CHILDREN'S DENTAL HEALTH ACT OF 1971

HEARING

BEFORE THE

SUBCOMMITTEE ON HEALTH

OF THE

COMMITTEE ON LABOR AND PUBLIC WELFARE UNITED STATES SENATE

NINETY-SECOND CONGRESS

FIRST SESSION

ON

S. 1874

TO PROVIDE FOR THE ESTABLISHMENT OF PROJECTS FOR THE DENTAL HEALTH OF CHILDREN, TO INCREASE THE NUMBER OF DENTAL AUXILIARIES, TO INCREASE THE AVAILABILITY OF DENTAL CARE THROUGH EFFICIENT USE OF DENTAL PERSONNEL, AND FOR OTHER PURPOSES

JULY 12, 1971

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CHILDREN'S DENTAL HEALTH ACT OF 1971

MONDAY, JULY 12, 1971

U.S. SENATE,
SUBCOMMITTEE ON HEALTH OF THE
COMMITTEE ON LABOR AND PUBLIC WELFARE
Washington, D.C.

The subcommittee met at 2 p.m., pursuant to notice, in room 6202, New Senate Office Building, Senator Edward M. Kennedy (chairman of the subcommittee) presiding.

Present: Senators Kennedy (presiding), Hughes, Pell, and Beall.

Committee staff members present: Dr. Charles O. Cranford, professional staff member and Jay B. Cutler, minority counsel to the subcommittee.

Senator KENNEDY. The subcommittee will come to order.

About 4 months ago this subcommittee began hearings on the health crisis in America. These hearings were held both in Washington and in several cities throughout the country. Many witnesses came forward to testify and tell of their problems with our health care system. From this multitude of witnesses, one general theme was clear—there exists an enormous gap between the health needs of our people and the delivery of essential health services.

The delivery of dental care offers no exception. It is appalling that two-thirds of the children of low-income families have never been to a dentist and that in a country as wealthy as the United States, access to dental care is still determined more often by economic status than by need.

During our field hearings in Chicago, we saw black children from low-income families receiving dental care in the Miles Square Neighborhood Health Center. For many of the children, it was the first opportunity to visit a dentist. And, I believe it is safe to say, without a federally sponsored program such as the one we saw, their chance of receiving dental care would be extremely poor.

This is especially distressing because of the nature and prevalence of dental disease. Irreversible damage to the teeth and other oral structures is almost certain to occur if treatment is not received at a very early age—irreversible damage that will affect the child for the remainder of his life.

We know the value of disease prevention. Among the most heralded advances in modern medicine have been those that prevent a dreaded disease from striking our population.

Dental decay also can be prevented. Scientists have discovered ways to prevent most forms of dental disease. We do not need to wait

for additional breakthroughs before we begin to conquer dental decay. The gap that now exists between dental needs and services is definitely a gap in the delivery process, and it can be closed.

The shortage of dentists and their auxiliary personnel is well known. Therefore, we must apply the resources we have in the most efficient manner possible. Other countries have recognized these facts and have acted long ago to establish dental programs for schoolchildren. New Zealand has had a school dental program since 1921. It is not surprising that they are an acknowledged leader in the delivery of dental services, having also utilized auxiliaries in effective ways that are, as yet, not a part of our dental care delivery system.

Despite our scarcity of dental manpower, we are failing to recruit military service veterans, who have had years of experience as dental corpsmen, into the civilian dental care system. Over 1,000 of these young men and women are being lost each year to some other civilian occupation.

Water fluoridation is accepted by all major health organizations as an effective and inexpensive means of decreasing the incidence of tooth decay. Many communities have already fluoridated their water supplies and many more are planning to do so.

In some cases, lack of public funds is delaying this action. Only a few days ago an article in the Boston Globe stated that 31 communities in my home State of Massachusetts, having completed all the legal steps to accomplish fluoridation are now only waiting to raise the funds needed to install the necessary equipment. Federal grants are needed to assist communities to provide this important public health measure.

The Nixon administration has consistently slighted appropriation requests for dental programs. Even today, the administration has declined to come and present testimony on S. 1874. Legislation enacted in 1968 to assist in financing dental care for young children has been given only token support. S. 1874 seeks to provide dental services for our children who have been so long neglected. We cannot permit such deprivation to continue unchallenged.

I will include in the record at the end of my remarks the text of S. 1874 and a copy of a letter from HEW dated July 9 received in my office over the weekend, which indicated that the Department would not be able to appear.

Our charge is clear. We must move quickly to act on this important bill introduced by the distinguished senior Senator from the State of Washington. Senator Magnuson has once again seen a substantial national health problem, and in keeping with his keen understanding of the health needs of the American people, has taken appropriate action by introducing S. 1874, the "Children's Dental Health Act of 1971."

(The text of S. 1874 and the letter referred to follow:)

92D CONGRESS
1ST SESSION

S. 1874

IN THE SENATE OF THE UNITED STATES

MAY 14, 1971

Mr. MAGNUSON introduced the following bill; which was read twice and referred to the Committee on Labor and Public Welfare

A BILL

To provide for the establishment of projects for the dental health of children to increase the number of dental auxiliaries, to increase the availability of dental care through efficient use of dental personnel, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Children's Dental Health Act of 1971".

SEC. 2. The Public Health Service Act is amended by adding at the end thereof the following new title:

"TITLE X—DENTAL HEALTH PROJECTS

"GRANTS FOR PROJECTS FOR DENTAL CARE FOR CHILDREN

"SEC. 1001. (a) There are authorized to be appropriated $5,000,000 for the fiscal year ending June 30, 1972; $15,000,000 for the fiscal year ending June 30, 1973; $30,000,000 for the fiscal year ending June 30, 1974; $50,000,000 for the fiscal year ending June 30, 1975; and $70,000,000 for the fiscal year ending June 30, 1976; which shall be used by the Secretary to make grants to the health agency of any State (or political subdivision thereof) or to any other public or nonprofit private agency, organization, or institution to pay for part of the cost of the carrying out (on a planned and systematic basis) by such agency, organization, or institution, of one or more comprehensive projects for dental care and services for children of preschool and school age. Any such project shall include such comprehensive corrective, followup, and preventive services (including dental health education), and treatment as may be required under regulations of the Secretary.

"(b) Grants under this section shall not be utilized to provide or pay for dental care and services for children unless such children are determined (in accordance with regulations of the Secretary) to be (A) from low-income families, or (B) unable, for other reasons beyond their control, to obtain such care and services.

"(c) Grants under this section may be utilized for the conduct of research, demonstrations, or experimentation carried on with a view to developing new methods for (A) the prevention, diagnosis, or treatment of dental problems, (B) the payment of dental care and services, or (C) the utilization of dental health care personnel with various levels of training; except that not more than 10 per centum of any grant under this section shall be so utilized.

"(d) In making grants under this section, the Secretary shall accord priority to projects designed to provide dental care and preventive services for children of preschool age and school age children who are in the first five grades of school.

"GRANTS FOR WATER TREATMENT PROGRAMS

"SEC. 1002. (a) There are hereby authorized to be appropriated $2,000,000 for the fiscal year ending June 30, 1972; $3,000,000 for the fiscal year ending June 30, 1973; $4,000,000 for the fiscal year ending June 30, 1974; $4,000,000 for the fiscal year ending June 30, 1975; and $2,000,000 for the fiscal year ending June 30, 1976; which shall be used by the Secretary to make grants to States, political subdivisions of States, and other public or nonprofit private agencies, organizations, and institutions to assist them in initiating, in communities or in public elementary or secondary schools, water treatment programs designed to re-

duce the incidence of oral disease or dental defects among residents of such communities or the students in such schools (as the case may be).

"(b) Grants under this section may be utilized for (but are not limited to) the purchase and installation of water treatment equipment.

"(c) Grants under this section shall not exceed—

"(1) in the case of a grant to any person who has received a grant under section 1001, 80 per centum of the cost of the treatment program with respect to which such grant under this section is made; and

"(2) in the case of a grant to any person (other than a person referred to in paragraph (1), 66⅔ per centum of the cost of the treatment program with respect to which such grant is made.

"GRANTS TO TRAIN AUXILIARY DENTAL PERSONNEL

"SEC. 1003. There are hereby authorized to be appropriated $12,000,000 for the fiscal year ending June 30, 1972; $20,000,000 for the fiscal year ending June 30, 1973; $25,000,000 for the fiscal year ending June 30, 1974; $20,000,000 for the fiscal year ending June 30, 1975; and $20,000,000 for the fiscal year ending June 30, 1976; which shall be used by the Secretary to make grants to public and nonprofit private institutions to assist them in establishing and carrying out programs to educate and train

persons for careers as auxiliary dental personnel with special emphasis on the education and training of veterans of the Armed Forces who have received experience and training in dental auxiliary functions.

"PROJECTS TO PROMOTE EFFECTIVE USE OF AUXILIARY DENTAL PERSONNEL

"SEC. 1004. (a) There are hereby authorized to be appropriated $6,000,000 for the fiscal year ending June 30, 1972; $10,000,000 for the fiscal year ending June 30, 1973; $10,000,000 for the fiscal year ending June 30, 1974; $15,000,000 for the fiscal year ending June 30, 1975; and $15,000,000 for the fiscal year ending June 30, 1976, which shall be used by the Secretary to make grants and enter into contracts (without regard to section 3648 of the Revised Statutes, 31 U.S.C. 539) under subsection (c) and to make grants to dental schools, and to other public or nonprofit private agencies, organizations, and institutions, and to enter into contracts (without regard to section 3648 of the Revised Statutes, 31 U.S.C. 529) with individuals, agencies, organizations, and institutions, for projects described in subsection (b),

"(b) Grants and contracts under this section may be made or entered into for projects for—

"(1) planning, establishing, demonstrating, or sup-

porting programs to teach dental students and dentists the efficient and effective utilization of dental auxiliaries and the management and supervision of total dental health teams (including, but not limited to, teams consisting of various types of auxiliary dental personnel who are trained in carrying out expanded functions or procedures which do not require the knowledge and skill of the dentist), with special emphasis on the employment and utilization of veterans of the Armed Forces who have received experience and training in dental auxiliary functions;

"(2) demonstration and experimentation of ways to organize dental health services to achieve maximum effectiveness in the use of auxiliary dental personnel, which projects take into account such factors as patient acceptance, quality of care, and cost of services; and

"(3) planning, establishing, demonstrating, or supporting field training programs for dental students and auxiliary dental personnel in which dental care and preventive services are provided by such persons under professional supervision in areas characterized by low family incomes or shortage of and need for dental services.

"(c) The Secretary is authorized to utilize sums appropriated pursuant to subsection (a) to make grants to dental schools and to other public or nonprofit private agencies,

organizations, and institutions, and to enter into contracts with individuals, agencies, organizations, and institutions for special projects related to investigation and demonstration of ways of providing incentives for developing or establishing dental facilities or services in areas or communities in a State determined by the appropriate State health authority in such State to have a shortage of and need for dentists.

"DENTAL ADVISORY COMMITTEE

"SEC. 1005. (a) The President shall appoint a Dental Advisory Committee consisting of seven members, four of whom shall be selected from the dental profession and three from the general public. Members shall be appointed from among persons who, by virtue of their training, experience, and background, are exceptionally qualified to appraise the programs established by this title. The Secretary shall be an ex officio member of the Committee.

"(b) (1) Members shall be appointed for six-year terms, except that of the members first appointed three shall be appointed for two years, two shall be appointed for four years, and two shall be appointed for a term of six years as designated by the President at the time of appointment. The members shall select their own chairman.

"(2) Any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall serve only for the remainder of

such term. Members shall be eligible for reappointment and may serve after the expiration of their terms until their successors have taken office.

"(3) The Dental Advisory Committee shall advise the Secretary in regard to the reports required under section 1006, in regard to programs established under this title, and in regard to activities carried on by the Department of Health, Education, and Welfare related to dental health, dental manpower, or dental training and services, and shall serve as a reviewing body for grants made pursuant to this title, where such review is deemed necessary by the Secretary.

"(4) Members of the Dental Advisory Committee who are not officers or employees of the United States shall receive compensation at rates not to exceed the daily rate prescribed for GS–18 under section 5332, title 5, United States Code, for each day they are engaged in the actual performance of their duties, including traveltime, and while so serving away from their homes or regular places of business they may be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as the expenses authorized by section 5703, title 5, United States Code, for persons in Government service employed intermittently.

"(5) The Secretary shall make available to the Dental

Advisory Committee such staff, information, and other assistance as it may require to carry out its activities.

"(6) The Secretary, after consultation with the Dental Advisory Committee, shall promulgate such rules and regulations as are necessary to carry out the purposes of this title.

"REPORT

"SEC. 1006. (a) The Secretary shall submit a report to the Congress not later than January 31 of each year on the progress of the implementation and administration of the programs established under this title.

"(b) The Secretary shall submit to the Congress a report containing his recommendations concerning the need and feasibility of a comprehensive national dental health program for children within ninety days after the end of the fiscal year ending June 30, 1976."

SEC. 3. Section 1902(a)(10) of title XIX of the Social Security Act is amended by adding at the end thereof the following: "and except that services described in paragraph (10) of section 1905(a) may be made available to individuals or groups of individuals under age eighteen without making available such services of the same amount, duration, and scope to individuals of any other ages;".

SEC. 4. (a) Section 1 of the Public Health Service Act is amended to read as follows:

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"SECTION 1. Titles I to X, inclusive, of this Act may be cited as the 'Public Health Service Act'."

(b) The Act of July 1, 1944 (58 Stat. 682), as amended, is further amended by renumbering title X (as in effect prior to the enactment of this Act) as title XI, and by renumbering sections 1001 through 1014 (as in effect prior to the enactment of this Act), as sections 1101 through 1114, respectively.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
Washington, D.C., July 9, 1971.

HON. EDWARD M. KENNEDY,
Chairman, Subcommittee on Health,
U.S. Senate, Washington, D.C.

DEAR SENATOR KENNEDY: This is in response to your letter of July 8, 1971, to Secretary Richardson, inviting the Department to testify at the hearing scheduled for Monday, July 12 at 2:00 p.m. on S. 1874.

This bill provides for the establishment of projects for the dental health of children, an increase in the number of dental auxiliaries, and grants for water treatment programs. As a result, the measure relates to a number of existing Departmental programs, as well as to other legislation currently pending before the Congress.

We appreciate the invitation to testify before your Subcommittee. However, because of the multiplicity of complex issues involved and the short notice we received on the scheduled hearing, the Department will not be ready to appear on Monday, July 12.

If the Subcommittee plans to schedule additional hearings on the bill at a later date, we would be pleased to appear.

Sincerely yours,

STEPHEN KURZMAN,
Assistant Secretary for Legislation.

Senator KENNEDY. Our first witness this afternoon is my distinguished friend and colleague, Senator Warren Magnuson, the senior Senator from the State of Washington. As I have just mentioned, he is the chief sponsor of S. 1874; and, Senator Magnuson, I congratulate you on your concern about this situation and your vision in seeing the great need for legislation in the area of dental health care.

A tremendously effective Senator, Senator Magnuson also serves as chairman of the Senate Commerce Committee and as a member of the Aeronautical and Space Sciences Committee, the Appropriations Committee where he chairs the Labor-HEW Appropriations Subcommittee, and a member of the Select Committee on Equal Educational Opportunity.

It is obvious that he is a man who is deeply committed to both equal educational opportunities and to equal health care opportunities.

Senator Magnuson, I am looking forward to hearing your testimony on this legislation.

Senator MAGNUSON. Thank you, Mr. Chairman.

Senator KENNEDY. Senator Javits wished that he could be here for he is deeply interested in this bill. He commends Senator Magnuson, the author of the bill, of which he is a cosponsor. He has a statement, and I would like to have his remarks printed in the record.

(The statement of Senator Javits follows:)

STATEMENT OF HON. JACOB K. JAVITS, A U.S. SENATOR FROM THE STATE OF NEW YORK

These hearings on S. 1874, the "Children's Dental Health Act of 1971", represent our deep concern with all facets of the nation's growing health crisis, and I highly commend Senator Magnuson, the author of this bill of which I am co-sponsor, for his initiative in this area.

As the Senator from Washington has so clearly pointed out in his floor statement introducing the bill, dental health is a most neglected aspect of our health care crisis. The Senate has just approved a comprehensive plan to attack cancer and soon will take up on the floor of the Senate S. 934 and S. 1747, which are designed to overcome our shortage of trained health manpower. I believe S. 1874 provides an effective complement to these measures.

The statistics on dental care in this country show how frighteningly inadequate dental care is for children. More than half the children in this nation have never visited a dentist and in rural areas even fewer children have visited a

dentist, and among our low-income groups the number approaches 70%, which is to say that *almost* ¾ of these children have never seen a dentist.

This situation is subject to be a multi-faceted attack and that is exactly what is proposed by S. 1874.

First, special comprehensive projects will be established to provide continuing corrective, follow-up and preventive dental care to children of pre-school and early school age who are from low income backgrounds or are otherwise unable to obtain dental care.

Second, funding will be provided on a matching basis for the establishment of water treatment—fluoridation—projects in those communities which desire such projects. Those communities which also have dental care projects will have an added incentive for this medically valuable prevention program and will receive greater Federal support to set up the fluoridation program.

Third, the bill establishes projects to promote the effective use of auxiliary dental personnel. The use of such personnel would greatly enhance the effectiveness of the more highy skilled dentists.

By treating children we will avoid future health problems and costs and instill in our children an awareness of the importance of dental health, something which if done in early childhood may prove as valuable as the dental care itself.

I so strongly believe in preventive dental care that my National Health Insurance and Health Services Improvement Act provides complete dental care for children as a vital level of benefits.

Senator KENNEDY. Senator Magnuson, I had a very fine opportunity to visit your State and to visit the Puget Sound group health plan. It is one of the most imaginative, creative, and successful programs in the country.

The role of the consumer in this program is enormous, and it has many other admirable features. But one of the features lacking is a dental program.

I was extremely interested to see that one of the most forward-looking group health programs in the country did not provide dental services. Yet, time and time again, as we visited various communities and neighborhood health centers in different parts of the country, we found that often the most utilized service was the dental facility.

In Denver, Colo., for example, there is a waiting period of 7 months before the children can see a dentist. In our meetings with various parents, who participate on the boards of these health centers, when asked what things they like and don't like about them, they consistently mention that one of the best features is dental care for their children.

As you know, I came from New England, although distinguished in many ways, it is not distinguished for having good teeth, because of the lack of certain minerals in the waters and a variety of other reasons. I think we provide a great service by bringing these matters to public attention.

I want to also recognize Senator Hughes. Would you like to make a comment at this time, Senator?

STATEMENT OF HON. WARREN G. MAGNUSON, A U.S. SENATOR FROM THE STATE OF WASHINGTON

Senator MAGNUSON. Thank you, Mr. Chairman.

I am pleased to be here less than 2 months after we introduced the Children's Dental Health Act of 1971, to testify in its behalf. Within the space of just a few weeks, 36 Senators, representing both sides of the aisle, have cosponsored this legislation.

I am most appreciative of the support you have given this bill, Mr. Chairman. Similarly vital has been the support of Chairman Williams, Senator Javits, and eight other members of the committee. That so many from both parties in the Senate, in the subcommittee, and in the full committee have lent their support to this bill in striking evidence of a widespread awareness of the need for a substantially expanded Federal dental health effort.

That the subcommittee has moved so quickly to consider my bill is, I hope, evidence of a commitment to make that expanded effort a reality in the very near future. For we cannot afford to further delay Federal action in this area of critical need until some undetermined time in the future, as the administration recommended earlier this year in its white paper entitled "Toward a Comprehensive Health Policy for the 1970's." A truly comprehensive health policy for the 1970's must include a substantially expanded Federal dental health effort.

Mr. Chairman, several very able and qualified witnesses will provide the subcommittee with their views as to how this bill would assist in solving specific problems in their particular fields of expertise. I am especially pleased that Dr. John Deines, the current president of the American Dental Association and also a good friend and fellow Washingtonian, is here today to testify in behalf of my bill. Because Dr. Deines and other witnesses will testify in depth on the separate parts of this legislation, I will limit myself to a more general, overall statement.

The Children's Dental Health Act of 1971 would authorize appropriation of $338 million over the next 5 years. A total of $170 million would be used for pilot dental-care projects providing preventive, corrective, and followup care to 1.5 million disadvantaged children. The amount of $15 million would be used to assist communities and schools to fluoridate their water supplies. The sum of $97 million would be used to train approximately 27,000 dental auxiliaries. And $56 million would be used to train dentists and dental students how to best utilize dental auxiliaries.

The most compelling reason for an immediate expansion of the Federal dental health effort is presented by the absolute paucity of dental care now available to our children—especially those in low-income families. By age 2, half of America's children have decayed teeth. By the time he enters school, the average child has three decayed teeth. By his 15th year, he has 11 decayed, missing, or filled teeth.

And—I would add—more often than not, those are 11 missing or decayed teeth rather than filled teeth, for over half of all our children have never been to a dentist, and this proportion is even higher for youngsters living in rural areas.

But, by far, the greatest need is among children from low-income families, for almost 70 percent of them have never received a dentist's care. The consequences of this national neglect follow one upon the next in a tragic chain reaction.

Left to fester and become more serious with each passing year, painful childhood dental defects impair learning and curtail youngsters' physical ability to eat properly. With adolescence—if not earlier—once relatively minor though painful childhood cavities grow into major dental problems and lead to serious oral diseases.

The results of this chain reaction set off by neglect of the dental

health needs of children, are staggering. An unpublished report written in 1970 by the staff of the Division of Dental Health in the Bureau of Health Manpower, stresses the "serious consequences" of this neglect. Those consequences, the report goes on to say, include the following:

> More than 20 million persons have lost all their teeth and another 26 million have lost half or more. Only six persons in every 1,000 in this country possess a full complement of sound teeth.

The cost—in dollars and cents—of this neglect is made strikingly clear in that same report when it states:

> Much, if not most, of the nearly $4 billion spent annually by Americans for dental care goes to correct conditions which need never have developed at all or which could have been arrested at an earlier stage at considerably less cost in money and professional time.

The cost—in human terms—was well stated by the Director of the Dental Institute in NIH in a report prepared earlier this year at the request of the Appropriations Committees. In that report, the Director wrote:

> Oral diseases impair nutrition, especially in older people, mar appearance, and impede communication. The individual thereby suffers biologically, psychologically, and socially.

Mr. Chairman, the costs of dental neglect do present an immediate and pressing need for meaningful Federal action. The pilot dental care projects and water treatment grants authorized in the first two sections of my bill would provide that kind of action.

These dental projects will not provide care to all children or even to all economically disadvantaged children. We have neither the funds nor the manpower to set out upon such an ambitious course. Instead, these would be pilot projects which—while providing direct care to 1.5 million disadvantaged children—would also provide an opportunity for determining how quality dental care can be provided to large numbers of people with maximum efficiency and minimum cost.

Given the fact that 70 percent of all poor children have never been to a dentist, the need to provide early dental care to as many of them as possible is obvious. Perhaps not so obvious—but certainly just as important for the entire Nation—is the knowledge which we will gain through these projects about how we can improve the delivery of dental health care.

As is the case with medicine, the progress of dental health science has outstripped our present capacity for making the benefits of that progress widely available to the public.

Somehow, we must close this gap between the dental scientist's laboratory and the dentist's chair. For this reason, then, specific provision is made in the pilot project section of this bill for experimentation within those projects with new methods of prevention, diagnosis, treatment, manpower utilization, et cetera.

Knowledge gained as a result of these pilot projects and this experimentation will lead to improvements in the delivery of dental care. And, hopefully, it will also help to pave the way for coverage of dental care through national health insurance as you have proposed, Mr. Chairman.

It is a part and parcel, I think, of the whole national health problem.

In sum, these pilot projects would permit us for the first time to

seriously confront the dental needs of a sizable proportion of the Nation's poor children—those most in need of immediate care—and, at the same time, pave the way for major advances in dental care delivery which will directly benefit every American.

Before leaving the subject of the pilot projects, I want to comment on one additional issue which may be troubling some members of the subcommittee. That is the question of whether this section of my bill unnecessarily duplicates the provision of title V of the Social Security Amendments of 1967 for pilot dental care projects.

The answer is clearly no. Since there is no separate funding authorization for these dental projects, they have had to compete for funds with a broad variety of other title V programs. As a result, and this was pointed out by you, Mr. Chairman, no funds were allocated for dental projects in fiscal years 1968, 1969, or 1970.

Finally, in fiscal year 1971, $500,000 as allocated to seven dental projects serving about 10,000 children. In fiscal year 1972, after which the authority for these projects expires, the President has indicated that $860,000 will be allocated for dental projects. This increase will permit the addition of only four new projects, making a total of 11 serving about 5,000 more children.

It is clear, then, that we must enact separate legislation with a separate authorization if we are to actually fund enough pilot projects to care for a significant number of children or obtain meaningful data for future application.

Finally, it should also be noted that the title V program provides only 75-percent matching grants whereas my bill would provide full funding of all care provided poor children.

Mr. Chairman, the second section of my bill would make it possible for the American people to save a sizable proportion of the nearly $4 billion which they are spending every year on corrective dental care. That section would provide $15 million for Federal matching grants to schools or communities wishing to fluoridate their water supplies.

This $15 million would make it possible for up to 7,000 communites with 45 million residents to obtain substantial Federal assistance to fluoridate their water. The 1969 census showed that 13,000 communities containing 57 percent of the Nation's population do not now have fluoridated water desipte the fact, as Dr. Deines will show, the effectiveness and safety of fluoridation in preventing tooth decay has been demonstrated again and again.

If you will compare this $15 million which I propose to spend over the next 5 years for the prevention of dental disease with the $4 billion that the public spends every year for corrective dental care, then I think you will agree with me that an ounce of prevention is not only better than a pound of cure—but that it is also much cheaper.

Before I go, Mr. Chairman, I wish to emphasize that this bill would not require any school or community to fluoridate its water. What the bill would do is assist those schools and communities which decide—on their own—that they wished to fluoridate their water.

Mr. Chairman, the current need for an expanded dental health effort is great. But the Nation's dental health needs, even given the preventive measures contained in the first two sections of this legislation, will continue to grow greater in future years. Population growth, increased public awareness of the importance of dental health,

and expanded accessability to dental care through private insurance plans all point toward a rising demand for dental care. Add to these factors the possibility that a national health insurance system, including coverage of dental care, will be implemented and predictions of future demand escalate sharply.

If we are to meet this future demand, then we must not only improve our dental care delivery system but we must also train much larger numbers of dental health personnel. And while we must continue to increase our supply of dentists, we can no longer rely upon dentists alone to provide dental care.

This point was emphasized in testimony presented last summer to the House Health Subcommittee by the American Dental Association, the American Association of Dental Schools, the American Dental Hygienists Association, and the American Dental Assistants Association. In a joint statement, they said:

"As this committee well knows, the drive to produce more dentists is complicated by the timelag, as much as 12 years in duration, between the planning stages of a new dental school and the year it graduates its first class. A timelag of such duration does not occur with supportive personnel in the dental field.

"In addition, there is increasing understanding within dentistry of the fact that the hygienist and the assistant can and should perform additional functions. Concentration on programs within these areas, then, is both professionally and pragmatically desirable."

However, Mr. Chairman, despite the need for—and the desirability of—training greatly increased numbers of these dental auxiliaries, our present training efforts are falling far short of filling the need.

Currently—and these figures are startling—there is only one hygienist for every six practicing dentists, although professional groups tell us that the minimum desirable ratio is one hygienist to every two dentists.

If we are to provide for even that minimum ratio by 1980, we must graduate at least 48,000 new hygienists during this decade. However, at the current rate, we will train only 23,000.

Thus, we will have a net deficit of 25,000 hygienists in 1980. Similar deficits in dental assistants and dental laboratory technicians will prevail unless our current training efforts are sharply accelerated. These 1980 deficits are predicted to be 137,000 for dental assistants and 23,500 for laboratory technicians.

The third section of my bill addresses this need by authorizing $97 million to train 27,000 new dental auxiliaries during the next 5 years. While even this increase will not completely close the gap between auxiliaries needed and auxiliaries available, it will substantially improve our capacity for meeting the increased demand for dental services we know lies ahead.

The fourth—and final—major section of this bill would authorize $56 million to be used during the next 5 years to train dentists and dental students to work with auxiliary personnel. Taken together, the final two sections of this legislation will provide us with dentists and dental auxiliaries trained to work as efficient, productive teams capable of providing higher quality dental care to more Americans than ever before.

Mr. Chairman, the Children's Dental Health Act would help to substantially reduce the incidence of dental problems and maximize the

dental profession's capacity to deal with those that do occur. Enactment and implementation of this legislation would compromise a sound investment in the Nation's health.

Senator KENNEDY. Thank you very much, Senator. That is a splendid statement, not only in analyzing the legislation, but also in justifying the various provisions for it. I can support completely the demand on public resources to help implement fluoridation of public water supplies.

As I mentioned in my brief opening comment, we have a number of communities in my State—I don't think that is probably unlike many other States—that desire fluoridation programs but just don't have the kinds of resources necessary to assist in their implementation.

Obviously, you have looked into this and have made some proposals on that question.

Manpower is another very significant area, as pointed out in your testimony. You have under sections 1003 and 1004 some important and meaningful directives for that particular need.

Senator MAGNUSON. I think those manpower figures are somewhat startling, Mr. Chairman. It is hard to realize the neglect that has been going on in this field, until you read some of those startling statistics and I would consider some of them quite conservative.

Senator KENNEDY. And about the increased manpower.

Our State and your medical society, of course, in the State of Washington have been rather progressive in utilizing paramedical personnel. The State of Washington Medical School along with the medical societies have begun a very significant program. I met a number of the corpsmen participating in the program and understand that they are carefully selected and matched with existing needs throughout the State of Washington.

It was interesting to note that for the approximately 100 initial positions, there were some 3,000 applications. I think the program now has approximately 164 who have either been graduated or are currently enrolled in the program.

We are also finding that there are 1,000 dental corpsmen that are coming out of the military every year that are not being utilized in the civilian sector.

I think you have focused on that particular question and I think your legislation is flexible enough to provide resources to help develop programs to also better utilize existing manpower resources. I think you have targeted the areas of need for creating additional personnel, and, in a greater sense, improved utilization of existing resources.

Senator MAGNUSON. That's right. I think we should try to utilize existing resources and facilities if practicable. You quite correctly noted that we are not effectively utilizing in a civilian capacity those who come out of the military with training as dental auxiliaries. That, of course, is why my bill specifically mentions them in sections 1003 and 1004. And of course you have noted the possibility, Mr. Chairman, of further utilizing the regional medical centers. That is an exciting idea, I think.

Senator KENNEDY. They have been cut back rather significantly, as you know and I know you have been trying to restore them.

Senator MAGNUSON. Mr. Chairman, I am hopeful we can pass S. 1874 as soon as possible and get started on solving some of these problems.

I want to assure this committee that I will do my best to implement it in the subcommittee on HEW appropriations once it becomes law.

Senator KENNEDY. Before departing, I thought one of the points you made, which we all ought to be reminded of, is the fact that this is a problem in rural America as well as in urban America.

I see the problem time and time again in many of the cities of industrialized States. But I think that you, representing a State which has many rural areas, are indicating the dimension of the problem in rural America; something that we ought to be mindful of.

Senator MAGNUSON. Yes. As I indicated earlier rural youngsters receive dental care even less frequently than does the child living in the suburbs. And that means the rural youngster has less than a 50–50 chance of receiving proper dental health care.

Senator KENNEDY. As you know, we have the Allied Health Manpower and the Health Professions Educational Assistance legislation which provides assistance to various medical schools, dental schools, schools of osteopathy, podiatry, and a variety of others. I am looking forward to testifying before your Appropriations Committee tomorrow regarding the HEW appropriations.

But you have some provisions in here in sections 1003 and 1004 to provide additional kinds of incentives to dental and dental auxiliary schools. As I understand, you feel personally that the nature of the dental crises is sufficient to justify both kinds of supports to creation of dental personnel. Am I correct in this?

Senator MAGNUSON. The important thing is that we get the job done. And I'm elated by the universal support that the dental profession is giving to this legislation. Mr. Chairman, I want to close with a little item that says a lot about the insufficiency of our current dental health care capacity.

When I went back to my office immediately after lunch, I had a note from my secretary. It said, "You have an appointment with Dr. Berman, Friday, July 16, at 8 o'clock."

Then there is a note here. "You had better go or you will lose your turn for the next 2 months." Dr. Berman is my dentist.

This is typical, Mr. Chairman.

Senator KENNEDY. We don't want that to happen.

Senator Hughes?

Senator HUGHES. No, thank you, Mr. Chairman, I won't delay the Senator with questions this morning, but just extend my appreciation to him for the leadership he is offering in this field and say that I am happy to join him in cosponsoring his legislation.

Senator KENNEDY. Senator Beall?

Senator BEALL. I want to thank Senator Magnuson for introducing this bill, Mr. Chairman, and for his testimony here today. I happen to be a cosponsor of this legislation. I think it is going to provide much help in the area of great need.

Interestingly enough, I had contacted HEW on Thursday last with regard to a grant to a small college in western Maryland under the dental systems program. But HEW is unable to make 20 awards, and they had 200 requests for participation in this program.

I think it shows the need for the kind of bill you are offering here today.

Senator MAGNUSON. $500,000 is as high as they would go. With this problem, that won't even come near scratching the surface.

Senator KENNEDY. I want to commend you on the President signing your increased education appropriations bill totaling $5.1 billion. I think we all read about it this morning. That, of course, is an additional tribute to you and the workings of your committee. It is very significant work, Senator.

Senator MAGNUSON. Thank you, Mr. Chairman.

Senator KENNEDY. Our next witnesses are a panel of distinguished dentists, one of whom is Dr. John M. Deines, Seattle, Wash., who is president of the American Dental Association for 1970–71. A private general practitioner in Seattle, Dr. Deines is a past president of the Washington State Dental Association and the State's unit of the American Society of Dentistry for Children.

For 6 years he served as a member of the ADA board of trustees, and for 8 years as a member of the ADA house of delegates. He is a consultant to the National Health Services Council of HEW.

Dr. Eddie G. Smith, Jr., of Washington, is vice president of the National Dental Association and will be installed as president-elect of NDA at the group's annual session in August to be held in Washington, D.C. Dr. Smith is project director of the Community Group Health Foundation in Washington, D.C., and also is currently serving as assistant professor at Howard University School of Dentistry.

Dr. John J. Salley of Baltimore, Md., is president of the American Association of Dental Schools and dean of the University of Maryland School of Dentistry. He received his dental degree from the Medical College of Virginia, and a Ph. D. from the University of Rochester. He is a consultant for the World Health Organization, and is immediate past president of the Southern Conference of Dental Deans and Examiners. Dr. Salley was a member of the faculty of the Medical College of Virginia from 1954, until his appointment in 1963 as professor of oral pathology and dean of the Maryland dental school.

Senator Beall?

Senator BEALL. I want to add that as a Marylander, we are very proud to work with Dr. Salley in our State, and for our University of Maryland Dental School of which he is dean. He brings excellent credentials and a national reputation to this meeting here today. I enjoyed working with him, and I am happy he is here in his official capacity, not only as a national officer but as the dean of the University of Maryland Medical School, to testify before the committee.

May I have unanimous consent to introduce a statement at the appropriate place in the record?

Senator KENNEDY. Fine.

(The statement referred to follows:)

STATEMENT OF SENATOR J. GLENN BEALL, JR., BEFORE THE LABOR AND PUBLIC WELFARE SUBCOMMITTEE ON HEALTH, JULY 12, 1971

Mr. Chairman, as a cosponsor of S. 1874, "The Children's Dental Health Act of 1971," I want to congratulate Senator Magnuson for initiating this proposal and the Chairman for scheduling these hearings and also urge early and favorable action on this legislation. The following statistics indicate the great unmet dental needs of the country and the need to respond to these needs.

It is shocking to hear that 70% of low-income youngsters have never been to a dentist.

More than half the population over the age of 65 have lost all their natural teeth.

For every recruit entering the service, Uncle Sam on the average, must perform 5 fillings. On 8 out of 10, it is necessary to extract a tooth.

The Federal Government spent $208 million in 1969 for dental treatment for welfare recipients.

In the health area, we hear a great deal of talk about preventive medicine. Dental care is an area whhere the value of preventive care is unquestioned. Periodic checkups and proper dental hygiene can prevent minor oral problems from becoming major ones.

Notwithstanding the value of preventive care, too many Americans put off seeing a dentist until the "pain" prevents the ignoring of the problem a minute longer. Often the problem may be simply that of education and certainly the health community, our schools, and other concerned groups and citizens must make clear the value of continued attention and care for proper dental health. For others, such as low-income children, it may be a problem of either availability of dental care or being able to afford such care. S. 1874 attempts to address itself to these problems in a number of ways.

First, it authorizes $170 million over a 5 year period for pilot programs of dental care and prevention to children from low-income families. It is estimated that 1.5 million children will be treated under the proposal. Priority is given to children in preschool and the early elementary years. It is important that these youngsters not only get off to a good start in school, but also that they begin with the proper treatment in dental care. The early years we know are important in determining a child's success for school and they are equally important in shaping his dental health.

Second, the bill would authorize to communities, if they wish it grants, for the purchasing and installing of water treatment equipment.

Third, the bill would authorize appropriations of $97 million over a 5-year period to public or non-profit institutions to assist them in training dental auxiliaries. Under this provision as many as 27,000 dental auxiliaries could be trained over a 5-year period.

Finally, the measure authorizes $97 million over 5 years for grants for programs to teach dentists and dental students how to utilize auxiliaries.

Hearings held by the health subcommittee on the various health manpower bills, which will be considered by the Senate this week, revealed the great manpower shortages presently existing and the need for greater utilization of paramedical personnel.

A projection of Maryland health manpower needs through the 1980s developed by the Maryland Council for Higher Education in 1969 recommended the following: "Immediate attention should be given to increasing the productivity of dental manpower in Maryland. This should be accomplished in two ways: (a) education of the dentist in more effective utilization of dental auxiliaries and (b) creation of educational opportunities in dental hygiene, dental assisting and dental laboratory technology."

In the Western part of the State where I make my home, the need for increased dental services in Allegany-Garrett Counties has been identified as the area's number one health need. I believe that this measure will go a long way in helping these counties, and other areas of my State to meet the unmet dental needs of low-income children as well as provide the support necessary to help assure the nation of the needed dental manpower to meet the dental requirements of our population. I am pleased to be a cosponsor and do what I can to bring about the enactment of this legislation.

STATEMENT OF DR. JOHN M. DEINES, PRESIDENT, AMERICAN DENTAL ASSOCIATION, SEATTLE, WASH.; ACCOMPANIED BY DR. EDDIE G. SMITH, JR., VICE PRESIDENT, NATIONAL DENTAL ASSOCIATION; DR. JOHN J. SALLEY, PRESIDENT, AMERICAN ASSOCIATION OF DENTAL SCHOOLS; AND BERNARD J. CONWAY, CHIEF LEGAL OFFICER, AMERICAN DENTAL ASSOCIATION

Dr. DEINES. Thank you, Senator Kennedy.

Mr. Chairman and members of the committee, I am Dr. John M. Deines of Seattle, Wash. In addition to maintaining a private dental

practice in that city, I am currently serving as president of the American Dental Association.

With me are Dr. Eddie G. Smith, Jr., of Washington, D.C., vice president of the National Dental Ascesociation; and Dr. John J. Salley, dean of the University of Maryland School of Dentistry and president of the American Association of Dental Schools.

Accompanying us is Mr. Bernard J. Conway, chief legal officer of the American Dental Association.

Our organizations are testifying jointly, Mr. Chairman, both to conserve the committees' time and to make clear our united support of S. 1874.

We fully share the conviction that Senator Magnuson's proposal is literally years overdue. We are long past the time when a witness could appear before Congress on this subject and say, "If this bill is not passed, then we will face serious problems with regard to the Nation's dental health." We are now living, and have been for some years, in the midst of an oral disease so massive that it could almost be called an epidemic. The burden of this near epidemic falls most heavily on the poor, the disadvantaged, and on millions of children.

The thrust of Senator Magnuson's bill, and of his eloquent testimony, is that the Nation must no longer passively acquiesce in this state of affairs. We hope this committee will agree with Senator Magnuson. In this connection, we are greatly pleased that 40 senators, including 11 members of this committee, have joined in cosponsoring this legislation.

S. 1874 would enact a series of activities in beginning to reverse the consequences of past neglect. With the chairman's permission, Dr. Smith and I will address ourselves to three of them: Experimental pilot projects for dental care of needy children, assistance to communities or schools wishing to fluoridate, and establishment of a dental advisory committee. Dr. Salley will then discuss those sections dealing with training expanded numbers of dental auxiliaries and teaching dental students and dentists how to best work with such auxiliary personnel.

EXPERIMENTAL PILOT PROJECTS

Section 1001 of S. 1874 would establish a 5-year program of experimental dental care projects for needy children and other young people who, for other reasons beyond their control, are not receiving oral health care. This section has four vital ramifications.

The first, of course, is that it will deliver dental care to an estimated 1½ million youngsters who do not now receive dental care. We think that, by itself, justifies the section. You are aware of the depressing statistics about the tooth decay and the beginnings of periodontal disease from which millions of children suffer before they are even of school age. And I know I can take as unanimous the agreement that no child should be permitted to suffer ill health because he lives in an isolated area or because his father is poor. This section of S. 1874 would merely move that principle from promise to performance.

Secondly, section 1001 would enable the Federal Government to field test, as it were, the various methods of delivery and administration that now lie in the realm of theory.

Senator KENNEDY. What sort of things are you talking about there?

Dr. DEINES. In regard to delivery, what we are speaking about in

our auxiliary personnel, we feel we probably have the manpower available to deliver, but we have to call upon our auxiliaries such as dental hygienists and dental assistants and expand their duties.

Senator KENNEDY. How does the dental society regard the utilization of auxiliaries? What is your general view of the returning corpsmen that have had some dental experience? Is this something you are trying to encourage the profession to work on? Could you tell us a little bit about that or do you get to it later on in your statement?

Dr. DEINES. I do. I would like to clarify the point now for the committee's interest and information. The American Dental Association is recommending that duties of auxiliary personnel be expanded. You must realize that it necessitates changing dental practice acts, dental laws, in the States. Some 29 States have done this already to expand the laws to allow them to perform functions that they have not been allowed to do up until now.

We would hope, and I have encouraged this throughout the United States last year and this year, that all States change their dental practice acts. I get into the advantages of expanding duties a little later in my discussion.

But the American Dental Association is for that, the House of Delegates is our governing body, and they have passed resolutions that allow this.

Senator KENNEDY. Do they feel that this is going to threaten the quality of dental care that the profession will be able to provide? Do they feel it is going to threaten the level of income of the dentist? How do they view these? Two areas which I am sure dentists are interested in and concerned about. How do they view the greater utilization of auxiliary personnel?

Dr. DEINES. We didn't go into this without studying it first, of course. There were experimentation programs as far back as 1961. One of them in particular was the Great Lakes area where, as a matter of fact, a classmate of mine conducted an experiment for a year to utilize corpsmen to do such things as place bands on teeth and place fillings and carve and polish.

I myself personally saw the slides. He brought them to Chicago. The work was comparable to that done by the dental officers. We had hangups in our profession for a while, but the profession now realizes that we need additional personnel and it is impossible to train dentists fast enough.

So we have to go to auxiliary personnel, and the dental profession is accepting it very well. Some States are a little slow in moving. But I think they will come along on it.

Senator KENNEDY. Does this utilization of additional personnel threaten the dentists livelihood or does it enhance it to some extent?

Dr. DEINES. It enhances it, of course. But the fact is we know we have a shortage and the dentist is certainly privileged to do this, although he doesn't have to. I think it is mentioned in one of our presentations that some dentists don't even have a dental assistant.

First, I think we have to look to utilization of dental assistants and then we have to recommend expansion of duties.

The dentists are accepting it very well. As I say, if he doesn't see fit to expand duties and use an expanded auxiliary, he doesn't have to. But there is no concern about that.

As I say, the American Dental Association's House of Delegates has already given us policy on this.

Senator KENNEDY. One way to increase the delivery of dental services is the greater utilization of auxiliary personnel, which I understand the dental profession is moving toward; but are there not also other kinds of techniques for delivering good dental care to our society?

Dr. DEINES. Yes, indeed.

Senator KENNEDY. Could you mention briefly some things that are happening today in this respect? Perhaps you could tell us what is happening in rural communities as well as in urban areas—some new things making possible delivery of dental services to groups that have not had dental care previously?

Dr. DEINES. I think probably that one of our large considerations is in areas where dentistry has not reached the people where auxiliary personnel will be utilized in this fashion to take the load off the dentists and perform duties in these rural areas that you speak of.

I am also speaking of neighborhood programs in urban areas. I don't recall at this moment—I think Dr. Smith can certainly tell you better than I can about this, because he is most familiar with that—but there are some ongoing programs now.

Many sound promising; many, perhaps, will prove out. The fact is, though, that we don't know and we won't ever know which are preferable until we test them. This is something, I might say, in which the dental profession has had an interest for long years.

The American Dental Association, some 5 years ago, issued the more recent of its calls for such experimentation. It seems to us unquestionable that massive care programs cannot hope to be efficient and economical unless some effort is made—at least concurrently—to investigate alternate methods of approach. We believe that the medicaid experience, as one example, would have been much happier than it has been if this approach had been incorporated.

Now that we are clearly moving toward even more extensive health coverage, we consider such experimentation essential.

Section 1001, third, would concentrate significant funds on children. It would thus be investing money in the group where we know it will pay the richest and most enduring dividend. This section could mark the genuine beginning of a shift in the focus of dental care from repair of disease to preventing it and maintaining oral health. Without such a shift in focus, there is little hope for bringing the oral disease problem under control.

Finally, Section 1001, by amending the Public Health Service Act, would place this program clearly within the jurisdiction of those congressional committees that are health-oriented and that handle most substantive health legislation.

This, we think, is where it belongs. As this committee knows, authority for projects similar to the ones proposed by S. 1874 exists within title V of the Social Security Act. It will however, expire at the end of this current fiscal year.

It is ironical that a program devised to combat a significant area of health neglect has, itself, fallen victim to a kind of bureaucratic neglect. That is what has happened to the title V dental programs since fiscal 1968.

Buried among a myriad of maternal and child health activities, they have been easy to overlook and the Department of Health, Education,

and Welfare has consistently done just that. It has maintained its indifference in the face of congressional concern raised by the HEW appropriations subcommittee of both Houses as well as by individual Members of Congress.

In fiscal 1970, when Congress tried to allot a token amount of money for the program, it was spotted by the Department and totally eliminated under the 2 percent cut authority given that year to the executive branch. S. 1874 would give the dental projects independent status, visibility, place them within the overview of the logical congressional committees and provide realistic, separate appropriation authority. This, we feel sure, will help call them to the attention of the Department.

MATCHING FLUORIDATION GRANTS

So far as the dental profession is concerned, one of the most exciting stories in this Nation's public health history is the discovery of fluoridation. That discovery has paid immense dividends over the years. Children living in fluoridated communities benefit by a reduction of tooth decay that runs as high as 65 percent.

Obviously, that is a lifelong benefit. The safety and efficacy of this public health measure has been endorsed by every well-known scientific and health organization that has investigated the subject. Presidents Eisenhower, Kennedy, Johnson, and Nixon have all, during their tenures of office, urged the Nation's communities to fluoridate.

The subject, as we well known, has occasioned political controversy in some places. We regret that deeply. We know that the massive documentation science has assembled over the years proves that such controversy is ill-founded. The dental profession has invested much time, effort, and money into urging fluoridation and will continue to do so.

We do, however, recognize that Senator Magnuson is being commendably prudent in writing section 1002 of S. 1874 in such a way as to make it absolutely clear that there is no intent to coerce or even to persuade any community or school district to initiate fluoridation. The decision is left squarely and entirely in local hands. What this section of S. 1874 would do, however, is offer one-time, matching grants to help communities to begin fluoridation if they desire to do so.

There is ample evidence that such communities exist. A recent article in the Boston Globe newspaper, for example, said that there are 31 Massachusetts communities that want to begin fluoridation but haven't yet found the funding to begin. Nationally, we estimate that the authorizations under section 1002 would permit some 7,000 communities to begin this effort.

As I have already noted, the focus of dental practice must shift from repair of disease to prevention of it if we are to bring oral disease under control. Fluoridation is the single, most potent public health measure known to science for preventing tooth decay, the repair of which currently costs about $2 billion a year in private sector payments. If viewed only from the standpoint of dollars, it is fiscal madness not to fluoridate.

DENTAL ADVISORY COMMITTEE

One of the most difficult and frustrating tasks the dental profession has had in recent years is its attempt to keep track of what money

is being spent within HEW for dental activities and what the sources for the funding are. Departmental dental affairs are a crazy-quilt of subsections, subdivsions and, not infrequently, afterthoughts. There is no unified Federal dental health policy. There never has been one. Arthur Flemming recognized this when he was Secretary and so has every last one of his successors in that post. But, like the weather, no one has been able to do much about it.

We would not contend that the Dental Advisory Committee proposal of section 1005 would totally reverse this long-standing chaos. We do believe that it is the place to start. It would mean that, for the first time, there would be a group of private citizens and public officials whose specific duty would be to scrutinize dental activities with an eye on their interrelationship and effectiveness within an overall Federal dental policy.

Equally important, the group would be in a position to communicate its findings and recommendations, on a continuing basis, directly to the Secretary.

Within the past year, Secretary Richardson instituted an ad hoc committtee to perform some of these overview functions. This is a genuine step forward and we believe that statutory existence of it is the logical and essential next step.

And now, Mr. Chairman, I should like to ask Dr. Smith to supplement my remarks on these three sections of S. 1874.

Thank you very much for your attention.

Senator KENNEDY. Could I ask, Dr. Deines, what your views are on group dental practice?

Dr. DEINES. The American Dental Association is encouraging group dental practices. There are several reasons for this, which I won't enumerate. But it certainly gives full coverage for the patients that are coming to the office, the office is covered all the time, it is not left vacant like a solo practice is. The backbone of our practice is solo practice. But we are encouraging group practices.

Senator KENNEDY. Do you have views about prepaid group dental practice, as well? Would you give us your own views?

Dr. DEINES. Our policy, in the American Dental Association—I am referring now to a resolution that was made last year—that wherever possible, if it was possible in a group practice to keep it from being a closed panel, that is what we recommend. That is what our policy reads.

As I say, we certainly encourage group practices and in some instances there are prepaid programs.

We favor the open panel type where the patient has a choice of his dentist.

Senator KENNEDY. Thank you.

Dr. SMITH. Mr. Chairman and members of the committee, the National Dental Association, let me say at the outset, is pleased to be able to join with our sister groups in giving Senator Magnuson's proposal an unequivocal endorsement. We feel strongly about all sections of this bill. We urge its passage.

The experimental care projects are, we think, exceptionally promising. They would enable the Nation and the profession to get off dead center and get going.

This Nation is, as the committee well knows, short of dentists. I might add that it is particularly short of dentists representative

of minority groups, a fact that is exceedingly relevant to some of the problems we face. This overall shortage is compounded by maldistribution of such practitioners as we do have.

In this regard, statistics fall somewhat short of telling the whole story. The ratio of dentists to population for an entire State or section, for example, may look reasonably favorable. But put a map of, let us say, the District of Columbia on the wall, put in a pin for every dental office location and a serious lack of balance is quickly evident. Do the same for Boston or Chicago, for New York or Los Angeles, for a long list of metropolitan areas and the result is the same.

At the present time, in addition to maintaining my private practice, as assistant professor of dentistry at Howard University and I am director of the Neighborhood Health Center serving the upper Cardozo area of Washington, D.C. In that capacity, I have had the honor of visits from the chairman of this subcommittee as he has pursued his keen interest in health matters. Other members of the committee, I know, have made similar visits elsewhere in the Nation.

You are all well acquainted with the desperate need for dental health care that is manifest among children in inner city areas, a need that is far from being met. What Senator Magnuson is saying with section 1001 is, simply, let us begin meeting that need and, in the process, learn as much as we can about the best way to do so.

Nor, of course, is it only the inner city child who is the victim. So too are large numbers of children, living in rural, sparsely settled areas of the Nation, as you have just recently pointed out in some of your opening remarks, Mr. Chairman.

The dental profession has periodically carried out surveys of dental need among Americans. The most recent large-scale study was in 1965. The 38-page report issued as a result makes depressing reading and there is little reason to think that there has been any substantial change in the past half-dozen years.

Among a group of white, male children between the ages of 10 and 14, for example, relating to that study, nearly 62 percent were in need of an average of three fillings and nearly 19 percent needed extractions. Within that same group, a full 25 percent needed to undergo correction for malocculsion. Less than 23 percent had no dental care needs at all.

Among a group of black children between the ages of 10 and 19 surveyed at the same time, 78 percent needed an average of four fillings, almost half needed extractions, and some 17 percent needed to undergo corrections for malocclusions. Less than 15 percent of that particular group had no dental needs at all.

The same study included investigation on dental visits classified according to income levels.

Senator KENNEDY. When was that study taken?

Dr. SMITH. 1965.

Senator KENNEDY. Is that in a poverty area?

Dr. SMITH. It included the poverty areas, the rural poverty, the whole country, Senator.

