DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta, Georgia 30333

Refer: FL-117
October 1981

SUMMARY OF STUDIES AND EVALUATIONS SINCE 1976 REFUTING ALLEGATIONS OF AN ASSOCIATION BETWEEN CANCER AND WATER FLUORIDATION

Since 1976, there have been numerous new published studies and evaluations of morbidity-mortality trends in the United States and other countries that confirm earlier published research on fluoridation and the public health. Rate trends in cancer and other diseases in fluoridated and nonfluoridated areas have been calculated and compared through recognized standard epidemiologic methods by the National Cancer Institute, the National Heart, Lung, and Blood Institute, the Centers for Disease Control, the U.S. National Academy of Sciences, National Health and Welfare (Canada), and other highly competent research organizations. Their published conclusions indicate that there are no confirmed trends in mortality rates in fluoridated areas that could be associated with natural or adjusted fluoridation at the recommended concentrations. Summaries of recent studies, evaluations, and review articles are enclosed.

The enclosed data were compiled and summarized as a joint endeavor by the Office of Scientific Reports of the National Institute of Dental Research (National Institutes of Health) and the Dental Disease Prevention Activity (Centers for Disease Control).

Dental Disease Prevention Activity
Center for Prevention Services

Enclosures

REFERENCES

1. Myers, D.M., Plueckhahn, V.D., and Rees, A.L.G. (Committee of Inquiry Into Fluoridation of Victorian Water Supplies): "Report. . .for 1979-80," Melbourne, Victoria, Australia, F.D. Atkinson, Government Printer, 1980, pp. 115-125, and Appendixes 4 and 5.

2. Goodall, C.M., and Foster, F.H.: "Fluoridation and Cancer Mortality in New Zealand," New Zealand Medical Journal, 92:164-67, August 27, 1980.

3. Strassburg, M.A., and Greeland, S.: "Methodologic Problems in Evaluating the Carcinogenic Risk of Environmental Agents," Journal of Environmental Health, 41:214-17, January-February 1979. (Acute Communicable Disease Control, Los Angeles Department of Health Services, 313 North Figueroa Street, Los Angeles, California 90012).

4. Minnesota Governor's Commission on Fluoridation: Report, February 26, 1979, Office of the Governor, 130 State Capitol Building, St. Paul, Minnesota 55155.

5. Newell, J.D.: "No Association Between Fluoridation and Cancer Deaths," paper presented at National Symposium on Water Fluoridation, South African Department of Health, Pretoria, South Africa, October 1979 (Department of Medical Statistics, University of Newcastle Upon Tyne, England).

6. Rogot, E., Sharrett, A.R., Feinleib, M., and Fabsitz, R.R.: "Trends in Urban Mortality in Relation to Fluoridation Status," American Journal of Epidemiology, 107:104-12, February 1978. (Epidemiology Branch, National Heart, Lung, and Blood Institute, Bethesda, Maryland 20205).

7. Erickson, J.D., Centers for Disease Control, Chronic Diseases Division: "Mortality in Selected Cities with Fluoridated and Non-Fluoridated Water Supplies, New England Journal of Medicine, 298:1112-1116, May 1978.

8. National Health and Welfare, Canada, Health Protection Branch: "Fluoridation and Cancer," Information Directorate, National Health and Welfare, Ottawa, Canada, 1978.

9. Doll, R., and Kinlen, L.: "Fluoridation of Water and Cancer Mortality in the U.S.A.," The Lancet, 1:1300-02, June 18, 1977 (Department of Regius Professor of Medicine, Oxford University, Radcliffe Infirmary, Oxford, England OX2 GHE).

10. Oldham, P.D., and Newell, D.J.: "Fluoridation of Water Supplies and Cancer--a Possible Association?" Applied Statistics, 26:125-35, No.2, 1977. (M.R.C. Pneumoconiosis Unit, Llandough Hospital, Penarth, Glamorgan, Wales).

11. National Academy of Sciences, National Research Council, Safe Drinking Water Committee: "Drinking Water and Health," National Academy of Sciences, Washington, D.C., 1977. ("Cancer," pp. 381-9).

12. Hoover, R.N., McKay, F.W., and Fraumeni, J.F., Jr., National Cancer Institute, Epidemiology Branch, "Fluoridated Drinking Water and the Occurrence of Cancer," Journal of the National Cancer Institute, 57:757-768, October 1976.

