

NW Coines / RT Kramer / R Steele - I mentioned this in our
Very interesting 2/12 meeting on KV
Doug Ben
NEW YORK UNIVERSITY MEDICAL CENTER
School of Medicine
350 FIRST AVENUE, NEW YORK, N.Y. 10016
AREA 212 679-3200
CABLE ADDRESS: NYUMEDIC
Department of Pathology

Received Feb 1979

RT / R Steele

I have a copy of it

October 24th, 1978

Occupational Safety & Health Administration
Office of Consumer Affairs
Room N-3635
U.S. Department of Labor
Third Street and Constitution Avenue, N.W.
Washington, D.C. 20210

Re: Docket # H 090

Dear Sirs:

Enclosed is my Post-Hearing Comment. The statements, data and arguments in it should not be interpreted as being those of the New York University Medical Center, as an institution.

Yours truly,

Harry B. Demopoulos

Harry B. Demopoulos, M.D.
Associate Professor
(for identification purposes only)

HBD:nz
Enclosures

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Post Hearing Comments:
A Dispassionate, Scientific Review of the Predominant
Causes of the Major Lethal Cancers in People, in the
United States

by

Harry B. Demopoulos, M.D.

Regarding the proposed new regulation
concerning the identification, classi-
fication and regulation of toxic sub-
stances posing a potential occupational
carcinogenic risk, by OSHA,
docket # H 090

The comments, data and arguments
herein should not be interpreted
as being those of the New York
University Medical Center, as an
Institution

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I. Introduction

I have participated in the recent OSHA Hearings that have focused on the proposed regulations to control carcinogens in the workplace because the studies that were conducted while I was the Director of the fledgling Cancer Center Institute of New Jersey (CINJ) in 1976 are directly relevant to the fears and concerns expressed by OSHA, the labor unions, and selected academicians. This Post-Hearing Comment is made for the same reasons, and on the same basis, i.e., the responsibility to report to the public, the results of studies performed with public funds, that have a bearing on the public welfare. .

A great deal of effort was expended at CINJ to probe the bedeviling question of what was causing so much cancer in the state of New Jersey, as indicated by the National Cancer Institute's U.S. Cancer Mortality by County: 1950-1969. In these probes we sought help for the public at large, and for the workers in the enormous chemical/petroleum plants in New Jersey by turning to the best available, objective data for clues as to the major causes of the lethal cancers. The weapons that could bring about a significant reduction in the cancer statistics that had placed New Jersey at the top of the mortality rate were: 1) Prevention and 2) Early Detection. The latter weapon was clear cut in that several leading cancer killers, like breast, colon, and uterine cancer, were amenable to inexpensive screening tests, and numerous studies had demonstrated that early diagnosis, while the primary cancer was still small and asymptomatic, could result in immediate striking decreases in the projected, future death rates. Prevention, however, required the knowledge of who the "real culprits" were in cancer causation; we recognized that if we chased the wrong ones, then the real culprits would continue to get away to add to the toll. When resources are limited, as ours were at CINJ then, and as the nation's are now, there is no margin for error. This search had become clouded in 1976 in New Jersey, with the media carrying almost daily reports provided by various officials that "... it's in the water...", "...it's in the air...", "...it's industry!" Now, in 1978, at the national level, the direction that Prevention efforts should proceed in are similarly enshrouded. The studies conducted at CINJ provide directions for Prevention efforts at a national level and are reviewed herein. Our data resources included the bibliographic references in this document as well as two major works by the National Cancer Institute:

- the NCI's Third National Cancer Survey: Incidence Data (1969-1971), which yields age-corrected cancer data on approximately 10% of the nation's population with sample areas that include: urban areas with heavy chemical industry (Detroit, Pittsburg, Birmingham); urban areas without heavy chemical industry (Atlanta, Dallas, Minneapolis); comparatively rural areas devoid of heavy chemical industry (States of Iowa and Colorado). The data is provided according to sex, race, age, standardized anatomic site of the original primary malignancy, and geographic areas. The data is expressed per 100,000 population and was certified as accurate by high-quality microscopic examinations of the malignancies.

- the NCI's U.S. Cancer Mortality by County: 1950-1969, which provides age-corrected cancer death rates, by sex, race and county, per 100,000 population for the 20 year period, 1950-1969; this data covered every county in the United States; by cross-checking with other federal studies and with encyclopedic references, we were able to compare geographic areas of similar urban density, with and without heavy chemical and petroleum industry.

II. Consideration of Major Variables in Cancer Causation.

Our rationale for conducting these studies was as follows. If the Heavy Chemical and Petroleum Industries do pose a carcinogenic threat to their employees, and worse yet, to the public at large who live in juxtaposed communities, then there should be higher cancer incidence and higher cancer mortality rates in those geographic areas of the United States that have Heavy Chemical/Petroleum Industries, compared to other areas of the U.S.A. that are similar in urban density and in other major variables. Before embarking on studies that could guide Prevention efforts, we reviewed the major variables in cancer causation.

