STATISTICS

Public Health Reports publishes in this and later issues a group of papers presented before the Second Conference on Public Health Statistics held June 16–20, 1952, at the School of Public Health of the University of Michigan.

This second conference—the first was held in 1948—was designed for health officers, program directors, and public health statisticians. These and other professional groups and disciplines were represented in discussions which ranged over a wide array of topics . . . the use of statistics in State and local programs, in general and specialized programs, in administration, in evaluation. Special attention was given to current developments and potentialities in survey and sampling methods.

Vistas in Public Health Statistics

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By whatever means one projects into the future, there appear on the horizon broadening functions and challenging fields of labor for the public health statistician. With this increase in scope one sees the public health statistician occupying positions of greater and greater responsibility on the public health team. One also sees closer day-to-day relation between the administrator and the statistician in planning, executing, and evaluating public health programs.

The public health statistician, however, should not be expected to bring suddenly into bold relief straight and unerring paths to success in all public health effort. The statistical method is an aid, but it is not a substitute for thinking and creative imagination. However, no administrator is so rash as to venture forward without the aid of this powerful tool. Thus one sees the public health team venturing forward, led by a courageous and imaginative administrator with the public health statistician at his side, sounding, probing, testing, sifting, evaluating.

That this opportunity is not a mirage but a reality is fortified by today's changing concept of public health, the pressure of expanding functions and new problems, and the increased power of new statistical tools. The public health task is conceived today to be the provision of not only an environment in which man can survive, but also one in which he will thrive. In the early years the task was conceived primarily as the conquest of the ravages of communicable disease. While the potentialities of

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epidemic disease still exist, today in the public mind the threat to survival is remote, and emphasis is shifting from "survive" to "thrive" with demand for positive health.

This changing concept greatly broadens the field of action. It also complicates and makes more difficult definition of problems and measurement of results. With the shifting of emphasis from survive to thrive, the basis for action is more vague and difficult to define and the measure of effectiveness more intricately interwoven with other public services.

There is no one short sure road to positive public health. Some roads may prove to be blind alleys; some may prove to be exceedingly expensive excursions; others may not appeal to the American way of life. Nor is the public health profession the only one in the field competing for public support on the road to that goal of "a better life." This much is certain: the public health team must justify the selection of the roads it takes and demonstrate that it is consistently moving toward the goal and not just traveling blind.

New Measurements

To chart these paths and mark progress is a challenge to the whole public health profession and particularly to the public health statistician in development of new measuring devices. At one time, death rate was an all-inclusive yardstick by which a problem could be defined and progress marked. From this simple, direct device the future leads to an ever-increasing chain of complexity: recording of births and deaths; partial reporting of communicable disease; shift from acute epidemic to chronic disease; shift from mortality summaries to morbidity surveys; periodic and then continuous sickness surveys; and finally, measurements in terms of positive physical and mental well-being and an environment conducive to thriving.

Although sights may be set on thriving and goals of positive health, it is not implied that competitive and self-inflicted hazards of life are all removed. Life probably always will remain a battle to survive. Hence, with the changing concepts of public health, new functions do not replace old responsibilities. There remains, always, the important work of improving accuracy and completeness of recording, of extending, not diminishing, communicable disease reporting, and of expanding generally the usefulness of mortality and morbidity data.

In the early days the administrator had very little need for services of the public health statistician beyond record keeping. Today the situation is quite different. In light of changing concepts of public health, it is inevitable that the public health administrator and the whole public health team are destined to lean more and more heavily on the public health statistician for aid in charting paths, appraising programs, and measuring progress.

In addition to the long-range influences associated with changing concepts of public health, new problems and expanding functions are already appearing. They are demanding immediate extension of the services of the public health statistician in environmental health, industrial health, medical care programs, community planning, and in over-all departmental management.

Environmental Health

One sees in the future a vast expansion of work for the public health statistician in the field of environmental health and a much closer working relation between the public health statistician and the public health engineer. We have been inclined either to view man as an isolated case independent of his environment or to deal with the environment as independent of the individual. Actually, man is inseparable from his environment. The trend is toward integration of the total environmental situation in which modern man lives and through this complex and varied context to identify and provide the beneficial and eliminate or control the detrimental. In this task the statistician can be of great assistance to the engineer.

As we proceed from the concept of survive to that of thrive, much that is undertaken in the name of environmental health will not be measurable in terms of death rate, or even sickness rate. Sensitive measures of environment itself and its relation to well-being must ultimately evolve.

Water Contact

Consider the water contact. The battle against stream pollution has been held back for years because of the old negative point of view written into public health law requiring demonstration of injury to health before corrective action could be enforced. Today State after State is in process of changing laws from a negative to a broad positive concept of multiple uses of streams, a concept which includes such intangibles as recreational value. No longer is it necessary to show that someone dies or becomes ill as a justification for pollution prevention and control of the water contact. Here, again, statistical methods must be applied to stream analysis and the evaluation of the mass of operational control data required of municipal and industrial water supplies, waste-treatment effluents, bathing beaches, and fishing and recreational areas.

