THE INTERNATIONAL APPRAISAL OF LOCAL HEALTH PROGRAMS

by C.-E. A. WINSLOW, DR. P. H.

IN the fall of 1935 the Committee on Administrative Practice of the American Public Health Association celebrated its fifteenth birthday. Established to collect data in regard to the current practice of health departments, to discover the best procedures, and to promote the simplification and standardization of such practice, this committee has made substantial contributions in this important field of community service. It has developed a technique for health surveys and thereby obtained a reasonably clear picture of American health practice in both urban and rural areas; it has crystallized the best elements of such practice in a manual of adequate community health organization; and it has prepared appraisal forms which are now generally accepted in this country as valid instruments for the objective and quantitative measurement of actual attainment as an aid in building a balanced program.[1]

Many of us have long felt that the principles involved in this program might have useful applications in other countries and the subject was brought to the attention of English sanitarians as early as 1926.[2] The obstacles in the way of the application of such a program on an international scale were, however, considerable. American tendencies toward "standardization" were under some suspicion; and it was, indeed, obvious that some procedure much more flexible than ours must be devised if one desired to compare the health programs of such countries as the Argentine, Denmark, England, and Roumania.

The Health Section of the League of Nations began serious study of this problem some two years ago and with the cooperation of the Milbank Memorial Fund and able leadership from Dr. Knud Stouman of Denmark and Dr. I. S. Falk of the United States has brought it far along the road to solution.

One of the major psychological obstacles in the path to progress was eliminated by replacing the American term "appraisal form standards" by the more tactful phrase "sanitary indices." This was, however, no mere trick of phraseology. In the American forms we first obtain an

[1] *American Journal of Public Health*, December, 1935, 25, No. 12, pp. 1296-1320.
[2] *Journal of the Royal Sanitary Institute*, 47, No. 2, 1926, pp. 133-151.

objective measure of a given activity (for example, in a given city, 1,000 visits to clinics for every 100 deaths from tuberculosis); we then state that the ideal ratio is 1,500 visits; and we allow 10 points on an appraisal score for the attainment of this ideal. The Geneva "sanitary index" calls for the objective measure of actual accomplishment but omits the ideal standard and the score. This was an act of true statesmanship, essential to success on an international basis. The record of accomplishment is the essential thing. Each country can establish its own standards if it desires; and in any case a comparison of performance in various localities establishes an automatic self-standardization which gives all the impulse toward progress which is necessary. This is an excellent example of the Geneva technique which selects what is generally useful in a given procedure and frees it from the adventitious elements of national psychology.

A second departure of the Geneva program from our own is equally significant. American appraisal has been concerned solely with administrative practices in accordance with our habit of considering the health program as a delimited area of sanitary and medical activity. European nations (and to some extent South American nations as well) have been ahead of us in recognizing that public health is a social science, intimately related to a multitude of factors influencing the physical and mental and social well-being of the community. It was decided therefore to include in the sanitary indices not only administrative practices but also measures of such factors as housing, nutrition, literacy, education, recreation, social security, and the like.

After continued preliminary work by Dr. Stouman and Dr. Falk at Geneva, Dr. Stouman came over to this country and spent some months, in consultation with American workers, in completing a schedule of sanitary indices under the three main headings of Indices of Vitality and Health (vital statistics), Indices of Environment (climatic, social, and economic factors) and Indices of Administrative Activity. From this schedule of 161 items with detailed subclassifications, from an abridged schedule of 100 items, or from a short list of sixty items, it should be possible to gain a clear picture of the health problems, the health resources, and the health attainments of any given community.

To illustrate the procedures involved, Dr. Stouman has applied the complete schedule to the City of New Haven, Connecticut, and in connection with the schedule itself, which has just been published in the *Quarterly Bulletin of the Health Organisation* of the League of Nations,

the full results of the New Haven survey are presented to illustrate the application of the new technique.

The work of Dr. Stouman and Dr. Falk in the selection and arrangement of their sanitary indices has been done with admirable skill and discretion. It seems to the writer probable that the preparation of this schedule will take its place as an outstanding landmark in the history of public health. If American experience offers any precedent, the application of the sanitary indices should prove of immeasurable value in stimulating in many countries the development of public health practice along sound and fruitful lines. For us, too, the new concepts introduced in the Geneva plan have great significance and will no doubt modify profoundly the spirit and content of our own appraisal forms. The whole enterprise represents an ideal type of international cooperation for which public health workers everywhere owe a deep debt to all concerned.

HEALTH INDICES[1]

A STUDY OF OBJECTIVE INDICES OF HEALTH IN RELATION TO ENVIRONMENT AND SANITATION

by K. STOUMAN AND I. S. FALK

I. GENERAL CONSIDERATIONS

THE purpose of public health statistics may be said to be three-fold. They should enable us to: (1) Measure the state of health of a community in all its aspects; (2) Appraise the activities undertaken for protection of the community health; and (3) Obtain indications concerning the relationship between the state of health and environmental factors, whether natural, social, or resulting from specific health measures.

The first point has hitherto received much the largest share of attention. Beginning with statistics of births and deaths more

[1] The complete manuscript of this report, including the accompanying schedules and the findings of a trial application of the indices in New Haven, Connecticut, is being published in the December issue of the *Quarterly Bulletin of the Health Organisation* of the League of Nations. Because of space limitations only the text of the main report will be published in the *Quarterly*, although the Fund purposes later making available a limited supply of the complete monograph for distribution in the United States.

than a century ago, this type of information has slowly spread to statistics of causes of death and of the prevalence of epidemic diseases, tuberculosis, venereal and occupational diseases. In recent years, the general morbidity statistics have received considerable attention, the approach having been partly through general sickness surveys and partly by analysis of the records of national health insurance systems. This development has largely been due to a growing interest in the problem of medical care and to an increasing recognition of the fact that mortality statistics alone are insufficient as indices of the state of public health.