Other studies, published by noted epidemiologists, including those from the NCI, have substantiated the need to control for the variable of urban density when making comparisons of cancer incidence and cancer mortality. (Hoover, R., Mason, T.J., McKay, F.W., and Fraumeni, J.F. Geographic patterns of cancer mortality in the United States. In: Persons At High Risk. (ed) J.F. Fraumeni, New York, Academic Press, 1975, p. 343). Urban density is as important as age, sex and race in the development of cancer; the percentage differences between urban and rural areas are on the average larger than the differences seen between the sexes and the races. For specific types of cancers the urban-rural differences can be very large, as shown in the accompanying Table 1 from Hoover's cited paper. The listed ratios can be converted to percent by subtracting 1 from the ratio and then multiplying by 100, e.g., a ratio of 3.08 is 208%, a ratio of 2.96 is 196%, etc. The increases due to urbanization are substantial and as other studies to be cited in this presentation will show, the increases are not due to air pollution from cars and industry (see Section III Cancer and Air Pollution in this document).

Table 2 from Hoover's cited paper, shows the relationship of Socio Economic Status (SES) within a race, and increased cancer risk. With higher SES, certain major cancers are increased, e.g., rectum 113%, thyroid 72%, colon 67%, bladder 67%, etc. The generally higher incomes and higher standards of living, particularly for whites, within urban areas compared to rural, may account for some of the urban-rural differences.

The question now at CINJ was, in view of the fact that New Jersey's population is the most urbanized of any state (nearly 90%), were the rates really high? The surprising answer was no. In fact, areas such as Nassau County, and Westchester County (wealthy, urbanized suburbs of New York City devoid of industry), San Francisco, and district of Columbia, had higher or equally high cancer mortality

GEOGRAPHIC PATTERNS OF CANCER MORTALITY

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TABLE 1

Urban-rural ratios of age-adjusted cancer mortality rates^a among whites in the contiguous United States, according to cancer site and sex, 1950-1969

Site	Male		Site	Female	
		Urban/rural			Urban/rural
Esophagus		3.08	Esophagus		2.12
Larynx		2.96	Rectum		2.11
Mouth and throat		2.88	Larynx		1.92
Rectum		2.71	Nasopharynx		1.66
Nasopharynx		2.17	Lung		1.64
Bladder		2.10	Breast		1.61
Colon		1.97	Bladder		1.58
Lung		1.89	Other endocrine glands		1.52
Breast		1.77	Ovary		1.52
All malignant neoplasms		1.56	Colon		1.51
Thyroid gland		1.56	Non-Hodgkin's lymphoma		1.42
Other endocrine glands		1.53	Hodgkin's disease		1.39
Stomach		1.45	Thyroid		1.38
Kidney		1.44	All malignant neoplasms		1.36
Non-Hodgkin's lymphoma		1.39	Stomach		1.35
Other and unspecified		1.38	Pancreas		1.34
Connective tissue		1.35	Mouth and throat		1.29
Pancreas		1.34	Connective tissue		1.28
Biliary passages and liver (primary)		1.34	Brain		1.26
Salivary glands		1.31	Multiple myeloma		1.25
Hodgkin's disease		1.25	Other and unspecified		1.17
Brain		1.21	Leukemia		1.15
Multiple myeloma		1.12	Kidney		1.12
Nasal sinuses		1.10	Salivary glands		1.12
Leukemia		1.07	Nasal sinuses		1.08
Bone		1.05	Biliary passages and liver		1.04
Melanoma of skin		1.01	Corpus uteri		1.00
Prostate		.96	Cervix uteri		1.00
Testis		.96	Eye		.92
Eye		.77	Bone		.89
Other skin		.67	Melanoma of skin		.87
Lip		.57	Other skin		.65
			Lip		.39

^aRates were calculated for 100 percent urban and 100 percent rural counties.

TABLE 2
Social-class ratios of age-adjusted cancer mortality rates^a among whites in the contiguous United States, according to cancer site and sex, 1950-1969

Site	Male	Site	Female
	Social-class ratio (hi:low)		Social-class ratio (high:low)
Rectum	2.13	Rectum	1.67
Thyroid gland	1.72	Breast	1.54
Colon	1.67	Ovary	1.52
Bladder	1.67	Other endocrine glands	1.52
Other endocrine glands	1.59	Non-Hodgkin's lymphoma	1.49
Connective tissue	1.54	Colon	1.45
Kidney	1.49	Connective tissue	1.43
Esophagus	1.49	Multiple myeloma	1.39
Non-Hodgkin's lymphoma	1.37	Hodgkin's disease	1.37
Multiple myeloma	1.35	Brain	1.35
Mouth and throat	1.19	Nasopharynx	1.23
Testis	1.18	Lung	1.27
Breast	1.18	Bladder	1.19
Brain	1.18	All malignant neoplasms	1.18
All malignant neoplasms	1.16	Kidney	1.14
Hodgkin's disease	1.14	Eye	1.12
Leukemia	1.11	Pancreas	1.10
Lung	1.10	Thyroid gland	1.09
Nasopharynx	1.10	Leukemia	1.06
Prostate	1.09	Stomach	1.03
Stomach	1.09	Nasal sinuses	1.01
Larynx	1.02	Esophagus	.97
Pancreas	1.01	Corpus uteri	.94
Melanoma of skin	.98	Biliary passages and liver	.94
Nasal sinuses	.96	Salivary glands	.86
Biliary passages and liver	.88	Other and unspecified	.85
Eye	.87	Melanoma of skin	.85
Other and unspecified	.85	Mouth and throat	.78
Salivary glands	.83	Cervix uteri	.74
Lip	.81	Bone	.69
Bone	.81	Larynx	.67
Other skin	.53	Other skin	.47
		Lip	.32

