DENTISTRY in PUBLIC HEALTH

PELTON and WISAN

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FOREWORD

The reissue of *Dentistry in Public Health* in its second edition is most timely for there is strong need for an orderly and considered statement of the many developments in dental public health which have taken place since the original publication in 1949. It is significant that the second edition is announced as "completely revised and rewritten." The use of this phrase indicates that the authors and contributors have taken the opportunity to restate many opinions, attitudes, recommendations and policies in order to make them consistent with the new facts and concepts that have been accumulating so rapidly in the fields of dentistry and dental public health.

At no point in its relatively short history has dental public health been confronted with so many sharp challenges and opportunities. There has been a robust growth of awareness on the part of the public of the value of dental health. There is an increasingly insistent demand that productive measures be taken to prevent and control dental and oral diseases through well-supported, dynamic public health programs. There is a growing body of dentists trained in public health, and a greater opportunity for their efforts. There is more recognition by public health administrators that programs designed to safeguard and advance total health are seriously deficient until they contain more than token dental health measures. There is an improving methodology in the field of dental public health.

There is the negative, but popular, tendency to exploit interest in dental health through the gaudy promotion of products "guaranteed" to do what the laboratory and clinical trials say they cannot do. There is a steady diminution of fad and fallacy about dental health and disease under the abrasive influence of continuing, scientific investigation and study. And, finally, there is at hand for the first time a number of weapons that can be used in both private practice and in public health for the effective control of dental caries.

All of these elements have been recognized in the revised text with the result that it is an up-to-date, clear and well-organized statement of the present capacities of dental public health. It goes without too much saying that all of those whose profession is public health in its

many phases will make this book a part of their essential reading and keep it available as an accurate reference source. For them, also, it will provide a good index to the merits and deficiencies of their own current dental programs.

As the authors repeatedly make clear, effective dental health programs require active participation beyond that of persons trained in the technical areas of public health. The book, therefore, will unqualifiedly recommend itself particularly to the dental student and the practicing dentist, to the dental hygienist, the physician and to the host of others interested in improved dental health.

The story of dentistry in public health has many chapters as yet unwritten. If progress in this important field of health continues, as it must, one can look with assurance in the next few years to another edition—"completely revised and rewritten."

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PREFACE

The "growing body of facts" which can be applied to the prevention of dental disease, mentioned in the Foreword to the first edition of "Dentistry in Public Health" by Dr. Reginald Atwater, is growing indeed.

Since publication of the first edition, dental public health has made important advances. For instance, from 1949 to 1955, the topical application of fluorides has been tested, accepted, and assigned a place in the dental health picture. Cautious statements concerning water fluoridation made in 1949 have been supplanted in this edition by the concept that fluoridation is nearly an "ideal" measure of preventing dental caries.

The future may be expected to bring other advances in the control and prevention of dental diseases, and details will change, existing procedures will be modified, and innovations tried. Whatever these technical changes are, it is anticipated that the emphasis on methods and procedure patterns contained herein will provide sound information on how to use the new public health tools to advantage. To achieve this result, this entire volume has been completely revised.

Statistical methods for analyzing dental data have been greatly simplified by limiting the presentation to fundamental essentials. Prevention and control of dental caries and other dental diseases have been given more comprehensive coverage. The use of fluorides has been authoritatively described, with emphasis given to the physiologic aspects of fluorides.

Current administrative principles and practices in the dental public health have been revised to provide better understanding of current trends in this field. Discussions of dental needs, dental resources, and payment for dental services are included as new areas of interest to dental public health workers. Authentications, sources of materials, and methodology for dental health education programs are reviewed.

Although the primary objective of this volume is to aid dental schools and dental hygiene schools in establishing courses in dental public health, material is included which should be of interest to private practitioners of both professions. It is hoped, moreover, that

professional public health workers, educators, and private practitioners of all kinds will find this volume useful.

The editors are indebted to the collaborators for their noteworthy contributions and to all authorities who have been quoted or cited in this book.

WALTER J. PELTON, D.D.S.
JACOB M. WISAN, D.D.S.

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Chapter 1

WHAT IS PUBLIC HEALTH?

