

Epidemiological Bulletin

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Epidemiology: Current Uses and Future Prospects¹

Introduction

The Pan American Health Organization in collaboration with the Ministry of Public Health and Environment of Argentina, and with the full participation of the countries in the Region, organized an open-forum seminar to formulate and analyze ideas and initiatives on uses and future prospects for epidemiology in Latin America.

The purpose of the seminar was to review the current practice of epidemiology within the context of disease control, evaluation of health conditions and planning of health care services and to consider the implications such activities have on the progress of research, epidemiological training, and health care services development.

Current Situation

The most important epidemiological event in the Region has been the perception of changes in the health profile of the population. Although communicable diseases persist in most countries, chronic and degenerative problems of adults and the elderly, accidents, illness associated with the work place and environmental pollution are becoming increasingly more important. The situation that emerges is a veritable epidemiological mosaic combining prob-

lems characteristic of societies with relatively under-developed socioeconomic conditions and problems more prevalent in so-called developed societies.

In health care services, epidemiology has been used to develop surveillance systems geared almost solely to detecting disease outbreaks and unusual situations, so that control measures can be activated promptly, particularly against some communicable diseases. In many countries these systems have become passive case-reporting mechanisms that typically collect data at the local level and compile them at the central level. In general, these data cover only a segment of the population (usually dealt with by public services); their quality is limited by defects in diagnostic services; and they are not analyzed at the levels at which services are provided. The situation is aggravated by the multiplicity of case reporting forms, which are controlled, standardized, and supervised by independent, autonomous categorical programs. Even in sporadic instances where these data are analyzed locally, the information obtained

¹Based on the Final Report of a seminar held in Buenos Aires from 7-10 November, 1983.

The working documents presented at the plenary sessions of the seminar in Buenos Aires will be published by PAHO in July 1984. Those interested in obtaining copies may write to Epidemiology Unit, Pan American Health Organization, 525 Twenty-third Street, N.W., Washington, D.C. 20037, USA.

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does not produce immediate action due to limitations in local administrative capacity.

At the central level, data thus collected, besides being of dubious reliability, are outdated as well. Much of the information is presented in statistical tables accompanied by little or no analysis. The extent of analysis of the health situation is generally limited to reporting national rates or indicators that do not reveal existing or potential geographic and social variations in each country.

In most countries morbidity and especially mortality data have been useful as a basis for setting national priorities. Analysis of these data has made it possible to identify risks or risk categories by specific causes that account for the highest incidence, prevalence, and mortality rates, and to relate them to age, sex, and residence. However, it is not yet possible to determine the precise magnitude of the health problems of specific social and economic groups. A leading concern is the proper selection of indicators that will facilitate a concise, comprehensive, and balanced assessment of health conditions in a community. Many of these indicators are chosen without a critical analysis of their implications and determinants.

An examination of the health infrastructure in areas where surveillance activities exist shows that, in most countries, health care services coverage is insufficient. However, the extent of this problem is unknown, as are the factors that influence the utilization or underutilization of health services by various population groups. As a rule, the characteristics of the population are unknown, which in turn hampers any assessment of their health situation.

The multiplicity of health care service delivery agencies, the absence of coordination among them, and the lack of trained personnel are factors which further complicate the analysis and evaluation of health conditions and services at all administrative levels.

Another related aspect involves the need to assess available technology for disease prevention and the clinical and surgical procedures used in medical care. During the 1970s it was found that the adoption of advanced technology did not, in most cases, generate the same benefits observed in countries where the technology had been perfected. The blind acceptance and acquisition of technology—rather than knowledge—without considering its actual usefulness has been the rule rather than the exception throughout the Region.

Epidemiological research has not proliferated as desired and has been confined to isolated clinical and

laboratory projects with little attention paid to population-based studies or research to improve health care services. The situation is aggravated by the fact that scientific research has been limited to universities and technical institutes with precious little participation by health care services. In addition a national research policy is often lacking and priorities are frequently distorted, sometimes in response to the particular interests of research funding agencies.