^aSee text for method of choosing high and low social-class counties.

rates, for white males, per 100,000. The white male cancer rates, incidentally, are most often used for comparisons because they account for the largest numbers of cancers.

Philadelphia	221/100,000
St. Louis, Missouri	220/100,000
New York City	215/100,000
Nassau County (an Eastern suburb of New York City)	212/100,000
San Francisco	206/100,000
Chicago	205/100,000
New Jersey	205/100,000
District of Columbia	203/100,000
Westchester County (a Northern suburb of New York City)	200/100,000
U.S.A. Nationwide	174/100,000

This initial CINCJ study demonstrated that serious misimpressions could be made if comparisons were made against invalid controls, wherein a key variable, such as urbanization, is not considered. In Dr. Samuel S. Epstein's book, the Politics of Cancer (Sierra Club Books, San Francisco, 1978) this type of error is made in his Table 1.10, p. 29, wherein he compares New Jersey, Wyoming and North Carolina. As a result of this comparison he concludes that New Jersey's higher rates are due to the Chemical, Petroleum Industries. Unfortunately, uncontrolled comparisons such as these by Epstein form the basis for much of the book, and for much of the document submitted to OSHA by NIOSH, NCI, and NIEHS, entitled Estimates of the Fraction of Cancer in the United States Related to Occupational Factors. The latter document, quite erroneously, relies heavily on extrapolations from an article published in Ca-A Journal for Clinicians (volume 28, 1978, p.87) by I.J. Selikoff and E.C. Hammond, entitled Asbestos-associated disease in United States shipyards. In this article, comparisons are made between the cancer deaths in asbestos insulation workers, and those expected cancer deaths in the average white male, as obtained from age-specific mortality data from the U.S. National Center for Health Statistics. As seen in Table 1 and Table 3 of this article by Selikoff and Hammond, a comparison with the average U.S. white male suggests that asbestos workers have approximately a 200% greater cancer rate; for example, Table 1, 319 total cancer deaths Expected, versus 994 Observed in the workers. Many, if not most, of the asbestos insulation workers were in urban areas, which could, in and of itself, account for much of the 200% apparent increase in cancer rates among the asbestos workers. Further, Selikoff's data does not take into account other factors, besides urban-rural differences, that markedly increase the risk for several forms of cancer. For example, socio-economic status, cigarette smoking, alcohol consumption, and fat ingestion (see References at end of this document). The asbestos insulation workers were high wage earners, a factor that made Selikoff's follow-up relatively easy since there was a low rate of job turn-over; however, this led to increases in socio-economic status. The lack of controlling for cigarette use in the asbestos cancer deaths is serious since several forms of cancer are caused by smoking. Hammond (Tobacco

TABLE 1
Deaths among 17,300 asbestos insulation workers
in the United States and Canada
January 1, 1967-January 1, 1977

Number of men	17,300
Man-years of observation	166,255

	Expected*	Observed
Total deaths, all causes	1,660.96	2,270
Total cancer, all sites	319.90	994
Lung cancer	105.97	485
Pleural mesothelioma	**	66
Peritoneal mesothelioma	**	109
Cancer of esophagus	7.01	18
Cancer of stomach	14.23	22
Cancer of colon-rectum	37.95	59
All other cancer	154.83	235
Asbestosis	**	162
All other causes	1,351.06	1,114

* Expected deaths are based upon white male age specific mortality data of the U.S. National Center for Health Statistics for 1967-1975 and extrapolation to 1976.

** These are rare causes of death in the general population.

The membership of the International Association of Heat and Frost Insulators and Asbestos Workers, AFL-CIO, CLC, was enrolled on January 1, 1967, and has been observed since.

TABLE 3
Deaths among 17,300 asbestos insulation workers in the United States and
Canada January 1, 1967-January 1, 1977: Analysis by
duration from onset of employment

Total men	12,583	12,051
Man-years of observation	89,466	77,389
	Before 20 years from onset	20 or more years from onset
	Expected* Observed	Expected* Observed
Total deaths, all causes	283.93 324	1,377.01 1,946
Cancer, all sites	42.65 83	277.25 911
Lung cancer	12.03 38	93.94 449
Pleural mesothelioma	.. 2	.. 64
Peritoneal mesothelioma	.. 3	.. 106
Cancer of esophagus	0.66 1	6.25 17
Cancer of stomach	1.56 1	12.57 21
Cancer of colon-rectum	4.07 4	13.79 55
Asbestosis	.. 3	- 154

*Expected deaths are based upon white male age specific mortality data of the U.S. National Center for Health Statistics for 1967-1975 and extrapolation to 1976.