Information concerning public health activities has long been available in the annual reports of national and local health departments and in the reports of special inquiries. It is largely of a heterogeneous nature, however, and no general attempt has been made to systematize it or to determine exactly what elements are really wanted and which are lacking. The only practical and elaborate contributions to the solution of this problem are the Appraisal Forms prepared and utilized by the Committee on Administrative Practice of the American Public Health Association. These forms were prepared with American conditions in view and cannot be applied in unaltered form to conditions obtaining elsewhere in the world. They are also meant rather for periodic surveys than for current publication.

Knowledge concerning relationships between factors of environment or sanitary measures and the state of public health is largely confined to areas which have been specially studied. This must, to a certain extent, always be so; it is generally possible to approach the question of ultimate causal relationships with any high degree of scientific exactitude only in studies of limited scope. This limitation, which to a large extent depreciates the practical value of public health statistics, is due, in the first instance, to the fact that precise information is not available, or at least is not readily accessible, concerning many of the important factors known to influence the state

of health. Such factors are notably housing, nutrition, social, economic, and cultural conditions.

The solution of these problems does not present exactly the same features in different countries. It seems, nevertheless, that much could be gained by devising from the beginning a comprehensive plan for health indices which could be followed, as far as local conditions permit, in at least a number of countries. The problem of international coordination and comparability will therefore arise at an early stage in a study of a system of health indices.

The Health Organization of the League of Nations already has contributed in the past to the development and publication of health statistics. The current epidemiological reports of the Health Section constitute in themselves a valuable contribution, and the special studies of infant mortality and the preparation of handbooks describing the organization of vital statistics in various countries have, in several respects, widened the scope of statistical procedures. Expert Commissions of the Health Organization have examined problems arising from the classification of joint causes of death and from the definition of stillbirths, as well as from the development of general morbidity statistics.

It was therefore a logical development of previous activities when the Health Organization decided to inquire into the possibilities of a further extension of public health statistics in the form of health indices. It obtained in this study the valuable collaboration of the Milbank Memorial Fund of New York, which had already accumulated considerable experience in collateral fields and notably in regard to sickness surveys and the problems of medical care. The Milbank Memorial Fund also generously provided financial support for the technical execution of this inquiry.

The study was commenced in Geneva in 1935 under the supervision of the Medical Director, Dr. L. Rajchman, but it was decided to transfer it to the United States in order to reap the fullest benefit from the large experience acquired in that country in regard to

health surveys. The work has been carried out principally at the Yale School of Medicine, New Haven, Connecticut, and the authors are particularly indebted to the valuable suggestions and the constant help and encouragement so generously given by Professor C.-E. A. Winslow, chairman of the Department of Public Health at the Yale School of Medicine and for fifteen years chairman of the Committee on Administrative Practice of the American Public Health Association.

Valued advice has also been received from other members of this Committee and notably from Dr. W. F. Walker, of the Commonwealth Fund (formerly Field Director for the Committee), and from Dr. George T. Palmer, of the New York City Department of Health. Professor Ira V. Hiscock and Dr. J. H. Watkins, of the Yale School of Medicine, have collaborated very generously in the preparation and experimental application of the plan.

The present plan is designed to facilitate the accumulation and presentation of information relating to public health and to elements of environment believed to influence it. The plan is not to be considered as a final system applicable in all its parts to all countries; it is, first of all, an attempt to establish a classification of data which are deemed desirable in order to arrive at a more complete and a more precise appreciation of health conditions than is now ordinarily obtained. While all of the information included in this plan is not available in any one locality, it all exists in one locality or another in such form that it has been or could be utilized. The importance of bringing together in one place, in systematic arrangement, pertinent information which is now published by many different public services, or which is not published at all, has been uppermost in the minds of the authors.

It is fully realised that much of the information called for in this plan is now utterly lacking in international, or frequently even in interurban, comparability. This is evidently the case, for example, in regard to the records of school medical examinations, which are

frequently not comparable even between two different examiners in the same town. Experience shows, however, that comparability of statistics has rarely, if ever, been obtained before there was a definite demand for it. Rather than omit from the beginning all data which are not yet satisfactory, the authors have hoped, by including them and utilizing them for what they are worth, to create a demand for their improvement and for international definitions and standards which lead to the development of comparability. Wherever possible, checks have been devised to facilitate evaluation of the data.

It should be emphasized that no sound system of health indices can be rigidly permanent in its form. It must grow and develop with the evolution of the community and must be adaptable to the changing problems which present themselves for solution. The element of continuity necessary to reap the full benefits offered by statistical records can best be safeguarded by a logically conceived plan sufficiently comprehensive to assure that proper weight is given to all factors relevant to the public health. The lack of continuity from which many records suffer is mainly due to the fact that the rôle of public health statistics has never been thought out as a whole but has been conceived piecemeal as need or occasion arose. We have here attempted to pose the entire question at once. What information ought we to have in order to evaluate the state of the public health and the factors which affect it, and how can this information be arranged in a logical and concise form?

The term Health Indices, which is due to the Medical Director of the Health Section, has been chosen, not only because it covers more than numerical indications, but also because it implies a reasoned selection from the unwieldy mass of available statistics of such elements as are most characteristic and descriptive of a given situation. No attempt has been made to devise a single health index by which the general state of public health of a community could be rated. It is the opinion of the authors that such unit rating would

have only slight practical interest and might serve as much to obscure as to measure the individuality of local problems. The present system is not meant to appraise these but to indicate, describe, and measure them.

When only general indications are desired, it will not be found necessary to employ the long list of Health Indices and to undertake the considerable statistical compilation which they require. Short lists have been devised which include all the indices believed to be necessary in order to indicate the fields in which the peculiar problems of a given community are mainly to be found. Once this has been done, sections of the long list corresponding to problems requiring special attention may be chosen for further elaboration. They may even, if needed, be worked out in greater detail than shown in Annex 1.