13. Royal College of Physicians, London England: "Fluoride, Teeth, and Health," a report and summary on fluoride and its effect on teeth and health. (Publisher: Pitman Medical Publishing Co. Ltd., 42 Camden Road, Tunbridge Wells, Kent TN1 2 QD, 1976).

REFERENCE 1:

Myers, D.M., Pleuckhahn, V.D., and Rees, A.L.G. (Committee of Inquiry Into Fluoridation of Victorian Water Supplies): "Report. . .for 1979-80," Melbourne, Victoria, Australia, F.D. Atkinson, Government Printer, 1980, pp. 115-25, and Appendixes 4 and 5.

SUMMARY:

A review of the past 7 years of scientific studies has revealed no new evidence challenging fluoridation's safety or effectiveness in reducing dental caries.

The study encompassed data from dental health organizations in Australia, the United States, Canada, South Africa, and England, as well as submissions from individuals and groups, mainly from Australia, both supportive of and opposed to fluoridation. Four non-dentist scientists evaluated the material and testimony and issued the report.

Commissioned in March 1979, the Committee of Inquiry Into the Fluoridation of Water Supplies told the Victorian state Parliament it had received much evidence which it considered opinionated and without scientific merit.

The purpose of the study was to examine new scientific evidence concerning fluoridation of water available since the enactment of a noncompulsory fluoridation act in 1973. Victoria is the second largest of the six Australian states, with a population of 3.8 million people.

The panel's conclusions were:

1. There is overwhelming evidence that regular ingestion of water containing fluoride is an effective measure in reducing the incidence of dental caries.

2. The cariostatic effect of such ingestion in early life will be carried through adult life, but even so, continued ingestion during adult life adds further benefit.

3. The beneficial effects of fluoride are greatest when optimal intake starts in early life.

4. Fluoridation of water supplies is the safest, most economical, and effective known way of distributing fluoride to a community.

5. Assertions that fluoridation of water supplies at recommended levels has toxic, carcinogenic, mutagenic, teratogenic, or allergenic effects on humans are not supported by sound, scientific evidence. There is no evidence that fluoridation at recommended levels has any harmful effect.

REFERENCE 2:

Goodall, C.M., and Foster, F.H.: "Fluoridation and Cancer Mortality in New Zealand," New Zealand Medical Journal 92:164-67, August 27, 1980.

SUMMARY:

This paper reviews briefly the principal scientific literature concerning cancer and fluoridation and presents new information about cancer mortality in two population groups in New Zealand served by fluoridated or unfluoridated public water supplies. In this article, we refer only to the important questions of a possible link between fluoridation and human cancer. We are not advocating continuance or discontinuance of fluoridation as such.

Fluoridation of municipal water supplies in New Zealand was first introduced in 1954, and by 1975, approximately 54 percent of the New Zealand population was receiving fluoridated water. Over 80 separate water supplies were fluoridated by then, under the control of about 70 independent regional authorities, with a few smaller supplies controlled by various departments of state.

We concluded from the study of 1961 and 1976 New Zealand cancer mortality data that there was no support for the assertion that fluoridation of public water supplies resulted in any increase in cancer mortality. On the contrary, there was some evidence that the rate of increase in cancer mortality over the 15-year period 1961-1976 had been greater in unfluoridated areas than that occurring in areas with fluoridated water supplies.

Claims that fluoridation of the municipal water supply causes cancer in humans have not been substantiated by independent objective studies in the United States of America, Canada, or New Zealand. After thorough re-examination of the earlier publications from other countries, and our own study of data available for the New Zealand population, we consider the 1976 statement of the Royal College of Physicians more than ever justified: "There is no evidence that fluoride increases the incidence or mortality of cancer in any organ."

REFERENCE 3:

Strassburg, M.A., and Greenland, S. "Methodologic Problems in Evaluating the Carcinogenic Risk of Environmental Agents," Journal of Environmental Health 41:214-17, January-February 1979. (Acute Communicable Disease Control, Los Angeles Department of Health Services, 313 North Figueroa Street, Los Angeles, California 90012).