**These are rare causes of death in the general population.

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In: Persons at High Risk of Cancer. (ed.) J.F. Fraumeni, New York, Academic Press, 1975, p. 131. ~~has shown statistically significant increases in cancer death rates in smokers in the following forms of cancer:~~

buccal cavity	890%
lung	684%
larynx	509%
esophagus	317%
pancreas	169%
bladder	100%

It is imperative when comparing cancer data for the purposes of strategizing a Prevention program to control for the variables discussed in this section. In using national data, it is often impossible to obtain information on socio-economic status, and the consumption of cigarettes, alcohol and fats. However, urban densities can be readily controlled and can prove valuable, as indicated in the next section.

III. Urban Centers With and Without Chemical/Petroleum Industry

In studying the Third National Cancer Survey: Incidence Data (1969-1971) comparative data was obtained which is summarized in the accompanying Table. The tabular data lists all cancers for all the standardized anatomic sites, as well as for three anatomic sites that are allegedly more likely to develop malignancy if the person lives in a county with heavy chemical/petroleum industry (see Blot, W.J., Brinton, L.A., Fraumeni, J.F., and Stone, B.J. Cancer mortality in U.S. Counties with petroleum industries. Science 198: p.51, 1977). In Blot's study, a major point was made of the data which suggested that the risk of developing cancers of the lung, nasopharynx and stomach were significantly greater in the 39 petroleum/chemical counties studied. It should be pointed out, incidentally, that Blot's selection of these 39 counties was not based on any attempt to choose a representative sample of the 604 petroleum counties in the U.S. This is freely admitted in Blot's article. Hence, although Blot's study was not meant to be representative, many individuals have made unwarranted extrapolations and have concluded that Blot's study shows that the chemical/petroleum industries in the 604 petroleum counties pose a higher cancer risk to the public, and to the workers. Therefore, these extrapolators of Blot's work continue, there is an urgent need to have far more stringent control over occupational exposures to chemicals. Many of the extrapolations of Blot's work show serious inconsistencies, e.g., there was no increase in lymphomas and leukemias in Blot's, yet, Epstein, in his book, The Politics of Cancer, p. 122, states that benzene causes lymphomas and leukemias, and that the petroleum/chemical industries therefore cause these types of cancers through environmental pollution with benzene.

The data in the table show, quite surprisingly, that over-all cancer incidence is lower in those urban areas with industry (average 299/100,000) compared to urban areas without industry (average 31-/100,000), and that there is no significant difference in the incidence of cancers that some individuals believe are more likely to occur in areas with heavy chemical/petroleum industry, i.e., rates for lung, nasopharynx, and stomach are almost identical for the two types of urban areas.

Table 1.

Average Annual Cancer Incidence in Urban Areas, with and without Heavy Chemical/Petroleum Industry (from the Third National Cancer Survey: Incidence Data, 1969-1971, Tables 10c, 11c, 12c, 13c, 14c, 15c, 16c; age-adjusted, white males per 100,000)

	All Cancers	Lung	Naso- pharynx	Stomach
Urban Areas with Heavy Chemical/ Petroleum Industry ¹				
Detroit	303	67	0.8	13.5
Pittsburg	299	67	0.8	14.5
Birmingham	<u>294</u>	<u>83</u>	<u>0.4</u>	<u>7.6</u>
average	299	72	0.7	11.9
Urban Areas without Heavy Chemical/ Petroleum Industry ¹				
Atlanta	304	72	1.1	7.4
San Francisco ²	330	68	0.8	14.2
Dallas	321	78	1.0	9.2
Minneapolis	<u>311</u>	<u>57</u>	<u>0.5</u>	<u>13.3</u>
average	314	69	0.8	11.0

Footnotes:

1. Heavy Chemical/Petroleum Industry includes those industries where chemical/petroleum products are produced, or used extensively in manufacture, e.g., automobile industry.

2. San Francisco's data in the Third National Cancer Survey includes the city of San Francisco, plus the counties of Alameda, Contra Costa, Marin and San Mateo. A study of the U.S. Cancer Mortality by County reveals that the cancer death rate/100,000, for white males, from 1950-1969 was 212 for San Francisco, 179 for Alameda, 174 for Contra Costa, 174 for Marin, and 176 for San Mateo. The average U.S. nationwide was 174, indicating that the San Francisco data in the Third National Cancer Survey is diluted by the inclusion of the low cancer mortality counties. No attempt, however, was made to correct for this in the above Table; the San Francisco data was used as it appeared in the Third National Cancer Survey.