In following this reasoning the authors have no intention of underestimating the value of the standards of administrative practice or of the rating scores employed in the American Appraisal Form or to question the procedure followed in the City and Rural Health Conservation Contests conducted by the United States Chamber of Commerce. These contests have stimulated community interest in public health in the United States. It would not, as a rule, be possible, however, to make such direct comparisons between one country and another where conditions of life, natural environment, and administrative procedure may be widely different. Not merely would the American scoring procedure be misleading as a measure of public health accomplishment, but standards of requirement in any given field should naturally vary with the magnitude and characteristics of local problems. Common standards cannot be applied indiscriminately to highly diverse areas. In one country, malaria control may be the most urgent problem, while in another this disease may never have been present. Similarly, the procedure of tuberculosis control cannot be quite the same in countries or localities where final success is in sight as in

those where the campaign against this disease is in its beginnings. Financial resources for health purposes are not unlimited, and it may be justifiable in one community to neglect a problem which is important in another, in order to concentrate available funds on the most urgent needs.

In abandoning, in the system of health indices, the standards, the scores, and the weighting of these scores which play an important part in the American Appraisal Forms, greater flexibility is obtained. Nothing is said as to what problems should be considered the most important nor as to what standards should be attained in the various fields. The indices are therefore merely what they were meant to be in the first place: a means of measuring community health and factors which may influence it. Comparison in point of time and from one locality to another will permit an appreciation of the significance of any one of the indices without expressing any opinion as to when a given performance or accomplishment should be considered satisfactory. It is obvious that the value of the system will increase with the opportunities of comparison afforded by its wide and current use. Such comparison will become more direct, more precise, and more useful concurrently with improvement in the national and international comparability of the data. The proposed health indices will not, therefore, give a full result immediately upon adoption of the system; they will constitute essentially a flexible and dynamic system adaptable to changing health conditions and capable of attaining considerable precision and utility progressively as they are tested, refined, and standardized. Yet, lest that which should remain fluid and adjustable might become fixed and rigid, the Health Indices should be subjected to periodic critical reviews.

2. HISTORICAL OBSERVATIONS

The first effective surveys of health conditions were performed nearly a century ago. Edwin Chadwick's report on "Sanitary Con-

dition of the Labouring Population of Great Britain (1842)" and Lemuel Shattuck's "Report of the Sanitary Commission of Massachusetts (1850)" have become classics. These reports, however, do not attempt to establish a system of indices capable of appraising at the same time health conditions and public health practice.

The first attempt to elaborate a complete system of appraisal of health conditions together with administrative activity was made some sixty years ago. It was conceived in the United States and was examined in a committee of the American Public Health Association. Credit for this most interesting and valuable work, from which inspiration may still be drawn in certain fields, belongs to the chairman of this committee, John S. Billings, M.D., surgeon of the United States Army and founder of the famous United States Army Medical Library.

Dr. Billings says in his covering letter, dated Washington, D. C., August 25th, 1875:

> These questions are intended to obtain, as far as possible, the information which would be desired in estimating the healthfulness of a given place, and to ascertain the local and especially the preventable causes of disease at that point. Facts and not opinions are desired, and the questions are drawn up in that point of view.

The list of the chapters gives a very interesting indication of the elements which Dr. Billings considered important in an appreciation of public health conditions. They show on several points a wider conception of public health activity than that which has usually prevailed up to recent times.

Chapters of Dr. Billings' Schedule (1875)

A. Location, Population, and Climate
B. Topography and Geology
C. Water Supply
D. Drainage and Sewerage
E. Streets and Public Grounds
F. Habitations

G. Gas and Lighting
H. Garbage and Excreta
I. Markets
J. Slaughter-Houses and Abattoirs
K. Manufactories and Trades
L. Public School Buildings
M. Hospitals and Public Charities
N. Police and Prisons
O. Fire Establishments, Alarms, Engines, etc.
P. Cemeteries and Burial
Q. Public Health Laws, Regulations, Officials-Municipal
R. Registration and Statistics of Disease
S. Quarantine

A handwritten note on the manuscript suggests in addition:

T. Consumption and Sale of Liquor and its Effect on Health and on Crime

Each chapter includes from twelve to forty-four questions which are concise and to the point so as to call for a precise and objective reply. The schedule was published in Baltimore in 1878 as an extract from a lecture delivered before The Johns Hopkins University.

It is truly remarkable that Dr. Billings should have recognized and emphasized sixty years ago the influence upon public health of urbanism, housing, and overcrowding which, in his own country, are not yet viewed as matters of public concern in relation to health. There are questions as to the employment of women and children in factories and diseases due to working conditions. In the chapter on schools, questions are asked, not merely regarding sanitation of the premises, but in regard to playgrounds, indoor and outdoor physical exercise, and the result of medical examinations and tests of vision.

It is readily understandable that health officers should have thrown up their hands in despair when they saw this long list of questions. The conception of the questionnaire was undoubtedly much ahead of its time and the more so as officials had not yet be-

come accustomed to surveys; but it is regrettable, nevertheless, that it should have received such scant attention in subsequent years on the part of those who were responsible for the organization of security against disease.

No new development of any importance occurred in this field until Dr. Charles V. Chapin, the health officer of Providence, Rhode Island, undertook in 1915 to make a comparative analysis of the activity of state health departments. Dr. Chapin's work, which was published by the American Medical Association, showed that a quantitative evaluation of health work could be made. This study was of decisive importance in awakening interest for the appraisal idea. It should be noted that the purpose of Dr. Chapin was much narrower than that of Dr. Billings and this well-defined restriction of scope is typical of Dr. Chapin's sense for realities, which always enabled him to carve out from his large vision of ultimate objectives to be attained those which can be immediately realized. He devised a "rating sheet" containing only thirty-six items which he considered essential. We here meet for the first time the idea of a short list of typical "indices," which was later to be discussed by Dr. Philip S. Platt, as distinct from a full list covering all elements to be appraised. This problem has not yet been fully solved, because the establishment of a short list must grow out of experience with a full list of subjects.

No further action followed for several years, and the health appraisal idea was kept alive largely by Dr. Lee K. Frankel and Dr. Louis I. Dublin, of the Metropolitan Life Insurance Company. It was clear, however, that this task could be undertaken only by a body representative of American public health opinion. This body was created by the appointment in 1920 of the Committee on Administrative Practice of the American Public Health Association. Professor C.-E. A. Winslow was appointed chairman and has, in this position during the following fifteen years, accomplished the tremendous task of devising indices and standards for the appraisal

of public health activities in the United States and of developing the appraisal technique. He was ably seconded in this work by Dr. Chapin, Dr. Haven Emerson, Dr. Dublin, Dr. W. S. Rankin, Dr. W. F. Walker, and many other leading public health men. The success which has attended this work is to a large extent due to excellent team work in this group of distinguished workers.

