

# HEALTH INDICES<sup>1</sup>

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

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## 5. INDICES OF ENVIRONMENT

ENVIRONMENT has always been one of the most important factors determining health and longevity. In view of the amazing reduction of mortality effected at certain periods of life and considering the relatively small sums spent on public health, sanitation has been eminently successful. It is probably the signal nature of this success which has led to the relative disregard, in the public health reports of countries and towns in temperate climates, of factors of environment and to the emphasis upon information concerned with activities directed at human beings for the betterment of public health.

This tendency is hardly justified. Even though the deleterious influence of *natural* environment has now been greatly reduced, that of *artificial* environment persists and has, on the whole, been only insufficiently dealt with from a health point of view. No attempt to appraise the health situation of a community would be adequate if it neglected the social, economic, and cultural background of the population.

The principal chapters on environment (B) which are proposed for inclusion in the system of Health Indices are:

- i. Climate
- ii. Topography and Density of Population
- iii. Occupation

<sup>1</sup> The first section of this report was published in the January, 1937, issue of the *Quarterly*. The complete manuscript of the report, including the accompanying schedules and the findings of a trial application of the indices in New Haven, Connecticut, was 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 has been published in the *Quarterly*, although the Fund has made available a limited supply of the complete monograph for distribution in the United States.

- iv. Distribution of Wealth
- v. Cultural Level
- vi. Illegitimacy and Prostitution
- vii. Housing
- viii. Nutrition
- ix. Consumption of Alcoholic Beverages, etc.

B-I and II. *Natural Environment.* Although the free influence of natural environment upon health has been greatly reduced by sanitation, it cannot yet be considered a negligible factor. The peak of summer mortality has been leveled wherever modern methods of sanitary control have been enforced, but the peak of winter mortality persists. It will therefore be useful to have information not only on the temperature but also on the number of hours of sunshine in the different seasons of the year. The altitude and the nature of the soil are also factors to be considered.

Even more important are the geographical factors in which natural and artificial environment combine to determine the extension of suburban settlement around the city. The diffusion of a large part of the population under semi-rural conditions should relieve congestion and, normally, have a favorable effect upon health. However, this is not always so; on account of inadequate organization, suburban administration frequently fails to take full advantage of the benefits offered by nature. But indices of the principal characteristics of the suburban extension must be available in order to judge the success of sanitary control and the relationship between the town and its surroundings. Such indices will notably cover the density of population in the various zones and their relation to the urban density, the nature of the settlement, the establishment of industries, and the proportion of rural farm population left in the area.

B-III to VI. *Characteristics of the Population.* The demographic and racial characteristics of the population have been treated in Part A of the indices. Its occupational distribution belongs to the

second part; occupation determines, for at least half the day, the place of work and, to a large extent, the habitual environment of the gainfully occupied persons. The classification cannot be very detailed, but by using only broad groups many differences in the various census classifications will be eliminated or avoided. It is essential to show the proportion of women and children who are occupied otherwise than at their own housework. This, in itself, is a valuable social index. Other indices of general interest are the proportion of domestic servants and the proportion of persons occupied in the liberal professions. Information can be obtained in many countries also in regard to position in the industry, whether employer or employee, and as to the proportion of the population which may be counted as falling within the "laboring classes."

Information concerning economic conditions comes from more varied sources. In some countries, census returns give the population according to distribution in income classes assessed for taxation. Where the limit for income tax is very low, income distribution is the best index of the distribution of wealth. Indices concerning the part of the population which is below the income tax limit may be found in the ratio of persons assisted by public or private agencies and in the prevalence of unemployment. The former ratio should, however, be used with caution, because it depends to a considerable extent upon the relief funds available and upon the policy pursued in this respect. Where nothing more definite is available, rentals paid may frequently give the best indices of the distribution of the population according to economic situation. Automobiles registered and telephones per hundred inhabitants may furnish valuable indications regarding the prosperity of a locality.

The cultural level of the population determines to a large extent the ability of the community to adapt itself to its environment and to profit by the technique of healthful living. The cultural level, being, so to speak, an intangible element, cannot be directly meas-

ured and expressed in statistics. Indications can be found, to a certain degree, in the percentage of illiteracy, in school attendance at various ages, in the number of volumes in public libraries, and sometimes in the circulation of newspapers and magazines. It is true that culture does not consist merely in reading and does not come only from attendance at school, but these are nevertheless among its most important bases.

