

Epidemiological Bulletin

PAN AMERICAN HEALTH ORGANIZATION

ISSN 0256-1859

Vol. 9, No. 1, 1988

XIV Conference of the Latin American and Caribbean Association of Schools of Public Health

Introduction

The Latin American and Caribbean Association of Schools of Public Health (ALAESP), with collaboration from the Pan American Health Organization (PAHO), and the participation of the U.S. Association of Schools of Public Health (ASPH) and the U.S. Centers for Disease Control (CDC), held its XIV Conference in Taxco, Mexico, from 15 to 19 November 1987.¹

The basic purpose of the conference was to review the current situation of epidemiology teaching in light of the changes that have been occurring in epidemiological practice at health services recently, in particular since the seminar on "Current Uses and Future Prospects in Epidemiology" sponsored by PAHO in Buenos Aires, Argentina, in November 1983. The conference also set out to lay the bases for strengthening, developing and changing the teaching of this discipline at the schools of public health and the departments and institutes of social medicine, 22 years after these problems were studied at the IV ALAESP Conference (Puerto Rico, 1965). The conference focused on three subtopics: (a) the *context of epidemiological training*, placing emphasis on the current trends in epidemiological thought and the relationship of

epidemiology with health services and policies; (b) the *guiding concepts of epidemiological training and practice*, highlighting its role in a new kind of health leadership that combines basic knowledge with an area of specialty; and (c) the *processes of systematic incorporation of knowledge* in this field, stressing academic training, epidemiological research, and in-service training.

The Context of Epidemiological Training

As was the case at the seminar in Buenos Aires, the participants were in agreement that the most relevant aspect of epidemiology in the Region of the Americas is the change in the health profile of the population. Although communicable diseases persist as a significant problem, most of the countries are now facing, as well, serious problems related to noninfectious diseases, accidents, and other health problems linked to environmental deterioration and poor living conditions. Taken together, these aspects describe a complex epidemiological situation that represents a true challenge for the health services.

In response to this situation and as part of the effort to attain the goals and objectives of Health for All by the Year 2000 (HFA/2000), the countries have undertaken to expand and reorganize their health services systems in an attempt to improve effectiveness, efficiency, and

¹Final report and recommendations

IN THIS ISSUE...

- XIV Conference of the Latin American and Caribbean Association of Schools of Public Health
- AIDS Surveillance in the Americas
- Epidemiological Status of Malaria. Region of the Americas 1986
- Epidemiological Activities in the Countries
- Calendar of Courses

equity. The economic crisis, which has become more accentuated in recent years, has had an impact on the living conditions of broad sectors of the population and on the possibilities for upgrading services. It has become increasingly evident that many types of resources need to be mobilized in the health and other sectors, such as education, water supply, agriculture, and employment, in order to create a global strategy of primary care and, at the same time, to develop mechanisms for increasing community participation in the planning and management of health services and actions.

This new strategy of strengthening the services requires strong epidemiological support to ensure a better understanding of the health-disease process and to assist in the definition of priorities and target populations, the assessment of program and service impact, and the identification of new techniques for diagnosis, prevention, and treatment.

The Buenos Aires seminar redefined the field of epidemiological practice in health services into four major groups of activities:

- Study of the *health situation* of different population groups, its determinants and trends;
- *Epidemiological surveillance* of diseases and other health problems;
- *Research on causes and explanations* of priority health problems, and
- *Evaluation* of the impact on health of services and other actions involving the population, the environment, and living conditions; and evaluation of technology in terms of its safety and impact.

The progress made in each of these areas has been varied. Studies of the health situation are often no more than descriptive analyses, with little conceptual or methodological content that could be used in understanding and explaining the relationships between the health-disease profiles of different population groups and their living and working conditions, thus having little impact on the planning and transformation of multisectoral actions and services with a view to modifying the health situation and achieving greater effectiveness, efficiency, and equity. Epidemiological surveillance has been limited in many countries to the routine collection of information on a group of diseases and is usually of little use in day-to-day decisions on control actions and programs. Research on causes and explanations in many cases has been restricted to the use of powerful quantitative techniques available to contemporary epidemiology to measure the association between one or more risk factors and a disease. The sole objective has been to assess problems and hypotheses arising from individual clinical views of health problems; has been made no attempt to develop a causal epidemiological thought that would help to strengthen the role of general scientific knowledge,

particularly the biological and social sciences, in the formation of a solid conceptual framework and in the definition of problems and hypotheses regarding the health problems of different social groups. Evaluation has undergone very limited development and continues to be characterized by exclusively administrative aspects without assessing the true impact of the actions and technologies used.

In recent years, the countries have made an effort to make epidemiological practice within the health services more comprehensive and PAHO has reoriented its cooperation strategies to contribute to this effort.

Studies done in some countries have shown that the epidemiological practice still falls very short of the objectives agreed on at the Buenos Aires seminar. However, almost all the countries have taken action and brought about significant changes. There is a growing awareness of the relevance of epidemiology in the strengthening and transformation of health services, and more concern is being shown regarding the need to continue with the modernization of epidemiological training. This concern is reflected in the priority assigned to this topic at almost all the country meetings held in recent years, e.g. the meetings in Venezuela in 1985, in Argentina and Brazil in 1986, and at special international meetings held on this topic in Costa Rica (July 1986), promoted by PAHO/PASCAP and ALAESP, and in Caracas (May 87), sponsored by PAHO, ALAESP, and ASPH.

The characteristics of the health situation and services pose serious challenges to the teaching of epidemiology. The growing evidence that society plays a determining role in health underlines the need for conceptual and methodological integration in the contributions of the social and biological sciences in order to ensure a better understanding of these phenomena. The development of epidemiology has always been linked to social change and to the kinds of needs that these changes create. In fact, epidemiology has traditionally had a major impact on health actions and services, reflecting developments in the sciences and the predominant views regarding the health-disease process.

In order to re-establish epidemiology's place in the educational process, it will be necessary to retake the epidemiological tradition along the lines of causal thinking, using today's powerful conceptual, methodological, and technical developments, and to ensure that training in epidemiology provides a solid knowledge of these developments and of the various areas of epidemiology in the health services. At the same time, it should be acknowledged that the development of a comprehensive approach to epidemiology requires an attitude toward leadership that will be able to overcome existing limitations progressively.

The most classical tradition identifies epidemiology as the study of the relationship between the living conditions and the health situation at the level of social

groups. However, there are some constraints that have stood in the way of further progress and better utilization of epidemiology in the health services. With few exceptions, these constraints are a contributing factor in the continued presence of the sizable differences that exist between what epidemiologists actually do and what they should do according to existing consensus. The following are a few of these constraints:

- Theoretical limitations of epidemiological thought regarding the study of the living conditions of social groups and their relationship with the health-disease process;

- Limited availability of information for these purposes;

- Limited mastery of epidemiology theory and methods by epidemiologists and health administrators; this has a marked impact on the individual clinical vision in the definition of public health problems and hypotheses, and tends to lead to inappropriate use of sophisticated quantitative techniques, without a solid conceptual basis or analysis that is adapted to the usefulness of the research proposed;

- Limitations of prevailing views on administration and planning;

- Limitations of the social framework in which the health services evolve, reflected in the priority assigned to these services in power and authority relationships, inside the services and in the area of research and scientific criticism;

- The trend toward training epidemiologists with specialties in certain pathologies and in the evaluation of specific risks, while neglecting their general methodological and conceptual education;

- Lack of understanding, on the part of the epidemiologists, of the process of administrative decision-making, and the tendency to underrate "political rationality" and to overrate "technical rationality" in epidemiology--this creates communication problems between epidemiologists and administrators, and

- The attitude of epidemiologists, who show a tendency toward passiveness and limited leadership.