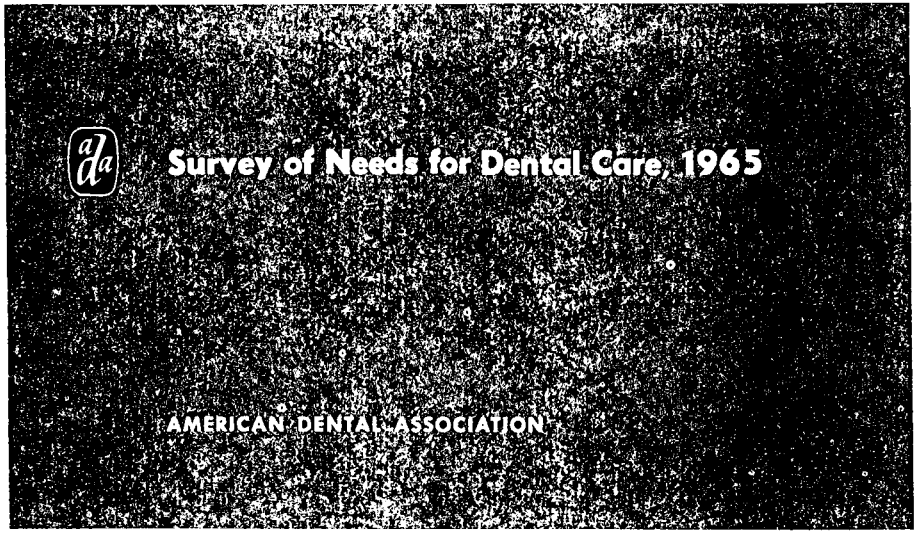
Senator KENNEDY. That is nationwide?

Dr. SMITH. Yes. We would be happy to make it available to you.

Senator KENNEDY Would you?

Dr. SMITH. Yes.

(The information referred to follows:)


Survey of Needs for Dental Care, 1965
AMERICAN DENTAL ASSOCIATION

Survey of Needs for Dental Care, 1965

A SURVEY BY THE
BUREAU OF ECONOMIC RESEARCH AND STATISTICS

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I. Methodology and composition of sample

Dental needs, especially of school children, have often been measured in local settings. When these studies are compared, the prevalence of dental needs is seen to vary considerably from place to place and from age to age. In some instances, such variances are the result of differences in study methodology.

To obtain internally comparable data on dental needs for the entire nation and for groups based on age, education, region, income, and length of time since the last visit to a dentist, this *Survey of Needs for Dental Care, 1965* was begun in December, 1965. Cooperating dentists from every state devoted considerable time and effort to completing the questionnaires. Without such profession-wide cooperation, this new body of information could not have been assembled.

Approximately 20,000 dentists, including nonmembers as well as members of the Association, were sent postcard-size questionnaires with instructions as to how to complete both sides. More than 1,500 of the profession responded. Each dentist was asked to record the dental needs of eight consecutive patients beginning in the morning of the Tuesday after receipt of the questionnaires. Only patients visiting for the first time in the present visit series were to be reported on. There were undoubtedly some inclusions of patients visiting within a series, but this is unlikely to have significantly affected the overall results. These definite instructions were given so that the dentists would not consciously or unconsciously select or exclude any particular type of patient. The total number of usable questionnaires returned was 11,852.

This survey is similar in purpose and method to one conducted by the Association in 1952, except that the present survey includes only first-visit patients, whereas the former one was comprised of consecutive dental patients, without regard to such first-visit status. The two surveys provide complementary data and comparable data for most groupings of patients according to length of time since last visit to a dentist.

One limitation of this survey must be remembered in studying or using the results meaningfully: This is a survey of dental patients and does not include persons who never go to a dentist. People seeing a dentist infrequently are underrepresented as compared with those seeing a dentist more frequently. Therefore, the statistics derived from the study do not strictly describe the general population.

Tables will be presented, however, which tend to overcome this limitation. For instance, dental needs will be analyzed according to length of time since the patient last saw a dentist. Needs will also be broken down according to age, sex, income, region, city size, and other factors. Thus, it will be possible to compare the sample with the population with respect to factors related to prevalence of dental needs.

The mailing of questionnaires was made on the basis of population of the state rather than on the number of dentists in the state. Thus, in the group of states with higher dentist-population ratios, the mailing was made to a smaller proportion of dentists than in those states with a lower ratio. By such selective sampling technics, it was possible to obtain a close geographic representation of the general population in the survey sample, as shown in Table 1 and Figure 1.

The distribution of dental patients according to size of city or town is shown in Table 2. Unfortunately, there is no closely comparable data available for the general population. The Bureau of the Census, in its presentations of this type,

does not classify all places by size (Table 3). Almost 30 percent of the population lives in places not classified as to size. Tables 2 and 3, however, are comparable in the largest two size-of-city categories, because no unincorporated places or rural areas are involved therein. Such comparison reveals a slight overrepresentation of dental patients in places of more than 100,000 population. This overrepresentation is to be expected because the dentist-population ratio is higher in larger places, generally. Also, it is likely that some dentists may have inadvertently recorded their own city's size rather than that of their patients.

Table 4 and Figure 2 show, by age and sex, the survey sample as a percentage of the total population. These percentages have considerable significance in comparing age groups and sexes with respect to dental visits. Males represented 47.1 percent of the sample; females, 52.9 percent. The percentage of the male population in the 20-to-24-year-old group represented in the sample is somewhat lower than might be expected from a comparison with the number of females. The same phenomenon, although considerably more pronounced, was noted in the 1952 survey. It is

Table 1 ■ Percentage distribution of population, 1965, and of white patients in **Survey of Needs for Dental Care, 1965**, by region and by state

Region and State	Percentage of population*	Patients	
		No.	%
New England	5.7	669	5.7
Connecticut	1.5	194	1.6
Maine	0.5	42	0.4
Massachusetts	2.7	319	2.7
New Hampshire	0.3	31	0.3
Rhode Island	0.5	50	0.4
Vermont	0.2	33	0.3
Middle Atlantic	18.8	2,054	17.6
New Jersey	3.5	377	3.2
New York	9.3	1,035	8.9
Pennsylvania	6.0	642	5.5
South Atlantic	14.8	1,760	15.1
Delaware	0.3	53	0.5
District of Columbia	0.4	10	0.1
Florida	3.0	391	3.4
Georgia	2.3	127	1.1
Maryland	1.8	251	2.1
North Carolina	2.5	343	2.9
South Carolina	1.3	105	0.9
Virginia	2.3	364	3.1
West Virginia	0.9	116	1.0
East North Central	19.7	2,491	21.4
Illinois	5.5	596	5.1
Indiana	2.5	252	2.2
Michigan	4.3	490	4.2
Ohio	5.3	778	6.7
Wisconsin	2.1	375	3.2
East South Central	6.6	524	4.5
Alabama	1.8	155	1.3
Kentucky	1.6	199	1.7
Mississippi	1.2	66	0.6
Tennessee	2.0	104	0.9
West North Central	8.2	1,346	11.5
Iowa	1.4	219	1.9
Kansas	1.2	184	1.6
Minnesota	1.8	398	3.4
Missouri	2.3	296	2.5
Nebraska	0.8	112	0.9
North Dakota	0.3	61	0.5
South Dakota	0.4	76	0.7
West South Central	9.6	945	8.1
Arkansas	1.0	106	0.9
Louisiana	1.8	139	1.2
Oklahoma	1.3	127	1.1
Texas	5.5	573	4.9
Mountain	4.0	612	5.2
Arizona	0.8	86	0.7
Colorado	1.0	177	1.5
Idaho	0.4	78	0.7
Montana	0.4	62	0.5
Nevada	0.2	46	0.4
New Mexico	0.5	35	0.3
Utah	0.5	98	0.8
Wyoming	0.2	30	0.3
Pacific	12.6	1,270	10.9
Alaska	0.1	8	0.1
California	9.6	931	8.0
Hawaii	0.4	0	0.0
Oregon	1.0	182	1.5
Washington	1.5	149	1.3
Total	100.0	11,671	100.0

*Source: U.S. Bureau of the Census. Statistical abstract of the United States: 1965, ed. 86. Washington, D.C., Government Printing Office, 1965, p. 11.

Table 2 ■ Percentage distribution of white patients by size of city or town

Size of place	Percentage of patients
1,000,000 or more	10.9
100,000-1,000,000	24.5
25,000- 100,000	24.6
2,500- 25,000	28.1
Under 2,500	6.9
Farm	5.0
Total	100.0

Table 3 ■ Percentage distribution of population by size of place, 1960*

Size of place	Percentage of population
Urban territory	69.9
Places of 1,000,000 or more	9.8
Places of 500,000 to 1,000,000	6.2
Places of 250,000 to 500,000	6.0
Places of 100,000 to 250,000	6.5
Places of 50,000 to 100,000	7.7
Places of 25,000 to 50,000	8.3
Places of 10,000 to 25,000	9.8
Places of 5,000 to 10,000	5.5
Places of 2,500 to 5,000	4.2
Places under 2,500	0.4
Unincorporated parts of urbanized areas	5.5
Rural territory	30.1
Places of 1,000 to 2,500	3.6
Places under 1,000	2.2
Other rural territory	24.3
Total	100.0

*Source: U.S. Bureau of the Census. Statistical abstract of the United States: 1965, ed. 86. Washington, D.C., Government Printing Office, 1965, p. 15.

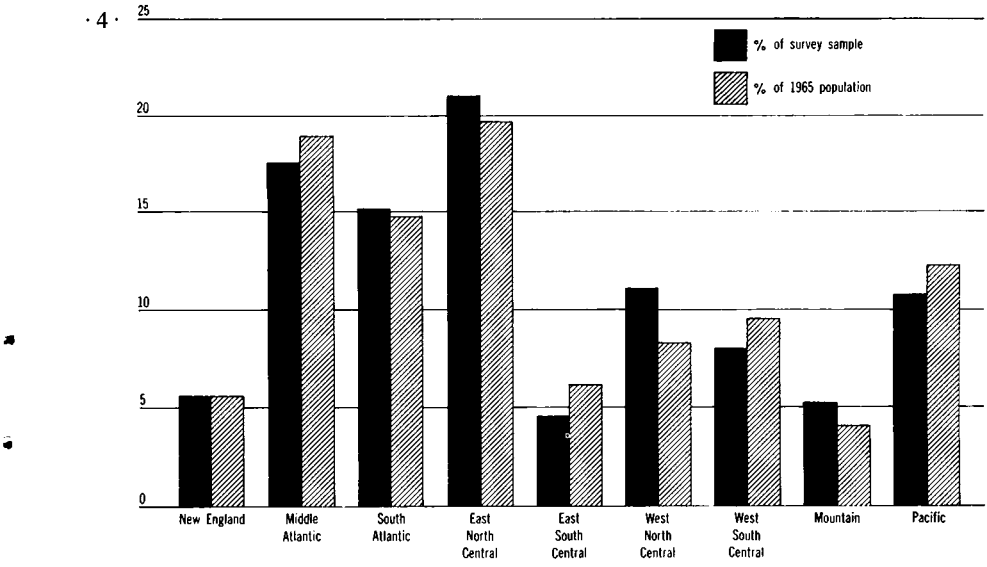

Fig. 1 ■ Comparison of regional distribution of 1965 population with distribution of patients included in **Survey of Needs for Dental Care, 1965**

probable that the large number of young men in the Armed Forces, who were included in the population age distribution but not in the survey, accounts for the deviations of this age group.

Table 5 shows how all patients were distributed according to income as estimated by the dentists responding. There are various bases on which a dentist may estimate income, as the respondents were asked to do, although some of these indicators can be misleading.

The 1963 income of the white population in general is also presented in Table 5. The pronounced difference in distribution of income between the population and dental patients is a function of the tendency for higher-income groups to visit the dentist more often. It is true that some of the difference is only apparent, because of the continuing rise in incomes as a whole over the 2-year span between the dates of the relative data in Table 5. *(See also Figure 3.)*

The distribution of patients according to length of time since last visit to a dentist is shown in

Age group	Total patients		Male patients		Female patients	
	No.	Percentage of 1965 population	No.	Percentage of 1965 population	No.	Percentage of 1965 population
- 4	297	0.0014	139	0.0013	158	0.0015
5- 9	1,230	0.0060	631	0.0061	599	0.0060
10-14	1,484	0.0079	717	0.0075	767	0.0083
15-19	1,507	0.0089	713	0.0083	794	0.0095
20-24	1,178	0.0087	484	0.0071	694	0.0102
25-34	1,467	0.0066	681	0.0061	786	0.0070
35-44	1,650	0.0067	773	0.0065	877	0.0070
45-54	1,332	0.0060	638	0.0059	694	0.0061
55-64	807	0.0048	383	0.0047	424	0.0048
65-	475	0.0026	220	0.0028	255	0.0025
Total	11,427	0.0059	5,379	0.0056	6,048	0.0061

Table 4 ■ Distribution of white patients, and number of white patients as percentage of 1965 population by age and by sex

[a]Source: Statistical abstract of the United States, 1966. Washington, D. C., Government Printing Office, 1966, p. 6, 7.

Fig. 2 ■ Percentage of 1965 population included in **Survey of Needs for Dental Care, 1965,** by age and sex

·6· **Table 5** ■ Percentage distribution of white patients by estimated income* and of white population by income

Income	Percentage of patients	Percentage of population†
Under $2,000	1.8	9.0
$ 2,000-$3,999	6.3	15.1
$ 4,000-$5,999	21.4	20.1
$ 6,000-$9,999	44.6	34.3
$10,000 and up	25.9	21.5
Total	100.0	100.0
Median	$7,840	$6,700

*If patient was a dependent, income of family head was recorded.
†Source: U.S. Bureau of the Census. Statistical abstract of the United States: 1965, ed. 86. Washington, D.C., Government Printing Office, 1965, p. 342.

Table 6 ■ Percentage distribution of white patients by length of time since last visit to a dentist and by sex

Length of time since last visit to dentist	Males	Females	Total
Less than 6 months	14.7	16.9	15.9
6 to 11 months	36.0	37.9	37.0
1 year	14.8	15.3	15.1
1.5 years	7.2	6.9	7.0
2 years	8.8	8.8	8.8
3 years	4.6	4.0	4.3
More than 3 years	9.3	6.2	7.6
Never been to dentist before	4.6	4.0	4.3
Total	100.0	100.0	100.0

Table 6. In accordance with the fact that more women than men are found in a random group of dental patients, this table shows that the average woman last saw her dentist at a more recent date than the average man.

The 1960 census indicates that Negroes comprised 10.5 percent of the total population. Of the patients included in the survey, less than 2 percent were Negro. Because of this pronounced underrepresentation, and because of established racial differences in prevalence of dental disease, almost all tables presented will be for white patients only. A summary table of some of the dental needs of Negroes will be presented, however.

The "other" racial category was reasonably representative as to number, but specifications given along with this response indicate a wide variance in classification, rendering the data unreliable. Therefore, no data are presented for this group of patients.

In general, biasing factors to be considered in analyses of the needs as indicated by this survey include a tendency for greater needs because of the sample's consisting of people visiting a dentist and a tendency for lower needs because of patients who generally receive more care being more likely to be drawn into the sample. In the case of patients who are in the category of those who had never before been to a dentist, there are two somewhat counterbalancing biases: a tendency to show high needs because of less previous care and a tendency to show low needs because of the evident lack of need for dental care that would often be true for those who never before have visited a dentist.

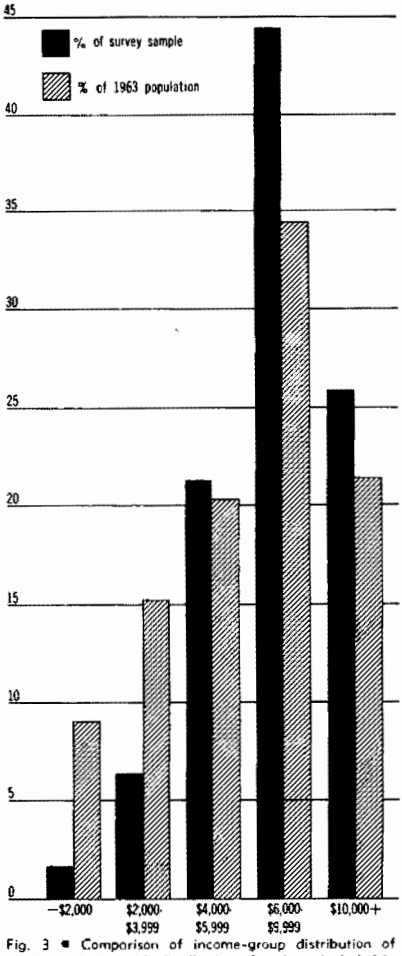

Fig. 3 ■ Comparison of income-group distribution of 1963 population with distribution of patients included in **Survey of Needs for Dental Care, 1965**

II. Dental needs according to age and sex of patients

Almost all types of dental need vary considerably with the age of the patient. Tables 7 and 8 show the dental needs of 11,427 white patients in 5-year age groups. Two types of statistics are given: percentages of patients needing the specified dental service, and average need for all patients in each age category. Average need is given in number of teeth, with the exceptions of fillings and space maintainers.

Fillings

The average number of fillings needed was highest in the 20 through 24-year-old group for both males (4.21) and females (4.17). Above that age there was a gradual tapering off, but not until patients reached their forties did they average less than two fillings needed. Despite the fact that the average patient over 60 was missing nearly a third of his teeth, more than 40 percent of these patients had teeth needing fillings.

The data from this survey do not establish any clear-cut distinction with respect to dental decay between male and female patients. On the average, males required a very slightly greater number of fillings, but this picture was not consistent among the various age groups.

Figure 4 shows the average number of fillings needed for each sex, by age.

Extractions

More teeth required extraction because of decay than for any other single reason through age 39 in both men and women. For patients over this age, periodontal disease was the reason for far more extractions being needed than was dental caries. The average need for extractions because

Table 7 ■ Dental needs of 5,379 white males, by age

Age	Fillings								Extractions needed because of											
	One surface		Two surfaces		Three or more surfaces		Total		Decay		Impaction		Periodontal disease		Prosthetic restoration		Other reasons		All reasons	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.
-4	45.3	1.50	33.8	1.16	7.9	.17	55.4	2.83	11.5	.22	0.0	.00	0.7	.01	0.0	.00	2.9	.07	12.9	.30
5-9	50.7	1.41	44.7	1.32	10.5	.23	67.0	2.96	12.5	.25	0.3	....	0.2	....	0.2	....	5.9	.09	17.6	.34
10-14	55.1	1.92	31.5	.83	7.8	.19	61.8	2.94	9.5	.18	0.8	.01	0.4	....	0.6	....	9.5	.25	18.5	.44
15-19	60.9	2.35	49.1	1.49	16.0	.36	71.9	4.20	14.0	.33	8.4	.17	0.7	.02	1.0	.02	3.6	.07	22.9	.61
20-24	57.4	1.99	53.7	1.65	20.0	.57	71.9	4.21	14.3	.51	12.8	.28	1.2	.02	1.2	.04	5.6	.09	27.9	.94
25-29	56.1	1.78	52.9	1.56	20.2	.46	72.8	3.80	20.2	.54	11.8	.21	3.8	.17	1.7	.04	6.4	.09	32.4	1.05
30-34	42.4	1.41	46.0	1.16	25.4	.49	66.6	3.06	14.6	.52	8.4	.14	3.3	.17	3.3	.13	2.4	.03	23.9	.99
35-39	43.7	1.29	41.4	.93	16.2	.29	60.4	2.51	12.7	.42	3.3	.06	6.1	.39	2.0	.07	2.8	.04	21.1	.98
40-44	47.2	1.28	41.2	1.00	16.1	.27	63.1	2.55	13.7	.44	2.4	.04	6.6	.46	2.6	.10	2.6	.04	23.7	1.08
45-49	35.3	.95	34.5	.79	13.0	.21	53.4	1.95	12.4	.37	1.1	.02	13.6	1.25	4.2	.20	2.3	.03	28.0	1.87
50-54	37.3	1.06	28.2	.65	8.1	.14	49.3	1.85	16.5	.73	2.8	.05	13.0	.94	3.9	.14	2.8	.07	31.7	1.93
55-59	32.1	.75	28.0	.44	11.5	.21	45.9	1.40	11.0	.30	0.9	.01	13.8	.96	2.3	.20	3.2	.11	24.3	1.58
60-64	35.8	.84	23.0	.44	7.9	.12	48.5	1.40	10.9	.18	1.2	....	14.5	1.08	4.2	.18	6.1	.15	24.8	1.59
65-69	26.4	.67	17.6	.31	8.8	.10	36.8	1.08	14.4	.28	0.8	.01	15.2	.92	5.6	.26	3.2	.25	33.6	1.72
70-74	28.8	.78	22.0	.43	5.1	.02	39.0	1.23	8.5	.08	1.7	....	11.9	.48	8.5	.34	3.4	.05	23.7	.95
75-	20.6	.29	14.7	.29	11.8	.15	32.4	.73	14.7	.32	0.0	.00	23.5	.97	2.9	.53	5.9	.12	38.2	1.94
Total	48.2	1.54	40.2	1.09	14.0	.29	62.2	2.92	13.3	.37	4.5	.08	4.9	.32	1.9	.08	4.7	.10	23.7	.95

Note: "%" means the percentage of patients needing the specified dental service or with the specified condition. "Avg." means the average need (in number of teeth except for those categories designated "Fillings" and "Space maintainers") among all patients, including those with no need. To obtain the average need among those patients needing a particular dental service, divide the average by the percentage and move the decimal point of the quotient two places to the right.

Table 7 ● Dental needs of 5,379 white males, by age—Continued

Age	Crowns		Fixed bridges						Partial dentures or removable bridges						Complete dentures		
			First		Second		Third		First		Second		Third		Lower only	Upper only	Upper & lower
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	%	%
-4	4.3	.29	0.7	.01	0.0	.00	0.0	.00	0.0	.00	0.0	.00	0.0	.00	0.0	0.0	0.0
5-9	3.6	.09	0.3	.01	0.0	.00	0.0	.00	0.3	....	0.0	.00	0.0	.00	0.0	0.0	0.0
10-14	3.2	.05	3.6	.04	1.3	.01	0.3	....	1.1	.02	0.4	....	0.1	....	0.0	0.0	0.0
15-19	5.0	.09	13.3	.16	4.1	.04	1.4	.02	5.2	.14	1.0	.03	0.0	.00	0.0	0.3	0.6
20-24	12.8	.28	19.8	.28	8.5	.12	2.5	.03	8.7	.34	1.2	.05	0.0	.00	0.0	0.8	1.2
25-29	9.0	.18	27.5	.36	13.9	.19	3.5	.05	10.7	.34	2.6	.06	0.0	.00	0.0	2.3	2.3
30-34	11.0	.21	19.7	.24	7.8	.10	3.9	.05	15.8	.65	3.6	.14	0.0	.00	0.0	3.0	2.4
35-39	9.9	.36	25.4	.35	11.7	.14	2.8	.04	18.8	.88	5.8	.27	0.0	.00	0.0	4.1	3.0
40-44	14.0	.30	24.0	.32	10.6	.17	4.5	.06	15.3	.64	5.3	.14	0.0	.00	0.3	2.6	3.7
45-49	9.6	.22	22.6	.29	9.6	.12	4.5	.07	16.9	.81	5.4	.21	0.0	.00	0.6	4.8	8.5
50-54	12.3	.26	20.1	.29	7.0	.09	3.2	.04	18.0	.81	8.8	.41	0.7	.01	1.1	6.7	10.2
55-59	13.3	.35	19.7	.24	7.3	.11	2.8	.04	21.6	.85	8.3	.40	0.0	.00	1.4	10.1	12.4
60-64	13.9	.35	12.7	.15	6.7	.08	3.0	.05	25.5	1.25	10.3	.48	1.8	....	1.2	6.7	15.8
65-69	13.6	.22	8.8	.11	1.6	.02	1.6	.05	17.6	.79	7.2	.23	0.0	.00	2.4	10.4	17.6
70-74	8.5	.14	13.6	.22	6.8	.08	0.0	.00	18.6	1.02	5.1	.22	0.0	.00	1.7	5.1	15.3
75-	2.9	.18	8.8	.18	2.9	.03	0.0	.00	32.4	1.85	8.8	.71	0.0	.00	8.8	23.5	11.8
Total	8.5	.20	14.8	.19	6.1	.08	2.2	.03	10.3	.43	3.3	.13	0.1	....	0.3	2.6	3.7

Table 7 ■ Dental needs of 5,379 white males, by age—Continued

Age	Periodontal treatment		Root canal treatment		Pulpotomy		Space maintainers		Correction for malocclusion	No dental needs*	Other dental conditions			
											Permanent teeth missing		Perm. teeth previously replaced	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	%	%	Avg.	%	Avg.
-4	0.0	.00	0.0	.00	5.8	.16	7.9	.12	3.6	39.6	1.4	.04	0.0	.00
5-9	0.2	.04	0.6	....	4.1	.07	9.5	.14	12.4	26.1	1.7	11	0.2	.01
10-14	0.7	.04	1.5	.02	0.7	.01	2.8	.04	25.0	22.5	6.7	.15	0.0	.00
15-19	4.8	.71	2.8	.04	0.6	.01	0.0	.00	9.4	19.4	18.8	.54	1.4	.09
20-24	7.2	.98	5.2	.07	0.4	....	0.0	.00	5.2	17.6	32.4	1.30	4.8	.20
25-29	11.6	1.64	4.0	.06	0.6	.01	0.0	.00	5.5	14.7	40.2	2.04	8.7	.52
30-34	14.3	1.89	3.9	.07	0.6	.03	0.0	.00	4.5	18.8	46.3	2.24	12.2	.55
35-39	14.5	2.19	3.3	.04	0.3	....	0.0	.00	3.6	20.3	48.7	2.97	16.2	.99
40-44	16.4	2.04	2.9	.11	0.0	.00	0.0	.00	4.5	18.5	54.9	3.48	23.5	1.35
45-49	17.8	2.63	2.5	.04	0.0	.00	0.0	.00	2.8	18.4	58.8	4.17	24.0	1.66
50-54	16.5	2.15	2.5	.03	0.4	....	0.0	.00	3.2	16.2	64.1	5.68	30.3	2.35
55-59	16.1	1.84	.9	.01	0.0	.00	0.0	.00	2.3	13.3	65.6	7.27	35.3	3.74
60-64	11.5	1.15	3.6	.07	0.6	.01	0.0	.00	1.2	15.2	69.7	9.03	38.8	4.74
65-69	16.0	1.44	1.6	.02	0.0	.00	0.0	.00	1.6	14.4	60.8	8.39	36.0	4.14
70-74	18.6	1.37	1.7	.02	0.0	.00	0.0	.00	1.7	18.6	64.4	9.64	44.1	4.95
75-	5.9	.35	0.0	.00	0.0	.00	0.0	.00	0.0	17.6	79.4	12.82	55.9	7.79
Total	8.9	1.18	2.5	.05	1.0	.02	1.7	.03	8.3	19.9	34.1	2.49	12.2	.99

*Other than prophylaxis

Table 8 ● Dental needs of 6,048 white females, by age

Age	Fillings								Extractions needed because of											
	One surface		Two surfaces		Three or more surfaces		Total		Decay		Impaction		Periodontal disease		Prosthetic restoration		Other reasons		All reasons	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.
-4	39.9	1.22	27.2	.96	7.6	.09	49.4	2.27	6.3	.14	0.0	.00	0.0	.00	0.0	.00	1.9	.04	7.6	.18
5-9	47.4	1 35	41.4	1.21	10.4	.26	64.4	2.82	12.9	.29	0.5	.01	0.2	....	0.0	.00	6.8	.15	19.2	.45
10-14	55.8	2.01	32.5	.83	9.3	.22	63.0	3.06	9.6	.18	1.7	.04	0.3	....	0.7	.01	9.5	.25	20.1	.48
15-19	61.1	2.13	51.6	1.45	16.9	.40	74.9	3 98	9.9	.25	7.1	.15	0.5	.01	0.6	01	4.4	.09	19.9	.51
20-24	59.1	2.12	53.9	1.58	20.7	.47	74.2	4.17	14 7	.51	14.4	.31	1.9	.12	1.7	.07	5.2	.09	30.4	1.10
25-29	56.1	1.78	52.4	1.52	25.2	.65	72 1	3.95	19.4	.61	9.5	.15	3.4	.17	3.4	.17	6.6	.09	32.3	1.19
30-34	47.9	1 43	47.6	1.29	16.0	.39	64.7	3.11	17.4	60	6.4	.11	4.8	.29	2.7	.12	3.2	.04	26.5	1.16
35-39	49.5	1.50	44.0	1.90	16.4	.32	67.8	2.82	12.0	.40	5.3	.08	5.6	.36	1.9	.07	3.5	.04	21.8	95
40-44	38.9	93	35.7	.71	13.9	.21	56.0	1.85	9.4	.28	2.2	.03	8.1	.47	1.8	.06	2.5	.03	19.6	.87
45-49	41.1	1 01	34.9	.62	11.2	.19	57.8	1.82	9.2	.31	1.7	.01	9.8	.34	2.5	.09	3.1	05	20.1	.80
50-54	41 7	1 00	30 7	.65	8.0	.18	51.2	1.83	9.8	28	0.3	.00	10.4	.61	3.3	.21	1.8	.02	21.1	1.12
55-59	36.4	.92	26 7	.44	4 1	.07	48.8	1.43	9.7	.40	1.4	.04	15.7	80	2.3	12	0.5		24 4	1 36
60-64	31.9	66	22 7	38	6.8	09	46.4	1.13	9.7	.32	1.4	.01	10.6	.54	3.9	.22	4.3	.08	22.7	1.17
65-69	34 3	80	23.1	46	3.7	.08	44.8	1 34	12 7	.25	0.0	.00	23.9	1.06	3.0	.17	3.7	.04	34.3	1.52
70-74	30 8	83	15.4	25	1.5	.02	35.4	1 10	10.8	.54	0.0	.00	16.9	.43	6.2	.26	3.1	.03	26.2	1.26
75	28.6	.86	8.9	.25	5 4	.05	33.9	1.16	8.9	13	0.0	.00	16.1	.89	0.0	0.0	0.0	.00	23.2	1.02
Total	49 3	1 54	40 4	1 04	13 6	.30	63.2	2 88	11.9	.35	4.6	.09	4.8	.24	1.7	.07	4.8	.09	22.9	.84

Note The meaning of "%" and "Avg" is explained in a footnote to Table 7

Table 8 ■ Dental needs of 6,048 white females, by age—Continued

Age	Crowns		Fixed bridges						Partial dentures or removable bridges						Complete dentures		
			First		Second		Third		First		Second		Third		Lower only	Upper only	Upper & lower
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	%	%
-4	3.8	.17	0.0	.00	0.0	.00	0.0	.00	1.3	.03	0.0	.00	0.0	.00	0.0	0.0	0.0
5-9	4.5	.10	0.2	—	0.0	.00	0.0	.00	0.3	—	0.0	.00	0.0	.00	0.0	0.0	0.0
10-14	3.8	.10	3.3	.05	1.4	.02	0.3	—	1.8	.04	0.8	.02	0.0	.00	0.0	0.0	0.1
15-19	5.5	.13	11.7	.15	4.5	.04	1.4	.02	3.5	.11	1.1	.03	0.0	.00	0.0	0.4	0.1
20-24	9.9	.20	15.1	.19	6.5	.08	2.0	.02	8.6	.32	2.0	.08	0.0	.00	0.0	1.9	1.2
25-29	11.2	.42	23.8	.34	11.2	.15	3.6	.06	12.4	.54	3.6	.17	0.0	.00	0.5	1.9	1.5
30-34	14.4	.42	24.9	.40	11.5	.15	2.7	.04	14.4	.61	4.3	.20	0.0	.00	0.3	1.6	4.3
35-39	12.0	.35	21.8	.31	10.0	.15	3.0	.05	16.9	.69	6.5	.27	0.0	.00	0.7	3.7	2.3
40-44	15.1	.42	23.6	.31	10.1	.15	2.9	.05	16.9	.67	5.4	.23	0.2	.01	0.2	3.8	4.0
45-49	12.8	.28	17.3	.20	4.7	.06	2.0	.03	17.9	.83	7.3	.28	0.0	.00	0.8	4.7	3.1
50-54	15.5	.36	17.9	.21	7.4	.10	1.2	.01	27.4	1.22	7.7	.32	0.0	.00	0.6	4.5	7.4
55-59	9.2	.27	12.9	.23	6.9	.09	3.2	.04	20.3	.86	9.2	.35	0.0	.00	1.4	5.1	10.6
60-64	5.8	.09	10.1	.17	6.3	.08	0.5	—	24.6	1.26	9.7	.39	0.0	.00	2.4	6.8	11.6
65-69	9.7	.37	12.7	.28	6.7	.16	0.7	.01	29.1	1.35	11.9	.56	0.0	.00	2.2	10.4	9.0
70-74	6.2	.08	6.2	.06	1.5	.03	0.0	.00	23.1	1.35	4.6	.15	1.5	.09	4.6	10.8	13.8
75-	8.9	.16	3.6	.09	3.6	.09	0.0	.00	17.9	.91	7.1	.61	.0	.00	3.6	10.7	28.6
Total	9.0	.24	13.4	.19	5.8	.08	1.6	.02	11.1	.47	3.7	.15	—	—	0.5	2.5	3.0

Table 8 ■ Dental needs of 6,048 white females, by age—Continued

Age	Periodontal treatment		Root canal treatment		Pulpotomy		Space maintainers		Correction for malocclusion	No dental needs*	Other dental conditions: Permanent teeth missing		Other dental conditions: Perm. teeth previously replaced	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	%	%	Avg.	%	Avg.
-4	0.0	.00	0.6	.01	7.0	.17	4.4	.06	4.4	45.6	0.0	.00	0.0	.00
5-9	0.0	.00	0.0	.00	4.8	.08	11.0	.18	16.0	23.0	2 2	.08	0.3	.01
10-14	0.9	.08	2.3	.06	0.8	.01	1.8	.03	24.0	19.8	8.2	.20	0.3	—
15-19	3.9	.46	2.9	.03	0.3	.01	0.5	.01	9.2	19.1	20.0	.50	2.1	.08
20-24	8.5	1.26	2.7	.04	0.3	—	0.0	.00	4.8	15.7	29.5	1.09	4.8	.19
25-29	13.1	1.62	3.6	.04	0.0	.00	0.0	.00	6.6	15.0	45.9	2.00	10 0	.45
30-34	15.0	1.93	3.5	.05	0.0	.00	0.0	.00	2.9	20.3	41.4	2.51	12.8	.87
35-39	14.8	2.00	3.7	.05	0.5	.01	0.0	.00	3.2	16.9	49.8	2.94	21.5	1.15
40-44	15.7	2.00	3.1	.04	0.2	.01	0.0	.00	5.4	22.2	52.4	3.44	22.0	1.63
45-49	15.9	1.89	0.8	.01	0.3	—	0.0	.00	3.1	20.1	57.5	4.27	28.2	1.86
50-54	15.2	1.98	4.2	.04	0.0	.00	0.0	.00	4.2	18.2	58.0	5.41	27.4	2.23
55-59	12.0	1.18	3.2	.06	0.0	.00	0.0	.00	2.9	18.9	65.4	7.18	41.0	3.68
60-64	13.0	1.14	0.5	.00	0.0	.00	0.0	.00	1.0	19.8	66.2	7.98	40.6	4.36
65-69	15.7	1.84	3.0	.03	0.0	.00	0.0	.00	3.0	14.9	67.2	8.43	39.6	4.52
70-74	7.7	.74	0.0	.00	0.0	.00	0.0	.00	0.0	20.0	67.7	10.62	40.0	5.83
75-	9.4	.83	1.8	.02	0.0	.00	0.0	.00	0.0	7.1	83.9	14.59	44.6	6.75
Total	8.8	1.10	2.5	.03	0.9	.02	1.5	.02	8.3	19.6	34.6	2.51	13.3	1.07

*Other than prophylaxis

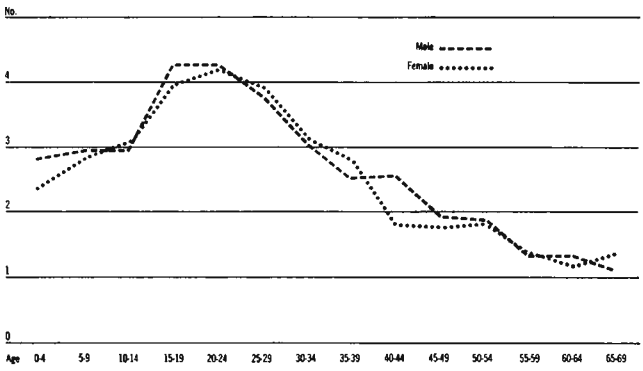

Fig. 4 ■ Average number of fillings needed, by age and sex

of decay did not decline greatly with age, but the number of extractions because of periodontal disease increased markedly. The average need for extractions because of periodontal disease was one third higher in men than in women. Impaction as a reason for extraction was greatest in the age group 20 through 24.

Males required more extractions than did females, and this difference was greatest at the upper age levels. For all ages combined, the two averages were .95 and .84, respectively. Among males, decay was given as the reason for 39.0 percent of the extractions required; periodontal disease, 33.7 percent; impaction, 8.4 percent; prosthetic restoration as the sole reason, 8.4 percent, and all other reasons, 10.5 percent.

Among females, decay was given as the reason for 41.7 percent of extractions needed; periodontal disease, 28.6 percent; impaction, 10.7 percent; prosthetic restoration, 8.3 percent, and all other reasons, 10.7 percent.

Figure 5 shows needs for extractions caused by all factors, by age.

Crowns

Nine percent of females and 8.5 percent of males were judged to be in need of crowns of any type. This difference was of doubtful statistical difference. The average need for crowns was about three times as great among adults as it was among patients under 15.

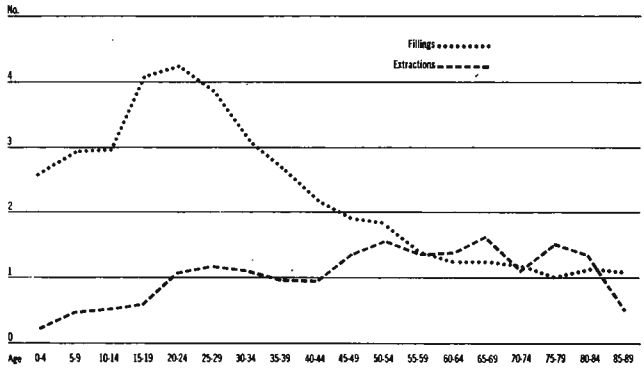

Fig. 5 ■ Average number of fillings needed and teeth needing extraction, by age

Fixed bridges

The need for fixed bridges was greatest for men in their late twenties and for women in their late twenties and early thirties. Of men between the ages of 25 and 30, 27.5 percent required a first fixed bridge. Nearly a fourth of all women between 25 and 35 required a first fixed bridge. Approximately one out of every seven patients in all age groups required a first fixed bridge. About one patient out of 17 required a second fixed bridge and one out of 53, a third. There was no appreciable difference in first, second, and third fixed bridges with respect to number of teeth in each. Fourth fixed bridges were needed in very few instances (0.6 percent). No patients needed a fifth fixed bridge.

Partial dentures and removable bridges

About one out of every nine patients was in need of a first partial denture or removable bridge, and about one out of 28 needed a second such appliance. The average number of teeth was 4.20 per first such appliance and 4.00 per second. The averages for males were very slightly lower than for females, per partial denture or removable bridge needed.

Complete dentures

The proportion of male patients needing both upper and lower complete dentures (3.7 percent) was nearly a fourth higher than the proportion of females needing both appliances (3.0 percent). However, the need for only one complete denture was approximately the same for both men and women. Of all patients needing complete dentures (6.3 percent of the total), 53.2 percent needed both upper and lower dentures, 40.5 percent needed an upper only, and 6.3 percent needed a lower only.

Other dental needs

Nearly 9 percent of all patients required treatment for periodontal disease. Among those patients requiring periodontal treatment, the average number of teeth involved was almost 13. The need for periodontal treatment increased considerably with age, but appeared to level off about age 50 and beyond.

The percentage of patients needing root-canal treatment was the same for both males and females (2.5 percent) and did not vary significantly with age. About one out of every 30 patients under age 15 required pulpotomies. The need for space maintainers was greatest in the 5 through 9-year-old group, with the group 4 years old and under second, and the group 10 through 14 third.

About one quarter of patients 10 through 14 years old were considered to be in need of correction for malocclusion. Beyond that age the need diminished gradually. The percentages given for upper age brackets, however, are probably without much meaning, since many dentists would not consider it practicable to correct malocclusion in an older patient.

The percentage of patients having no dental needs other than prophylaxis was the greatest in the lowest age group (about 43 percent). From age 5 and continuing upward in the age scale, the percentage of patients having no dental needs steadily declined until age 30, when the rate stabilized.

Permanent teeth missing and replaced

Among all patients, the percentage of missing permanent teeth that had been previously replaced by bridges and dentures was 40.0. Males averaged about the same number of permanent teeth missing, but females averaged a greater number replaced (Fig. 6).

Tables 9 and 10 show the distribution of patients according to number of permanent teeth missing and number of these teeth previously replaced.

Dental needs of children

Table 11 shows the needs of children aged 1 through 19, by single year of age. Notably, no 1-year-old children visited their dentist without some need; this would be expected, since most dentists do not recommend visits purely for examination at such an early age. The decided and relatively steady increase in need for fillings and in perma-

· 16 · nent teeth missing, proportionate to age (after the first two ages), may be contrasted with the declining percentage of patients with no dental needs. On the other hand, the need for extractions remains relatively stable throughout the range of the table, as does the need for extractions because of decay, except for a dip in the ages 11, 12 and 13. This dip is probably due to

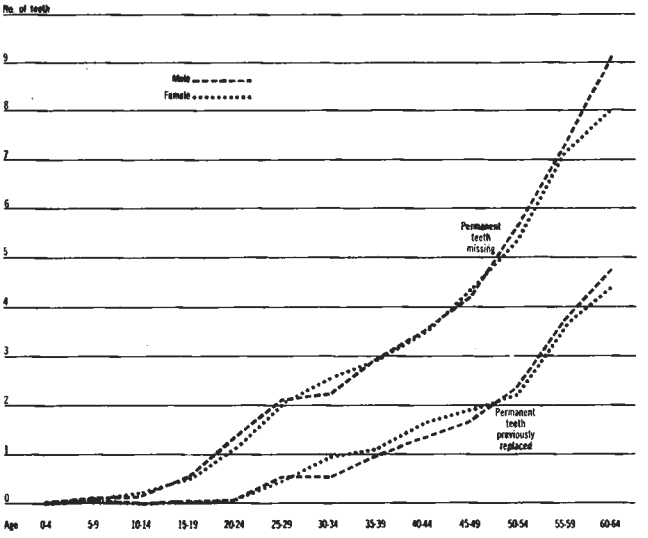

Fig. 6 ■ Average number of permanent teeth missing and number of these permanent teeth replaced, by age and sex

Table 9 ■ Percentage distribution of dental patients (white), by number of permanent teeth missing

No. of teeth	% Males	% Females
0	66.1	65.0
1	6.2	5.8
2	4.7	5.0
3	3.9	3.5
4	3.3	3.7
5	2.0	2.2
6	2.1	2.2
7	1.1	1.5
8	1.4	1.6
9	0.8	1.0
10	0.9	0.8
11	0.6	0.4
12	0.5	0.6
13	0.4	0.5
14	0.7	0.8
15	0.4	0.3
16	0.4	0.3
17	0.4	0.3
18	0.4	0.5
19	0.3	0.3
20	0.3	0.4
21	0.3	0.3
22	0.3	0.3
23	0.2	0.1
24	0.2	0.2
25	0.1	0.1
26	0.1	0.2
27	0.1	0.1
28	1.8	1.8
Total	100.0	100.0

Table 10 ■ Percentage distribution of dental patients (white), by number of permanent teeth previously replaced

No. of teeth	% Males	% Females
0	87.9	86.9
1	2.7	2.3
2	1.3	2.0
3	0.8	1.0
4	1.0	1.1
5	0.7	0.7
6	0.7	0.8
7	0.4	0.6
8	0.5	0.6
9	0.1	0.3
10	0.3	0.3
11	0.2	0.1
12	0.1	0.2
13	0.1	0.2
14	0.9	0.8
15	0.1	0.1
16	0.5	0.3
17	0.1	0.1
18	0.1	0.2
19	0.1	0.2
20	0.1	0.2
21	0.1	0.1
22	0.3	0.2
23	0.1	0.1
24	0.1	0.1
25	0.0	—
26	0.1	0.1
27	—	—
28	0.6	0.6
Total	100.0	100.0

Table 11 ■ Dental needs of 4,565 white children, by single year of age

Ages	No.	Total fillings		Total extractions		Decay extractions		Permanent teeth missing		No dental needs
		%	Avg.	%	Avg.	%	Avg.	%	Avg.	%
1	2	50.0	2.00	100.0	1.50	50.0	1.00	0.0	.00	0.0
2	10	50.0	2.90	10.0	.50	10.0	.40	0.0	.00	30.0
3	83	44.6	2.17	4.8	.11	4.8	.11	0.0	.00	51.8
4	206	54.9	2.71	11.7	.21	10.2	.19	0.0	.00	40.8
5	217	68.7	2.95	15.2	.37	12.9	.33	0.0	.00	26.3
6	227	64.3	3.00	17.2	.33	11.9	.24	1.3	.15	27.8
7	274	68.2	3.28	23.4	.50	13.5	.29	1.8	.11	22.6
8	284	66.5	3.12	19.4	.41	14.4	.32	2.5	.06	21.5
9	243	60.1	2.21	15.2	.32	10.3	.19	2.9	.08	26.3
10	280	59.6	2.35	21.1	.61	11.8	.26	2.5	.06	25.4
11	247	57.9	2.41	18.2	.43	7.7	.12	4.5	.21	20.2
12	344	58.4	2.68	20.3	.51	9.0	.17	6.4	.14	22.7
13	286	67.1	3.14	18.9	.41	8.7	.12	10.1	.21	19.2
14	342	69.0	4.07	18.7	.44	10.5	.21	12.3	.25	17.8
15	263	73.4	4.55	17.9	.37	11.4	.17	19.4	.42	19.0
16	319	73.4	4.25	19.7	.57	13.8	.41	19.7	.63	19.1
17	305	77.0	4.23	20.0	.53	10.5	.24	14.1	.33	17.4
18	316	71.8	3.42	23.4	.62	11.7	.32	19.3	.59	20.9
19	317	71.6	4.00	25.6	.71	12.0	.28	24.3	.59	19.9

Note: The meaning of "%" and "Avg." is explained in a footnote to Table 7.

Table 12 ■ Dental needs of 181 Negroes, by age

Age	Fillings		Extractions		Crowns		Space maintainers		Other replacements*	Periodontal treatment		No needs†	Correction for malocclusion
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	Avg.	%	Avg.	%	%
-9	75.0	4.13	5.4	1.71	16.7	.29	25.0	.33	.04	0.0	.00	12.5	8.3
10-19	78.1	4.15	48.8	1.02	17.1	.32	4.9	.05	1.05	12.2	1.02	14.6	17.1
20-29	90.3	6.74	54.8	1.39	16.1	.32	0.0	.00	4.10	12.9	1.71	3.2	6.5
30-39	57.6	2.64	54.5	2.36	21.2	.58	0.0	.00	2.94	24.2	2.97	15.2	0.0
40-49	51.7	2.59	69.0	1.41	27.6	.66	0.0	.00	3.48	41.4	6.38	3.4	3.4
50-	39.1	1.61	52.2	4.87	13.0	.17	0.0	.00	1.87	13.0	.78	13.0	0.0
Not spec.	33.3	1.33	33.3	.67	0.0	.00	0.0	.00	.67	0.0	.00	33.3	33.3
Total	66.3	3.70	54.9	1.95	18.5	.39	4.4	.05	2.25	17.4	2.15	10.9	7.1

*Average number of teeth needing replacement by fixed and removable bridges and partial dentures.
†Other than prophylaxis.
Note: The meaning of "%" and "Avg." is explained in a footnote to Table 7.

the final emergence of permanent teeth and deciduous tooth loss. Dentists, of course, are more chary of extracting permanent teeth than deciduous ones.

Dental needs of Negroes

On the average, Negroes required more fillings than did white patients (Table 12). The need for extractions was much higher among Negroes, as were the needs for crowns, space maintainers, periodontal treatment, and other replacements. Fewer needed correction for malocclusion, however. A smaller percentage of Negro patients had no dental needs other than prophylaxis than was true with white patients. A considerable proportion of these deviations undoubtedly can be attributed to the differing average socioeconomic levels of the racial groups.

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III. Dental needs according to length of time since last visit to a dentist

The relationship between dental needs and age was presented in the preceding chapter. Nonetheless, age, since it is such an important factor in the dental needs picture, cannot be ignored in studies of relationships between needs and other variables.

Therefore, age has been retained in this comparison of needs by length-of-time groups, and will be retained in subsequent comparisons. However, it has been necessary to combine the five-year age groups presented in Chapter II into broader groups to provide adequate samples for reliable percentages and averages by other variables. This chapter and subsequent ones will not present all types of needs covered in the preceding chapter; rather, a selection has been made to show representative needs (Table 13).

For length-of-time groups, as for other groupings, the visit made to the dentists on the day of the survey was either the first visit of a series or the only visit deemed necessary at that time.

Because of the small differences between the sexes in regard to dental needs, particularly according to other variables, and for reliability considerations, the sexes are, for the most part, combined in this and subsequent chapters.

Although length of time since last visit to a dentist provides an interesting and significant basis for study of dental needs, it is not an accurate measure of regularity of attendance at the dentist. Of those patients who last saw a dentist 6 months previously, probably most had been obtaining dental treatment with the recommended frequency for a number of years. Among this group, however, it is reasonably safe to say that there were some patients who were negligent in earlier years.

To study the relationship between visiting a dentist and existing dental needs in an ideal manner would have required obtaining a complete history of each patient's visits to dentists. Since this was not practicable, length of time since last visit was used as an index.

Table 14 indicates a definite relationship between patient income and frequency of visits to a dentist. Income is highest in the "less than 6 months" and "6-11 months" groups. These are the groups that apparently contain the highest percentage of patients who see a dentist with the recommended frequency.