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As a consequence of our CIMS studies we concluded that according to the best available data, there is no correlation between high cancer rates and the presence of heavy chemical/petroleum industry. It therefore seems unlikely, with the exception of a few very special instances, that occupational exposures of chemical/petroleum workers or pollution of communities juxtaposed to industrial sites have contributed in a significant way to the development of cancer. The estimate that 1-4% of human cancers are occupationally induced is a generalization that is too high. Perhaps 1-4% are industry-related wherein an occupational exposure, plus more generally used carcinogens such as cigarette smoke or alcohol, bring about additive or synergistic effects under unusual circumstances, e.g., extra-ordinary asbestos exposure and cigarette smoke leading to bronchogenic cancer. Such instances are quite rare, when put into perspective. If additive or synergistic effects were generally significant for human carcinogenesis, then we should have seen higher cancer rates in those urban areas that have heavy chemical/petroleum industries. Instead, we saw slightly lower rates in such urban, industrialized areas. It should be noted that the seven cities compared (Detroit, Pittsburgh, and Birmingham versus Atlanta, San Francisco, Dallas and Minneapolis) represent 16 million people out of the 21 million total in the Third National Cancer Survey. Hence, the data do not represent some type of exception.

IV. Cancer and Air Pollution

With respect to "...What is it about urbanization that leads to higher cancer rates..." some people would jump to the conclusion that it is the air pollution in crowded, urban areas. The objective answer to this is, "...not so...", based on NCI data, as well as data from one of the most heavily air-polluted countries in the world, Japan.

Let us examine California first since it provides excellent data on the question of air pollution. Los Angeles is notorious in the U.S. and averages over 300 days per year of air quality that is "unhealthy, or hazardous" according to the National Wildlife Federation. San Francisco has about 125 such days per year. Further, in Los Angeles, there is heavy petroleum industry concentrated near the coastline so that the prevailing west to east winds carry the pollutants inland and add them to the stagnant automotive exhaust. San Francisco is bathed in pure Pacific Ocean breezes. Yet, according to the NCI's U.S. Cancer Mortality by County: 1950-1969, the figures are as follows for white male deaths in Los Angeles and San Francisco:

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Los Angeles	175/100,000
San Francisco (alone)	212/100,000
U.S. Nationwide	174/100,000

Lung

Los Angeles	41/100,000
San Francisco (alone)	47/100,000
U.S. Nationwide	38/100,000

Nasopharynx

Los Angeles	0.4/100,000
San Francisco (alone)	0.6/100,000
U.S. Nationwide	0.38/100,000

Stomach

Los Angeles	15/100,000
San Francisco (alone)	20/100,000
U.S. Nationwide	15/100,000

Again, there is an absence of the "expected" correlation, that air-pollution must cause cancer, especially in a petroleum county.

From Japan, Kunio Aoki and Hiroyuki Shimizu published a paper entitled "Lung Cancer and Air Pollution" in an NCI Monograph, #47, called Epidemiology and Cancer Registries in the Pacific Basin. They showed an absence of a correlation between lung cancer and highly industrialized areas. Further, they showed a gradation in incidence that paralleled the density of population; both rose together.

V. The Predominant Causes of the Major Lethal Cancers

The question then is what urban factors do cause cancer, if it is not industry, and it is not air-pollution? The answer may lie in life-styles and the consequent habits that develop in urban areas with respect to cigarette use, alcoholism, and poor nutritional practises. Cigarettes alone account for virtually all of the lung cancers, and major percentages of cancer of the urinary bladder and pancreas; all told, cigarettes alone account for 30% of the cancer mortality rate. When cigarette smoking is coupled with alcoholism, an additional 10% of the cancer mortality is explained by the causation of cancers of the mouth, larynx and esophagus following the conjoint use of cigarettes and alcohol. Poor nutritional practises, such as excess fat intake, and obesity lead to an estimated additional 40% of the cancer death rate by promoting the development of such cancers as colon, rectum, breast and others. These life-style aspects of urbanized humans may help explain the significantly higher cancer rates in urban areas. Additional evidence that life-style is involved comes from a study of the Seventh Day Adventists; many of these 500,000 Americans live in places like the Washington, D.C. area and Los

Angeles. They do not smoke, or drink and are vegetarians. Roland Phillips and Jan W. Huzma found that the over-all cancer rates in 7th Day Adventist males was one half that of the U.S. Nationwide rate for white males. (see Rational and methods for an epidemiologic study of cancer among Seventh Day Adventists, in Epidemiology and Cancer Registries in the Pacific Basin, NCI monograph #47). (See attached references).

VI. The Role of Occupational Exposures

With respect to the idea that occupational exposures cause between 20-40% of cancers, as expressed in the recently submitted document, "Estimates of the Fraction of Cancer in the United States Related to Occupational Factors", prepared by individuals from NIOSH, NCI, NIEHS and submitted to OSHA for the hearings on occupational carcinogens, the following should be borne in mind:

- major reliance is placed on Selikoff's data which purports to show that asbestos insulation workers have higher cancer death rates from cancers of the lung and gastro-intestinal tract, compared to the average U.S. white male; this is a serious error in comparisons, since most of the workers were concentrated within urban centers. The valid control groups are white males in urban areas, not average U.S. figures.
- extensive extrapolations are made upon data bases that are in themselves very limited, and uncontrolled, e.g., smoking, alcohol and nutritional factors are generally not considered in the original studies that were extrapolated.