The situation described so far is closely related to inadequacies in training in epidemiology, in part caused by a lack of trained faculty but also due to a mismatch between the practice of epidemiology and the theoretical content of the courses. Many of the so-called practical courses in epidemiology are really geared to teaching infectious disease control principles and methods and include precious few fundamentals in epidemiological methodology.

The lack of access to scientific medical literature and the limitations of the health information which is on hand in medical libraries add to the difficulties experienced in training and carrying out research and hinder the overall development of epidemiology.

Future Prospects for the Development of Epidemiology

The previous overview suggests a series of approaches which require future development and which are detailed below.

Health Care Services

The practice of epidemiology should be reoriented to realize the discipline's full potential for improving knowledge, evaluation, and control of health problems and developing health care services.

To improve surveillance, collected data should be analyzed and utilized at the local level where decision making should also take place. Moreover, at progressively higher levels, analysis must also be carried out to contribute to the understanding of health problems, support decision making at each level and provide information for central levels where planning and standard setting take place.

Surveillance should be extended to such problems as malnutrition, chronic diseases, accidents, chemical intoxication, occupational problems and environmental pollution. However, since reporting systems used in epidemiological surveillance of acute diseases may not permit the acquisition of information adequate for understanding other problems, new data sources and mechanisms for data collection will have to be identified. New methods for analysis

will have to be defined to evaluate the preventive and curative measures directed towards these conditions.

The evaluation of health conditions should be expanded to include additional indicators such as the number of years of life lost prematurely and the number of cases which can be prevented under certain assumptions of effectiveness of disease control measures. Likewise, demographic analyses should consider particular characteristics of the Region such as the urban explosion, fertility variations and the composition of the population pyramid.

At higher levels in the health infrastructure, multidisciplinary functional groups with adequate representation by epidemiology should be formed for the purpose of promoting joint analysis for problem definition and program evaluation. These groups should work closely with particular programs. Their establishment becomes more important as the complexity and compartmentalization of the health sector increases.

To facilitate local programming and evaluation of health care services, data analysis should be based on the smallest geographical units and consider the structural characteristics of the health services and the distribution of population groups by living conditions. Programmed activities should be directed at solving the problems of these groups.

The analysis of certain indicators in terms of national averages can be complimented by analyses of health conditions of particular population groups stratified by types and levels of risk, including access by the population to health services.

The development of analytical capabilities will assist in defining more clearly what information is required and will generate increasingly pertinent and relevant analyses. Thus, epidemiology will enrich the process of health service planning and health evaluation, particularly in the areas of problem definition, priority setting, identification of alternatives and technological options and evaluation of strategies, programs and services.

Epidemiological Research

A continuing analysis of health conditions will reveal gaps in substantive and methodological knowledge that can not be filled by study of existing data. These gaps should become the object of research activities which should be undertaken by the health care service delivery agencies themselves.

All these elements should be taken into account when formulating national research policies, and

identified research priorities should be compatible with those of the health sector. Moreover, creation of an appropriate infrastructure will be necessary to facilitate the implementation of these policies. The infrastructure will require mechanisms for coordinating the efforts of diverse university and health care service institutions and groups which, in turn, provide necessary resources and advice. The infrastructure should facilitate the development of more comprehensive, integrated research projects, with the necessary multidisciplinary support for collaborative studies on a national and international scale. At the same time, these mechanisms should contribute to the development of research capabilities in a proportion of health professionals, both in universities and in health care services, and the promotion of epidemiological research as a standard activity in health programs.

Under these general policies, special attention should be given to epidemiological and social research which focuses on the health-disease process as both a result and a determinant of the level of well-being and living conditions to which different groups in a society are exposed.