The work of the Committee on Administrative Practice is well summarized in a symposium by Dr. Dublin, Dr. Winslow, and Dr. John L. Rice, Commissioner of Health of the City of New York, presented to the annual meeting of the American Public Health Association in 1935. In 1923, the Committee completed a survey of health practice in the eighty-three largest cities of the United States, which was published by the United States Public Health Service. Based upon this and other work, a first comprehensive Appraisal Form for experimental use was prepared and, in August 1924, approved by a representative committee of city health officers. After a year's experimental field work, a revision was made and a new and definitive edition published in January 1926. It was provided that periodical revisions should be undertaken, in order to keep the form abreast with the development of public health thought and practice, and a Sub-Committee on Revision was appointed. New revised editions were published in 1929 and 1934.

In the meantime, work had begun on a Rural Appraisal Form, a tentative draft of which was first published in 1927. A second and final edition of this form was published in 1932, after a large amount of experimental field work. Studies are now being carried out for a new revision of this form, which seem likely to result in extensive changes.

The abridged forms used in the City and Rural Health Conservation Contests in the United States are a development of the Appraisal Forms, although they do not altogether cover the same facts. The first of the city contests was held in 1929, the first of the rural contests in 1934. In 1936, 234 cities and 160 rural counties

participated in these competitions for distinction in respect to their public health practices and accomplishments.

The purpose of the American Appraisal Form is, according to its authors, definitely limited: "first to assist the health officer in planning his program and in evaluating the activity of the various units of his organization; second, to provide a simple and clear-cut picture of the achievements and the needs of his organization." Elsewhere, the introductory statement says: "The score attained by a city does not pretend to measure its 'healthfulness'. 'Healthfulness' can be measured by no single or simple method. It is reflected only incompletely, for instance, by mortality rates, the most readily available measure. Mortality rates are influenced by many factors: the economic, industrial, cultural, and educational status and the nativity stock of the inhabitants; the age distribution of the population; the geographic location, and climatic environment; as well as the actual community measures that are carried out to conserve health."

Such limitation of scope is legitimate and even desirable in order to produce a concise picture, so long as none of the elements essential to assure the desired evaluation is omitted. This depends to a certain extent, although not altogether, upon the conception of the rôle of the health services. This conception is not the same in all countries nor at all times.

There is a fundamental reason why the plan of "Health Indices" here proposed differs considerably from the American Appraisal Form. The new system is not meant primarily to evaluate the activities of the health department but to measure, so far as feasible, the "healthfulness" of a given community. Many features of the two forms will nevertheless remain similar and comparable. It is only fair to acknowledge that it would hardly have been possible to prepare a workable list of health indices without the wealth of experience previously accumulated by the preparation and use of the American Appraisal Forms.

The American Appraisal Form for City Health Work is divided into four main divisions and thirteen sections. The Rural Form differs only slightly from this pattern in its general construction. The divisions and sections are:

I. *Common Services:*
   - A. Vital Statistics
   - B. Laboratory

II. *Preventable Disease Activities:*
   - A. Acute Communicable Diseases
   - B. Venereal Diseases
   - C. Tuberculosis
   - D. Other Disease Activities (not scored)
   - E. Mental Hygiene (not scored)

III. *Activities for the Promotion of Hygiene of the Individual:*
   - A. Maternity Hygiene
   - B. (1) Infant Hygiene
     (2) Preschool Hygiene
   - C. School Hygiene

IV. *Sanitation Activities:*
   - A. General Sanitation
   - B. Food and Milk

The classification is seen to be rather by objectives than by services, the visiting nursing activities, for example, being distributed under the various subject headings.

It should be noted that the form does not touch on curative medicine except in respect of tuberculosis, venereal disease, and infant hygiene clinics. Hospitals are not covered by the form nor is industrial hygiene except for a general question as to whether or not the health department takes any cognizance of this subject. Problems of housing and nutrition are not mentioned. The primary reason for these omissions seems to be that these subjects are not, as a rule, dealt with by the health departments in the United States.

The classification used in the forms for the Health Conservation Contests is possibly less theoretical and covers certain subjects not

included in the Appraisal Form, such as method of sewage disposal, dental care, periodic health examinations, life loss statistics, auto deaths, and budget. Its main divisions are:

I. Water Supply
II. Sewage Disposal
III. Protection of Milk Supply
IV. Preventive Measures
V. Community Interest and Education
VI. Life Loss Statistics
VII. Financial Support for Local Health Work

Other appraisal forms for health work have been inspired by these forms. Amongst them may be mentioned the "Appraisal Form for Industrial Health Service," prepared in 1932 by Dr. Leverett D. Bristol, health director of the American Telephone and Telegraph Company.

Appraisal forms have been developed in other and allied fields, such as "The Community Score Card" prepared by the Federal Council of Citizenship Training and published in Washington, D. C., in 1924 by the Bureau of Education. A score card entitled "Community Measurement Standards" was prepared in 1925 by the Wisconsin Conference of Social Work in 1925. The "Standard Schedule for grading cities and towns of the United States with reference to their fire defences and physical conditions" first adopted in 1916 by the National Board of Underwriters is also worth mentioning as it covers not merely the fire department but also water supply, climatic conditions, building regulations, and structural conditions of buildings.

The appraisal of public health and social work in the United States in the twentieth century has been dominated by the ideas of the scoring of activities and of using these presumably objective scores as guides and stimuli toward improvement of service. The basic purpose in these undertakings has been less that of scientific investigation of relationship between the state of health, the en-

vironment and the work performed, than of stimulating competition in fields already selected as full of promise.

This development is not a direct continuation of the original idea of Dr. Billings, which was to establish a series of indices showing the state of public health and of the conditions influencing health. He had evidently in mind rather to collect material upon which planning could be based than to organize a contest.