It will be noted that among children 14 years of age and under the number of fillings required

Table 13 ■ Dental needs of 11,357 white patients, by length of time since last visit to a dentist and by age

Age	Less than 6 months		6-11 months		1 year		1.5 years		2 years		3 years		More than 3 years		Never		Total	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.
TOTAL FILLINGS																		
-14	40.5	1.59	54.9	1.75	75.4	3.51	82.7	4.45	89.9	5.50	81.8	6.09	92.2	7.50	71.8	4.55	62.8	2.91
15-29	58.8	2.61	63.7	2.31	77.3	4.00	82.2	5.09	87.4	6.05	91.1	7.01	88.8	8.20	90.0	8.93	73.2	4.08
30-49	46.3	1.34	54.2	1.39	66.7	2.63	74.9	3.15	77.9	4.29	71.3	3.97	70.9	4.53	75.0	6.00	61.2	2.46
50-	35.4	1.00	50.5	1.26	53.6	1.69	57.9	1.96	54.9	1.91	56.5	2.62	30.4	1.52	100.0	8.00	46.1	1.45
Total	45.7	1.65	56.7	1.75	70.4	3.18	77.0	3.99	79.8	4.76	76.7	5.02	67.4	5.09	74.2	5.12	62.8	2.90
ONE-SURFACE FILLINGS																		
-14	34.3	.95	43.2	1.09	63.5	2.05	66.5	2.31	81.0	3.45	74.5	3.65	82.4	4.22	58.0	2.22	51.7	1.67
15-29	45.4	1.28	48.5	1.24	61.6	2.11	67.4	2.53	74.2	2.85	74.0	3.28	81.0	4.30	85.0	5.02	59.1	2.08
30-49	32.2	.71	36.3	.76	46.2	1.29	54.1	1.42	56.2	2.03	52.1	1.99	57.5	2.22	62.5	3.50	43.3	1.23
50-	26.2	.58	36.7	.76	43.3	1.10	42.1	1.06	38.9	1.07	44.6	1.31	24.4	.86	100.0	7.00	34.5	.85
Total	34.7	0.89	42.1	1.00	55.1	1.73	60.2	1.98	64.2	2.41	61.1	2.52	58.0	2.65	61.6	2.59	48.8	1.54
TWO-SURFACE FILLINGS																		
-14	21.1	.51	25.9	.58	48.1	1.26	54.3	1.84	59.5	1.70	59.7	2.00	62.7	2.24	49.6	1.84	36.5	1.03
15-29	37.9	.96	37.9	.88	58.4	1.54	64.1	2.02	69.9	2.48	74.0	2.58	72.9	2.70	68.3	2.92	52.1	1.54
30-49	25.8	.48	29.9	.50	46.2	1.04	56.5	1.35	59.7	1.79	56.3	1.47	55.0	1.61	62.5	2.00	40.6	0.94
50-	16.4	.31	23.9	.39	27.0	.49	34.2	.68	35.8	.69	37.0	1.09	24.4	.54	100.0	1.00	24.9	0.48
Total	25.7	.57	30.2	.62	47.9	1.19	55.8	1.61	59.7	1.86	58.6	1.85	53.1	1.71	52.4	1.97	40.3	1.06
THREE-OR-MORE-SURFACE FILLINGS																		
-14	5.7	.13	4.5	.08	11.8	.20	13.6	.30	17.9	.35	16.4	.44	27.5	1.04	15.3	.49	9.3	.21
15-29	14.0	.37	8.9	.19	18.2	.35	26.8	.54	28.5	.72	43.2	1.07	38.7	1.20	35.0	.99	19.2	.46
30-49	10.4	.15	9.7	.13	15.3	.30	15.9	.38	28.6	.47	23.4	.51	29.7	.70	25.0	.50	15.9	.29
50-	6.2	.11	6.1	.11	6.3	.10	9.6	.22	9.9	.15	17.4	.22	7.8	.12	0.0	.00	7.2	.12
Total	9.3	.19	7.4	.13	14.0	.26	19.2	.40	23.8	.49	28.4	.65	26.7	.73	17.8	.56	13.7	.30
EXTRACTIONS BECAUSE OF DECAY																		
-14	5.2	.13	3.8	.05	11.1	.20	19.1	.34	25.6	.55	23.6	.60	29.4	.80	24.6	.56	10.8	.22
15-29	9.2	.25	4.0	.08	9.9	.18	16.8	.47	24.1	.64	32.5	1.03	46.1	1.83	53.3	1.63	14.5	.43
30-49	6.1	.16	3.6	.07	9.2	.21	17.9	.46	24.7	.88	28.7	1.13	34.8	1.37	25.0	.50	12.7	.42
50-	5.4	.15	4.6	.06	11.9	.25	14.9	.51	21.0	.62	34.8	1.57	23.0	.87	100.0	1.00	11.6	.25
Total	6.5	.18	3.9	.07	10.3	.21	17.5	.44	23.9	.69	30.9	1.11	35.1	1.37	28.2	.69	12.5	.36
TOTAL EXTRACTIONS																		
-14	20.2	.63	9.3	.17	19.7	.41	29.5	.61	29.8	.68	30.9	.95	31.4	.82	28.6	.64	18.1	.42
15-29	23.5	.72	12.1	.30	24.1	.66	31.2	.90	38.9	1.15	47.3	1.50	61.0	3.03	63.3	2.17	26.5	.87
30-49	14.6	.54	9.7	.29	20.6	.75	27.5	.92	38.3	1.83	45.5	2.68	54.3	3.52	37.5	.57	23.0	1.07
50-	19.0	.88	12.7	.30	29.8	1.65	33.3	1.61	38.9	2.28	55.4	3.52	49.3	3.81	100.0	1.00	26.3	1.44
Total	19.2	.68	10.7	.26	22.8	.76	30.3	.94	37.3	1.45	46.5	2.22	53.7	3.28	33.1	.82	23.1	.89
PERIODONTAL TREATMENT																		
-14	0.5	....	0.1	....	0.7	.07	1.7	.20	1.2	.31	3.6	....	0.0	.00	0.0	.00	0.4	.04
15-29	6.6	.80	2.8	.34	7.0	.96	6.7	1.19	12.3	1.64	15.4	1.95	15.6	2.21	26.7	4.02	7.3	.99
30-49	14.8	1.90	8.5	1.00	14.9	1.93	12.6	1.30	27.6	3.81	29.3	4.96	25.6	3.67	25.0	7.00	15.7	2.08
50-	11.8	1.16	10.7	1.03	17.5	2.02	17.5	1.27	12.3	1.75	33.7	4.55	18.4	2.24	0.0	.00	14.3	1.57
Total	8.6	0.99	4.6	.50	9.0	1.12	8.7	1.01	15.2	2.09	22.6	3.27	19.0	2.62	3.7	.59	8.8	1.13

Table 13 ■ Dental needs of 11,357 white patients, by length of time since last visit to a dentist and by age — continued

Age	Less than 6 months			6-11 months			1 year			1.5 years			2 years			3 years			More than 3 years			Never			Total		
	COMPLETE DENTURES																										
	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)
-14	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-29	1.3	0.0	1.1	0.2	0.0	0.5	0.5	0.2	0.4	0.7	0.0	0.3	1.9	0.3	0.8	3.6	0.0	1.2	3.3	0.0	4.8	3.3	0.0	0.0	1.1	0.1	0.9
30-49	2.5	0.2	3.1	0.8	0.2	0.6	2.6	0.4	2.2	3.4	0.5	2.9	8.1	0.6	3.9	7.2	1.2	7.8	9.9	0.0	16.0	0.0	0.0	0.0	3.6	0.3	3.9
50-	4.1	0.5	6.9	3.4	0.8	1.6	6.7	2.8	11.1	7.0	1.8	9.6	9.9	3.7	17.9	22.8	3.3	14.1	18.4	3.7	44.2	0.0	0.0	0.0	7.6	1.7	12.0
Total	2.0	0.2	2.7	0.8	0.2	0.5	1.9	0.6	2.4	2.1	0.4	2.3	4.8	0.9	4.4	8.0	1.0	5.8	9.5	0.9	18.7	0.4	0.0	0.0	2.5	0.5	3.3
	%		Avg.	%		Avg.	%		Avg.	%		Avg.	%		Avg.	%		Avg.	%		Avg.	%		Avg.	%		Avg.
	PERMANENT TEETH MISSING																										
-14	4.3		.22	4.1		.09	4.3		.12	6.9		.14	7.7		.24	9.1		.11	13.7		.29	1.7		.04	4.5		.13
15-29	24.3		1.10	21.6		.76	27.6		.99	40.6		1.33	34.8		1.25	32.0		1.09	50.2		2.24	15.0		.67	28.5		1.07
30-49	45.7		2.99	44.9		2.12	46.6		2.82	50.7		3.28	62.7		4.41	64.1		4.74	73.8		6.06	12.5		1.50	51.1		3.25
50-	61.5		6.62	55.0		4.51	68.7		7.48	64.0		6.96	74.7		9.47	78.3		10.17	84.8		15.47	100.0		4.00	64.8		7.56
Total	33.6		2.62	27.4		1.47	32.9		2.22	39.3		2.38	45.3		3.37	49.4		3.95	65.3		6.90	3.7		.15	34.4		2.50
	PERMANENT TEETH PREVIOUSLY REPLACED																										
-14	0.0		.00	0.1		....	0.5		.01	0.6		.01	0.6		.04	0.0		.00	0.0		.00	0.0		.00	0.2		....
15-29	5.0		.29	4.3		.19	4.7		.24	5.0		.17	5.5		.15	3.0		.21	4.1		.27	0.0		.00	4.5		.21
30-49	22.5		1.30	22.8		1.06	17.5		1.28	17.9		1.35	18.5		1.50	19.2		1.32	16.9		1.59	0.0		.00	20.2		1.26
50-	41.8		4.11	36.5		2.98	34.5		3.43	36.0		3.92	37.7		4.32	30.4		4.01	30.9		5.45	0.0		.00	35.9		3.74
Total	16.8		1.34	12.7		.78	11.5		.93	11.8		.98	13.9		1.21	13.4		1.28	15.4		2.06	0.0		.00	12.8		1.05
	NO DENTAL NEEDS OTHER THAN PROPHYLAXIS																										
-14	24.8			34.0			16.1			10.4			5.4			12.7			5.9			22.7			24.7		
15-29	23.5			27.8			13.7			10.4			5.5			3.6			1.1			5.0			17.4		
30-49	28.9			30.0			16.8			10.6			4.2			4.2			2.9			0.0			19.5		
50-	25.6			24.7			9.5			11.4			5.6			3.3			1.4			0.0			16.5		
Total	25.7			29.7			14.6			10.6			5.1			4.7			2.1			20.0			19.7		

Note: The meaning of "%" and "Avg." is explained in a footnote to Table 7.

Table 14 ■ Percentage distribution of patients by income group, according to length of time since last visit to a dentist and according to sex

Length of time	Under $2,000	$2,000-$3,999	$4,000-$5,999	$6,000-$7,999	$8,000-$9,999	$10,000 and more	Total	Median
Males (by income group)								
Less than 6 months	1.8	3.9	13.8	19.8	18.8	41.9	100.0	$9,100
6 - 11 months	1.3	3.2	14.3	23.8	21.3	36.1	100.0	$8,700
1 year	0.9	4.2	21.6	26.3	23.5	23.5	100.0	$7,700
1.5 years	1.1	6.0	22.2	33.1	18.0	19.6	100.0	$7,300
2 years	1.8	8.4	25.8	31.9	15.5	16.6	100.0	$6,900
3 years	1.2	8.5	28.1	29.4	19.6	13.2	100.0	$6,800
More than 3 years	4.5	10.5	32.6	23.7	16.6	12.1	100.0	$6,200
Never been to dentist before	1.8	10.2	36.0	25.5	18.0	8.5	100.0	$6,200
Total	1.3	4.9	21.4	25.0	21.1	26.3	100.0	$7,800
Females (by income group)								
Less than 6 months	2.0	6.8	17.4	22.8	15.4	35.6	100.0	$8,100
6 - 11 months	1.2	5.0	17.6	24.4	20.8	31.0	100.0	$8,200
1 year	2.0	6.0	23.8	29.4	18.6	20.2	100.0	$7,200
1.5 years	1.6	8.0	25.9	27.2	19.5	17.8	100.0	$7,100
2 years	1.6	10.2	33.3	26.8	17.4	10.7	100.0	$6,400
3 years	1.4	13.9	30.1	30.6	13.1	10.9	100.0	$6,300
More than 3 years	4.6	13.1	31.6	26.3	15.9	8.5	100.0	$6,100
Never been to dentist before	3.7	7.3	32.1	28.1	16.4	12.2	100.0	$6,300
Total	1.6	6.3	22.9	27.6	17.4	24.2	100.0	$7,400

was substantially lower for those who had never been to a dentist than for those who had seen a dentist more than a year and a half before. This is explained by the fact that this age group included many of the very young children who had not seen a dentist before, not because of neglect, but rather because of their early age.

The need for extractions was almost five times as great among patients who last saw a dentist over 3 years previous to the time of the survey as it was among patients in the "less than 6 months" group. At all age levels, patients who had never before seen a dentist required fewer extractions than those who had seen a dentist more than 3 years before. For certain other dental needs, as well, there was a lower average in the "never" group. This was a relatively small group, and it is highly probable that it included many

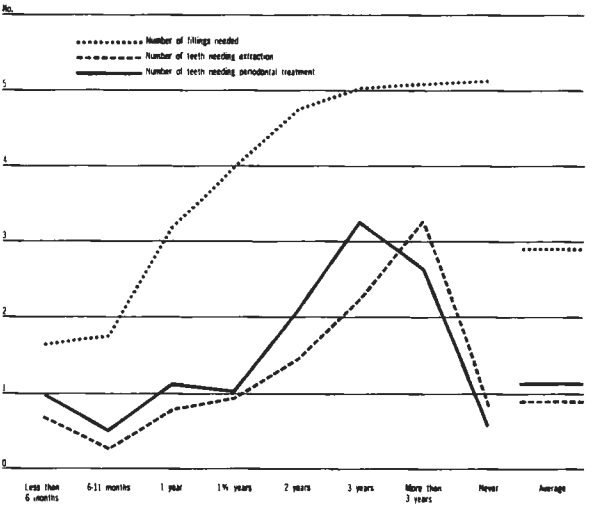

Fig. 7 ■ Average needs of fillings, extractions, and periodontal treatment, by length of time since last visit to a dentist

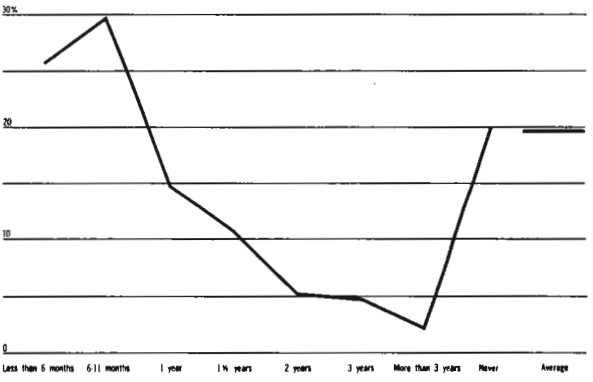

Fig. 8 ■ Percentages of patients with no dental needs, by length of time since last visit to a dentist

Table 15 ■ Percentage distribution of patients by age, according to length of time since last visit to a dentist

	Age				
Length of time	-14	15-29	30-49	50-	Total
Less than 6 months	24.5	25.3	28.5	21.7	100.0
6-11 months	29.6	29.8	25.6	15.0	100.0
1 year	25.0	32.9	27.1	15.0	100.0
1.5 years	21.9	37.6	26.1	14.4	100.0
2 years	16.7	36.4	30.7	16.2	100.0
3 years	11.4	35.0	34.6	19.0	100.0
More than 3 years	6.0	31.7	36.8	25.5	100.0
Never been to dentist before	85.9	12.3	1.6	0.2	100.0
Total	26.3	30.3	27.0	16.4	100.0

Table 16 ■ Percentage distribution of patients by length of time since last visit to a dentist, according to age

	Age				
Length of time	-14	15-29	30-49	50-	Total
Less than 6 months	14.9	13.3	16.9	21.1	16.0
6-11 months	41.5	36.3	35.1	33.6	36.9
1 year	14.3	16.3	15.0	13.6	15.0
1.5 years	5.8	8.7	6.8	6.2	7.0
2 years	5.7	10.7	10.1	8.7	8.9
3 years	1.9	5.0	5.5	5.0	4.3
More than 3 years	1.7	7.9	10.3	11.7	7.6
Never been to dentist before	14.2	1.8	0.3	0.1	4.3
Total	100.0	100.0	100.0	100.0	100.0

Table 17 ■ Percentage distribution of patients by sex, according to length of time since last visit to a dentist

Length of time	Male	Female	Total
Less than 6 months	43.9	56.1	100.0
6-11 months	45.9	54.1	100.0
1 year	46.3	53.7	100.0
1.5 years	48.6	51.4	100.0
2 years	47.1	52.9	100.0
3 years	50.8	49.2	100.0
More than 3 years	57.9	42.1	100.0
Never been to dentist before	51.0	49.0	100.0
Total	47.3	52.7	100.0

persons relatively immune to dental caries.

A pronounced increase in percentage of patients needing complete dentures occurred in the "more than 3 years" group as compared with the "3 years" group.

Those patients who had last seen a dentist within the preceding 6 months averaged nearly twice the number of permanent teeth missing as those who last saw a dentist between 6 and 11 months previously. The probable explanation for this fact is that there were included in this group of patients many with generally poorer dental health. It may be noted that the need for complete dentures in this group is also greater. Some dentists may have inadvertently included some patients in process of having dentures fitted. The number of permanent teeth previously replaced by dentures and bridges does not vary as much as most of the figures with length of time since the last visit to a dentist.

The percentage of patients with no dental needs other than prophylaxis was highest in the

Table 18 ■ Percentage distribution of patients by length of time since last visit to a dentist, according to sex

Length of time	Male	Female	Total
Less than 6 months	14.7	16.9	15.9
6-11 months	35.9	37.9	37.0
1 year	14.8	15.4	15.1
1.5 years	7.2	6.8	7.0
2 years	8.8	8.9	8.8
3 years	4.6	4.0	4.3
More than 3 years	9.3	6.1	7.6
Never been to dentist before	4.7	4.0	4.3
Total	100.0	100.0	100.0

"6 to 11 months" group, with the "less than 6 months" group second. This can be explained by the usual unlikelihood of visiting a dentist more often than each 6 months if no dental problem arises to instigate a visit sooner.

The patient who had not seen his dentist in more than 3 years was generally in a rather deplorable dental condition, on the average. The typical patient in this category required 5.09 fillings and 3.28 extractions. He had 6.90 permanent teeth missing before the indicated extractions. A total of 29.1 percent of this group needed at least one complete denture, and only 2.1 percent needed no dental treatment other than prophylaxis.

By contrast, the average patient in the "6 to 11 months" group needed only 1.75 fillings and 0.26 extractions. He had but 1.47 permanent teeth missing before the few indicated extractions. Only 1.5 percent of this group needed one or two complete dentures, and 29.7 percent had no dental needs other than prophylaxis.

Figures 7 and 8 graphically depict this pronounced relationship between dental needs and length of time since last visit to a dentist.

Tables 15 and 16 provide analytic data relating age groups and "length of time" groups. Tables 17 and 18 perform the same function with regard to sex and "length of time" groups.

IV. Dental needs according to region of the country

In the preceding chapter, a pronounced relationship was shown between unmet dental needs and length of time since patients had last visited dentists. Regional differences in unmet dental needs are in most instances relatively smaller; they are a function not only of differences in incidence rates but also of dental care received in the past. Some of the regional differences are undoubtedly due to fluoridation, in the earlier age groups particularly.

Although regional differences are not startling, on close inspection it is possible to discern some rather definite patterns.

With respect to the number of fillings needed among all age groups combined, the East North Central, West North Central, and South Atlantic regions are below the national average, whereas the remaining six regions are above (Table 19). Figure 9 shows the regions and the states contained in each.

The East North Central, West North Central, and South Atlantic regions were also distinguished by an average or lower than average number of teeth requiring extraction because of decay and for all reasons in the first two regions. The East South Central, Mountain, and Pacific regions were also below the national average in number of extractions needed because of decay, and the latter two for all reasons, as well. The Middle Atlantic Region was also below the national average in total extractions. When total extractions required were added to permanent teeth previously missing, the West South Central Region had the highest average (3.96) and the Mountain Region, the lowest (2.58).

Figure 10 shows needs for fillings and extractions by region.

Need for treatment of periodontal disease was more than twice as great in the West South Central Region as in the West North Central Region.

There were four regions in which patients exceeded the national averages with respect to percentage needing complete upper or lower dentures or both: East South Central, South Atlantic, West South Central, and East North Central. More than double the percentage of patients requiring complete dentures in the Mountain Region were judged to have such need in the East South Central Region.

The greatest number of permanent teeth missing was in the East North Central Region, and the lowest was in the Mountain Region. The East South Central Region not only recorded the second greatest number of permanent teeth missing,

Table 19 [B] Dental needs of 11,538 white patients, by region and by age

Age	New England		Middle Atlantic		East North Central		West North Central		South Atlantic		East South Central		West South Central		Mountain		Pacific		United States	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.
TOTAL FILLINGS																				
-14	64.0	3.13	68.9	3.40	64.1	2.70	61.3	2.37	57.3	2.62	59.3	2.92	58.0	2.63	63.2	3.35	63.5	3.29	62.8	2.91
15-29	75.0	4.28	77.0	3.91	70.2	3.90	78.4	4.38	68.0	4.13	73.6	4.42	74.7	4.75	75.4	3.85	70.6	3.70	73.2	4.08
30-49	64.7	2.34	64.9	2.85	57.7	2.22	65.1	2.52	60.1	2.40	58.5	2.41	57.5	2.49	60.5	2.35	62.5	2.46	61.2	2.46
50-	56.0	1.85	51.0	1.80	42.1	1.20	43.1	1.26	41.6	1.80	43.9	1.44	42.1	1.35	61.2	2.09	51.1	1.71	46.1	1.45
Total	67.3	3.19	67.4	3.10	60.0	2.64	64.3	2.85	58.6	2.75	60.9	3.04	60.1	3.04	65.2	3.01	63.9	3.01	62.8	2.90
ONE-SURFACE FILLINGS																				
-14	53.7	1.94	61.3	2.02	52.9	1.66	46.8	1.35	46.5	1.55	46.9	1.58	50.6	1.65	50.8	1.81	48.7	1.46	51.7	1.67
15-29	61.5	2.26	61.5	2.05	59.1	1.98	63.8	2.11	55.0	2.13	58.6	2.35	61.9	2.40	63.7	2.09	50.4	1.74	59.1	2.08
30-49	52.6	1.47	52.6	1.47	38.7	1.13	48.4	1.18	42.1	1.24	36.7	1.03	42.1	1.18	42.1	1.24	40.9	1.09	43.3	1.23
50-	42.9	1.23	42.9	1.23	32.2	.70	29.3	.63	42.9	1.23	34.1	.83	30.5	.69	48.2	1.31	38.8	.93	34.5	.85
Total	55.0	1.85	54.0	1.71	46.9	1.43	49.2	1.42	45.0	1.48	45.6	1.57	48.5	1.63	51.1	1.65	46.2	1.40	48.8	1.54
TWO-SURFACE FILLINGS																				
-14	38.3	1.01	38.5	1.18	36.3	.89	31.1	.84	30.9	.87	35.4	1.11	33.7	.83	43.5	1.32	43.0	1.40	36.5	1.03
15-29	51.6	1.44	55.1	1.58	47.1	1.44	59.6	1.78	49.4	1.46	54.6	1.53	52.8	1.76	52.6	1.38	50.6	1.50	52.1	1.54
30-49	37.2	.67	43.3	1.11	37.0	.83	43.7	1.01	38.2	.82	47.6	1.07	38.8	.97	42.1	.93	43.5	1.00	40.6	.94
50-	33.3	.60	26.2	.49	20.2	.37	27.6	.50	22.6	.44	23.2	.54	25.5	.52	32.9	.69	27.5	.56	24.9	.48
Total	41.9	1.02	42.9	1.17	36.7	.94	42.5	1.12	36.9	.94	43.1	1.14	39.5	1.09	44.0	1.13	43.4	1.21	40.3	1.06
THREE-OR-MORE-SURFACE FILLINGS																				
-14	8.0	.18	9.5	.20	6.0	.15	8.1	.18	9.5	.20	9.7	.23	9.4	.15	13.0	.22	13.3	.43	9.3	.21
15-29	18.9	.58	14.7	.28	17.5	.48	22.9	.49	19.0	.54	23.6	.54	22.6	.59	21.6	.38	21.2	.46	19.2	.46
30-49	14.1	.20	17.1	.27	13.9	.26	14.7	.33	15.1	.34	17.7	.31	17.6	.34	13.8	.18	20.6	.37	15.9	.29
50-	2.4	.02	6.1	.08	6.9	.13	6.0	.13	7.2	.13	7.3	.07	8.3	.14	9.4	.09	12.4	.22	7.2	.12
Total	13.0	.32	12.6	.22	11.7	.27	14.1	.31	13.5	.33	16.2	.33	15.2	.32	14.9	.23	17.3	.40	13.7	.30
EXTRACTIONS BECAUSE OF DECAY																				
-14	12.6	.20	13.2	.30	11.3	.23	7.8	.18	11.3	.27	15.0	.21	9.8	.18	10.4	.15	7.8	.19	10.8	.22
15-29	18.9	.58	15.0	.42	14.3	.38	4.2	.17	12.8	.41	18.4	.56	17.0	.71	11.1	.36	10.5	.26	14.5	.43
30-49	12.8	.35	13.6	.45	13.0	.44	15.0	.40	11.9	.47	12.9	.27	12.5	.45	6.6	.21	12.0	.38	12.7	.42
50-	14.3	.37	10.8	.32	10.7	.40	15.1	.40	6.9	.21	12.2	.17	17.2	.79	3.5	.05	16.3	.33	11.6	.35
Total	15.2	.40	13.4	.38	12.5	.36	13.8	.35	11.2	.36	14.9	.34	13.9	.51	8.7	.21	10.9	.28	12.5	.36
TOTAL EXTRACTIONS																				
-14	16.0	.26	20.0	.53	16.8	.35	14.6	.36	19.0	.45	24.8	.45	22.4	.56	17.1	.34	16.4	.37	18.1	.42
15-29	28.7	1.07	22.4	.61	25.5	.68	28.1	.83	25.6	.98	32.8	1.31	35.8	1.54	28.7	.99	23.3	.70	26.5	.87
30-49	21.2	.86	22.0	.88	21.7	1.00	24.6	.84	23.1	1.31	25.9	.80	28.6	2.00	17.8	.78	22.9	1.09	23.0	1.07
50-	29.8	1.71	23.3	.90	25.3	1.37	31.0	1.38	24.6	1.67	24.4	1.65	28.3	2.17	18.8	1.85	32.6	1.37	26.3	1.44
Total	23.6	.99	21.8	.71	22.4	.82	24.4	.81	23.1	1.06	27.5	1.02	28.9	1.49	20.8	.84	22.7	.79	23.1	.89
PERIODONTAL TREATMENT																				
-14	0.0	.00	0.6	.10	0.7	.06	0.3	....	0.7	.06	0.0	.00	0.4	....	0.0	.00	0.3	....	0.4	.04
15-29	7.8	1.08	8.3	1.17	7.5	.90	5.5	.57	6.8	1.08	7.5	.69	11.7	1.47	5.8	.96	5.4	.95	7.3	.99
30-49	17.3	2.46	20.5	2.85	10.9	1.33	10.6	1.33	17.0	2.20	11.6	1.67	21.6	2.69	11.8	1.95	18.3	2.67	15.7	2.08
50-	17.9	1.37	19.5	1.93	8.8	.78	9.5	1.08	19.3	2.07	12.2	2.13	15.2	2.22	11.8	1.28	15.7	2.16	14.3	1.57
Total	9.1	1.12	11.5	1.45	7.0	.79	6.1	.69	10.5	1.32	7.8	1.06	12.0	1.52	6.5	.94	8.3	1.23	8.8	1.13

Table 19 ■ Dental needs of 11,538 white patients, by region and by age — continued

Age	New England			Middle Atlantic			East North Central			West North Central			South Atlantic			East South Central			West South Central			Mountain			Pacific			United States		
																COMPLETE DENTURES														
	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)	Upper (%)	Lower (%)	Upper & lower (%)
-14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15-29	1.6	0.4	0.4	1.1	0.0	0.0	0.8	0.0	1.4	1.0	0.0	1.0	1.0	0.0	1.9	2.3	0.6	1.7	1.9	0.0	1.5	1.2	0.0	0.0	0.3	0.0	0.5	1.1	0.1	0.9
30-49	3.8	0.0	4.5	3.1	0.9	2.4	4.2	0.4	4.5	2.3	0.3	2.3	4.3	0.2	3.7	2.0	0.0	6.8	4.0	0.0	8.1	3.9	0.7	1.3	3.0	0.0	3.3	3.6	0.3	3.9
50-	10.7	1.2	8.3	7.9	1.2	6.4	9.2	1.7	12.0	7.3	2.2	11.6	7.9	1.6	13.1	1.2	4.9	23.2	3.4	1.4	19.3	7.1	1.2	8.2	5.6	3.4	10.7	7.6	1.7	12.0
Total	2.8	0.3	2.2	2.5	0.4	1.7	3.1	0.4	3.9	2.4	0.4	3.2	3.0	0.4	4.2	2.1	0.4	6.1	2.2	0.2	5.7	2.3	0.3	1.5	1.6	0.5	2.4	2.5	0.5	3.3
		%	Avg.	%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.	
																PERMANENT TEETH MISSING														
-14		6.9	.16		6.3	.16		4.3	.11		3.1	.17		5.4	.14		5.3	.12		2.0	.04		3.1	.09		3.6	.09		4.5	.13
15-29		29.9	1.05		29.9	1.12		28.3	1.21		28.9	1.10		28.5	1.09		31.6	1.17		30.6	1.14		25.1	.73		24.3	.73		28.5	1.07
30-49		50.6	3.90		55.3	3.46		50.8	3.56		49.6	2.85		49.5	3.14		54.4	3.59		52.4	3.22		49.3	2.57		47.2	2.72		51.1	3.25
50-		67.9	7.74		65.9	7.20		62.7	7.68		66.8	7.31		66.2	8.04		61.0	8.20		64.8	7.86		60.0	5.95		66.3	7.59		64.8	7.56
Total		33.6	2.33		36.7	2.51		34.9	2.77		34.1	2.45		35.3	2.66		37.0	2.73		34.3	2.47		29.1	1.74		29.3	1.96		34.4	2.50
																PERMANENT TEETH PREVIOUSLY REPLACED														
-14		0.6	.01		0.0	.00		0.5	.01		0.0	.00		0.2	.01		0.0	.00		0.0	.00		0.0	.00		0.0	.00		0.2	....
15-29		6.1	.28		4.8	.17		4.5	.27		4.2	.17		3.5	.09		6.3	.25		3.4	.28		2.9	.13		4.9	.24		4.5	.21
30-49		24.4	1.85		25.1	1.44		20.4	1.31		20.5	1.34		16.8	1.05		11.6	.55		16.8	1.12		21.1	1.26		20.6	1.30		20.2	1.26
50-		47.6	4.35		42.0	4.53		34.3	3.71		38.4	3.62		32.5	3.44		22.0	2.39		33.1	3.83		30.6	2.59		37.1	3.84		35.9	3.74
Total		14.3	1.09		15.2	1.19		13.4	1.13		13.2	1.03		11.6	.94		9.0	.63		10.9	.99		10.8	.76		11.6	.93		12.8	1.05
																NO DENTAL NEEDS OTHER THAN PROPHYLAXIS														
-14		27.4			22.1			24.6			26.1			30.9			18.6			19.6			24.9			23.7			24.7	
15-29		17.2			14.7			20.1			12.5			22.1			15.5			12.5			15.2			20.5			17.4	
30-49		18.6			14.7			21.3			19.9			20.9			19.0			16.5			25.0			21.9			19.5	
50-		15.5			15.2			18.0			19.0			19.3			12.2			12.4			12.9			14.6			16.5	
Total		20.0			16.7			21.2			19.1			23.4			16.8			15.7			20.6			20.8			19.7	

Note: The meaning of "%" and "Avg." is explained in a footnote to Table 7.

Fig. 9 ■ Composition of regions

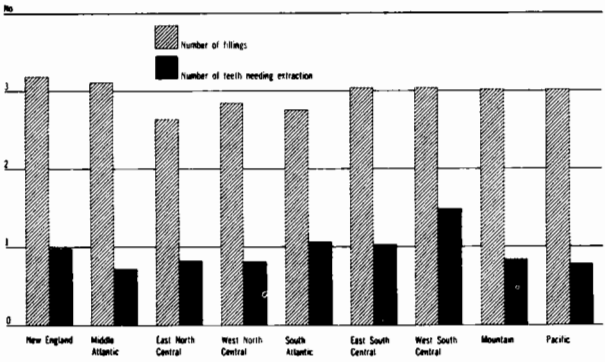

Fig. 10 ■ Average needs for fillings and extractions, by region

but it also had the lowest number of these teeth replaced previously. Thus, the gap between teeth missing and teeth replaced was considerably greater in the East South Central (2.10) than in any other region and more than double that in the Mountain Region (.98).

The percentage of patients with no dental needs other than prophylaxis varied somewhat from region to region; the West South Central, West North Central, Middle Atlantic, and East South Central regions were all below the national average in respect to percentage of patients requiring no dental treatment other than prophylaxis.

V. Dental needs according to income

The factors correlated with dental needs in this and in previous articles in this series are not independent of each other. Thus, the relationship between income and dental needs is not distinct from that between needs and length of time since last visiting a dentist, because of the close relationship existing between frequency of visits to a dentist and income. There is also some relationship between income and region of the country. Similarly, correlations of varying degree exist between other factors that have been related to dental needs in this report.

As shown in Table 20 and Figure 11, the number of fillings needed varies somewhat according to family income. The difference is especially pronounced between the two highest income groups, with patients in the "$10,000 and up" income group needing a relatively low number of fillings.

Older patients with very low incomes needed relatively few fillings. The reason for this seemingly anomalous finding becomes apparent on inspection of the statistics for total extractions needed and for permanent teeth previously missing. Those patients 50 years old or older who were in the lowest income bracket averaged almost three times as many teeth either missing or requiring extraction as did patients of the equivalent age group in the highest income bracket.

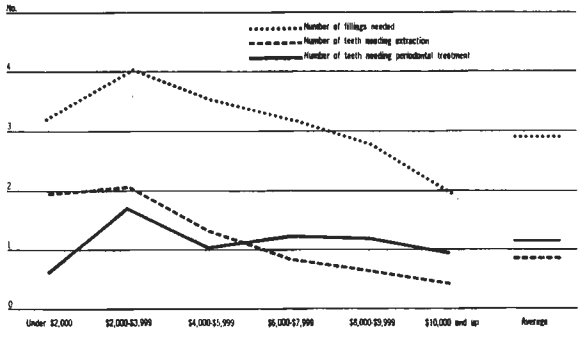

Fig. 11 ■ Average needs for fillings, extractions, and periodontal treatment, by income group

Table 20 ■ Dental needs of 10,683 white patients, by income and by age

Age	INCOME													
	-$1,999		$2,000-$3,999		$4,000-$5,999		$6,000-$7,999		$8,000-$9,999		$10,000 and up		Total	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.
							TOTAL FILLINGS							
-14	82.8	4.31	85.7	4.90	74.8	3.81	63.8	3.16	61.0	2.71	49.7	1.81	62.8	2.91
15-29	76.3	4.70	80.8	5.43	79.2	4.96	77.8	4.42	70.1	3.64	61.6	2.47	73.2	4.08
30-49	40.9	2.55	57.5	3.32	64.3	2.76	64.2	2.72	63.0	2.54	56.0	1.89	61.2	2.46
50-	28.6	1.05	45.5	1.44	44.6	1.39	49.1	1.54	45.8	1.73	48.8	1.42	46.1	1.45
Total	57.4	3.16	69.0	4.01	68.7	3.55	66.0	3.18	62.0	2.76	54.6	1.94	62.8	2.90
							ONE-SURFACE FILLINGS							
-14	72.4	2.55	71.4	2.90	61.6	2.12	52.8	1.82	50.3	1.53	39.6	1.03	51.7	1.67
15-29	61.8	2.70	68.2	2.72	64.9	2.55	62.5	2.20	56.5	1.78	46.8	1.27	59.1	2.08
30-49	36.4	1.32	45.1	1.87	48.1	1.45	44.6	1.32	43.2	1.17	39.0	.97	43.3	1.23
50-	15.9	.43	35.3	.92	31.6	.84	36.6	.87	35.5	.94	37.3	.87	34.5	.85
Total	45.3	1.76	56.8	2.16	54.5	1.89	51.1	1.66	47.7	1.40	41.0	1.05	48.8	1.54
							TWO-SURFACE FILLINGS							
-14	51.7	1.52	49.0	1.29	46.4	1.43	40.6	1.12	33.8	.96	25.4	.67	36.5	1.03
15-29	57.9	1.57	63.9	2.00	57.7	1.81	54.8	1.71	50.3	1.47	40.0	.94	52.1	1.54
30-49	31.8	1.05	37.2	.96	43.6	1.08	46.5	1.06	41.5	1.01	33.5	.68	40.6	.94
50-	22.2	.33	23.4	.40	26.4	.47	28.5	.54	24.5	.63	23.0	.43	24.9	.48
Total	42.1	1.08	47.3	1.32	46.2	1.32	44.8	1.19	39.3	1.06	31.2	.70	40.3	1.06
							THREE-OR-MORE-SURFACE FILLINGS							
-14	13.8	.24	23.5	.71	10.7	.26	10.8	.22	8.0	.22	5.7	.11	9.3	.21
15-29	22.4	.43	30.5	.71	24.2	.60	20.3	.51	17.5	.39	9.7	.26	19.2	.46
30-49	13.6	.18	15.0	.49	14.2	.23	16.2	.34	20.5	.36	14.4	.24	15.9	.29
50-	11.1	.29	4.2	.12	5.7	.08	9.1	.13	8.1	.16	7.9	.12	7.2	.12
Total	16.3	.32	20.4	.53	15.3	.34	14.8	.33	14.6	.30	9.7	.19	13.7	.30
							EXTRACTIONS BECAUSE OF DECAY							
-14	34.5	.83	37.8	.81	18.6	.43	12.0	.23	6.9	.12	2.7	.04	10.8	.22
15-29	23.7	.73	25.5	1.06	23.4	.68	15.6	.37	8.7	.17	2.8	.04	14.5	.43
30-49	22.7	2.14	28.3	1.10	16.5	.71	16.0	.46	12.0	.38	4.6	.06	12.7	.42
50-	15.9	.46	12.6	.51	14.5	.54	14.4	.38	11.7	.42	7.5	.13	11.6	.35
Total	22.6	.84	24.5	.90	19.0	.60	14.3	.35	9.6	.25	4.1	.06	12.5	.36
							TOTAL EXTRACTIONS							
-14	37.9	.79	40.8	.84	24.1	.57	20.4	.44	16.1	.37	9.9	.27	18.1	.42
15-29	40.8	1.16	38.4	2.00	35.5	1.13	27.5	.78	20.6	.55	15.0	.36	26.5	.87
30-49	50.0	4.50	45.1	3.45	28.3	1.73	26.9	1.13	21.4	.82	13.0	.40	23.0	1.07
50-	39.7	2.35	32.3	1.99	28.8	2.15	30.0	1.57	25.6	1.17	21.0	.77	26.3	1.44
Total	41.1	1.94	38.3	2.05	29.8	1.31	25.6	.89	20.3	.67	14.1	.42	23.1	.89
							PERIODONTAL TREATMENT							
-14	3.4	....	3.1	.56	0.2	....	0.6	.05	0.0	.00	0.3	.03	0.4	.04
15-29	5.3	.72	12.9	1.82	9.1	1.06	6.8	.98	7.1	1.09	4.0	.54	7.3	.99
30-49	4.5	1.27	21.2	2.82	16.8	1.96	17.6	2.40	16.6	2.18	12.2	1.63	15.7	2.08
50-	12.7	.51	13.2	1.59	13.2	1.34	14.9	1.77	14.7	1.67	15.4	1.75	14.3	1.57
Total	7.4	.62	12.9	1.72	9.5	1.04	9.1	1.19	9.0	1.16	7.5	.93	8.8	1.13

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Table 20 ■ Dental needs of 10,683 white patients, by income and by age — continued

Age	- $1,999			$2,000 - $3,999			$4,000 - $5,999			$6,000 - $7,999			$8,000 - $9,999			$10,000 and up			Total		
									COMPLETE DENTURES												
	Upper %	Lower %	Upper & Lower %	Upper %	Lower %	Upper & Lower %	Upper %	Lower %	Upper & Lower %	Upper %	Lower %	Upper & Lower %	Upper %	Lower %	Upper & Lower %	Upper %	Lower %	Upper & Lower %	Upper %	Lower %	Upper & Lower %
-14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	....
15-29	0.0	2.6	0.0	4.0	0.3	2.3	1.2	0.1	1.7	0.6	1.4	0.7	0.2	0.6	0.4	0.0	0.1	0.1	1.1	0.1	0.9
30-49	0.0	0.0	27.3	6.2	2.7	9.7	4.6	0.4	8.3	4.6	0.1	3.7	2.3	0.5	2.5	2.2	0.2	1.4	3.6	0.3	3.9
50-	20.6	4.3	33.3	8.4	1.2	24.0	10.9	3.6	19.2	9.4	1.3	7.6	4.0	1.1	11.4	5.2	0.6	4.1	7.6	1.7	12.0
Total	7.9	2.1	14.2	4.8	0.8	8.5	3.4	0.7	5.8	2.8	0.2	2.3	1.3	0.3	2.4	1.5	0.2	1.2	2.5	0.5	3.5
	%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.	
									PERMANENT TEETH MISSING												
-14	6.9	.38		10.2	.21		7.1	.22		4.7	.10		3.7	.09		2.4	.07		4.5	.13	
15-29	34.2	1.76		43.0	1.63		38.4	1.58		30.6	1.09		22.2	.73		15.2	.37		28.5	1.07	
30-49	63.6	5.18		59.3	4.27		57.7	4.67		54.8	3.55		50.8	2.92		43.7	2.29		51.1	3.25	
50-	82.5	15.30		82.6	11.87		67.9	9.24		67.9	6.68		61.5	6.62		58.7	5.63		64.8	7.56	
Total	49.5	6.44		50.7	4.37		40.0	3.26		35.1	2.26		31.2	2.03		27.9	1.77		34.4	2.50	
									PERMANENT TEETH PREVIOUSLY REPLACED												
-14	0.0	.00		0.0	.00		0.3	.01		0.1	....		0.3	.01		0.0	.00		0.2	....	
15-29	3.3	.39		3.6	.22		6.4	.31		4.1	.17		3.7	.15		3.2	.10		4.5	.21	
30-49	31.8	1.55		13.0	1.52		15.9	1.11		19.7	1.23		23.3	1.46		22.5	1.26		20.2	1.26	
50-	33.3	4.60		37.7	4.54		28.5	3.88		36.0	3.26		34.8	3.18		44.0	4.17		35.9	3.74	
Total	16.8	1.86		13.4	1.47		10.9	1.03		11.7	.85		13.1	.93		15.2	1.12		12.8	1.05	
									NO DENTAL NEEDS OTHER THAN PROPHYLAXIS												
-14	3.4			9.2			15.9			23.9			24.6			33.9			24.7		
15-29	10.5			8.3			9.7			14.3			23.1			28.4			17.4		
30-49	13.6			9.7			10.4			15.2			20.3			29.6			19.5		
50-	7.9			9.0			12.4			14.6			19.4			19.9			16.5		
Total	8.9			8.8			11.9			17.4			22.0			28.7			19.7		

Note: The meaning of "%" and "Avg." is explained in a footnote to Table 7.

Table 21 ■ Percentage distribution of patients by age, according to income category

Income	Age				All ages
	-14	15-29	30-49	50-	
-$1,999	15.2	40.0	11.6	33.2	100.0
$ 2,000-$3,999	14.4	44.4	16.6	24.6	100.0
$ 4,000-$5,999	25.4	34.0	23.7	16.9	100.0
$ 6,000-$7,999	28.8	29.5	27.7	14.0	100.0
$ 8,000-$9,999	29.4	25.5	31.7	13.4	100.0
$10,000-	26.5	26.1	30.0	17.4	100.0
All incomes	26.4	29.9	27.2	16.4	100.0

Patients in the highest age group and lowest income bracket average 17.65 teeth either missing or indicated as needing extraction. It appears that the relatively small amount of remediable decay found among these patients results at least in part from the absence of many susceptible teeth and from the high incidence of prospective tooth loss among the remaining teeth.

The number of extractions required because of decay shows a pronounced variation according to the income of the patient. This need was 14 times as great in the lowest income group as in the top one.

The table shows a pronounced correlation between income and need for complete dentures. For instance, for patients 50 years old or older, 60.2 percent of the lowest income bracket needed one or more complete dentures, compared with only 9.9 percent in the highest income bracket.

A much higher proportion of permanent teeth previously missing had been previously replaced in the high-income groups than in the low-income groups. Far more patients in the higher income

Table 22 ■ Percentage distribution of patients by income category, according to age

Age	Income						All incomes
	$1,999	$2,000-$3,999	$4,000-$5,999	$6,000-$7,999	$8,000-$9,999	$10,000	
-14	1.0	3.5	20.5	27.8	21.2	26.0	100.0
15-29	2.4	9.4	24.3	25.1	16.2	22.6	100.0
30-49	0.8	3.9	18.6	26.0	22.1	28.6	100.0
50-	3.6	9.5	22.0	21.8	15.6	27.5	100.0
All ages	1.8	6.3	21.4	25.6	19.0	25.9	100.0

classifications had no dental needs (other than prophylaxis). The need for periodontal treatment shows roughly the same picture, with the lowest income category again low in need, for the same reasons as those indicated for that group's low needs for fillings.

Age is part of the explanation of income group deviations with respect to dental needs, as is occupation.

Income, of course, is highly correlated with age of family head. Also, the age distribution of patients varies among the different income categories.

The highest income category had a greater-than-average proportion of patients in each of the two highest age groups (Table 21). In addition, within the two highest age groups, the highest income category was the largest (Table 22).

Some of the higher earning power accruing to more mature workers is offset in the highest age group by the generally lower earnings of retirees.

Thus, the patients in the younger age groups within the higher income categories tend to reflect the income of a family head older than those in the lower income groups and otherwise tend to be affected by the various socioeconomic factors associated with the stage of the family life cycle. The relatively low number of youthful patients in the lowest income group may be explained in part by proportionately less dental care being provided in cases of economic deprivation. The dental profession's recognition of the importance of such dental indigency can be seen in the recently adopted American Dental Association Dental Health Program for Children (JADA 74:330 Feb., 1967).

For the foregoing reasons, the age-income correlations presented cannot isolate these factors quite as well as some others are isolated in this study.

Data regarding occupation of patients were not gathered in this survey.

VI. Dental needs according to education

Of all variables studied in this survey, education is the least amenable to separate comparison with dental needs because of the relationship of that variable with others that are pertinent in the study of dental needs differences.

It is difficult to separate the effects of education on dental needs from those of income since these variables are so highly correlated in our society. Length of time since last visit to a dentist, the most important variable with respect to dental needs, except age, is also highly correlated with educational level. This high correlation is because the more highly educated are more prone to realize the importance of regular care. Because of the close relationship between income and length of time since last visiting a dentist (as indicated in the third article in this series), and the relationship of education with both these variables, all three are highly interrelated.

Age is also highly correlated with education since both are related to income; this relationship is taken into account to a considerable degree by the presentation in Table 23. The education of the family head was used, which should be kept in mind in analyses of the younger age groups.

The clear relationship between formal educational attainment and dental needs can be seen in almost every need analyzed and at almost every age level of patients.

The data for the lowest category of educational achievement used in the questionnaire, less than 5 years of schooling, were comparatively low in reliability, since proportionately few persons in this category were dental patients. Therefore, the first two educational categories were combined. The resultant group, with less than 9 years of education, was still proportionately small.

It is clear that the less educated members of the population are underrepresented as dental patients. The majority of patients fell into the category of those having had 9 to 12 years of formal education. Dental needs differences of great significance are found between that group and the second largest, that with college education. These two groups constituted more than 90 percent of all patients.

The college group needed only two thirds the number of fillings needed by the high school group and a quarter as many extractions because of decay. Total extractions needed averaged less than half as many among the college patients. Only three quarters as many of the college-educated patients needed periodontal treatment. This group also had only half as many permanent teeth missing; of those missing, a greater proportion had been replaced. High school-educated patients needed four times the number of complete dentures than were needed by college-educated ones. Patients with no dental needs represented 10.6 percent more of the college group than they did of the high school one.

Table 23 ■ Dental needs of 10,764 white patients, by education of family head and by age

Age	Less than 9 years		9-12 years		College		Total	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.
TOTAL FILLINGS								
-14	67.5	3.77	69.8	3.44	51.6	1.88	62.8	2.91
15-29	81.6	6.06	78.0	4.72	67.4	3.13	73.2	4.08
30-49	54.4	2.59	65.3	2.89	57.8	2.02	61.2	2.46
50-	35.6	1.13	48.1	1.66	48.1	1.32	46.1	1.45
Total	59.1	3.17	67.7	3.41	58.1	2.26	62.8	2.90
ONE-SURFACE FILLINGS								
-14	57.2	2.19	58.6	1.99	40.3	1.04	51.7	1.67
15-29	73.4	3.30	64.3	2.45	51.9	1.54	59.1	2.08
30-49	40.4	1.39	47.2	1.43	39.9	1.02	43.3	1.23
50-	26.2	.71	36.3	.97	34.9	.73	34.5	.85
Total	48.6	1.81	53.8	1.82	43.3	1.16	48.8	1.54
TWO-SURFACE FILLINGS								
-14	41.0	1.25	41.0	1.18	29.3	.74	36.5	1.03
15-29	55.0	1.84	58.0	1.75	45.0	1.23	52.1	1.54
30-49	36.0	.86	45.0	1.11	36.2	.73	40.6	.94
50-	21.8	.37	25.8	.54	25.9	.46	24.9	.48
Total	37.1	1.03	45.0	1.24	36.0	.86	40.3	1.06
THREE-OR-MORE-SURFACE FILLINGS								
-14	11.9	.33	11.9	.27	5.3	.10	9.3	.21
15-29	29.4	.92	22.3	.52	14.8	.36	19.2	.46
30-49	13.2	.34	17.6	.35	14.9	.25	15.9	.29
50-	4.4	.05	7.9	.15	8.1	.13	7.2	.12
Total	12.4	.33	16.0	.35	11.7	.24	13.7	.30
EXTRACTIONS BECAUSE OF DECAY								
-14	19.3	.41	14.0	.28	3.8	.07	10.8	.22
15-29	35.8	.94	19.0	.52	7.0	.15	14.5	.43
30-49	30.9	1.39	17.1	.60	5.5	.10	12.7	.42
50-	20.9	.80	12.7	.41	6.8	.11	11.6	.35
Total	23.5	.73	16.2	.46	5.8	.11	12.5	.36
TOTAL EXTRACTIONS								
-14	26.5	.57	21.0	.46	11.7	.31	18.1	.42
15-29	43.1	2.03	30.3	.98	20.6	.56	26.5	.87
30-49	47.1	3.82	28.0	1.41	14.5	.36	23.0	1.07
50-	43.1	3.07	27.4	1.51	19.3	.80	26.3	1.44
Total	36.2	1.91	26.8	1.05	16.5	.47	23.1	.89
PERIODONTAL TREATMENT								
-14	1.0	....	0.6	.06	0.1	.02	0.4	.04
15-29	9.2	.93	9.3	1.30	4.8	.64	7.3	.99
30-49	14.0	1.96	18.8	2.55	12.6	1.60	15.7	2.08
50-	15.1	1.59	14.6	1.64	15.2	1.58	14.3	1.57
Total	7.8	.84	10.5	1.36	7.3	.88	8.8	1.13

COMPLETE DENTURES

	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)
-14	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	....
15-29	0.0	0.9	2.8	1.7	0.1	1.4	0.4	0.0	0.1	1.1	0.1	0.9
30-49	8.1	0.7	16.9	5.5	0.6	5.3	0.8	0.1	0.9	3.6	0.3	3.9
50-	15.1	2.7	32.0	8.3	1.9	12.2	3.7	1.2	4.2	7.6	1.7	12.0
Total	5.2	0.9	11.3	3.3	0.5	3.8	0.8	0.2	0.8	2.5	0.5	3.3

	%	Avg.	%	Avg.	%	Avg.	%	Avg.
PERMANENT TEETH MISSING								
-14	3.4	.08	6.2	.16	3.2	.11	4.5	.13
15-29	40.4	1.52	34.7	1.41	20.8	.63	28.5	1.07
30-49	63.2	6.22	59.6	4.28	41.8	1.80	51.1	3.25
50-	84.4	13.23	68.1	8.00	57.5	5.21	64.8	7.56
Total	38.7	4.66	39.4	2.92	27.6	1.47	34.4	2.50
PERMANENT TEETH PREVIOUSLY REPLACED								
-14	0.5	.02	0.1	....	0.1	....	0.2	....
15-29	4.6	.16	4.9	.28	3.9	.14	4.5	.21
30-49	18.4	1.82	21.3	1.56	19.7	.88	20.2	1.26
50-	28.0	4.44	36.9	3.89	40.8	3.58	35.9	3.74
Total	11.1	1.48	13.2	1.13	12.6	.79	12.8	1.05
NO DENTAL NEEDS OTHER THAN PROPHYLAXIS								
-14	21.9		19.5		32.1		24.7	
15-29	5.5		13.5		22.8		17.4	
30-49	11.8		13.6		27.4		19.5	
50-	6.7		16.0		20.0		16.5	
Total	14.1		15.4		26.0		19.7	

Note: The meaning of "%" and "Avg." is explained in a footnote to Table 7.

VII. Dental needs according to size of city

Dental needs differences by size of city of patients' residence are given in Table 24. Such differences are somewhat a function of availability of dental services. They may also be partially attributable to different levels of valuing dental services between patients in varying city sizes. Income, too, varies somewhat according to size of city, and must be kept in mind as a causative factor for dental needs statistics differing among various city-size categories. As indicated in the third article in this series, income is inversely related to unmet dental needs. The slight variations in age of the population in various sizes of city is overcome by the presentation in the table.

As can be observed, there is a generally direct, although not pronounced relationship between size of city and dental needs. In regard to total number of fillings needed, the overall average was exceeded by patients residing in the three largest city-size categories and on farms. Patients living in cities or towns of under 25,000 population showed lower-than-average need for that service.

For permanent teeth missing, the same pattern is seen: the mean number in the largest two city-size categories and on farms exceeded the average, whereas the others were lower.

The total need for extractions appeared more directly related to city size; persons in the largest three city-size categories had average needs greater, and persons in the other three categories had average needs less than the national average.

In the highest three city-size categories, there were fewer patients with no dental needs; in the lower three, more.

There is no particular relationship between the need for complete dentures and the size of city of the patient, whereas there is a clearly inverse relationship between the prevalence of the need for periodontal treatment and city size. The latter rather mysterious correlation suggests the need for specific research to determine the causeative factors in these circumstances.

It has been hypothesized by dental authorities that nervous tension is a contributing factor in the incidence of periodontal disease. On the other hand, it has been hypothesized by sociologists that more rural living conditions produce less emotional stress. Therefore, the findings in this study in regard to periodontal disease appear inexplicable within the current level of dental knowledge.