The Guiding Concepts of Epidemiological Training and Practice

The development of epidemiology is linked to that of public health: in order to strengthen epidemiology, public health must also be strengthened. Consequently, epidemiology education needs to include a strong element of training in public health coupled with efforts to foster an attitude of leadership and commitment aimed at strengthening the public health organization of the country. In addition to solid training in the theory, method, and techniques of the specialty, the epidemiologist should be trained for multidisciplinary interaction in

public health, taking an active role in the various social sectors that affect decisions on health and well-being and promoting a greater role for public health thought within health services.

The current state of development of epidemiology,--in conceptual, methodological, and technical terms--makes it possible to regard it as a basic discipline of public health that goes beyond the field of medicine. It is, rather, a way of thinking and understanding health problems and actions as an expression of the interaction of biological, ecological, psychological, cultural, economic, and social determinants. Epidemiology has become a converging point for contributions from various biological and social disciplines in an attempt to explain the health-disease phenomena of different population groups.

The incorporation of this kind of approach is based on changes that have occurred in the object of study, i.e. in public health problems, and on the changes that have taken place in how these problems are perceived and what is understood to be the responsibility of the epidemiologist vis-à-vis these problems.

The changes refer basically to modifications in health-disease patterns, the appearance of new problems besides the traditional infectious and communicable diseases, and the accentuation of the differences between social groups. These changes have exhausted the explanatory capabilities of the prevailing conceptual paradigms, posing the need for new explanatory models and forms of research and action.

The changes in how health problems are perceived essentially refer to the recuperation of the epidemiological tradition in order to view these problems as an expression of objective forms of existence of different population groups in the specific circumstances of Latin American societies, as an expression of living conditions and of the complex relationship between biological and social processes. This has created the need to rehabilitate the explanatory capabilities of other disciplines outside the biological and clinical areas in order to understand health phenomena. Such a comprehensive and explanatory vision had been lost through a slow process as epidemiological research began to limit itself to identifying the relationship between specific risks and health problems. Specialization increased and a strong role was given to the individual clinical vision in defining problems and formulating hypotheses: epidemiology was reduced to a simple set of techniques for quantifying monocausal and multicausal associations. Epidemiological practice at the health services was limited to the epidemiological surveillance of certain diseases.

The changes in epidemiologists' attitudes, in how they view their responsibility, refer basically to their acknowledgment of the need to use epidemiological thought to influence technical, administrative, and political decisions that have an impact on health and to assess the

impact of these actions and general changes in society on the health of different population groups, i.e. assuming that epidemiology is once again regarded as a basic discipline of public health. The educational program should sharpen skills in how to set priorities, promote community participation, lead organizations and programs, interpret trends, and apply knowledge in problem-solving.

The transformation of epidemiology from a discipline into a specialty has occurred relatively recently; it is linked to the level of development of the health services system and to the requirement that its actions be efficient. The need for the rationalization of medical services was imposed by the socially problematic nature of health at a specific point in time: at that point, epidemiological knowledge became indispensable for the health services. In this sense, epidemiology appeared to be a kind of social science based on the format of the natural sciences. The concepts then were inadequate for prevention. The emergence of social medicine and social security, epidemiology of chronic diseases and the incorporation of ecological and behavioral approaches and, ultimately, to an even broader sphere as we know it today, epidemiology linked to decisions on policies and planning, incorporating approaches based on political science, economics, sociology, anthropology, and other social sciences, redefines previous knowledge and developments as a whole.

Although this scheme may be lacking in some aspects, it helps to shed light on how a higher level of explanation incorporates and redefines previous developments.

These changes have had different histories and different paths in the countries. In general, though, they have always produced a reformulation of the basic concepts and categories used to identify, describe, and explain health problems. Obviously, different experiences have resulted in different conceptual proposals that require further methodological and technical development and, in many cases, practical validation at the health services.

In epidemiology, chance does not explain the distribution and patterns of health problems. Hence, this science focuses on the identification and study of the processes that determine health problems, thus making it possible to assess the impact that changes in society and the services have on these determining processes and on health-disease patterns in different population groups.

These health problems, and the processes that determine them, cannot be dealt with exclusively at the level of the individual. They can only be understood in more explanatory terms, such as in terms of the differences in the living and working conditions of the population groups or the different forms of articulation of each group in the general dynamics of society.

In Latin America, the epidemiological practice began at the turn of the century in connection with certain diseases, such as smallpox, malaria, yellow fever, and

other rural endemic diseases; subsequently, it expanded to include "urban endemic diseases," such as tuberculosis and venereal diseases. The two decades that followed World War II were characterized by technological optimism in the industrialized societies and by the predominance of "pragmatic thought" and "instrumental reasoning." This atmosphere gave rise to the projects for the "eradication of poverty" and subsequently, in the 1960s, the "Decade of Development." All of this was expressed in the Ten-Year Health Plan for the Americas and in projects for the extension of coverage and the strengthening of the basic network of services.

In the wake of the crisis of the 1970s, development strategies have changed. The "basic needs" approach, as a preliminary stage for growth, has gained a predominant role. This framework includes the strategies for primary care as a means of attaining Health for All by the Year 2000. In this context, the concept of strategic planning opens up new opportunities for traditional planning. We should expect major changes in the health services over the coming years, provided that the mentality of the health administrators continues to change. Still, it will be necessary to acknowledge the insufficiencies of epidemiology, as a discipline, in explaining health phenomena. Supplementary approaches will be required from other disciplines, especially in the social sciences and administration. However, epidemiology maintains its position as the basic science of public health and therefore should serve as liaison between health research and services.

In recent years, in reference to intervention, the polemic between using a population-based strategy in justifying health actions has become more heated. In this regard, mention should be made of some of the limitations of using the high-risk strategy as a basis for the organization of health services and primary care strategies:

- For example, identifying individuals with high serum cholesterol and pathological symptoms, and to recommend them to modify their diet would require costly screening activities and, in practice, these programs are limited to select population groups who have access to health services. This is obviously not the same than implementing activities to reduce the serum cholesterol levels in the general population.

- Individual preventive measures do not go to the root of the problem; they merely tend to modify the degree of exposure to risk for persons who are already exposed.

- Just as relative risk does not provide any information on absolute risk, the ability to predict the occurrence of disease in an individual on the basis of his high risk factors and its magnitude, is very limited. It should be remembered that a population with many low-risk individuals tends to produce more cases of illness than does a smaller group of high-risk individuals.

- The habits and behavior of an individual do not depend solely on his will. The ability to change in many cases hinges on the opportunities for change in his family, social group, and even in the general population.

Epidemiology has the dual responsibility of not only describing and explaining the health situation of the different social groups but also of evaluating specific risk factors in order to optimize control measures for certain key problems within the general services. It is necessary, therefore, to combine population-based strategies with high-risk strategies, ensuring that a predominant role is given to the population-based strategies, for the development of effective, efficient, and equitable models of care.

