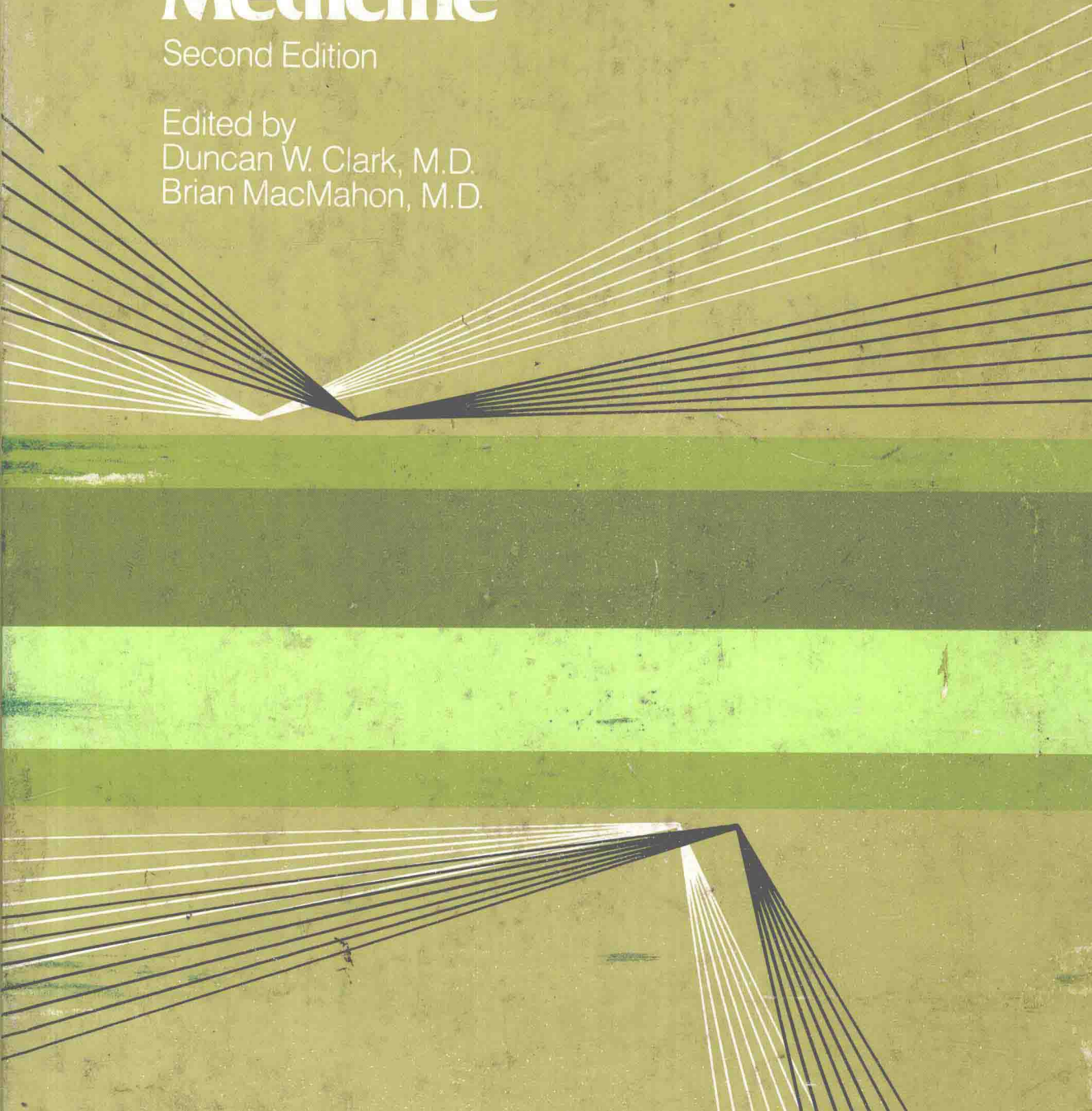


Preventive and Community Medicine

Second Edition

Edited by
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Preventive and Community Medicine

SECOND EDITION

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Second Edition

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Preventive and Community Medicine

Preface

The second edition of this text has been renamed and expanded. The first edition was designed with the needs of medical students in mind, and this has been a prime consideration again. But when the first edition enjoyed a wider audience than anticipated — with use in schools of public health and related programs — and proved attractive to clinicians, possibly in part because it organized preventive and epidemiologic information by organ systems, we decided to address in this edition the needs of a wider audience through a greater emphasis on specifics.