SUMMARY:

In recent years, scientific papers dealing with potential environmental carcinogens (cancer-causing substances) have appeared with increasing frequency. Many of these papers contain statistical analyses in which objectivity has not always been of primary concern. Sometimes the bias in the presentation is so pervasive and obvious that the mistaken logic is readily seen; other times the analysis may be biased by subtle methods of manipulation which only experts can detect easily. Unfortunately, the reader is called on to evaluate and interpret more and more sophisticated methodological and statistical techniques. Many papers are accepted by the scientific community and the public in general without the proper scrutiny which should be given any scientific investigation. The discussion presented here evaluates a paper from the National Health Federation (NHF) for the purpose of pointing out several pitfalls of data analysis which may occur.*

The NHF paper discussed provides clear examples of the most commonly committed errors in the analysis of mortality data on human populations. Though the paper claimed to have rallied impressive evidence linking cancer and fluoridation, it, in fact, failed to provide any evidence capable of withstanding careful scrutiny. Our critique does not and is not meant to provide an argument that fluoridation is safe or that it is not carcinogenic. However, because in the future we can expect the appearance of many studies claiming to have found a link between an environmental agent and disease, we have endeavored to present an often neglected part of the scientific standard against which any such investigation should be judged.

SELECTED EXCERPTS:

There are other considerations to be made in evaluating research papers. For example, authors frequently cite a large number of references as supportive of their findings. These references may have been poorly screened and may have limited relevance. The National Health Federation paper concludes that fluoride and cancer are linked in humans, even though many of the references are studies performed on invertebrates and plants involving massive doses of fluoride.

*National Health Federation (John A. Yiamouyiannis, Ph.D.): "A Definite Link Between Fluoridation and Cancer Death Rate," March 25, 1975, 9pp. (circulated, not published).

REFERENCE 4:

Minnesota Governor's Commission on Fluoridation: Report, February 26, 1979, Office of the Governor, 130 State Capitol Building, St. Paul, Minnesota 55155.

SUMMARY:

With regard to potential adverse health effects of fluoridation, the Commission finds that the claims that fluoride is allergenic, mutagenic, or carcinogenic are not supported by the preponderance of available scientific data.

SELECTED EXCERPTS:

The Commission is aware of the recent decision of Judge Flaherty in the case of Aitkenhead v. Borough of West View Water Authority, in the Court of Common Pleas of Allegheny County, Pennsylvania, Civil Division. Substantially the same body of scientific literature was available to the Commission as to the trial court in Pennsylvania; in addition, the plaintiff's summary of evidence, the defendant's summary of evidence, Judge Flaherty's opinion, and the transcript of the proceedings were available to the Commission. In ruling in favor of the plaintiff, Judge Flaherty appeared to place primary reliance on the study of Drs. Yiamouyiannis and Burk (1977). Although the Commission has examined the same body of evidence as did Judge Flaherty, the Commission has come to the opposite conclusion: an association between fluoridation and cancer has not been shown. The Commission is of the opinion that if accepted methods of adjustment, including the use of Standardized Mortality Ratios, are used, the fluoridation-cancer link is not supported.

It is the view of the Commission that the available evidence does not suggest that fluoride (1 mg/liter) is a causal factor in human cancer.

REFERENCE 5:

Newell, D.J.: "No Association Between Fluoridation and Cancer Deaths," paper presented at National Symposium on Water Fluoridation, South African Department of Health, Pretoria, South Africa, October 1979 (Department of Medical Statistics, University of Newcastle Upon Tyne, England).

SUMMARY:

Many authorities state that there is no association between fluoridation of water supplies and cancer deaths. This paper reanalyses data of Burk and Yiamouyiannis, and shows that the difference they found in cancer mortality in fluoridated and unfluoridated U.S. cities can be completely explained by the age, race, and sex structure of those cities. Further investigation of other analyses of Burk and Yiamouyiannis shows that they ignore the scientific methods long established by epidemiologists and that there is no substance to their claim that fluoridation causes cancer.

REFERENCE 6:

Rogot, E., Sharrett, A.R., Feinleib, M., and Fabsitz, R.R.: "Trends in Urban Mortality in Relation to Fluoridation Status," American Journal of Epidemiology 107:104-12, February 1978. (Epidemiology Branch, National Heart, Lung, and Blood Institute, Bethesda, Maryland 20205).