Table 24 ■ Dental needs of 11,382 white patients, by city size and by age

Age	Over 1,000,000		100,000–1,000,000		25,000–100,000		2,500–25,000		Under 2,500		Farm		Total	
	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.	%	Avg.
							TOTAL FILLINGS							
–14	70.7	3.15	67.9	2.94	68.4	3.40	60.0	2.67	56.1	2.53	60.3	2.99	62.8	2.91
15–29	75.5	4.91	74.6	4.49	76.1	4.19	73.0	3.94	70.2	3.75	72.1	4.29	73.2	4.08
30–49	64.7	2.08	70.4	2.97	62.5	2.53	60.2	2.41	58.5	2.19	59.9	2.88	61.2	2.46
50–	44.1	1.52	45.3	1.22	47.7	1.49	47.9	1.48	43.5	1.42	48.3	1.54	46.1	1.45
Total	65.4	3.02	66.5	3.12	66.3	3.14	62.1	2.80	58.7	2.59	61.6	3.07	62.8	2.90
							ONE-SURFACE FILLINGS							
–14	60.2	2.21	55.7	1.71	57.1	1.94	48.0	1.50	46.4	1.38	49.2	1.77	51.7	1.67
15–29	61.9	2.58	63.5	2.34	61.0	2.17	59.3	1.95	54.8	1.86	60.1	2.26	59.1	2.08
30–49	39.3	1.03	49.7	1.37	45.4	1.33	43.3	1.19	39.8	1.04	44.9	1.52	43.3	1.23
50–	31.4	.70	37.8	.70	35.6	.92	34.7	.84	32.5	.82	39.8	.98	34.5	.85
Total	49.1	1.68	52.7	1.65	52.2	1.70	48.1	1.45	44.6	1.32	49.7	1.69	48.8	1.54
							TWO-SURFACE FILLINGS							
–14	35.8	.79	37.4	1.09	40.6	1.22	36.5	1.00	31.0	.86	37.3	1.06	36.5	1.03
15–29	55.5	1.78	52.9	1.67	53.6	1.57	53.2	1.54	48.4	1.41	52.9	1.59	52.1	1.54
30–49	42.2	.80	46.2	1.14	40.7	.92	40.1	.95	36.3	.85	42.8	1.04	40.6	.94
50–	28.4	.58	23.4	.42	27.2	.48	26.9	.53	22.4	.46	23.8	.44	24.9	.48
Total	41.9	1.04	41.6	1.17	42.8	1.14	41.0	1.08	36.6	.95	41.0	1.09	40.3	1.06
							THREE-OR-MORE-SURFACE FILLINGS							
–14	8.9	.15	7.7	.14	12.2	.24	6.8	.17	9.6	.29	8.3	.18	9.3	.21
15–29	23.2	.55	19.3	.48	19.1	.45	20.1	.45	17.2	.48	19.7	.44	19.2	.46
30–49	15.0	.25	17.8	.46	14.9	.28	17.9	.27	15.5	.30	14.1	.32	15.9	.29
50–	11.8	.24	8.0	.10	5.9	.09	7.8	.11	6.8	.14	8.0	.12	7.2	.12
Total	15.2	.30	13.3	.30	14.2	.30	13.9	.27	13.0	.32	13.6	.29	13.7	.30
							EXTRACTIONS BECAUSE OF DECAY							
–14	17.9	.33	13.8	.34	13.9	.30	9.4	.17	6.5	.13	10.7	.16	10.8	.22
15–29	20.6	.49	18.0	.55	16.6	.49	13.8	.42	11.8	.33	12.2	.38	14.5	.43
30–49	11.0	.20	14.8	.41	13.0	.49	13.6	.41	11.4	.38	12.3	.38	12.7	.42
50–	14.7	.32	14.6	.40	11.9	.37	13.2	.32	8.9	.35	10.7	.31	11.6	.35
Total	15.9	.33	15.5	.45	14.3	.42	12.4	.33	9.9	.30	11.6	.32	12.5	.36
							TOTAL EXTRACTIONS							
–14	27.6	.57	17.9	.46	20.3	.45	17.7	.44	14.0	.33	18.7	.35	18.1	.42
15–29	29.0	.75	32.4	.96	27.2	.91	25.6	.86	26.2	.89	22.4	.74	26.5	.87
30–49	20.2	1.03	29.6	1.42	23.8	1.27	23.8	1.06	21.0	.90	21.6	.89	23.0	1.07
50–	34.3	2.04	32.1	2.02	27.4	1.66	26.7	1.48	21.9	1.17	27.6	1.11	26.3	1.44
Total	26.9	1.03	27.3	1.10	24.4	.98	23.0	.88	21.0	.81	22.6	.78	23.1	.89
							PERIODONTAL TREATMENT							
–14	0.0	.00	1.2	.11	0.3	.03	0.4	. . .	0.3	.04	0.8	.14	0.4	.04
15–29	3.9	.39	6.1	.74	6.9	.88	8.1	1.07	7.6	1.12	9.0	1.30	7.3	.99
30–49	8.7	.88	13.6	1.01	14.5	1.77	16.1	2.21	17.2	2.63	19.5	2.57	15.7	2.08
50–	7.8	1.19	16.1	1.41	12.8	1.21	11.8	1.48	15.3	1.72	21.1	2.22	14.3	1.57
Total	5.2	.60	8.2	.75	7.9	.92	8.5	1.11	9.9	1.36	12.7	1.55	8.8	1.13

Table 24 ■ Dental needs of 11,382 white patients, by city size and by age — continued

Age	Over 1,000,000			100,000–1,000,000			25,000–100,000			2,500–25,000			Under 2,500			Farm			Total		
	COMPLETE DENTURES																				
	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)	Upper (%)	Lower (%)	Upper & Lower (%)
–14	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	..
15–29	0.0	0.0	0.6	0.0	0.0	0.4	2.3	0.1	1.0	1.0	0.1	1.0	0.6	0.0	1.1	0.5	0.0	1.0	1.1	0.1	0.9
30–49	2.3	0.6	5.2	2.4	0.6	4.1	3.3	0.2	4.4	3.6	0.4	3.8	3.4	0.4	4.0	4.8	0.0	2.1	3.6	0.3	3.9
50–	8.8	2.0	21.6	9.5	5.1	16.1	7.5	2.5	12.3	6.8	1.4	12.0	6.8	1.0	10.6	10.0	0.8	6.9	7.6	1.7	12.0
Total	2.3	0.5	5.7	2.2	1.0	3.9	2.6	0.4	3.2	2.3	0.4	3.1	2.4	0.3	3.4	3.5	0.2	2.3	2.5	0.5	3.3
	%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.		%	Avg.	
	PERMANENT TEETH MISSING																				
–14	10.6	.20	4.1	.20		4.9	.11	4.8	.11		3.5	.14		3.2	.10		4.5	.13			
15–29	33.5	.90	34.4	1.25		29.7	1.21	28.4	1.14		25.7	.87		27.4	1.04		28.5	1.07			
30–49	56.1	4.15	56.8	3.49		52.5	3.17	51.7	3.31		46.8	3.10		52.1	3.26		51.1	3.25			
50–	80.8	8.10	72.3	9.67		66.7	7.82	62.3	7.28		64.0	6.78		67.4	7.79		64.8	7.56			
Total	40.7	3.09	36.4	2.85		34.0	2.33	32.7	2.34		33.5	2.42		37.5	2.85		34.4	2.50			
	PERMANENT TEETH PREVIOUSLY REPLACED																				
–14	0.0	.00	0.0	.00		0.4	.01	0.0	.00		0.2	...		0.0	.00		0.2	...			
15–29	1.9	.02	4.9	.34		5.2	.26	5.2	.26		3.6	.10		4.0	.23		4.5	.21			
30–49	17.9	1.46	18.3	1.40		18.9	1.21	21.2	1.19		19.9	1.23		25.4	1.58		20.2	1.26			
50–	20.6	1.85	38.7	5.34		34.9	3.41	34.0	3.59		38.9	3.79		41.8	4.65		35.9	3.74			
Total	10.0	.80	12.1	1.33		11.7	.88	12.2	.93		13.8	1.07		16.9	1.46		12.8	1.05			
	NO DENTAL NEEDS OTHER THAN PROPHYLAXIS																				
–14	18.7		22.0			21.1		27.4			26.7			28.2			24.7				
15–29	16.1		14.3			16.1		16.7			20.3			18.2			17.4				
30–49	17.3		15.4			18.3		19.6			21.7			21.0			19.5				
50–	12.7		13.9			15.8		17.0			18.6			16.5			16.5				
Total	16.5		17.0			18.1		20.5			21.8			20.6			19.7				

Note: The meaning of "%" and "Avg." is explained in a footnote to Table 7.

VIII. Summary and comparison with previous surveys

The primary goal of this survey was deriving current national statistics on needs for dental care according to patient age, sex, length of time since last visit to a dentist, region, income, education and size of city. The results also produced data concerning the possible interrelationships of dental needs in various categories of the variables.

In studying overall needs for dental care, a cross section of the general population is the most indicative sample. However, the current survey was restricted to dental patients. This has the advantage of indicating the level and variation in dental needs as encountered by dentists—that is, the needs among those seeking dental care. Conversely, there tends to be an overrepresentation of patients who visit dentists more often, and an underrepresentation of those who attend to their dental needs less often. Those who do not utilize dental services are not included.

The dental needs of some groups of patients in the survey approach more closely those of the typical individual of the general population than those represented by the total figures. Since median spending-unit income in the United States was $6,600 in 1964,[1] the dental needs figures for the $6,000-$7,999 income bracket might be used to describe the dental needs of the general population. That group, for example, averaged 3.18 total fillings needed, with 17.4 percent of patients having no dental needs other than prophylaxis.

Since the median length of time since the last visit to a dentist was about 1 year in 1963-1964,[2] the dental needs figures for the 1-year "length of time" category might also be considered typical. That group also averaged 3.18 total fillings needed, with 14.6 percent of patients showing no dental needs other than prophylaxis.

Dental needs varied more with age than with any other variable considered in this study. Next to age, variation in dental needs was greatest according to length of time since last visit to a dentist. This factor showed a considerably closer relationship to dental needs than did income of the patient.

As in previous surveys, females of all ages were seen to visit a dentist more frequently, on the average, than males. This is shown by the fact that the proportion of the female population included in the sample was greater than that of the male population in length of time groupings up to 2 years since the last visit to a dentist, and less in the groups after that. In all 5-year age groups except the first two, female patients outnumbered males proportionately to their respective representation in the general population. For every 10 males in the survey, there were 11 females.

For many years, a large amount of unmet dental needs of various types has been present among the population at large. Whether unmet needs

· 38 · **Table 25 ■ Average number of fillings required according to 1940, 1952 and 1965 surveys of dental needs, by age and sex**

Age	Males			Females		
	1940*	1952*	1965*	1940*	1952*	1965*
–4	†	3.1	2.9	*	3.4	2.3
5–9	†	2.6	3.0	*	3.7	2.9
10–14	†	4.2	2.9	*	4.6	3.0
15–19	7.0	6.0	4.2	6.5	5.4	4.0
20–24	6.5	4.4	4.2	6.5	4.6	4.2
25–29	5.7	3.8	3.8	5.4	4.0	4.0
30–34	5.4	3.3	3.1	4.4	3.3	3.1
35–39	3.7	2.6	2.5	4.0	2.7	2.9
40–44	3.6	2.2	2.6	3.2	2.3	1.8
45–49	2.7	1.7	2.0	2.8	1.9	1.8
50–54	2.1	1.4	1.8	2.3	1.7	1.8
55–59	1.8	1.0	1.4	1.9	1.2	1.4
60–64	1.1	0.8	1.4	1.1	1.1	1.1
65–	1.6	0.7	0.9	1.1	0.9	0.8
Total	‡	2.9	2.9	‡	3.1	2.9

*Not strictly comparable, because of exclusion of return-visit patients in 1965 survey.
†Not included in survey.
‡Total omitted because of exclusion of first three age groups.

are greater or less than formerly is a difficult question to resolve.

The 1965 survey, together with similar surveys conducted by the Association in 1940 and 1952, presents some information relating to this question. In the 1940 survey, *A Study of the Dental Needs of Adults*, the sample consisted of 7,541 dental patients 15 years of age and older. In the 1952 *Survey of Needs for Dental Care*, the sample comprised 39,551 dental patients of all ages. Both samples were, as was the latest, selected in a manner to provide representation in regard to the universe of dental patients.

However, the 1965 survey included only first-visit patients, and the earlier two included all patients. For most needs, categories by length of time since last visit to a dentist, with the exception of those under 6 months, can be compared among the surveys.

Since those patients already in a course of treatment were excluded from the sample in 1965, it was expected that average needs for most services would be higher. Despite this, the majority of needs showed the same or lower averages, which indicated a more than counterbalancing actual decline in dental needs in the nation.

Table 25 shows that the difference between the total need for fillings as shown in the last two surveys is relatively inconsequential. The decline since 1940 can be attributed to improvements in dental preventive technics, more frequent attendance at the dentist, and the inception of community fluoridation.

Extractions (Table 26) show a considerable decline in the 1965 survey results as compared to the previous data. Since fewer teeth needed extraction in 1965, while the number of fillings were indicated as the same as in 1952, it is indicated that there may have been less uncared-for decay per person actually extant in 1965 than in 1952.

This is shown by a comparison of the rate of extractions needed because of decay in the 2 years. In 1952,[3] the average was .66 per male patient; in 1965, only .37. For females, the comparable figures were .60 and .35, respectively.

The overall percentage of patients requiring complete dentures in 1952 does not differ significantly from that shown by the 1940 figures, whereas the current survey shows perceptibly lower ratios. One of the main reasons for the size of the decline is that many of the patients returning for subsequent fittings were included in the first two surveys, but not in the latest.

A comprehensive analysis of all three surveys leads to the conclusion that there is some appearance of generally declining average unmet dental needs in the nation. This can be accounted for by multiple factors: increasing fluoridation, steadily improving dental technics, greater utilization of dental services by an increasingly aware public, the relatively improved economic situation, and other socioeconomic causal phenomena.

Table 26 ■ Average number of extractions required according to 1940, 1952 and 1965 surveys of dental needs, by age and sex

Age	Males			Females		
	1940*	1952*	1965*	1940*	1952*	1965*
–4	†	0.3	0.1	†	0.3	0.2
5–9	†	0.9	0.3	†	0.9	0.5
10–14	†	0.6	0.4	†	0.6	0.5
15–19	1.0	1.1	0.6	0.8	0.9	0.5
20–24	1.3	1.4	0.9	1.3	1.3	1.2
25–29	2.6	1.5	1.1	1.4	1.4	1.1
30–34	1.9	1.6	1.0	1.9	1.5	1.2
35–39	2.6	2.0	1.0	2.1	1.6	1.0
40–44	3.2	2.3	1.1	2.5	1.6	0.9
45–49	4.8	2.4	1.9	3.1	2.2	0.8
50–54	4.2	2.5	1.9	2.9	1.8	1.1
55–59	4.7	3.0	1.4	3.1	2.1	1.4
60–64	4.1	3.2	1.6	3.2	2.1	1.1
65–	3.5	2.7	0.7	2.9	2.0	0.8
Total	‡	2.0	1.0	‡	1.6	0.8

*Not strictly comparable, because of exclusion of return-visit patients in 1965 survey.
†Not included in survey.
‡Total omitted because of exclusion of first three age groups.

1. U.S. Bureau of the Census. Current population reports, series 60, no. 47. Income in 1964 of families, and persons in the United States. Washington, D.C., U.S. Government Printing Office, Washington, D.C., 1965, p. 2.
2. U.S. Public Health Service. Vital and health statistics, series 10, no. 29. Dental visits—time interval since last visit. Washington, D.C., U.S. Government Printing Office, 1966.
3. Bureau of Economic Research and Statistics. Survey of needs for dental care. Chicago, American Dental Association, 1954, p. 11; 14.

Dr. SMITH. At the time of the study, some 24 percent of the total population had incomes under $4,000. But they constituted barely 8 percent of the patients. Thirty-four percent of the population had, at that time, incomes between $6,000 and $10,000 and they constituted nearly 45 percent of the patient load.

What will section 1001 do about this? Dr. Deines has already indicated substantially what its intent is. Certainly, I subscribe to his thoughts. I would add only a few thoughts. With respect to children in rural, isolated areas, the projects could be of value far beyond their cost in finding new ways to deliver care with the use of mobile clinics and portable equipment, which we know are helpful but which are in woefully short supply. The projects could do much with respect to inner city areas now devoid of practitioners by helping to rebalance, at least in part, the existing maldistribution.

The need we are speaking to varies, of course, from region to region but is manifest all across the country. The survey to which I earlier referred documents this as well.

Take, for example, the need for one-surface fillings found among children less than 14 years of age. The findings were 64 percent in New England, almost 69 percent in the middle Atlantic region, 63.2 percent in the mountain States and 63.5 percent in the Pacific region. In none of the nine regions into which the survey divided the Nation was a need of less than 59 percent discovered.

These are shameful statistics. With the enactment of section 1001, we could begin to reverse them. Another section of S. 1874 would take action of a similar kind. It would amend title XIX of the Social Security Act to permit States to focus their dental care funds on the young.

The fluoridation section of S. 1874 is, as well, one that the National Dental Association particularly prizes. As has already been said by Senator Magnuson and Dr. Deines no one is suggesting—and section 1002 would clearly prohibit—forcing fluoridation on any community or school district.

Indeed, there isn't a penny authorized for propagation of fluoridation or even information on it.

Given all the factors involved, I would accept the necessity of so writing the section. But I would not hide the regret of the profession that this is necessary. If there is any public health measure known that has been more thoroughly scrutinized from every possible scientific perspective, I am not aware of it.

The thoroughness of the documentation bearing on fluoridation's safety and efficacy has been the subject of congressional interest more than once. I can particularly recall one time involving the House Appropriations Subcommittee. The late John E. Fogarty, one of the greatest health leaders this Nation ever had, initiated a discussion with representatives of the dental profession on this matter. He wanted, he said, to allay any remaining concern anyone might have about fluoridation. The profession's witness told him that we would be glad to supply some 6,000 references from the scientific literature, references of studies that had been conducted on the safetv and efficacy of fluoridation. Mr. Fogarty said, and I quote, "I would like to have you do it . . . I think we ought to lay this thing at rest."

Not all of the submissions were printed in the record of that hearing; they were too voluminous. The selected excerpts, however, run for 72 pages of small type. They make, we think, interesting and informative reading. Even the excerpts that were printed do what Mr. Fogarty wanted. They lay the question to rest.

There is much, justified concern in this Nation—not least of all within Congress—about the gap between discovery and application in the health field. Senator Magnuson raised it pointedly earlier today in his testimony.

The beginning of the discovery of fluoridation dates back to the early years of this century. It was nearly 50 years later—years filled with exploration and careful investigation—before responsible health bodies began to endorse the measure. Section 1002 simply says we should not stand in the way of enlightened communities wishing to fluoridate and that, if needed, we should respond to their call for a modest amount of financial assistance. We think that is a minimum gesture on the part of the Federal Government. And now, Mr. Chairman, Dr. Salley will discuss sections 1003 and 1004 of S. 1874.

Senator KENNEDY. Thank you.

How would this legislation affect Cardozo Neighborhood Health Center in terms of providing additional dental care for those kids? Would it have any impact or would you really depend upon resources coming through OEO? What do you see in this legislation that would help you, other than propose additional trained personnel? Is there sufficient flexibility in the features of the legislation in terms of delivery and experimentation to support the kinds of things you are trying to do at Cardozo?

Dr. SMITH. Yes, I think so, Senator. The fact of the matter is, we are concerned about a number of patients who, of course, do not reside particularly within our target area who are really adjacent to us.

Unfortunately, in view of the fact that dental care is not included in the medicaid program, these children we presently cannot see in our program, until of course we remove the boundaries, which of course apply there in our program by OEO.

So what we are saying is that these kids would be treated through the Public Health Service or through some other pilot program that could possibly be arranged for them. Of course, there is also the possibility that we could enter into contractual arrangements and contractual studies to provide some of the care.

Senator KENNEDY. You may proceed.

Dr. SALLEY. Mr. Chairman and members of the committee, the American Association of Dental Schools is grateful for this opportunity to present joint testimony with the American Dental Association and the National Dental Association on Senate bill 1874.

Te rationale for the two sections related to auxiliaries in S. 1874 can be stated in a few words. We do not now have enough dentists. We aren't, in the years immediately ahead, going to make good that shortage.

There are, of course, other and more detailed considerations involved. Paramount among them is the question—now the subject of searching inquiry by groups both within and without the profession—of just what a dentist is, and should be and should do. The education of a dentist is long, exacting, and arduous.

It is also, from the student's vantage point, the most expensive of all professional educations to undertake. The degree to which the performance of oral health procedures is reserved solely to the dentist has immense impact on both the amount of care that can be delivered and on the unit cost of that care.

For both philosophical and practical reasons, then, dental auxiliaries assume today more importance than ever before in our history.

We know, to state a few simple facts, that there are a number of dental care duties that auxiliaries can be educated in a much shorter period of time, and at much less expense than a dentist. We know that a dentist with just one well-trained auxiliary can stretch his productivity by more than 50 percent.

If there is much left to be explored, then, there is also a great deal already known and ready to be acted upon. All of this potential progress, comes grinding to a halt, however, if there aren't enough auxiliaries to train and employ. And if our shortage of dentists is acute, the shortage of dental auxiliaries is arguably even more critical.

At the present time, there are some 18,000 full-time (or full-time equivalent) dental hygienists in practice. This gives a ratio of one hygienist to every five or six dentists. At a minimum, the desirable ratio should be one hygienist for every two dentists.

The numerical shortage of trained dental assistants is even worse. Presently, there are some 103,000 dental assistants in practice, giving a ratio of about 1 to 1 with respect to dentists. A minimally desirable ratio would be two assistants for every dentist.

The third auxiliary, the dental laboratory technician, does not engage in chairside care nor is he normally employed directly by the dentists. His work, however, is vital and the shortage here is also quite severe.

Based on the current graduation rate, the deficit by 1980 for these three auxiliaries with respect to the desirable ratios will be as Senator Magnuson has said, 25,000 hygienists, 137,000 assistants and 23,500 technicians.

Section 1003 of S. 1874 would help move us toward achievement of the proper ratios in an accelerated way. Were this law enacted and funded today, we could count on having an additional 30,000 or more auxiliaries than we will otherwise have by 1980.

Measured against the deficit figures, this will not close the gap but it will narrow it significantly. Together with new research findings, better materials and more productive delivery methods, section 1003 gives us a fighting chance to make good, by 1980, on the promise of oral health care being readily available to all Americans. Without enactment of S. 1874, it is our conviction that this chance goes down the drain for the foreseeable future.

EFFECTIVE USE OF AUXILIARIES

Section 1004 of S. 1874 would then take the next, logical step in the attempt to stretch dentists' productivity. It would institute, on a much broader scale than has heretofore existed, programing to instruct both the practicing dentist and the dental student on how to work most effectively with auxiliaries. As part of this effort, the section would authorize support for demonstration projects that could be

models of how to create and use the most effective dental team possible. Such projects would be carried out in areas characterized by low family incomes and thus, as with the dental care projects for needy children, would serve a double purpose.

Given what we know about the potential to be realized from effective use of auxiliaries, it would be logical to assume that no dental student is permitted to graduate today without intensive instruction in this subject area. In fact, this is not so. Current surveys indicate that almost no first or second year students receive it, and that few third year students have such training. Moreover, senior students have far less of it than we think is necessary.

The reason for this relative inattention lies in the fiscal crisis that has gripped the dental education system for some years now. This committee is thoroughly knowledgeable on the facts relating to this, especially because of its recent hearings on extension of health-manpower legislation.

As a consequence, the dental education system has relied largely on Federal funding for instituting these programs.

The Division of Dental Health within HEW has had a program for some years that helped schools to carry out this activity. The support has been most welcome and the schools have been grateful for it.

Everyone connected with the dental auxiliary utilization program has, however, recognized that the activity was too severely limited. This is for for a number of reasons. First, the very existence of the program is annually in doubt because it has no satutory basis. The prevailing uncertainty militates against the soundest possible planning for use of the funds.

Second, the amount of money available to the individual school is insufficient to build a solid program.

As I have already mentioned, the typical student is being introduced to auxiliary assistance in his final year. Yet, his heavy clinical experience begins at least in his junior year and, in an increasing number of schools, even earlier than that.

The student, thus, starts to develop a pattern of clinical practice one or two before seeing an auxiliary. This is clearly unsatisfactory. In addition, because of funding limitations, the training that is available is too narrow in scope and does not cover the aspects of dental practice that it should.

The lack of such education during school years—coupled with the shortage of auxiliary personnel—goes far toward explaining why there are still some 15,000 dentists who practice without auxiliaries. Frankly, that is 15,000 too many. Section 1004 of S. 1874 would enable us to change this. We know few actions better designed to increase the availability of dental care in a relatively short period of time than enactment and full funding of this section.

With respect to sections 1003 and 1004 providing for increased training and utilization of dental auxiliary personnel, we recognize that some of the purposes of the bill conceivably could be carried out under existing authorities.

At an earlier point in time or with a different record of experience, that might be a substantial consideration. Given the facts as they are today, however, we do not believe this objection has sufficient merit

to detract from the need for passage of S. 1874. I should like to take a further minute of your time to say why we feel as we do.

Let me start with some known facts about dental disease. It is all but universal. Once it appears, it continues; it is not self-healing. The progress of dental caries or of pariodontal disease, to cite two common manifestations of oral disease, is remorseless until the affected tissue is destroyed. Preventive dental care is not merely a desirable professional goal, then, it is a practical necessity. The lack of it throughout our history explains why we are a nation of dental cripples. The lack of it today explains why we are raising the present generation of children to be dental cripples.

To interrupt this cycle of needless pain, expense and frequent disfigurement is the task of preventive dental care. To begin preventive dental care we must somehow train many more auxiliaries, we must take full advantage of known public health measures, we must concentrate our efforts on children and we must experiment meaningfully with alternative methods of organization and delivery of dental health services. These are precisely the programs S. 1874 would enact.

It is true, that some laws now exist that are directed to some of these ends. Indeed, we supported their enactment and were delighted when they became law.

But if the proof of the pudding is, as they say, in the eating of it, the proof of a good law's value is in the implementation of it. And here, so far as the dental programs under discussion are concerned, we have met with much delay and little action.

Senator Magnuson, Dr. Deines, and Dr. Smith have already mentioned this with respect to the dental care projects. Let me briefly mention some experience with respect to the dental auxiliary section.

The particular law with similar purposes to sections 1003 and 1004 of S. 1874 is the Allied Health Professions Personnel Training Act. That law was only recently renewed and, at that time, our associations had cause to look into its workings.

In fiscal 1970, as one example, there were 100 accredited dental assisting curricula. Under the terms of the law at that time, only 17 of them were eligible for basic institutional grants. Those 17 received an average of $7,150 in such grants.

In fiscal 1970, there were 80 accredited dental hygiene schools. Of these, only 51 were eligible under the terms of the law. These 51 received an average of $9,300 in basic institutional grants.

When the law was renewed, its terms were broadened so that most of the accredited courses are now eligible for benefits. The new law authorizes some $100 million for some nine types of activity. The fiscal 1972 appropriations request is for $30 million. The 1972 appropriations request is for $30 million. Only three of the nine sections of the law are apparently to be funded. This money must be distributed of course, among a far larger number of eligible categories of allied health personnel because of the broadening of the definition of eligibility.

Under these conditions, we see little hope of that program making a significant impact with respect to the training of dental auxiliaries.

We believe S. 1874 offers the best hope this country has had for years in redeeming its pledge to combat dental disease systematically and rationally. We are deeply grateful to Senator Magnuson for

authorizing it and for the 40 Senators who are its cosponsors. We urge its enactment.

Let me add that the American Dental Hygienists' Association and the American Dental Assistants' Association fully endorse this view. Both groups are filing with the committee statements in approval of S. 1874.

Finally, before concluding, we should like to say one word about the Division of Dental Health, mentioned earlier. This HEW agency is, quite literally, the only one in the Department whose programs are of a similar nature to those outlined in S. 1874.

The Division is the basic source of dental care expertise within the Department. We believe that it is this agency to which the programs of S. 1874, once enacted, should be delegated.

Mr. Chairman, this concludes our testimony. We are grateful to you for holding this hearing and for this opportunity to present our views. Dr. Deines, Dr. Smith, Mr. Conway, and I would be glad now to respond to any questions.

We also have with us Mr. Conway, the legal counsel.

Senator KENNEDY. Thank you very much. It is again very excellent testimony.

Now I would like to play the devil's advocate, because I think there will be arguments regarding portions of the bill, and I would like to have the most complete response that we can gather.

You touched on it in the latter part of your testimony. The real question is if we pass the revised S. 934 that has come out of the full committee, to be reported this afternoon to the floor and to be considered probably tomorrow or Wednesday, will that not do the job if we get sufficient funding for it?

Or are you saying in the last part of your testimony, that there hasn't been enough resources, that there won't be enough resources to do the job, and we need S. 1874 in addition. Is S. 934 not broad or wide enough to do the kinds of things that you are suggesting?

Why will S. 1874 be needed if we get S. 934 passed and if we are able to get adequate funding for institutional grants?

Dr. SALLEY. Senator, I think the health manpower bill only goes up to a point with respect to the auxiliary training which we touched upon in the final part of this testimony today.

We are certainly grateful to this committee and the parent committee of the subcommittee for the very fine treatment that you gave that legislation thus far.

But to answer your question specifically, the health manpower legislation would not cover a large segment of dental auxiliary training programs which Senator Magnuson's bill would include.

So I would say that this would supplement the other legislation.

Senator KENNEDY. Of course, there is nothing in S. 934 on fluoridation.

Dr. SALLEY. No. I am only speaking to the point of auxiliary training. There is, as you say, no provision in S. 934 on the fluoridation of the water supply.

Senator KENNEDY. Of course, S. 934 does provide significant institutional help for dental schools and it does have some incentives built in to provide additional grants for those dental schools that are expanding their enrollments.

It has that feature. But you are saying the greater utilization of auxiliary personnel is an integral part of a total comprehensive view of the dental crisis that exists today and that this legislation, S. 1874, is needed to develop essential dental auxiliary programs.

Dr. SALLEY. Yes. If I could bring the question close to home, the health manpower legislation would assist us in the University of Maryland where we have a dental hygiene program incorporated. It would not help the Allegany Community College in Senator Beall's hometown as this bill would.

Senator KENNEDY. We have seen, for example, a number of community colleges develop outstanding nurse training programs that have been very successful. We have seen this in my own State of Massachusetts and it is very exciting and encouraging.

Do you see community colleges, State and private colleges and other training institutions moving into dental auxiliary training programs as well?

Dr. SALLEY. Very much so. We anticipate that will happen. In fact, we are actively promoting it.

Senator KENNEDY. I think your statement is first-rate. I believe this will be the area of principal questioning. I would hope that maybe after we consider S. 934 tomorrow, and it passes the Senate, you would be able to analyze that legislation and point out how S. 1874 either complements it or supplements it. And, if you could follow the bill as it comes out of conference we would appreciate the benefit of your judgment at that time.

Obviously, there may be some changes that will take place on the floor. But to the extent you can do that, I think it would be enormously helpful to those of us who want to see this legislation achieved.

I think that would be the argument. They will say:

If we do this with dental care, why aren't we going to do this for osteopathy or schools of podiatry or all those others? They have needs as well. Why are we singling out dentistry in this?

I believe you pointed out the difference between self-healing that occurs in most other kinds of medical problems and the differences that take place in terms of dentistry. You pointed this out quite well.

But to the extent you can elaborate on these points, I think it would provide very, very useful testimony for us and for your other friends who are going to be helping you.

Dr. SALLEY. We will help you the best we can in providing that information.

Senator KENNEDY. Senator Beall?

Senator BEALL. Thank you, Mr. Chairman.

Just briefly, Dr. Salley, do you envision problems with State licensing prodecures with regard to dental hygienists and dental auxiliaries and if there are problems, are the States making the necessary accommodations so that these people can be used to the fullest extent of their capabilities?

Dr. SALLEY. Some are more impatient than others, Senator. But as Dr. Deines pointed out, some 28 or 29 States have now or are in the process, have either changed their statutes governing the practice of dentistry, or are in the process of change to allow this to take place.

Senator BEALL. We have a maldistribution of dentists. As we train more dentists how can we improve the distribution into the rural areas and the inner city where dental personnel are desperately needed?

Dr. SALLEY. I think one of the very good features of Senator Magnuson's bill is the provision for new ways to deliver dental health services. If I could look at my crystal ball for a minute, perhaps we could look at dentists assistants out on the firing line in these areas that are underserved by dentists who would then take care of certain problems that are within that capability and training and refer the more difficult problems to the dentists who would have overall supervision and be perhaps in some kind of health center.

Senator BEALL. Do you think this would be sufficient?

Dr. SALLEY. With enough auxiliaries and enough backup dentists, I think it would be.

Senator KENNEDY. Senator Pell.

Senator PELL. Thank you very much.

Am I correct in saying that the most important single factor in preventing dental disease in later life is if we teach our children how to brush their teeth correctly? That is, to say, they really must do the job properly?

Dr. SALLEY. Senator Pell, I think it is a combination of that, a combination of the nutrition at the time the child is in his formative stage, and I would not underestimate the role of fluoridation. I think that is very significant.

Senator PELL. I am enthusiastically in support of this bill of Senator Magnuson's.

Along the line of this subject, I am interested in your opinion as leaders in the field of toothpaste regarding the statements made by Mr. Nader last week, and the study undertaken by the Government at Walter Reed, comparing the various kinds of toothpaste and showing that one of them does better than ordinary water and that the other five are substantially worse than water from the viewpoint of encouraging diseases of the gums.

I would note at this point, somewhat like the Pentagon papers, we are trying to break the toothpaste code in Government since the Army is reluctant to say which brand toothpastes A, B, C and so forth, were used in their testing.

Are you familiar with the study? Maybe the gentleman from Howard could answer that?

Dr. DEINES. We answered Nader. We would insert this for the record, if you wish. The accusation was unfounded because of the fact that the staining takes place on the plaque, which is a coating, which stains and the no-stain took place on the enamel of the tooth.

I saw the statement and the statement said it stained the tooth. But the stain is on the plaque and if the teeth are brushed properly and denal floss used to clean the plaque off, then using fluoridated paste is not going to cause any stain.

Senator PELL. I was impressed that what Mr. Nader was talking about was staining. But I was talking about the study of the Defense Department concerning gum disease. I think it is called stomatitis. It was found that the five most popular kinds of toothpaste, if used alone and continuously, increased the sensitivity and the disease of the gums compared with plain water and salt.

I think it would be important to try to break this code and get the names of these toothpastes—unfortunately, the American public who should know the results continues to use those pastes. Are you familiar with the study?

Dr. DEINES. I am not familiar with the study.

Senator PELL. What about the gentleman from Howard?

Dr. SMITH. I think the study you are referring to related to the content of abrasives in the toothpastes. Of course, indeed, all toothpastes do have some abrasives and therefore, one could question whether or not the abrasive qualities of the toothpastes themselves were primarily instrumental in providing this sort of damage.

We have been conducting some studies, yes, at Howard. They are not conclusive. But the content and the amount of abrasives in the average toothpaste we have not found to be extremely detrimental.

Here again, it relates to the usage and the proper usage of the toothpaste. It also relates to the brushing technique and the brush itself, whether it is hard, fine, et cetera.

Some patients are inclined without the proper toothbrush and instructions to cause damage and inflamatory conditions of their gums. Here again, patient education plays a great part.

Senator KENNEDY. We have got to vote. It has been going for a few minutes. I have just been reminded.

Senator PELL. I have one more question, Mr. Chairman.

If we can break the toothpaste code and put it in the Congressional Record, with the study, would that not be a considerable service to the unfortunate American toothbrushing public?

Dr. SMITH. I would be inclined to concur with you. The revelation of any sort of facts and figures should be helpful.

Senator KENNEDY. We keep reading on certain toothpastes that are endorsed by the American Dental Association. Can you endorse various toothpastes?

Dr. DEINES. We have endorsed Colgate and Crest to be specific. This is a matter of record, because it is on the toothpaste itself.

We feel that any toothpaste that meets the requirements of the American Dental Association has the right to put the seal of acceptance on it. These are tested very, very thoroughly.

Senator KENNEDY. If we could submit additional written questions we will recess the hearing now. We will convene in 10 or 15 minutes. We want to thank you very much. You are very, very helpful. We are going to rely on you as we move along with this legislation.

Dr. DEINES. We would be glad to cooperate.

Senator KENNEDY. Thank you.

(A brief recess was taken.)

Senator KENNEDY. The subcommittee will come to order.

Our next witness this afternoon is Dr. Robert J. H. Mick, who has been actively practicing dentistry for over 35 years. During this time he has conducted fluoride research experiments with animals into the third generation.

In addition, Dr. Mick has performed many types of animal research experiments with various food products, has been involved with water studies for over 27 years, has been appointed an international representative by the American Academy of Nutrition, and

has conducted research studies in Africa; these studies were related to body nutrition, dental decay, and the effect of fluorides in water supplies.

We are glad to have you, Doctor.

STATEMENT OF ROBERT J. H. MICK, D.D.S., REPRESENTATIVE, AMERICAN ACADEMY OF NUTRITION; ACCOMPANIED BY CLINTON MILLER, VICE PRESIDENT, NATIONAL HEALTH FEDERATION

Mr. MILLER. I would like to introduce Dr. Mick to the committee. I am Clinton Miller, legislative advocate and vice president of the National Health Federation.

I have with me a letter which was composed an hour ago to you, sir. It says:

To the Honorable Edward M. Kennedy. This letter is being presented for your consideration concerning Section 1002 of Senate bill 1874. The National Health Federation representing over 45,000 Americans concerning the matter of health freedom have asked Dr. Robert Mick to represent us in urging that Section 1002 of S. 1874 be amended to specifically prohibit any federal funds being appropriated for the purchase of fluoridation water supply equipment and/or fluorides.

In addition to Dr. Mick, we will have here a young lady who lives within a block of the Senate Office Building who has had the questionable opportunity of consuming fluoridated water throughout her whole lifetime. This young lady is Terry Diane Glover. We wish to make it clear that the National Health Federation is strongly in support of you and the 40 sponsors of this bill, in doing all that we can to having as perfect dental health in this country as we can possibly have.

When Senator Magnuson complimented the chairman because the subcommittee has moved so quickly, that I had just a little feeling of apprehension. It seems to us, sir, that perhaps the subcommittee has moved a little too quickly.

I was notified during my vacation at 2:30 last Friday that the hearing would be held today.

I was notified today by a staff member that the record would be closed in about 1 week. We would like to register at this time, sir, the very strongest possible protest to closing the record in 1 week, or in limiting the testimony to those witnesses who have appeared today. We would like you to keep the hearings open until other great scientists who have taken strong positions against fluoridation of public water supplies have a chance to appear before the committee.

At this time, I would like to turn the microphone over to Dr. Mick for his testimony.

Dr. MICK. Would you mind if I stood? I am more comfortable.

Senator KENNEDY. You proceed whichever way you desire. However, just for the record, I would like to say that the notice about this hearing was placed in the Record last Tuesday.

We can't notify people all over the country about the times of these hearings. But we publish it in the Congressional Record, that is the procedure which has been followed for as many years as this great democracy has existed.

So we apologize and regret that you didn't have other personal knowledge of it. Just for the record, I wanted to make that clear.

Mr. MILLER. For the record, is there any intent to close the hearings as of today or will there be a chance for other witnesses to appear?

Senator KENNEDY. I expect the record would be open for several days for statements.

Mr. MILLER. That is not my question. Will other witnesses be allowed to appear?

Senator KENNEDY. I don't expect that we will have additional hearings.

Mr. MILLER. We wish to protest that very strongly. I don't think that is a fair way to conduct this hearing.

Dr. MICK. Senator Kennedy, and the other honorable Senators, my name is Dr. Robert Mick. I have been in the dental profession for more than 35 years. During the last 27 years I have been involved in experimental animal research and research studies on waters and foods as to their effect on animals and humans in the area of dental decay, perfect teeth, normal and malformed dental arches, cleft palate, et cetera. My research studies on humans was conducted in both equatorial Africa and the United States.

The testimony I present will be on S. 1874. It is my hope that I may provide you gentlemen with some information to influence you to not vote for this bill, whether you have already sponsored it or not.

Senator Kennedy, you made an observation in Chicago that you had seen so many children in need of dental care. I do not know if you were informed that Chicago has had the benefits of fluorides for approximately 16 years.

Washington, D.C., has had the fluorides added to their water since 1952.

The city of Pittsburgh has had it since the early 1950's. The report from Pittsburgh (and you made your own findings in Chicago) were that 17 years after fluoridation, plans for a $1½ million, 5-year program, with teeth in it for thousands of lower side Pittsburgh children and 16 elementary schools had been unveiled by Allegheny General Hospital. The program, which will be added by Federal grants, totaling more than $1 million will be the largest of its kind to date in the United States and unique in many respects, said the U.S. Health, Education, and Welfare Department officials.

Senator Kennedy, I feel like many other people do. I have spent my life on this particular subject and I happen to be one of the first promoters in this world of fluoridation. And at one time, I sat, not on that honorable bench, but before people and pleaded and pleaded. I was one of the first ones in New Jersey. I wanted to do the best for them and for my children.

In 1948, I learned how I had willingly—as you gentlemen will learn some day—willingly but unknowingly become involved in what was to become the biggest scandal of its particular type.

Senator, just about a quarter after one, Mr. Miller said, "Doctor, I think that there are some folk within 2 blocks of here and within a period of 5 minutes."

We found a group of children. I would like to introduce to you Terry Glover, 7 years old, of 211 C Street NE.

Terry has had the benefits of fluorides since she was born. We also

saw her mother. She was working in another home. She was going to try to be here. Her mother had a beautiful set of teeth.

She came from outside of Washington, D.C. But Terry here has some teeth that have had the full effects of fluorides that are decayed to the gum line. But on the front of her tooth there is also, and you may care to see it for your own interest, a white mark. It doesn't hurt the tooth. It is only a sign of what is called fluorosis.

This sign did not come directly from the mouth, Senator. It has to come by ingestion, and then through the body, and that which is in the tooth is only an outward sign of that which takes place in the body.

The following is not in my prepared testimony:

When you take a telephone pole, and I use a lot of fluoride in my dental practice on teeth, because fluoride and many other elements are one of the finest enbalmers, the same as you take a telephone pole and you place it in creosote and then you can put it in the ground and then the bacteria in the ground will not attack that pole for a long. long time.

You can't put a drop of creosote or any other deadly chemical along side of that growing tree and have the tree turn black and grow beautifully. You must attack it after it is formed. You can't add anything in your mouth, go through your stomach, and only go to the tooth.

No doubt you partake of foods and vitamins. It is a mystery how a vitamin is used for our benefit, for our eyes and the rest of our body and the fluoride can only go to our teeth.

Senator Kennedy, before you is a model showing mottling of teeth. I happen to be fortunate enough to be a lieutenant colonel in the military. I have done research work even there.

Senator KENNEDY. Excuse me. Is this Miss Glover?

Miss GLOVER. Yes.

Senator KENNEDY. Are you in school? Maybe you can answer yourself.

Miss GLOVER. We have a vacation.

Dr. MICK. She is on vacation.

Would you like to ask Terry?

Senator KENNEDY. No; I was just interested.

Dr. MICK. I looked at their teeth. Her cousin also had teeth that were also eaten off at the gum line.

Senator, before you is a model that I was able to obtain of one of the soldiers. If you will pick it up, you will see every type of mottling that you can ever imagine. On this model you will see the dental decay that you are led to believe cannot occur. If I could have you to look at this bottle, you would see the minerals that one partakes in approximately 600 quarts of water. These are the precious body building minerals that make up the food and which makes the animals, as they are supposed to be, the finest.

I happen to be involved in water analysis and distillations and each of these bottles contains the various types of minerals that you personally are partaking of in 1 gallon or 7 gallons of water.

If the commitee were to see this bottle they would realize that you can't add one mineral to this material without having something take place.

I have volunteered to represent the millions of voters in this country who oppose fluoridation. I am one of the original promoters of

fluoridation in the United States. I learned in 1948 how I had willingly but unknowingly became involved in what was to become the biggest international scandal ever to be promoted in the name of a health program.

I have spent the last 23 years exposing the promotion of fluoridation by employees of the U.S. Public Health Service and defeating fluoridation at referendums. I believe, I personally have a 100-percent average of wins by just telling the truth to the voting audience. Fluoridation, when allowed by city and State legislators to go to referendum, is the biggest voter interest issue that has ever been voted upon.

S. 1874 is cited as the "Children's Dental Health Act of 1971" but, on page 10 of the bill, this act may be cited as the "Public Health Service Act." The children, poor children, are used as a mask for S. 1874.

The doubletalk and unknowns for which graduated grants are sought in sections 1001, 1003, and 1004 is beyond comprehensions. The "poor children" will receive but a trace of the grants that are being sought.

Every section of S. 1874, except section 1002 "Grants for Water Treatment Programs," can do no physical harm.

Senator KENNEDY. I am interested in the child. Is she supposed to have lived here in the District?

Dr. MICK. Yes. Her name is Terry. You live just 2 blocks away. We just went up on C Street.

Senator KENNEDY. Terry, how long have you been here?

Miss GLOVER. All of my life, since I was born. I was born in Washington.

Senator KENNEDY. You have always lived in Washington?

Miss GLOVER. Yes.

Senator KENNEDY. Have you ever visited North Carolina? Do you have some friends down there?

Miss GLOVER. Cousins.

Senator KENNEDY. Have you ever visited down there?

Miss GLOVER. No.

Senator KENNEDY. We are very glad to have you here. You have been our youngest witness.

Dr. MICK. I will proceed. I would love to be able to be of some service.

Every section of S. 1874, except section 1002, entitled "Grants for Water Fluoridation," can do no physical harm and a lot of good. and if the same Government interest in dental decay was taken as in the cigarette problem and if the USPHS used the radio, the TV and the printing of articles on food that help accelerate dental decay and other body problems, the program would be truly fantastic.

Moneys allocated to sections 1002, 1003, and 1004 can be used for every type of fluoridation propaganda under the headings of "accord priority to projects designed to provide preventive services," "comprehensive projects," "prevention," "demonstrations," "experimentation," "establishing and carrying out programs to educate," et cetera.

In 1970, just one of the grants made bv HEW, grant No. DH–00151–02 (ESR), to Department of Political Science, University of California, Riverside, Calif. This was given under the title of "Fluorida-

tion and Community Decisionmaking," $92,895. That would have bought an awful lot of fluoride tablets and would have helped some of the poor children to have some other dental care.

You gentlemen realize, that as young men you rarely saw a Public Health Service dentist in your area. Fluoridation has become a major program for the dental division in the health departments. As a young man, a father and a Senator you probably have had many dogs. Has it ever occurred to you that these animals have perfect teeth while drinking the same water as your family? What do you believe should be added to your dog's water to improve the quality of his teeth?

Your dogs provide a 10- to 15-year experiment, if you want to call it that, right in your own backyard. But if you vote against this bill, you may be called antipoor, antidental and antifluoridation.

Senator, if true words of intent had been used in this title, as publicized by the American Dental Association, the title should read "Grants for Fluoridation." I would ask that that which is publicized by the American Dental Association referring to this as a fluoridation bill or fluoridation be accepted by the committee.

So worded as it was referred to by the ADA, S. 1874 would have received large-scale public opposition and opposition has started as of July 10. I assure you it will gain momentum.

The massive evidence that documents the harms from fluoride could provide testimony for hundreds of pages and many previous hearings since 1954 have recorded the story of fluoridation and the promotion along with reports of the harms from fluoride. I will come back to this point.

Honorable Senators, some of you may have witnessed how the word fluoridation has been built up even in your own minds over a period of 27 years to being in the same category as a religion, a sect, political side, a word that can split a group or a family. The documented facts concerning these poisonous fluorides are overshadowed by the efforts of the promoters at fluoridation to influence one group against the other—all in the name of a children's dental health program. How this poisonous fluoride can be swallowed and only effect teeth, while all other foods and vitamins go to all parts of the body is indeed fantastic and a mystery to any thinking individual.

The congressional hearings in 1954 entitled "Fluoridation of Water" H.R. 2341, "A bill to protect the public health from the dangers of fluoridation of water" are probably unknown to most Congressmen.

These hearings exposed fluoridation as a scheme with no regard to the toxic effects as known and reported by officials in the U.S. Public Health Service and other professional men.

I ask that those hearings (H.R. 2341–1954) be placed into these records for guidance of this Congress.

Senator KENNEDY. Are you asking for the whole hearings?

Dr. MICK. It would be very, very fine, because there are none of these available. Would you accept that part that was put in there showing the harms from fluorides?

Senator KENNEDY. If you have got the particular citation, I will be glad to review it and if it is pertinent include it.

Dr. MICK. Thank you.

(The material referred to follows:)

Medical Evidence Against Fluoridation of Public Water Supplies

(By George L. Waldbott, M.D., Detroit, Mich.)

Note.—Dr. Waldbott has published more than 100 scientific papers on original research on various phases of allergy, and one book entitled "Contact Dermatitis," Dr. Waldbott is the vice president of the American College of Allergists, a Fellow of the American College of Physicians and of the American Academy of Allergists, as well as of other national and international societies in his specialty.

Health and dental groups introduced the project of adding fluorides to the domestic water supplies because a lowered incidence of dental caries was observed in areas where fluorides occurred in the water naturally.

May I preface my remarks by explaining why I am interested in this subject. As an allergist, I have seen much serious trouble in allergic patients caused by indiscriminate medication. Moreover, the opposition to fluoridation has thus far depended largely upon nonprofessional people for leadership. In general, competent medical men have either been too busy or have not yet given the problem adequate attention to oppose the powerful groups pressing fluoridation. Naturally, the view of a practicing physician like myself differs from that of health officers, research people and dentists.

In this controversy two facts must be acknowledged from studying the available literature: First, this drug has a tendency to settle in the tooth enamel rendering it denser, harder, and more resistant in children under the ages of 10 to 12. However, whether this actually means healthier teeth has not been proven. Second, in the concentration in which fluorides are being added to drinking water, they are not likely to induce acute fulminating poisoning. However, the probability of chronic poisoning will be discussed at length later. Do these two facts justify the "calculated risk" of which the proponents of this plan speak when they require every individual in the community to drink water containing fluorides, rather than to permit dentists to prescribe the drug when they consider it necessary?

I shall discuss the medical aspect of the fluoridation problem by elaborating upon the following points:

1. Can there be a "safe concentration"?
2. Is the value of fluorides scientifically proven?
3. Is there danger of disease and death from fluoridation?
4. What methods are being employed in some scientific circles to promote this program?

There are many political, social, and legal aspect involved in the controversy upon which I shall not touch.

I. SAFE CONCENTRATION

From animal experiments and statistical studies in humans, the proponents of the plan conclude that a concentration of 1 part of sodium fluoride in 1 million parts of drinking water by weight (1 p.p.m.) entails no harm. According to dental research authorities, mottling of the tooth occurs at 0.7 p.p.m. and a mottled tooth is a poisoned tooth. Therefore, how can the concentration of 1 p.p.m. be called "safe"?

If animals are fed diets containing 7 to 12 p.p.m. the first signs of poisoning begin to appear. The incisor teeth become chalky, pitted, and corroded. The bones and kidneys show minor degenerative changes.

Other findings are damage to the liver, to the stomach and bowels, and to the tissues surrounding bones and teeth. The animals loose their appetite, they may develop anemia and brain disturbances. (1.)

When fluorides are taken into the system through ingestion by mouth, a large portion reaches the bloodstream by penetrating the mucous lining of the inestinal tract. It is then distributed by the blood to bones, teeth, kidneys, liver, spleen, brain and other organs where about 10 percent is retained for many weeks even months. (2.) The remaining 90 percent is then eliminated from the blood mainly through the kidneys in the urine and through the skin in the sweat.

Reactions in the human body differ from those in a test tube. Every single phase of the above metabolic process is subject to tremendous individual variations. Blood samples, for instance, for individuals in the artifically fluoridated city of Newburgh showed variations of as much as 900 percent (3.) in spite of the attempted regulation of the "safe" 1 p.p.m. intake of fluoridated water.

There are many reasons why this intake of 1 p.p.m. cannot be properly controlled and maintained in a person drinking such water. What, for example, about simultaneous ingestion of fluorides in food? Tea, for instance, contains 30 to 60 p.p.m. For a habitual tea drinker, therefore, this drink would bring the daily intake of fluorides just within the safe limit. If, in addition, he were to eat food grown in a fluoridated area which contains much larger amounts than usual, and if this food were boiled in fluoridated water, thus concentrating the fluorine content further, the intake would most likely reach toxic levels. Furthermore, if an individual has diabetes or a disease accompanied by fever his water intake could rise so much higher that this might conceivably decide the course of his illness.

The amount of fluorides absorbed from the bowels is greatly influenced by the acidity of the bowel content. Furthermore sodium fluoride which is added to the water supply is much more soluble than organic compounds containing fluoride present in water of naturally fluoridated areas. Therefore, much more will be absorbed through the bowels under the artificial scheme than in an area where it occurs in nature. The condition of a person's teeth, bones, kidney, liver, and brain—especially their calcium content—determines how much fluorine is retained in these organs. Thus, under certain circumstances the 10 percent figure of fluorine retention may be considerably exceeded.

The elimination of the fluoride salt through the kidneys is of special importance for a patient with a diseased nonfunctioning kidney. Much less can be eliminated; in other words, much more is retained in his system for potential development of toxic symptoms. There is a great likelihood of extensive damage from this salt in elderly individuals who notably have a tendency to arteriosclerotic, poorly functioning kidneys. What will happen to such individuals after drinking such water year after year can only be imagined. Finally, there are further individual differences in the event that a person is allergic. I should like to refer to my own experimental work published a year ago on "Drug Tolerance in Asthma" (4.). It was demonstrated that an asthmatic patient may be poisoned by otherwise harmless doses of any given drug. I am not referring here to allergic symptoms, but to true poisoning from otherwise harmless amounts of such drugs. This was observed clinically and proved experimentally. One cannot escape the conclusion that there may be considerable damage to a large part of the population from artificially fluoridated water in the so-called safe concentration of 1 p.p.m. for everyone in an entire community.