The priorities for specific research ought to be formulated in each country on the basis of an analysis of its own situation and be directed towards the solution of its most important problems. Nevertheless some general priority areas can be identified, for example the frequency and distribution of principal health problems and the biological and social risk factors that shape that distribution. These areas should include accidents, chronic diseases, occupational health and environmental pollution as well as the problems of the elderly.

The definition of health problems would be expedited if the health profile of a given group could be inferred from its living conditions. To validate this relationship, studies are required to relate the observed mortality and morbidity profile with variables which are easy to measure such as housing, employment and income levels.

Health care services research should be strengthened to include aspects related to coverage and how the population uses or fails to use these services, their accessibility and degree of acceptance and satisfaction and their relationships with different types of technical, administrative and funding organizations.

Research should focus special attention on measuring the effectiveness and efficiency of disease prevention and control measures aimed at the most

prevalent problems. In this sense, epidemiology must be extensively involved in the development of mechanisms for evaluating existing and new technologies used not only for health promotion and protection, but also for medical care where there is a tendency to adopt increasingly more costly technologies which are not always proven to be effective. Epidemiological research must play a central role in evaluating and choosing technologies in terms of effectiveness, efficiency, feasibility and practicality for implementation at different levels in health care services.

Much of this research will require new methodologies which should include simplified procedures and methods which can be incorporated into the activities of the health care services at different levels.

The majority of this research, especially as applied in health care services, should be multidisciplinary and carried out by teams composed of epidemiologists and specialists in administration, economics, sociology and other disciplines as necessary.

Training in Epidemiology

If the above viewpoints and recommendations for the uses of epidemiology in health care services and research are to be implemented, then training programs in epidemiology will have to undergo a profound transformation at all levels.

All health personnel should receive some training in epidemiology, and the characteristics of that training will depend on several factors including health and training policies, structure and organization of health care services and functional responsibilities of health care personnel. Manpower training programs must meet the needs of the health care delivery system in order to produce appropriately trained health personnel in general and epidemiologists in particular.

Training should include long range academic instruction as well as alternatives in continuing medical education and provide opportunities for in-service training, basic courses, refresher courses and epidemiology seminars for professionals with no prior training in this area.

Instruction in epidemiology and epidemiological methods should include a solid foundation which permits analysis of any health problem; it should allow for approaches to combinations of health problems in specific population groups and not be restricted to the traditional approach of teaching the epidemiology of a few specific diseases.

The training process should include different levels of complexity: a basic, practical approach to epidemiology for professionals in health care delivery; an undergraduate level for students of health sciences; general public health training; and, finally, specific training for epidemiologists with different degrees of specialization. The training process should include innovative techniques such as modular self teaching courses, the use of simulation exercises, and training-by-doing using course content based on actual situations in the countries themselves.

Within this context, the linkage between the training process and health care delivery should be improved so that professionals can "learn-by-doing". The epidemiological research which is needed in health services offers an excellent opportunity for strengthening this education-health care linkage since epidemiology acts as a unifying element for the body of health knowledge. This linkage should be used to improve epidemiological training through active participation in all levels of the health planning process, especially in defining health problems and possible interventions.

Greater coordination is necessary between ministries, schools, university centers and other parts of the health sector since these relationships are important for the development of epidemiology as a profession and, in particular, for the training of specialists, teachers and researchers.

The development of training programs with the features described will take resources beyond those currently available in national institutions. National resources should be mobilized and mechanisms should be developed for exchange among existing programs of teaching staff, instructional materials and educational experiences in general with the support and participation of international agencies.

Finally it should be stressed that the interdisciplinary nature of epidemiology enables it to transcend the mere aggregation of concepts and complementary actions and contribute to a synthesis of knowledge which is important for the understanding of health problems. Epidemiology should guide research, training and activities aimed at providing health services which are more effective, efficient and equitable for the populations of the countries of the Region.

(Source: Epidemiology Unit and Health Manpower Program, PAHO.)