Air Contact

Similarly, in the air contact, the concept is broadening to include not only the indoor industrial hazard but also outdoor atmosphere, including climatological aspects, fungi and pollen pollution, as well as industrial and smoke pollution. We can well profit from the experience gained in dealing with the water contact and avoid the negative approach of requiring demonstration of injury to health. Positive measures are needed, and again statistical methods must be used in defining and evaluating approaches to control in terms of positive health.

Food Contact

There is certain to be a decided extension of the use of statistical methods in dealing with the food contact. Evaluation procedures now employed lean heavily upon provision of physical means of handling and processing, without adequate supporting evidence of the value of these means in terms of real quality. One of the most pressing needs in food control is the development of more efficient objective measures of quality in terms of end results of food products consumed. There is also certain to be increasing demand for assistance of the statistician in evaluation of nutritional problems.

Industrial Health

Another fertile area for labors of the public health statistician is industrial health. A number of public agencies are now concerned with this problem, while private industry is attempting to deal with the problem on a within-plant basis. The trend is toward integration of effort, both governmental and private, aimed at the total problem. The division between health problems which occur within industry and those which occur in the community is artificial. For example, industry has already discovered that absenteeism from nonoccupational injuries and illness by far exceeds that associated with occupational. The statistician with a public health viewpoint can assist, first, in setting up record systems in industry and in government agencies which will be interlocking and, second, in analyzing and evaluating health problems which have a reflection in production manpower. This should mean not only better over-all community health, but dollars and cents to industry.

Medical Care

A new field, at least in the United States with great potential demand for services of the public health statistician is that of medical care programs. Whether these develop to be public or private programs, the need for assistance from the statistician will be equally acute. Record systems, the definition and scope of programs, the types and number of services, the control of panels and equitable payments by those who receive service and the physicians rendering service, and fiscal and administrative management offer opportunities to the statistician.

Community Planning

A challenge is extended to the public health statistician to participate to a greater extent in community planning, particularly in providing practical long-range population forecasts as a basis for rational design. Every community endeavor is ultimately related to the problem of population change. All of the medical services and environmental controls—hospitals, clinics, water and milk supply, sewerage and

sewage disposal, refuse collection, and housing—are projected on the basis of population.

Although the individual is the basic unit, in practice the planning and administration of these services and facilities is developed on a community basis. Community development requires years in promotion, planning, and construction; consequently, its adequacy depends upon our ability to anticipate future needs. Every index points to a leveling off of population growth from the steep rates of the past toward population saturation. In this transition, estimating future needs becomes increasingly difficult.

Projection of future growth on the basis of the steep midstage rates unquestionably would result in spending vast sums for facilities for which, most probably, no population will exist. Furthermore, such misplaced expenditures would be reflected in shortages of funds for new types of facilities and services needed in the transition to population saturation. Accordingly, it becomes increasingly important to measure and evaluate characteristics of community growth and population change. The emerging patterns of community growth go beyond birth, death, and migration rates to the underlying force of economic opportunity. In a free, mobile society, such as the United States, migration is extremely sensitive to the socioeconomic opportunity offered by a community. Quite aside from biological factors of fertility, the will to have children is also strongly influenced by economic opportunity.

In defining community growth, more than mere consideration of the number of individuals is involved. Some basic questions need to be studied: How old are our cities? What is their limit, their life span? What is their present stage of development and what are the logistic characteristics of their growth curves? Is each community a law unto itself or are there marked common characteristics which are quantitatively referable to underlying forces?

Preoccupation with argument about world population in the mass has often kept the experts from considering the practical down-to-earth needs of the community. It takes courage to venture a population forecast for specific practical purposes for a specific community. Too frequently, knowledge of all the refinements of population growth drives the expert into the shelter of his ivory tower and robs him of the courage needed to make a clean-cut practical forecast. On the other hand, ignorance too frequently leads to irresponsible boldness and vast expenditures of public funds for under- or over-designed facilities.

These are but a few of the expanding problems destined to increase the demand for services of the public health statistician.

New Statistical Tools

The power and economy of new statistical tools now developing is a potent force in itself, propelling the public health statistician into positions of greater opportunity for service. I venture to predict the future will show that the applications of modern sampling survey methods mark the beginning of a vast new era in public health. As we deal with the more complex social and environmental problems, this modern instrument of the statistician will come into wider and wider use in defining and evaluating progress toward positive public health. For the first time within the grasp of the administrator, there is available an instrument of efficiency in time, cost, and effort which can frequently be employed in measuring community-wide needs, problems, and progress.

Also, through the advances in mechanization for handling mass data, such as the newer electronic machines, it will be possible to undertake massive and complex analyses heretofore prohibitive because of sheer bulk.

This, indeed, is a promising and challenging vista. It is hoped that the administrator, by a better understanding of the power and economy of the statistical tools, will continue to expand their application and to utilize more fully the potentialities of the statistician. The public health statistician must welcome these added responsibilities. He must speak a language understandable to the administrator and the public. He must leave, for a moment, argument concerning refinement of theory and come to grips with practical application. If the public health statistician is to measure up to the challenges ahead, he must take the initiative in offering his services to the entire public health team.