SUMMARY:

Mortality trends from 1950 to 1970 were studied for 473 cities in the United States with populations of 25,000 or more in 1950, according to fluoridation status of their water supplies. Findings showed no relationship between fluoridation and observed changes in general mortality over the 20-year period. Also, no relationship was found between fluoridation and heart or cancer death rate trends.

SELECTED EXCERPTS:

The safety of this public health measure with respect to mortality was established by studies conducted during the 1940's and 1950's of communities with naturally high fluoride content. More recent studies of limited geographic areas have continued to show no adverse effects of naturally occurring fluoride in drinking water on mortality or on cardiovascular disease. Evaluation of possible health effects in cities which introduced fluoride for caries control is limited to a morbidity survey in Newburgh versus Kingston, New York, and mortality studies involving 28 cities fluoridated before 1954 and 12 matched Pennsylvania cities. A study of cancer mortality and incidence for U.S. counties from 1950-1969 showed no trends attributable to fluoridation. Similarly, a recent report comparing 10 fluoridated cities with 10 nonfluoridated cities showed that fluoridation was not associated with an increase in cancer mortality.

Some opponents of fluoridation have singled out particular cities which showed increased mortality rates following the introduction of fluoridation. Since it is always difficult to assess the representativeness of areas of limited geographic extent, we undertook to study the experience of all cities for which data were available and which were of sufficient size to yield fairly stable estimates of mortality rates.

REFERENCE 7:

Erickson, J.D., Centers for Disease Control, Chronic Diseases Division, "Morality in Selected Cities with Fluoridated and Non-Fluoridated Water Supplies," New England Journal of Medicine, Vol. 298:1112-1116, May 1978.

SUMMARY:

Earlier attempts by Burk and Yiamouyiannis to show a relationship between community water fluoridation and cancer mortality failed to properly adjust for factors such as age, race, and sex. Their subsequent efforts to remedy

these faults in methodology added but slight improvement to the validity of the report. The conclusions of Burk and Yiamouyiannis still were not supported by these later reports. However, the renewed charges did suggest the need for an updated investigation of U.S. mortality rates in relation to community water fluoridation.

The findings presented in Dr. Erickson's study further substantiate the safety of fluoridated community water supplies:

> Mortality rates--for blacks and whites only--in 24 cities with fluoridated and 22 with nonfluoridated water supplies in the United States, were compared for the years 1969-1971. During these 3 years, 570,671 deaths occurred in the cities with fluoridated water; the 1970 reference population in those cities was 15,972,817. The figures for the cities with nonfluoridated water were 351,053 and 11,106,746 respectively, so that the crude death rates for all causes were 1,190.9 (fluoridated) and 1,053.6 (nonfluoridated) per 100,000 person-years. Adjustments for age, sex, and race reduced differences for some causes and removed them for others. Further correction, using analyses of covariance for city characteristics that influence mortality, gave adjusted death rates for all causes of 1,123.9 and 1,137.1, and for malignant neoplasms 195.3 and 196.9, in the cities with fluoridated and nonfluoridated water respectively. No evidence of a harmful effect of fluoridation was found.

REFERENCE 8:

National Health and Welfare, Canada, Health Protection Branch: "Fluoridation and Cancer," Information Directorate, National Health and Welfare, Ottawa, Canada, 1978.

SUMMARY:

The purpose of the investigation reported here is to examine data for cancer mortality in Canada in relation to the known history of fluoridation in this country. This has been accomplished by a retrospective study of cancer mortality in 100 Canadian cities during the period 1954 to 1973.

No appreciable differences in death rates from all types of cancer or any specific tumour site were indicated between fluoridated and nonfluoridated municipalities over this period, nor were any significant differences apparent between death rates from all types of cancer when compared within the same group of municipalities prior to and after fluoridation.

SELECTED EXCERPTS:

In 1975, it came to our attention that an organization in the United States known as the National Health Federation had claimed that a relationship

exists between fluoridation of drinking water and increased incidence of cancer among those consuming the water. The National Health Federation is a private organization, the primary role of which appears to be to lobby intensively against fluoridation.

In support of the allegation that fluoridation causes cancer, the National Health Federation has published brochures summarizing studies attributed to Dr. John Yiamouyiannis in which mortality rates from cancer were compared for the 10 largest cities in the United States in which no fluoride is added to the water.* Subsequently, Dr. Dean Burk has used similar data at a number of public meetings, many of which have received considerable publicity. Unfortunately, neither of these individuals has published full details of their investigations in scientific or medical journals, so that it is difficult to assess the scientific validity of their conclusions.

