



THE DOW CHEMICAL COMPANY

BENNETT BUILDING
2030 DOW CENTER
MIDLAND, MICHIGAN 48640

March 29, 1977

RECEIVED

APR 1 1977

MEDICAL
DEPARTMENT

Mr. John Stafford
Imperial Chemical Industries
Plastic Division
P. O. Box 6
Bessemer Road
Welwyn Garden City
Hertfordshire AL7 1HD
England

Dear Mr. Stafford:

I'm sorry for the delay in supplying the information I discussed with Mr. Ross Adams of Air Products Company.

Unofficially, the US appears to have had 17 deaths due to angiosarcoma of the liver in vinyl chloride workers. In November 1975, NIOSH reported 15 confirmed deaths. Since that time B. F. Goodrich reported 1 in 1976 and Union Carbide reported 1 in January 1977. One of the two men reported as alive in November 1975 is still alive and it seems doubtful if he has angiosarcoma.

The attached table is an update of one supplied me by Dr. Walter Harris of UNIROYAL Company. This table is most interesting. For some reason there has not been the tremendous increase in the number of angiosarcoma deaths predicted by many. The total number of cases is small and it may just be a statistical fluke but cumulative averages since 1961 or since 1968 show a rather consistent pattern. We've heard about the tip of the iceberg and that a large number of deaths could be expected. Perhaps the iceberg isn't there or maybe it is just chance but at this time it is encouraging that there has not been a marked increase. I hope we continue to remain so fortunate.

I hope these figures are of use to you.

Sincerely yours,

T. R. Torkelson mso

T. R. Torkelson, ScD
Corporate Medical Dept.

ebg

cc: Ross Adams, Air Products Co., P. O. Box 538, Allentown, Penn, 18105
✓ Walter Harris, PhD, Uniroyal



U/RL 16932

CUMULATIVE DEATHS FROM
ANGIOSARCOMA OF THE LIVER
IN POLYVINYL CHLORIDE WORKMEN
IN THE UNITED STATES

<u>YEAR OF DEATH</u>	<u>NUMBER OF DEATHS</u>	<u>CUMULATIVE AVERAGE SINCE 1961</u>	<u>CUMULATIVE AVERAGE SINCE 1968</u>
1961	1	1.0	
62		0.5	
63		0.3	
64	1	0.5	
65		0.4	
66		0.33	
67		0.28	
68	3	0.63	3.0
69	2	0.78	2.5
70	1	0.80	2.0
71	1	0.82	1.75
72		0.75	1.4
73	2	0.84	1.5
74	1	0.84	1.4
75	3	1.0	1.6
76	1	1.0	1.6

URL 16933

BASED ON NIOSH COMPILATION
OF NOV 29, 1975 AND
ONE DEATH REPORTED IN 1976

REPORTED DEATHS FROM ANGIOSARCOMA OF THE LIVER
IN POLYVINYL CHLORIDE WORKERS

GERMANY	7	USA	17
FRANCE	6	CANADA	<u>10</u>
SWEDEN	3		27
ITALY	3		
UK	2		
NORWAY	1		
BELGIUM	<u>1</u>		
	23		
E EUROPE	<u>4</u>		
	27		