It is more difficult to find indices concerning the moral level of the population. The prevalence of illegitimacy and the institution or abolition of prostitution have some bearing upon this, although they do not have the same meaning in all countries. Information in these respects should, at any rate, be included, because such indices deal with aspects of the subject which have a direct bearing upon public health.

B-VII. *Housing*. Housing is probably the most important element of environment. Men spend, on the average, at least one-half of their time at home, women and children more. The majority of houses, in any country, are not up to the level of reasonable modern requirements, and overcrowding affects a part of the population in any town in the world. Health conditions cannot be adequately described without due reference to housing.

Census reports contain, in many countries, fairly detailed information concerning housing and the occupancy of houses. Special housing surveys have been made for selected areas of other countries. To this may be added special slum surveys made in various large cities. Where such information does not exist, the necessity for obtaining it cannot be sufficiently emphasized.

Wherever available, housing statistics have the advantage over most other social statistics of being complete, definite, and objective. The nature of the house and the number of rooms, as well as the number of occupants, can be expressed in quite simple numerical terms. The accommodation available can be summarized by a tabulation of the distribution of houses into one-family and

two-family houses and apartment or tenement houses, and of the dwellings according to number of rooms.

It is true that no international definition exists in regard to what is considered a room. In some countries, the kitchen is counted as a room; in others, not. In France, any space large enough for a bed is counted as a room. It should not be too difficult, however, to reach an international agreement in this respect. The proposal toward such an agreement which might be worked out by a committee of experts could also profitably include a list of other items for which information should be asked in a housing census.

The room in itself is an element of fundamental importance, because it allows segregation of sleeping quarters in the family. But not less important is the volume of air space, as small rooms obviously have not the same hygienic value as large rooms. Information is rarely available in this respect, but efforts should be made to obtain it, as it would allow of a more precise evaluation of the problem of overcrowding. Small rooms are the rule in the poorer sections, and overcrowding is therefore really worse there than would appear from the statistics of persons per room.

More than one but less than two persons per room is usually considered as overcrowded, two persons or more per room as seriously overcrowded. These may be fair measures so long as the rooms are of reasonably good size and are provided with necessary light and air. It would be preferable, however, to distinguish the inhabitants as between adults and children, because the latter, if small, can better be placed together without serious overcrowding resulting.

More difficulty is experienced in establishing indices of the quality than of the quantity of housing. Quality is always to a large extent a matter for subjective consideration. Certain objective, quantitative measures nevertheless throw light upon the quality of housing. Such measures are: the proportion of dwellings provided with individual bathrooms, with individual water-closets, with

central heating; the proportion of dark or semi-dark rooms; the proportion of dwellings partly below street level. Such indices convey more information than that which they specifically contain, because, for example, a dwelling with individual bathroom and central heating already attains a certain definite standard of quality; conversely, flats without individual water-closets signify a low type of housing.

Information can frequently be obtained from the building inspection service regarding the number of houses, flats, and rooms built each year. The ratio of those built during the last ten or fifteen years to the total numbers available furnishes a significant index of the rate at which old housing is being replaced. Though new houses are not always better than old ones, generally they are, and this index is therefore apt to contain a qualitative element.

The percentage of vacant dwellings according to number of rooms will show whether there is a real shortage of housing accommodation or whether such overcrowding as may exist is due entirely to the inability of a part of the population to pay for adequate living quarters.

Finally, the housing indices should include statistics of the population living in hotels, lodging houses, or institutions.

Certain houses, streets, or areas are slums less because the buildings are grossly inadequate than because the inhabitants make them slums by their disorder, uncleanness, and slovenliness. Records of cleanliness of houses and yards are frequently kept by the sanitary inspectors, but such reports must necessarily remain subjective; practical objective standards could scarcely be devised.

**B-VIII. Nutrition.** Wholesome and adequate nourishment undoubtedly contributes as much to the building-up of health as does good housing. Indices of consumption of alimentary products are much more difficult to obtain, however, than indices of housing. The approximate amount of the principal food products consumed can sometimes be calculated for the country as a whole from the

statistics of production and of net importation. Such data cannot be procured for individual cities, except occasionally for certain products under special sanitary control—such as milk and cream.