The incorporation of these concepts, notwithstanding the broad consensus that there is a need for this, has encountered some problems and limitations that will need to be overcome, namely:

- The high level of complexity and abstraction that is characteristic of some of the new conceptual categories, and the limited methodological and technical developments that are available to them;

- Resistance derived from the tradition of epidemiological practice at the health services, and the tendency towards confrontation and conflict which makes it difficult to understand the new approaches;

- Gaps in the scientific education of many epidemiologists and public health physicians;

- Isolation of epidemiology and the health services from community organizations, which fosters technocratic and scientific trends that make it difficult to conduct research;

- Resistance to the legitimation of knowledge, methods, and techniques that were not created in the medical field or that are supported by nonpositivist scientific concepts, such as the social sciences;

- Insufficient empirical validation of new knowledge, and

- Conceptual inflexibility of new developments, making them appear as the rejection, rather than an improvement and redefinition, of previous conceptualizations. As a result, it is more difficult to re-establish the potentiality of more traditional explanations at a more comprehensive level.

The processes of systematic incorporation of knowledge in the field of epidemiology

Academic training in epidemiology through regular, formal courses is geared either to train health professionals at the undergraduate and graduate levels or to train epidemiologists for specific tasks at health services or for research in the field of epidemiology.

Epidemiology education, however, should not be restricted to academic instruction: the practice itself

should become an ongoing exercise of observing real situations and data, studying their meaning, and assessing the impact of activities on the health-disease process.

In most curricula, the epidemiology component focuses solely on quantitative, descriptive aspects. Activities are limited to measuring vital statistics and morbidity, and the relationship between epidemiology and vital statistics is very tenuous. Another area that is often included is the specific epidemiology of diseases, classified by their etiological agent (e.g. malaria, tuberculosis), anatomical location (e.g. cardiovascular), or type of lesion (e.g. degenerative, accidents).

The pedagogical strategy is based on expository classes and the "practice sessions" are held in classrooms: students use fictitious data in simulated exercises of epidemiological research. Often, the data used are not related to the area of residency of the professors and students, and sometimes information, data, and exercises are even taken from books and materials from other countries.

The undergraduate programs in epidemiology are totally isolated from health services and include other curriculum contents as well, thereby making it difficult for the student to understand the significance of epidemiology in his professional practice. It is necessary to restructure the epidemiology component at the undergraduate level to reflect its role in the work of physicians, dentists, nutritionists, and nurses. At the graduate level, this activity should focus on the areas of epidemiological practice at the health services. In this regard, there has been a trend toward modernization which tries to expand the area already legitimated by prevailing clinical and medical thought.

Clinical epidemiology, which arose outside the area of public health and preventive medicine, is one proposal then which, although it has some technical limitations, has a strong ideological content that is based on principles and laws that reflect empirical aspects, mainly the laws of probability. Its linkage with clinical aspects gives it a powerful base, and the use of electronic technology, along with economic backing from various international foundations, makes it very appealing. Epidemiology is without a doubt very useful in differential diagnosis, the definition of syndromes, and the assessment of risks, drugs, and therapeutic effects. In fact, it represents a major advance in the scientific and technical foundations of clinical practice. However, to assume that this trend toward modernization and pragmatism in clinical epidemiology can be an alternative for the conceptual and methodological development of a causal mentality in epidemiology and for the comprehensive study of the health-disease process would relegate the field of epidemiology to the role of a simple technique for evaluating problems and hypotheses formulated from an individual clinical view of health problems. Training clinicians in epidemiology in order to improve the quality of

their practice and their understanding of public health approaches is quite different from assigning a predominant role to epidemiological thought based on a clinical vision of health phenomena.

The main outcome of this is an inability to assess the health situation and its trends in social groups and, therefore, the inability to make decisions on the planning and evaluation of health services. A further consequence is the difficulty faced by clinicians in incorporating the multidisciplinary contribution of other professionals in the areas of causal research and service administration, placing them in a subordinate position in conceptual, methodological, and technical terms. As a result, epidemiology lacks practical usefulness in the exercise of its own functions. Another result is that quantitative information becomes an "obsession." Quantifiable aspects are valid, nonquantifiable aspects are not; quantification and the use of sophisticated electronic and statistical techniques are the only criteria for validation. This is translated into a disdain for the subjective aspects and a strong tendency to reduce the complex, "poorly structured" processes that determine health and disease into formal, incremental relationships. The most regrettable aspect of this obsession with the power of numbers is that it ultimately detracts from any positive contributions from mathematics and statistics in the search for solutions to the complex problems of measurement, sampling, and units of observation.

Another current trend in the teaching of epidemiology stresses the deepening of epidemiological knowledge on the nature of the object of study, the methods and techniques for apprehending the intrinsic and extrinsic relationships of determination, and the postulates that confirm or disapprove these relations. This trend rejects the primacy of biological aspects and regards social aspects as the ultimate determinant of the health-disease process. The focus is no longer on establishing a relationship between biological and social aspects but rather on delving into the nature of society itself, in the dialectic contradiction between health and disease, life and death. The scientific product of this trend is found mainly in the theoretical and methodological area, with a high level of abstraction. This level of abstraction becomes a barrier blocking acceptance and comprehension by students and professors in the health field, for whom empirical and biological aspects are most important. The situation is further aggravated when, as is often the case, only scant training has been provided in the areas of application of these categories. Notwithstanding the major theoretical and methodological advances and the empirical experience of recent years in the areas of health and work, nutrition, mental health, and some parasitic endemic diseases, there are still some major limitations in the operationalization of the basic concepts and in the appli-

cation of research results: the limited theoretical training of students does not favor the introduction of new concepts that are more comprehensive and explanatory with regard to the health-disease process. Discussion of the theory of scientific thought, the differences between science and ideology, between normal situations and pathological manifestations, and structures and superstructures does not appear to be the best way to explain the social nature of the origin and distribution of diseases and their various agents to students and professionals who are not in the area of the social sciences.

The best prospect for changing epidemiology education at the undergraduate level appears to be integrating classroom activities with actual practice at health services. This kind of integration will progressively contribute to the conceptual, methodological, and technical knowledge needed to identify the health problems of a community, as well as to observe, describe, and explain them and formulate proposals for carrying out and evaluating health actions.

At the graduate level, there is often a mixture of faculty and students from different biological and social disciplines. Despite this mixture, epidemiology education frequently suffers from the lack of a comprehensive methodological and theoretical approach and the lack of an element for developing real skills in epidemiological practice. The most commonly found scenario is the one in which training is fragmented into multiple disciplines, each of which, in turn, organizes its own programming contents in keeping with its internal logic rather than with epidemiological practice at the health services. There is a growing trend toward producing epidemiologists who are specialized in given areas, such as communicable diseases, cancer, cardiovascular diseases, occupational health, nutrition, mental health, but who do not have a solid basic training in general methodological and conceptual aspects, thereby promoting a mechanist and reductionist view of causal relationships.

The most promising alternative for the organization of graduate-level training in epidemiology appears to be the linkage with health services and "hands-on" activities in the four basic areas: studies of the health situation, epidemiological surveillance, research on causes and explanations, and the evaluation of services, programs, and techniques. In tandem with these practical activities, the necessary theoretical, methodological, and technical contents should be introduced while fostering a critical, inquisitive approach of the scientist vis-à-vis reality. The organization of curricula around in-service practice and research, as a means of integration, will help to develop a scientific mentality and, at the same time, practical technical skills. Among the basic guidelines for a new effort in the training of epidemiologists, consideration should be given to the linkage with the services, to th

teaching in contact with the concrete problems of the population and the stimulus to research and the production of information on the complex relationships between living conditions, social processes, and the unequal health situation among social classes and groups; and on the processes that mediate these relationships at the biological, ecological, ideological, cultural, and economic levels.