There is no intention in these lines to minimize the utility of friendly competition in these or in any other fields. It should be remembered, nevertheless, that the purpose of statistics is not merely to establish a chronological record of past happenings or performances. Statistics are essentially a compendium of research, a general headquarters activity upon which the planning of future activities is to be based.

It is interesting to know that the leaders in the Appraisal Form movement in America with whom the authors have been in contact have expressed themselves as in hearty accord with the broadening of the scope and the elimination of rigidity in the program we are here presenting.

The present study is an attempt to prepare a system of indices which will measure, not merely (1) the performance of the health department and allied organizations, but also (2) the actual state of health and vitality of the population, and (3) the conditions of natural and artificial environment which may influence health and vitality. The indices are meant for local, national, and international use.

The American Appraisal Forms use *indices, standards,* and *scores.* The indices are the basic descriptive data or rates. The standards are generally the indices (or derivatives from the indices) actually attained by the upper quartile of the previously appraised communities. The scores are arbitrary values assigned to each type of health activity according to the accepted professional opinion as to its relative importance. A full score is given for an activity

when it reaches or exceeds the prescribed standard, a partial score for a performance which is lower but still creditable. The total of these scores, after appropriate and agreed weighting, forms the score of performance of all the health activities.

In the present study, the system of standards and scores has been abandoned; a single set of standards could not be applied to countries where conditions and administrative practice differ widely, and if no common standards can be set, no scoring is possible. If the setting-up of standards for comparable areas should be found desirable, this could be done, at any rate, only when sufficient experience had accumulated. As it is, the indices alone are retained. They are simply indices of facts which may be utilized for guidance and comparison as occasion demands and by suitable methods.

3. COMPOSITION OF THE HEALTH INDICES

Any system of indices devised to furnish precise and objective information on the state of public health and the factors which influence it must cover a very wide field. It cannot be limited to subjects and activities for which only the health department is responsible. If, in the future, it should become desirable to widen the scope of official public health work, its proper administrative expression will be found in due time. In the meantime, there can be no objection to the pooling and collective analysis of information concerning any conditions or activities which may have a bearing upon the public health, just as there have been no objections to the publication of extracts of all national statistics in statistical handbooks.

A growing tendency to widen the scope of public health conceptions has been clearly evident in European countries for several years. At present, a similar tendency is rapidly gaining ground in the United States. The questions of adequate medical care, especially for the part of the population which, for lack of sufficient resources, does not always obtain it, is at present one of the most

important problems under discussion. A solution of this problem has been attempted in most European countries—and in many of them with a substantial degree of success—by the institution of national health insurance and public medical provisions. There may be other or intermediate solutions which might be better adapted to American conditions, but the problem is clearly on the order of the day. Information, not merely regarding mortality and contagious diseases, but also concerning the prevalence of disease in general and as to what care the sick are now receiving, is therefore urgently needed.

Adequate housing accommodation is essential to healthy living, and interest in this problem is rapidly growing in the public health profession. In Europe, the housing problem is officially recognized as being of national concern by the governments of an increasing number of countries. This evolution has occurred without distinction of political tendencies, governments of so different fundamental conceptions as those of Great Britain and of Italy having taken the lead in this direction. It is obvious, at any rate, that no complete picture of the background of public health can be drawn without reference to the housing situation.

Our knowledge of the elements of nutrition has been greatly enriched in recent years, but next to nothing has been done to bring this knowledge effectively and practically to that part of the population which, on account of its limited resources, needs it most. The attachment of trained nutritionists to the visiting nursing services has been inaugurated with success in some of the model services of the United States, such as New Haven, Connecticut. It is clear that information is badly wanted in order to establish the influence of this factor. So far, adequate statistics on the consumption of the various articles of food are available only in Italy, but an expressed demand for them must be created if they are to become available.

These are the outstanding *new* problems with which the public

health profession is now concerned, but there are many others, notably in the fields of industrial hygiene, mental hygiene, physical examination, and physical education. Even the accident problem—whether industrial, traffic, or general—is one of direct and frequently growing concern to public health.

This widening scope of the conception of public health—from control of specific diseases to responsibility for the protection and betterment of individual life and health in general—involves the collection and analysis of a vastly increased amount of information. In order that this information should not become too unwieldy, it is desirable that: (1) it should be logically classified; (2) the most essential and characteristic parts of it should be extracted from the mass of specialized reports; and (3) such information should be currently published in one place, so as to allow a convenient appreciation of the health situation as a whole. This is what the present system of health indices proposes to do.

The difficulties to overcome are very serious, and there is no precedent to follow, except insofar as administrative practice in the narrower field of public health is concerned. The proposed plan must, therefore, be regarded as experimental. The arrangement of many items will undoubtedly prove unsatisfactory and will have to be improved. But the experimental stage cannot be hurdled. It may be recalled that the establishment of the American Appraisal Form, which is much more limited in scope than the system contemplated, has required several years of work and experimentation on the part of a large number of the most experienced men of the American public health profession before it became a really effective tool. A beginning must be made with some system; it must first be used experimentally in several localities and thereafter be revised by a competent committee, perhaps subsequently assisted by competent subcommittees of experts in specific fields.

It is proposed to divide the system of health indices into three main divisions:

A. Indices of Vitality and Health
B. Indices of Environment
C. Indices of Administrative Activity

The first part includes the Health Indices proper. The second covers the natural or artificial background of the health situation, and the third shows what is being done to ameliorate the one and the other.

4. INDICES OF VITALITY AND HEALTH

The main chapters of this first division comprise the following:

I. Population
II. Natality
III. Stillbirths, Infant and Maternal Mortality
IV. General Mortality and Causes of Death
V. Morbidity
VI. Invalidity
VII. Insanity and Mental Defects
VIII. Alcoholism and Drug Habit
IX. Accidents
X. Suicides and Homicides
XI. Examinations of Physical Fitness

These chapters cover the indices on the vitality and health of the population which generally are or readily could become available. The elements which are actually available will naturally vary considerably from one country or city to another, and a completely answered survey form is only a goal to be gradually attained. Inasmuch as no scoring or total rating is contemplated, the contents of one chapter will not be invalidated if that of another should be incomplete.