By JOHN W. KNUTSON, D.D.S., DR.P.H.

INTRODUCTION

Among the many definitions of public health which have been formulated, that of Winslow is most widely accepted and quoted by public health workers. Winslow defines public health as "the science and art of preventing disease, prolonging life, and promoting physical health and efficiency through organized community efforts . . ."[2] This definition is very comprehensive and encompasses aims which are noble indeed. Undoubtedly these characteristics of the definition have had much to do with its widespread acceptance among the public health profession. It is doubtful, however, that it gives the private dental practitioner or the student of dentistry or of dental hygiene a working knowledge of public health. A clear understanding, not just a general or vague concept, is essential if the private practitioner is to fulfill with competence his direct and indirect roles in shaping his community's public health programs.

The Private Practitioner's Role in Public Health

Perhaps the dental student's most common aim is to become a successful private practitioner, either as a "generalist" or as a specialist. Because of the personal nature of the services he will render, success ordinarily will be directly related to the number of people in the community who place confidence in his abilities. That confidence will not be limited to his technical dental services but will extend over a broad scope of day-to-day community affairs. The community affairs may include proposals to build a new school house, fluoridate the drinking water supply, expand the recreational facilities for children, build a community health center, construct a new water treatment plant, increase the salaries of school teachers, and a wide diversity of projects. Whatever the proposal at issue, many persons will want the advice and guidance of their family dentist. Furthermore, they will expect good advice because their dentist is a good dentist. In particular, they will expect expert advice on community

proposals for health improvement. Moreover, they will not understand or be satisfied with a disclaimer of competency to advise because a particular proposal is of a non-dental nature. The patient seeking the advice is a layman. She may be chairman of the school health committee, which has been charged with the responsibility of considering the proposal and of making specific recommendations for its approval or rejection.

A prominent characteristic of successful public health administrators is the ability to stimulate broad discussion of community health problems by local civic, social, and professional groups and organizations and to encourage wide participation in designing plans and providing continuing financial support for an organized community program. An evasive reply arising from the dentist's lack of knowledge in these matters will be interpreted by the patient as indifference. It may inadvertently influence the patient to assume a similar attitude. On the other hand, response based on inaccurate information is likely to be poor advice. In either event, the dentist has materially, although indirectly, shaped the pattern of his community's action on a public health problem. Therefore, the responsibility of being an adviser or counselor on community affairs resides in the practicing dentist whether he wills it or not.

The dentist's opportunities to exercise his responsibilities directly are also very great. The chances are excellent that he will be appointed to community health committees of civic, social, or voluntary organizations or to school, industrial, city, or county health councils. How well and how long he serves will depend on the quality of the knowledge, advice, and guidance which he brings to such councils. Furthermore, his own professional organizations, such as local or State dental societies, will have their own councils on dental health. Here, too, effective participation requires a clear concept of public health and the procedures employed in solving public health problems. Thus, the opportunities of a dentist to serve his community and his profession well will inevitably arise. Whether or not his professional life is enriched by active participation in community affairs will be determined by the manner in which these opportunities are accepted and handled.

Public Health Is People's Health

Since public means "of or pertaining to the people of a community, State or nation," the simplest yet most comprehensive definition of

public health might be the literal one—public health is people's health. It is concerned with the aggregate health of a group, a community, a State, or a nation. Public health, in accordance with this broad definition, is not limited to the health of poor folks, or by methods of rendering health services or by the nature of health problems. Nor is it defined by the method of payment for health services, or by the type of agency responsible for supplying those services. It is simply concern for and activity directed toward the improvement and protection of the health of a population group in the aggregate.

Leavell and Clark attempted to clarify the meaning of public health by pointing to the essential differences between the public health officer and the private practitioner in the exercise of their professions.[1] The opposite approach will be adopted here, in emphasizing the marked similarity in methods and procedures employed by the private dental practitioner and by the public health officer. The dental student receives long and intensive training to equip him to care for his patients effectively and efficiently. He is encouraged to develop a pattern of thinking and a method of approach which, when followed, are most likely to lead to desirable results. If it is recognized then that the same pattern of thinking and the same methods of procedure are employed in public health, the task of comprehending the meaning of public health should be greatly simplified. In the one case the individual patient is the object of concern. In the other, it is the people of a community. Although the tools employed in handling each may vary somewhat, the basic procedural pattern is virtually identical.

