Sinaloa 125 (18.9 per cent), followed in descending order by Jalisco 107 (16.3 per cent), Guanajuato 98 (14.8 per cent), Michoacán 76 (11.5 per cent), and Colima 51 (7.7 per cent). Together the five states accounted for 69.2 per cent of the new cases reported throughout the country.

Of these patients, 54.6 per cent (355) were identified by the mobile teams of the leprosy program and 38.7 per cent (254) by dermatological centers. The Mexico City General Hospital, which comes under the authority of the Ministry of Health and Welfare, reported 6.7 per cent (40 patients).

Of the cases, 42.3 per cent (278) were diagnosed during dermatological consultations, 25 per cent (164) during the examination of contacts, and 32.7 per cent (215) were reported by various institutions and private practitioners. The patients in the last-mentioned group had been diagnosed in earlier years and were receiving sulfone treatment.

Although the examination of patients with symptoms makes it possible to detect a large number of leprosy cases, their disease is usually advanced and the attack rate is low: in 1979 it was 1.5 cases per 1,000 consultations. In contrast, the examination of contacts led to the detection of 7.4 cases per 1,000 consultations, and also resulted in their diagnosis at an early stage. These data highlight the importance of increasing the periodic examination of contacts.

In Mexico the open forms of leprosy are the most common. In 1979 their distribution was as follows: lepromatous 52.7 per cent (346 individuals), tuberculoid 15.2 per cent (100), dimorphous 6.2 per cent (41), and indeterminate forms 25.9 per cent (170). Of the 387 lepromatous and dimorphous patients registered, the results of bacilloscopy were negative on the date of diagnosis in 32 per cent since they had been given specific treatment.

The age distribution of the patients was: 93.3 per cent (613) over 15 years of age and 6.7 per cent (44) aged 15 years or less.

The foregoing data show that the cases are not detected promptly and that when diagnosed are already infectious. In 41.6 per cent of the patients examined, the evolution of the disease was less than two years; in 19.5 per cent between three and five years; and in 38.9 per cent five years or more.

During the period studied, 805 patients were removed from the register: 187 by reason of death, 112 because of cure, 21 because of change in residence, and 485 because they could not be located or for other reasons. At the end of 1979 the active register contained 15,237 persons, which represents a prevalence rate of 0.22 per 1,000 population.

In Colima and Sinaloa, where the prevalence rate is higher than 1 per 1,000, the endemicity of leprosy is highest. At the end of 1979 the number of leprosy patients in those states was 2,779 (18.2 per cent of the national total). Next in importance were 15 federal units where the endemicity is average (11,508 patients or 75.5 per cent of the total), since the prevalence rates range between 0.10 and 0.99 per 1,000 population. In the other 15 states the problem is of little importance; the prevalence rates are below 0.10 per 1,000 population and together they account for 950 patients (6.2 per cent). Among the last group of states, only Mexico, Oaxaca, San Luis Potosí, and Nuevo León carry out specific leprosy control activities; it is, therefore, to be assumed that there are still patients that have not been identified.

Colima, Sinaloa, Guanajuato, Jalisco, and Michoacán have the largest number of patients on the active register; 10,155 (66.6 per cent of the total of the country). Among the cases documented, the open forms of leprosy also predominate: lepromatous and dimorphous 63.4 per cent (9,650 patients), tuberculoid 14.4 per cent (2,198), and indeterminate 22.2 per cent (3,389).

According to the records, 76.8 per cent (7,259) of the lepromatous patients, 79.2 per cent (156) of the dimorphous, 75.6 per cent (2,562) of the indeterminate, and 67.7 per cent (1,489) of the tuberculoid were receiving drug treatment in 1979.

(*Source: Boletín de Epidemiología*, Vol. 1, No. 5, 15 April 1981, Epidemiological Directorate, Under-Ministry for Health, Mexico.)