Pedagogical strategies need to be developed that prioritize the active participation of students in problem-solving and in epidemiological research, along with the development of self-instruction and self-information skills and the use of rapid means of access to up-to-date bibliographical sources. An inquiring mind and the ability to question, critique, and analyze are essential and need to be encouraged if the epidemiological approach is to penetrate the health services and be the driving force of change. In order to provide a collective response to health problems, the health services will have to be restructured if they are to meet the objectives agreed on: reduce social inequities in the health field and improve the quality of life of the community.

The current status of epidemiological training at the undergraduate and graduate levels shows certain limitations that will have to be overcome, namely:

- Isolation of academic training from the health services and the community;
- Limited role of research in education and, in many cases, lack of properly defined lines of research;
 - Curricula that are not very flexible and that normally have a high level of theoretical content;
 - Limited follow-up of graduates;
 - Limited connection between teaching at the undergraduate and graduate levels, and
 - In the case of undergraduate schools, public health education and epidemiology seem to have a low level of prestige in undergraduate programs. As a result, they are given the worst time slots and very limited resources for field activities and research, and consequently few students enroll in these areas.

Recommendations

The development and transformation of the health services in response to the needs of the population requires a solid epidemiological practice; for this reason, it is necessary to give a new impetus to undergraduate and graduate training in this discipline. As basic lines of work to achieve this, the following recommendations were made:

1. Assign priority to training high-level epidemiologists with a strong mastery of epidemiological theory and

methods. For this, it will be necessary to curb the current trend of training epidemiologists who are specialized in limited areas of health problems, but who do not have a solid conceptual and methodological basis that enables them to understand their field of action. It will also be necessary to halt the trend toward replacing epidemiology and public health education with the training of clinical specialists in clinical epidemiology, as promoted by some international foundations. Also, training programs need to be more flexible in order to utilize topical health situations for educational purposes and to provide options or areas for specialization only after a solid training in general epidemiology.

2. Strengthen epidemiological research, with emphasis on studying the health situation of specific population groups. Such research should incorporate local studies, with the participation of the organized community, and should promote an interdisciplinary approach, while not limiting itself to the use of already recorded information. This means promoting multidisciplinary epidemiological research at all levels of the health services and centers for public health education. Research efforts should focus on producing knowledge for the design of a strong explanatory conceptual model of the health-disease phenomena that will provide better support for the reorganization of services.

3. Promote interest in the development of epidemiological theory and methods, and overcome the use of conceptual models, such as the "epidemiological triad," which are insufficient for explaining the current set of health problems. The restatement of causality should reestablish the complex articulation between the biological and social processes in determining the health situation of different population groups and in the changing economic and political situations of the countries. This effort, which aims to deepen the relationship between health and working and living conditions, will have to reconceptualize many of the categories and indicators utilized. It should, however, become an area of research that is accessible to most epidemiologists and health workers. In other words, the complexity of the conceptual and methodological effort that is required should be translated into accessible designs for research on and approaches to health problems.

4. Promote the study of the relationship between the general social processes and health phenomena, to develop categories and intermediate indicators that are more closely linked to the daily actions of the health services and more accessible to all health workers.

5. Strengthen the autonomy of training and research institutions as an area for the production of critical thought in health and, at the same time, promote articulation with the health services. Preferably, these training centers should be located at universities and they should

be multidisciplinary in character. It is also important to strengthen the leadership of the schools and departments of public health and social medicine in graduate-level training.

6. Strengthen the relationship between epidemiology and planning, not by placing epidemiology in a position subordinate to planning but by acknowledging that it is not possible to make health plans at the local, regional, and national levels without an ongoing evaluation of the health situation. It is also recommended that the role of epidemiology be strengthened in the process of decentralization and horizontalization of the health services. In this regard, a contribution needs to be made to the development of general and comprehensive health services and of grass-roots participation in the planning, management, and evaluation of these services.

7. Strengthen epidemiology training for all health workers. Mention was made of the desirability of organizing epidemiological knowledge and techniques in such a way that they could be connected with different practical needs of each worker. Thus, workers whose basic practice is clinical should receive training in techniques for evaluating specific risks and assessing diagnostic and therapeutic techniques. For auxiliary personnel at the operational level, emphasis could be placed on simple techniques of registration, surveillance, and control. The general training for all levels should be based on a comprehensive conceptual framework that identifies these techniques as a component of public health, emphasizing the epidemiological and social aspects of health problems. In no case should they lead to the reduction of epidemiology to an individual and clinical view of public health problems. It will also be necessary to promote the development of educational materials for different levels in order to facilitate comprehensive training in epidemiology.

8. Strengthen the activities of scientific updating for epidemiologists and public health physicians, offering epidemiological knowledge to general public health physicians, halting the trend toward training that is limited to managerial techniques in health. The teaching of epidemiology should also be strengthened at the undergraduate level in the health professions.

9. Promote the exchange of experience among epidemiologists at the national and international levels. In this regard, attention was drawn to the importance of strengthening mechanisms for the dissemination of scientific information on epidemiology and improving rapid access to modern technology, highly efficient, and of low-cost. These mechanisms, along with specialized journals and newsletters that have a broad circulation in Latin America, acquire special relevance enabling access to information in times of growing economic problems.

10. Reduce the political vulnerability and instability of epidemiology workers. For this, actions should be

taken to provide a greater awareness of epidemiological thought and knowledge to political leaders, administrators, and the public in general; to strengthen the scientific and professional associations of epidemiologists and their linkage with the scientific community, professional unions, health workers associations, and community organizations.

11. Promote the definition of multiannual development plans for the teaching of epidemiology at the national and international levels. These plans could be coordinated by ALAESP and receive support from PAHO, ASPH, and other institutions.

12. Promote mechanisms to encourage exchanges and cooperation among the members of ALAESP with a view toward joint work in priority areas for the development of training in epidemiology. In this regard, the study of possible programs or areas in which common strategies and mutual support could be identified is suggested.

13. Study the possibility of instituting a cooperative doctoral program in epidemiology among various Latin American centers and with support from schools of public health in North America.

Finally, it should be pointed out that there was a high level of consensus among the participants, who represented various epidemiology training centers in Latin America and the Caribbean, regarding the need to develop a conceptual framework with greater explanatory capabilities and the ability to incorporate the relationship between the biological and social processes in the determination of health phenomena. There was also consensus that the contributions of "traditional" epidemiology be integrated with those of "social" epidemiology in order to strengthen the ability of epidemiology to describe and understand the growing challenges of the health situation of different population groups, by incorporating the contributions of the social sciences to this process.

It was also widely agreed that the field of epidemiology should be approached in all its aspects, including the studies of health situation, epidemiological surveillance, research on causes, and service evaluation. Special mention is made of the consensus on the need to emphasize the application of epidemiological thinking and principles on public health problems and the need to avoid attempts to reduce epidemiology to a simple technique for validating hypotheses that are formulated on the basis of individual clinical approaches

The consensus shown in these broad fields of Latin American epidemiological thought should contribute to strengthening the teaching and practice of epidemiology in the Hemisphere.

AIDS Surveillance in the Americas

Cumulative number of cases and deaths.