The "Estimate" that 20-40% of cancers are occupationally related with directly causal agents in the workplace, or additive/synergistic effects is wrong. If the massive extrapolations in this "Estimate" document were valid then we should see more cancer in urban areas that have a great deal of industry. Instead, we do not see this when we use National Cancer Institute data, e.g., Third National Cancer Survey. (see Section III of this document).

The pervasive question raised by the "Estimate" document is whether potentially carcinogenic industrial substances have escaped into the communities and have caused cancer. The studies in Section III show that this is not the case. However, we went further in view of the continuing public remarks of some individuals that asbestos has not only escaped, but is ubiquitous, particularly in urban areas.

An asbestos-risk study was initiated by CUNY in late 1976 in view of the fact that New Jersey has a major asbestos industry in Manville, N.J. One of the components of this study was to determine the numbers of mesotheliomas seen in large urban medical centers in the Greater New York/New Jersey Area over the ten years, 1967-1976, as one of several bases for future comparisons. Among the largest, most complete contributors to this data pool were the four affiliated hospitals of the New York University Medical Center: Bellevue, University, Manhattan VA, and Booth Memorial. The data from these hospitals is particularly interesting in the light of the implications made by

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Selikoff and others that the "marker tumors" of asbestos (pleural/peritoneal mesotheliomas) are harbingers of a massive wave of cancers induced by exposures to industrial sources. Supposedly, even a one-time exposure to small quantities of asbestos will pose an increased risk for the future development of not only the "marker tumors", but also bronchogenic and gastro-intestinal tract cancers, in the general public as well as industry workers. If Selikoff's dire predictions have objective, scientific validity, then there should be a clearly evident trend in the appearance of pleural/peritoneal mesotheliomas over the ten years, 1967-1976. The Third National Cancer Survey: Incidence Data catalogued a total of 134 pleural/peritoneal mesotheliomas in the years 1969, 1970, 1971 in the approximate 163,000 cancers included in the survey of all the geographic areas. This is approximately 1 mesothelioma per every 1,000 new cancer cases seen. The Third National Cancer Survey did not provide a breakdown of the distribution of these mesotheliomas according to geographic areas, but the figure of 1/1000 new cancer cases is useful. At the N.Y.U. hospitals an average of 3,000 new cancer cases are seen each year (Squamous and Basal Cell Carcinomas of Skin are not included). The excellence of the anatomic pathology services, coupled with good records and tumor registries provided the numbers of cases summarized in the accompanying Table. There was slightly less than one mesothelioma per 1000 new cancer cases (26 mesotheliomas in ten years, with 30,000 new cancer cases), or 0.86/1000 cancer cases/per year. The NYU figures are of interest for several reasons:

- there is no trend over the years, as would be expected if Selikoff's fears were valid
- the four hospitals provide a significant cross-section of the public from the New York/New Jersey areas, and include balanced percentages of lower, middle and upper income patients
- New York City and New Jersey have had significant asbestos exposure, according to Selikoff, because of the wartime ship-building industry, extensive construction, the use of asbestos in New York City grade-school materials, demolitions, heavy use of automobiles with release of asbestos from the brakes, the clothing industry which sometimes has included asbestos fibers, etc.

Table 2.

Mesothelioma cases at the New York University
Medical Center (1967-1976)¹

	<u>Probable or Compatible</u>	<u>Definite</u>	<u>Total # for the four Hospitals</u>
1967	0	3	3
1968	1	1	2
1969	0	3	3
1970	2	2	4
1971	0	1	1
1972	0	2	2
1973	0	1	1
1974	1	2	3
1975	2	2	4
1976	2	1	3
TOTAL:	8	18	26

¹Footnote:

New York University Medical Center includes four Hospitals:
University, Bellevue, Manhattan Veterans Administration and the
Booth Memorial Hospital in Queens.

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VII. Summary

In summary, although we have searched extensively, we have been unable to find any direct, positive correlations between the presence of heavy chemical/petroleum industry and the development of cancer. This is true for the New Jersey and New York areas, as well as for the rest of the country as shown in the Third National Cancer Survey and in the U.S. Cancer Mortality by County: 1950-1969. We also found no increase in the urban areas with heavy chemical/petroleum industry, in selected anatomic sites that are thought to be at greater risk, e.g. lung, nasopharynx, and stomach. These studies, plus the serious flaws in the data base used for extrapolations in the NIOSH/NCI/NIEHS "Estimates" document submitted to OSHA, indicate that in no way can occupational factors account for 20-40% of the cancer mortality in the U.S.A. Dr. Donald Louria, Chairman of the Department of Preventive Medicine and Community Health, in the New Jersey Medical School, studied this question in New Jersey, with New Jersey state funds. His paper, "Cancer in New Jersey: An Overview," was presented at the "Seminar for Physicians: Cancer Risk Identification Within New Jersey and Methods of Cancer Control", May 1-2, 1976. He concludes his paper by stating, "...only about 600 or 4 percent of the deaths can be felt to be related to industrial exposure". Wynder recently ascribed a similar low percentage to industrial exposure (Toward the Prevention of Cancer. Cancer Bulletin 29: p. 186, 1977).