Rapid Tests for the Diagnosis of Acute Bacterial Respiratory Diseases

When antibiotics were introduced into the treatment of infectious diseases, with the promise of prompt control or eradication, it appeared that a specific etiological diagnosis would be unnecessary. Nevertheless, experience has shown that although the incidence of certain microbial diseases has declined, others have appeared to take their place. The availability of new chemotherapeutic substances against certain bacteria, viruses, and parasites requires the rapid identification of those agents if the proper therapeutic regime is to be established.

In order to disseminate the present methods of etiological diagnosis of acute bacterial infections of the respiratory tract, the World Health Organization convened a meeting of experts to discuss the methods most frequently used, their sensitivity, specificity, and cost. A summary of those methods is presented below (see Table 1).

There are two types of laboratory methods for the etiological diagnosis of acute bacterial diseases of the respiratory tract: conventional bacteriological methods and rapid laboratory methods.

Table 1. Rapid tests for the diagnosis of acute respiratory diseases caused by bacteria, by type of specimen.

Bacterial species	Sputum	Pleural liquid	Serum	Urine
Streptococcus pneumoniae	CIE	CIE LA	CIE LA ELISA	CIE
Staphylococcus aureus	—	CIE	CIE RIA	—
Haemophilus influenzae	CIE	CIE LA	CIE LA CA	CIE CA
Legionella pneumophila	ELISA	—	CIE ELISA	CIE ELISA
Klebsiella pneumoniae	CIE	—	CIE	—
Pseudomona aeruginosa	—	—	CIE RIA	RIA
Mycoplasma pneumoniae	CIE	—	—	—
Mycobacterium tuberculosis	RIA	—	—	—

CIE: Counterimmunoelectrophoresis.
CA: Coagglutination.
RIA: Radioimmunoassay.
LA: Latex particle agglutination.
ELISA: Enzyme-linked immunosorbent assay.

Conventional Bacteriological Methods

The agent responsible may be identified by direct microscopic examination or by culture for subsequent identification.

• *The direct microscopic examination* can be used for sputum or pleural liquid. Occasionally, this simple test can provide the diagnosis, if there are numerous pneumococci in the sputum or pneumococci and staphylococci in the pleural liquid.

• *Culture.* In the case of a pleural fluid or hemoculture the pathogenic agent isolated is most likely to be responsible for the lung infection. Although positive results are very reliable, one disadvantage of the method is its cost, its slowness, and sometimes negative results make it necessary to repeat the test, even if no previous antibiotic therapy has been given.

Cultures of sputum specimens are more difficult to interpret because of their intense contamination by the normal flora of the mouth. To overcome this difficulty, some technicians recommend that specimens diluted to 10^{-6} be used and that they be considered positive only when pathogenic bacteria are found under these conditions.

Rapid Laboratory Methods

The tendency nowadays is to abandon the conventional methods for the detection of visible or viable bacteria and to use immunological methods that make it possible to detect soluble bacterial antigens. These antigens, which are located in the capsule or outer layer of the bacterial cellular wall, are highly resistant and their presence can be detected not only in the infected tissues, (lung, pleural liquid, sputum), but also in different areas of the body (serum, urine, etc.). Their resistance means that they can be tested for in transported specimens or samples stored in the laboratory.

A number of rapid immunological tests are used to demonstrate bacterial antigens such as:

• *Counterimmunoelectrophoresis.* This method, which is also known as electroimmunodiffusion or electrosyneresis, was described in 1959 and has been used since 1971 to detect the polysaccharides of the pneumococcal capsule. In essence, it is a gel precipitation test which can be defined as a double immunodiffusion performed under the influence of a difference in electrical potential.

• *The passive agglutination method* consists of fixing the immune serum on immunologically inert particulate media. When these media are challenged by a specific antigen, a macroscopically visible agglutination reaction takes place. The following procedures are used in the test:

(a) *Latex particle agglutination.* Sensitized 0.81 μm particles are agglutinated in the presence of the antigen (*Haemophilus influenzae, Streptococcus*) in 2–3 minutes.

(b) *Coagglutination with Staphylococcus aureus.* The *S. aureus* strains that synthesize protein A in large amounts fix the IgG on it by means of their Fc fraction and leave the Fab free. If these staphylococci, which are the carriers of immunoglobulin, are put in the presence of the specific antigen, the latter fix on the Fab fraction to produce an agglutination visible to the naked eye. There are other tests which call for a more advanced technology and are more expensive.