A-I. *Population.* The chapter on population should include the elements which are characteristic for, or have a direct bearing upon, its vitality and health; its size and growth, natural and by migration; the sex and age distribution; the proportion of women of childbearing age, married or not; the size of families; and, wherever

necessary (as in the United States), the nativity and racial distribution.

It is essential, in the case of a city, that the growth of the population should be shown separately for the city and its suburban area. The rapid spread of the city population into suburban areas, chiefly owing to the increasing use of the automobile, has for the last twenty years been one of the chief characteristics of urban development in practically all parts of the world. It is essential to know how this movement responds to changing economic conditions and how it affects the health of the population. Difficulties arise as to the definition of suburban areas, which at present are left largely to the judgment of local authorities. It will be necessary to have this question examined some day by an international group of experts, which may seize the occasion also to consider the question of the definition of urban and rural areas. It is probable that, in the end, the element of growth itself must be included in the definition, so that the suburban area comes to cover all the surrounding territory in which there is a marked swelling of the population owing to the proximity of the town. This would give moving limits, however, and it may be found necessary to introduce a system of zoning, using the density and not the administrative area as a basis. The proportion of rural farm population may also be a useful index. Until such work has been carried out, there is probably no other way out of the difficulty than to use the local definitions, which on the whole, will be based upon actual knowledge as to where people who work in town, or are intimately connected with its economic life, live.

It is desirable, in general, that these indices should not become too unwieldy, and the classifications must therefore be fairly short and simple. The annual statistical reports of the various departments can always be examined when greater detail is wanted. The age distribution used throughout the plan is therefore as short as is both possible and practical: under 5 (except for infant mortality),

5-14, 15-24, 25-44, 45-64, and 65 and over. These groups correspond roughly to preschool and school ages, youth, early and late working ages, and old age. Each of these groups has characteristics of its own in respect to mortality, causes of death, morbidity, and conditions of life.

Statistics of size of family are also very useful in an evaluation of living conditions and as a complement to natality data, but standard definitions are wanted also here. It is necessary to know whether all living children or only those being at home are counted, whether all offspring or only minor children are included, and where adopted children, orphans, or children of dissolved marriages are counted. A solution of this problem, however, is less complicated and probably also less urgent than the one mentioned previously.

The data in the chapter on population will come largely from census returns. Other sources of information should not be overlooked, however, notably in regard to intercensal estimates of urban and suburban population, which, when based entirely upon decennial returns, have proved to be over 10 per cent off in many towns, thus falsifying all rates. Among auxiliary sources of information on the movement of the population should be mentioned population registers, school censuses, lists of voters, directories, telephone, electricity and gas company returns, none of which may be quite exact and complete, but may nevertheless furnish valuable indication as to current trends in the population. Whenever such estimates are used, the source should be given together with a comparison with census returns.

These indices are not sufficient for a complete population study, but they do show at a glance those demographic characteristics of the locality which have a direct bearing upon community health and growth.

A-II. *Natality*. Statistics of natality are equally necessary in order to show with what kind of population we are dealing. A low-birth-

rate population conveys in itself an image quite different from that of a high birth rate population. What this image stands for cannot be expressed definitely in figures, but we know that it means something quite tangible in the mode of life and in cultural and social conceptions.

Apart from this, natality has a very direct bearing upon the vitality of the community. It is not only an important element in population growth, but is also to a certain extent related to the infant mortality and the prevalence of certain communicable diseases of early childhood.

The principal indices which should be included in this chapter are: live birth rate; fertility rate of women, married and single, 15-44 years of age; reproduction rate (gross or net, as may be feasible). If necessary, certain of these rates may be given by race, color, or other important divisions. Marriage statistics may be included, although they are not always of great value.

All birth statistics, as well as all other statistics, should be fully corrected for residence. Birth rates for towns not so corrected are useless and should be discarded.

A-III. *Stillbirths, Infant and Maternal Mortality.* Stillbirths are dealt with together with infant mortality because they are antenatal deaths and, as such, closely related to the neonatal mortality. It is true that stillbirth records are frequently not complete. They may nevertheless be considered as fairly reliable now in a considerable number of countries, and the principal obstacle for direct comparison is the variation in the lower limit which separates them from nonreportable abortions. This question can be solved, and has been dealt with in the definition proposed in 1925 by the Expert Committee on Stillbirths of the Health Section. A further attempt to have this definition more widely adopted might be useful. Differences in the upper limit (whether a birth is a live or a stillbirth) might be eliminated, when necessary, by combining for the purpose the stillbirth rate with the neonatal mortality (under 1

month) to give a rate of "birth mortality." This rate is widely employed in Italian vital statistics and is of particular interest in connection with studies of the results of prenatal care and of the organization of obstetrical services.

Earlier and later infant mortality (1-11 months) must be kept strictly separated because their nature is largely different. This should be done also for the causes of infant mortality—injury at birth, prematurity, congenital debility, and malformations being typical for the neonatal infant mortality; respiratory and intestinal infections for the later infant mortality. The inclusion of a few causes of stillbirths may be warranted in certain localities but not in all.

Statistics of abortions are occasionally available from the prenatal nursing records, but can be employed only with due reference to the month of pregnancy when treatment began.

Maternal mortality is dealt with in this chapter because it is closely connected with prenatal and obstetrical care. Deaths from abortions should be kept separate from deaths in childbed, and the principal causes of maternal mortality should be specified. Whenever feasible, it might be well to give the maternal mortality according to attendance at birth, but it must be borne in mind that the most difficult cases are apt to end in hospitals. Classification should therefore preferably be made according to who was first in charge of the case.

A-IV. *General Mortality and Causes of Death.* Crude and standardized death rates of the town and its suburban area are included in the plan of Health Indices, but neither can replace the specific death rates by age and sex, as only these will indicate how the population responds to its surroundings at the various stages of life. Unfavorable conditions in youth or early working ages, where mortality is always relatively low, may thus easily be obscured in the general death rate, whether standardized or not, by a comparatively low infant or old age mortality. Each age of life presents its

peculiar problems, and specific death rates give a first valuable indication of the direction in which additional efforts for the improvement of health are particularly needed.