Subregion Country	Cases ^{a)}	Deaths	First report	Last report
REGIONAL TOTAL	66,194	36,017		
LATIN AMERICA^{b)}	6,089	2,370		
ANDEAN GROUP	419	180		
Bolivia	6	3	31 Dec 85	31 Dec 87
Colombia	174	21	31 Dec 86	31 Dec 87
Ecuador	30	17	31 Dec 85	31 Dec 87
Peru	69	39	30 Jun 82	31 Dec 87
Venezuela	140	100	31 Dec 84	31 Dec 87
SOUTHERN CONE	229	120		
Argentina	141	72	31 Dec 83	31 Dec 87
Chile	63	29	31 Dec 84	31 Dec 87
Paraguay	8	8	31 Dec 86	31 Dec 87
Uruguay	17	11	31 Dec 83	31 Dec 87
BRAZIL	2,458	1,319	31 Dec 82	31 Dec 87
CENTRAL AMERICAN ISTHMUS	217	134		
Belize	7	5	31 Mar 87	31 Dec 87
Costa Rica	43	24	31 Dec 83	31 Dec 87
El Salvador	23	14	31 Dec 85	31 Dec 87
Guatemala	34	29	30 Sep 86	31 Dec 87
Honduras	80	41	30 Jun 85	31 Dec 87
Nicaragua	-	-	30 Sep 87	31 Dec 87
Panama	30	21	31 Dec 84	31 Dec 87
MEXICO	1,121	319	30 Jun 81	31 Dec 87
LATIN CARIBBEAN^{c)}	1,645	298		
Cuba	27	6	31 Dec 86	31 Dec 87
Dominican Republic	378	42	31 Dec 85	31 Dec 87
Haiti	1,240	250	31 Dec 83	31 Dec 87
CARIBBEAN	803	487		
Anguilla	-	-	31 Mar 87	31 Dec 87
Antigua	3	3	31 Dec 85	31 Dec 87
Bahamas	176	83	31 Dec 85	31 Dec 87
Barbados	55	34	31 Dec 84	31 Dec 87
Cayman Islands	3	2	31 Dec 85	31 Dec 87
Dominica	4	2	31 Mar 87	31 Dec 87
French Guiana	103	75	31 Dec 86	31 Dec 87
Grenada	8	5	31 Dec 84	31 Dec 87
Guadeloupe	74	36	31 Dec 86	31 Dec 87
Guyana	14	6	30 Sep 86	31 Dec 87
Jamaica	35	20	30 Jun 86	31 Dec 87
Martinique	38	22	31 Dec 86	31 Dec 87
Montserrat	-	-	30 Jun 87	31 Dec 87
Netherlands Antilles	23	15	31 Mar 87	31 Dec 87
Saint Lucia	10	6	31 Dec 84	31 Dec 87
St. Christopher-Nevis	1	-	31 Dec 85	31 Dec 87
St. Vincent and the Grenadines	8	5	30 Jun 85	31 Dec 87
Suriname	9	7	30 Jun 84	31 Dec 87
Trinidad and Tobago	227	163	30 Jun 83	31 Dec 87
Turks and Caicos Islands	5	3	31 Dec 86	31 Dec 87
Virgin Islands (UK)	-	-	31 Mar 87	31 Dec 87
Virgin Islands (US)	7	-	31 Mar 87	31 Dec 87
NORTH AMERICA	59,302	33,160		
Bermuda	72	54	31 Dec 84	31 Dec 87
Canada	1,663	916	31 Dec 79	31 Mar 88
United States of America ^{c)}	57,567	32,190	30 Jun 81	31 Mar 88

^{a)}Differences or changes in case-definitions may lead to discrepancies with other published data.

^{b)}French Guiana, Guyana, and Suriname included in Caribbean.

^{c)}Puerto Rico included in USA.

Epidemiological Status of Malaria Region of the Americas 1986¹

It is estimated that the population at risk of contracting malaria in the Region of the Americas increased from 143.6 (30%) million in 1960 to 263.4 million (39%) in 1986.

Since 1965 around 9 million parasitoscopic thick-film blood tests have been done each year in the Region. In the last 20 years the percentage of blood samples with plasmodia rose from 2.7% in 1965 to 9.5% in 1986.

The 950,471 cases of malaria registered in the Region in 1986 represent an increase of 57,236 cases over the total registered in 1985. This is the highest figure registered since 1958. Morbidity per 100,000 population in the malarious area went from 164.95 in 1965 to 360.89 in 1986.

The increase occurred in 12 countries in which control activities are under way (Argentina, Bolivia, Brazil, Colombia, Costa Rica, Dominican Republic, French Guiana, Guyana, Mexico, Nicaragua, Panama, and Peru). The number of cases registered in 1986 was lower than in 1985 in seven countries (Belize, Ecuador, El Salvador, Guatemala, Honduras, Paraguay, and Suriname). In Venezuela the number of cases registered in 1986 was the same as in 1985. In Haiti the case detection system was modified substantially at the end of 1985, which means that the lower figures registered in 1986 should be analyzed with care (Table 1).

In Mexico, which had 13.8% of all the cases in the Region, there were 16,028 positive localities, or an increase of 14.4% over 1985. At the same time, the cases of *P. falciparum* fell by 30% during the same period.

The malaria problem in Brazil, a country that has 46.7% of the cases in the Region, continues to be associated with the areas of recent colonization in the Amazon region, which accounts for 96.3% of all the cases registered in the country. Over 70% of these are registered in the states of Pará and Rondônia; 16 municipalities in these states adopted emergency plans involving selective chemotherapy in order to reduce parasitemia.

In Guatemala, 97% of the cases were attributed to *P. vivax* and 3% to *P. falciparum*; 54% of the positivity in the country is concentrated in the northern area.

Of Argentina's 2,000 registered cases, 751 were classified as imported.

In Cuba there was a considerable drop in the total number of cases, of which 90% were imported and 10% were classified as introduced.

The situation in Guyana is alarming: the index of parasitemia for the population in the malarious area was 20.6 per thousand in 1986, the highest for the Region, with 56.6% of the infections attributed to *P. falciparum*. Transmission occurs most frequently in the areas of *A. darlingi*.

The process for bringing and keeping malaria under control in the countries of the Region has depended not only on the previous intensity of transmission but also on new trends in agriculture or mining, and on the current distribution of the rural population. The traditional malarious areas are being replaced by a mobile rural population, traveling around in search of jobs. Workers are concentrated temporarily in unsuitable camps or shacks where conditions are favorable for transmission.

For the successful design and implementation of integrated control, emphasis needs to be placed on studies of malaria epidemiology in general, including aspects related to demography and social and economic development, as well as vector ecology, resistance of the plasmodia to drugs, and vector resistance to insecticides.

This involves, in addition, the development of methodologies for predicting, registering, and following epidemics.

Problems Impeding the Progress of the Programs

The public health problem that malaria represents for the Region of the Americas is currently being dictated by a combination of sociocultural factors that are associated with the ordinary development and economic problems that affect most of the countries. In addition, factors relating to territorial contiguity and to transportation between the countries facilitate more intense interaction of the geographical and bioecological factors involved in the epidemiology of malaria. Such factors are propitiating the transmission and spread of the disease faster than the operating capacity of the health services responsible for controlling malaria are able to contain it. The use of malaria indexes for monitoring the progress of malaria

¹This article includes aspects covered in the XXXV Report on the Situation of Malaria Programs in the Americas (Document CD32-INF-2, Rev.1), submitted to the XXXII Meeting of the Directing Council of PAHO (September 1987).