II. APPRAISAL OF THE VALUE OF FLUORIDATION

In their pamphlets the health authorities promise a 63 percent reduction in dental caries if fluoridation is adopted. This figure is derived from statistical studies in such fluoridated cities as Grand Rapids and Newburgh. The teeth of school children drinking this water were examined and the number of cavities recorded periodically. This evidence is not accepted by some leading dental research authorities. Hurme (5), for instance, points to the many pitfalls in compiling statistics of this kind, especially to the lack of standardization of the methods employed, to the personal bias of the examiner, and to the relatively short period of observation.

Let me give an example of the confusion: Mottling of teeth is commonly found in fluoridated areas and is identified with beginning fluoride poisoning. (6.) Most proponents of fluoridation consider a mottled tooth aesthetically undesirable rather than diseased. Such a divergence of opinion is bound to affect the statistical appraisal of healthy teeth, and this alone renders the statistics inadequate. In addition, Boyd and Wessels (7.) state that repeated examinations of the same tooth made by the same examiner at different times may result in a different interpretation from one examination to another.

Furthermore, children who have periodic examinations of their teeth are usually at the same time alerted to the importance of good dental hygiene, good nutrition, and elimination of sweets and soft drinks.

Finally, most statistical reports disregard the observation of such thorough students of the subject as Smith and Smith (8). They found that individuals in fluoridated areas, who as children showed an apparent reduction in dental caries, after they had passed the age of 21 manifested much more extensive deterioration and weakening of the tooth structures than those in nonfluoridated areas. A similar observation is related by Newman (9.) in two suburbs of Shef-

field, England. He and other observers have noted in various publications that people in areas where the water is practically fluorine free have excellent teeth. Therefore, the 63 percent reduction in caries from fluoridation of water is not substantiated.

III. HAZARDS OF FLUORIDATION

Why are there no reports of disease and deaths from fluoridated water? In distinction from acute poisoning, symptoms of chronic fluoride poisoning are vague and insidious. Nausea, general malaise, joint pains, decreased blood clotting, anemia, and similar vague symptoms may result from a variety of causes and do not represent a clearcut disease syndrome. Even an extremely well-trained clinician is not likely to make the correct diagnosis. When a patient finally succumbs to a kidney or liver disease, it is practically impossible for the average physician or pathologist to trace the disease to its true cause. Health authorities and some dentists do not take this into count. Indeed, in two municipalities of metropolitan Detroit, physicians are so little aware of this problem that I found hardly a single doctor who knew that he, personally, was drinking fluoridated water.

Shouldn't we expect a significant rise in the death rate from kidney, liver, and brain diseases in fluoridated areas if there is chronic intoxication from poisoning? First let us consider that such diseases and death in naturally fluoridated areas are much less likely to occur than in artificially fluoridated ones because of the above-mentioned lower solubility of organic fluorides as compared to sodium fluoride. Furthermore, vital statistics on diseases which are difficult to diagnose, notoriously furnish very unreliable information. I personally observed, in reviewing deaths from bronchial asthma, that the majority of deaths recorded in death certificates represented asthmalike wheezing from other sources. Similarly, without an autopsy even the most expert clinician would find it extremely difficult to establish the diagnosis of fluorine poisoning. There is evidence which, however, cannot be fully corroborated because of insufficient published information that Grand Rapids deaths from kidney, heart, and brain diseases have increased since 1945 (10).

The benefits derived from fluoridation have been compared with those from penicillin. In 1949 I reported the first death from penicillin ever reported in literature (11) Since that time nearly every general practitioner, certainly every allergist, has observed serious reactions, near deaths, and even deaths from this drug. I recognize the value of penicillin as much as anyone; I use it extensively in my practice; however, like other competent physicians I am against its indiscriminate use. Assume, for instance, that this otherwise harmless drug were given every day to everyone in the country in very small doses for prophylactic purposes. Based on my extensive studies on human anaphylaxis which were carried out in 1933–36 (12), I would have to conclude that the results would be disastrous. Similarly, it will take many years and much careful and thorough clinical observations by competent physicians to evaluate the potential harm of fluorides. I predict that once the first fluorine death is reported, others will be recognized in rapid succession.

I have attempted to set forth why there can be no such thing as a safe concentration, why statistical evidence concerning the benefits of fluoridation is unreliable, and why thus far no serious illness and no fatalities from this cause have been reported. Whereas I have endeavored to keep this discussion on a factual basis, I cannot help but refer to the method used by health and dental authorities in promoting this program and smothering opposition.

IV. HOW THE FLUORIDATION PROGRAM IS PROMOTED

In practically all the voluminous literature on the subject hardly a paper is published which does not capitalize on the fact that there is no organized medical opposition. "No scientific point of view" (13). "Persons misled either by emotional prejudice or by lack of knowledge" (14).

In a very informative article issued by the Commission on Chronic Illness (15), such leaders of the profession as K. F. Maxcy, E. J. Stieglitz, and N. Shock present throughout the text the safety of the fluoridation project as an incontrovertible fact. In their last paragraph, however, there is the inconspicuous note "evidence does not absolutely exclude the possibility of risk."

Heyroth, of the Kettering Institute (16), another staunch proponent of fluoridation, assembles all the available data on the possibility of toxicity from fluorides

in an excellent contribution. The author sets out to convince the profession of the safety of fluoridation, yet at the end of the paper he makes a plea that evidence of toxicity in patients with chronic nephritis be sought. He recommends that such patients should buy nonfluoridated water if residing in a fluoridated community. He disregards the well-known fact that many patients are ignorant of suffering from this disease.

Practically all publications convey the impression to the reader that dental caries are primarily the result of lack of fluorides. Even if lack of fluorides in food and water were to play a part in the production of caries, the fact remains that such other causes as dietary digressions, lack of vitamins, glandular deficiencies, allergies, and many other factors are equally, if not much more, responsible.

In an attempt to prove the harmlessness of fluoridation, many of the articles claim that fluorine is a trace element necessary to good human nutrition similar in action to iron in forming red blood corpuscles and to iodides in counteracting goiter. This is contradicted by numerous sources (17).

None of the papers mention the excellent work by Taylor (18) who fed fluorides to a large number of mice in the so-called safe concentration. They developed cancer much sooner than the control group which was fed a fluoride-free diet. Also ignored is the work of Harris (19) which proved that hamsters fed corn and milk from Texas developed only half as much dental caries as those fed corn and milk from New England. His work clearly indicates that not lack of fluorides but vitamins were involved in the reduction of dental caries.

All this data indicates that most of the evidence presented by the proponents of fluoridation on the question of safe concentration, possible danger and on its value in preventing tooth decay is not convincing.

Why is there so little medical opposition to fluoridation? From personal contract with competent physicians and dentists, I know that there is a strong potential opposition. These never, however, wonder why scientific medical organizations officially endorse the program, I am told by a member of the house of delegates to the AMA who attended the meeting at which the principle of fluoridation was endorsed by this body that he personally was not informed sufficiently in advance to carefully appraise its drawbacks. He states that the vote was taken so precipitously that there was little chance to oppose it. Further you know that "the councils on pharmacy and chemistry of the AMA purposely refrained from making any recommendation that communities support or oppose projects for the fluoridation of water supplies." "The house of delegates did not urge or recommend that any communities undertake to fluoridate their water supplies." (Quotation from the statement of the AMA.)

Other physicians are overwhelmed by the vast repetitious information presenting the proponent aspect and puzzled by the absence of opposition. For instance, at present every member of the American Academy of Pediatrics is receiving a propaganda pamphlet—not a scientific paper—advocating fluoridation. This is likely to result in another endorsement of a scientific group. Furthermore, they cannot find literature against fluoridation in competent medical and dental journals. It is evident that conventional dental publications do not accept scientific material representing the other side. For such information one is obliged to search in second-rate journals. Moreover, doctors scientifically qualified, hesitate to oppose the project lest they jeopardize their standing among colleagues, their practice, and their medical appointments. They do not want to be identified with those who oppose the project on religious, political, and emotional grounds.

Let me conclude by reminding you of what happened in the early twenties. A drug much less harmful than sodium fluoride, namely, sodium iodide, was added to the public drinking water of some Michigan communities for the prevention of goiter. McClure and coworkers (20) soon noted a marked increase in the incidence of mortality from toxic goiter among those disposed to it. Immediately the health authorities who had promoted this scheme made iodine available in table salt instead. Now, anyone can partake of it or not according to his need.

Why do we not follow this example? Fluorides are now available to be taken as a tablet in water or milk, or they can be painted on the teeth of those who wish to avail themselves of their benefits. At present, neither the benefit nor the safety of fluoridation of water supplies are sufficiently proven to warrant experimentation with human life.

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Dr. MICK. The very request for section 1002 by HEW (USPHS) and the American Dental Association is more unbelievable when one has seen the minutes of the U.S. Public Health Service Conference of 1951, entitled "Promotion and Application of Water Fluoridation." I have that included in the testimony envelopes.

This meeting took place 6 years after fluoridation was started. It took 17 years to locate the one known true copy in the library of HEW. Its existence had been denied by the librarian up to May 1968. The call No. is 21.C55, 1951, "Proceedings—Fourth Annual Conference of State Dental Directors With the Public Health Service and the Children's Bureau, June 6–8, 1951, Federal Security Building, Washington, D.C." detailing, as entitled, "Promotion and Application of Water Fluoridation."

Dr. Knutson was also Chief, Division of Dental Public Health, U.S. Public Health Service. Dr. Leonard Scheele was Surgeon General and President of the World Health Organization.

The following should further influence your decision on section 1002, S. 1874. These are but a few statements from 21.C55, 1951, of Public Health officials who were promoting use of poisonous fluorides in your drinking water and had been for 6 years.

Dr. Scheele speaking, he is addressing this audience of approximately 50 Public Health Service representatives from the States:

I am sure you are going to have an interesting meeting. I did have a chance to look over your schedule. Obviously one of the biggest things facing us is the catalyzing of real national program water fluoridation.

As you turn to various sections, these are Government records that are not available. I ask, Senator Kennedy, that this document No. 21.C55, 1951, be put into the record for the guidance of the Senators and the Congress.

Senator KENNEDY. We will accept it for the committee files.

Dr. MICK. You won't accept it?

Senator KENNEDY. We will review those parts that are particularly relevant to the legislation. We will include those in the record. But we are not at the taxpayers' expense just going to reprint a lot of material. I don't know what is in that record.

Dr. MICK. This particular official document of this meeting conducted by the U.S. Public Health Service is entitled "Promotion and Application of Water Fluoridation." It is to try to show those in attendance how to promote fluoridation. This meeting is taking place 2 years after some of the most fantastic reports on harms from fluorides had been published by Government officials. In this USPHS "Proceedings" is the following statement: "Well, we now have enough evidence from cities that had demonstrations to show that controlled fluoridation has the same effect as natural fluoridation. Incidentally, we never had any 'experiments' in Wisconsin. To take a city of 100,000 and say, 'We are going to experiment on you, and if you survive we will learn something'—that is kind of rough treatment on the public. In Wisconsin, we set up demonstrations. They weren't experiments.

"Now, in regard to toxicity—I noticed that Dr. Bain used the term 'adding sodium fluoride.' We never do that. That is rat poison. You add fluorides. Never mind that sodium fluoride business, because in most instances we are not adding sodium fluoride anyhow. Everything, except what Dr. Scheele said in the beginning, is being said by a Dr. Francis Bull from Wisconsin."

Senator KENNEDY. You have about 4 or 5 more minutes.

Dr. MICK (continuing). All of those things give the opposition something to pick at, and they have got enough to pick at without our giving them anymore. But this toxicity question is a difficult one. I can't give you the answer on it. After all, you know fluoridated water isn't toxic, but when the other fellow says it is, it is difficult to answer him. I can prove to you that we don't know the answer to that one, because we had a city of 18,000 people which was fluoridating its water for 6 or 8 months.

This is only part of what was told. These minutes of the Government were found 2 years after they took place, accidentally, by a Congressman from the State of Washington. They are so vital.

It is so vital that the people should know what took place in 1951 when the Government was trying to promote fluoridation and had no experiments done whatsoever, no experience on the harms to the people.

This book here was put out entitled "Dentistry and Public Health," Senator. It tells all the harms, the possible harms to kidneys, to teeth, to bodies from fluorides. This was all recorded in 1949 by some of the very same men that started to promote fluoridation in 1951. (Will return to these Government records.)

One of the men who you are led to believe in is Dr. David Ast, of New York State, who started the fluoridation program in Newburgh, N.Y. As of August 5, 1964, from a letter to a woman in Connecticut, Dr. Ast says:

I have your letter of August 3 and wish to advise you that this department has not done any original work dealing with fluoridation as it relates to the bill. Some of this work has been done in Connecticut. I would suggest you communicate with the Connecticut State Department of Health in this matter.

Senator, I did contact them. At no time has any of this work ever been done.

You are interested in cancer. So am I. I am interested in degenerative diseases. For your guidance on your cancer programs, this is from Times Section "medicine." At the bottom, on a report on radioactive diagnosis: "Fluorine, a related element, has a radioactive isotope, S. 18, that concentrates in bones facilitating the detection of bone cancer."

In my own animal research work, and Senator, I happen to be—I guess it is a disgrace—one of the men in the world to conduct research work into the third generation on rats and had the bones, the teeth, the kidneys, livers, and spleens analyzed for fluoride retention.

These findings were all published. I found up to 500 percent more fluorides in these tissues than in the control animals.

We learn, as stated (if I can't influence you in any other way) by a D.D.S., the Assistant Surgeon General, Director, Division of Dental Health, that in 1967, he wrote a letter concerning fluoridation and in it he stated, "Absolute safety can never be absolutely demonstrated."

In Year Book of Agriculture, by the U.S. Government, it tells that fluorine is a cumulative poison and long continued consumption of relatively small quantities produces chronic fluorosis in all farm animals and the general symptoms are abnormal teeth and bones, stiffness of joints, a loss of appetite, salt hunger, kidney damage, and injuries to other organs, such as the liver, the heart, the thyroid, and others.

Senator Kennedy, you are also interested in other research on cancer. So am I. I would suggest reading the fantastic work that has been done by Dr. Taylor on animals in relationship to cancer and how fluorides affect cancer prone animals and the shortening of life where fluoride is also used in these experiments.

Then, by the American Dental Association, Senator, there was published as the work of a physician a report of the harms to humans from the presence of fluoride in drinking water and how these symptoms were alleviated by the omission of the fluorides.

Senator KENNEDY. Doctor, do you want to sum up now? We are running into a time problem. We will make sure your statement is included in its entirety in the record.

Dr. MICK. Continuing from USPHS meeting, "Promotion and application of water fluoridation":

Then a campaign was started by organized opposition on the grounds of toxicity. It ended up in a referendum and they threw out fluoridation. So I would hate to give you any advice on that deal. It's tough.

So when you get the answer on the question of toxicity, please write me at once, because I would like to know. We have answers, but apparently in some places they don't work.

One thing that is a little hard to handle is the charge that fluoridation is not needed. They talk of other methods, and when they get through adding up all the percentages of decay that we can reduce by such methods, we end up in a minus. When they take us at our own word they make awful liars out of us.

If it is a fact that some individuals are against fluoridation, you have just got to knock their objections down. The question of toxicity is on the same order. Lay off it altogether. Just pass it over. We know there is absolutely no effect other than reducing tooth decay, you say, and go on. If it becomes an issue, then you will have to take it over, but don't bring it up yourself.

If you can—I say if you can, because five times we have not been able to do it—keep fluoridation from going to a referendum.

Honorable Senators, some of the most valuable documents on harms and possible harms from fluorides are recorded in a book entitled "Dentistry in Public Health" by Pelton and Wisan, published in 1949. That is 4 years after fluoridation was started. "Dentistry in Public Health" is edited by Walter J. Pelton, B.S., D.D.S., M.S.P.H., senior dental surgeon, U.S. Public Health Service, Colorado, and Jacob M. Wisan, D.D.S., M.S.P.H., director, Joseph Samuels, Dental Clinic, Rhode Island, State Hospital for the Dental Health Section of the American Public Health Association.

Some of the contributors to this book were: Francis A. Arnold, D.D.S., Dental Surgeon, U.S. Public Health Service, National Institute of Dental Research, National Institutes of Health, Bethesda, Md.; H. Trendley Dean, D.D.S., Dental Director, U.S. Public Health Service, Director, National Institute of Dental Research, National Institutes of Health, Bethesda, Md.; Harold Hillenbrand, D.D.S., Secretary of the American Dental Association; John W. Knutson, D.D.S., D.P.H. Senior Dental Surgeon, Chief, Dental Section, States Relations Division, U.S. Public Health Service, Washington, D.C., are but a few but these were the leading authorities.

As you listen to these statements on fluorides, as recorded, try to ascertain how or why these same men could possibly proceed with fluoridation and, in 1951, arrange for the Government meeting "Promotion and Application of Water Fluoridation."

At the same time, try to ascertain how our U.S. Public Health Service (HEW) could be so bold as to ask for "Grants for Water Treatment Programs" to reduce dental decay.

From page 161, "Dentistry in Public Health:" Statement by Dr. Dean:

Conclusive evidence has been presented to show that this element (fluoride) is the etiologic factor in the production of one dental disease, fluorosis (mottled enamel).

"The ingestion of such waters during the period of calcification of the crowns of the permanent teeth results in a disturbed calcification pattern. Both the severity of affection and the percentage of individuals affected are correlated with the concentration of fluorine in the water ingested. There is slight but discernible evidence of a disturbed calcification in a small percentage of individuals who have used domestic waters containing 0.5 or about 1.5 ppm of fluorine.

Gentlemen, that was later to be known as the safe range for artificial fluoridation.

From page 163, "Dentistry in Public Health," Dr. Arnold:

"Signs of toxic nephritis may follow the ingestion of toxic but not fatal doses." Dr. Knutson: "Little information is available to establish the acute toxic or lethal dose of fluoride compounds for human beings." From page 164: Arnold—

Teeth showing fluorides have an increased fluorine content, and skeletal tissues showing typical fluorine pathology have proportional increases in fluorine.

The histopathologic changes accompanying this fluorine increase in skeletal tissues represent on the whole a disturbed osseous metabolism . . . however, the results of these high doses do give warning of the potential danger of fluorine and fluoride compounds.

Concerning the effect of fluoride domestic water supplies on human populations: (Arnold) "Comparatively little information is available on this subject," (Gentlemen—this was 4 years after the start of fluoridation) (Arnold)—

Kemp, Murray and Wilson recently have sought to relate the ingestion of fluoride in a certain fluoride drinking waters in England with a kyphosis-like spinal change and "severe" dental fluorosis in children using domestic water containing 0.3 to 1.2 ppm of fluorine.

Page 166—Arnold—

There is a remarkably close correlation between urinary fluorine concentration and the fluorine content of the local water supply. With exposures as low as 0.5 ppm of fluorine in the local water supply, the urine specimens show an increase in fluorine.

Page 176—Dentistry in public health—Arnold:

It is essential, however, that any supplementary feeding of fluorides be under direct prescription and supervision of the child's dentist or pediatrician.

Gentlemen, these were the words of the men who, within a few months, planned the mass addition of poison fluorides in our drinking water.

On November 9, 1967, Dr. Viron L. Diefenbach, DDS, Assistant Surgeon General and Director, Division of Dental Health, wrote the following in a letter: "absolute safety (from fluoride) can never be absolutely demonstrated." Such plain and unequivocal proof of harmful effects of 1 p.p.m. fluoride in water demonstrates beyond question that the claim that fluoridated water is "perfectly safe" is simply not valid.

Water fluoridation is economically unsound—See references on Seattle, Washington and Toronto, Canada for tonnage of fluoride pollutants, corrosive—See Erco, compulsory medication, violates religious beliefs and freedom of choice and damages biological organs.

I trust that one of the witnesses supporting S. 1874 will supply you with at least one copy of any controlled experiments with the U.S. Public Health Service recommended parts per million, and water, that shows that poisonous fluorides are—as published as fact by promoters of fluoridation—safe, beneficial, and will cause no future body harms. There is a $100,000 reward offer—that can go to some military charity—if you can be provided with same. The statement "safe, beneficial and will cause no future harms" are statements of promoters.

You are probably familiar with the ban of fluoride tablets in 1966 for pregnant women; and yet, the U.S. Public Health Service, HEW, are putting fluoride, asking for fluoride to be put in the water for you, for me, for everyone, for the young, the old.

Senator, one of the most damaging of all things from fluorides, from 2 years of research at the Oregon Medical University was on prolapsed intestines. This was done with a mass of animals and wherever there was prolapsed intestines, it was found that the fluoride was in the animal pellets.

The U.S. Government, Navy, also had surprise findings. They did not do any fluoride research as such, but fluoride was found in the animal pellets that were being fed these animals.

The last two sentences sum this up: (This is from the Bethesda, Md., Naval Medical Research Division.)

Inasmuch as this investigation was not planned, or specifically controlled for the purpose of relating these substances to toxic effects the actual finding of fluorine in the rations of five of the swine in which serious lesions were observed is not conclusive evidence, but in view of the fact that many studies reported in the literature have shown that teeth and bones are subject to developmental changes by the addition of relatively small quantities of fluorine,

it is believed that these observations should be reported as specific cases wherein fluorine in the diet may be a factor and, Senator, it says nutritionists should be informed of the possibility of fluorine being present in food supplements in quantities approaching toxic level.

Senator KENNEDY. You have about 30 more seconds, Doctor.

Dr. MICK. For your information, there is such a mass of findings on fluorides that a journal on fluorides comes out every 3 months.

You had fine men testifying here. You have had "oodles" of information. Senator Kennedy, not one man offered you one reference. They told you there were 4,000 references. Not one man offered you a reference of research work on animals or humans with any of the fluorides at any of the recommended parts to prove what they said.

A group of professional men, there are approximately 20 of us, and these are some of the finest men interested in heart work, eye work, cleft palate, nutrition, have banded together because they are doing the same thing by showing that they are opposed to fluoridation.

This $100,000 reward offer is not a "screwy" thing. It is very simple. Anyone should be able to collect it. Fluoridation was started in 1945. Promoters claim up to 50 years of research with fluorides. I will read this last paragraph.

This reward offered of $100,000 will go to the first individual who can provide one copy of any controlled experiments with the United States Public Health Service recommended fluorides in water at the United States Public Health Service recommended parts per million, that shows that poisonous fluorides are—as published as fact by promoters of fluoridation—safe, beneficial, and will cause no future body harms.

I trust that you, Senator Kennedy, would take the challenge and say to these gentlemen—and call in the HEW—"Look, either we—Senator Magnuson and the committee—and I am going out on a limb for you, or let us expose Dr. Mick and all of these other men that are making this 'reward' statement. You said there are 4,000 of these experiments."

Senator, I have a lot of influence at times. I am half a gambler. As I said, I was one of the original promoters of fluoridation. It is a challenge. I trust that until you at least find one experiment or until one of the men that were here today provide you with one——

Senator KENNEDY. Who is going to decide? Are you prepared to let the American Dental Association appoint a five-man group and let them decide?

Dr. MICK. We will take it to any college that you state without me being there, that has a biology department, anyone that is interested in doing research work at all. The laboratories in Philadelphia and Washington; any college that does research work with animals of any kind. That is all you have to do.

Senator KENNEDY. What do they have to do then?

Dr. MICK. All they have to do, Senator, is the same as if you and I were doing an experiment. We have two groups of guinea pigs, two groups of anything.

Senator KENNEDY. What do they have to prove, that they are able to show that the number of cavities have gone down?

Dr. MICK. All they have to do is show that fluoridation is safe, as they say, that it is beneficial, that the cavities go down. And that it will cause no future body harms.

Senator KENNEDY. No future body harms?

Dr. MICK. It only takes 9 months for three generations. I have done this. So have many others. Dr. Taylor had 645 animals, 12 experiments. Senator, one other thing, please, for 9 months, it would only cost approximately $1,000—$1,000 of Government funds. Won't you have either Howard University or some university, unbeknownst to me, grant them this money and have them do this research? It only takes 9 months.

All they have to do is the same as I did, have the bones, the teeth, the spleens, the kidneys, and the livers analyzed for fluoride retention and see what happens to the bones and the teeth and bring this to you personally.

I will tell you what I will do. If you and I will go together, I will put up half of it, you put up half of it, and we will conduct a private experiment and then either you or I or both of us will learn something.

Senator KENNEDY. That is a very generous offer, but one which I don't think I will go along with.

Dr. MICK. It only costs us $500 each.

Senator, thank you for our courtesy.

Senator KENNEDY. Thank you. We appreciate your appearance here.

Dr. MICK. May I add one thing. I happen to be, I guess, one of those individuals that continue to try to present testimony before congressional committees and have done it for a good many years. Because I am just an individual, I guess the material is never observed in the congressional records. I too, attended that testimony that was referred to, and in that testimony under Congressman Fogarty, are untold references on harms from fluorides.

Thank you very much.

Mr. MILLER. Senator Kennedy, could we add one paragraph?

Senator KENNEDY. Yes.

Mr. MILLER. In the Times of April 14, there is a simple reporting which is headlined "Government Not Doing Job in Fluoridation Research—Nader." It has these three paragraphs. I would like to submit them for the record.

A serious and immediate re-evaluation of the fluoridation theory is overdue consumer advocate Ralph Nader declared during a press conference, preceding his address at the University of San Francisco Sunday afternoon. The subject was raised by a question posed by one of the reporters. The question was, "How does fluoridation of public water systems fit into the pollution picture?"

His crisp response zeroed in on an issue which until now has not been considered during the pro and con discussions of fluoridated drinking water. Said the fiery young crusador, "The urgent consideration is total fluoride ingestion. How much fluorides are people taking into their bodies from fluoride air pollution, from soil, from water, from water products processed in fluoridated water, from pharmaceuticals, pesticides, urbicides, et cetera."

"The Federal Government," Nader continued, "has not been willing to answer that question. No segment of the fluoridation problem, whether it is fluoridation of the water supply, or fluoride pollution, can be scientifically analyzed until we analyze the total fluoride intake."

For your information, Senator, our testimony before the House caused the Public Health Service to again report airborne fluorides. For some reason, after the Public Health Service started to promote fluoridation of public water supplies, they stopped reporting airborne fluorides and it was through Representative Ottinger's pressure on the Public Health Service that they again reported airborne fluorides.

Senator KENNEDY. Thank you for coming.

Dr. MICK. In courtesy of Dr. Cashmire Sheft, a dentist: you received a beautiful letter written by him. It was addressed to Senator Magnuson, dated June 4, 1971. Could I ask that this letter be put into the record.

Senator KENNEDY. We will include it in the file. The staff will include those parts in the record that are pertinent.

Thank you very much.

(The prepared statement of Dr. Mick, and excerpts from the letter referred to above follow:)

PREPARED STATEMENT OF ROBERT J. H. MICK, D.D.S., ST. PETERSBURG BEACH, FLA.

My name is Dr. Robert J. H. Mick. I have been in the dental profession for more than thirty-five years. During the last twenty-seven years I have been involved in experimental animal research and research studies on waters and foods as to their effect on animals and humans in the area of dental decay, perfect teeth, normal and malformed dental arches, cleft palate, etc. My research studies on humans was conducted in both Equatorial Africa and the United States.

The testimony I present will be on S. 1874. It is my hope that I may provide you gentlemen with some information to influence you to *not* vote for this Bill, whether you have already sponsored it or not. Each section of the bill adds more insult to anyone who knows the problems of degeneration—and dental decay.

I have volunteered to represent the millions of voters in this country who oppose fluoridation. I am one of the original promoters of fluoridation in the U.S. I learned in 1948 how I had willingly but unknowingly became involved in what was to become the biggest international scandal ever to be promoted in the name of a health program.

I have spent the last twenty-three years exposing the promotion of fluoridation by employees of the United States Public Health Service and defeating fluoridation at referenda. I believe I personally have a 100% average of wins by just telling the truth to the voting audience. Fluoridation, when allowed by city and state legislators to go to referendum, is the biggest voter interest issue that has ever been voted upon.

S1874 is cited as the "Children's Dental Health Act of 1971", but, on page 10 of the Bill, this act may be cited as the "Public Health Service Act." The children, the poor children, are used as a mask for S1874.

The double talk and unknowns for which graduated grants are sought in Sec. 1001, 1003 and 1004 *is beyond comprehensions.* The "poor children" will receive but a *trace of the grants that are being sought.*

Every section of S1874 except Sec. 1002 "Grants for Water Treatment Programs" can do no physical harm.

Monies allocated to Sections 1001, 1003 and 1004 can be used for every type of fluoridation propaganda under the headings of "accord priority to projects designed to provide preventive services", "comprehensive projects", "prevention", "demonstrations", "experimentation", "establishing and carrying out programs to educate", etc.

You gentlemen realize, that as young men you rarely saw a Public Health Service Dentist in your area. Fluoridation has become a major program for dental division in *the health departments.* As a young man, a father and a senator you probably have had many dogs. Has it ever occurred to you that these animals have perfect teeth while drinking the same water as your family? What do you believe should be added to your dog's water to improve the *quality of his teeth?*

But if you vote against this Bill you may be called anti-poor, anti-dental, anti-fluoridation.

That brings us to Sec. 1002, "Grants for Water Treatment Programs". I trust that you gentlemen will not become a party to that which is about to happen according to the American Dental Association. You Senators know that this title could only infer that water would be treated for quality and/or purity.

You cannot treat water to reduce dental decay. There is no mention in this Bill what the water would be treated with or how. The most important part of Sec. 1002 is in parentheses on page 4. lines 4 and 5, (b) section; namely, (but are not limited to) the purchase and installation of water treatment equipment.

If the true words of intent had been used in this title, as publicized by the

American Dental Association, the title should read "Grants for Fluoridation." So worded, as it referred to buy the ADA, S1874 would have received large scale public opposition. Opposition has started in mass as of July 10th. I assure you it will gain momentum.

The mass of evidence that documents the harms from fluoride could provide testimony for hundreds of pages. Many previous hearings since 1954 have recorded the story of fluoridation and its promotion along with reports of the harms from fluorides. I will come back to this point later.

Honorable Senators. Some of you may have witnessed how the word "fluoridation" has been built up over a period of twenty-seven years to being in the same category as a religion, a sect, a political side, a word that can split a group or a family. The documented facts concerning these poisonous fluoride are overshadowed by the efforts of the promoters of fluoridation to influence one group against the other—all in the name of a children's dental health program. How this poisonous fluoride can be swallowed and only effect teeth, while all other foods and vitamins go to all parts of the body is indeed fantastic and a mystery to any thinking individual.

The Congressional Hearings in 1954, entitled "Fuoridation of Water" H.R. 2341, "A Bill to Protect the Public Health From the Dangers of Fuoridation of Water" are probably unknown to most Congressmen. These hearings exposed fluoridation as a scheme with no regard to the toxic effects as known and reported by officials in the United States Public Health Service and other professional men. I ask that those hearings (H.R. 2341-1954) be placed into these records for guidance of this Congress.

The very request for Sec. 1002 by HEW (USPHS) and the American Dental Association is more unbelievable when one has seen the minutes of the U.S. Public Health Service Conference of 1951, entitled "Promotion and Application of Water Fluoridation." This meeting took place six years after fluoridation was started. It took seventeen years to locate the one known true copy in the Library of HEW. Its existence had been denied by the librarian. The Call No. is 21.C55, 1951—"Proceedings—Fourth Annual Conference of State Dental Directors with the Public Health Service and The Children's Bureau, June 6–8, 1951, Federal Security Building, Washington, D.C.,"—detailing, as entitled, "Promotion and Application of Water Fuoridation". Dr. John Knutson, the government's major promotor of fluoridation at that time was Chairman of the Conference. Dr. Knutson was also Chief, Division of Dental Public Health, U.S. Public Health Service. Dr. Leonard Scheele was Surgeon General and President of the World Health Organization.

The following should further influence your decision on S1874. These are but a few statements from 21.C55, 1951 of Public Health Officials who were promoting use of poisonous fluorides in your drinking water and had been for six years.

Dr. Scheele speaking: "I am sure you are going to have an interesting meeting. I did have a chance to look over your schedule. Obviously one of the biggest things facing us in the catalyzing of a real national program of water fluoridation."

"Well, we now have enough evidence from cities that had demonstrations to show that controlled fluoridation has the same effect as natural fluoridation. Incidentally, we never had any "experiments" in Wisconsin. To take a city of 100,000 and say, "we are going to experiment on you, and if you survive we will learn something"—that is kind of rough treatment on the public. In Wisconsin, we set up demonstrations. They weren't experiments.

"Now, in regard to toxicity—I noticed that Dr. Bain used the term "adding sodium fluoride." We never do that. That is rat poison. You add fluorides. Never mind that sodium fluoride business, because in most instances we are not adding sodium fluoride anyhow. All of those things give the opposition something to pick at, and they have got enough to pick at without our giving them any more. But this toxicity question is a difficult one. I can't give you the answer on it. After all, you know fluoridated water isn't toxic, but when the other fellow says it is, it is difficult to answer him. I can prove to you that we don't know the answer to that one, because we had a city of 18,000 people which was fluoridating its water for six or eight months. Then a campaign was started by organized opposition on the grounds of toxicity. It ended up in a referendum and they threw out fluoridation. So I would hate to give you any advice on that deal. (Laughter) It's tough."

"So when you get the answer on the question of toxicity, please write me at once, because I would like to know. We have answers, but apparently in some places they don't work."

"One thing that is a little hard to handle is the charge that fluoridation is not needed. They talk of other methods, and when they get through adding up all the precentages of decay that we can reduce by such methods, we end up in a minus. When they take us at our own word they make awful liars out of us."

"If it is a fact that some indivíduals are against fluoridation, you have just got to knock their objections down. They question of toxicity is on the same order. Lay off it altogether. Just pass it over, we know there is absolutely no effect other than reducing tooth decay, you say, and go on. If it becomes an issue, then you will have to talk it over, but don't bring it up yourself."

"If you can—I say if you can, because five times we have not been able to do it—keep fluoridation from going to a referendum."

Honorable Senators: Some of the most valuable documents on harms and possible harms from fluorides are recorded in a book entitled "Dentistry in Public Health", by Pelton and Wisan, published in 1949. That is four years after fluoridation was started. "Dentistry in Public Health" is edited by Walter J. Pelton, B.S., DDS, M.S.P.H., Senior Dental Surgeon, U.S. Public Health Service, Colorado and Jacob M. Wisan, DDS, M.S.P.H., Director, Joseph Samuels, Dental Clinic, Rhode Island, State Hospital for the Dental Health Section of The American Public Health Association. Some of the contributors to this book were: Francis A. Arnold, DDS, Dental Surgeon, United States Public Health Service, National Institute of Dental Research, National Institutes of Health, Bethesda, Maryland. H. Trendley Dean, DDS Dental Director, United States Public Health Service, Director, National Institute of Dental Research, National Institutes of Health, Bethesda, Maryland, Harold Hillenbrand, DDS, Secretary of the American Dental Association, John W. Knuston, DDS, D.P.H., Senior Dental Surgeon, Chief, Dental Section, States Relations Division, United States Public Health Service, Washington, D.C., are but a few, but these were the leading authorities.

As you listen to these statements on fluorides as recorded, try to ascertain how or why these same men could possibly proceed with fluoridation and, in 1951, arrange for the government meeting "Promotion and Application of Water Fuoridation."

At the same time, try to ascertain how our U.S. Public Health Service (HEW) could be so bold as to ask for "Grants for Water Treatment Programs" to reduce dental decay. (Sec. 1002, S. 1874.)

From page 161, "Dentistry in Public Health": Statement by Dr. Dean: "Conclusive evidence has been presented to show that this element (fluoride) is the etiologic factor in the production of one dental disease, fluorosis. (mottled enamel)". "The ingestion of such waters during the period of calcification of the crowns of the permanent teeth results in a disturbed calcification pattern. Both the severity of affection and the percentage of individuals affected are correlated with the concentration of fluorine in the water ingested. There is slight but discernible evidence of a disturbed calification in a small percentage of individuals who have used domestic waters containing 0.5 or about 1.5 ppm. of fluorine." Gentlemen, that was later to be known as the safe range for artificial fluoridation.

From page 163, "Dentistry in Public Health, Dr. Arnold:

"Signs of toxic nephritis may follow the ingestion of toxic but not fatal doses." (of Knuston) "Little information is available to establish the acute toxic or lethal dose of fluoride compounds for human beings."

From page 164 (Arnold) "teeth showing fluorides have an increased fluoride content, and skeletal tissues showing typical fluorine pathology have proportional increases in fluorine."

"The histopathologic changes accompanying this fluoride increase in skeletal tissues represent on the whole a disturbed esseons metabolism." "However, the results of these high doses do give warning of the potential danger of fluorine and fluoride compounds." Concerning the effect of fluoride domestic water supplies on human populations: (Arnold) "Comparatively little information is available on this subject, (Gentlemen—this was 4 years after the start of fluoridation) (Arnold;) Kemp, Murray and Wilson recently have sought to relate the ingestion of fluorine in a certain fluoride drinking waters in England with a kyphosis-like spinal change and "severe" dental fluoresis in children using domestic water containing 0.3 to 1.289 parts per million of fluorine."

*Page 176 (Denistry in Public Health) (Arnold): "It is essential, however, that fluorine concentration and the fluorine content of the local water supply. With exposures as low as 0.5 ppm of fluorine in the local water supply, the *urine specimens show an increase in fluorine.*

Page 176 (Dentistry in Public Health) (Arnold): "It is essential, however, that

any supplementary feeding of fluorides be under direct prescription and supervision of the child's dentist or pediatrician."

Gentlemen, these were the words of the men who, within a few months, planned the mass addition of poison fluorides to our drinking water.

On No. 9, 1967, Dr. Viron L. Diefenbach, DDS, Assistant Surgeon General of Director, Division of Dental Health wrote the following in a letter: "*absolute safety* (from fluoride) *can never be absolutely demonstrated*". Such plain and unequivocal proof of harmful effects of 1 ppm fluoride in water demonstrates beyond question that the claim that fluoridated water is "perfectly safe" is simply not valid. Water fluoridation is economically unsound, (See references on Seattle, Washington and Toronto, Canada for tonnage of fluoride pollutants), corrosive (See Erco), compulsory medication, violates religious beliefs and freedom of choice and damages biological organs. I trust that one of the witnesses supporting S. 1874 will supply you with at least one copy of any controlled experiments with the U.S.P.H.S. recommended parts per million, that shows that poisonous fluorides are (as published as fact by promoters of fluoridation) safe, beneficial, and will cause no future body harms. There is a $100,000 reward offer (that can go to some military charity) if you can be provided with same. The statements "safe. beneficial and will cause no future harms" are statements of promoters.

PASSAIC, N.J., *June 4, 1971.*

HON. SENATOR WARREN G. MAGNUSON,
U.S. Senate,
Washington, D.C.

DEAR SENATOR MAGNUSON: I read with interest your proposed omnibus dental bill (S1874) entitled "The Children's Dental Health Act of 1971." It is praiseworthy except for one section; the one that would authorize $15 million over five years as matching grants to communities wishing to fluoridate. From this proposal, I deduce that you are a proponent of fluoridation, and therefore must not be aware of the real danger of fluoridation.

I am a summa cum laude graduate of the University of Maryland Dental School (Class of 1944) and a member of the American Dental Association. I am also a member of dentistry's highest honor society, Omicron Kappa Upsilon, and have achieved many honors.

I, like you, have a strong humanitarian inclination—which is evidenced by my donating twenty years of dental service to the children of an orphanage; six years as an elected member of a Board of Education (two years of which I was vice president); five years' membership on a Youth Guidance Council; and five years of service as a member of a Juvenile Conference Committee. My altruism compels me to warn you (and other proponents of fluoridation) of your grievous mistake.

For twenty-five years I have been deeply engrossed in a comprehensive study and evaluaton of fluoridation and have spent thousands of hours in this research. My conclusions lead to the firm conviction that our health authorities are taking us down the road to disaster!

Some of the startling true facts—all documented—which bear me out are:

Sodium fluoride is one of the most toxic poisons known to man—and cannot be purchased without a prescription!

The dictionary describes sodium fluoride as "a colorless crystalline, water soluble poisonous solid, used chiefly in the fluoridation of water, as an insecticide, and as a rodenticide." (*Random House Dictionary*, p. 1352)

The Encyclopedia Americana (Vol. 25; p. 221) describes it as ". . . a poisonous insecticide for poultry and dogs."

Van Nostrand's Scientific Encyclopedia (4th Ed., p. 1643) states that: "Sodium fluoride is used as a poison for rats and cockroaches."

The Journal of the American Medical Association (Feb. 10, 1951) reported: "Fuorine also tends to accumulate in the bones leading to hypercalcification (over-calcification) and brittleness. Ligaments and tendons also become calcified. Serious symptoms may ensue such as loss of mobility of joints, easy fracture and pressure on the spinal cord. Other effects include decreased blood clotting power; and in women, painful menstruation, lowered birth rate, high incidence of fracture, thyroid alteration and liver damage."

* * * * * * *

"The plain fact that fluorine is an insidious poison, harmful, toxic, and cummulative in its effect—even when ingested in minimal amounts—remains

unchanged no matter how many times it will be repeated in print that fluoridation of the water supply is safe." (Dr. Ludwik Gross, M.D., Chief of Cancer Research of the V.A.)

Dr. Alfred Taylor of the Biological Institute of the University of Texas, found that sodium fluoride even in such very low levels as one part in 20 million stimulated the growth of cancer cells in mice and embryonated eggs. (*"Proceedings of the Society for Experimental Biology and Medicine,"* Vol. 119, p. 252, 1965)

* * * * * * *

Epidemic skeletal malformations have been reported among people drinking water containing as little as 0.8 ppm. of fluoride in Lebanon. (*Archives of Environmental Health*, May 1963)

One percent of children under ten years of age and pregnant women could not tolerate even the low-level dosages of fluoride that have been recommended by public health officials. (Feltman and Kosel: *The Journal of Dental Medicine*, Oct. 1961)

"Fluorides are violent poisons to all living tissues because of their precipitation of calcium. They cause fall of blood pressure, respiratory failure, and general paralysis. Continuous ingestion of non-fatal doses causes permanent inhibition of growth." (*The U.S. Dispensatory*, 24th Ed., pp. 1456–57)

* * * * * * *

Fluoridated water aggravates arthritic conditions and is a "potential long-range danger to health." (Dr. William Gutman, M.D.; Flower Fifth Avenue Hospital, N.Y.C.)

* * * * * * *

The contention that fluorides will harden bone and help reduce the bone disease osteoporosis is false. That claim has been discredited and contradicted by no less than the illustrious British Research Council in a report published in the *Medical News* (London), on Sept. 26, 1969; and also in a report published in the *American Journal of Clinical Nutrition* (Jan., 1971).

In October, 1966, the Food and Drug Administration banned the sale of all prenatal fluoride products because of the recognized danger to unborn babies. If prenatal fluoride ingestion by way of a carefully controlled tablet dosage was found to be dangerous, how can it be claimed that the consumption of uncontrolled quantities of fluoridated water by a pregnant woman (or anyone) is safe?

* * * * * * *

To further compound the contamination: In fluoridated areas the processed foods, soft drinks, beer, and fruit punches to which water has been added will all contain fluoride. Marier and Rose of the National Research Council of Canada, have shown that processing of foods increases their fluoride content by as much as 5 times—which together with the fluoride intake from drinking water adds up to an estimated total daily intake per person of between 2 to 5 mg. of fluoride. This level of fluoride intake is recognized as toxic even by the most ardent of fluoridationists.

* * * * * * *

It is inconceivable that a toxic prescription drug listed as a dangerous cumulative proto-plasmic poison could be taken by every citizen from the cradle to the grave, sick or well, young or old, and the same dose given to a six-pound baby and a 250-pound man without somebody being harmed.

Your bill, Senator Magnuson, places you in the paradoxical position of having the commendable altruistic good intentions of a human benefactor, but actually aiding and abetting a scheme that has been proven harmful to millions.

I sincerely hope, sir, that you investigate thoroughly the con side of fluoridation and then reevaluate your position on this issue. I fervently hope also, that someone in the Congress will soon recognize the serious blunder of fluoridation and launch a Congressional investigation of fluoridation—which I am certain would result in a total rejection of this so called "health" measure.

Sincerely yours,

CASIMIR R. SHEFT, D.D.S.

Senator KENNEDY. Our last witness this afternoon is Dr. Wesley O. Young, professor of community dentistry at the University of Kentucky Dental School. He is a past president of the American Society of Dentistry for Children and presently serves as chairman of that

organization's dental care committee. Prior to joining the faculty at Kentucky, Dr. Young pursued an extensive career in public health work including a period as director of all child health activities, medical and dental, for the State of Idaho.

We welcome you, Doctor.

STATEMENT OF DR. WESLEY YOUNG, CHAIRMAN, DENTAL CARE PROGRAMS COMMITTEE, AMERICAN SOCIETY OF DENTISTRY OF CHILDREN

Dr. YOUNG. Thank you, Senator Kennedy.

I am Dr. Wesley Young of Lexington, Ky. I am a public health dentist and teach preventive dentistry and community health at the University of Kentucky College of Dentistry where I am professor of community dentistry.

I am a past president of the American Society of Dentistry for Children and currently chairman of their dental care programs committee. The ASDC is an organization primarily of general practitioners of dentistry whose objective is the improvement of the dental health of children. Our membership also includes most of the specialists in dentistry for children and the dental care programs committee is a joint activity with the American Academy of Pedodontics, the official organization of specialists in the field.

On behalf of all who are interested in improving the health of children I urge favorable consideration of S. 1874, "The Children's Dental Health Act of 1971." Dental diseases are one of the most common health problems of children today. I will not recite statistical figures giving the high rate of attack or the serious consequences of the lack of treatment.

Instead, two quotations will be given from a major study of dental health and the dental profession conducted just 10 years ago under the auspices of the American Council on Education and published as the "Survey of Dentistry."

> **The shamefully low level of dental health of the American people becomes particularly apparent when viewed in the light of the economic capacity of the nation and the technical achievements in dentistry. This wide disparity between capacity and accomplishment is the heart of the dental health problem. Dental health is more a problem of public conscience than of statistics: not merely that a vast amount of dental disease exists, but that the American society has the resources to combat these diseases and is not using them to the fullest.**

In the decade that has elapsed since those words were written, only limited progress has been made toward improving the dental health of the American people. S. 1874 addresses itself to several important recommendations made in that study.

The Congressional Record of May 14, 1971, includes Senator Magnuson's explanation of the reason for the introduction of this bill. This statement is a well-reasoned description of the need for legislation. I would like to call particular attention to a portion of the statement which starts by quoting a comment made in 1969 by the current administration's first Secretary of HEW, Mr. Robert Finch:

"I was * * * shocked to find, after coming into office, that we have not really had a national dental policy, particularly with respect to youngsters."

Senator Magnuson's statement continues by describing some of the legislative efforts that had been made, with only limited success, since that time to "* * * realign Federal dental health care policy in a more rational and constructive way."

In 1969, a study was conducted of "Dental Health Related Programs in Federal Agencies." A brief description of these activities occupied 35 single-spaced typed pages. It indicated that dental activities were being conducted within programs administered by every major agency in the Department of Health, Education, and Welfare. Dental activities were also conducted or supported by four other departments of the Federal Government as well as by two independent agencies.

Although the national effort to improve dental health falls short of the need, we are particularly concerned with the lack of focus for this effort—particularly a focus for dental health activities directed toward children. In October of 1969, the executive council of the American Society of Dentistry for Children passed a resolution related to this problem:

> One of the major problems facing the dental profession is the fragmentation of funding and programming in the area of dental health by various agencies of the Federal Government. The Executive Council of ASDC urges the Department of Health, Education and Welfare to centralize administrative responsibilities for dental health activities to the maximum degree possible. The Counci also recognizes the leadership provided by the Division of Dental Health and sugguests that this unit appears to be a logical focus for many dental activities.

The establishment of a more clearly defined national policy toward dental health also will require a more critical evaluation of priorities. A year ago the executive council adopted the following statement which is relevant to the legislation under consideration:

> The seriousness of dental disease as a public health problem has been recognized and provisions for providing dental care through public funds have been included in a number of recent federal programs and by legislation under consideration by the Congress. The American Society of Dentistry for Children, and all members of the dental profession, are gratified at the belated recognition of the seriousness of a group of diseases that attack almost all members of the population periodically throughout life. Dental diseases cause untold Americans to suffer unnecessarily from pain, loss of the ability to speak and chew efficiently, and deterioration of appearance.
>
> The ASDC is concerned, however, that recent programs such as "Medicaid" and other legislative proposals which have been introduced or are being drafted fail to recognize the special nature of dental diseases or the enormity of the dental health problem.
>
> It is inconceivable that either the professional manpower or public funds could be made available overnight to solve the dental problems of the entire population which have been accumulating, in some instances, for as long as 50 years.
>
> The ASDC strongly urges that public dental care programs be designed on the basis of sound dental judgment and the special characteristics of the dental health problem:
>
> The first priority should be to emphasize prevention before treatment.
>
> The second priority would call for offering publicly funded dental care only to children, with emphasis on the youngest age groups first, until such time as the backlog of need in this segment of the population has been brought under control.
>
> As these children grew older, it would become feasible to offer care on a maintenance basis, since treatment would be needed only for new disease as it occurred.

The "Children's Dental Health Act of 1971" would represent a major step forward in solving some of the problems that have been of concern. First it would clearly place priority emphasis on preven-

tion. This month the commissioner of health of a major State characterized fluoridation as "one of the four great preventive health measures of our time" comparing it with the pasteurization of milk, purification of water, and immunization against disease.

As long as 25 years ago, there was a massive amount of evidence available on the universal safety of fluoridation and its consistent effectiveness in reducing the attack of dental caries. This preventive procedure has been approved by almost every health organization in the United States and many in other countries.

Despite these facts, about 13,000 communities containing 57 percent of the Nation's population do not have fluoridated water. These communities are predominately small areas where the cost of initiating and maintaining fluoridation has proved to be prohibitive in terms of the tax funds available to the community. This bill authorizes appropriations of $15 million to provide Federal funds to assist communities or schools to fluoridate their water supplies.

It should be pointed out that the provisions of the bill in no way intrude on the right of the individual communities or States to decide whether or not to adopt this preventive measure. It merely makes available badly needed financial assistance to those communities that wish to fluoridate their water supplies and are unable to do so without help.

Second, the bill would help us to get on with the business of seeing that children get the dental care they need in an organized, systematic fashion. Realistically this would be done by implementing a series of pilot projects to provide preventive, corrective, and followup care to children from low-income families and to other children who are unable, for other reasons beyond their control, to obtain proper care. It is estimated that 1.5 million children could be treated in the projects authorized by the bill.

One of the most crucial aspects of the pilot projects will be the opportunity to obtain experience and information about efficient and effective ways of bringing dental care to the large number of children who do not now receive dental service. This type of knowledge is badly needed and sadly lacking.

Another significant, and perhaps equally important, byproduct of the provisions authorizing the pilot dental care projects is that it will permit and encourage the involvement of dental and dental auxiliary students in these community preventive and care programs under proper professional supervision, of course.

Dental education still provides clinical training primarily in the facilities of the dental school itself, an unreal world that—at best—prepares the student to function in ways that were appropriate in the 1950's. To be prepared to meet community needs in this decade, the student must have the opportunity to get out into the field and observe the unmet dental needs and be able to participate in meeting these needs.

It has been obvious to the dental profession that the needs for treatment were great, but that any major effort to increase the availability of dental service may well overwhelm the available dental manpower resources. This bill attacks this problem realistically by authorizing a program to produce more than 27,000 auxiliaries within 5 years and by instituting a program to develop methods for making the dentist

captain of a health care team rather than an isolated provider of services.

There is clear evidence that this development is necessary and desirable if the dental profession is to be able to meet its responsibilities to bring dental health care to all segments of the population.

Even if there are enough dentists and dental auxiliaries, the unequal distribution of professional personnel is a difficult, nagging challenge that has defied solution. Even today, affluent areas of large cities are glutted with dentists, while urban areas of poverty and rural areas are frequently almost without professional resources. S. 1874 recognizes this serious problem and authorizes "* * * special projects related to investigation and demonstration of ways of providing incentives for developing or establishing dental facilities or services * * *" in areas of shortage.

Finally, this legislation would authorize these desirable programs and at the same time make a logical step toward the development of a more coherent national policy toward dental health.

Dental diseases are unique in their nature and therefore present unique problems in their resolution. The education of the dental student and the characteristics of dental practice, although superficially similar to those of medicine, have special characteristics because of the fact that dentists deal almost exclusively with chronic diseases that accumulate when neglected, must rely heavily on the use of prevention, and are not hospital based.

Improving the dental health of the American public will require some very specialized approaches because of the special nature of the problem and this bill will create a legislative framework to make this possible.

I have pointed out earlier that there are a wide variety of dental activities scattered throughout many agencies of the Federal Government. These programs are piecemeal and fragmented. Because they are usually only a small part of a larger activity dental health activities are usually the last to be initiated when funds are limited and the first to be cut when funds are reduced. This bill will put together legislative authorization for a significant package of activities to attack the problem of dental diseases. The ASDC strongly urges that the provisions of the bill be administered as a single program, preferably by the Division of Dental Health.

In closing, I would like to point out the urgency of legislation of this character. I hardly need remind members of this committee that national health insurance is one of the most critical public issues facing the Congress.