The preface to the first edition cited three main areas of content in the curricula of departments of preventive medicine: (1) the methods of study of prevention (particularly those based on population), (2) etiology and prevention of disease and injury, and (3) health programs and services. While the alliance of the first two content areas needed little justification, their association with the third was thought to require explanation, and the preface went on to rationalize the connection. In this edition such justification is no longer necessary because the text has been expanded to encompass community medicine. This is not to imply that community medicine is being equated with health services. We see preventive medicine and community medicine as overlapping fields, each population-based and each concerned with the goal of prevention. Community medicine, or community health, is the broader of the two concepts since it concerns itself with all of the health services, curative as well as preventive, a point developed more fully in Chapter 1.

For the purposes of a text, any of several organizing themes may serve to represent community medicine. In the experience of this nation in recent years, we see as one unifying theme the ex-

traordinary increase in volume and range of federal legislation. The impact of these laws has been to reduce regional differences and to favor a nationwide trend toward greater uniformity and standardization in the delivery of services at the community level. Accordingly, the final section of the text has been expanded and revised more than any other.

The purpose of the editors has been to produce a balanced text. Each of the four sections can stand as basis for a course or be drawn upon selectively to illustrate standard courses in the field. In professional schools, preventive and community medicine generally is taught to students at different levels of development. The basic language and concepts, in the form of *Methods in Preventive and Community Medicine* (Part I), are usually introduced in a basic science year with examples drawn from any of the three sections that follow. *Disease Etiology and Prevention* (Part II) may follow in the same or in a subsequent year, often in support of selective or elective programs as well. *Prevention in Practice* (Part III) can be expanded readily by drawing on the companion chapters of Part II. *The Health Services and Health Legislation* (Part IV) may serve as a theme for presentation in any one of the academic years since its vocabulary does not depend on the earlier chapters.

We believe we have met the requirements of a balanced text: (1) adequate consideration of the four areas of methods, specific disease epidemiology, preventive practice, and medical care; (2) adequate representation of the most important causes of our morbidity and mortality, the chronic diseases; (3) a reasonably comprehensive list of topics addressed and some depth in their treatment; and, finally, (4) the introduction of many new subjects. In the competition for space, new

subjects have displaced some topical material, but every effort has been made to include all salient themes.

Acknowledgments

It is a pleasure to pay tribute to all who have cooperated and assisted in the preparation of this text. Primary credit must go to our collaborators for the quality of their product and their patience with us on many counts. The assistance of colleagues — those of our contributors as well as our own — is gratefully acknowledged, along with the necessary notation that their number exceeds any possibility of listing them. To the authors and publishers whose work this text is privileged to quote or draw upon, our deep appreciation is noted.

The senior editor gratefully acknowledges the technical assistance of Dr. Joseph G. Feldman and Mr. Edward Trapido, the editorial assistance of Mrs. Helen Grossbard, and the untiring effort and patience of the secretarial staff under the supervision of Mrs. Maureen Roaldsen.

The editors wish to express the deepest sense of appreciation to the officers and staff of Little, Brown — in particular, Mr. Fred Belliveau and Mr. James Krosschell — for their forbearance and encouragement throughout the assembly of this book.

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Notice

The indications and dosages of all drugs in this book have been recommended in the medical literature and conform to the practices of the general medical community. The medications described do not necessarily have specific approval by the Food and Drug Administration for use in the diseases and dosages for which they are recommended. The package insert for each drug should be consulted for use and dosage as approved by the FDA. Because standards for usage change, it is advisable to keep abreast of revised recommendations, particularly those concerning new drugs.