Table 1. Cases of malaria reported annually, by groups of endemic countries, 1983-1986

Country groups		Population in malarious areas in 1986 ^a	Number of cases registered			
			1983	1984	1985	1986
Group 1	Countries in which malaria eradication has been certified ^b	75,523	914	1,206	1,755	1,664
Group 2	Argentina	3,915	535	437	774	2,000
	Costa Rica	753	245	569	734	790
	Panama	2,146	341	125	126	1,060
	Subtotal	6,814	1,121	1,131	1,634	3,850
Group 3	Brazil	59,367	297,687	378,257	401,904	443,627
	French Guiana	84	1,051	1,021	691	979 ^c
	Guyana	796	2,102	3,017	7,900	16,388
	Paraguay	2,838	49	554	4,568	4,329
	Suriname	296	1,943	3,849	1,635	1,316
	Subtotal	63,381	302,832	386,698	416,698	466,639
Group 4	<i>Subregion A:</i>					
	Dominican Republic	6,337	3,801	2,370	816	1,360
	Haiti	4,925	53,954	69,863	16,662	14,363
	<i>Subregion B:</i>					
	Belize	171	4,595	4,117	2,800	2,779
	El Salvador	4,325	65,377	66,874	44,473	23,953
	Guatemala	3,333	64,024	74,132	54,958	42,609
	Honduras	4,182	37,536	27,332	33,828	29,130
	Mexico	42,570	75,029	85,501	116,016	130,915
	Nicaragua	3,371	12,907	15,702	15,130	20,308
	<i>Subregion C:</i>					
	Bolivia	2,588	14,441	16,338	14,354	20,993
	Colombia	19,639	105,360	55,268	55,791	89,251
	Ecuador	5,569	51,606	78,599	68,989	51,430
	Peru	6,692	28,563	33,724	35,026	36,866
Venezuela	13,951	8,400	12,242	14,305	14,361	
Subtotal	117,653	525,593	542,062	473,148	478,318	
TOTAL	263,371	830,460	931,097	893,235	950,471	

^aIn thousands.

^bCountries or territories with no evidence of transmission are: Cuba, Chile, Dominica, Grenada, Guadeloupe, Jamaica, Martinique, Puerto Rico, Saint Lucia, Trinidad and Tobago, the United States of America, and the Virgin Islands (USA).

^cInformation is not complete.

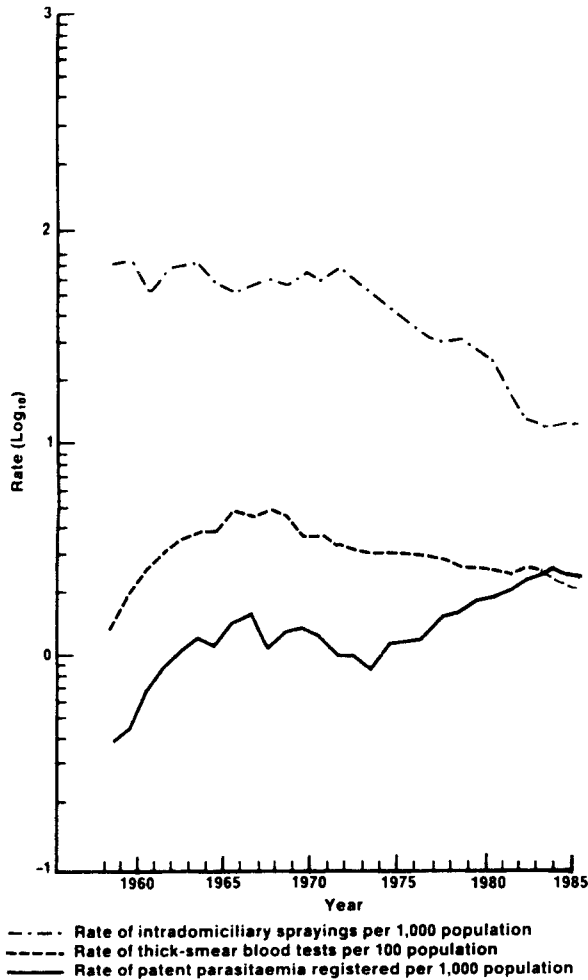
prevention and control programs have been very helpful when strategies were aimed at eradication. Coverage with intradomiciliary spraying as measured by the IRC (index of intradomiciliary sprayings per 1,000 population), attempts to evaluate the foregoing through the IAES (rate of thick-smear blood tests per 100 population), and the IPA (rate of patent parasitaemia registered per 1,000 population) have not been sufficient to establish the status of the programs and of the disease in the population.

Figure 1 shows the sharp drop in the number of intradomiciliary sprayings per 1,000 inhabitants in the countries of the Region as well as the parallel decline in blood examinations performed, and the resulting rise in the rate of detected parasitaemia.

On the other hand, the countries are going through a transition between an eradication strategy and a control strategy, and they are aware of the need to change their programs and gear up their administrative structures for malaria surveillance, prevention, and control based on an epidemiological approach that takes into account the local socioeconomic conditions of the population and their resources. For this purpose, the countries are working on incorporating malaria control into the activities of the local health systems in order to ensure the continuity and permanence of their actions, in keeping with the strategy of Primary Health Care.

The continued rise in malaria cases has obliged the countries to intensify their use of antimalaria drugs, and programs are being made aware of the need for earlier

Figure 1. Malariometric rates of 21 countries of the Americas, 1960-1986.



diagnosis so that their efficiency in controlling the endemic disease can be improved through the timely treatment of patients.

Activities in the Countries

In 1986 the human population protected by intradomestic spraying was 25,446,864. The insecticides used were DDT (89.3%), fenitrothion (5.1%), propoxur (2.0%), bendiocarb (1.0%), deltamethrin (0.6%), malathion and chlorfoxin (0.2%), and others (1.8%).

In Mexico, larvicides were used in 1,078 localities over an area 11,175 km², providing protection for a population of 12,780,858. In El Salvador, sanitary engineering projects continued to be used for the reduction of breeding sites, thus providing protection for 156,191 persons in an area of 867 km².

Collective distribution of antimalaria drugs reached 1,125,817 inhabitants at risk--that is to say, starting from the diagnosis of cases in a given community, treatment

was extended to the entire population in the area. In other countries selective medication was used for 4,560,178 persons. This last figure has fallen by half (it was nearly 9 million in 1985), showing reduced levels of action in diagnosis and treatment at the primary care levels. In Mexico, radical treatment of *P. vivax* infections was given to 577,588 persons (confirmed cases and household members).

The population in the Region covered by combined measures (insecticides and drugs) was 14.7 million. However, 19,678,870 persons at risk did not receive any protection at all, for the following reasons: lack of resources (58.1%), sociopolitical problems (14.9%), difficult access (4.4%), migratory population (2.9%), and unspecified (19.7%).

As a result of malaria cases occurring through blood transfusion, a serological study was carried out to evaluate the potential risks of this mechanism of transmission using the indirect immunofluorescence (IIF) test and the detection of parasites in thick blood film and blood specimens in 829 blood bank donors in an endemic area in the North of Brazil. While all blood donors tested negative in the thick blood film and the blood specimens, the IFI tests were positive for 32% of the donors.

Anopheline Resistance

Vector resistance to the insecticides should be studied in relation to the use of pesticides in agriculture and other environmental interventions in order to better understand the relationship between them, to study the genetics and the mechanisms of resistance, to make predictions, and to evaluate the impact of resistance on the dynamics of transmission. In Guatemala there has been evidence of resistance to DDT, fenitrothion, propoxur, and chlorphoxim in the southern ecological area, which has led to intensification of the studies with cyfluthrin in Puerto San José, Escuintla.