It seems clear to any informed observer that we probably will soon have a national approach to the financing, and perhaps the organization of health care. Any type of legislation adopted by the Congress which will mount a national effort toward bringing comprehensive health care to the entire public will create enormous strains on existing resources and programs.

The time to start preparing to meet these challenges is now. The Children's Dental Health Act of 1971 will not only help to meet the problems of today, but, more importantly, will make a start toward the challenges of the immediate future.

Senator KENNEDY. That is a very good statement.

I was wondering what methods are currently used to take dental care to rural areas? Do you know of any experimentation or pilot programs in Kentucky or in other States that are trying to take dental care to the rural communities?

Dr. YOUNG. The experimentation to my knowledge has been quite limited. This is one of the areas where we need a great deal of information.

Some State health departments have used dentists employed on a salary, using trailers equipped with dental equipment to provide care for the rural areas. But this does not provide continuity of care.

In general, the resources of State health departments have been so limited that it has been more like a drop in the bucket rather than comprehensive care. There have been some attempts by groups of dentists organized to use portable equipment.

Most of these attempts and developing new approaches were done before the expanded duties of the auxiliaries concept which was referred to in the earlier testimony.

I think one of the most critical problems that should be addressed in mounting these pilot projects is how a dentist with fully trained auxiliaries can be utilized in rural areas.

Senator KENNEDY. Don't you utilize some University of Kentucky students in the summertime?

Dr. YOUNG. Yes, we do. We have, I think, 85 of our students now in summer programs.

Senator KENNEDY. They are working in some of these rural communities?

Dr. YOUNG. Yes.

Senator KENNEDY. How is that program funded?

Dr. YOUNG. It is funded from a variety of sources. A very limited number of them, 10, are from a Public Health apprenticeship program. In some cases they are employed by the State health department. We have four students employed in the Job Corps center. We have had to patch together what little resources we could find. It is a very good experience for the students to see the need where it occurred and to see their responsibility to try to see that people get care who were not receiving it.

Senator KENNEDY. Do you find that more dental students and dentists are interested in these people in the last few years than before?

Dr. YOUNG. We have seen a very definite change in the attitude of dental students, much more concerned with people and getting care to people than just setting up their own practice.

Senator KENNEDY. That is obviously your experience in the University of Kentucky. Do you also find that true in other dental schools?

Dr. YOUNG. Yes.

Senator KENNEDY. I think we are certainly seeing more social awareness in medical schools; we see it in law schools; and even in business schools. It is really one of the most encouraging features in our country today, quite frankly. I am interested in the fact that it is applicable to the dental profession, as well.

Dr. YOUNG. Very much so, Senator.

Senator KENNEDY. There is no reason to think that it wouldn't be, but, it is reassuring to hear your comments.

You commented, and we have heard other testimony, on the ques-

tions of fluoridation. Although there is some disagreement, I personally feel that the balance is heavily weighted in favor of fluoridation. But what other preventive techniques or measures are useful in a preventive dental health program?

Dr. YOUNG. There are a number of other measures. I think the important thing, just to briefly say about fluoridation, is that it helps the child, regardless of whether the child is in a position to perform certain things or do certain things, or whether he has a parent who will take care of him.

In other words, the beautiful thing about fluoridation, it doesn't require the time of a dentist, it doesn't require the concern of a parent, which is frequently absent, unfortunately, in homes.

Over and above that, I think dentists are very much concerned and have been for many years in reducing the amount of free sugar in the diet. But again this requires a great deal of self-discipline on the part of the child and the parent and a very great resurgence in what we used to call toothbrushing. Now the technical term is "plaque control," the removal of a membrane covering of the teeth which results in both attack of dental caries and perodontal disease, and it certainly has very definite promise and hopefully would be included in these community programs as one of the preventive methods included.

Senator KENNEDY. Do you think there is enough in this bill to cover those? Does it provide enough flexibility to support these kinds of programs? Should we give more flexibility to the Secretary of HEW to support pilot programs and other kinds of research programs?

You referred to a comprehensive health program, of which, obviously, dental care would be a feature. In the Health Security Act, we have a resource development fund which, hopefully, would be utilized to develop dental care as well as other health areas.

I am just wondering if we shouldn't have in this legislation some resources provided for the Secretary to try and encourage experimentation in dental care delivery systems, and particularly the kinds of efforts which are creative and innovative in providing dental care in both urban and rural areas.

I don't know whether we have got the kinds of flexibility we need. No doubt there will be disagreement. Some people will say that you shouldn't give that kind of unrestricted authority to the Secretary, but perhaps we should in these specific areas. We support special impact, for example, under the special project grant authority of S. 934.

Should we have this kind of a feature in a dental program, too?

Dr. YOUNG. Let me answer that question in two ways: First, by supporting very much your comments of the need for imagination and experimentation. Second, my interpretation of the bill is that the authorization is adequate and I would hope that it would be administered in such a way that we would learn these kinds of questions.

Senator KENNEDY. Do you think it is already sufficiently flexible?

Dr. YOUNG. I believe so.

Senator KENNEDY. Section 1001, on page 2, line 16, says that any such project shall include comprehensive corrective, followup preventive services, including dental health, education, and treatment as may be required by the regulations.

We might try to express in the committee report the kind of things we are attempting to do.

I want to thank you very much, Doctor, for your appearance here. This is extremely important legislation.

My parents cared a great deal about the the care of my teeth and of all my brothers and sisters. I remember well the times when I was marched down to the dentist's office and the hours I spent there, with the bands, the fillings, et cetera.

I want to thank you very much for your appearance and for the others who have taken the time to come here. This isn't the most convenient time. All of you have inconvenienced yourselves to be with us and we are very much appreciative.

At this point we receive for the record a statement by Senator Metcalf.

STATEMENT BY HON. LEE METCALF, A U.S. SENATOR FROM THE STATE OF MONTANA

Senator METCALF. Mr. Chairman, as a cosponsor of S. 1874, the Dental Health Act, I would like to submit the following statement in support of the bill.

Last year Dr. A. Jack Terrill, the director of the Dental Division of Montana's Health Department and chairman of the Montana Dental Association's Legislative Committee, wrote a series of comprehensive reports on the conditions of dental health in Montana. After visits to dozens of Montana's primary and secondary schools, Dr. Terrill was appalled by the extent of dental health problems and convinced of the need to remedy the situation. He reported that 30 percent of the youngsters in some schools "should have been in a dentist's chair yesterday."

Prompted by Dr. Terrill's findings, Senator Mansfield and I made some investigative efforts of our own. We were astounded to learn that 1 of 10 Americans has lost his natural teeth, that the typical child suffers decay in one-third of his teeth by age 15, and that nearly 70 percent of children whose parents earn less than $4,000 a year do not receive any dental service.

We were further chagrined to learn that the dental assistance programs now in existence do not adequately speak to the needs of the poor and underprivileged child. While the Department of Health, Education, and Welfare invests around $200 million per year in dental health care programs, there appears to be little coordination or professional policy direction. Moreover, while about half of the money spent for adult dental programs, practically no money is spent to provide decay preventive services to children. If dental damage is preventable, then HEW's pattern of expenditures is certainly a reversal of necessary priorities.

In Dr. Terrill's behalf we examined other possible sources of public funds for child dental health care programs. Dr. Terrill had suggested setting up an emergency fund in the schools. We informed him of funds made available to school districts under the Elementary and Secondary Education Act, the distribution of which is based on the number of low-income families in the district. These funds could be used for dental care, but then other educational needs would have to go unfilled.

Our last effort was trying to appropriate money under a section of the Social Security Act which authorizes a pilot dental program for children. The appropriations bill which came out of this committee last year contained $200,000 for this purpose, but the President saw fit to veto it. Thus, youngsters in Montana and elsewhere continue to be deprived of the dental care they so desperately need.

Let me relate briefly another experience in Montana which I believe illustrates the worthiness of this bill. The largest group of low-income people in Montana are the members of Indian tribes on reservations—nearly 50 percent of whose families earn less than $4,000 a year.

Their need for dental services is shown by an event which took place in the early part of 1969.

A program had been established under the Indian Health Service to provide dental services to Indians. Yet, the program lacked sufficient personnel and equipment to adequately care for the preschool and school-age childrn. Therefore, the Montana Department of Indian Affairs asked my office to investigate the possibility of obtaining from the Defense Department, unused dental equipment at the then just recently closed Glasgow Air Force Base. In the end, we were not able to secure the equipment because of possible air base activity. The needs of the Indians remained.

But in corresponding with the Indian Health Service, the Montana Department of Indian Affairs, the Indian Intertribal Council, and others involved, I became aware of the acute dental health problems Montana Indians face. A resolution sent to me on January 23, 1969, from the Business Committee of the Chippewa Cree Tribe of the Rocky Boys Reservation, describes the dimensions of dental health inadequacies and I ask that the resolution be inserted in the record at this point. Secondly, I was impressed, as one must be, by the resourcefulness of these people in trying to improve their own dental health services. This resourcefulness manifests a potential responsiveness to programs, such as the one we hope to enact, which provide the means for people eo improve their dental services. Two years ago, the will to better dental health conditions existed among Montana Indians, we were simply not able to supply them with the means. This is encouraging to us, who as legislators, are inclined to doubt at times that programs we propose will be well received once they become operational, for we realize that a "will" or "intent" on the part of the recipient is essential. Montana Indians are a group of people who have shown themselves to be aware of their needs, in search of potential solutions, and therefore, I think, responsive to actual solutions once they are enacted.

Let me close by saying, that I fully support S. 1874. It will provide a start for a comprehensive program with proper administration and coordination, to deal with a problem we have neglected for too long—the conditions of dental health among underprivileged children.

(The resolution submitted follows:)

RESOLUTION

Whereas, Dental diseases are nearly universal among Indian people in the Billings Area. Dental caries experience is high. Periodental disease is common among adults. Among Indian people, limited knowledge and appreciation of oral hygiene practices, diet selection, and need for early treatment of dental condi-

tions contribute to the frequency and severity of dental disease and their sequelae—pain, infection, and the loss of teeth. The program is providing a dental examination for 49.7 percent of the Indian people within the scope of the program. Of the 11,128 children (3–19 years of age) examined, only 4.837 (or 4.34 percent) received complete dental care in Fiscal year 1968. Of the 10,400 adult population (20 years of age and older) only 2,067 (or 19.8 percent) received an examination. Of the number of adults, only 142 (or 6.8 percent) were completed.

Whereas, The Montana Inter-Trial Policy Board is aware of the need for medical and dental services beyond the present capacity of the staffs and facilities of the Indian Health Service, and is concerned with improving health services for Indian people, and

Whereas, The Indian Health Service is charged with the responsibility of providing medical and dental services for all Montana Indian reservations, but is unable to meet all the needs of the Indian people because of limited staff and equipment, and

Whereas, The Department of Defense has available at the recently closed Air Force Base, Glasgow, Montana, medical and dental equipment and supplies not now being used, and

Therefore be it resolved, That the Montana Congressional Delegation by the Montana Inter-Tribal Policy Board in session in Helena, December 23, 1968, take appropriate action to obtain from the Department of Defense the medical and dental equipment available at the Glasgow Air Force Base for use by the Indian Health Service to help meet the dental and medical needs of Montanan Indians.

Approved at a regular meeting held January 6th, 1969 by the Business Committee of the Chippewa Cree Tribe of the Rocky Boy's Reservation.

JOE DEWOUTINEY,
Chairman, Business Committee.
JOSEPH D. ROSETTE,
Secretary, Business Committee.

Senator KENNEDY. At this point I order printed all statements of those who could not attend and other pertinent material submitted for the record.

(The material referred to follows:)

AMERICAN DENTAL ASSOCIATION

WASHINGTON OFFICE • SUITE 1004 / 1101–17TH STREET, N.W. • WASHINGTON, D.C. 20036 / Phone: 833-3036

July 22, 1971

Senator Edward M. Kennedy
Chairman, Subcommittee on Health
Committee on Labor and Public Welfare
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

In accordance with your recent request, I am enclosing comments on the questions submitted to us subsequent to the July 12 hearings on S. 1874, the Children's Dental Health Act of 1971.

Please have your office get in touch with us if there is anything further we should do.

Sincerely,

Hal M. Christensen
Director
Washington Office

HMC:aw

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QUESTIONS SUBMITTED BY SENATOR EDWARD M. KENNEDY TO HAL M. CHRISTENSEN, AMERICAN DENTAL ASSOCIATION, WITH RESPONSES

Does dental disease have characteristics sufficiently different from other medical problems to justify a federally supported "crash" program?

Dental disease, as it actually exists in this country, presents a combination of factors that make it nearly unique. Paramount among these factors are: 1) The incidence of the disease; 2) the nature of the disease, and 3) the demonstrated potential the nation possesses for readily eliminating many manifestations of it.

Incidence

Dental disease is all but universal. Its most common manifestations, tooth decay and gum disease, afflict nearly every human being to one degree or another.

In the case of most other diseases, by contrast, the rate of incidence is generally stated on a percentage basis. For example, about 25 per cent of American adults have either definite or suspected heart disease. Thus, about 75 per cent don't. Or, about 9 per cent of Americans are afflicted with arthritis severe enough to require medical care, which means that about 91 per cent aren't so afflicted. Or, about 1 out of every 200 Americans have Parkinsonism, which means about 199 out of 200 don't.

What is of significance here, of course, is not the seriousness of a given disease. Obviously, heart disease is more serious than tooth decay and severe arthritis is generally more critical than is periodontitis.

The fact, however, that relatively small percentages of people suffer from these ailments, while everyone suffers from dental disease, makes the latter a different sort of problem and one that needs a different sort of approach.

It is not, so to speak, John Doe's two decayed teeth that deserve national attention. It is the fact that we are all John Doe that makes the problem worthy of special attention.

In addition, there are some less common manifestations of oral disease that are life-threatening or that so seriously limit a person's ability to live a normal life. Oral cancer, for example kills some 7,000 people each year. Cleft lip and/or palate is a birth anomaly that afflicts some 6,500 babies born

annually. It constitutes 13 per cent of all reported birth anomalies and can have a seriously unfavorable impact on general health as well as the emotional and psychological development of the child.

Nature of the Disease

There are some diseases known to man in which the bodily processes themselves help to restore health. In such cases, the body assists in the healing process and/or provides a compensatory mechanism that helps restore the lost function.

This is not true with respect to dental caries or periodontal disease, the two most common manifestations of oral disease. These are progressive and require the intervention of treatment by a skilled practitioner. Without such intervention, the progression is remorseless until the affected tissue is totally destroyed. Most dental diseases, in this respect, are like forms of cancer.

Potential for Prevention

Just as dental disease is perhaps the most universal ailment of man, it is also perhaps the most preventable. Further, many of the known preventive tools have been available for literally years. Among the most basic tools is regular attention by a practitioner, attention that comes early enough in life that it can focus on maintaining health rather than repairing disease.

It is in this regard that dental auxiliaries hold such high promise, if we can manage to train sufficient numbers of them. The hygienist and assistant in dentistry can constitute a vanguard in delivering many kinds of preventive service on a large-scale basis. In that sense, they have a special kind of potential usefullness in dental care that their counterparts in other health care fields do not always possess.

The combination of these three factors -- universality of the disease, the immense amounts of money (in excess of $4 billion a year) now being spent to combat its ravages, and the amount of possessed knowledge on how to proceed to better control of the disease -- tend to an objective conclusion that dental disease could amply justify special attention.

Such a program, it could also be said, would hardly inflate the percentage of federal health funds going to dental programs beyond comparative distribution in the private sector. The

fact is that public sector attention to dental disease has traditionally been lacking. About 9 per cent of the private sector health dollar is devoted to dental care; the federal health care dollar spends barely 3 per cent for the same purposes. The almost total failure to fund Title V dental care projects is another example of public sector neglect of dental disease.

Passage of S. 1874, in fact, would not constitute a "crash" program for dental care so much as it would represent a balancing of the federal health dollar in a way that for the first time, begins to give dental disease attention that is reasonably proportionate to its rate of incidence and the fiscal and physical costs it exacts from all Americans.

What portion of Medicaid dental services are currently performed on the 0-12 age group?

Administrators of the Medicaid program have not been able to measure the percentage of dental care funds that goes to care of children. The difficulty, in part, is that Medicaid dental care funds of all types are a very small percent of total Medicaid spending. Dental care funds were 5.4 per cent of the total in fiscal 1968; 4.8 per cent in fiscal 1969 and an estimated 3.5 per cent in fiscal 1970.

There are, however, some studies available that yield data on the general question of dental care funds spent on the young.

One such study[1] reports on all types of public and private dental care spending by three age categories, the first of which is 0-19 years of age. This study shows the following:

Estimated Personal Health Care Expenditures by Type of Expenditure, Source of Funds and Age Group

Total Public Funds for Dental Care	Amount Spent on Those 0-19 Years	% of Total Spent on Those 0-19 Years
	Fiscal 1967	
$81 million	$32 million	39.5%
	Fiscal 1968	
$203 million	$87 million	42.7%
	Fiscal 1969	
$234 million	$111 million	47.4%
	Fiscal 1970	
$241 million	$109 million	45.2%

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[1] Medical Care Outlays for Three Age Groups: Young, Intermediate and Aged, by Barbara S. Cooper and Mary F. McGee, Division of Health Insurance Studies, Office of Research and Statistics, Social Security Administration, Social Security Bulletin, Volume 34, Number 5, May, 1971, pps. 3-14, Table 1

Another study, not yet published, was carried out with the aid of a Public Health Service grant by the University of Chicago in consultation with the American Dental Association. This measured private sector spending on dental care and attempted to gauge the percentage of that total that was spent on those 2-12 years of age. The study indicates that about 15 per cent of the total in any recent year was spent for care of children of those ages. Extrapolations based on that estimate would give the following dollar figures:

Fiscal Year	Total Private Sector Dental Care Expenditures	Estimated Amount Spent on Those 2-12 Years
1967	$3.07 billion	$460 million
1968	$3.29 billion	$493 million
1969	$3.58 billion	$537 million
1970	$3.91 billion	$586 million

There are an estimated 6 million children in this nation aged 0-19 who are eligible for public assistance programs. It is the American Dental Association's judgment that reasonably comprehensive dental care of such a child would cost about $55 per year. This would mean an expenditure, within public assistance, of some $330 million per year.

Is legislation like S. 1874 needed to help prepare the dental profession to carry out the dental provisions that are proposed in several of the national health care plans?

The American Dental Association believes that experience with programs such as those proposed by S. 1874 is absolutely essential if the profession is to be able to develop a substantial national dental care program.

The United States is not today in a position to substantially expand dental care services without first taking a number of preliminary steps.

Among the reasons for this are: 1) shortages of both dentists and dental auxiliaries; 2) insufficient concentration on preventive dental care, especially for children; 3) under-utilization of known public health measures like fluoridation that reduce the incidence of dental disease; and 4) insufficient experience with varying methods of organizing, administering and financing dental care services on a large scale.

The programs proposed in S. 1874 would do much to fill the gaps that exist in all four of these areas.

Section 1001 of the bill would allow us to experiment with various methods by which dental care can be delivered to large groups of children in such differing settings as the suburbs, rural areas, and inner cities. We do not now have such experience. This section, as well, would provide a lever for us to begin to shift services from mostly reparative treatment to preventive care.

Section 1002, by making fluoridation available to many more millions of people, would greatly reduce the incidence of tooth decay and, thus slow the growth of the dental disease backlog.

Section 1003 would enable us to train as many as 30,000 more dental auxiliaries by 1980 than we could otherwise hope to have. Expanded use of auxiliaries is, of course, one of the keys to increasing the productivity of our dentists.

Section 1004 would take action closely tied to Section 1003 by teaching both dental students and practicing dentists how to best use available dental auxiliary talent.

Allied health legislation provides support to some schools of auxiliary dental professions. If a trend curve can be established, how long will it take to produce adequate dental auxiliary manpower if the schools must rely only on present sources of Federal funds to supplement their non-Federal resources?

The indications are that the schools could not produce adequate dental auxiliary manpower in the foreseeable future with present sources of Federal funding.

The following tables take into account actual levels of federal support in recent years, as well as non-federal support. They indicate the massive deficits expected by 1980 under the current circumstances.

III. Graduation Increases Necessary to Meet Future Need

Present Ratios: 100 dentists to every 17 hygienists and 101 assistants
Desired Ratios: 100 dentists to every 40 hygienists and 200 assistants

1.	Hygienists	
	a. Hygienists needed by 1980	56,000
	b. Current hygienists expected to be still active in 1980	8,000
	c. Number of hygienists who must be graduated in next ten years	48,000
	d. Expectable graduates based on current rates	23,000
	e. Deficit of Hygienists by 1980	25,000
2.	Assistants	
	a. Assistants needed by 1980	220,000
	b. Current assistants expected to be still active in 1980	55,000
	c. Number of assistants who must be graduated in next ten years	165,000
	d. Expectable graduates based on current rates	28,000
	e. Deficit in Assistants by 1980	137,000
3.	Technicians	
	a. Technicians needed by 1980	50,000
	b. Current technicians expected to be still active in 1980	21,500
	c. Number of technicians who must be graduated in next ten years	28,500
	d. Expectable graduates based on current rates	5,000
	e. Deficit in Technicians by 1980	23,500

S. 1874 would make possible a significant reduction in these deficits. It is anticipated that with full funding S. 1874 would allow for the training of slightly more than 30,000 additional auxiliaries of all types by 1980. This could mean, as an example, an additional 9,000 hygienists, 17,000 assistants, and 3,500 technicians.

At the same time, new research findings, the development of better dental materials, and a genuine shift from reparative to preventive care are also expected to further ease the situation by increasing the productivity of dental manpower.

What has been the impact of Section 510, Title V of the Social Security Act on the dental care delivery problems of this country?

Section 510 has had no appreciable impact-- either in terms of (1) providing care for a significant number of children or (2) providing information needed for the development of an efficient dental program for children. Since fiscal 1972 is the final year of the project, it is reasonably safe to say that there is no hope of it's having any impact.

The major reason for the program's failure is insufficient funding. In fiscal year 1968,1969, and 1970, no money was appropriated for it. In fiscal 1971, it received $500,000. For fiscal 1972, some $860,000 is being requested.

The most optimistic projection indicates that the program will expire after having established 11 projects serving a total of 15,000 children.

It is impossible for a two-year program involving 11 projects and 15,000 children to realize the objectives slated for it: to mount a sufficient number of varied projects, each involving a sizeable group of children, in order to emulate the differing conditions under which dental care would have to be delivered to all the nation's children.

Section 1001 of S. 1874, on the other hand, would provide the amount of time, level of money and degree of flexibility needed to give us solid information about the most efficient, economical and professionally effective ways of caring for the dental needs of all children, whether they live in suburban, inner-city or rural areas. In addition, of course, S. 1874 would extend care to some 1.5 million poor children not now receiving care.

What evidence is there that the grant authorized under Section 1004 would have a significant impact on the delivery of dental care?

Section 1004 would provide funds for, among other purposes, teaching dentists how to work most effectively with auxiliaries. The most pertinent studies of potential impact, perhaps, are those estimating the percentage of increase in productivity a dentist experiences as he adds auxiliaries to his staff.

The most recent of such studies indicates that a dentist going from 0 to 1 auxiliary increases his office's productivity by 55.7 per cent; a dentist going from 1 to 2 auxiliaries increases productivity by 44.2 per cent; a dentist going from 2 to 3 auxiliaries increases productivity by 25 per cent, and a dentist going from 3 to 4 or more auxiliaries increases productivity by 21.9 per cent.

The same study indicates that if a dentist went from 0 to 4 or more auxiliaries he would increase his office's productivity by more than 225 per cent. There are presently 15,000 dentists in private practice who use no auxiliaries.

To realize such increases, of course, requires at least two things. One is a sufficient supply of auxiliaries, something Section 1003 would help accomplish. The second is that auxiliaries and dentists learn how best to work as a team. This is the purpose of Section 1004.

In what ways does S. 1874 complement or supplement the Health Professions Education Assistance Act of 1971 currently being considered by Congress?

Both S. 1874 and the health manpower legislation are, of course, designed to provide better health care to Americans, a similarity in goals that is shared with a number of other health laws and proposals.

Two sections of S. 1874, in particular, possess a significant and exciting potential for supplementing and helping to fulfill some of the provisions of the current health manpower legislation. These are Section 1003, concerned with training of dental auxiliaries, and Section 1004, directed toward teaching dentists and dental students how best to work with auxiliary talent.

These two sections are particularly relevant to some aspects of the proposed amendments in S. 934 to Section 722 of the Public Health Service Act. The proposed amendments would create special grants for 10 specified purposes, three of which relate to the goals of Sections 1003 and 1004 of S. 1874.

There are, as well, some proposals in H.R. 8629, especially in Sections 105 and 107 of the bill, that could be similarly helped by enactment of S. 1874.

The health manpower legislation sections in question, of course, are educationally oriented within the framework of the bill in which they are located. In some cases, the project grant money they would make available would go only to health professions schools. The purposes in these sections that relate to S. 1874 are only a part of the over-all purposes outlined in those sections of the health manpower legislation. Finally, the available funds would be shared among competing grants from some 275 health schools as well as a number of other educational and health agencies.

It is for these reasons that passage of S. 1874 is essential to supplement these aspects of the health manpower legislation and bring their intended objectives to full fruition.

As noted in answers to other questions, the massive incidence of dental disease in this country exacts a hugh fiscal cost in addition to its consequences in terms of individual health. The preventive care programs needed to reverse this continuing

situation depend heavily upon producing as massive a number of well-trained auxiliaries as obtainable in as short a time as possible and at the same time, mount extensive programs to teach dentists how to make use of these auxiliaries.

The sections in question that are part of the health manpower legislation cannot, of themselves, possibly make significant strides in this direction for the reasons outlined. Coupled with Sections 1003 and 1004 of S. 1874, however, the combined effect could be most useful.

It is the unique potential for auxiliary use in dental care and the massive fiscal and physical effects of dental disease that make today the time for determined action on a reasonably broad scale to begin the long-delayed, long-postponed national campaign against dental disease.

Why do the grants for treatment of water supplies, authorized under Section 1002, decrease after the fourth year of the program?

The nation today spends well in excess of $4 billion a year in dental care. The philosophy embodied in all sections of S. 1874 -- a philosophy shared by the dental profession is that some relatively modest shifts in the way in which that money is spent could achieve substantial benefits with respect to oral health. It could achieve a more efficient and purposeful use of this money.

Section 1002 is a particularly good case in point. The first four years of the section will provide sufficient time to do three essential things: 1) assist communities of schools now wishing to fluoridate; 2) give notice of such potential assistance to other communities or schools, and 3) accrue sufficient experience with this approach to know how fruitful it is.

Section 1002 has a sufficient authorization to assist as many as 7,000 communities with a potential total population as high as 45 million. Extension of fluoridation to this point would mean a nearly 50 per cent increase in the number of Americans having the benefits of fluoridation available to them. It could increase the total number of Americans thus benefiting from about 92 million to almost 140 million.

After the first four years of the program, we believe a meaningful evaluation of the experience can be undertaken, something that can be done while the section still has one year of life.

This evaluation may show that an extension of this approach is desirable, that modifications should be made or that there is no further need for action of this sort.

This section, it should also be noted, authorizes a total of $15 million. This can be contrasted with the approximately $2 billion now spent annually by Americans for repair of tooth decay. A number of documented studies of fluoridation show reductions in tooth decay as high as 65 per cent.

What prominent national and international organizations endorse the fluoridation of water as being a safe or effective measure for reducing the incidence of dental decay?

American Academy of Pediatrics
American Association for the Advancement of Science
American Association of Dental Schools
American Association of Industrial Dentists
American Association of Public Health Dentists
American College of Dentists
American Commission on Community Health Services
American Dental Association
American Dental Health Society
American Dental Hygienists Association
American Federation of Labor and Congress of Industrial Organizations
American Heart Association
American Hospital Association
American Institute of Nutrition
American Legion
American Medical Association
American Nurses Association
American Osteopathic Association
American Pharmaceutical Association
American Public Health Association
American Public Welfare Association
American School Health Association
American Society of Dentistry for Children
American Veterinary Medical Association
American Water Works Association
Association of Public Health Veterinarians
Association of State and Territorial Health Officers
Canadian Dental Association
Canadian Medical Association
College of American Pathologists
Federation of American Societies for Experimental Biology
Federation Dentaire Internationale
Great Britain Ministry of Health
Health League of Canada
Inter-Association Committee on Health
National Congress of Parents and Teachers
National Education Association
National Institute of Municipal Law Officers
National Research Council
Office of Civil Denfense
Pan American Health Organization
U.S. Department of Agriculture
U.S. Department of Defense
U.S. Department of Health, Education and Welfare
World Health Organization

STATEMENT

OF

THE AMERICAN ACADEMY OF PEDIATRICS

CHILDREN'S DENTAL HEALTH ACT (S. 1874)

The most common physical defect found in school-age children and youth is dental decay. Nearly all children experience dental decay in some degree during their school years, much of this decay is preventable by the use of methods and procedures currently available.[1] Despite the great prevalence of dental disease, Federal programs have given little priority to dental care.

Although dental disease is nearly universal in children, one quarter of all children between ages five and fourteen have never seen a dentist. By two years of age, half of all children have decayed teeth. The average child on entering school has three decayed teeth and by age fifteen has eleven teeth decayed, missing or filled.

Poverty intensifies dental neglect. Children from low income families have five times as many untreated decayed teeth as the average child. Among the underprivileged, ninety-seven out of one hundred dental cavities go unchecked. When underprivileged children do visit the dentist, extractions are six times as frequent as in the average child.

Utilization of dentists' services is related to family income, educational level of the parents, availability of service, the effectiveness of health education and the degree to which a dental program has been organized. Family income, though perhaps not the principal reason why more children do not receive dental care, is an important factor. Seventy-five percent of children in families with annual incomes under $2,000 and 66% of those in families with incomes under $4,000 have never been to a dentist, compared to 40% of children in families with incomes of $4,000 or more. Organized programs can increase utilization of dental services by removing or reducing financial barriers.

The Special Projects for the Health of School and Preschool Children (C & Y) authorized through Section 509 of the Social Security Act do provide dental health services to some children as part of their comprehensive health services. The value therein and the benefit to be accrued from the Children's Dental Health Act are reflected in the C & Y Project data which indicates that at recall examinations for dental services, there is a decrease of over 50% in the number of dental caries. The number of children receiving the benefit of these dental services must be increased so that the quality of life for all children will be improved.

The Social Security Act authorizes a program of special project grants to promote the dental health of children, Section 510. The failure to give adequate attention to dental health needs of children is reflected in the failure to fund these programs during 1969 and 1970. In fiscal year 1971 $500,000 was made available to initiate projects to provide comprehensive dental care which reached an estimated ten thousand children. Fiscal year 1972 request for appropriation is $860,000 to increase the number of children served to approximately fifteen thousand, despite the fact that well over ten million children might benefit from these services. The fiscal year 1972 appropriation request will increase from seven to eleven the number of special dental projects for children throughout the nation. Since Section 510 authority expires this fiscal year, the Children's Dental Health Act will provide new initiative for the prevention of dental disease, early treatment and routine supervision, and new opportunity for education of the public toward preventive dental health. These efforts will help assure that all children will receive needed dental attention.

The Children's Dental Health Act of 1971 should provide that projects for the dental care of children be coordinated with other child health programs so that comprehensive care is available for all low income children. Children and Youth Projects, Neighborhood Health Centers, and other programs providing health care to children might be used as a locus for dental care projects funded through

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this proposed new authority. The establishment of a new authority for the dental care of children will afford better focus on unmet dental needs, and facilitate efforts toward providing preventive services, early detection and treatment for preschool and school-age children.

A comprehensive dental care program for children should be expanded on a systematic basis to include additional age groups as rapidly as experience and resources permit. S. 1874 provides that a priority be placed upon funding projects which provide dental care and services to preschool children and those in the first five grades of school. Children already in the program should be retained in it as the program expands. A program initiated for the preschool age group and eventually expanded throughout all the school years, will assure routine supervision and maintenance. Studies indicate that such an approach is most effective in saving the dentition and reducing the annual cost of treating children.

WATER TREATMENT PROGRAMS

Effective techniques are available for the prevention of dental diseases. Appended to this statement are several reports of the American Academy of Pediatrics supporting the fluoridation of the communal water supply.

The Children's Dental Health Act provides that communities wishing to fluoridate their water supplies might receive Federal funds. This approach is consistent with the recommendations of the Academy, for in its Report on the Delivery of Health Care to Children to be published later this year the Academy recommends: "Federal and state support should be given to all communities for fluoridation, possibly in the form of a subsidy for the purchase of equipment and supplies and the employment of personnel for the fluoridation program."

A great cost-benefit ratio will accrue from the fluoridation of water for it has been reported that each dollar invested will yield forty dollars of benefit. It has been projected that the expenditure of $100,000 toward fluoridation will prevent 666,666 cavities.[2]

The November 1970 Bulletin of Pediatric Practice summarized the major recommendations contained in the forthcoming Report on the Delivery of Health Care to Children under preparation by the Academy since October 1967. The Academy's major recommendation in regard to dental care programs contained in the Bulletin reads:

> "Dental Care Programs: This section of the Report emphasizes the generally recognized fact that very large numbers of children in the United States are not presently receiving adequate preventive and corrective dental care. Therefore, WE RECOMMEND THAT
>
> 11. (a) There be provided improved education of the public and the health professions, with special emphasis on young children, stressing the importance of preventive and corrective dental care embracing, first, the use of fluoride in community drinking water; second, greater attention to the teeth during the examination of children; third, the value of regular visits to the dentist, and fourth, other prophylactic measures to prevent dental decay. (b) The more general acceptance of the concept that dental services are an integral part of child health care, and that a higher degree of cooperation be achieved between dentists and other members of the health professions.

TRAINING OF AUXILIARY DENTAL PERSONNEL

The White Paper prepared by the Department of Health, Education and Welfare outlining the Administration's comprehensive health strategy indicates that the productivity of the dentist can more than double through the proper utilization of

all the skills of the dental team. The training and utilization of auxiliary personnel is a crucial factor in moving toward meeting the dental health needs of this nation, for we know there are not enough dentists to take care of all the dental problems of our population today. Projections by the United States Bureau of Census indicate that the preschool population, now about 24.5 million, will increase by 1985 by almost 50%, or by twelve million additional children. The school age population of 49.5 million (25% of the total population) will increase by almost 30% or by thirteen million additional children. The total number of children under nineteen years of age will increase from seventy-four million to about ninety-eight million. The Children's Dental Health Act of 1971 will help assure that auxiliary dental personnel will be made available to meet the increased demands for dental services which will be a result of the increased population, the higher education level of parents, and the reduction of financial barriers to the receipt of dental care also made available through this Act.

During fiscal year 1970 there were one hundred schools accredited for the training of dental assistants. Only seventeen institutions received Federal financial support for the training of dental assistants. Dental hygienists are trained in eighty accredited institutions throughout the country and during fiscal year 1970 only fifty-one such institutions received Federal financial support for the training of dental hygienists. The enactment of the Children's Dental Health Act of 1971 will help assure more meaningful efforts in manpower training so that the productivity of the dentist might indeed be more than doubled.

CONCLUSION

During recent testimony before the House Appropriations Subcommittee on Labor-HEW, the Academy testified in support of increased funding for Maternal and Child Health Programs. The Academy representatives were accompanied by several patients who are receiving medical care through the Children and Youth Project located at

Children's Hospital in the District of Columbia. These individuals participated in the Academy's presentation to help emphasize that in our discussions of programs and funding we must not lose sight of a most important fact -- that we are talking about people, and improving the quality of their life.

In conclusion, it is hoped that the members of Congress might bear in mind during the forthcoming deliberations this vignette which portrays the meaning and value of comprehensive dental care for children. A young boy in Appalachia, after extensive dental treatment, returned to the dentist for a follow-up visit and exclaimed, "Gee Doc, I thought teeth were always suppose to hurt but you made mine all better."

1. Report of the Committee on School Health, American Academy of Pediatrics, 1966
2. Per Dr. Charles W. Gish, Indiana State Board of Health, "Portfolio for a Pilot Dental Health Program for Children," State Secretaries Management Conference, June 1969

Resolution Adopted at the Annual Meeting of
the American Academy of Pediatrics, October 1953

Whereas, No harmful effects of water containing one part in a million of fluoride have ever been demonstrated, and

Whereas, The addition of up to one part in a million of fluoride to communal water supply has decreased dental caries in children from fifty-five to sixty-five percent, and

Whereas, The American Medical Association, the American Dental Association, the United States Public Health Service and the National Research Council have all gone on record as recommending the fluoridation of communal water supplies, be it therefore

RESOLVED, That the American Academy of Pediatrics in annual session approve the addition of up to approximately one part in a million of fluoride to communal water supplies in order to reduce dental caries in the children of our nation.

REPORT OF THE JOINT COMMITTEE OF THE AMERICAN ACADEMY OF PEDIATRICS AND THE AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

DENTAL CARIES AND A CONSIDERATION OF THE ROLE OF DIET IN PREVENTION

THE FOUNDATION for dental health is established early in life. The greatest single cause of dental disease is caries which, in turn, is largely a disease of the first two decades of life. The deciduous teeth are no less susceptible than the permanent ones, and disease in them is not without serious consequence for the permanent dentition. Since those physicians caring for children should be informed of current knowledge concerning the relation between diet and caries prevention, representatives of the American Academy of Pediatrics and the American Society of Dentistry for Children met to prepare a joint statement on this problem. The report which follows represents a summary of the position taken by this Committee.

This report has been reviewed by the Committee on Nutrition of the American Academy of Pediatrics; it has endorsed those portions which relate specifically to nutrition. The dental aspects, particularly the pathogenesis of caries, are the responsibility of dentists. Since there is significant difference of opinion on these problems, even among experimental pathologists in dentistry, the burden of responsibility must be borne by those assisting in the preparation of this report.

Anyone interested in a broad survey on the pathogenesis of dental caries may find a comprehensive statement in a publication of the National Research Council, *Control of Tooth Decay*, from the Committee on Dental Health, Food and Nutrition Board (N. R. C., Washington, D.C., 1953).

Dental caries is a disease of the calcified tissues of the teeth. It is generally believed to be caused by acids resulting from anaerobic glycolysis by microorganisms, is characterized by decalcification of the inorganic portion, and is accompanied or followed by disintegration of the organic substance of the tooth. The lesions tend to occur in particular regions of the teeth, i.e., the occlusal fissures of the molar teeth, the contact areas between adjacent teeth, and, in cases of rampant caries, the cervical areas near the gingiva. These are areas which are not self-cleansing.

Lactic acid, which has been demonstrated in areas of initial caries activity (Fancher *et al.*,[1] Muntz,[2]) and advanced caries (Armstrong *et al.*,[3] Miller,[4]) is the principal acid involved in the caries process.[5] It is derived from bacterial action upon a carbohydrate substrate. Any microorganism, or combination of microorganisms, capable of producing an acidity of about pH 5, which is sufficient to decalcify enamel, can initiate dental decay.[6] The time that the acid must be in contact with the tooth in order to produce decalcification is not precisely known, but from in-vitro studies of adult teeth, may be as short as 10 to 15 minutes.

Whether or not the acid formed will decalcify the enamel of a tooth is dependent on the concentration of the acid, its protection against dilution, and its duration of contact with the tooth.

There are natural factors in the mouth which contribute to the dissipation of acids formed on the tooth surface, such as the amount of saliva and the buffering capacity of the saliva.[7] Specific inhibitory factors may play a part.

Of course, variations in the inherent re-

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sistance of the teeth to destruction are important in determining the onset of caries.

FACTORS DETERMINING CARIES FORMATION

Certain conditions are essential for development of dental caries: 1) a caries-susceptible individual or teeth; 2) the presence of acid-producing bacteria which are capable of producing a sufficient concentration of decalcifying acids; 3) the presence of a substrate of orally fermentable carbohydrate; 4) bacterial plaque or accumulations which will concentrate the action of acid at caries-susceptible areas of the teeth.

Most individuals are caries susceptible; less than 5% of the population is immune. Animal studies indicate that caries immunity and susceptibility may be partly a matter of heredity.[8] Klein and associates[9] suggest the same possibilities in humans, but changes in caries activity in a single generation seen in Esquimaux and Maoris following changes in dietary habits indicate that heredity is only a minor factor. Caries activity is greatest during early childhood and adolescence and tends to taper off after maturity is reached. This is believed to be the result of a decreasing susceptibility of individual teeth with increasing exposure in the mouth.

The bacteria necessary for producing acid are always present in the mouth (Miller *et al.*[10]) and in dental plaques. Many microorganisms have been found capable of producing the pH necessary for decalcification of enamel, including: lactobacilli, aciduric streptococci, diphtheroids, leptotrichia, actinomyces, fusiform bacilli, staphylococci and certain strains of sarcina. The lactobacilli have frequently been shown to have a numerical correlation with caries experience.[11]

The substrate necessary for bacteria to produce acid is an important variable in caries attack rate. Fosdick and Burrill[12] pointed out in 1943 that the only available substrates from which acids can be formed in the mouth are the carbohydrates and that easily fermentable carbohydrates, such as sucrose and glucose, are the ones most likely to be quickly converted to decalcifying acids under conditions existing in the mouth.

The importance of the bacterial plaque in the development of caries was pointed out in the early 1890's.[13, 14] Williams,[13] in a study of 400 subjects, found that caries invariably occurred under a felt-like mass of microorganisms in which he postulated the necessary acid had to be formed. Recent animal studies[15] support the idea that decalcification occurs principally under fixed deposits on the teeth. Rapid acid formation giving a pH as low as 4.5 has been shown to occur in vivo when sugars are placed on plaques on human teeth.[16]

Various oral conditions may modify the activity of the preceding factors in caries. Principal among these would be: the destructibility of enamel in organic acids as it might be influenced by fluorine or other chemicals; the flow, consistency, neutralizing power and antibacterial action of saliva; irregularities of teeth or tooth surfaces, which contribute to bacterial and food deposits; and the presence of phosphates or other buffers in the food or of certain proteolytic bacteria. The absence of certain amino acids and vitamin fractions in the mouth may also play a part.

PREVENTION OF DENTAL CARIES

Since resistance to caries is determined in part by the ability of the teeth to withstand caries attack, it is logical that much attention should have been given to the effects of nutrition on tooth structure and caries resistance. The adequacy of the diet is often considered as being related to the dental caries experience. There is, however, a division of opinion concerning the relationship between dental caries and either specific dietary factors or the general nutritional status. Mellanby[17] has offered evidence that teeth formed on vitamin D deficient diets were defective in surface structure and more susceptible to caries, but

many have questioned her conclusions. Bunting *et al.*[18] observed 611 children in five public institutions. He concluded that the feeding of an adequate, well-balanced, low-sugar diet definitely decreased the caries activity. Dental caries occurs in well-nourished children, and it is of interest that the condition of the deciduous teeth of children suffering from malignant malnutrition (kwashiorkor) is reported to be good.[19] There are no data indicating that a lack of minerals (Ca, P, Mg) or vitamins in the diet contributes specifically to the development of caries in humans.

Hence, there is insufficient evidence to claim a causal connection between general nutritional status and caries susceptibility.[20-22] Furthermore, since calcification of all deciduous teeth is completed by 3 years of age, it is difficult to ascribe cavities which develop in deciduous teeth subsequent to this age to lack of minerals or vitamins in the diet. Certainly the improvement in the nutritional status of children in the United States during recent decades has not been associated with a decline in the prevalence of caries. Enamel hypoplasia, which is believed by some observers (though not all) to result from nutritional deficiency, is not associated with caries susceptibility.[20]

Whether or not proper formation of the tooth is dependent on adequacy of the diet, it seems clear that once the enamel is complete it becomes relatively unresponsive to systemic influences of a nutritional nature. This is shown by the fact that there is no evidence of repair of carious lesions and the finding that there is essentially no passage of radioisotopes, such as P^{32}, from the tooth pulp to the enamel. The little which does reach the enamel arrives there through the saliva (Sognnaes and Shaw).[23] The nutritional status can influence the integrity of the various periodontal structures[21] and no one questions its importance in maintaining their health.

In practice, the best proven way of increasing the resistance of the teeth and preventing dental caries is by the addition of fluoride to drinking water and the topical application of fluoride. Although other methods of prevention on a mass scale have been attempted in recent years, none has proven effective. The information now available clearly indicates that fluoridation of public drinking water leads to a significant decrease in dental caries. The observed reduction in the incidence rate of decayed, missing and filled teeth (DMF) among children drinking fluoridated water has varied between 30 and 70% in different studies. In general, the magnitude of the reduction is inversely related to the age at which the fluoridated water is first regularly consumed. The caries-preventive effect is comparable to that seen in populations drinking naturally fluoridated water.[24]

Most foods contain fluoride at a level of 0.2 to 0.3 parts per million (ppm) as consumed, except for seafoods and tea which contain considerably more. In this country about 3,500,000 people drink *naturally* fluoridated water. Excessive intake is known to result in mottled dental enamel in children and, when taken in very large amounts over long periods of time, in skeletal fluorosis in both children and adults.[25] No confirmed deleterious effects have been observed in the United States.[26]

The ideal vehicle for dietary fluoride should be such that its consumption is self-limiting, it is easily and cheaply available, and it is readily accessible to regulatory control. The fluoridation of communal water supplies meets these qualifications and is, in principle and in practice, the most effective approach to caries prevention on a large scale. The adjustment of the fluoride content of drinking water to 1 ppm in temperate climates (or about 0.7 ppm in hotter areas) appears to provide an *optimal* intake.* This amount results in

* Recently consideration was given to a plan to include fluoride in milk formulae fed to infants living in areas where fluoridation of community water supplies was not practiced. This plan was rejected as unsafe, since positive control of intoxication under these circumstances was not believed possible.[26]

significant reduction of caries without evidence of toxicity.[24, 25] To achieve maximal caries-preventive effect, fluoride should be ingested during that time when the teeth are in the formative stage and throughout the caries-susceptible years. This ingestion must cover a period from the fourth month *in utero* (when the first deciduous central incisors begin to calcify) to the age of 18 years.

Studies of children who have drunk artificially-fluoridated water for periods up to 10 years have failed to disclose any evidence of adverse effects on growth, or general health and well-being, or any changes in skeletal density or rate of skeletal maturation.[27] Twenty-six million people in the United States are currently drinking *artificially* fluoridated water. Fluoridation of communal water supplies is a safe and effective means of caries control and should be extended to as wide a segment of the population as possible.

In areas where fluoridated water is not available, the topical application of a 2% solution of a fluoride to the crowns of the teeth, soon after the teeth are erupted, should be substituted. Many studies indicate a 40% decrease in the dental caries attack rate after such applications. Evidence available suggests that the reduction of caries is related to lowered solubility of fluoridated enamel in acid.

Regulation or restriction of intake of carbohydrate serves not only to foster adequate nutrition but also to withdraw the substrate from which bacteria form decalcifying acids. If strictly enforced, it also reduces the numbers of lactobacilli, which are used by many as an index of caries activity.

There is increasing evidence that between-meal eating and the frequency of eating are related to the dental caries experience of children. Gustafsson *et al.*[28] conducted a well-controlled study of dental caries and observed that a group of patients who received a diet high in fat and very low in carbohydrate, and practically free from sugar, exhibited low caries activity. When refined sugar was added to the diet in the form of mealtime supplement, there was still little caries activity. In the same study, when caramels were given between meals, there was a significant increase in the numbers of new carious lesions. It was concluded from these studies that dental caries activity could be increased by the consumption of sugar, if the sugar consumed was in a form easily retained on the tooth surface. The more frequent the latter form of sugar was consumed *between meals*, the greater was the tendency for an increase in dental caries.

Mack[29] studied a group of institutionalized children who were receiving an adequate diet. These children received sugar at mealtime only. She studied the effect of further additions of carbohydrate to the diet in the form of candy. This did not significantly increase dental caries activity, but the children did not receive candy between meals and they were encouraged to brush their teeth after meals.

Potgieter *et al.*[30] surveyed the dental status in relation to diet as determined from records of weekly food intake of 864 Connecticut school children. Children who consumed more fruits and vegetables and who had better diets had a lower incidence rate of decayed, missing and filled teeth. The frequency of between-meal snacks also showed a slight positive relationship to the dental caries activity.

Dental caries does not often occur when the daily food intake contains no refined sugar and only minimal carbohydrate. When caries-susceptible individuals are given a low-carbohydrate diet, lactobacilli rapidly disappear from the oral cavity, and in many individuals it has been found that, after reducing the salivary lactobacillus counts by the use of a restricted diet, the carbohydrate intake can be gradually increased without a return of the previously high lactobacillus count. It is not necessary to restrict carbohydrate intake in highly susceptible patients as long as the lactobacillus count remains low. Counts of 10,000 lactobacilli per milliliter of saliva.

or higher, are an indication that these organisms are sufficiently active to present a threat of development of caries.[31]

Although a low-carbohydrate diet may provide sufficient nutrients for the average individual, it is not consistent with contemporary eating habits in children, may cause ketosis, and is extremely difficult to maintain. Furthermore, the necessity of a diet which restricts not only simple sugars but also complex carbohydrate is not clear, because, in the joint report of the Council on Dental Health and the Council on Dental Therapeutics of the American Dental Association, it was concluded that starchy carbohydrates are of minor importance in the development of caries. In any case, this is therapy and not prophylaxis.[32] Furthermore, pediatricians have questioned the advisability of restricting some of the starches as well as sugar, fearing that such a diet might not only be calorically inadequate but also cause emotional strain in some children.

The recommended diets[3] can provide the daily allowances of nutrients recommended by the Food and Nutrition Board of the National Research Council. The daily intake of carbohydrate is restricted to 100 gm for 2 weeks. After this 2-week period starch is reintroduced. This procedure produces a rapid change in the oral flora, characterized by a marked reduction in the number of acidogenic bacteria. It is not meant to be a permanent regimen, but one to be followed for a short period of time and for a special purpose.

It is worth remembering that special dietary programs have other implications in childhood. If a child is compelled to eat a diet that is different from that of the other children, even in his own home, and, if the diet is different from the school meal, other children will make life miserable for the child in question. The result may be damaging to the sense of security. This factor should be carefully considered in relation to whatever advantages may be obtained by special diets. It is difficult, because of ready availability, to completely withhold candy from children. It would seem better to provide some candy in the home, to be eaten at the end of a meal, rather than to deny it completely. Furthermore, highly concentrated sources of refined sugar, such as candy, given after meals are apparently less apt to produce caries than if given between meals.

A number of investigators have reported on the decalcifying effect of acid beverages (made effervescent by addition of carbon dioxide or acid by addition of phosphoric or citric acid). McClelland,[33] in 1926, reported that the presence of a pH of 3.5 and below, even if existing for only a few minutes, is a potential source of damage to teeth. West and Judy,[34] in 1938, stated that "when an individual places a piece of ordinary acidified candy in his mouth and allows it to dissolve slowly against his teeth, the concentration of the solution at the surface of the candy will be very high, with a pH in the region of 3.4."

Restarski *et al.*,[35] in 1945, reported: "In an initial experiment some extracted human teeth were immersed in a common . . . beverage. When first inspected after 2 days immersion, the enamel surfaces were found to be grossly decalcified. Severe destruction of the enamel on the molars of 200 white rats was produced by allowing the animals to drink the popular soft beverage for periods of 5 days or more." However, none of this relates directly to caries in human subjects, and the weight of evidence indicates that carbohydrates taken in liquid form are less destructive than those used in a viscous or solid form.

The role of simple dental hygiene, such as toothbrushing, in prevention of dental caries, while generally accepted, has not been exempt from the type of questioning directed at many other wide-spread hygienic measures. Nevertheless, few dentists or physicians fail to support the practice of proper brushing of the teeth.

Whether or not prepared dentrifices are more effective than simple brushing with water is, at present, the subject of controversy. Nevertheless, as both the lay public and physicians are targets for consid-

erable advertising by manufacturers of dentrifices, it seems worth including a summary of the report on this subject[36] made by the Council on Dental Therapeutics of the American Dental Association:

A dentifrice is a substance used with a toothbrush for the purpose of cleansing the accessible surfaces of the teeth. Commercial dentifrices are available in the form of paste, powder and liquid. . . .

However, the evidence to date indicates that, when such dentifrices are employed as adjuncts to supervised toothbrushing in controlled clinical investigations, their superiority over conventional dentifrices has not been clearly established.

Controversial evidence concerning the possible usefulness of dentifrices containing urea and dibasic ammonium phosphate is reviewed in numerous publications.

Some control of dental caries has been reported in controlled and supervised studies of the use of a penicillin dentifrice. Other studies have failed to reveal the same amount of usefulness from this dentifrice. It has not been shown that the unsupervised use of a penicillin dentifrice by the general public will result in a reduction of the incidence of dental caries.*

There is a slight increase in the number of penicillin-resistant organisms in the mouths of the users of penicillin dentifrices.

Dentifrices containing chlorophyll derivatives have also been placed on the market. There is some evidence that the use of a chlorophyll derivative in a dentifrice increased the rate of improvement of gingivitis in a special group of children under observation, but this effect was transitory. Other investigators have not been able to observe significant beneficial effect from the use of a "chlorophyll" dentifrice.

Certain new foaming agents have recently been incorporated into tooth pastes, and some of these dentifrices have been promoted with greatly exaggerated claims for "antienzyme" and "antibacterial" activity. Evidence in support of these claims is controversial, and the usefulness of these dentifrices in caries control has not been adequately established.