PERSONAL VERSUS COMMUNITY HEALTH

Examination—Survey

When a patient comes to the dental office or clinic, the first thing the dentist does is to give him a careful examination. The examination ordinarily starts with a case history, which may be obtained in many ways. The usual way is to ask the patient what his difficulty is or what problem brought him to the office for service. If the patient has a chief complaint, the time of onset, the mode of development, and the symptomatology are determined. The history will also include identifying data such as name, age, sex, address, occupation, and previous health experience. The dental examination may be simple or complex, but it usually includes examination of lips, oral mucosa, tongue, pharynx, and teeth. The examining dentist will observe the occlusion and signs of abnormal functional stresses; lost, carious, and devital-

ized teeth; condition of restorations; and arch relationships. He may want a series of dental roentgenograms, a blood analysis, a urinalysis, or biopsy studies. He may examine the regional lymph nodes, and may seek information of a general medical nature which has a bearing on the patient's dental health or on his ability to undergo successful treatment. The dentist will use judgment in availing himself of the modern chemical and laboratory aids which can assist him in arriving at a correct diagnosis.

The first step in modern public health procedure is identical to that used by the dental clinician, only here it is the community which must be examined. We call it a survey instead of an examination; nevertheless, it is an examination, and the techniques and purposes of the survey are the same. Furthermore, the survey or examination of the community may be initiated by a chief complaint. One of the school teachers may complain that there are no facilities for caring for the toothaches of children of indigent parents. The school health committee, after studying reports of experiences with a new preventive measure applied in a neighboring community, may raise the question, "Why aren't we doing something about it in our community?" Whatever the specific health problem, the initial approach to its solution should involve an examination to determine its dimensions and its particular characteristics. If, for example, the health problem is tuberculosis, one might obtain information first on the size of the population involved, its age and sex distribution, occupational composition, tuberculosis mortality rates, number of cases diagnosed, and frequency of hospitalization. One may augment this information by conducting a community chest x-ray program for examination of large groups of the population. Such a survey is designed to determine the amount of active tuberculosis in a community, and to screen out or identify cases which have not been diagnosed or recognized. The survey would include an examination of the community's resources for doing something about the problem, the hospital facilities, the physicians, the nursing care, facilities for modern therapeutic treatment, the economic status of the community, and the nature of the distribution of the community's wealth.

The problem may be the widespread occurrence of mottled enamel and the survey might be limited to a diagnosis of the condition and determination of the degree of mottling. The survey would include a chemical analysis of the local water supply to determine its precise fluoride content. But the purpose of the survey in either case would

be to determine the nature and extent of the problem, just as was done when a patient came to his dentist with a complaint.

Diagnosis—Analysis

The examination or the survey is not an end in itself. It is an important beginning—an essential first step—which, when taken carefully, increases the likelihood that subsequent action will be correct and effective. The second step is diagnosis. An accurate diagnosis is essential if a proper course of treatment is to be prescribed. A need for additional information or supplementation in order to make a differential diagnosis may not become apparent until the initially collected data have been analyzed. This analysis may also indicate a need for the services of expert consultants or specialists.

The same methodology is used in public health. However, in public health the diagnosis, or second step, is frequently referred to as analysis of the survey data. Information collected in the survey is analyzed in order to define the characteristics of specific community health problems. Here we are dealing with groups of people instead of with the individual and it becomes necessary in most instances to organize our data in such a way as to obtain meaningful figures. Such figures can then be used for comparisons and to help us simplify the description of the situation at hand. For this purpose we may use statistical tools in order to derive such common descriptive constants as the mean, the median, the range, and the standard deviation. Rates may be calculated to determine the number of times an event occurs among the number of persons exposed to the risk of its occurrence during a given interval of time. Examples would be birth, death, and sickness rates. Ratios, or relative figures in fractional form, are used to indicate the relationships of two factors to each other. These are some of the means of converting raw data, or absolute numbers collected in an examination or survey, into meaningful figures or statistics. They are the material that the public health worker uses to obtain a description of the problem and its characteristics. They are the material he uses to arrive at a correct diagnosis or analysis, just as the dental clinician uses his examination data to guide him to an accurate diagnosis.