However, Yiamouyiannis and Burk based their conclusions on statistical information published by the National Cancer Institute (NCI) in the United States. Statisticians of the NCI have carefully analyzed the same information and were unable to reach similar conclusions; they pointed out that marked differences existed between the two groups of cities in terms of population, age, race, and sex and that these had been overlooked. Other groups of statisticians and epidemiologists have subsequently examined the same data and reached similar conclusions to those reached by officials of the NCI. Of particular note are studies conducted by Oldham and Newell on behalf of the Royal Statistical Society of Great Britain, and by Doll and Kinlen. Additional shortcomings in the statistical methods used by Burk and Yiamouyiannis have recently been published.

*(with mortality rates for 10 large fluoridated cities)

REFERENCE 9:

Doll, R., and Kinlen, L.: "Fluoridation of Water and Cancer Mortality in the U.S.A.," The Lancet 1:1300-02, June 18, 1977 (Department of Regius Professor of Medicine, Oxford University, Radcliffe Infirmary, Oxford, England OX2 GHE).

SUMMARY:

Authoritative statements that fluoridation of public water supplies is not associated with any increase in cancer have been challenged on the basis of data which, it is claimed, show that cancer mortality in the United States rose more sharply in cities with fluoridated water than in those without. However, during the period of study (1950-70) the population structures of these cities changed substantially. When account is taken of age, sex, and ethnic group the ratio between observed cancer mortality and expected cancer mortality fell slightly in the cities with fluoridated water and did not change in the nonfluoridated cities.

SELECTED EXCERPTS:

The American evidence, when analyzed in detail, is consistent with the British evidence that was examined earlier by one of us. None of it provides any reason to suppose that fluoridation is associated with an increase in cancer mortality, let alone causes it.

REFERENCE 10:

Oldham, P.D., and Newell, D.J.: "Fluoridation of Water Supplies and Cancer--A Possible Association?" Applied Statistics 26:125-35, No. 2, 1977. (M.R.C. Pneumoconiosis Unit, Llandough Hospital, Penarth, Glamorgan, Wales).

SUMMARY:

In the recent book "Fluoride, Teeth and Health" published by the Royal College of Physicians, it was asserted inter alia that there was no evidence that fluoride increases cancer mortality.

This statement was challenged by the presentation of data showing crude cancer mortality rates in two groups of large American cities. The rise in the crude mortality rate between 1950 and 1970 in 10 cities which had fluoride added to their water supplies early in that period was undoubtedly larger than the rise in 10 unfluoridated cities.

The U.S. National Cancer Institute asserted that this rise could be explained by the different age-sex-race structures of the populations in the two groups of cities. The Royal College of Physicians invited the Council of the Royal Statistical Society to comment.

Our analysis shows that the two groups of 10 cities differed in their age-sex-race structure in 1950. The cities which were to be fluoridated started with many fewer elderly white females, somewhat fewer elderly white males, and more non-whites at ages below 50.

When these differences are taken into consideration, the two groups both had higher-than-expected cancer mortality in standardized comparison with national rates; this conforms with world-wide experience that cancer is generally more common in towns than in rural areas. But the two groups were not similar in 1950, despite similar crude death rates: the cities which were to be fluoridated had at that time an excess of cancer deaths which was 10.3 per 100,000 population greater than that of the control cities.

By 1970, the two sets of cities differed much more in their demographic structure than they had in 1950. The fluoridated cities now had many more non-whites of all ages in their populations, and many fewer whites under the age of 55. These demographic changes made the fluoridated cities much more likely to have deaths from cancer.

When these demographic changes are taken into account, we find, in proportional terms, that the excess cancer rate increased by 1 percent over the 20 years in the fluoridated cities, but it also increased by 4 percent in the unfluoridated control cities, giving a difference of 3 percent to the advantage of the fluoridated cities.

We have established that the association claimed by Burk and Yiamouyiannis between fluoridation and cancer has not been substantiated. We concur with the statement by the Royal College of Physicians, in "Fluoride, Teeth and Health," that there was no evidence that fluoride increases cancer mortality.