A paste dentifrice containing stannous fluoride has appeared on the market in some parts of the country. The inclusion of other fluoride salts in dentifrices has not been demonstrated to be beneficial. The published evidence concerning stannous fluoride in a dentifrice is still too limited to form the basis of a reliable evaluation.

Adequate dental supervision by a dentist seems to be an accepted health practice in most American communities, and there is little question that dental supervision can play a part in caries prevention. While there are now a limited number of specialists in pediatric dentistry (pedodontics), supervision must usually be obtained from dentists not limiting practice to children. The pediatrician can recommend that toothbrushing start at about 24 months of age and also that dental visits begin at between 24 and 30 months of age. Then the dentist will have the opportunity to give counsel in general hygiene and also to search for remediable oral pathology.

The pediatrician not only sees children before the dentist but also is able to care for their total health needs. Therefore, it would seem wise to encourage pediatricians to learn more about the dental care of children, and, at the same time, to urge dentists to learn more about the general health problems of children. There seems to be need for co-operation between dentists and pediatricians; this should begin in the medical and dental schools. The dental faculty should have an opportunity to teach the etiology and treatment of dental pathology to medical students, and conversely, dental schools should have a place in their curriculum for the pediatrician to teach those aspects of pediatrics which relate to dental problems. Pediatric hospitals and children's services should have dentists in attendance, and attempts are now being made to have dental interns in pediatric hospitals.

SUMMARY

As dental caries is primarily a disease of childhood and appears to be at least in

* No mention was made in this report of what may be a real hazard in the use of this type of dentifrice, that is, the possibility of sensitization of the individual to penicillin with consequent unpleasant or even dangerous side effects.[37, 38]

part preventable, the pediatrician is obliged to be interested in this problem and can play an important part in prophylaxis. Present knowledge indicates that the most effective prevention available is the consumption of fluoridated drinking water containing a concentration of fluoride appropriate to the environmental temperature. Reduction of the intake of refined sugar both in amount and frequency has a beneficial effect on caries control. The prescription of diets essentially devoid of all sugars should be used to stem the progression of rampant caries. That this regimen would be as effective when complex carbohydrates are permitted and only refined sugar prohibited has been indicated by some studies. However, any highly restricted program must be considered therapeutic and not preventive and should be under pediatric supervision.

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NATIONAL CONGRESS OF PARENTS AND TEACHERS

National Office

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STATEMENT ON THE CHILDREN'S DENTAL HEALTH ACT OF 1971

Submitted to the Senate Subcommittee on Health
Senator Edward Kennedy, Chairman

by Mrs. Walter G. Kimmel, Coordinator of Legislative Activities
National PTA

July 15, 1871

On behalf of National PTA, we appreciate this opportunity to express our long standing and continued concern for the general health of all children, including dental care. Our PTA Manual, directing the work of all local units carries the following suggestion, "Work for the fluoridation of the local central water supply and for all other means of reducing dental caries, including topical applications of fluoride, good nutrition and regular dental checks."

Also, many years ago the National Board of Managers of the National PTA adopted the following statement. "Since fluoridation of the water supply, one part in a million, has been shown to reduce dental decay by one half, PTA's should be encouraged to interest themselves in making this health measure available to the children in their communities." Probably updated and improved statistics are now available on the effectiveness of fluoride, however, we are told that communities containing 57% of the nation's population do not have fluoridated water. Our support of fluoridation has remained strong through the years and we continue to urge our people to work for fluoridation in their own communities. Passage of this act would provide financial assistance in their effort.

We are aware of the high rate of dental caries among children, and that dental defects and disease in children pose a substantial national health problem. The damage to the child's emotional health, due to dental neglect is also of concern. Recently a Juvenile Court Judge commented that it seemed to him the two most common factors among children in trouble were that they couldn't read and they had bad teeth. Admittedly, this doesn't prove anthing, but it said something to him. Millions of children in this country need dental care, both preventive and corrective, that is not available to them - mainly for economic reasons. We hope sincerely that this situation can be changed through federal, state, local and private funds and effort.

Thank you for receiving our views.

AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL ORGANIZATIONS

EXECUTIVE COUNCIL

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WASHINGTON, D.C. 20006

(202) 293-5000

July 16, 1971

Honorable Edward M. Kennedy
Chairman, Health Subcommittee
Senate Labor and Public Welfare Committee
United States Senate
Washington, D. C.

Dear Mr. Chairman:

I am writing you to indicate the support of the AFL-CIO for S. 1874. This bill would authorize the Secretary of the Department of Health, Education and Welfare to make grants to pay for part of the cost of providing comprehensive dental services for preschool and school age children from low-income families. Secondly, the bill would provide grants to assist communities in developing water treatment programs to reduce the incidence of oral disease. Lastly, S. 1874 would provide grants to train dental auxiliaries as well as to support programs to teach dental students and dentists the efficient and effective use of such auxiliaries and to train them in the team approach to delivering dental services.

Almost 50 percent of all children under the age of 15 have never been to a dentist. The need is greatest among poor families where 70 percent of the children have never seen a dentist. Dental disease and the need for adequate dental services is a general problem affecting the entire population but exists in its most acute form among low-income families. The AFL-CIO therefore favors a broad national dental program to implement the concept that dental care is a right for all children, as provided by the National Health Security program (S. 3) introduced by yourself and Senators Cooper, Saxbe and many other of your distinguished colleagues. However, until such time as a comprehensive health program can be enacted, S. 1874 is a step forward.

The grant programs for fluoridation and for the training of dentists and auxiliary personnel in the team approach to delivering dental care are most important. Fluoridation will substantially reduce dental disease. The training of dental auxiliaries will help relieve the shortage of dentists so that all Americans will eventually be able to receive all the dental care they need.

Honorable Edward M. Kennedy, 7/16/71

Our principal criticism of the bill pertains to the amounts authorized for these vital programs. We think the funds authorized under the bill should be substantially increased.

We urge speedy enactment of S. 1874.

Sincerely yours,

Andrew J. Biemiller, Director
DEPARTMENT OF LEGISLATION

cc: Honorable Warren G. Magnuson

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Sec. II - 13

FLUORIDATION

WHEREAS, Fluoridation has been approved by the American Medical Association, the American Dental Association, the American Hospital Association, the American Association for the Advancement of Science, the U.S. Public Health Service, the World Health Organization,

RESOLVED, That this Convention reaffirm AFL-CIO support to fluoridation of water supplies, and be it further

RESOLVED, That the AFL-CIO Executive Council continue to keep abreast of developments in the fluoridation program.

Adopted Fourth Constitutional Convention of the AFL-CIO, Florida, December 13, 1961

President
Hollis S. Ingraham, M.D.
Albany, New York

President-Elect
Ira L. Myers, M.D.
Montgomery, Alabama

Secretary-Treasurer
E. Kenneth Aycock, M.D.
Columbia, South Carolina

Executive Committee:
John S. Anderson, M.D.
Helena, Montana
J. T. Herron, M.D.
Little Rock, Arkansas
Edwin D. Lyman, M.D.
Topeka, Kansas
Alfred L. Frechette, M.D.
Boston, Massachusetts

THE ASSOCIATION OF STATE AND TERRITORIAL HEALTH OFFICERS

WASHINGTON OFFICE—SUITE 61, 128 C ST., N.E., D.C. 20002
TELEPHONE: (202) 547-3470

July 14, 1971

Honorable Edward M. Kennedy, Chairman
Subcommittee on Health
Senate Committee on Labor and Public Welfare
U. S. Senate
Washington, D.C.

Dear Senator Kennedy:

It is the intent of this letter to apprise you of the Association of State and Territorial Health Officers' support of S. 1874, the Children's Dental Health Act of 1971. In our view, all four provisions of the bill will contribute to alleviating the costs and disabling effects of dental defects and disease.

It is particularly heartening to note that the emphasis of this proposal is placed on dental care for children. I need not point out that prevention is the cornerstone of our state public health programs and adequate attention to dental health needs of children will assuredly prevent future unnecessary dental disease and the expenses attendant to the correction thereof. Preventive procedures which obviate remedial procedures are a saving. State health departments are vitally interested in dental health and almost all have dental care programs. These programs are concerned primarily with the low income group to which S. 1874 is addressed. None of our states' programs are currently meeting fully the need, and the added support proposed in this bill would provide greatly needed support. It would be the hope of the ASTHO that these grants be made to or through the state health department so that the necessary coordination could be assured and maximum accomplishment obtained. I am advised by both Dr. Charles Gish, Director, Division of Dental Health, Indiana State Board of Health, the immediate past president of our affiliate of Dental Health Directors; and the current president, Dr. John K. Peterson, Director, Division of Dental Health, North Dakota State Department of Health, that in their own and their Association's opinion, the sheer magnitude of the dental health problem

indicates the need for a concerted childrens' dental health program in order to begin an orderly attack on this problem.

State health departments have long supported programs to provide fluoridated water to communities in the respective states. I take pride in the fact that some of the earliest studies which proved the efficiency of this procedure were done in my own state, by the New York State Health Department. Despite our best effort, there remain great opportunities to expand fluoridation programs to protect persons using a public water supply. For example, consolidated school districts where perhaps several hundred children receive their elementary and secondary education could provide fluoridated water for these children when it would be virtually impossible to so treat hundreds of individual water supplies in their residences. The support for fluoridation programs included in S. 1874 would be of great assistance to our efforts.

Both the provision to help in increasing the number of dental auxiliaries and the provision to help develop dental care programs so as to utilize this resource more effectively are worthy of support.

Thank you for your consideration of the views of the ASTHO in respect to this legislative proposal. It would be appreciated if this letter could be made a part of the hearing record relative to S. 1874.

Yours truly,

Hollis S. Ingraham

Hollis S. Ingraham, M.D.
President

AMERICAN PUBLIC HEALTH ASSOCIATION
1015 Eighteenth Street, N.W., Washington, D.C. 20036

July 14, 1971

The Honorable Edward M. Kennedy, Chairman
Subcommittee on Health
Senate Committee on Labor and Public Welfare
4230 Senate Office Building
Washington, D.C.

Dear Mr. Chairman:

I am pleased to inform you and your Committee of the support of the American Public Health Association of S. 1874, the Children's Dental Health Act of 1971. The severity of the problem of dental defects and disease of our population have been well documented and made a matter of public record. Knowledge of methods and procedures whereby this toll could be markedly diminished has been available, especially in the case of fluoridation, for decades. Since the 1950's the APHA has repeatedly urged fluoridation, at optimum levels, of community drinking water supplies. These positions, urged by APHA's Governing Council, were enunciated in 1950, 1955, 1956, 1959 and finally in 1969 when the Governing Council adopted a policy resolution especially pertinent to that portion of S. 1874 related to fluoridation as follows:

National Fluoridation Act

"Improvement of dental health, elimination of dental manpower shortages, and dental care of the indigent are problems which are national in scope and require national solutions.

"Community water fluoridation is a proven effective measure for preventing tooth decay. Since fluoridation cuts tooth decay by two-thirds, the costs of initial and maintenance dental care for children in fluoridated communities are one-half of such costs in comparable nonfluoridated communities. The effectiveness of fluoridation does not depend on family income, education of parents, or on the availability of dentists.

"Although nearly a quarter of a century has passed since Grand Rapids, Mich., first adjusted the fluoride content of its water supply to the optimum level for better dental health, almost half of the nation's

population with public water supplies does not have access to this proven public health measure.

"The effectiveness of financial assistance in bringing about community fluoridation has been demonstrated. Utilizing dental health formula grants, funds for fluoridation equipment offered on a matching basis to small communities resulted in the fluoridation of a great number of communities within a two-year demonstration period.

"Incentives to initiate fluoridation would make possible substantial progress toward the fluoridation of all public water supplies in the United States and greatly improve the dental health of the nation.

"Universal fluoridation could cut the ultimate annual costs of comprehensive dental care for children by more than 50 percent.

"The American Public Health Association recommends adoption of legislation to provide federal grants to state health departments for a grant-in-aid program to assist communities to initiate and maintain fluoridation programs."

The APHA supports, too, that portion of S. 1874 which would provide project grants for the dental care of children. This provision of the bill would be a start toward the program urged by our Association. Adopted in 1966, this policy resolution reads as follows:

A National Dental Health Program for Children

"The protection of children against the ravages of dental disease by using every proven dental health measure known could, within a generation, be reflected in higher levels of dental health among young adults.

"The American Public Health Association urges that a national program of dental health for children be developed so as to meet the total dental health needs of all children.

"The full range of available preventive measures, including adjusting the fluoride content of all communal water supplies, should be applied.

"Due consideration should be given to the development and maximum use of auxiliary dental personnel.

"State and local health departments should have a major role in the administration of the program."

In many respects a properly deployed, adequate supply of health manpower would go far to solve this nation's health care crisis. Inherent in this premise is the advisability, if indeed not the necessity, to utilize to the fullest the talents, training and experience of the respective members of

the health professions team. The advantages and the improved efficiency of the dental practitioner through cooperative use of the dental hygienist, the dental technician, and the chairside assistant have been well established. The provisions of S. 1874 which would (a) stimulate the training of added numbers of auxiliary dental personnel and (b) promote the effective use of these personnel are in the judgement of the APHA worthy of support.

On behalf of the APHA, may I express our appreciation for this opportunity to present this Association's views on S. 1874 and request that they be made a part of the hearing record on this legislative proposal.

Yours truly,

James R. Kimmey, M.D.
Executive Director

Record Statement of the
American Dental Hygienists' Association
On S. 1874
"THE CHILDREN'S DENTAL HEALTH ACT OF 1971"
Before the Subcommittee on Health
Committee on Labor and Public Welfare
U.S. Senate
July 12, 1971

The Children's Dental Health Act of 1971 has special significance to members of the American Dental Hygienists' Association in that the early dental hygiene practitioners functioned primarily to improve the dental health of children by providing preventive and educational services in the public schools of Bridgeport, Connecticut. Today, though most dental hygienists in the country are employed in dental offices, several states are endeavoring to maintain the school dental health program, utilizing the skills and services of dental hygienists.

The American Dental Hygienists' Association vigorously endorses this specific legislative authority for dental health. We earnestly hope this initiative will be supported by this Committee because it addresses the major problems associated with dental disease in this country, problems which have been identified by the American Dental Association and the American Association of Dental Schools before congressional committees.

We are aware of previous congressional support for the implementation of pilot dental care projects for needy children as recommended by the American Dental Association and are certain the efforts of the Congress greatly enhanced the reality of the few projects that currently are underway. We believe, however, that the existence of an independent statute containing appropriate funding levels on a five-year graduated basis, as set forth in S. 1874, will give far greater impetus to efforts to provide comprehensive dental health care and services to pre-school and school age children from low-income families or to those children who are unable to obtain such care. We are especially pleased to note the inclusion in S. 1874 of preventive services, including dental health education, and treatment as part of a comprehensive program to elevate the dental health status of these children.

Other features of S. 1874 also are highly desirable, such as the Federal grant program to assist in fluoridation of community or public elementary or secondary school water supplies and a specific grant authority to assist institutions in carrying out programs to educate and train dental auxiliaries. In this regard, the availability of a substantially broader level of Federal support would greatly aid in narrowing the gap between the supply and demand for competent, well-qualified dental auxiliaries in terms of both existing and projected shortages.

Along these lines, we are equally interested in aspects of existing and proposed Federal legislation that would support expanded utilization of dental auxiliaries. Recognizing the value of effective dental auxiliary utilization to the practicing dentist, the American Dental Hygienists' Association has encouraged curriculum change in schools of dental education to include a program designed to educate dental students in effective utilization of dental hygienists. We therefore strongly support the development of dental team management programs which include experience in utilizing dental hygienists who perform both traditional and expanded duties. In our view, the availability of project funds at the levels indicated in S. 1874 would best achieve the objectives of more efficient, effective dental auxiliary utilization in order to increase the delivery of dental care and services to a greater segment of the population than previously has had access to such care.

CASIMIR R. SHEFT, D. D. S.
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—
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July 14, 1971

The Honorable Senator Edward Kennedy
Chairman
Senate Health Committee
United States Senate Office Building
Washington, D. C. 20510

Dear Senator Kennedy and Members of the Senate Health Committee:

On behalf of the New Jersey Council Opposing Fluoridation, Inc., representing fifteen hundred people, I would like to submit the following testimony to be placed in the Record of the Hearings being held currently by your Committee on Health on Senator Warren Magnuson's omnibus dental health bill S-1874 entitled "The Children's Dental Health Act of 1971."

The New Jersey Council Opposing Fluoridation, Inc. is strongly opposed to Section 1002 of S-1874 which proposes federal grants of 15 million dollars to assist communities wishing to fluoridate their water supplies.

Since sodium fluoride is defined in the dictionary as "a colorless crystalline, water soluble poisonous solid, used chiefly in the fluoridation of water, as an insecticide, and as a rodenticide" (Random House Dictionary, p. 1352) and in The Encyclopedia Americana (Vol. 25; p. 221) as ". . . a poisonous insecticide for poultry and dogs," if Section 1002 of Senate Bill S-1874 is approved, it would in effect make the Federal Government an accessory to the perpetration of the worst and most dangerous type of water pollution.

I am a summa cum laude graduate of the University of Maryland Dental School (Class of 1944) and a member of the American Dental Association. I am also a member of dentistry's highest honor society, Omicron Kappa Upsilon, and have achieved many honors.

I, like you, gentlemen, have a strong humanitarian inclination—which is evidenced by my donating twenty years of dental service to the children of an orphanage; six years as an elected member of a Board of Education (two years of which I was vice president); five years' membership on a Youth Guidance Council; and five years of service as a member of a Juvenile Conference Committee. My altruism compels me to warn you of the great danger to the health of all the people existent in fluoridation.

For twenty-five years I have been deeply engrossed in a comprehensive study and evaluation of fluoridation and have spent thousands of hours in this research.

Some of the startling true facts—all documented—which bear me out are:

Sodium fluoride is one of the most toxic poisons known to man—and cannot be purchased without a prescription!

Van Nostrand's Scientific Encyclopedia (4th Ed., p. 1643) states that: "Sodium fluoride is used as a poison for rats and cockroaches."

The Journal of the American Medical Association (Feb. 10, 1951) reported: "Fluorine also tends to accumulate in the bones leading to hypercalcification (over-calcification) and brittleness. Ligaments and tendons also become calcified. Serious symptoms may ensue such as loss of mobility of joints, easy fracture and pressure on the spinal cord. Other effects include decreased blood clotting power; and in women, painful menstruation, lowered birth rate, high incidence of fracture, thyroid alteration and liver damage."

The British Medical Journal (Oct. 25, 1963) reported that: "Sodium fluoride destroys certain enzymes of the body, and so upsets normal metabolism. Laboratory evidence showing that sodium fluoride in minute amounts (one-tenth of the 'recommended' one part per million for humans) appreciably depressed the growth of human cells."

Two British scientists, Dr. Roger Berry, fellow in radiobiology, and Wilfred Trillwood, director of pharmaceutical services at Oxford United Hospitals—after experiments lasting two months, found laboratory evidence that human cells are killed by sodium fluoride one-twentieth the strength of fluoridated drinking water!! (Canadian Intelligence Service—Supplementary Section, Vol. 14, No. 2, Feb. 1964)

"The plain fact that fluorine is an insidious poison, harmful, toxic and cummulative in its effect—even when ingested in minimal amounts—remains unchanged no matter how many times it will be repeated in print that fluoridation of the water supply is safe." (Dr. Ludwik Gross, M.D., Chief of Cancer Research of the V.A.)

Dr. Alfred Taylor of the Biological Institute of the University of Texas, found that sodium fluoride even in such very low levels as one part in 20 million stimulated the growth of cancer cells in mice and embryonated eggs. ("Proceedings of the Society for Experimental Biology and Medicine," Vol. 119, p. 252, 1965)

A study by R. Herman reported in "Proceedings of the Society for Experimental Biology and Medicine" (Vol. 91, p. 189, 1956) tells us that fluorine was found in 8 out of 10 urinary tract stones in concentrations up to 1800 ppm. Dr. Alfred Taylor also found urinary bladder stones developing in his laboratory animals which were on fluoridated water. This condition had never before been observed in his experimental animals—which indicates that fluorine is related to the formation of at least some type of bladder stones.

Radioactive strontium 90 (from H-Bomb fallout) combines with accumulated fluorides in the body and precipitates as the highly insoluble Sr 90 F_2

within the body. This means that the rate at which the strontium 90 is excreted or thrown off will be even slower than ordinarily occurs. ("The Biological Hazards of Stronitium 90 and Fluoridation" by Dr. J. Kerwin: Dental Digest, Feb., 1958)

Epidemic skeletal malformations have been reported among people drinking water containing as little as 0.8 ppm. of fluoride in Lebanon. (Archives of Environmental Health, May, 1963)

One percent of children under ten years of age and pregnant women could not tolerate even the low-level dosages of fluoride that have been recommended by public health officials. (Feltman and Kosel: The Journal of Dental Medicine, Oct., 1961)

Independent studies by at least six groups of scientists have shown that fluoride causes hardening of the arteries even in young persons. (Dr. P. Zanfagna, M.D.; International Society for Fluoride Research)

Abnormal bone and osteomalacia is produced when fluoride supplements are given without a concomitant calcium supplement. (Dr. Jowsey; Mayo Clinic)

"Fluorides are violent poisons to all living tissues because of their precipitation of calcium. They cause fall of blood pressure, respiratory failure, and general paralysis. Continuous ingestion of non-fatal doses causes permanent inhibition of growth." (The U. S. Dispensatory, 24th Ed., pp. 1456-57)

Fluoridated water aggravates arthritic conditions and is a "potential long-range danger to health." (Dr. William Gutman, M.D.; Flower Fifth Avenue Hospital, N.Y.C.)

Use of fluoridated Ottawa City water in artificial kidney machines was accompanied by bone diseases, including pain in the bones, arthritic pains in the joints, nerve irritation, knobby growths on some bones and such marked dissolution of bone that spontaneous fractures occurred. Ribs even cracked under the pressure of breathing. (Dr. Gerald Posen, M.D., Ottawa General Hospital; Jan., 1969)

Because of its toxicity and danger to health, fluoridation has been rejected in Austria, Italy, Spain, France, Sweden, Denmark, Norway and Switzerland.

The contention that fluorides will harden bone and help reduce the bone disease osteoporosis is false! That claim has been discredited and contradicted by no less than the illustrious British Research Council in a report published in the Medical News (London), on Sept. 26, 1969; and also in a report published in the American Journal of Clinical Nutrition (Jan., 1971).

In October, 1966, the Food and Drug Administration banned the sale of all prenatal fluoride products because of the recognized danger to unborn babies. If prenatal fluoride ingestion by way of a carefully controlled tablet dosage was found to be dangerous, how can it be claimed that the

consumption of uncontrolled quantities of fluoridated water by a pregnant woman (or anyone) is safe?!

The ingestion of 2 mg. of sodium fluoride per day is recognized as being toxic. This means that people drinking two or more quarts of fluoridated water per day are consuming a toxic amount of fluoride—harmful to their health. I need not point out that millions of people drink two or more quarts of water per day. For example; people working in iron and steel foundries, laundries; and ball players; diabetics, etc. Why should this real danger to those people be ignored—especially since the fluoride that they ingest will not benefit their teeth one iota! (Fluoride is only 'beneficial' during the formative years of tooth development)

Sodium fluoride will not boil off, but becomes more concentrated when water is boiled down—since it is a salt. This occurs because the given amount of fluoride salt remains constant while the quantity of water decreases. Obviously, there is great danger in boiling fluoridated water too long. Those of us who drink tea, coffee, or soup run the risk of ingesting two or three times the 'normal' amount of fluoride, if we allow the water to boil down to half or one-third of the original amount. Most serious of all is the danger to new-born bottle-fed infants, whose total source of food in the first few months of life consists of at least 90% water—which is used in the milk formula and juices. Can you see the danger in boiling down this fluoridated water for the infant's formula? If a mother starts with two quarts of fluoridated water (containing 2 mg. of fluoride) and boils it so long that half of it has evaporated, she ends up with <u>one</u> quart of water which now contains 2 mg. of fluoride—a toxic dosage!! Two milligrams of fluoride to a six-pound infant is the same ratio equivalent as 60 mg. to a 180-pound man!!! If this infant happens to be the one out of a hundred who is hypersensitive to the poison fluoride, could this daily dosage be fatal?? Could this possibly be the cause of Sudden Infant Death?? A true scientific investigation of this possibility must be made.

The claim that fluoridation will reduce tooth decay by 66% is untrue. Dental teams from the New York State Department of Education found the opposite—50% more dental defects in the fluoridated city of Newburgh than the unfluoridated 'control' city of Kingston. The independent New York State survey included gingivitis, pyorrhea, and malposition of teeth as defects. The fact is that fluoride poisons the tooth structure in the formative years; delays eruption of the teeth; does not produce permanent benefits to the teeth but merely delays the onset of tooth decay by one to three years. Children in fluoridated areas when they reach age 16 tend to catch up with the number of DMF (decayed, missing and filled) teeth of those in the unfluoridated areas. A fact that cannot be overstressed is that nutritional deficiency (<u>not</u> fluoride deficiency) causes tooth decay.

Even without water fluoridation many people are ingesting toxic amounts of fluorides in their food. There are many fluoride-containing foods, especially tea and wines. Some of the fluoride-containing foods and the

amounts of fluoride they contain are listed in the 1964 issue of "Toxicology of Fluorine" as follows: Peaches up to 5 ppm; apples up to 4 ppm; carrots up to 5 ppm; spinach as much as 21 ppm; milk up to 2.3 ppm; and celery leaves up to 135 ppm.

Another way in which we absorb fluorides is through our lungs by way of fluoride-polluted air. Automobile exhaust contains hydrogen fluoride, and many factories belch tons of fluorides into the air through their smoke-stacks (e.g., aluminum and steel mills, phosphate and fertilizer plants, smelters, etc.). In European countries fluoride is now being recognized as the No. 1 air contaminant—much more damaging than sulfur dioxide (which in the past had occupied first place).

When we brush our teeth with fluoridated tooth paste we may not rinse our mouths thoroughly after brushing and swallow some fluoride residue.

Aerosol spray cans have fluoride in their charge which contaminates the air we breathe when we use a deodorant spray or hair spray, etc.

A widely used surgical anesthetic (Penthrane) contains fluoride—which was responsible for at least two reported deaths.

To further compound the contamination: In fluoridated areas the processed foods, soft drinks, beer, and fruit punches to which water has been added will all contain fluoride. Marier and Rose of the National Research Council of Canada, have shown that processing of foods increases their fluoride content by as much as 5 times—which together with the fluoride intake from drinking water adds up to an estimated total daily intake per person of between 2 to 5 mg. of fluoride. This level of fluoride intake is recognized as toxic even by the most ardent of fluoridationists.

In his newscast of October 1, 1970, Lowell Thomas announced that: "Scientists at the University of Barcelona in Spain—undertaking to determine the cause of death in a million year old Java man . . . their conclusions: The Java man said to be an apparent victim of fluorine poisoning."

A million years have passed, and fluorine is still not recognized as the deadly poison that it is! In fact, it is being legislated into millions of luckless people—who are misinformed and lulled into believing that it is a harmless and beneficial 'nutrient.' Instead of legislating poisonous fluorides into the people, every effort should be made by our government and health officials to remove this toxic pollutant from our air, food, and water!!

It is inconceivable that a toxic prescription drug listed as a dangerous cumulative proto-plasmic poison could be taken by every citizen from the cradle to the grave, sick or well, young or old, and the same dose given to a six-pound baby and a 250-pound man without somebody being harmed!

In addition, fluoridation of drinking water is most wasteful and expensive, since 99.5% of the drinking water is used for purposes other than drinking; such as flushing toilets, washing cars, washing dishes, washing clothes, taking baths, watering lawns, and in industrial plants. So 99.5% of the fluoride which a community purchases to put into the water supply is 'wasted.' In addition, of the 0.5% of fluoride that is actually consumed by people, in the drinking water, only 8% of that amount reaches the young children for whom it is intended (i.e., those in the calcification stage of tooth development). For all the rest of the population (92%) it is of absolutely no benefit—and would be harmful ultimately, since 40% of the fluoride ingested daily remains in the body and gradually accumulates until a toxic level is reached. This fact was reported by Herta Spencer, M.D., and co-workers at the Metabolic Section of the V.A. Hospital in Hines, Illinois (Federation Proceedings, 20(2), Abstracts, 1440, March-April, 1970).

An alternative to water fluoridation, which is far more desirable and acceptable than water fluoridation, is to subsidize local school districts to add sodium fluoride to the milk in the elementary schools from kindergarten through the third grade. The fluoridation of milk in the elementary schools has the following advantages:

1. It would be consumed for only those few years of a child's life when it is most beneficial.

2. Only those children whose teeth are in the formative stage of tooth development would receive the fluoride.

3. It would be administered in the presence of large quantities of calcium—which enhances its safety to the health.

4. A more carefully controlled and accurate daily dosage can be administered.

5. There probably would be no appreciable danger to the health since the fluoride would be ingested for only the few formative years rather than for a lifetime.

6. There would be no opposition to it since it can be made a voluntary choice on the part of the children's parents as to whether or not their children should take fluoridated milk or plain untreated milk.

7. Any children allergic to the fluoride could receive unfluoridated milk instead.

8. There would be no expense to the municipality at all since the Federal Government would subsidize it.

9. The constitutional right of freedom of choice on the part of the individual would not be usurped since parents will have the right to choose whether or not their children will drink fluoridated milk.

10. It would not add to the contamination of all of our foods processed with water nor create any greater general pollution of our environment.

I contend that fluoridation of drinking water is not in the best interest of the majority; it is not the best nor most sensible method of administering fluoride; that it arouses much opposition; and that it is harmful to many and of no benefit to the great majority.

Therefore, gentlemen, I respectfully request that you carefully reconsider Section 1002 of Senate Bill S-1874 and fervently hope that in your sagacious wisdom you see fit to delete Section 1002 from this bill.

Thank you.

Respectfully yours,

Casimir R. Sheft, D.D.S.

Casimir R. Sheft, D.D.S.

[From the Alameda (Calif.) Times Star, Wednesday, Apr. 15, 1970]

THE FLUORIDE THING IN FOCUS—THANKS TO NADER

If the highly-toxic fluoride is not safe in the air—and it is among the pollutants now on the list for ultimate removal from the atmosphere—how can it be termed beneficial when introduced into the human body through fluoridated water supplies?

The nation's top consumer advocate, Mr. Ralph Nader, came to grips with that issue during a press conference in San Francisco, and with his usual candor assailed the Public Health Service for its unscientific approach to fluoridated water.

Mr. Nader approvingly quotes Alfred North Whitehead who said: "Beware the scientific policy that does not keep open its options for revision."

The Public Health Service has served notice that fluoride's effect on the human body is a closed issue. The dictum has been made that children should have it to prevent tooth cavities, and no power on earth is going to change the minds of the bureaucrats.

At a press conference at the University of Kansas, Mr. Nader raised three points on which he bases his contention that far from being a closed issue, research should be heightened as to the potential deleterious effects of fluoride on the human body.

As Mr. Nader asks, how does fluoridated water affect the person who is allergic to fluoride in even infinitesimal amounts? Added to the intake via foods and air, what is its total ingestion when combined with drinking water? What effect might it have when concentrated in water pipes as it has been known to do?

Although the Public Health Service has not been interested in pressing research in these and related fields, this doesn't mean that all scientists have been asleep. As this newspaper has pointed out on previous occasions, there is increasing evidence in the scientific community that fluoride should indeed be kept out of the bloodstream. A few countries ban its use in drinking water altogether.

Yet the United States Public Health Service, ignoring the new information which pinpoints fluoride as a public enemy, goes blithely along, ordering its officials throughout the country to promote its introduction into water supplies. PHS serves as a propaganda center for dissemination of articles pooh-poohing fluoridation's toxic qualities, claiming that those who argue for unpolluted water are, as Mr. Nader says, "kooks."

As a matter of fact, political realists now acknowledge that for all practical purposes, fluoridation of drinking water is on its way out in this country. Its death knell has been sounded by the alert Mr. Nader who did what no one else has done—exposed the fallacy of adding it to drinking water while trying to keep it out of the atmosphere.

And we wonder how long it will take President Richard Nixon to realize this fact of life and get with it, ordering the Public Health Service to cease its fluoride promotion efforts and start listening to evidence of scientists who have been willing to continue searching for facts?

No one occupying the office of President during the 25 years of the fluoridation fraud has been exposed to such a volume of evidence against it as has President Nixon. Earlier administrations could perhaps have been deceived by the fluoride promoters into going along with the scheme. But on the record, in view of the enormous volume of evidence pouring in, as well as the detailed coverage of various fluoride pollution scandals in many sections of the country—the latest in Washington—during the past year, there can be no excuse for Mr. Nixon to give aid and comfort to fluoride promoters. His duty is clear: stop the promotion at its source, and then investigate the whole matter of who and why!

And if he fails to get the message, perhaps Senator Muskie might take the initiative in this pollution issue as he has so brilliantly done in other cases, and bring the practice to a halt. There must be people on the national political scene with the foresight and the courage to tackle this issue and bring to an end the grim threat of fluoridation—a threat to people, animals, plantlife and the entire agonized environment.

Do we hear a second?

[From the Alameda (Calif.) Times Star, Tuesday, Apr. 14, 1970]

GOVERNMENT "NOT DOING JOB" IN FLUORIDATION RESEARCH—NADER

A "serious and immediate reevaluation of the fluoridation theory" is overdue, Consumer Advocate Ralph Nader declared during a press conference preceding his address at the University of San Francisco Sunday afternoon.

The subject was raised by a question posed by one of the reporters: "How does fluoridation of public water systems fit into the pollution picture?"

His crisp response zeroed in on an issue which until now has not been considered during the pro and con discussions of fluoridated drinking water. Said the fiery young crusader: "The urgent consideration is total fluoride ingestion—how much fluoride are people taking into their bodies from fluoride air pollution, from soil, from water, from products processed in fluoridated water, from pharmaceuticals, pesticides, herbicides, etc.?

"The federal government has not been willing to answer that question. No subsegment of the fluoride problem, whether it is fluoridation of the water supply or fluoride pollution, can be scientifically analyzed until we analyze the total fluoride intake. This of course focuses the need for a complete reevaluation of our policy toward fluorides.

"The only people who benefit from fluoridation are young children, therefore if fluoride is to eliminate cavities, then we should try to find ways to eliminate cavities. There is no such thing as being against fluoridation. The issue is how to eliminate cavities. If it can be done in other ways, without exposing 80 per cent of the population to what is conceivably a series of relative unknowns in terms of overall fluoride ingestion from air, food, water, etc, then it should. The Navy is developing other ways. Other groups outside the country are. The problems is, if there is a hardening of the intellectual arteries on this issue, it becomes a subject upon which no rationale nor scientific discussion can be deployed. We are not going to find the answers."

Nader charged that "pseudo-scientific handling of the problem by the Public Health Service is indicated by one outstanding point: PHS never has responded to any scientist—whether of the stature of Barry Commoner, Washington University Law School, or anyone else—on the question, 'Do you have data about total fluoride ingestion from all sources, products, etc.?'

"If they don't have the data and are making no attempt to get it, they are performing an article of faith rather than of science, and when it comes to a public health measure, we'd better have more science and less faith. A serious and immediate reevaluation of the fluoridation theory is in order."

Sources of the chemical are now far more extensive than the average person realizes. Fluoride pollution is involved in some 50 different types of industries. And research projects in Canada and the United States have established that a person may ingest up to 5 mgs of fluoride daily from food and beverages in a fluoridated area, alone.

This is considered to be in the toxic range by the very authorities who continue to advocate public water fluoridation, and who admit that water fluoridated at 1 ppm "poses no safety problem if it is the only source of added fluoride." (Letter from HEW, May 31, 1968). This is obviously an impossible proviso in view of the steadily-proliferating problem of total fluoride exposure from multiple sources. There is no longer a question of fluoride deficiency—a fluoride excess is now the name of the game.

As reported in a UPI story, Nader called on young people to "find constructive self-expression through action to achieve reforms." And "the average citizen should support those doing such a job. No longer can citizenship responsibilities be delegated. No longer can we look to ideology or charisma to do it—sweat and strain was needed. It's a myth that individuals can't change conditions."

COMMUNITY WATER FLUORIDATION AND TOTAL FLUORIDE INTAKE

Viron D. Diefenbach, D.D.S., Assistant Surgeon
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In determining the fluoride level for drinking water which will have optimal dental health benefits but no adverse effects, the intake of fluoride from dietary sources has been taken into account. Studies have shown that the average diets of children and adults provide from one-fifth to one-half milligram of fluoride per day.[1-6] Further information on adult dietary fluoride intake is being obtained in a current Public Health Service-supported study. Atmospheric fluoride has been found to contribute relatively little to human intake (maximum: 0.046 milligram per day).[7-11] The available fluoride from pharmeceuticals, other than from those formulated as fluoride supplements for specific and known therapeutic use, is negligible.[12]

Because fluorides occur so commonly as natural constituents of water supplies, research scientists have had a great natural laboratory in which to work for several decades.[13-20] Studies of large numbers of long-time residents have been made in areas of the United States having naturally fluoridated water with up to 8 parts per million or more fluoride. In these areas, the water was used for drinking, cooking, and food processing. These studies include ten-year medical investigations of large groups of individuals, roentgenologic surveys for bone changes, postmortem examinations and chemical analyses of tissues, and metabolic assessments.[21-32] Extensive research also has been done using laboratory animals.[33-34] Health statistics in high-fluoride and low-fluoride areas have been compared.[35-36] The findings from these studies have provided consistent evidence that, in addition to all food and ambient sources of fluoride, humans may daily ingest water having up to at least eight times the amount of fluoride provided by optimally fluoridated water without adverse effect other than mottling of tooth enamel. Mottling, however, does not result from the use of optimally fluoridated water.[37-39]

The Food and Nutrition Board of the National Research Council has stated that fluoride is a normal constituent of all diets and is an essential nutrient (1968).[40] The American Institute of Nutrition has recognized fluroidation as a safe, effective, and low-cost means of improving nutrition.[41] The U. S. Department of Agriculture Extension Service regards fluoridation as an important community health benefit.[42] Each of these organizations is directly concerned with proper nutrition; each endorses community water fluoridation.

In recognition of the dental benefits that accrue from fluoridation--benefits which continue in adult life[43-45]--the United States Army, Navy and Air Force provide fluoridated water at all bases where children are in regular residence.[46-48] For the military personnel who come to the bases at an age when water fluoridation is not effective, the Armed Forces have a dental preventive program which includes the clinical application and personal use of fluorides.[49-51]

Dental researchers who are exploring new techniques for combating tooth decay are not seeking to supplant water fluoridation. Rather, their successes will provide decay resistance for persons who have not had the protective benefits of water fluoridation and possibly provide some additional resistance for those who have.[52-61] However, not all of the new decay preventive methods envisioned will be adaptable to public health.[62]

The policy of the Public Health Service on fluorides and fluoridation is founded on extensive scientific knowledge. The Service makes every effort to develop, obtain, and evaluate current relevant information by supporting research, by reviewing current scientific literature and the popular press, and through interdisciplinary contacts with other governmental and professional organizations. The Service also makes every effort to share what is learned through these mechanisms with interested organizations, institutions and individuals.

Fluoridation has undergone a nearly constant process of reevaluation since its inception. Detailed reports have been published on all aspects of fluoridation from cities in the United States and other countries that have been fluoridating for 25 years, and from others with extensive but shorter

experience.[63-64] Publications of the National Council and the American Association for the Advancement of Science concerning the relationship of fluorides to dental health and general health appeared as early as 1942 and as recently as 1968.[4-40-65-70]

The accumulated dental, medical, and public health evidence concerning fluoridation has been reviewed and judged at various times by committees of experts and special councils of most of the world's major national health organizations. Their findings and conclusions are public information.[71-72] In several of the more than 30 other countries where fluoridation is practiced or planned, commissions have been appointed to obtain and review all information relevant to fluoridation and to make recommendations according to their findings. Some of these commissions made special efforts to seek out and consider the statements of both professional and lay critics of fluoridation. Such commissions reported to their respective governments in Great Britain in 1952 and 1962; in Canada in 1955 and 1961; in New Zealand in 1957; in Australia in 1954, 1963, and 1968; in Ireland in 1960; in South Africa in 1966; and in Norway in 1968.[73-83] In July 1969, the delegates to the World Health Organization of the United Nations, meeting as a body, considered the Director General's evaluatory report on water fluoridation.[84] They approved a resolution, co-sponsored by 37 nations, that embodied their findings and recommendations, which, like those of the other commissions, supported and encouraged fluoridation of community water supplies.[85]

The impressive body of information available concerning community water fluoridation and fluorides is constantly increasing and continues to support the validity of community water fluoridation as a safe and effective public health measure.[86] There is no evidential basis for questioning the medical safety, effectiveness, and practicality of community water fluoridation as a public health measure for preventing dental caries.

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

Refer To: PS, CPB-10
September, 1969

RELATIONSHIP OF AIR POLLUTION TO COMMUNITY WATER FLUORIDATION

Fluoride concentrations in ambient air (atmosphere) pose no problem for communities with water fluoridation.

Ambient fluoride concentrations are routinely measured at all of the National Air Sampling Network Stations. The data collected do not support claims of hazards from inhaled fluoride to people living in communities with fluoridated water supplies.

The following statement has been prepared by the National Air Pollution Control Administration:

> Assuming that the maximum fluoride concentration of approximately 2.0 micrograms per cubic meter, reported by the National Air Sampling Network was present continuously in the atmosphere of a city having 1.0 ppm fluoride in its water supply, intake of this atmospheric fluoride concentration could increase the total fluoride intake by only five percent. This figure was derived as follows: if an individual breathes 0.8 liters per breath at a rate of 20 breaths per minute for 24 hours per day and lives in an atmospheric fluoride concentration of 2.0 micrograms per cubic meter, he would absorb 46 micrograms of fluoride in one day. This assumes that 100 percent of inhaled fluoride was absorbed into the blood stream.

Simultaneously he would ingest 1000 micrograms of fluoride if he consumed one liter of water containing 1.0 ppm fluoride. Of the total intake of 1046 micrograms fluoride from these two sources, 46 micrograms (approximately 5 percent) would be contributed by inhalation. This small contribution would result only under conditions of continous and very high atmospheric fluoride exposure and under the unrealistic assumption of complete absorption of all inhaled fluoride.

Data reported by Edward J. Largent (A.M.A. Archives of Industrial Health 21: 318-323, 1969) and F. J. McClure and C. A. Kinser (Public Health Reports 59: 1575, 1944) give evidence for achievement of a metabolic balance in the human between total intake and total output of fluoride. This balance was achieved even in the presence of high levels of daily fluoride intake ranging from 3500 micrograms to 8000 micrograms. In the same article by Largent evidence is presented to show that when other sources of fluoride were controlled inhalation of high concentrations of particulate or gaseous fluoride resulted in a ready fluoride excretion closely related to the concentrations of fluoride in the inhaled air. This evidence supports the contention that fluoride concentrations in ambient air are unlikely to add to the total body concentration of fluoride in communities having fluoridated water.

Community Programs Branch
Division of Dental Health
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R-10-70

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

NATIONAL INSTITUTES OF HEALTH

Refer: PPB-22
March 1971

REPEAT

SWEDEN DOES NOT BAN FLUORIDATION

Opponents of fluoridation have again circulated information that Sweden has recently banned fluoridation. This is not true. The following are excerpts from a letter dated February 19, 1971, from The Swedish Dental Federation.

"To begin with, I would like to state, that the Board has not taken any action to ban fluoridation. These rumours are partly results of tendentious statements made by professor Arvid Carlsson, for which he has collected some criticism from the Director General of the Board.

"The real situation is, that we have by now in Sweden a law, which permits the different communities to demand from the National Board of Health and Welfare permission to add fluoride to their water supplies. The WHO resolution on water fluoridation, upon which Sweden has agreed, requests that the member countries should actively recommend water fluoridation. At the same time as the Board of Health and Welfare began to consider to take this further step, professor Arvid Carlsson started to write articles against water fluoridation in the newspapers. As professor Carlsson is a consultant to the Board of Health and Welfare as well as is professor Yngve Eriksson, the Board came in a difficult position. It was, of course, not easy officially to neglect one consultant in advantage of the other.

"So, the Director General of the Board arranged a conference on water fluoridation in June with some 40 experts on different parts of medicin (sic) and odontology. During this conference a great number of situations were discussed, in which one could eventually find a harmful effect of fluoride. In no case such effects were even made probable. On the contrary some speakers claimed an advantageous effect in cases of osteoporosis among old people. Professor Carlsson had to end his plead (sic) against water fluoridation by asserting that the epidemiological studies supporting water fluoridation were not new and accurate enough.

"The Director General had started the discussion by stating that it was not his intention that the conference should end in any decision or recommendation. He had arranged this conference, and intended to arrange a later one on other vehicles than water in order to get information on the latest research and opinions on water fluoridation before he decided upon the more activ (sic) recommendation.

"This later conference mentioned took place last autumn. It revealed mainly, that there are today no methods available that are as efficient as water fluoridation, although some interesting research work is going on for instance concerning immunisation.

"The Board of Health and Welfare is now preparing a document on water fluoridation, which is said to be ready towards the end of this year.

"It is absolutely not correct as is said in one of the articles cited by you that the Board of Health and Welfare has 'discovered that it had no really scientific basis for decission (sic) one way or the other'".

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This information supplements information contained in CPB-13, January 1970.

THE QUESTION OF ALLERGY TO FLUORIDE AS USED IN THE FLUORIDATION OF COMMUNITY WATER SUPPLIES

A request to the American Academy of Allergy has been made by the United States Public Health Service for an evaluation of the question of allergy to fluoride as used in the fluoridation of community water supplies. It was further requested that such an evaluation include a review of clinical reports on allergy to fluoride and express an opinion whether or not such reports constitute valid evidence of a hypersensitivity reaction.

The response to this request has been handled as follows:
Reports of allergic reactions have been reviewed. First, these reports were evaluated in an attempt to determine whether or not there is sufficient clinical or scientific information to classify any case of presumed fluoride allergy in one of the four major classes of hypersensitivity reaction (Type I-IV) (1). These immunologically mediated reactions are the anaphylactic or reaginic, the cytotoxic, the toxic complex and the delayed-type of reactivity (1). Second, the reports were evaluated to determine whether or not there was sufficient clinical evidence to support the possibility that intolerance or allergy to fluorides might occur as one of the less-well understood types of drug reactions that may or may not be immunologically mediated (2).

The reports of fluoride allergy reviewed (3, 4, 5, 6, 7) listed a wide variety of symptoms including vomiting, abdominal pain, headaches, scotomata, personality change, muscular weakness, painful numbness in extremities, joint pain, migraine headaches, dryness in the mouth, oral ulcers, convulsions, mental deterioration, colitis, pelvic hemorrhages, urticaria, nasal congestion, skin rashes, epigastric distress and hematemesis.

The review of the reported allergic reactions showed no evidence that immunologically mediated reaction of the Types I-IV had been presented. Secondly, the review of the cases reported demonstrated that there was insufficent clinical and laboratory evidence to state that true syndromes of fluoride allergy or intolerance exist.

As a result of this review, the members of the Executive Committee of the American Academy of Allergy have adopted unanimously the following statement:

> "There is no evidence of allergy or intolerance to fluorides as used in the fluoridation of community water supplies."

K. Frank Austen
M. Dworetzky
Richard S. Farr
G. B. Logan
S. Malkiel
E. Middleton, Jr.
M. M. Miller
Roy Patterson
C. E. Reed
S. C. Siegel
P. P. Van Arsdel, Jr.

February 18, 1971

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WATER FLUORIDATION SAFETY STATEMENT

From a critical review of the voluminous and steadily growing literature on the biological effects of inorganic fluoride, no evidence has been found of an ill effect of water fluoridation at 1 ppm in temperate climates. In the United States, there are over 10 million people drinking naturally fluoridated water at near optimal concentration or higher. These waters have been consumed by large numbers of people for many years. Therefore, an extraordinary and exceptional reliability is conferred on the safety of water fluoridation because nature in a sense has already made the demonstration in hundreds of communities where the drinking water naturally contains fluoride. Under controlled conditions as recommended by qualified public health authorities, the Society of Toxicology finds water fluoridation to be a safe measure.

Approved by the Council of the Society of Toxicology, Inc.*
October 30, 1968

* "Persons who have conducted and published original investigations in some phase of toxicology and who have a continuing professional interest in their field of research. (Toxicology is the quantitative study of the injurious effects of chemical and physical agents as observed in the alteration of structure, function, and response in living systems, including evaluation of safety.)" Encyclopedia of Associations, 1968.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

NATIONAL INSTITUTES OF HEALTH

Refer: PPB-30
July 1971

ALLEGED BAN BY F.D.A. ON USE OF FLUORIDE COMPOUNDS BY PREGNANT WOMEN

The policy of the Food and Drug Administration, first announced in October, 1966, does not forbid fluoride preparations to pregnant women.* It does forbid selling such preparations with representations, advertising, or labeling showing claims that such preparations taken during pregnancy will prevent dental caries in the offspring. The Administration has judged that there is insufficient evidence to support such a claim. There is no question of any adverse effect on the mother or child. Procedures for obtaining authorization for further use of such preparations in clinical studies are also presented, indicating that there is not a "ban" on ingestion--only on commercial sale with claims of benefit.

The inadequacy of evidence of the usefulness of prenatal fluoride preparations does not in any way detract from the proven effectiveness of childhood consumption of optimally fluoridated water in providing a lifetime of better dental health through reduction of tooth decay.

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*U. S. Food and Drug Administration (Commissioner): "Oral prenatal drugs containing fluorides for human use," Federal Register, Volume 32, No. 55, March 22, 1967 (Title 21, chapter 1, subchapter A, part 3).

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

FLUORIDATION AND THE USE OF FLUORIDATED WATER IN ARTIFICIAL KIDNEYS

Recently questions have been raised about the use of fluoridated water in artificial kidneys. The Public Health Service would like to issue some facts relative to the use of water fluoridation as a public health measure and the use of water containing fluoride and other elements in artificial kidneys.

Consumers of public water supplies enriched with minute quantities of fluoride in order to prevent tooth decay should not be misled by news articles which mention medical problems that may arise from using tap water in the artificial kidney. There is no relationship between the daily consumption of fluoridated water and the use of such water in artificial kidneys for the treatment of patients with total kidney failure.

The National Institute of Arthritis and Metabolic Disease (NIAMD), National Institutes of Health of the Public Health Service is responsible for research related to the use of artificial kidneys. The NIAMD estimates that 1800 persons in the United States depend upon "hemodialysis" by artificial kidney equipment for the preservation of life. These are persons who have suffered criticial failure of natural kidney function through disease or accident. In hemodialysis, the blood of the patient with kidney failure is passed through a unit containing permeable tubing or membranes immersed in a water solution of special composition so that blood impurities will be removed. During this process, there is also transfer of dissolved substances from the water

solution into the blood. The dialysis techniques that have been developed permit patients to continue such treatments for years.

Under average circumstances such a patient's blood is "washed" in an artificial kidney two or three times a week for from 6 to 14 hours. In this process, in most cases, about 300 quarts of water to which helpful chemicals have been added are used to purify the patient's blood during a dialysis session. Thus the patient's bloodstream is exposed to tremendous amounts of water each week (which amounts in most cases to about 900 quarts). In many parts of the country it has long been necessary to purify the local tap water before using it in artificial kidneys in order to remove iron, calcium, magnesium, and other natural or added solutes before its use in dialysis. Such purification may be accomplished by distillation or by passing the tap water through a special device, not unlike a water-softener, which "deionizes" it. In the United States the overwhelming majority of dialysis treatments are given in special hospital centers, and most of these are using such specially purified water for their artificial kidneys.

The desirable fluoride content of water to be used in dialysis has not been finally determined. Some clinicians have suggested that a small quantity of fluoride may counteract to a degree, undesirable bone demineralization that occurs in patients with kidney failure. There are also some indications that the absorption of fluoride during dialysis from the approximately 900 quarts of water used each week, an amount of water 50 to 100 times the amount of fluid consumed by the average person,

can result in increased storage of fluoride in the skeleton. Because various solutes may be absorbed from the water as it is normally supplied during long term dialysis, most water used in dialysis should be deionized.

It should be pointed out again that the need to process some water supplies before therapeutic use in large quantities in artificial kidneys has no bearing on the ingestion by anyone of optimally fluoridated water from community water supplies, recommended by health authorities as a medically safe procedure for the reduction of dental caries.

The United States Public Health Service endorses water fluoridation as a safe and effective public health measure and urges all communities to make its benefits available to people at the earliest possible time.

William H. Stewart

William H. Stewart, M. D.
Surgeon General

March 1969

LEHIGH UNIVERSITY,
COLLEGE OF ARTS AND SCIENCES, DEPARTMENT OF BIOLOGY,
Bethlehem, Pa., March 16, 1970.

DR. FREDERICK J. STARE,
Harvard University School of Public Health,
Department of Nutrition,
Boston, Mass.

DEAR DR. STARE: Dr. Wm. Gross sent me a copy of your letter concerning the addition of fluorides to drinking water now being considered by some as a source of pollution. I have been involved in battles against water pollution for a half century. I have worked on biological surveys of inland waters for many years and I am quite aware of the different types of water pollution and their effects.