Death rates for the major causes must also be given by sex and age, for the same reason. Moreover, the age of death from a given cause has a significance of its own. It is more or less natural, for example, that many old people should die from heart failure, but it is very serious when death from this cause takes an increasing toll in the prime of life. The list of causes of death have been limited in the Health Indices, as far as possible, to those which constitute serious problems of health and concerning the incidence of which better information cannot be obtained from other sources. The incidence of such notifiable epidemic diseases as no longer cause an appreciable mortality are better treated in the chapter on morbidity.

A-V. *Morbidity.* Up to the present, we have been chiefly concerned with current census and vital statistics; the new element has been more in the selection and arrangement of data than in the provision of information not currently used. With morbidity statistics we enter the field of statistics which have not generally been currently used in the evaluation of the state of public health. These statistics are almost always less complete than the mortality returns. In many countries and cities, parts of the morbidity data are now complete enough, however, to take their place in a general descriptive system. The reporting of most epidemic diseases, and even of tuberculosis, is certainly now, in many localities, as good as or better than the certification of most causes of death was in the Nineteenth Century, when there was usually no other source of information available concerning the prevalence of disease. The same may be said of the records of certain diseases compiled by many health insurance services.

The chapter on morbidity includes case rates and case-mortality rates for the more important epidemic diseases; the reported case

rates for syphilis and gonorrhœa, if possible by sex, age, and marital condition; the reported case rates for tuberculosis, preferably by sex, age, and type; the incidence of tuberculosis cases carried on the register; cases of occupational diseases notified; general morbidity data by cause, from health insurance records wherever possible, if not eventually from community sickness surveys; sickness returns and the results of medical examination of school children, wherever available.

Venereal disease returns are approximately complete only in very few countries and in a certain number of cities and other localities elsewhere. Attempts have frequently been made to keep a check upon the reporting of practising physicians, however, and a fair knowledge exists of the extent to which the records can be trusted. They constitute, on the whole, a valuable source of information concerning the prevalence of these very important diseases.

The tuberculosis registers have in recent years been handled very efficiently in many countries and localities, and ultimate checking against the deaths is always possible. These data are therefore entitled to a prominent place in any system of health indices where they will be accompanied by the necessary ratios of control. With the prolongation of life and the saving of many tuberculous patients, mortality records can no longer be considered to measure adequately the prevalence of tuberculosis nor even its trend at a given moment. The deaths are now chiefly those of old cases. There will naturally be an increase both of new cases reported and of those already on the register until the records are well established, but, thereafter, efficient tuberculosis control should result in a decrease in new cases. There should, at the same time, be an increase in the number of cases on the register, especially when compared with the new cases, on account of the extension of life of the patients. This ratio has been introduced in the present system of health indices and deserves closer examination.

Tuberculosis cases should be reported by sex, age, and type, be-

cause the evolution of the disease and of its public health aspects vary accordingly. It is essential to keep cases of the hilum or childhood type apart. Information, which is not now generally available, should be sought as to the proportion of respiratory cases which were in the initial stage when reported.

Adequate tuberculosis registers now exist in a large number of localities of many countries, but it seems desirable, before making international comparisons, to obtain a standard definition as to what cases should be on the register. In some countries, only "open" cases are counted. This does not seem to be a safe procedure, the more so as a large number of advanced and really not arrested cases now become "closed," thanks to the various forms of collapse therapy. It would be desirable also, from a prophylactic point of view, to include indices as to the extent to which collapse therapy is used.

Silicosis is probably the most important occupational disease—at any rate, it is undoubtedly deserving of this invidious distinction when considered in terms of its repercussions upon public health in general. Case reporting is probably much less reliable than that of the various industrial poisonings, but an effort must be made to obtain more complete information regarding the incidence of this condition. The case rate in exposed occupations should therefore be included, even if the data are incomplete.

Other information regarding the incidence of specified diseases may be shown in the Health Indices wherever warranted, such as the typing of pneumonia cases, spleen measurements in malarial regions, etc.

The huge amount of information on morbidity available in the records of national health insurance services generally has not so far received the attention which it merits. The best morbidity returns from this source published in annual form are probably those of Scotland and of Czechoslovakia, where such reports are already rendering a substantial service. A further analysis by geo-

graphical and social divisions will render them still more useful. When utilizing such returns as Health Indices, it is not sufficient to give the number of cases; the number of days of incapacitating illness due to each disease must also be taken into consideration. The significance of any of these rates must be duly weighed against the type of medical care given, the classes of the population covered, the situation of dependents in the insurance scheme, the benefits guaranteed, the waiting period, and similar factors which vary greatly from one system to another. It is important also to know whether members are dropped from the lists or are maintained by contributions paid in their behalf when they can no longer pay their contribution themselves.

Practically nothing has been done so far with the records of disease among school children as distinct from the current medical examinations. It is important, however, that better information regarding the prevalence of disease in childhood be obtained, and questions to this effect have therefore been included in the Indices.

The principal findings of the school medical examinations have also been included in the Indices, but careful research into the possibilities of establishing international standards and definitions for the various pathological conditions must be undertaken before these data will have any real comparative value. It should not be too difficult to reach an agreement on standards for defects of vision and hearing, but it will prove much more difficult to deal with morbid throat conditions. For example, the medical appreciation of the needs for tonsillectomy, according to recent studies in New York, seems so far to be not much more than guesswork. These difficulties should not discourage attempts in this direction. The study of physical defects conducted among school children in New York City under the direction of Dr. George T. Palmer, and published in 1934 under the title "Physical Defects: The Pathway to Their Correction," shows the value of this material when properly prepared. Hospital statistics may, under certain circumstances, be

of some value, but it is necessary to keep in mind that they are always much influenced by the adequacy of available facilities and by the conditions of payment for service.

Apart from the current records for the common epidemic diseases, the various categories of morbidity data here mentioned are not published in the vital statistics reports, but are scattered over many reports, if they are published at all. The Health Indices will therefore render a service by bringing them together in one place.