Even if such statistics were available, they would throw only scant light upon the daily fare of that poorest part of the city population for whom the obtaining of adequate nourishment constitutes a real problem. A 10 per cent lowering of the food consumption among that 10 per cent of the population where it was already scanty would mean a lowering of less than 1 per cent in the total consumption of the entire population, but such a change might still suffice to bring a considerable increase in community ill health through undernourishment. Too much useful direct evidence should therefore not be expected from statistics of this type.

Better data might be obtained from careful surveys of family food budgets in various economic and social classes of the population. Such research has been carried out in several localities and should be utilized, whenever available, for the city being surveyed.<sup>2</sup>

Direct evidence of malnutrition may be obtained from the medical examination of school children. If such data are to be used at all, it is necessary to use measurements which are more objective than the personal opinions of examining physicians. Interesting suggestions in this respect are contained in the New York City survey of physical defects among school children, which advocates the ratio of arm girth minus chest depth to hip width as a good measure of the state of nourishment.<sup>3</sup>

B-IX. *Consumption of Alcoholic Beverages.* Alcoholic beverages being subject to tax in practically all countries, statistics of their consumption are usually available. Such data may, at times, be obtained also for cities or other local administrative areas. Such indices may be of interest in connection with the prevalence of alcoholism.

<sup>2</sup> See Wiehl, Dorothy G.: Diets of Low-Income Families Surveyed in 1933. *Public Health Reports*, United States Public Health Service, January 24, 1936, 51, No. 4, pp. 77-97.

<sup>3</sup> See Fransen, Raymond: Physical Measures of Growth and Nutrition, Monograph II of the School Health Research Series; and Physical Defects; The Pathway to Correction, American Child Health Association, New York.

## 6. INDICES OF ADMINISTRATIVE ACTIVITY

The third part of the Health Indices deals with administrative measures undertaken to safeguard and improve public health. This part therefore has much in common with the American Appraisal Form, and comparability has been preserved as far as possible. It has not been thought advisable, however, to constitute this part of the Health Indices as a mere extract from the Appraisal Form, with omission of standards and scores; the purposes of the Appraisal Form and of the system of Health Indices are not altogether identical. The Appraisal Form is chiefly designed to rate the activity of city health departments and allied official or voluntary organizations working in the same fields. The third part of the Health Indices, while also attempting to formulate numerical expressions for these activities, has the special function of being an auxiliary in the interpretation of the indices of the first two parts. It must therefore cover all activities relating to public health and care of the sick, whether or not they fall within the competence of the health department or of the public health agencies.

Part C of the Health Indices contains twenty-four chapters. Ten of these are adapted from the Appraisal Form, and three others are based upon the rearrangement of information which is also contained in that document. Two other chapters (Expenditures and Personnel) are dealt with in the Appraisal Form only insofar as the health department is concerned. For three subjects, there is no special provision in certain countries (none in the United States generally) namely: health insurance, invalidity care, and care of the aged. The remaining six chapters concern problems with a definite public health aspect which are being dealt with in one way or another in nearly all countries. These are: physical education, housing, industrial hygiene, care of the insane, hospital facilities, and medical assistance.

The chapters of the third part (C) of the Health Indices are:



- I. Community Expenditures on Sickness and Public Health
- II. Sanitary Personnel
- III. Vital Statistics
- IV. Laboratory Services
- V. Acute Communicable Diseases
- VI. Venereal Diseases
- VII. Tuberculosis
- VIII. Other Diseases
- IX. General Public Health Nursing
- X. Maternity Hygiene
- XI. Infant and Preschool Hygiene
- XII. School Hygiene
- XIII. Physical Education
- XIV. General Sanitation
- XV. Food Inspection and Nutrition
- XVI. Housing
- XVII. Industrial Hygiene
- XVIII. Health Instruction
- XIX. Care of the Insane and Feeble-minded
- XX. Hospital Facilities
- XXI. Health Insurance
- XXII. Free Medical Assistance
- XXIII. Invalidity Care
- XXIV. Care of the Aged

This is a very long list, and each of the chapters contains many questions. It cannot be shorter, however, if the entire field is to be fully covered. It is very likely, however, that a much abridged list, including only the cardinal points of public health activities, may be substituted for most practical purposes. This possibility will be discussed in the following chapter, and it will be emphasized that an abridged list can attain definite form only after experimental use in several countries.<sup>4</sup>

C-I. *Community Expenditures*. No score is given for budget in the American Appraisal Form, although the principal items of the health department budget are recorded. Those who were respon-

<sup>4</sup> This discussion is published in the complete report.

sible for the Appraisal Form wanted to know what was being accomplished in a community rather than how much money the health department could spend.