In Honduras, given the suspected widespread resistance of *A. albimanus* to DDT (since 1962), malathion (since 1965), and propoxur, steps were taken to introduce the use of fenitrothion. In Mexico, bendiocarb was sprayed inside dwellings for the first time in areas where the vector is resistant to DDT.

Parasite Resistance

Parasite resistance to drugs is restricted to the countries of South America with the highest prevalence having been registered in Brazil, Colombia, Ecuador, and Venezuela. In the foci where there is resistance to *P. falciparum*, the phenomenon occurs frequently at lower levels of resistance (R-1), which makes it possible to use the 4-aminoquinolines effectively for the treatment of

acute attacks of malaria, especially at the level of primary care.

With a view to analyzing the current status of chemotherapy for *P. falciparum* malaria in Brazil, several studies have been carried out *in vivo* and *in vitro*. *In vitro* resistance was observed with chloroquine, quinine, and mefloquine in sample strains of *P. falciparum* isolated from patients in the Amazon region. Follow-up of another group of patients with *P. falciparum* infections in the same region who had been treated with the sulfadoxine (1,500 mg) and pyrimethamine (75 mg) in combination showed that almost all the patients had a certain degree of resistance to the drug.

Resistance of *P. falciparum* infections to the pyrimethamine-sulfadoxine (PYR-SO) combination has been increasing. There do not appear to be high levels of resistance to tetracycline or to quinine when it is used in combination with PYR-SO. These are alternative therapies that are being used increasingly at the secondary level of care in infections that are resistant to the 4-aminoquinolines and the PYR-SO combination.

Despite these data, another study showed that the use of chloroquine, to which the strains (Brazil) of *P. falciparum* are apparently resistant *in vitro* (artificial selection) continues to be important in preventing malaria mortality and morbidity.

Studies conducted in Colombia to test drug combinations such as sulfadiazine-pyrimethamine showed that 33.9% of the patients were resistant to the therapy. Tests were also done on clindamycin, a derivative of lincomycin, in combination with quinine and amodiaquine. It was demonstrated that this combination was effective for the treatment of patients with *P. falciparum*. The specimens isolated from these patients were resistant *in vitro* to quinine (87%), amodiaquine (19%), and mefloquine (97%). However, more studies need to be done on tolerance and efficiency relative to the harmful action of the antibiotics and their combinations with quinine, the 4-8 aminoquinolines, and the sulfonamides.

Development of the Technical Cooperation Program

The PAHO Communicable Diseases Control Program channels its technical cooperation toward the strengthening of national capacity to prevent mortality, reduce morbidity, curtail transmission, prevent and/or control epidemics, and, on the basis of the epidemiological approach, recognize local variability in the distribution, intensity, and evolution of malaria.

In order to achieve the objectives that have been set forth, technical cooperation has been geared to: supporting the Governments' efforts to analyze critically the evolution of the malaria problem as well as their specialized programs for its control, which will facilitate the

planning and selection of appropriate strategies; continuing and enhancing epidemiological stratification of the malaria problem for operational purposes; supporting national initiatives to reorient the information subsystems that enhance the epidemiological surveillance of malaria, making the information compatible with that of the general health services; promoting and supporting efforts to increase inter- and intrasectoral cooperation; promoting field studies in order to obtain more information on how to use knowledge about the sociocultural and economic factors that influence the transmission of malaria with a view to enlisting the active participation of communities in control of the disease; promoting and collaborating in human resource development and in orienting personnel toward the epidemiological approach to control; and, finally, fostering and supporting research aimed at identifying the gaps that exist in current knowledge and contributing technology and appropriate methodologies to the solution of problems.

In the Americas, training of personnel in entomology at the graduate level is based on general, economic, and agricultural entomology, with basic courses in epidemiology and vector-borne disease control, providing basic knowledge on the ecology and biology of the arthropods of public health importance. Graduate courses are being developed to train epidemiologists in vector-borne diseases and specialists in environmental management, vector and rodents control. At the same time, short courses are already available in vector and rodents control as well as on the management and maintenance of equipment for the application of insecticides and larvicides. In addition, short modular courses on epidemiological surveillance and malaria control, given for professional and technical personnel in the general health services, received considerable impetus in 1986.

In a meeting held in Brazil the discussion focused on methodological aspects related to several research projects under way with financing by the socioeconomic research component of the UNDP/World Bank/WHO's Special Program for Tropical Disease Research and Training (TDR). The main conclusion was that for malaria control there is no single formula that makes it possible to carry out social research with regard to malaria. The broad variation in the patterns of malaria in the different ecological and sociodemographic environments, combined with the diversity of control measures and the specific contribution of the different areas within the social sciences, rules out any uniform approach to dealing with the problem.

Another important conclusion of the meeting is that investigators need to work in close contact with personnel of the control programs at all the stages of research, from definition of the problems and design of the research up to analysis and final dissemination of results.

As a result of the meeting, a network of institutions working on the subject was established to promote the generation and exchange of knowledge that is not only scientifically appropriate but also useful for the control programs.

Finally, during 1986 efforts were devoted to the preparation of visual material and technical documents on the teaching of biology and the prevention and control of

malaria and other vector-borne diseases. In addition, the publication of scientific articles prepared by PAHO personnel and health personnel of the countries was promoted. The complete list of publications on the subject, as well as an extensive bibliography on malaria, can be obtained from the Communicable Diseases Program, Pan American Health Organization, 525 Twenty-third Street, N.W., Washington, D.C. 20037, USA.

Epidemiological Activities in the Countries

Strengthening of Epidemiology in Haiti

In 1986 Haiti's health authorities detected delays in the dissemination of data along with a lack of analysis and interpretation of information on epidemiological surveillance, the lack of a systematic analysis of the health situation, insufficient use of epidemiology in the evaluation of the impact of health programs, the lack of a systematic response to epidemic situations, and a limited level of epidemiological research. In response to this situation, the Ministry of Health decided to train four epidemiologists each year over the next four years in order to strengthen the epidemiological practice at the services. With the cooperation from the Pan American Health Organization (PAHO), the first training program was successfully carried out from 23 February 1987 to 2 February 1988.

The training material selected was simple, easy to understand, and in French: the practical exercises reflected the real conditions existing in Haiti. The teaching activities included a few hours of specialized courses, workshops, problem-solving, and, in general, interaction between teaching, learning, and research. Field work took 80% of the duration of the course.

Administratively, the practice sessions and the work at the health services were coordinated through specific responsibilities assumed by the regional health directors.

The knowledge, skills, and aptitudes acquired by the students aimed at preparing them to fulfill the tasks of analyzing the health situation, service evaluation, epidemiological surveillance, and research health problems in the population.

The first stage of the course consisted of a workshop on the principles of epidemiology (based on the model documents prepared by PAHO), a community survey on the utilization of services, and a course dealing with research on epidemics.

It should be pointed out that, subsequent to this workshop, the students then taught a second similar workshop in their respective health regions. They also participated in the community survey, taking part in the entire process from the preparatory phase up through execution and the discussion of results, during which they supervised the interviewers.

In the second stage, the objective was to identify the importance of epidemiology in evaluating the impact of health programs. The physicians in charge of Haiti's seven priority programs made a presentation on the areas of each of the programs, describing the problems, the specific actions of the programs, and how program results are measured. The discussions helped to identify gaps that could be bridged by a contribution from epidemiology.