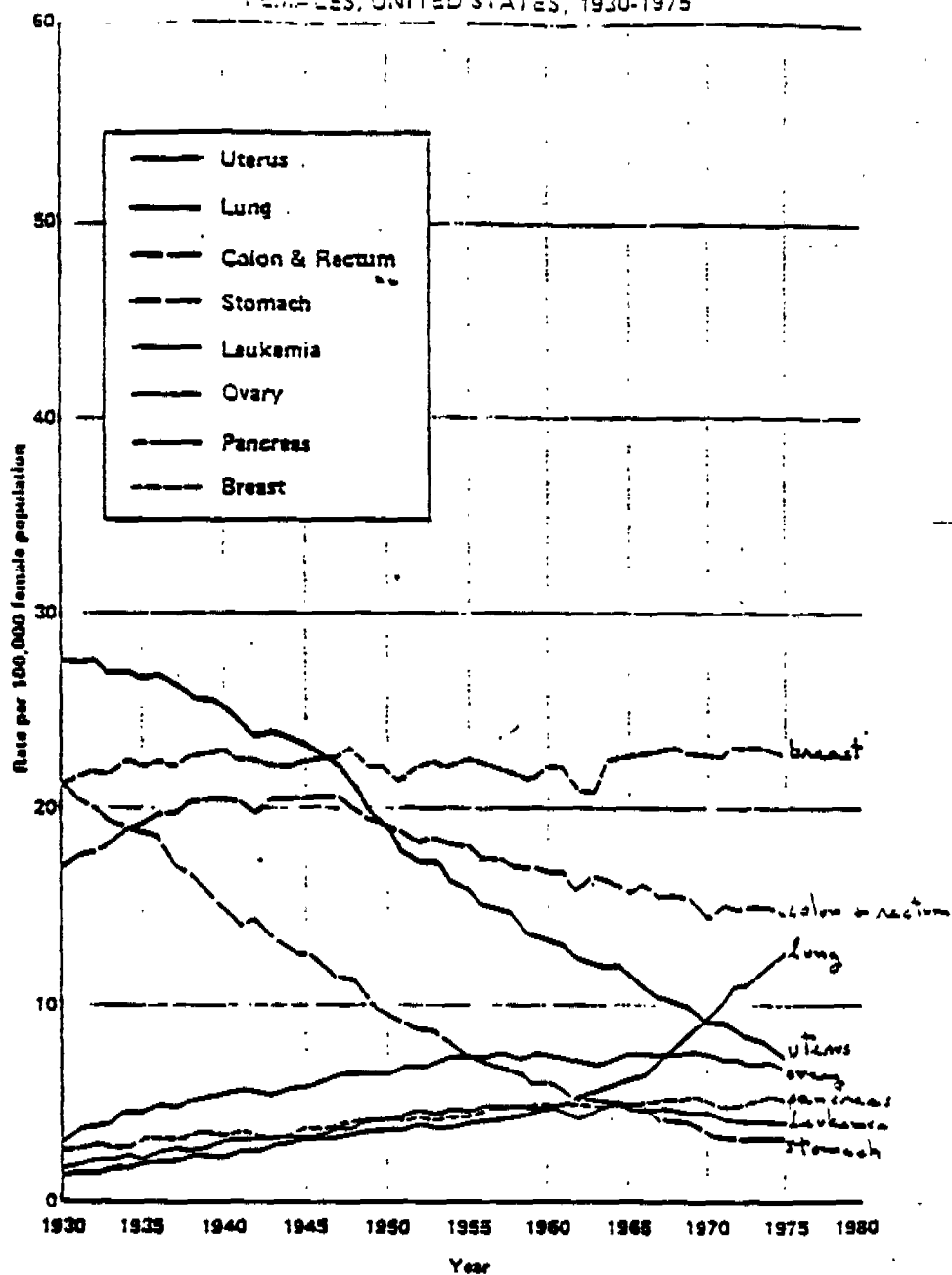
There are many inconsistencies to OSHA's approach to the cancer problem. Some of these inconsistencies have been demonstrated by the studies we conducted at the Cancer Institute of New Jersey with the aid of an NCI "Planning grant". Other serious inconsistencies that we did not specifically study are pointed out in closing:

- it is widely acknowledged that cancer of the stomach is a rapidly disappearing disease, and the causes for this striking downturn over the past 15-20 years are not known; in any case, this most dramatic event (stomach cancer used to be the leading cancer killer in men) is not in keeping with the implications made from Blot's work (Science 198: p.51, 1977) that petroleum/chemical industries pose an increased risk for the development of certain cancers, like stomach, in the public at large.
- if lung cancers are excluded, the over-all cancer rates have not changed in any statistically significant way in the past 15 years; the lung cancers that we are seeing now were initiated 20-35 years ago, when filter tips were rare, and the great bulk of the smoking was done by males; current trends in the use of greater filtration and more female smokers will not beneficially affect the male lung cancer rates for another 10-15 years. See attached tables, reprinted from Ca - A Journal for Clinicians (volume 28, 1978, pp. 20, 21).