A-VI. *Invalidity.* The incidence of invalidity (defined as a permanent or prolonged total or partial incapacity to work) is an important element in the measurement of community health. Complete and reliable information is available only where a system of compulsory invalidity insurance exists, or where special surveys have been made; but, even so, it must be accompanied by specification of the scope of the insurance and the definition of cases covered by it. It must usually be supplemented by the invalidity cases coming under the Workmen's Compensation Act.

Disease and accidents contribute by far the largest share to invalidity, but blindness and other physical defects are also of importance. Information regarding such cases can, in some countries, be obtained from census returns. Even where this is not the case, there will frequently be information available from various sources concerning the blind. It is preferable, wherever possible, to give the data on blindness and other invalidity by broad age groups in order to separate the cases which are due to mere old age infirmity from the others.

A-VII. *Insanity and Mental Defects.* It is usually difficult to obtain precise information regarding the prevalence of mental disease, because the number of sick interned in asylums and those known and otherwise cared for depends largely upon the policy pursued and the facilities available. These difficulties are even greater in the case of mentally abnormal children than for adults. For cities or other local areas of administration, an additional difficulty fre-

quently arises from the fact that institutions for the mentally deficient and for the insane usually serve a much larger territory than that of any local government area.

The problem of mental disease, nevertheless, cannot be disregarded in an appraisal of the health and vitality of the population, and such data as are available must be included in the Health Indices for what they are worth. They comprise notably returns of insane asylums, institutions for mentally defective children, behavior clinics and other outpatient services, and, in some countries, certain information from the census returns.

Only experience can show which data are the most significant and the most apt to be made comparable by setting up the necessary standards and definitions. It may prove preferable to select as indices for adults certain well-defined mental diseases which may furnish more definite numerical indications than the total figures. The incidence of general paralysis of the insane has a definite public health interest of its own, and it should be possible to obtain fairly accurate information about it. This entire field is comparatively unexplored, and, if the Health Indices in the beginning should serve merely to stimulate interest in the organization of new research, the inclusion of this item would be largely justified.

A-VIII. *Alcoholism and Drug Habit.* Alcoholism cannot be disregarded in a stocktaking of community health, although statistical evidence concerning its prevalence and effects has always been among the most debated subjects. Most of the statistical material will be in the form of evidence of effects rather than direct indices of the actual abuse of alcohol. Even so, such records may be useful in determining with some degree of certainty the upward or downward trend of the evil. Such indices are the number of persons treated for alcoholism or sentenced for offences committed in the state of inebriety. The first group of evidence relates to extreme conditions of chronic abuse, while the second is apt to throw light upon the extension of drunkenness in general, whether habitual

or occasional. The latter is probably the most important of the evils, but the incidence will naturally depend to a large extent upon the attitude of the police and the judicial authorities and upon their efforts to trace any evidence of drunkenness. Whatever information can be obtained must therefore be utilized with all necessary precautions.

Information concerning drug habits will usually be limited to the internment and treatment of addicts, the number of which covers only a small fraction of those who are affected. Such figures may, however, at times, furnish useful indications regarding its trend.

A.-IX. *Accidents.* Accidents may, for purposes of control and other administrative action, be divided into three large groups: occupational accidents, traffic accidents, and other more occasional accidents. All represent substantial menaces to life and health against which definite action can and should be taken. Statistics of nonfatal bodily injury can usually be obtained regarding the first two categories; only statistics of death are usually available in respect to the third.

Workmen's compensation insurance covers, in nearly all countries, the occupational accident risk, and full details of cases are as a rule obtainable. Such data are usually classified by duration of incapacity for work and give, therefore, a substantial picture of the magnitude of the problem.

Traffic accidents have increased enormously during the last twenty years and have therefore attracted much attention in view of the establishment of improved systems of traffic regulation and other means of reduction. Complete statistics are now usually available, notably concerning automobile accidents, to which are assigned all accidents in which motor vehicles were involved. Rates should be given, not merely on the basis of population, but also per 1,000 motor vehicles registered, which is usually the best index of density of traffic. This may not be the case, however, in rural communities with crossings of important highways on their terri-

tory. It is preferable to classify accidents according to place of occurrence and only in secondary classification by residence of the victim. The rate of automobile accidents is an indispensable element in a system of health indices, because a community cannot be said to offer an adequate guarantee to life and health so long as its rate of traffic accidents is unduly high.

A-X. *Suicides and Homicides.* The suicide rate is an important index of nervous strain in relation to nervous adaptation and resistance. The rates should be given, if possible, by large age groups and, at any rate, by sex, because considerable changes have occurred within comparatively recent years in the age and sex distribution. It is frequently seen that the rates for certain groups increase while others decrease, indicating a shifting of the strain from one class to another.

When the homicide rate is given, it should be made clear whether it includes nonwillful manslaughter, as in case of accident due to gross negligence. Such cases should, so far as possible, be excluded, so that homicide is taken to mean intentional killing and death from intentionally inflicted injury.

A-XI. *Examinations for Physical Fitness.* Measures for physical fitness should, at any rate theoretically, be an important element in a system of health indices. Perfect health does not mean merely the absence of incapacitating illness—which is only the final breakdown of a physique unable to resist general or specific conditions of its environment. So far, little is available which can furnish objective measures of the physical fitness of the population.

Medical examinations of school children have been dealt with under "Morbidity," where they properly belong, because they do not yet go much beyond the detection of certain morbid conditions.

A number of physical examinations of adults are carried out by life insurance companies and among employees of various industrial or commercial concerns. The findings are generally not available in detail, if at all, and the groups examined cannot as a rule be

considered as typical for the population at large. More valuable information can be obtained, in certain countries, from the physical examinations for military conscription. They are often influenced, however, by consideration of whether the number of recruits really wanted represents a high or a low proportion of the young men available. Even when such data are obtainable in adequate form it should be remembered that deductions cannot be drawn from them as to the physical conditions of men at middle life or of women. Only when such information becomes more abundantly available will it be possible to determine whether the lengthening of the span of life is partly due to a betterment of physical fitness or merely to a decreased incidence of disease.

The chapter on physical fitness will, therefore, at present, be more an indication of an essential factor not to be lost from sight than a real index of the vitality of the population as a whole.

(To be continued)