Contents

Preface vii

Contributing Authors ix

I. METHODS IN PREVENTIVE AND COMMUNITY MEDICINE

1. A Vocabulary for Preventive and Community Medicine 3
Duncan W. Clark

2. Causes and Entities of Disease 17
Brian MacMahon

3. Sources of Health Data in the United States 25
Philip S. Lawrence

4. Indices of Community Health 37
Joseph G. Feldman

5. Epidemiologic Methods 59
Brian MacMahon

6. Experimental Trial and Program Review 81
George B. Hutchison

7. Community Prevention and Control 97
Duncan W. Clark

II. DISEASE ETIOLOGY AND PREVENTION

8. Injury Control 109
William Haddon, Jr., and Susan P. Baker

9. Prevention of Adverse Effects Related to Drug Therapy 141
Paul D. Stolley

10. Prenatal and Perinatal Causes of Early Death and Defect 149
Carol W. Buck

11. Diseases of the Mouth 167
Kenneth J. Rothman

12. Diseases of Blood and Blood-Forming Tissues 175
Stanley L. Lee and Bernard D. Gussoff

13. Disease of the Cardiovascular System 193
Jeremiah Stamler

14. Renal and Urinary Tract Disorders 219
Edward H. Kass

15. Diseases of the Skin 235
Lawrence Frank and Stephen J. Danziger

16. Alimentary Disorders 247
Ascher J. Segall

17. Neurological Disorders 265
David C. Poskanzer

18. Mental Retardation 293
Zena A. Stein and Mervyn Susser

19. Acute Respiratory Infections 309
Hjordis M. Foy and J. Thomas Grayston

20. Chronic Respiratory Disease Other than Cancer and Tuberculosis 331
Frank E. Speizer

21. Tuberculosis 349
Phyllis Q. Edwards

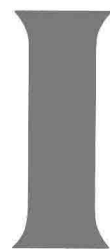
22. Acute Infections of the Alimentary Tract 367
E. Russell Alexander

23. Nosocomial Infection 391
Elizabeth Barrett-Connor

24. Sexually Transmitted Diseases 411
Ralph H. Henderson

25. **Epidemiology and Prevention of Parasitic Diseases in the United States** 425
Donald Heyneman
 26. **Drug and Alcohol Abuse** 437
Donald B. Louria
 27. **Cancer** 451
Brian MacMahon
 28. **Metabolic Disorders** 469
Julie E. Buring and Brian MacMahon
 29. **The Physical and Chemical Environment** 481
James L. Whittenberger
- III. PREVENTION IN PRACTICE**
30. **Food, Nutrition, and Public Health** 497
Daphne A. Roe
 31. **Prevention in the Medical Care of Children** 523
Kenneth D. Rogers
 32. **Occupation and Health** 551
J. Wister Meigs
 33. **Screening and Early Detection of Disease** 571
Robert M. Thorner
- IV. THE HEALTH SERVICES AND HEALTH LEGISLATION**
34. **Health of the U.S. Population** 583
Joyce K. Walsh and Joseph G. Feldman
 35. **Economics of Health** 603
Herbert E. Klarman
 36. **Health Care Financing** 617
Herbert E. Klarman
 37. **Patterns of Medical Practice** 635
Jeffrey A. Cutler and Sidney Shindell
 38. **Legal Regulation of Medical Practice** 653
William J. Curran
 39. **Medical Peer Review: Medical Regulation in Medical Practice** 669
Duncan W. Clark
 40. **Health Activities of State and Local Government** 681
Duncan W. Clark
 41. **Health Resources: Federal Administration and Regulation** 693
Duncan W. Clark
 42. **Publicly Aided Personal Health Services** 715
Duncan W. Clark
 43. **Mental Health Services** 735
Duncan W. Clark
 44. **Federal Disease Prevention and Consumer Protection** 753
Duncan W. Clark
 45. **Federal Regulation of Environmental Hazards** 763
Duncan W. Clark
- Index** 779

**Methods in Preventive
and Community Medicine**



A Vocabulary for Preventive and Community Medicine

Duncan W. Clark

1

This chapter reviews the meanings of some terms in common use in preventive and community medicine. Meanings change with time. Terms long in standard use acquire extended meanings — a case in point is the term *preventive medicine* itself — and new terms are coined to signal a new emphasis. The meanings of some terms may overlap, and different shades of meaning may be associated with use of the same term. Preventive medicine and community medicine contain ideas that overlap, as is evident throughout this text. So, there should be little expectation that definitions can be other than arbitrary and imprecise.