SELECTED EXCERPTS:

The nature of epidemiological proof is somewhat different from that in the laboratory sciences. This is because it is seldom possible to hold other factors constant when the item under study is changed. As Lord Douglas of Barloch expresses this in his Appraisal of the RCP Report, under the heading "Spurious Statistics," ". . .they make comparisons in fluoridated and unfluoridated areas without any proof that in the absence of fluoridation the rates would have been equal." (Although he is there referring to the incidence of dental decay, he could equally well have been referring to mortality.) Such "proof" is never irrefutable, and if other factors have changed, the statistical epidemiologist must attempt to take into account such factors as seem to be both relevant and measurable.

It is because of such considerations that the WHO report emphasized that ". . .no single epidemiological study can in itself provide rigorous proof of the safety of fluoridation of water supplies. The strength of the case for fluoridation is not based on the results of a single study; it is based on the mutually corroborative observations of many different workers."

Addendum: for Publication in Applied Statistics
P.D. Oldham and D.J. Newell

Many readers of our report, "Fluoridation of Water Supplies and Cancer--A Possible Association?" (Applied Statistics, 26:125, 1977), will have come across documents which imply that our finding that there was no association was wrong because there were errors in the vital statistical data that we analysed. We think, therefore, that a comment on this implication is called for.

First, it should be made clear that our responsibility was to provide an independent appraisal of the data and information given to us by the Royal College of Physicians, not to initiate a search for further data.

Second, the demographic data received by us from the Royal College had been provided by the U.S. National Cancer Institute, and it emerged that in extracting these data, transcription errors had been made. Of these, we are told the most material was the attribution of 215 more cancer deaths in 1970 to the unfluoridated city of Boston, Massachusetts, than had occurred. This was because the figures for Suffolk County, which includes Boston, had been transcribed instead of those for Boston itself.

The effect of this error was that where we published (foot of p. 132 in Applied Statistics) that the standardised cancer death rate of the fluoridated cities had increased in 20 years by 3% less than it had in the unfluoridated cities, the corrected figures showed that it had really increased by 1% less than in the unfluoridated cities. Thus the different age, race and sex structures of the two sets of cities explained (even more exactly than the original figures suggested) their difference in cancer mortality. The claim that fluoridation had increased the risk of death from cancer remains unsubstantiated.

We should perhaps add that, to our knowledge, no new data relevant to the question at issue has been presented since our report, and that the criticisms we made of the original claim of an association between fluoridation and cancer have not been answered.

REFERENCE 11:

National Academy of Sciences, National Research Council, Safe Drinking Water Committee: "Drinking Water and Health," National Academy of Sciences, Washington, D.C., 1977. ("Cancer," pages 381-9.)

SUMMARY:

Early in 1975, it was claimed by Yiamouyiannis that there is a linkage between fluoridation of water and increased cancer rates. The initial data are the sum of rates for nine specific cancer sites (seven for white males and two for white females) for the 10 largest cities with fluoridated water supplies for more than 12 years prior to 1970 and for the 10 largest nonfluoridated U.S. cities. The source of the data was the age-specific cancer rates for a 20-year period by site and county compiled by the National Cancer Institute (NCI) and published by the Department of Health, Education, and Welfare (HEW) in 1974. There is clearly a difference between the two groups of cities, with the fluoridated ones having about 25/100,000 more cancer deaths than the nonfluoridated ones.

In considering this evidence, the NCI found that Yiamouyiannis and Burk had failed to take into account differing demographic factors and age distributions that affect cancer rates. When the NCI used 1950 rates for the U.S. population as a whole to adjust the crude mortality rates for sex, race, and age and expressed the results as the ratio of observed deaths to expected deaths (standard mortality ratios, SMR), the time trends are eliminated.

None of the specific sites give any indication of an increase in cancer following fluoridation; rather, a possible decrease is suggested. The "other" category is of interest as the only grouping which suggested a possible increase for both sexes.

The other study compared naturally fluoridated and nonfluoridated counties in Texas on the same basis as in the previous one. The SMR's are more variable because of the smaller numbers involved, but there are no consistent trends with increasing fluoride content except for a possible decrease in the "other" category.

Thus, there is no confirmation of the hypothesis that fluorides or fluoridation cause cancer. Moreover, epidemiological studies in England fail to support the hypothesis that stomach or any other cancer is associated with fluoride intake (Kinlen, 1975; Royal College of Physicians, 1976).