The short form used for the American Health Conservation Contests takes the opposite line and includes budget as a scoring item, arguing that the provision of funds is a significant expression of community interest in public health.

There is much to say in favor of each point of view. It would be difficult to justify complete omission of reference to budget in the Indices; budget is fundamental among the elements which determine the possibilities for extension of public health activities.

The question of expenditures on sickness and public health is probably the most difficult of all which come within the scope of the Health Indices. It must be remembered that the budget of the local health department constitutes only a fraction of these expenditures. Provincial and national health departments also spend on public health for the benefit of each locality, and it is difficult to determine exactly what proportion of the expenditure may be properly charged to the city or district in question. Voluntary associations contribute to the health work and so do the social insurance systems wherever they exist. In addition, there is the budget of the hospitals and of similar institutions which, in the aggregate, frequently exceed that of the health department. This brings us into the very complicated question of the costs of medical services. It might be decided that such expenditures should be included—they certainly serve definite public health functions—when they are met from tax funds or from voluntary contributions. However, there is little practical difference between taxes and compulsory contributions to national insurance schemes, so that a line of separation between the two is in a measure academic.

It may be thought preferable to exclude the costs of medical care altogether, but it is difficult even to distinguish clearly between these costs and the costs of public health activities. The care of

epidemic diseases, tuberculosis, and venereal diseases are usually, and properly, considered as part of any system of preventive medicine. But then, apart from traditional practice, it seems arbitrary to include some diseases and exclude others which also have an important or direct reaction upon the state of the public health.

The problem of community expenditure in respect to sickness and public health is obviously a very difficult and complicated one in any particular community. It becomes much more so when the subject must be considered internationally, because so much depends upon the administrative organization and the general policy followed in each country. Everything turns really upon the extent to which the general health program is related to, or is based upon, organized care of the sick.

A chapter on expenditure has been included in the present schedules, because the authors think it is an important element in the evaluation, but it has been done without much confidence that the proposed draft will prove final or that it can be fully used anywhere. It would probably be very desirable to have this whole subject thoroughly examined by an international group of experts who might establish categories which might offer an opportunity for rough comparison.

C-II. *Sanitary Personnel.* The personnel of the local health department is included as a nonscoring item in the American Appraisal Form. It seems desirable to add to this the technical personnel of other official or voluntary bodies engaged in public health work.

Apart from this, it would seem useful to show the numerical strength of the entire sanitary profession—physicians, dentists, nurses, *et cetera*—in order to have an indication of how far the requirements of the population in this respect are met. A definite deficiency in one category or the other is apt to have an unfavorable influence upon the state of public health.

C-III. *Vital Statistics.* The questions concerning vital statistics

are divided into five sections of which three cover the main points where inexactitudes are most apt to arise: correction for residence, verification of certificates, and certification and tabulation of causes of death. These questions have not been fully dealt with in the Appraisal Form, and it is strange that the question of correction for residence should not have been posed at all.<sup>5</sup> It is the most important of all because the errors due to omission of this correction may be so great that the compilation of statistics might as well be dispensed with.

Some of the questions which are new to the Health Indices schedule are included for reasons of international comparison, such as the percentage of deaths medically certified, whether or not the medical statement of the cause of death is confidential, the percentage of deaths ascribed to unknown or ill-defined causes, and the use of the international list of causes of death. Other questions, besides that concerning correction for residence, would be of interest even for comparisons among American cities, as, for example, the percentage of deaths on which an autopsy was made and the inquiries into insufficiently specified causes of death.

*C-IV. Laboratory Services.* The Appraisal Form does not attempt to give a full account of the public health laboratory activity, but singles out certain analyses as being the most important and eventually characteristic for the rest. These are: typhoid fever, diphtheria, tuberculosis, syphilis, gonorrhoea, milk and cream, water, urine from prenatal cases, and total laboratory procedures. This may be fully justified for a short list but does not do sufficient justice to new developments in this field, which should be encouraged. It may also unwisely encourage the neglect of other analyses by the inference that they are not important because not shown or rated.