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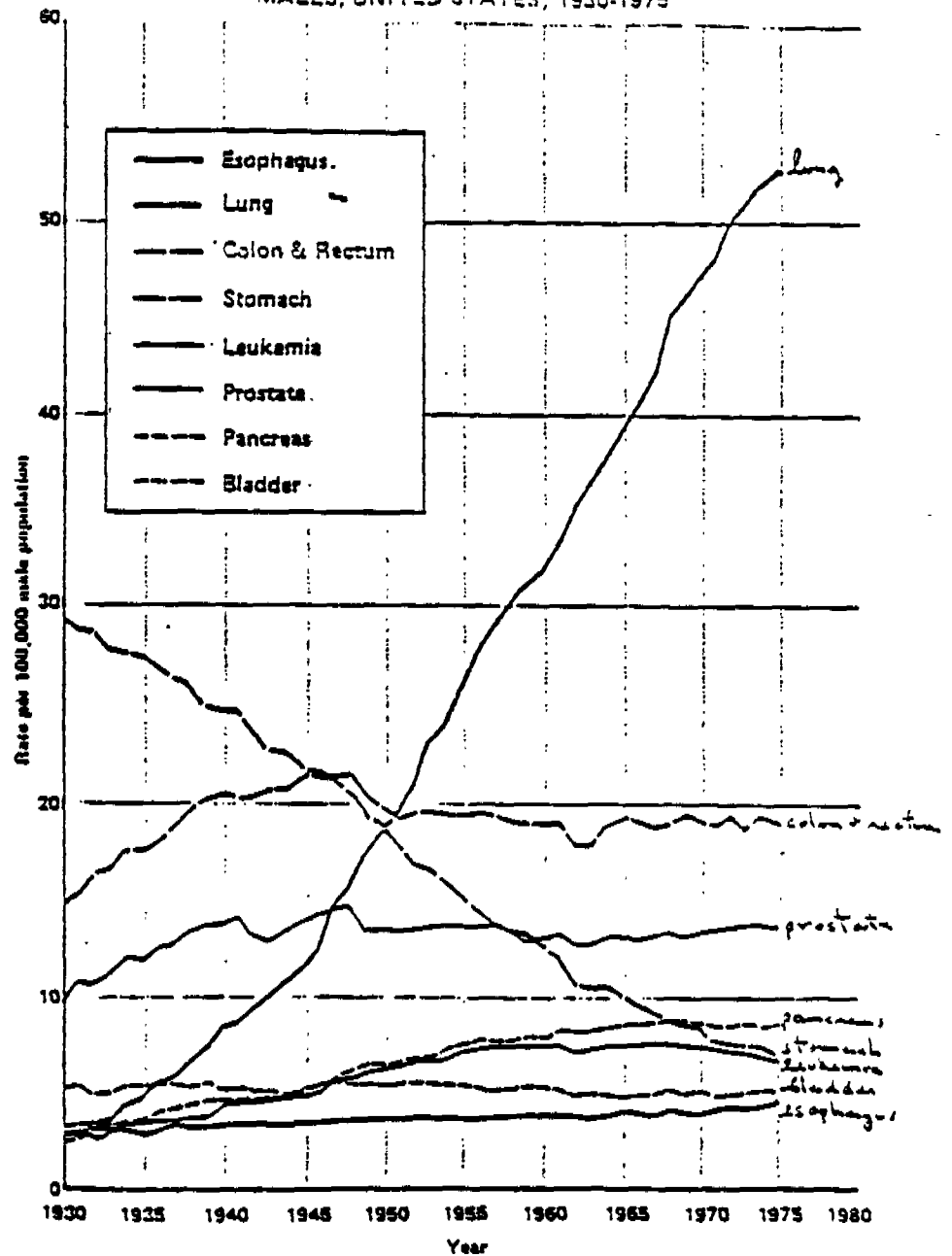
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AGE-ADJUSTED CANCER DEATH RATES* FOR SELECTED SITES
FEMALES, UNITED STATES, 1930-1975



Sources: U.S. National Center for Health Statistics and U.S. Bureau of the Census.
* Standardized on the age distribution of the 1940 U.S. Census Population.

AGE-ADJUSTED CANCER DEATH RATES* FOR SELECTED SITES
MALES, UNITED STATES, 1930-1975



Sources: U.S. National Center for Health Statistics and U.S. Bureau of the Census.
*Standardized on the age distribution of the 1940 U.S. Census Population.

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