Treatment Planning—Program Planning

Once the diagnosis has been made, one can proceed to make plans for effective treatment. The job of treatment planning may be simple

or extremely complex, more frequently the latter than the former. To most persons in need of dental treatment the cost of treatment is an important factor, and in many instances alternative methods of treatment at varying costs must be considered. In fact, the problem may be resolved in a variety of ways, ranging from the patient's refusal to undergo treatment at all because of a lack of appreciation of its importance, to acceptance of the ideal solution recommended by the dentist who made the examination and diagnosis and designed the treatment plan. For example, the ideal treatment plan may call for balancing of occlusion, construction of one or more dental bridges, the filling of several carious teeth, treatment of gingivitis, changes in diet, and the institution of a specific home care regimen. Perhaps baked porcelain fillings may have been prescribed as the ideal restorative material for cavities in the anterior teeth. However, the reaction of the individual patient can vary widely. As previously suggested, he may decide to do nothing. He may decide to have the carious teeth filled and let the rest go till later. It may be he cannot afford the cost of baked porcelain fillings but can afford synthetic porcelain. He may be able to pay the cost of amalgam fillings but not that of gold inlays in the posterior teeth. He may choose a removable appliance instead of the more desirable but more costly fixed dental bridge. He may accept the advice on dietary changes, but the length of time he adheres to the change may vary widely. Similarly, the instructions given for home care may be followed implicitly; they may be carried out indifferently; or they may be completely ignored.

The broad range of factors which influences the reaction of the patient to treatment plans has been emphasized to point up the need for considering alternative methods of treating a patient's problem. The patient becomes an active party in making the decision. His financial resources, the value he places on health services, his health habits, and his whole background of correct and incorrect health information will affect the decision. The same factors influence the third step of the public health worker, namely, program planning, in a similar fashion. All of us, dental clinicians or public health workers, desire to have our optimum treatment or program plan accepted without question. However, the community's reaction to such a plan, like that of the patient, may be to do nothing, to carry out only part of the plan, or to adopt an alternative, less comprehensive, and probably less costly program. It is the community which makes the decision either directly or indirectly through its administrative offi-

cials. The decision will reflect the relative value which the community places on solving the particular health problem in comparison with the many other community problems which are in need of attention. Therefore, if the community's decision is to be a realistic one, it must be based on community-wide knowledge of the survey findings, on an understanding of the analysis of these findings, and on a familiarity with proposals for a control program. Each of these areas of need for information can be filled through appropriate health education techniques. However, the most certain and effective way of insuring not only that the community will be informed but that the facts are correctly understood is through broad community participation in the conduct of the survey, in the analysis, and in the program planning.

Treatment—Program Operations

When the plan has been accepted by the patient, the dental clinician arranges a specific schedule for carrying out the indicated treatments. If the treatment plan is rather complex, it may involve referring the patient to the exodontist for needed extractions, to a prosthodontist for partial dentures, or to a periodontist for treatment of the supporting tissues of the teeth. A variety of specialists within the field of dentistry may be called upon to carry out the treatment plan. However, responsibility for coordination of these efforts will rest with the patient's primary dentist. He will be held responsible for successful administration of the plan. Similarly, when a specific community public health program has been adopted, a variety of disciplines may be called upon for execution of the program. If, for example, the program is water fluoridation, local dentists may be asked to collect base-line data on the prevalence of dental caries, engineers will determine the type of equipment needed to carry out the fluoridation procedure, chemists will make water analyses, and the water works operators will be given the job of adding the proper amounts of fluorides to the water supply. Since fluoridation is a continuing program, there will be the over-all problem of administration or responsibility for seeing that the work of the different specialists is coordinated and carried out effectively and efficiently.

Payment—Financing

Mutually agreeable methods of paying for dental services are usually arranged between the patient and his dentist before the treat-