make it a point to check on the procedures employed.

As you know, the most appropriate statistical technique for analysis of data such as this is the analysis of the birth cohorts. This method begins with finding the number of individuals born during a specific period and entering the workforce at differing ages in a given enviornment. These subjects are followed up to a certain point in time. Records of their health status and whereabouts supply the information necessary to construct a life table for these individuals.

We have developed such life tables for two birth cohort groups born in 1890-1909 and 1910-1919, respectively, for two events. One is the mortality from all causes of death and the other for lung cancer mortality. Such tables need to be developed for other conditions as well. The tables are for quinquennial age intervals and these need to be refined for one-year age intervals. Therefore, I must emphasize that this analysis and the conclusions must be regarded as preliminary. (See the four attached tables.)

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The main finding from this data is two-fold. First the mortality from all causes for the individuals in the two above cohort groups who worked in this particular environment is not materially different from what may be expected as judged by the presently available cross-sectioned analysis for the nation. Secondly, the lung cancer mortality for these employees, particularly for birth cohorts of 1890-1909, appears to be in excess of what one may expect it to be.

To this end, one needs to give more consideration in any followup work to: 1) the smoking history of the deceased subjects, which is of great potential value; 2) the fact that the total number of employees exposed is too small and 3) the location of a cohort analysis life table covering specific conditions for the time intervals 1900 and on. All three of these aspects would require considerable amounts of time.

Naturally, we did not have sufficient time to investigate the level of exposure and the latency period of some cases. However, this should be done in addition to the breakdown of life tables for specific conditions according to race.

A minor discrepancy came to our attention. The number of employees is 309, instead of 307, which you mentioned in your letter. Furthermore, 192 of these 309 employees were hired prior to 1950.

I, as a physician, duly understand your concern for maintaining the confidentiality of these records and I have not duplicated the material. If you wish to have this material returned to you, please so indicate.

I regret that we could not complete this project despite my steadfast efforts to do so.

Sincerely yours,

E. Mahboubi, M.D., M.P.H.
Professor and Head Epidemiology

EM:dk

Life table for birth cohorts of 1890-1909

All causes

Age interval x	Number alive at the beginning of age interval lx	Number died during age interval dx	Number lost to follow up during age interval ux	Death rate during age interval qx	
-19	77				
20-24	77				
25-29	77		1		
30-34	76		1		
35-39	75	1	6	0.0139	
40-44	68		3		
45-49	65	1	1	0.0155	
50-54	63	6	3	0.0976	
55-59	54	6		0.1111	
60-64	48	3	1	0.0632	
65-69	44	6	1	0.1379	
70-74	37	3		0.0811	
75 +	34	2		0.0588	

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Life table for birth cohorts of 1910-1919

All Causes

Age interval x	Number alive at the beginning of age interval lx	Number died during age interval dx	Number lost to follow up during age interval ux	Death rate during age interval qx	
-19	106				
20-24	106	1	4	0.0098	
25-29	101	0	5		
30-34	96	1	12	0.0111	
35-39	83	0	5		
40-44	78	0	5		
45-49	73	3	0	0.0411	
50-54	70	4	0	0.0571	
55-59	66	6	0	0.0909	
60-64	60	2	1	0.0333	
65-69	57				
70-74					
75 +					

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Life table for birth cohorts of 1890-1909

Lung Cancer

Age interval x	Number alive at the beginning of age interval lx	Number died during age interval dx	Number lost to follow up during age interval ux	Death rate during age interval qx	
-19	77				
20-24	77				
25-29	77		1		
30-34	76		1		
35-39	75		6		
40-44	68		3		
45-49	65		1		
50-54	63	1	3	0.0169	
55-59	54	1	0	0.0194	
60-64	48	0	1	0.0000	
65-69	44	2	0	0.0482	
70-74	37	1	0	0.0278	
75 +	34	0		0.0000	

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Life table for birth cohorts of 1910-1919

Lung Cancer

Age interval x	Number alive at the beginning of age interval lx	Number died during age interval dx	Number lost to follow up during age interval ux	Death rate during age interval qx	
-19	106				
20-24	106		4		
25-29	101		5		
30-34	96		12		
35-39	83		5		
40-44	78		5		
45-49	73		0		
50-54	70	1	0	0.0146	
55-59	66	0	0		
60-64	60	0	1		
65-69	57	0	0		
70-74					
75 +					

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Six Lung Cancer Cases

Employee number	Year of birth	Year hired	Age at time of hiring	Exposure dates first	Exposure dates last	Total yrs worked	Age at which first exposed	Amount of time exposed (months, days)	Interval between hire & exposure* (yrs)	Date of death	Age at death	Latency period (yrs)**	Remarks
191	1909	1940	31	9/20/54	10/11/54	24	45	less than 1 mo.	14	1964	54	9	
190	1909	1951	42	2/9/56	7/27/58	15	47	3 mo., 12 d.	5	1966	56	9	
93	1912	1951	38	8/21/51	4/12/54	17	39	27 mo.	--	1968	56	17	
51	1893	1943	50	12/3/43	4/2/48	15	50	34 mo., 27 d.	--	1963	69	19	3 yrs. on pension before death
54	1892	1934	42	8/20/37	10/25/37	26	45	2 mo., 5 d.	3	1963	71	26	3 yrs. on pension before death
27	1909	1942	33	8/8/51	12/1/53	26	43	27 mo., 22 d.	9	1968	59	17	

Indicates period of time employees worked at other departments of the company prior to 1967 K. Plant.

atency figured on basis of period elapsing between first date of exposure and death instead of date of onset of ung cancer.

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age death

69 Otto Davis oper

— Ambrose Fewem

56 Stanford Johnson

Oliver Rich (?)

Oliver Thorne (?)

Isadore Archie

Lung cancer

St. Clair County 49.7 W.M

Nation 37.9 W.M

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