An independent evaluation of the data presented by Yiamouyiannis and Burk was carried out by Taves (1976) using the same basic statistics as those used by NCI (U.S. Census and Vital Statistics). To gain more precision, the cancer mortalities observed in the year prior to the census year have been averaged with the figures for the census year. In no case is there a significantly different time trend; thus, the assertion that fluoridation has caused an increase in cancer rates does not hold up. The rates in fluoridated cities are higher only for a particular set of cities and the higher rates in these cities were present before fluoridation.

In summary, the available evidence does not suggest that fluoridation has increased the overall cancer mortality rates.

REFERENCE 12:

Hoover, R.N., McKay, F.W., and Fraumeni, J.F., Jr., National Cancer Institute, Epidemiology Branch, "Fluoridated Drinking Water and the Occurrence of Cancer," Journal of the National Cancer Institute, 57:757-768, October 1976.

SUMMARY:

An examination by National Cancer Institute (NCI) scientists of trends in cancer death rates in the United States during 1950-1969 has failed to produce evidence linking natural or adjusted fluoridation of public water supplies to cancer.

The scientists also found no evidence of cancer risk attributable to fluoridation from a comparison of the numbers of cancer cases diagnosed in 1947-48 and 1969-71 in two major metropolitan areas, one fluoridated and the other nonfluoridated.

The study indicated that well-known risk factors in cancer, such as urbanization, industrialization, and socioeconomic, racial, and cultural characteristics of the population, appeared to explain reported variations among fluoridated and nonfluoridated areas.

Cancer death rates over a 20-year period were studied in two groups of counties in the United States: counties in Texas long exposed to natural fluoride, and U.S. counties first fluoridated in one of three 5-year periods (1950-54, 1955-59, or 1960-64).

In the naturally fluoridated counties, the scientists looked for increased risk of cancer in both males and females that could be associated with exposure to low, medium, or high levels of fluoride. They found little variation from expected risk for any type of cancer except cancer of the brain and nervous system, for which death rates were lower than expected in counties with high natural levels of fluoride.

In counties where the majority of the population was exposed to adjusted fluoridation, the scientists looked for an increase in cancer death rates in 5-year time periods following fluoridation. They found no trends attributable to fluoridation, even in counties fluoridated in 1950-54, and thus having death rates available for 15 years following fluoridation.

To study cancer occurrence for a possible relationship to fluoridation, the NCI scientists compared the numbers of cancers diagnosed in Denver, Colorado, and Birmingham, Alabama, in 1947-48 as compared to 1969-71. Denver was fluoridated soon after the 1947-48 survey. Birmingham has remained largely unfluoridated. Again, no fluoridation-associated difference in cancer risk were apparent.

On the basis of their findings, the scientists concluded that fluoridation has not increased the risk of cancer, either in counties long exposed to varying levels of natural fluoride, or in counties relatively recently exposed to fluoride by artificial means.

REFERENCE 13:

Royal College of Physicians, London, England: "Fluoride, Teeth and Health," a report and summary on fluoride and its effect on teeth and health. (Pitman Medical Publishing Co. Ltd., 42 Camden Road, Tunbridge Wells, Kent TN1 2 QD, 1976.)

SUMMARY:

In 1973, a special committee was set up by the Royal College of Physicians. This was done in response to a request from the British dental profession for views on the merits and safety of fluoridation of water supplies. The committee examined data relating to the effects of fluoride and the fluoridation of water supplies in particular. The charge that fluoride can cause cancer was one of the major subjects investigated by the committee. Evidence examined consisted of published and unpublished work as well as oral evidence presented by both proponents and opponents of fluoridation. The committee was not able to find any relationship between cancer mortality or cancer incidence and fluoride levels in water supplies.

SELECTED EXCERPTS:

A comparison was also made between cancer incidence in the three areas of England and Wales that were fluoridated before 1968 and neighboring low fluoride areas. In none of these areas was there any tendency for the incidence of these cancers to be higher in the fluoridated areas than in the low fluoride areas--if anything, the opposite was the case.

The lack of any relationship between fluoride and cancer incidence is in keeping with mortality studies of this question.

There is no evidence that fluoride increases the incidence or mortality of cancer in any organ.