The present schedule has attempted a more systematic classification of laboratory procedures into specimens of human and other

<sup>5</sup> Except that correction for residence is provided in the mortality tabulations which are included in the (nonscored) general information items of the introductory section.

origin and given more details of bacterial examinations. It adds water examinations other than those of the public water supply.

It may be added that the standards set by the Appraisal Form for bacterial analyses of specimens of human origin seem altogether insufficient to allow for preventive work on contacts, food handlers, *et cetera*, which should be systematically pursued. Such low standards might easily discourage good work.

*C-V. Acute Communicable Diseases.* The sections of this chapter are notification, case investigation and recording, hospitalization, control of contacts, control of carriers, diagnostic service, visits to cases, and immunization. Most of these elements are found in the Appraisal Form, although they are arranged somewhat differently.

The number of cases notified per death has been used as a criterion for the quality of the notification, as in the Appraisal Form. It is not a perfect measure, as the case-mortality rate varies from one locality to another and even from one epidemic to another, but it is difficult to devise a better one. So long as no standards are set but the figures left to speak for themselves, an evaluation can, to some extent, be based on local knowledge of the gravity of each disease. The ratio of cases discovered to deaths is particularly important in the case of acute poliomyelitis which has not been mentioned at all in the Appraisal Form, although it now constitutes a more serious problem than some other epidemic diseases of childhood. If the case-mortality rate is high, it is almost certain that the non-paralytic cases have not been properly traced.

The search for carriers is an important element in the control of several epidemic diseases, and especially so in the case of typhoid fever; it should therefore be included in the schedule. In a community where typhoid and diphtheria control are well established, more carriers than cases may be found.

It would also be desirable to show more complete information concerning immunization than that given in the Appraisal Form which covers only smallpox and diphtheria. It is probable that

scarlet fever immunizations will soon become an established part of the ordinary health program, and others are likely to follow. BCG has already been widely employed in Europe, and vaccinations against the epidemic diseases of intestinal origin constitute an important element of control when epidemics threaten or occur.

C-VI. *Venereal Diseases.* The incidence of venereal diseases varies widely from one country to another, between cities and rural districts, and even among cities in the same country. The reported incidence of syphilis is thus five times higher in New York than in nearby New Haven, where the reporting is undoubtedly equally good. It is therefore quite unfair to establish any given number of cases per 100,000 inhabitants as a measure of the completeness of reporting. The 600 cases of venereal diseases per 100,000 population which the Appraisal Form sets as a standard for good reporting are not reached in Denmark or Sweden, where the reporting is above suspicion.<sup>6</sup> Many American cities do not reach this incidence of 600 cases by a wide margin.

When dealing with venereal disease reporting, it is essential to keep syphilis and gonorrhoea apart. Syphilis is taken seriously everywhere, gonorrhoea—although wrongly—generally is not. In some cities where 80 per cent or 90 per cent of the syphilis cases are probably reported, gonorrhoea reporting may not cover 20 per cent of the existing cases. A great many cases will not even come to the attention of a physician, and if they do, he will frequently not trouble to report them. Gonorrhoea is undoubtedly on the whole now more widespread than syphilis. Yet, reported gonorrhoea cases amount in a great many towns only to a fraction of the reported syphilis cases. Syphilis reporting can be, and generally is, checked against the positive Wassermanns, but many physicians do not send in a smear for gonococcus examination when the diagnosis is obvious. It is altogether misleading to strike an average between two

<sup>6</sup> The level reached in 1935 was 184 cases per 100,000 population in Sweden and 293 cases in Denmark. The corresponding incidence of syphilis alone was only seven and twenty-three cases, respectively, per 100,000 inhabitants.

such widely different ratios, because such an average will be true for neither. All statistics of venereal disease control must therefore be kept separate for syphilis and gonorrhea, while soft chancre may be omitted altogether, because it is no longer of any practical importance.

Clinics and hospitals report their venereal disease cases, practicing physicians may or may not. One indication of the quality of reporting is therefore to be found in the proportion of cases reported by practicing physicians. Such indications are subject to reserve if the public clinics do not reach a reasonably normal share of the cases, owing to lack of accessibility or to other shortcomings.