A logical term to start with is *medicine* itself since so many ideas derive from it. The purposes of medicine have been summarized in the words of the medical historian Henry Sigerist [21]: “Medicine, by *promoting health* and *preventing illness*, endeavors to keep individuals adjusted to their environment as useful and contented members of society. Or, by *restoring health* and *rehabilitating the former patient*, it endeavors to readjust individuals to their environment.” (In preventive work in particular, the adjustment of the environment to the individual is a standard purpose and practice.)

The part of medicine that deals with promoting health and preventing illness is *preventive medicine*. The part of medicine that restores health and rehabilitates individual patients is the domain of *curative medicine*. Addressing certain aspects of all four purposes, usually from an institutional community base, is the responsibility of *community medicine*. These distinctions are more fully developed in the course of the chapter.

The Nature of Health

There are many views as to what constitutes “health.” To some, health simply means the absence of disease, i.e., there are no impediments to

an individual’s functioning or survival. A second view is expressed by the Oxford English dictionary, which defines health as “soundness of body; that condition in which its functions are duly and efficiently discharged” [17]. Implicit in this view is a set of abilities that favors growth and development and the efficient performance of bodily functions in the face of changing environmental conditions, a capability known as *adaptability*, and the process itself as *adaptation*. As a corollary, *disease* corresponds to failures or disturbances in growth, development, functions, and adjustments of the organism as a whole or any of its systems [6].

A third meaning of health is that embodied in the constitution of the World Health Organization. “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [24]. This definition is commonly seen as the statement of an ideal toward which nations should aspire rather than as a practical working definition.

An operational definition of health, one drawn from this ideal, has been devised by a technical study group of the World Health Organization [25]. In this definition, the concept of health is viewed as being of two orders. Health can be seen in a broad sense as “a condition or quality of the human organism expressing the adequate functioning of the organism in given conditions, genetic and environmental.” In a narrow sense, one more useful for working purposes, health means (1) there is no obvious evidence of disease and that a person is functioning normally, i.e., conforming within normal limits of variation to the standards of health criteria generally accepted for one’s age, sex, community, and geographic region; and (2) the several organs of the body are functioning adequately in themselves and in relation to one another, which implies a kind of equilibrium or ho-

meostasis. While there are advantages to this narrow definition, it also has its limitations, in particular its dependence on normality as a reference point.

The terms *normal* and *abnormal* also have several meanings, depending upon the reference point. One popular meaning of normal is kin to *conventional*, but what is conventional today may be unconventional tomorrow. Thus, definitions of normality based on this criterion are of limited value. Popular impressions are basically a form of consensus, and the public has its impression of what is normal and what is abnormal behavior, for example. A variation on this idea of consensus is a formal committee definition of a standard for use in psychiatric diagnosis, i.e., a definition of normal and abnormal as the "consensus of experts."

The concept of normal in *clinical* use comes from pathology, a field that deals with abnormality. In the absence of evidence of active disease with implication for morbidity or mortality, the normal state is said to prevail. Minor deviations, if seen as harmless and carrying no penalty, tend to be classified by the clinician as normal.

Other meanings of normality are *statistical* and are based on observations of a population. One derivative concept is the *optimal value* of an attribute for the survival and functioning of the organism. This concept assumes that the criteria for optimal can be defined and documented. Ideal body weight tables, based on studies of survival by insurance companies, serve as an example [15]. In this sense, there are some who urge that we begin to replace the term *normal* with the term *optimal*.

Another meaning derived from statistical observation specifies as normal the *central* or *typical* value of an attribute in a population. If an attribute has a continuous distribution, limits have to be set in defining what is normal, namely, those values encompassed within a range around the central value. Departures from this range are taken to represent abnormality, i.e., disease or the likelihood of future disease. Before this judgment can be applied in any specific situation, the method of selection and the characteristics of the population in which the standard was established

must be taken into account. Moreover, it is important to note that the method of assigning abnormality to the observations at the extremes requires the use of cutoff points, which are chosen in an arbitrary way, generally. It is customary to select 95 percent of the area under the distribution as the "normal range," with abnormality imputed to those in the lower and upper 2½ percent. The reason for assigning 95 percent to the normal range seems to stem more from usage by statisticians testing hypotheses than any biologic basis [15].