By no stretch of imagination can I or anyone else, rightly claim that the additional of one part per million of sodium fluoride or other fluorides to drinking water be considered a form of pollution. The word pollution comes from the Latin word "polluere" which means to make dirty. In general this literal meaning of the word pollution is satisfactory but in some cases the meaning must be expanded. The escape of phosphates into lakes and rivers from modern detergents does not make the receiving waters dirty but they do enormously increase the abundance of blue green algae which overgrow themselves, die, decay, disintegrate and foul water devastatingly. In general pollutants disrupt the normal aquatic biota, or act as actual poisons or in some way make the water unsuitable for some other use. The addition of 1 ppm of fluoride to the water does none of these. There is no evidence at all that the addition produces any harmful changes in the aquatic biota (plants and animals.)

The addition of fluoride may actually make the treated water more productive. Many animals as well as man need fluorides in the production of tooth enamel and strong bones. Some 450 million years ago some ancient fishlike creatures learned the trick of extracting fluorides and some other mineral salts from sea water, combining them and precipitating them as apatite mineral on the surfaces of scales. Later in the history of life on earth some of these enamel covered scales developed into enamel-covered teeth in the mouths of sharks and other fishes. Amphibians, reptiles (with the exception of turtles, ancient birds (but not modern)) and our own group the mammals followed. The ancient ability of enamel production on teeth has great survival value and has withstood the test of time.

Ancient sharks teeth, 50 million years old, dredged up from the ocean bottom or found in fossil deposits show beautiful, shiny enamel coverings and a cutting tooth edge as sharp as it was the day the shark died. The original method of enamel production invented as a natural process many millions of years ago has never been improved upon and there is no substitute for it. It depends upon the availability of the needed minerals including fluoride. No fluoride, no hard protective enamel.

We must always turn to Nature for understanding of life and living processes. To call the addition of the necessary amount of fluoride to allow the young animal, be it a chipmunk, a cow or the kid next door, to form its natural protective enamel on its teeth, a form of pollution is ridiculous. Were the waters of the earth polluted 450 million years ago when the process evolved?

Sincerely,

F. J. TREMBLEY,
Professor of Ecology.

EFFECTS OF SODIUM FLUORIDE ON BONE; APPLICATION TO OTOSCLEROSIS AND OTHER DECALCIFYING BONE DISEASES

3

Shambaugh, G. E., Jr., and Petrovic, Alexander: "Effects of sodium fluoride on bone; application to otosclerosis and other decalcifying bone diseases," Journal of the American Medical Association 204:969-73, June 10, 1968. (Abstract from American Journal of Orthodontics 54:794, October 1968)

The authors conducted experiments on the effects of sodium fluoride on bone with a view to its possible use in certain decalcifying diseases of bone, including the disease peculiar to the labyrinthine capsule known as otosclerosis. These experiments were prompted by the report of the use of large doses of sodium fluoride for postmenopausal osteoporosis, corticoid-induced osteoporosis, and osteitis deformans (Paget's disease).

A sufficient intake of fluoride in early life is necessary for the formation of caries-resistant teeth. In the later years of life, a higher intake of fluoride appears to be necessary to maintain normal calcification of bone. Experimental studies indicate that the principle action of fluoride on bone is a slowing of the resorptive phase of the remodeling process, with an additional promotion of calcification. For the prevention of osteoporosis induced by heparin, cortisone, or fracture, previous medication with large doses of sodium fluoride over a long period of time appears to be effective. When one of these forms of osteoporosis or localized osteoporosis of the labyrinthine capsule due to active otosclerosis develops in a patient not so protected, the favorable effect of fluoride appears to be enhanced by simultaneous administration of phosphates, as indicated by experiments still in progress.

The time may not be far distant when fluoride will be recognized as essential to health and when, in addition to being added to the water supply, it will be prescribed for older persons to prevent senile osteoporosis and frequent fractures.

III. 1969 WHITE HOUSE CONFERENCE ON FOOD, NUTRITION AND HEALTH URGES FLUORIDATION

Excerpt from 1969 White House Conference on Food, Nutrition and Health Final Report published in 1970.

Dental Health and Diet

"Dental health of adults is determined to a large extent by the nutrients ingested, personal oral hygiene, and preventive dental services experienced during infancy and childhood. For example, if a child is provided a balanced diet, devoid of excess sugar but containing fluoride in optimal amounts, dental caries experienced in a lifetime will be minimal.

"The fluoridation of public water supplies with 0.7 to 1.2 ppm of fluoride has been the most effective and economical means yet developed to prevent dental decay in masses of people. It has been shown to be completely safe. Yet opposition by antifluoridationists has deprived about 75 million people who are served by central water supplies of these benefits.

The Panel recommends:

1. That the Federal Government and all relevant State and local agencies, as well as professional groups, continue to give highest priority in supporting and promoting fluoridation of commercial water supplies. Further, in order to expedite the implementation of fluoridation in small communities that may be financially hard pressed, there be established a Federal grant-in-aid program to provide funds for the installation, initial operation, and maintenance of fluoride dispensing equipment.

2. That in areas lacking central water supplies, which applies to more than 40 million people, school water supplies, ingested on a 25 hour weekly basis, should be fluoridated with higher levels of fluoride, for example 3 to 5 ppm. This is equivalent to 1 ppm of fluoride in the central water supply. There is no evidence that such a practice will result in mottled tooth enamel

3. That a feasibility study be made on the practicality and effectiveness of providing fluoride in some other vehicle, such as lozenges or tablets, to children where neither fluoridation of central or school water supplies can practically be accomplished."

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Fluoridation for All: a National Priority

(By Roger O. Egeberg, M.D., Assistant Secretary for Health and Scientific Affairs, Department of Health, Education, and Welfare)

(After 24 years, little more than half of our population using public water supplies has fluoridated water. The nation's top health officer tells why fluoridation has not been implemented in some areas and why it should.)

A generation of young people in many communities has been raised on fluoridated water, with less tooth decay, more attractive teeth, and less malocclusion caused by early loss of teeth. This fluoridation generation will have better dental health for a lifetime.

The first priority in improving the dental health of this nation is to bring the benefits of fluoridation to all children. Our unmet dental needs are beyond the capacity of the dental profession to treat, and beyond the nation's private and public budgets to finance. Millions of dollars are spent every year on repairing the ravages of dental disease, through Medicaid, Head Start programs for children, neighborhood health centers, and other public and private programs. Yet, as things are now, treatment cannot catch up with the needs, and the needs grow relentlessly, particularly in areas where fluoridation is not yet in effect.

Fluoridation is not the total answer to control of decay, but it must be the basis of any response to the national dental problem. Fluoridation holds particular promise for the poor who do not have access to other elements necessary for good dental health—regular dental care, good nutrition, and proper home hygiene.

Prevention is imperative, and there is no prevention that can make a greater impact on our total dental needs than fluoridation of all public water supplies.

The benefits of fluoridation are now available to 88 million Americans in 7400 communities and to an estimated 30–40 million people around the world from Ireland to Russia to Australia to the Ryukyu Islands. Most of the major cities in this country routinely add fluoride to their water supplies. Seven states have enacted legislation making fluoridation mandatory and similar legislation is pending in other states.

The measure is approved by the American Medical Association, the American Dental Association, the Public Health Service, and every other qualified health and scientific organization in this country. In 1969, fluoridation was endorsed by the World Health Organization in a resolution that recommended the adoption of flouridation by member states. Flouridation is now in operation in more than 30 countries and is in extensive use in Ireland (where it is compulsory), the Netherlands, Canada, Australia, Czechoslovakia, Chile, Brazil, and Hong Kong.

This approval is based on proof of the safety and effectiveness of fluoridation which is demonstrated in literally thousands of studies on every aspect of its use. Fluoridation's safety has been proved many times over. The cautious few who have been waiting for a final judgment can be assured that the time of testing is past. Now is the time for action.

New impetus for prompt action comes from the documentation of economic reasons for instituting the measure. It has been reported from the landmark research project in Newburgh and Kingston, New York, that the cost of providing all necessary dental care to children aged five and six was twice as much in fluoride-deficient Kingston than in fluoridated Newburgh. The cost of regular maintenance care was also twice as much. The dentist chair-time needed to provide dental care in the nonfluoridated city was just about one and one-half times that needed in the fluoridated city.

Fluoridation's savings for public care programs were reported from Head Start projects providing dental care for preschool children in California. The average treatment costs per child in fluoridated San Francisco and Vallejo were $26.35 and $27.77, compared to $70.01 and $85.58 in the nonfluoridated areas of Berkeley and the San Joaquin Valley. Dental insurance administrators in California have reported that insurance claims for children are consistently less in fluoridated San Francisco than in fluoride-deficient Los Angeles.

These economic facts add a new dimension to fluoridation's importance as public and private spending for dental care increases dramatically with still less than half the population getting dental care in any year.

Today, only a little more than half of our population on public water supplies has fluoridated water. Seven states have legislation requiring fluoridation. With so much to gain, why isn't fluoridation implemented in more areas? In the face of reason, research, experience, and qualified scientific judgement, there continue those who work to defeat fluoridation wherever and whenever they can.

Fluoridation's history in this country and others has clearly disproved the claims of the opponents. Adding fluorides to the water supplies of Grand Rapids, Michigan; Newburgh, New York; and Brantford, Ontario, in 1945 marked the beginning of fluoridation only as a controlled public health measure. Fluoridation has existed in nature for untold generations.

The role of fluoride as a natural protection against tooth decay was discovered in the 30's, when fluoride in the water was finally identified as the cause of the mottling of teeth which was common in high-fluoride areas of Colorado and Texas. Dentists had observed that the stained teeth were curiously resistant to decay. Long, careful, epidemiological research was carried on during the thirties to determine the exact relation of different degrees of natural fluoride in the water to decay and to mottling. The United States presented a vast natural laboratory for this research because of the wide extent of natural fluoridation. In 1969, it was reported that more than eight million people in 2630 communities in 44 states have water supplies naturally containing enough fluoride to have a significant effect on tooth development.

The trace of fluoride which confers the maximum prevention against decay with no danger of unsightly mottling was determined to be about one part fluoride per million parts of water. The next step was to add the optimum one ppm of fluoride to the water supplies of Grand Rapids, Newburgh, and Brantford to measure the effects of controlled fluoridation on tooth decay. It cannot be emphasized enough that when these test projects began, it had already been established that fluorides in water, even at levels much greater than one ppm, were not harmful to health. Studies of people who for generations had been drinking water with as much as eight ppm of fluoride found them to be healthy; the only adverse effect was the expected mottling of teeth. With fluoridation controlled at the optimum concentration, there is no mottling of teeth.

The results of these first fluoridation projects have since been duplicated all over the United States and throughout the world. From Watford, England, to Karl-Marx Stadt in East Germany, Tiel in the Netherlands, Curico in Chile, and Hastings in New Zealand, the findings have been the same—a dramatic reduction in the number of decayed, missing, and filled teeth in children and a dramatic increase in the number of children with no decay at all.

Children who have had fluoridated water from birth will have the greatest protection against tooth decay. Children exposed to fluoridated water at later ages will have less benefits. Longer term studies in Brantford and in Evanston, Illinois, have traced these dental health benefits through the teen-age years. We know from examination of the people in near-optimal naturally fluoridated communities that the improvement in dental health will last throughout life.

In its early history, fluoridation moved fast. Community after community was quick to adopt this benefit. But the opponents began to organize, to print their leaflets, to spread their antiscientific gospel, to contact their counterparts in other communities, and to turn to the polls. As a controlled public health procedure, fluoridation was consistently successful. Through the efforts of its opponents, fluoridation became a political issue and in politics it has been less than fully successful.

Why do people oppose fluoridation? To my certain knowledge, all the other questions relating to fluoridation have been answered satisfactorily by scientific research. The reasons for opposition are studied with diligence and even fascination by the social scientists, but no consensus has been reached.

As an observer of fluoridation experience, I distinguish between two general types of people who vote against the measure. There are the activists who strongly oppose fluoridation for a variety of reasons and who write, travel, quote, print, and testify to keep the measure from others. Then there are the passive voters who give a low priority to dental health and have little information on fluoridation. They are easily confused or alarmed by the scare propaganda of the activists. When in doubt, they vote against fluoridation.

The activist antifluoridationists range from the paranoid through the profit or publicly-oriented to the genuinely well-intentioned but misguided who are looking for a cause to make their lives more interesting. Many of those who oppose fluoridation at this stage are beyond accepting the scientific facts of the matter.

Among the active antis are individuals and organizations who oppose other scientific advances. There are still a few dissenting physicians and dentists, although I suspect some of these may oppose fluoridation for political or philosophical rather than scientific reasons. Some scientists reject the vast preponderance of evidence supporting fluoridation and advance their own personal studies.

Other opponents object on principle to what they see as tampering with their "pure water," unaware that water is routinely processed with as many as a dozen chemical substances to make it safe and drinkable. Others object to fluoridation as an example of unnecessary and unwarranted government action, although the courts have consistently upheld fluoridation. Even if these individuals are few in number they know how to make their voices heard, and they can turn a fluoridation campaign into a political and emotional controversy. The result is often the loss of fluoridation for a community.

No political losses or even political victories can alter the standing of fluoridation as a scientific measure, but such actions can win or deny the benefits for children. We can no longer afford to deny fluoridation for the many because of the opposition of a few. The crisis of health care in this country makes it absolutely necessary for us to make the most of our existing health resources.

Dentist time spent filling the teeth of children in fluoride-deficient communities is a grossly inefficient use of scarce dental manpower. It is wasteful to spend public funds for repair of dental needs which could have been prevented by fluoridation. It is tragic to doom underprivileged children to a lifetime as dental cripples because they have access neither to dental care, good nutrition, toothbrushes, nor fluoridation.

The state of dental need in this country and the status of fluoridation make it perfectly clear that the first national priority in dental health should go to fluoridation of all public water supplies. I urge public officials at all levels to take prompt action to implement fluoridation. In so doing, they will be acting in the best interests of the men, women, and children they represent.

Time and cost factors to provide regular, periodic dental care for children in a fluoridated and nonfluoridated area: final report

David B. Ast, DDS, MPH
Naham C. Cons, DDS, MPH
Sydney T. Pollard, DDS, MPH
Joseph Garfinkel, MPH, Albany, NY

A six-year study, designed to compare time and cost factors involved in providing regular dental care to children in fluoridated and nonfluoridated areas, indicates the advantages of a public health caries-prophylactic procedure. Cost of dental care for children who drank fluoridated water from infancy was less than half that for those who did not. Less time was needed for dental care of children in the fluoridated area. Detailed comparison shows the extent of economic benefits and improved dental health resulting from this procedure.

Certain aspects of the water fluoridation process have been well studied and documented. Major studies have been concerned with the prevention of both the onset and the progression of dental caries,[1-4] with safety,[5] and with the cost to the community to purchase and maintain equipment.[6,7] These major studies have shown that waterborne fluoride ingested at the optimum concentration, beginning during the years of tooth development, will prevent the onset of dental caries by approximately 60% and that this benefit continues into adult life.[8,9] Because fewer teeth will succumb to caries, fewer and less extensive fillings will be required, and fewer teeth will have to be extracted. In addition, these studies, combined with more than 20 years of practical experience, have demonstrated that the process is safe. It is also clear from these studies that the cost is low.

However, by the early 1960s, after 15 years of experience with water fluoridation, very little emphasis had been given to potential benefits that may accrue from fluoride caries prophylaxis, in terms of costs for dental care. There were no documented reports of controlled studies to indicate the extent of the dollar savings in the cost of dental care as a result of this public health caries-prophylactic procedure. If such economic benefits could be documented, they would have positive implications for individuals, families, and the community.

In addition to the need for documenting the costs for dental care related to fluoridation, there was another concern. The problem of dental defects due to caries, although reduced by fluoridation, still remained. Unless regular, periodic dental care starting early in life is also provided, children and adults will continue to have accumulated dental defects and their concomitant results. Therefore, in 1962 this study was designed to permit detailed comparisons of the actual time and cost factors involved in providing regular, periodic dental care to children who have ingested waterborne fluorides from birth with those who have not had the benefit of fluoridated water.

In two previous papers, preliminary results of this study were presented. The initial report[10] was based on the first two years of the study and indicated that the cost for both initial and incremental care was approximately twice as high in the nonfluoridated area. The second progress report[11] after three years of study showed the same trend of reduced time and cost for dental care. This final

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report after six years of experience supports the previous findings that a community water fluoridation program will considerably reduce the cost of dental care for children; in addition, it will reduce the hazard of tooth loss and keep the cost for annual treatment within reasonable limits.

Methods

Since 1945, the water supply in Newburgh, New York, has been fluoridated to a concentration of 1 to 1.2 ppm; the water supply in Kingston, New York, has remained at a fluoride concentration of about 0.05 ppm.

A group of 5- and 6-year-old children in each city was selected for study. Selection was based on residence in the poorest socioeconomic areas of the cities and parental permission to participate. In addition, the children in the Newburgh group must have lived continuously in that city from birth. The children included in the initial treatment groups in 1962 were pupils in the kindergarten and first grades of six Newburgh and three Kingston schools.

The initial groups of children were admitted to the study during the school year 1961-1962 and new first grade groups in each city were admitted each year thereafter through the school year 1965-1966. At the time a child was admitted to the study, all accumulated carious defects were corrected. Annual routine incremental care was then given each child through the school year 1967-1968, at which time the children were 8 through 11 years of age. All dental treatment was provided in a modern, fully equipped mobile dental trailer staffed by a full-time dentist and dental assistant. All children were given a complete clinical examination including bitewing radiographs and a prophylaxis at their first visit each year. All examinations were made without reference to previous records. Services rendered included all those usually provided by a dentist in his office, except prosthetic or orthodontic services. A detailed record was kept of each dental examination, including the types of services rendered. The amount of chair time needed to provide routine dental treatment for both initial and incremental care was also recorded from the time the child was seated until he was dismissed after each session.

Although a total of 827 children 4 through 8 years of age was admitted to the study, this paper reports on only 766 children comprising a series of 5- and 6-year-old cohorts followed throughout the study years. Since the number of children 4, 7, and 8 years old was so small (61), data on them were not analyzed.

Table 1 ■ Number of 5- and 6-year-old children, by color and sex, who received initial care, 1962 to 1966.

	Newburgh	Kingston
Total	387	379
White	253	284
Male	126	146
Female	127	138
Nonwhite	134	95
Male	65	50
Female	69	45
5-year-olds	205	197
White	135	139
Male	71	66
Female	64	73
Nonwhite	70	58
Male	28	32
Female	42	26
6-year-olds	182	182
White	118	145
Male	55	80
Female	63	65
Nonwhite	64	37
Male	37	18
Female	27	19

Results

■ *Initial care:* Of the 766 5- and 6-year-old children admitted to the study (Table 1) during the period 1962 to 1966, 253 Newburgh children (65.4%) and 284 Kingston children (74.9%) were white. The differences were statistically significant ($P<0.05$ at each age). This racial imbalance was predictable from documented differences in racial composition in the 1960 US census,[12] and adjustments were made for white and nonwhite groups according to this census. There was no significant imbalance between sexes ($P>0.50$ at each age).

Table 2 illustrates accumulated dental caries experience for the series of 5- and 6-year-old cohorts selected for study. The assumption that few of these children would have received dental care before entrance into the study was shown to be correct when it was determined that more than 85% of df and DMF teeth diagnosed at initial examination in each city required treatment. In Newburgh, 41% of the children had no caries experience on

Table 2 ■ Dental caries experience of initial care groups of 5-and 6-year-olds, by color, 1962 to 1966.

Age	Color	No. of children	% of caries free children	DMF teeth per child	df teeth per child	% df teeth requiring treatment
			Newburgh			
5 and 6	Total	387	40.8	0.04	2.2	85.7
	White	253	39.4†	0.04†	2.2†	84.7†
	Nonwhite	134	53.0†	0.01†	1.8†	94.8†
5	Total	205	43.0‡	0.00	2.1‡	86.3‡
	White	135	41.5	0.00	2.2	85.5
	Nonwhite	70	55.7	0.00	1.6	92.7
6	Total	182	38.6‡	0.09‡	2.2‡	85.1‡
	White	118	37.3	0.09	2.2	83.8
	Nonwhite	64	50.0	0.05	2.1	97.0
			Kingston			
5 and 6	Total	379	16.7	0.22	5.0	88.3
	White	284	16.3†	0.22†	5.1†	87.5†
	Nonwhite	95	20.3†	0.22†	3.9†	94.4†
5	Total	197	19.4‡	0.02‡	4.9‡	88.3‡
	White	139	19.4	0.02	5.0	87.4
	Nonwhite	58	19.0	0.02	3.7	96.2
6	Total	182	14.0‡	0.39‡	5.2‡	88.2‡
	White	145	13.1	0.38	5.3	87.7
	Nonwhite	37	21.6	0.46	4.2	92.4

Adjusted for age and color according to New York state 1960 census population of 5- and 6-year olds.
† Adjusted for age, according to New York state 1960 census population of 5- and 6-year-olds.
‡ Adjusted for color, according to New York state 1960 census population at each age

Note: Percent DMF teeth requiring treatment is not shown because of small numbers of DMF teeth at each age color combination. More than 90% of the DMF teeth in each city required treatment.

Table 3 ■ Mean number of services* per child† (initial and annual incremental,‡ 1962 to 1968) for children 5 years old at initial examination in 1962.

Examination	Age	No. of children	Restorations				Extractions
			Total	One surface	Two surface	Three or more surfaces	
			Newburgh				
Initial	5	205	1.62	0.72	0.83	0.07	0.15
2nd	6	148	0.77	0.24	0.52	0.02	0.06
3rd	7	171	0.90	0.20	0.65	0.04	0.05
4th	8	127	0.55	0.16	0.34	0.04	0.09
5th	9	58	0.93	0.24	0.70	0.00	0.08
6th	10	43	0.44	0.13	0.31	0.00	0.24
			Kingston				
Initial	5	197	3.41	0.90	2.09	0.42	0.34
2nd	6	152	1.43	0.40	0.98	0.05	0.19
3rd	7	143	1.69	0.50	1.07	0.11	0.16
4th	8	102	1.50	0.54	0.88	0.09	0.11
5th	9	64	1.44	0.53	0.82	0.10	0.19
6th	10	29	1.31	0.62	0.59	0.10	0.16

* Excluding clinical examinations, radiographs, and prophylaxis.
† Adjusted for color, using New York state 1960 census population at each age.
‡ Per child year for incremental care

initial examination, compared to 17% in the Kingston group.

The types of services required to correct dental defects are listed in Tables 3 and 4 for 5- and 6-year-olds in Newburgh compared to 5- and 6-year-olds in Kingston. In addition to those corrective services listed, all the children received a prophylaxis and had bitewing radiographs taken and evaluated before subsequent treatment. At the time of initial examination, the Kingston children needed an average of more than twice as many corrective services as the Newburgh children.

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Table 4 ■ Mean number of services* per child† (initial and annual incremental‡) for children 6 years old at initial examination in 1962.

Examination	Age	No. of Children	Restorations				Extractions
			Total	One surface	Two surface	Three or more surfaces	
			Newburgh				
Initial	6	182	1.87	0.85	0.91	0.11	0.33
2nd	7	133	0.90	0.34	0.53	0.03	0.12
3rd	8	160	0.58	0.12	0.41	0.05	0.10
4th	9	135	0.63	0.16	0.43	0.03	0.01
5th	10	67	0.41	0.15	0.23	0.03	0.09
6th	11	54	0.60	0.36	0.24	0.00	0.03
			Kingston				
Initial	6	182	3.88	0.91	2.40	0.58	0.61
2nd	7	151	1.61	0.61	0.92	0.09	0.19
3rd	8	141	1.67	0.52	1.04	0.11	0.15
4th	9	106	1.66	0.64	0.95	0.06	0.10
5th	10	64	1.00	0.43	0.58	0.00	0.20
6th	11	45	0.76	0.33	0.43	0.00	0.07

* Excluding clinical examinations, radiographs, and prophylaxis.
† Adjusted for color, using New York state 1960 census population at each age.
‡ Per child year for incremental care.

Comparison of the children in the two cities at each age shows that in Kingston, about 75% of the average number of restorations per child were compound restorations, whereas in Newburgh, only about 55% of the restorations per child were compound. In addition, at both ages 5 and 6 there were twice as many deciduous tooth extractions required per child in Kingston as in Newburgh. No child in either city had to have a permanent tooth extracted.

■ *Incremental care:* The incremental care data are also shown in Tables 3 and 4. The number of services required is adjusted to show maintenance needs over a 12-month interval between rescheduling. Some few children missed their second examination but were seen again at the third examination. This accounts for a larger number of children in Newburgh at examination 3 than examination 2. The rates for these children were adjusted, as for all children, on a 12-month interval basis. The average number of services per child year for incremental care is included in these tables. These data show that Kingston children consistently required more corrective services during each year of incremental care than did the same groups in Newburgh. In both cities the amount of maintenance services required was considerably lower than services required for initial care. The mean number of corrective services for each year of incremental care was reduced by at least 40% relative to the mean number of services required for initial care in both cities. However, it should be observed that in Newburgh the children required about half as many corrective services for incremental care as did the Kingston children.

The mean number of deciduous extractions per child year for incremental care was generally less than for initial care for both groups, although Kingston remained higher than Newburgh for this service. In both cities, no child required the extraction of a permanent tooth from the time he was admitted until the time he completed the study.

■ *Cost and chair time:* The costs were computed on a fee-for-service basis using the New York state maximum reimbursable fee schedule promulgated in 1966. This schedule provided $5 per surface

Table 5 ■ Mean cost* per child (per child year for incremental care years).

Examination	Age	Cost†	
		Newburgh	Kingston
5-year-olds			
Initial	5	$13.86	$33.73
2nd	6	6.85	13.65
3rd	7	8.55	15.90
4th	8	5.44	13.41
5th	9	8.62	13.30
6th	10	5.18	11.23
6-year-olds			
Initial	6	16.93	40.78
2nd	7	8.14	14.64
3rd	8	6.09	15.54
4th	9	6.19	14.26
5th	10	3.97	9.10
6th	11	4.41	6.34

* Adjusted for color, using New York state 1960 census population at each age.
† Cost is for corrective care, excluding costs for examination, prophylaxis and radiographs.

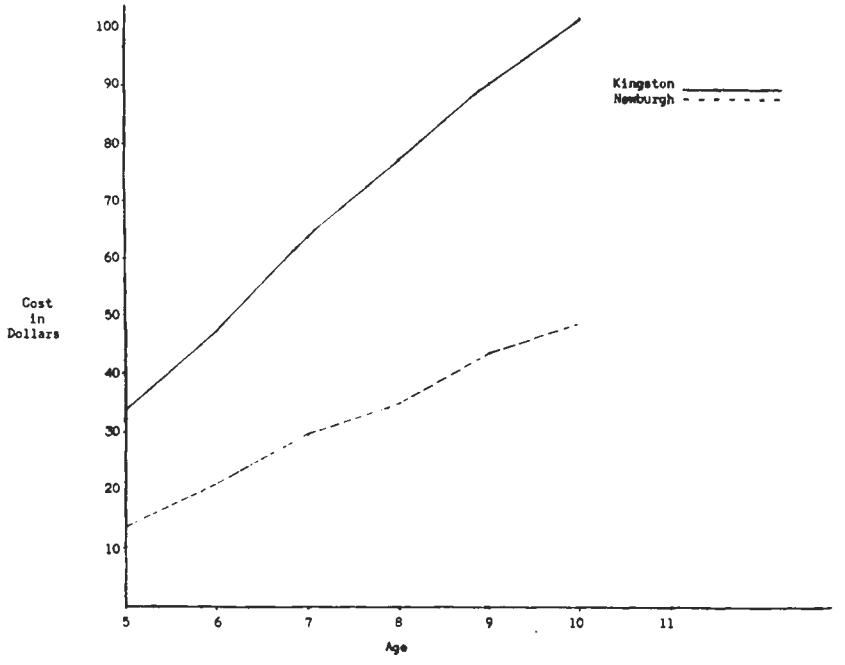

Fig 1 ■ Cumulative costs for dental services to children who started receiving care at age 5.

for restorations and $6 for each extraction. It is understood that fees change from year to year and vary according to locality. However, use of this fee schedule permits comparisons of the relative costs of an incremental care program in a fluoridated and nonfluoridated area.

Table 5 shows the mean cost needed to provide initial and incremental corrective dental care for the Newburgh and Kingston groups. The mean cost in Newburgh remains consistently lower than in Kingston throughout the study for both initial and incremental care. The mean cost for initial corrective care starting at age 5 was $13.86 in Newburgh compared to $33.73 in Kingston; at age 6 the costs were $16.93 and $40.78 respectively. Thus the cost of initial care was about 60% lower in Newburgh at both ages. For each of the incremental care years, the mean costs for both age groups were approximately 50% lower in Newburgh.

Figures 1 and 2 show the cumulative cost for initial and incremental care for children admitted at ages 5 and 6. The cumulative costs in the nonfluoridated area remained at least twice the cumulative costs in the fluoridated area over the six-year period for both age groups. As the program progressed, the dollar savings increased; at the end of six years the difference between the cost of care for children from the fluoridated city and nonfluoridated city is magnified.

The mean amount of chair time required to provide both initial and incremental care, for both cohorts is shown in Table 6. Although the working speed and habits of individual clinicians and the cooperation of the patient vary, this table offers comparative data in terms of professional time required to provide treatment in a fluoridated and nonfluoridated community. Chair time was recorded on the child's record by an electric time clock at the time he was seated in the dental chair and at the time he was dismissed. Chair time includes time for examination, prophylaxis, and bitewing radiographs as well as corrective care, because it was not possible to separate these items. Thus, for initial care groups, the children in Kingston required about 1.6 times as many minutes of chair time as did the children in Newburgh. The

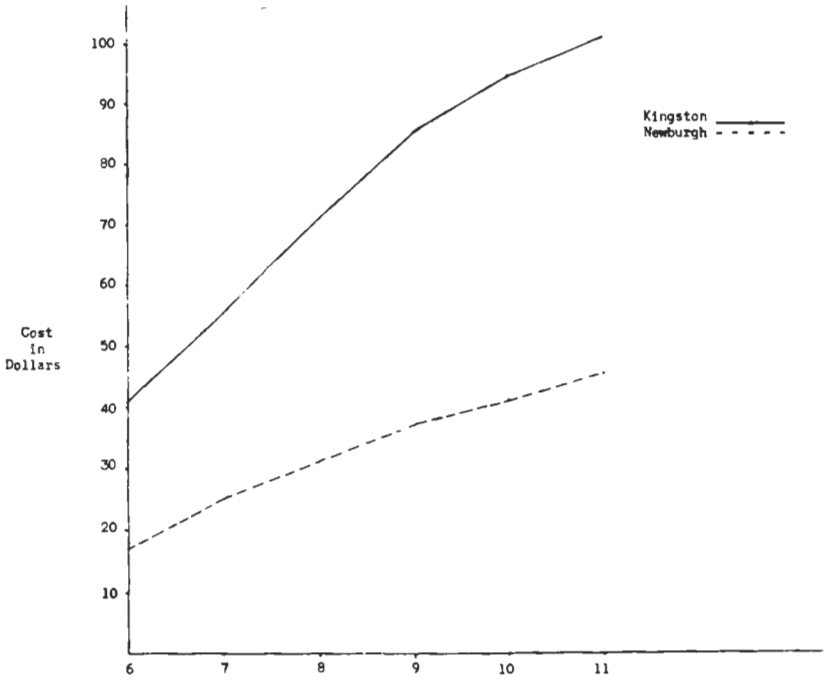

Fig 2 ■ Cumulative costs for dental services to children who started receiving care at age 6.

mean amount of time required to provide incremental care was consistently higher in Kingston for all age groups.

Discussion

Evidence continues to accumulate to give unequivocal confirmation that the ingestion of optimally fluoridated water during the years of tooth development considerably reduces the hazards of initial and progressive caries. This is demonstrated by the fact that among 387 Newburgh 5- and 6-year-old children, 157 were completely free of caries, whereas among 379 Kingston children of the same age only 63 were without caries. With regard to the progression of disease, at initial examination and in each incremental year the Kingston children required more compound restorations and more extractions than did their counterparts in Newburgh. This is reflected in the cost for corrective services and in the required chair time; costs were more than twice as high in Kingston and chair time was more than 1½ times greater.

A 1966 report from New Zealand on a one-year

Table 6 ■ Mean chair time* per child (per child year for incremental care years).

Examination	Age	Chair time (minutes)	
		Newburgh	Kingston
5-year olds			
Initial	5	41.5	71.5
2nd	6	21.8	32.2
3rd	7	22.7	38.8
4th	8	19.1	36.2
5th	9	27.0	37.4
6th	10	18.9	38.8
6-year olds			
Initial	6	62.3	93.6
2nd	7	26.3	36.4
3rd	8	17.5	34.6
4th	9	18.9	40.1
5th	10	17.0	30.2
6th	11	24.2	27.6

* Adjusted for color, using New York state 1960 census population at each age
† Includes time required for examination, prophylaxis and radiographs.

study of the effects of fluoridation on a dental public health program[13] gives additional evidence of the savings in both time and money resulting from community water fluoridation. After ten years of fluoridation in Hastings, the cost to the government (on a fee-for-service basis) for dental care rendered by private dentists to 13½- to 16-year-old children was half as much as comparable care in fluoride-free Gisborne. The services rendered to younger children aged 2½ to 13½ were provided by dental nurses in the schools. In Hastings the ratio of children treated per nurse was 690, whereas in Gisborne it was 475.

These data from New York state and from New Zealand are particularly significant today when the cost for accumulated dental care under the government-supported Medicaid program in New York state in 1968 reached more than $133 million.[14] It is clear that the benefits from fluoridated water and from regular periodic dental care starting early in life make this kind of program essential for reducing the hazard of tooth loss and its potential concomitant results, for economic reasons, and for conserving the limited professional manpower time so that more patients needing attention can get it.

Summary

A study was conducted in fluoridated Newburgh and fluoride-deficient Kingston to determine the cost and time required to provide regular, periodic dental care for children during a six-year period starting when the children were 5 and 6 years old. The study adds a new dimension to the benefits of water fluoridation. The cost of corrective dental care for children with lifelong exposure to fluoridated water is less than half of the cost for children in a nonfluoridated area; the cost of incremental care is just about half. As a result of regular incremental care in both cities there was no need to extract any permanent teeth. The chair time needed to provide examination, prophylaxis, and corrective care was about 1½ times more in the nonfluoridated area than in the fluoridated area.

This study was presented at the International Symposium on Fluoridation and Preventive Dentistry, 57th annual session of the Federation Dentaire Internationale and 110th annual session of the American Dental Association, October 12, 1969, New York city.

The services of Barnet Wachs, staff senior public health dentist who served as dental clinician from 1963 to 1968, are very much appreciated. Likewise, the services of Victor L. Chesser of the US Public Health Service, who was dental clinician for the year 1962-1963, are greatly appreciated.

Throughout the study, the staff enjoyed full cooperation from Harold Munson, superintendent of schools in Newburgh, and Wendell Hoover, superintendent of schools in Kingston, as well as from the principals and teachers in the schools in both cities.

Harold Weiss, supervising school dentist in Newburgh, was helpful in arranging details for the examinations in Newburgh. The practicing dentists in both cities were sympathetic, understanding, and cooperative.

The authors are members of the New York State Department of Health. Doctor Ast is associate director, Division of Medical Care Services and Evaluation; Doctor Cons is director, Bureau of Dental Health; Doctor Pollard is regional Public Health dentist; Mr. Garfinkel is associate biostatistician. The address is New York Dept of Health, 84 Holland Ave, Albany, NY 12208.

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Twenty-Second World Health Assembly—Resolution on Fluoridation and Dental Health

(Approved: July 1969, Boston, Mass.)

Having considered the report of the Director-General[1] on the fluoridation of water supplies presented in accordance with resolution EB43.R10;

Bearing in mind that dental caries is a widespread disease in many populations, and is becoming increasingly prevalent in many others;

Recalling that studies in several countries have consistently shown the prevalence of this disease to be markedly low whenever an optimal concentration of fluoride occurs naturally in water supplies;

Accepting the reports now coming from countries with experience of the procedure indicating that the adjustment of the fluoride content of water supplies to an optimal level is a practicable, safe and efficient public health measure;

Noting that other equally effective means are not available for conferring on whole populations the beneficial effects of fluoride on dental health;

Emphasizing that in the extensive scientific literature on the subject no valid evidence has been forthcoming of any ill effects on human health from the use of water supplies with an optimal concentration of fluoride;

Recognizing that several authoritative and independent enquiries conducted in a number of countries have all reached similar conclusions to the above; and

Recognizing further that for many populations the provision of potable water supplies is a first consideration.

1. Thanks the Director-General for his report;

2. Recommends Member States to examine the possibility of introducing and where practicable to introduce fluoridation of those community water supplies where the fluoride intake from water and other sources for the given population is below optimal levels, as a proven public health measure; and where fluoridation of community water supplies is not practicable to study other methods of using fluorides for the protection of dental health;

3. Requests the Director-General to continue to encourage research into the etiology of dental caries, the fluoride content of diets, the mechanism of action of fluoride at optimal concentrations in drinking water and into the effects of greatly excessive intake of fluoride from natural resources and to report thereon to the World Health Assembly, and

4. Requests the Director-General to bring this resolution to the attention of all Member States.

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[1] Document A22/P&B/7.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE

NATIONAL INSTITUTES OF HEALTH

Refer: PPB-29
July 1971

$100,000 SO-CALLED REWARD OFFER -- A GIMMICK

For years a so-called reward offer has been circulated by the opponents of fluoridation. The fact that the reward has not been collected has been used by them as substantiating their claims. Recently, a flyer has appeared in which the reward has been increased. The clever wording of this reward offer clearly exposes it to be an uncollectible gimmick. Examples of its inherent fallacies follow:

(1) The wording asks proof that fluoridation "will cause no future body harms." This would require proof of events which will take place in the future, which is impossible.

(2) The wording asks that, using PHS recommended fluoride levels (approx. 1 ppm), proof be given that "poisonous" fluorides are safe. Fluorides at PHS recommended levels are not poisonous, and proof of effectiveness and safety at such levels would be irrelevant to use at the much higher levels at which fluoride could be termed "poisonous."

(3) The so-called reward offer is ambiguous, with no indication of what would be considered a "controlled" experiment, what proof would be considered acceptable, or who would make the decision as to whether the proof was acceptable.

(4) The flyer requires the posting of a bond by anyone attempting to collect the reward to cover any costs which the offerors of the reward might incur if the proof is deemed invalid; this condition would be extremely difficult to comply with, for the amount of such possible costs would appear to be impossible to determine in advance. Moreover, in view of the difficulties and ambiguities in the nature and wording of the offer which are pointed out above, a person seeking to collect the reward could easily be placed in an impossible economic position.

(5) Posting of the bond, above, could make payment of the reward unenforceable, because the entire offer might be considered a wager, and the courts will not enforce the collection of a gambling debt.

It is clear, therefore, that the so-called reward is a gimmick that serves to confuse and deter action on a proven public health measure. If after a quarter-century of demonstration of the use of fluoridation at Public Health Service recommended levels, with no clinically substantiated evidence of any bad or harmful effects from drinking such water, opponents still question the safety and effectiveness of fluoridation, it would appear that no evidence could ever be acceptable to them.

Division of Dental Health
Preventive Practices Branch
9000 Rockville Pike
Bethesda, Maryland 20014

FLUORIDES AND CANCER

Research by Dr. Alfred Taylor and others

In a letter published in the Saturday Review in 1965, Dr. Taylor referred to his research purporting to show a cancer promoting property of fluoride in cancer-susceptible mice. However, similar experiments carried out by Dr. W. D. Armstrong of the Department of Biochemistry, University of Minnesota in collaboration with Dr. J. Bittner, the eminent cancer biologist, failed to confirm Dr. Taylor's work. In their experiments, Armstrong, Singer and Bittner used a blind testing technique to eliminate bias and showed that the cancer-susceptible mice drinking water containing 5-10 p.p.m. fluoride did not develop tumors any more quickly than those drinking fluoride-free water.

Statement by Director, Clayton Foundation Biochemical Institute

Later in 1965, the Director of the Clayton Foundation Biochemical Institute, where Dr. Taylor performed his experiments, wrote that ". . . I feel I must disassociate the anti-fluoridation opinions expressed by Dr. Alfred Taylor from the opinions of the other members of the Institute. At the time Dr. Taylor retired from the Institute, September 1, 1965, he had not convinced his colleagues of the soundness of his position on this matter. His results appear marginal; hence, carrying them over from inbred strains of mice to humans is questionable. The presence of fluoride in healthy teeth, its presence in many excellent potable waters, and the beneficial effects of fluoridation on tooth decay seem, in the minds of his colleagues, to be overriding considerations."

Information from the Jackson Laboratory

The Jackson Laboratory at Bar Harbor, Maine, which raises millions of mice for biological laboratory use, including cancer-prone strains has noted that five years of using optimally fluoridated water has been compatible with a general improvement in the well-being and productivity of their colonies through 18 generations of mice.

Statement by the American Cancer Society

The American Cancer Society does not consider the common fluoride salts to be carcinogenic. Its position with respect to water fluoridation for the purpose of dental caries prophylaxis is that such treatment of public water supplies is without danger so far as cancer causation is concerned.

U S DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Dental Health

NATIONAL ORGANIZATIONS ENDORSING FLUORIDATION

American Academy of Pediatrics
American Association for the Advancement of Science
American Association of Dental Schools
American Association of Industrial Dentists
American Association of Public Health Dentists
American College of Dentists
American Dental Association
American Dental Health Society
American Dental Hygienists' Association
American Federation of Labor & Congress of Industrial Organizations
American Heart Association
American Hospital Association
American Institute of Nutrition
American Legion
American Medical Association
American Nurses Association
American Osteopathic Association
American Pharmaceutical Association
American Public Health Association
American Public Welfare Association
American School Health Association
American Society of Dentistry for Children
American Veterinary Medical Association
American Water Works Association
Association of Public Health Veterinarians
Association of State & Territorial Health Officers
Canadian Dental Association
Canadian Medical Association
College of American Pathologists
Federation of American Societies for Experimental Biology
Federation Dentaire Internationale
Great Britain Ministry of Health
Health League of Canada
Inter-Association Committee on Health
National Commission on Community Health Services
National Congress of Parents and Teachers
National Education Association
National Health Council
National Institue of Municipal Law Officers
National Research Council
Office of Civil Defense
Pan American Health Organization
Society of Toxicology
U.S. Department of Agriculture
U.S. Department of Defense
U.S. Department of Health, Education, and Welfare
U.S. Junior Chamber of Commerce
World Health Organization

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

PUBLIC HEALTH SERVICE -- NATIONAL INSTITUTES OF HEALTH

Refer: PPB-25
May 1971

92,000,000 ON FLUORIDATED WATER SUPPLIES

As of December 31, 1970, there were 83,725,771 persons having access to water supplies whose fluoride content had been adjusted to the optimum level for better dental health. In addition, another 8½ million were enjoying the benefits of fluoridation through naturally fluoridated water supplies, bringing the total served by fluoridated water supplies to over 92 million.

Population Served by Adjusted Fluoridation
Total 83,725,771*

State	Population	State	Population
Alabama	852,442	Montana	47,578
Alaska	133,375	Nebraska	619,404
Arizona	41,432	Nevada	5,475
Arkansas	688,230	New Hampshire	71,961
California	2,053,501	New Jersey	837,622
Colorado	1,127,651	New Mexico	105,127
Connecticut	2,215,368	New York	12,095,860
Delaware	222,201	North Carolina	1,849,621
D.C.	755,552	North Dakota	259,104
Florida	1,563;398	Ohio	3,798,312
Georgia	2,164,163	Oklahoma	1,176,675
Hawaii	99,010	Oregon	304,321
Idaho	53,273	Pennsylvania	4,730,652
Illinois	8,927,829	Rhode Island	767,994
Indiana	2,833,258	South Carolina	854,146
Iowa	1,240,346	South Dakota	269,190
Kansas	863,068	Tennessee	1,724,427
Kentucky	1,452,021	Texas	2,514,701
Louisiana	177,436	Utah	22,785
Maine	343,485	Vermont	118,036
Maryland	3,005,116	Virginia	2,755,670
Massachusetts	683,502	Washington	1,251,423
Michigan	5,538,560	West Virginia	871,143
Minnesota	2,754,729	Wisconsin	2,626,537
Mississippi	417,604	Wyoming	39,855
Missouri	1,990,429	Puerto Rico	1,811,173

*Growth factors used during past decade have been revised to reflect population changes as reported by 1970 Census.

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DEPARTMENT OF PATHOLOGY

Area Code 503 222-9781

June 22, 1971

Senator Robert Packwood
Room 6327, New Senate Office Building
Washington, D.C. 20510

Dear Senator Packwood:

I would like to thank you for your letter of May 21, 1971 in which you outlined your efforts in behalf of our National Cancer Institute Clinical Cancer Training Grant. You may be interested in knowing that we have been awarded almost half of our last year's budget. Certainly, this is better than nothing, which is what I understand many schools received. I agree with you that there are many unanswered questions in Dr. Baker's letter; perhaps the NCI will elucidate in the near future. One of our problems in Oregon is that we are not represented in the study section for the clinical cancer training grants, and the guidance we receive in their preparation is often diluted. Some of the members of the study committee have suggested me as a new member, but so far I have not been approached. Neither they nor I really understand how the members are selected.

If you will have the goodness to bear with me, I should like to discuss with you some thoughts on how I may be of greater service in the future. As you may see in the enclosed curriculum vitae, I am at present Chairman of the Pathology Department of the University of Oregon Dental School. I believe I have played a major role in this department's becoming one of the more innovative in the school and perhaps in the country--at any rate we seem to enjoy a good reputation outside the school as well as within it, since the graduating seniors have almost routinely given us the "Best Basic Science Department" award since its inception.

The foregoing is only to establish the fact that I have been effective; but, at present, for several reasons, I do not feel that I am contributing as much as I might. Perhaps the momentum of previous years and my excellent staff's teaching abilities have led to this feeling. Because of my sense of social responsibility, I have given a great deal of thought during the past fifteen years to the probable shape of health delivery in the future--which is now almost upon us. I feel that I have the background and innovative ability to make a real contribution in helping to formulate a possible pattern of dental care of the future.

For example--it has become obvious that expanded use of auxiliaries will occur to an increasingly greater degree in dentistry--perhaps there will even be a new auxiliary--to be called "Dental Associate," "Associate Dentist," "Assistant Dentist" or some similar name--who would be prepared to perform most of the

technical procedures on the patient which are now done by the dentist. But, then what will the dentist do? The usual answer is that he will serve as the leader and coordinator of a team delivering oral health care. Although this probably will be his role, the dentist of today is uneasy over the prospect of being very little different from the "Associate Dentist" of the future, and I believe this unease contributes to the resistance of many dentists toward greater utilization of auxiliaries. To paraphrase the Dean of Harvard Dental School--the dentist of today is overtrained for what he does and undertrained for what he should be doing.

There are many possible pictures of the dentist of the future; I shall attempt to paint one of them.

The dentist of the future should be:

1. As competent technically as he is now.
2. Better able to direct and coordinate a team of auxiliaries in prevention and treatment.
3. More sensitive to problems of society, particularly those involving the delivery of health care.
4. Better able to evaluate and manage his patient's non-dental oral disease.
5. Better able to manage his patients with known systemic disease--e.g., diabetes, high blood pressure.
6. Better able to evaluate his patients for the presence of unsuspected systemic disease.

Point 1--It is my belief that it is possible to train a dentist to be technically competent in far less time than is now consumed. For example, when I taught at the University of California, a small percentage of the dental students were switched to an orthodontic curriculum some time during their freshman year. During their four-year curriculum they had about one-half to two-thirds the experience in restorative dentistry (fillings, dentures, etc.) as did their classmates--yet they were as successful in passing state board examinations.

Point 2--He will need slightly more time than at present to learn directing and coordinating skills. It might be noted here that, although prevention of oral disease should occupy a sizeable proportion of the practice of dentistry, the dentist himself need spend only a minimal amount of time on this aspect, with well-trained auxiliaries actually performing the preventive procedures.

Point 3--To become more socially sensitive, the dental student will have to spend part of his time working in deprived areas, as well as taking more formal course work.

Point 4--As an oral pathologist I can state that generally neither dentists nor physicians are adequately prepared in the diagnosis and treatment of oral lesions, ranging from oral cancer to "canker sores." Nor is either professional sufficiently familiar with the many oral manifestations of systemic disease.

Point 5--Most dentists are not adequately prepared to optimally manage patients who also suffer from known conditions such as cardiovascular or kidney disease, or to properly consider the effects of drugs these patients may be taking.

Point 6--I feel most strongly on this point--that most dentists do not know how to evaluate patients for unsuspected diabetes, cardiovascular, or other systemic diseases--conditions which might well be aggravated by dental procedures such as oral surgery or periodontal treatment. Dentists are in the unenviable position of performing procedures potentially harmful to certain patients, without the training to suspect these conditions. This situation is one of the causes of great friction between physicians and dentists on equality of hospital privileges for the two professions. (Unfortunately, another reason, I believe, is economic control--so that many well-qualified oral surgeons are not permitted parity with their medical colleagues, merely because their initial training was in dentistry--even though their residency training has resulted in superb surgeons.)

Health care of the mouth is restricted to a very small anatomic area, similar to the eye. We find that there are two classes of eye specialists: 1) the optometrist, who although he has a good biological background, only refracts eyes for glasses--he does no surgery nor does he prescribe drugs and, therefore, cannot harm the patient systemically and 2) the ophthamologist, who does everything the optometrist does and, in addition, performs surgical procedures and prescribes drugs. The training of both is adequate for what they do (although if they worked as a team instead of separate professions, I believe, the ophthamologist could spend his time much more profitably). Contrast this with the training of the general dentist, which is inadequate because he does perform surgery and he does prescribe drugs. In some European countries there are two separate groups of professionals engaged in oral health care: 1) dental mechanics (analogous to the optometrist) and 2) stomatologists (physicians who are concerned primarily with the medical and surgical aspects of oral disease and not restorative procedures). These professionals do not work together either, and as a result, dentistry in these countries is not of the highest quality.

In the not-too-distant future I should like to see the dentist have as much training and experience in internal medicine as the ophthamologist. This should adequately fulfill points five and six and could take place within the framework of dental education with cooperation from associated medical schools. Then, the dentist may, if he wishes, take additional training in one of the specialties, such as orthodontics, oral surgery or oral pathology. The bulk of dentists would probably elect to practice as the leader of an effective group of auxiliaries, perhaps associated in a group practice with other dentists (generalists and/or specialists) and physicians.

As a half-way step, we at the University of Oregon Dental School are attempting to teach dental students to screen patients (by questionnaire, simple laboratory tests and physical examination) for the presence of important systemic disease with subsequent referral of patients with positive findings to the proper physician.

I wonder how many realize the potential that the more than 100,000 dentists enjoy as case-finders of early and presumably more readily treatable disease. This alone could benefit the country tremendously in terms of the prevention of serious disease with its attendant burden on our health facilities and lost man-hours of work. Many investigations have demonstrated the relatively high yield of early disease detectable in the dental office. (In one of our investigations we found at least 20% of patients over age 35 to be afflicted with unsuspected significant disease.) One critical consideration here is that patients usually visit their dentists when they feel well, whereas they usually seek out their physician only when they are ill.

Many health plans are now being considered by Congress. I am by no means familiar with all of them, but the stimulus for this letter came from a news item describing Senator Magnuson's latest proposal which is primarily aimed at the improvement of the oral health of children. A portion of it does provide for pilot projects, and I wonder whether this portion or a portion of some other legislation (perhaps new legislation should be introduced) might not be used to support an experimental educational program with the six objectives mentioned above. I would envision that only a small percentage of each class would go through the experimental curriculum, until its products could be evaluated.

The program could stop with the foregoing, but if one wished to really dream, one could ask for support for an experimental oral health delivery facility as well. This facility could include the graduates of the new curriculum, older general dentists with additional training in internal medicine, a whole team of dental auxiliaries and dental specialists. Ideally this whole group would be integrated into an ongoing medical group, such as the Permanente Foundation. Then, if the whole set-up proved to be very effective in delivering oral health care of high quality and quantity at a reasonable cost, it might become a national pattern.

I also note that Senator Magnuson's bill calls for a dental advisory committee. If I can be of service on this committee, or in any other way, I should be very happy to discuss the possibility.

Completely aside from the foregoing, I note that you will be traveling to the Middle East shortly. As you can see in my curriculum vitae, I did spend an exciting 1966-1967 sabbatical year as a Fulbright Professor in Israel, about which I wrote the enclosed letter to friends after our return. I'm sure that you have more information available now from the State Department and others than you can absorb; but, I should be most pleased to comment on any questions you might wish to put to me.

My experience in the Middle East has so enriched my life that I would welcome occasional assignments in any area of my competence in other parts of the world in order to contribute to my capacity.

I am looking forward to your comments with anticipation. In any event, please have a good trip to the Middle East--I hope that your visit will help bring those unhappy nations together; I'm certain that if left to themselves the peoples would have no difficulty in living together.

Very sincerely yours,

Norman H. Rickles

Norman H. Rickles, D.D.S., M.S.
Chairman, Department of Pathology

NHR:bdw

Senator KENNEDY. The subcommittee stands in recess subject to the call of the Chair.

(Whereupon, at 5:10 p.m., the subcommittee was recessed subject to the call of the Chair.)

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Sent per your request
Congressman Fred B. Rooney

Fred B Rooney