Statistics of the activity of clinics, of examination of contacts and other tracing of sources of infection, and of control of cases under treatment, should give an indication of the amount and quality of work performed in this field.

C-VII. *Tuberculosis*. Tuberculosis control probably gives, together with infant hygiene, the best test of the efficiency of the health service. Tuberculosis is, at the same time, a communicable disease and a social disease. It can be reduced to a quite low level; but this cannot be done without considerable and sustained effort, nor can it be done by any single measure. Its control is more complicated than that of typhoid fever or diphtheria; it is numerically of far greater importance; it has a definite social aspect, and the final success of the campaign is more distant. The earnestness and skill with which the community has attacked the tuberculosis problem is therefore a good index of the whole public health effort. It reaches from the health department and the institutions of treatment through the visiting nurses out into the home and the factory and is closely related to social and housing problems. Success in tuberculosis control, more than in any other branch of public health work, therefore denotes joint planning in many fields and by many groups. Such activity usually has repercussions on the public health in general.

The organization of tuberculosis control is based on four principal elements: case-finding and recording, clinical service, field nursing, and institutional care. The other elements of control are more or less auxiliary to these. Both the Appraisal Form and the Health Indices are therefore based upon these four main sections.

The cornerstone of the whole fabric is the tuberculosis register, which assures control and supervision of the individual cases and discovery of new cases among the contacts as well as the detection of conditions favorable to the spread of the disease. The first important test of tuberculosis control is therefore to know whether or not the register is fairly complete.

The Appraisal Form sets as its only test in this respect the standards of two new cases and five cases on the register (exclusive of hilum type) per tuberculosis death. Where the registration under conditions usually prevailing at present does not reach this level, it may surely be assumed to be insufficient. But wherever final control begins to be within sight, a stage would be reached when the deaths are mostly of old cases, while new cases are becoming more rare. In the meantime, there should certainly be more than five known living cases per death and generally also more than two new cases per death. It is, of course, important to know whether or not hilum cases are included, but it seems that they ought to be on the register so that they can be watched and so that something can be done about them. Frequently, the distinction of type cannot be obtained and the data will suffer from this limitation.

The New Haven tuberculosis register, which includes the hilum type, counts about twenty cases per resident death, and the Danish register eleven pulmonary cases per death. This level may even be increased for some time through the extension of the life of tuberculous patients by improved methods of treatment (collapse therapy in advanced cases, *et cetera*). The number of new cases per resident death may increase to three or four before a definite decline, reflecting an approaching final success, sets in.



The Appraisal Form contains a note to the effect that, in establishing these ratios, correction should be made, if possible, for residents dying away from the city and for nonresident deaths and cases. This is insufficient. Records of tuberculosis deaths are worthless if not corrected for residence, because tuberculous patients generally do not die at home. Uncorrected records should be discarded and no ratios should be based on them.

Insofar as a check is concerned, the ratio of new cases and cases on the register to resident deaths merely gives an indication of whether or not the reporting is any good at all. The question of the ratio of new cases to cases on the register has been dealt with under Part A.

A better test of the completeness of the register will be had by the percentage of resident tuberculosis deaths not found on it. To this may be added a statement of the percentage of deaths which were reported less than six months previous to death. Cases thus reported were evidently reported too late to do anything much to save them, although some work on contacts might be done.

Another check is afforded by a tabulation of the source of notification. Clinics, sanatoria, and other institutions can easily be made to report cases and generally do so, but practicing physicians frequently do not report, especially if the patient is not likely to become a public charge. If, therefore, a fair proportion of the notifications does not come from private practitioners, the reporting may be assumed to be incomplete and steps should be taken to assure improvements. What may be considered a fair proportion, depends to some extent on local conditions.

It is important that tuberculosis registers should be verified every year in order to discard cases which are no longer on the active list. The number on the records may otherwise be unduly large.

The questions concerning clinical service, field nursing, and institutional care are much the same in the Health Indices as in the Appraisal Form.

C-IX. *General Public Health Nursing.* Reference to public health nursing is made under each subject—epidemic diseases, tuberculosis, child hygiene, *et cetera*. In view of the great importance of the nursing service in any public health program and as it is frequently the same nurses taking care of cases of different description, it has been thought advisable to include a recapitulation of all public health nursing activities without distinction of subject.