There is confusion in the application of the term *normal* in medicine. The confusion comes in part from the use of the normal curve and what the curve seems to connote. Originally, the German mathematician Gauss propounded a "law" to describe a bell-shaped distribution of variation obtained in repeated measurement of the same object under constant conditions. It was observed subsequently that a number of biologic and physical variables also conform approximately to this distribution, one occasionally referred to as "Gaussian" but more commonly known as the "normal distribution." For example, the heights of boys of a given age are approximately normally distributed. Here the point must be emphasized that the observation of a normal distribution of a characteristic in individuals has no connotation of optimality or freedom from pathology. Statisticians went on to demonstrate a most important mathematical property associated with the normal distribution, namely, that sampling variation of an average or mean value of a series of measurements tends to follow the normal (Gaussian) distribution, provided sample sizes are reasonably large. Moreover, even if an attribute does not follow the normal distribution, variability of the mean values of the attribute will. In fact, mean values of sufficiently large samples of any phenomenon whatever, including distinctly pathologic phenomena, are approximately normally distributed. This property is the most important reason for the wide use of the normal curve.

In sum, because of variations in the concepts of health and normal, it is essential to clarify the reference sense in which each term is used. The dis-

cussion of the concept of health has served the additional function of introducing a series of related terms in common use in preventive and community medicine. As for health itself, while no single concept is fully acceptable, there is support for perceiving health in positive terms — one that expresses a favorable balance with the environment. Efforts by investigators to conceptualize health in its several dimensions — physical, mental, and social — are continuing. An overview of the efforts to define health in a positive sense and the implications of this definition for health planning has been compiled by Cardus and Thrall [4].

Health Promotion

Health promotion includes activities that foster well-being and stimulate disease prevention. These activities may involve the individual, the family, and the community. In the selection of approaches to the promotion of health it is natural to look for “causes” or sources of ill health, and for any obstacle to the maintenance of good health. Usually, the origins of ill health can be traced to influences emanating, respectively, from environment, lifestyle, social organization, and human biology. The relative contribution of any one of these four sectors to a health problem varies considerably. In efforts to control the “causes” of ill health at their source, and to cope with obstacles to health maintenance, the knowledge base and methods of environmental health, behavioral theory, health service organization, and medicine are drawn upon.

In day-to-day practical application, health promotion has been heavily weighted toward prevention, and motivating people to change self-destructive health habits to behavior that will restore and sustain well-being. Public efforts to change lifestyles have commonly concentrated on behaviors that may prevent or control the excessive use of cigarettes, drugs, and alcohol, and the failure to observe automobile safety regulations. The role of medicine has been to introduce and to test the value of screening for early disease detection, and also, to provide the scientific basis for certain public health measures. Environment, when broadly defined, encompasses the social environment, e.g.,

social legislation; some enactments have directly concerned health protection and some have indirectly supported health, e.g., assurance of adequate housing for low-income groups. The contribution of behavioral theory to health promotion has found health education an important tool in public health campaigns and in personal care situations as well.

HEALTH EDUCATION

A general goal for people of all ages is the inculcation of a sense of responsibility for their own health and for avoiding injury to the health of others. The education of the individual in health is an important teaching function not only of physicians and health personnel but of parents and teachers as well. On behalf of children, this implies encouragement to parents in child-rearing practices that foster normal growth and development as well as health-promoting habits, values, attitudes, behaviors best learned through actual practice. In health education these goals can be reinforced through systematic instruction in hygiene, bodily function, reproduction, physical fitness, and use of leisure time. Introduction to an understanding of how to use health services is also necessary. For example, regular periodic visits to a dentist can be seen as a way for a child to learn the role of dental patient and to appreciate the importance of dental health at an early age.

In the case of the adult, health education is most practicable in group settings, such as places of employment, and at a time of change in social role, as in entering marriage or becoming a parent. In addition, each new illness may be seen as an occasion of potential receptivity to personal health education.

In recent years the public health education movement has gained in strength and public support. Its aim is to inform and motivate people to adopt and maintain healthy living practices, use health services judiciously, and support proposals for environmental improvement. The movement depends, of course, on the mass media for the dissemination of health information. However, much more than the mere diffusion of health informa-