The third stage consisted of analyzing the health situation. The objective was to familiarize the students with principles and methods useful in describing the health situation and its determinants in the regions in which they will work and to give them access to that knowledge and make sure that they practice these principles and methods in order to use that knowledge. After the presentation of some conceptual aspects, a 5-day practical exercise was held at a town near the capital. Then, the complete practical exercise under this stage was carried out over a period of five months. Prior to this, programming guidelines had been prepared that enabled each student to draw up a program of work for the collection, presentation, analysis, and discussion of data.

The fourth stage focused on promoting epidemiological research based on the problems identified in order to provide the students with the knowledge needed to properly design and conduct research on priority problems. In theoretical sessions the analyses of the health situation that were done for each region were studied and hy-

potheses were formulated for specific research, touching on methodological aspects of various kinds of studies, e.g. case and control, cohort, experimental, cross-studies, and operations. A special consultant was contracted to perform these tasks. There was discussion on sampling using practical examples from the first-hand experience of the students. Each of the students was involved in operations research on the health information system with a view to identifying the system's characteristics and improve operations. The results were discussed at special sessions held in each region with the entire health team. Additionally, an introductory course in computer science was also held.

The fifth stage consisted of evaluating the course and programming the activities of each epidemiologist for 1988. During these three weeks, the students attended workshops with the persons in charge of the course, with the health team of their respective regions, and with the national authorities of the Ministry of Health to discuss and program specific activities that would be congruent with the post description of regional epidemiologist, with the health policies and priorities in effect, and with regional circumstances.

In summary the program was designed as part of the process of promoting the use of epidemiology at the health services. Therefore, during the field work, the students coordinated the analysis of the health situation of each of the regions and set the bases for establishing a continuous process of analysis. Emphasis was placed on ensuring correspondence between the aspects taught and the requirements of the prospective posts of the students after graduation, including the need to familiarize them with the constraints and resources that they will encounter in their tasks.

Uses of Epidemiology in Ecuador

The process of strengthening epidemiology in Ecuador began with the national meeting on "Uses and Perspectives for Epidemiology" held in the city of Ibarra in August 1985, (see *Epidemiological Bulletin*, Vol. 7, No. 3, 1986) and has continued through the fulfillment of various key activities in compliance with the recommendations made at that meeting.

For the purpose of evaluating the process and discussing some of the topics in greater detail, a second meeting was held in March 1987 in Conocoto, Ecuador. Its objectives were to evaluate the degree to which the seminar's recommendations were being fulfilled and to define strategies for their implementation, to know the status of health and of the use of epidemiology in Ecuador, to formulate health priorities and to define guidelines for research policies.

The meeting was attended by representatives from the schools of medicine of Quito, Guayaquil, and Cuenca, the medical research institutes, the Association of Schools of Medicine of Ecuador, the National Science and Technology Council, and the Ministry of Public Health.

The recommendations made at Ibarra on health services, manpower training, and research were evaluated. One of the important achievements was the establishment of the Epidemiological Information and Analysis Unit under the Ministry of Health.

During this period several research projects have been carried out with the participation of various sectors that have contributed in many aspects to strengthen the use of epidemiology. Among them, it is important to mention "The health situation in Ecuador, 1962-1985", by José Suárez Torres, "Chronic Diseases in Ecuador", by H. Noboa et al, and "National research on the prevalence of alcoholism in Ecuador", by E. Aguilar et al. Many other research projects were undertaken of different health problems, such as sexually transmitted diseases, acute respiratory infections, diarrhoeal diseases, and diseases subject to the Expanded Program on Immunization.

First Annual Scientific Meeting on Epidemiology in Venezuela

The National Commission for Strengthening of the Teaching and the Practice of Epidemiology in Venezuela, with backing from the Ministry of Health and Social Welfare and from PAHO, organized the First National Scientific Meeting on Epidemiology in Caracas on 26-29 November 1987.

The meeting was attended by over 150 epidemiologists and public health researchers from different professions related to the production of knowledge in this discipline. A total of 59 scientific works were presented and discussed, grouped into the following five areas:

- a) studies of the health situation,
- b) epidemiological surveillance and disease control,
- c) research on causes,
- d) evaluative studies, and
- e) research on the teaching-learning process in epidemiology.

In addition, the meeting included four special lectures: "Epidemiology and the Organization of Health Services," by Dr. Pedro Luis Castellanos, "Epidemiological Research," by Dr. Pablo Sabrosa of the National School

of Public Health of Brazil, "Epidemiology and the Health of the Elderly," by Dr. Elías Anzola, and "Epidemiological Surveillance," by Dr. Alvaro Llopis.

Workshops were held on the social aspects of epidemiology, computers and epidemiology, oral health, AIDS, the epidemiological surveillance of hepatitis, hospital infection, pesticides, and the epidemiological surveillance of meningitis.

The meeting also paid tribute to key personalities in Venezuela's public health scene who have contributed significantly to the development of epidemiology: Dr. Arnoldo Gabaldón, Dr. Jacinto Convit, Dr. Aníbal Osuna, Dr. Juan Halbourg, Dr. Carlos Luis González, and especially Dr. Darío Curiel, the founder of epidemiology services in Venezuela. In his honor, the epidemiology conference to be held each year will bear Dr. Curiel's name.

In addition, a preparatory meeting was held to lay the bases for actions to organize the Venezuelan Association of Epidemiology. An organizing commission was ap-

pointed to handle the necessary arrangements for formal and legal establishment. All the participants agreed to be founding members and to hold a national scientific meeting on epidemiology each year.

This first scientific meeting at the national level constitutes an important landmark in the development of epidemiology in Venezuela, highlighting the progress made in recent years on the promotion of research in this discipline within the health services, educational institutions, and research centers. It is also worth noting that the participants were from a variety of disciplines: in addition to physicians, there was a strong representation of veterinarians, dentists, bioanalysts, and social scientists from different areas. Also, many of the works and topics presented or discussed at the workshops were led by multidisciplinary teams. The National Commission for the Development of Epidemiology is currently preparing a publication on the proceedings of the meeting and is continuing work on the program for the comprehensive development of epidemiology in Venezuela.

Calendar of Courses

*The Johns Hopkins University School of Hygiene and Public Health will sponsor the Sixth Annual Graduate Summer Program in Epidemiology, to be conducted from 20 June to 8 July 1988.

Further information is available from Ms. Helen Walters, Program Coordinator, Graduate Summer Program in Epidemiology, School of Hygiene and Public Health, The Johns Hopkins University, 615 North Wolfe Street, Baltimore, Maryland 21205, U.S.A.

*The University of Michigan School of Public Health announces the 23rd International Graduate Summer Session in Epidemiology (formerly held at the University of Minnesota), to be conducted from 10 to 29 July 1988.

For further information write to Dr. David Schottenfeld, Professor and Chairman, Director, Graduate Summer Session in Epidemiology, The University of Michigan, School of Public Health, 109 Observatory Street, Ann Arbor, Michigan 48109-2029, U.S.A.

*Tufts University at Medford, Massachusetts, The New England Epidemiology Institute, and the Postgraduate Medical Institute, are sponsoring a course to be conducted from 24 July to 12 August 1988.

For more information contact Ms. Karen Donelan, Program Coordinator, The New England Epidemiology Institute, P.O. Box 57, Chestnut Hill, Massachusetts 02167, U.S.A.



PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
525 Twenty-third Street, N.W.
Washington, D.C. 20037, U.S.A.