• *ELISA* (enzyme-linked immunosorbent assay). The demonstration of the antigen is based on the use of specific immunoglobulins conjugated with an enzyme. The specific antibodies of the antigen being tested for are fixed on a surface and the pathological product is added; then a specific immunoglobulin conjugated with an enzyme (peroxidase, alkaline phosphatase, etc.) is added. If the product does not contain the antigen, the immunoglobulin conjugated with the enzyme disappears when washed. If, in contrast, the immunoglobulin reacts, the

enzyme acts on the substrate and it is revealed by a colorimetric reaction.

• *RIA* (radioimmunoassay). The test consists in fixing the antibodies for the bacterium tested for on a surface. The pathological specimen and specific antibodies, labeled with ^{125}I, are then added in turn. If the antigen is present, labeled antibodies remain and radioactivity is observed.

Persons interested in obtaining additional information on these tests should get into touch with the Laboratories Program, Division of Disease Prevention and Control, PAHO.

(*Source*: Laboratory Program, Division of Disease Prevention and Control, PAHO.)

Risk Approach in the Extension of Health Service Coverage

The idea that certain individuals or population groups are more likely to become ill than others dates from very remote times. More than 120 years ago, Little drew attention to the influence of specified conditions and antecedents of a mother on the mental and psychological health of her child and identified the first risk factors in perinatal morbidity. However, it is only since the second half of this century that systematic epidemiological studies based on the idea of prediction which characterizes risk studies have been carried out.

This approach is valid for all health activities, but it is especially used in primary health care programs and has been developed most fully in maternal and child health care and in particular perinatal care. Women and children, the vulnerable groups of the population, are exposed to special risks arising from the processes of reproduction and of growth and development, respectively. For example, it has been observed that certain characteristics of a mother such as advanced age, multi-parity, presence of diseases, and complications of earlier deliveries are associated with an unfavorable course of pregnancy.

While some of these characteristics are probably of universal importance, other risk factors may be present in different countries or regions and need to be identified through epidemiological studies.

Although maternal and child health indicators show that there has been a substantial improvement in the situation in the past decade, there are still many communities in the Region in which conditions are below the minimum acceptable and for which special efforts are required, including the application of the risk approach.

To develop this approach, each community or area needs first to define its own priority problems, to analyze them from an epidemiological point of view, and to reach an understanding of their "etiological chain." The next step is to decide, in the light of such criteria as feasibility and viability, where to intervene in that chain to change the undesirable results. For that purpose, existing resources will have to be reassigned and frequently others that are not traditionally considered health resources will have to be mobilized.

An essential part of this process consists in defining the characteristics of the individuals or groups "at risk" so that they can be promptly identified and appropriate measures taken.

The assignment of risk figures to individuals, families, and communities makes it possible to develop appropriate strategies and to reassign resources for averting or reducing undesirable results. The risk approach is therefore a management strategy that can improve the design of health services and the mobilization of community resources for promoting its health and preventing disease.

Since the beginning of the past decade it was understood how valuable the risk approach could be, especially if it were possible to develop a methodology enabling it to be systematically applied to the rationalization of the use of health resources. In 1977 WHO convened an expert group whose discussions laid the conceptual groundwork for the use of this method. Since 1978 experimental studies based on the approach advocated by WHO and PAHO have been initiated in a number of the countries. These studies have resulted in operational guidelines that will make it possible to systematize the method of study and application of the risk approach. In April 1980, an interregional workshop held in Nottingham, England, spelled out the methodological basis of the approach and wrote a manual that is being published. In March 1981 PAHO organized in Bogotá, Colombia, the First Regional Meeting on the Risk Approach in the Extension of Health Service Coverage. It was attended by representatives of 15 countries in the Americas who reported on the various experiments underway in the countries.

The studies on this subject made in the Americas have been of two types:

• Those that have followed all the stages of the methodology