NUMBERS APPROXIMATE
MARCH 1977

NIOSH
November 12, 1975

TABLE 1
REPORTED CASES OF ANGIOSARCOMA OF THE LIVER AMONG
VINYL CHLORIDE POLYMERIZATION WORKERS

COUNTRY	CASE #	BIRTH DATE	1st VC or PVC EXPOSURE	DX ANGIO-SARCOMA	AGE AT DX	YRS 1st EXP TO DX	TOT YRS EXP	DATE OF DEATH
Canada	01*	AWAITING DETAILS						
Canada	02*	AWAITING DETAILS						
Canada	03*	AWAITING DETAILS						
Canada	04*	AWAITING DETAILS						
Canada	05*	AWAITING DETAILS						
Canada	06*	AWAITING DETAILS						
Canada	07*	AWAITING DETAILS						
Canada	08	AWAITING DETAILS						
Canada	09	AWAITING DETAILS						
Canada	10	AWAITING DETAILS						
Czechoslovakia	01*	00-00-28	00-00-57	00-00-73	46	16	16	00-00-74
Czechoslovakia	02*	00-00-26	00-00-51	00-00-66	40	15	15	00-00-66
Fed. Rep. Germany	01*	07-26-31	10-14-57	09-25-70	40	13	12	12-14-71
Fed. Rep. Germany	02*	06-24-30	10-01-57	09-19-68	38	11	11	01-25-69
Fed. Rep. Germany	04	09-04-30	04-16-57	00-00-74	44	17	11	11-25-74
Fed. Rep. Germany	05*	04-28-25	02-00-57	07-00-74	49	17	12	ALIVE
Fed. Rep. Germany	06*	01-01-32	07-26-62	00-00-75	43	13	12	01-09-75
France	01*	04-15-24	01-00-46	02-18-67	43	21	19	02-19-67
France	02	06-03-11	07-06-59	01-08-75	63	15	12	01-24-75
France	03*	00-00-19	00-00-46	01-00-75	55	29	29	ALIVE
Great Britain	01*	00-00-01	00-00-46	12-00-72	71	26	20	12-00-72
Great Britain	03	06-02-37	02-00-66	00-00-74	37	9	4	12-24-74
Italy	02*	11-13-29	00-00-57	12-13-72	43	15	6	12-00-72
Italy	03*	03-14-20	00-00-53	07-10-75	55	22	21	07-10-75
Norway	01*	12-23-15	03-00-50	12-20-71	56	22	21	01-04-72
Sweden	01*	06-23-27	08-14-51	02-00-70	43	19	18	10-20-70

TABLE I (continued)

REPORTED CASES OF ANGIOSARCOMA OF THE LIVER AMONG
VINYL CHLORIDE POLYMERIZATION WORKERS

COUNTRY	CASE #	BIRTH DATE	1st VC or PVC EXPOSURE	DX ANGIO-SARCOMA	AGE AT DX	YRS 1st EXP TO DX	TOT YRS EXP	DATE OF DEATH
United States	01*	10-17-23	12-09-48	03-03-73	49	22	16	03-03-73
United States	02*	08-19-33	11-15-55	05-00-70	37	14	13	09-28-71
United States	03*	05-25-15	11-28-45	12-19-73	58	28	28	12-19-73
United States	04*	01-15-24	07-06-52	08-19-67	43	15	15	01-07-68
United States	05*	01-25-12	06-19-44	04-09-64	52	20	18	04-09-64
United States	06*	00-00-29	01-17-62	02-00-74	45	12	12	07-24-75
United States	07*	05-03-22	08-00-44	00-00-68	45	24	18	03-23-68
United States	08*	05-06-20	10-07-46	08-00-61	41	15	15	08-29-61
United States	09*	11-08-31	09-09-54	03-01-74	43	17	17	03-00-75
United States	10*	08-16-13	06-12-51	05-00-68	55	17	17	05-10-68
United States	11*	05-27-09	10-14-46	03-00-70	61	23	23	03-16-70
United States	12*	11-17-18	09-13-49	05-02-69	50	20	15	05-02-69
United States	13*	12-01-21	08-19-44	05-00-74	52	30	30	07-04-74
United States	16*	11-04-27	05-08-50	00-00-69	41	17	4	03-27-69
United States	17*	05-06-31	06-23-55	10-11-74	43	19	19	ALIVE
United States	18*	04-22-28	00-00-54	00-00-75	46	21	13	11-02-75
United States	19	00-00-15	00-00-43	06-19-75	60	32	32	ALIVE
Yugoslavia	01*	04-05-14	00-00-53	04-08-73	59	20	20	04-08-73
Yugoslavia	02*	11-15-31	00-00-50	07-12-73	42	23	18	07-12-73

Total Reported Cases = 45

Median Values:

17 U.S. Cases

17 Non-U.S. Cases

34 Total Cases

46.0 20.0 17.0

43.0 17.0 15.0

45.0 18.0 16.0

* Indicates microscopically confirmed angiosarcoma of the liver.

"00" Indicates unknown data.