C-X. *Maternity Hygiene.* The Appraisal Form divides this chapter into: obstetrical service, medical health conferences, field nursing service, and community health instruction. It is proposed in the Health Indices to follow the chronological order of events, and the following sections are proposed: prenatal care, measures concerning pregnant women working in factories, obstetrical service, and postpartum care.

The subject is well covered by the Appraisal Form, except that it would be useful to add more information concerning the deliveries made in the homes. It seems important to obtain information concerning the nature of the obstetrical assistance given in the home and especially whether it was given by a qualified obstetrician or by an ordinary practicing physician. An attempt should be made to ascertain the maternal mortality according to the various types of obstetrical assistance.

C-XI. *Infant and Preschool Hygiene.* The Appraisal Form chapters on infant hygiene and preschool hygiene have been combined into one as the work is usually done by the same agencies and statistics frequently cannot be given separately for the two.

This chapter of the Health Indices has been divided into: clinics and medical care; nursing service; provision of milk for infants; supervision of illegitimate, boarded-out, and neglected infants and children; and preschool round-up. The information required is not very different from that of the Appraisal Form, but the tabular arrangement is new.

C-XII. *School Hygiene.* The Appraisal Form is very complete

so far as the observation and medical examination of the school children is concerned. It is proposed to add in the Health Indices information concerning recreation and physical training, school kitchens and meals at school, and provision for summer holidays in the country for city children. These three elements cannot be neglected in the building-up of health, especially among poor city children. The school kitchen has furthermore a utility which goes much beyond school hygiene, being a promising method of diffusing knowledge of rational nutrition, at least for the next generation when the present schoolgirls shall become housewives and mothers. The question of provisions for proper utilization of the summer holidays has been neglected in most countries, but the question should be posed in view of the excellent results obtained in certain localities and notably in Copenhagen, where some forty years of experience is now available.

C-XIII. *Physical Education.* Physical education does not come within the scope of the Appraisal Form, and it is clear that the subject cannot be dealt with in detail here. There can be no doubt, however, that it is a powerful aid in the building-up of the health of children and young people. It has been thought useful, therefore, to include very summary information concerning the active membership of scout and other organizations supervising physical education outside of schools. Questions have also been included concerning gymnasia, swimming pools, and playgrounds.

C-XIV. *General Sanitation.* While covering approximately the same ground as the Appraisal Form, it has been thought advisable to add a few more questions. It seems necessary to make mention of the source and treatment of the municipal water supply. The consumption of water per capita may also be of interest in showing the sufficiency of the supplies, although, in most towns, there is a good deal of waste, so that the consumption is really greater than the actual needs. The important questions as to the extent to which houses are supplied with municipal water and the frequency

of analyses of it are already included in the Appraisal Form.

The Appraisal Form chapter on sewerage includes only two questions: the percentage of dwellings connected with street sewers, and the percentage of unsewered dwellings having other satisfactory arrangements. The remainder of the subject of sewage and refuse disposal is not dealt with in the Form because, in the United States, these questions usually do not come within the competence of the health department. These subjects cannot be omitted, however, from a general sanitary survey, in which must figure the essential information concerning the treatment and the disposal of the sewage, garbage, and other refuse. Omission to inquire into those problems, together with other questions of sanitation, conveys too easily the impression that nothing need be done in these respects. Their omission in the Appraisal Form may not be entirely without responsibility for the fact that, in many American cities having otherwise an excellent health program, the methods of sewage and garbage disposal are unsatisfactory and antiquated.

*C-XV. Food Inspection and Nutrition.* Food and milk inspection and control of food handlers are usually exceptionally thorough and efficient in the United States. The Appraisal Form questions are therefore very complete in this respect and it has been thought possible even to abbreviate some of them in the Health Indices. It would seem useful nevertheless to add a question as to the medical examination of food handlers and another one concerning the tuberculin testing of dairy cattle. For many countries where much milk is sold unbottled, it would seem useful also to add a question concerning the proportion of milk sold in sealed bottles. The control of the shellfish trade might also be touched upon.

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This completes the subjects dealt with in the American Appraisal Form. It will depend upon the policies to be adopted by the Committee on Administrative Practice of the American Public Health Association, whether any of the following subjects will be included

in a future revision of the Appraisal Form. It is the opinion of the authors of the present Health Indices that housing and industrial hygiene must form integral parts of future health programs and cannot be neglected in a health survey. It is their opinion, fortified by current European health practice, that the question of medical care—in the home as well as in institutions—must also be covered.

C-XVI. *Housing*. The question of the quality and the amount of housing available has been dealt with in Part B. The present chapter therefore inquires only into the provisions made for town planning and the improvement of housing. The proposed sections are: housing survey, town planning and slum reduction, standards for new buildings, and inspection of premises. The first two sections concern planning; the second two, current activities which are already carried on in nearly all cities.

C-XVII. *Industrial Hygiene*. Legislation concerning industrial hygiene has mostly come into being largely through a collaboration of labor and employers' organizations with the state. It is therefore usually national or state legislation which is not part of the local public health programs. Much of it concerns health directly, but by no means all of it, and it is difficult to separate the health part from the remainder. Accident prevention is of concern in the conservation of health just as much as disease prevention and should not be overlooked. The regulation of the work of women and minors has also a repercussion upon their health and so has the hygiene of the premises in general. It is better, therefore, to include too much than too little. It should be remembered that the average man spends nearly one-third of his time, and many men spend more than that, at the workplace. The conditions under which the work is carried out cannot therefore fail to affect profoundly the health of the worker.

The sections of this chapter are: size of plants according to number of employed persons, factory and workshop inspection, medical examination of workers, prevention and compensation for indus-

trial accidents, prevention of occupational diseases, work of women and minors, and supervision of home work.

The object of this part of the indices is to obtain a brief survey of action taken in regard to such conditions in industry and other branches of employment as are likely to have a direct influence upon health. The indices suggested are therefore not the same as those contained in Dr. Leverett D. Bristol's Appraisal Form for Industrial Health Service. The principal purpose of Dr. Bristol's form is to appraise the "development of modern industrial health practice *in a company* or any unit of the same" and to promote such health work. The principal chapters of this form are:

- A. Vital Statistics Activities
- B. Communicable Disease Control
- C. Tuberculosis Control
- D. Occupational Disease and Accident Control
- E. Personal and Environmental Hygiene of Office, Shop, Store, Factory, and Outdoor Fieldworkers
- F. General Health Publicity

There is also a brief form for smaller concerns and a special form for the personnel and industrial relations service in general. The forms are thus meant for the use of the individual company which takes an interest in and acts to safeguard the health and welfare of its personnel and not for the appraisal of industrial hygiene from a community point of view.

C-XVIII. *Health Instruction*. In the American Appraisal Form, information relating to health publicity and education is given separately in each chapter of major activities; in the Health Indices, this has been gathered into a single chapter. This has been done because much of the health instruction is of a general nature and cannot be divided among specific categories; also because it seems necessary to add several subjects not mentioned in the Appraisal Form. Such subjects are: cancer, colds and pneumonia, nutrition, physical education, industrial hygiene, and accident prevention.

It has been thought advisable not to give special prominence to the distribution of printed matter, because, in our opinion, the number of copies of such material distributed means very little in itself. Instead, a table summarizes how far the various subjects have been covered by each of the following methods: leaflets distributed, cinema or exhibits, lectures or demonstrations, posters and newspaper publicity, teaching in schools.

C-XIX to XXIV. *Medical Care.* The last chapters of the Health Indices relate in brief form to the facilities for institutional or other organized medical care. There is the question of the care of the insane and feeble-minded which presents itself with different aspects for adults and for children. This question will frequently be found difficult to deal with in local surveys because the institutional care is usually organized on a state or provincial basis. If so, it will be necessary to estimate the share of the city in the total of available facilities.

A numerical expression of available facilities is more readily established for hospitals and similar institutions. Nevertheless, it happens frequently that hospitals of a minor town also serve the suburban area or even more distant rural districts. This is nearly always the case with tuberculosis institutions. There should be little difficulty, however, in such cases to determine the share of accommodations available for or used by the city.

The questions concerning health and invalidity insurance and free medical assistance are of a general nature. There is no intention here to go into any details of their organization. The simple numerical expressions for their coverage and the scope and magnitude of such activities will, however, materially assist in an appreciation of how far medical care is being systematically supplied to the part of the population that could not afford or would hesitate to apply for ordinary medical care. When the Health Indices are applied to specific problems it should not be difficult to devise measurements appropriate to the needs.