Evaluation of Leprosy Epidemiology in 12 Countries of the Americas, 1980–1983

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To assess the leprosy situation prevailing in 12 countries of Latin America and the Caribbean in 1980–1983, the authors reviewed data on eight indicators—four relating specifically to leprosy cases and four to general health conditions. On the basis of scores derived from these indicators, the 12 countries were classified into three groups wherein the leprosy endemic appeared to be declining, stationary, or increasing. Countries of the first group, where the leprosy endemic appeared to be receding, exhibited generally favorable leprosy-specific indicators and general health indicators, and the findings generally agreed with those of prior leprosy prevalence surveys. Similarly, those in the third group, where the endemic seemed to be increasing, showed generally unfavorable leprosy-specific indicators and general health indicators plus general agreement with prior leprosy prevalence surveys. In contrast, the results obtained for the three countries where the leprosy endemic seemed “stationary” differed substantially from one country to the next—but in all cases the “stationary” situation appeared to depend less upon a stable equilibrium than upon interaction of opposing trends.

The limited information available suggests leprosy was introduced into the American Continent by settlers and explorers arriving from areas of Europe where the disease was endemic and subsequently by people brought over as slaves from highly endemic areas of Africa.

Once established in the Americas, the disease slowly found its own pattern of geographic distribution in response to various factors—including climate, other environmental conditions, and the demographic, socioeconomic, and cultural circumstances prevailing in different places.

Historical analysis of leprosy trends in Europe, especially Norway, and more recently in Japan, has clearly delineated the connection between endemic levels and socioeconomic development. Specifically, this analysis has shown that a population’s general living conditions and health status strongly influence the intensity of transmission, the effectiveness of the health system, and the epidemiologic picture of the disease (1,2).

Demographic factors such as intense and unregulated urban growth, and operational factors such as the extent of control program coverage and effectiveness (whether or not these programs are integrated into the primary health care system) are emerging as important variables in leprosy epidemiology. Also, in recent years the resistance of M. leprae to traditional dapsone treatment regimens has introduced a new factor into the disease’s epidemiologic profile, necessitating widespread adoption of new treatment regimens based on multidrug chemotherapy.

For these reasons, among others, we...
felt it would be useful to employ specific leprosy indicators in association with general indicators to evaluate leprosy epidemiology in the Americas.

MATERIALS AND METHODS

Twelve countries of the Americas were selected as being representative of the hemisphere's various geographic regions (exclusive of the United States and Canada), the diverse populations of the continent, and registered leprosy cases. The 12 countries selected on the basis of these criteria were Argentina, Brazil, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, Guyana, Mexico, Paraguay, Trinidad and Tobago, and Venezuela. As of 1983 these countries accounted for roughly 80% of the population in those parts of the Americas outside the United States and Canada where leprosy was endemic, and for 92% of all officially registered leprosy cases in the Americas (3–7).

Leprosy prevalences per 100,000 inhabitants that were found in these 12 countries by four previous surveys are shown in Table 1.

Because of the known influence of general living standards and health levels on the distribution of leprosy, a method was sought for evaluating the epidemiologic situation in the 12 selected countries by examining certain specific leprosy indicators together with certain general health indicators (12–14). The specific indicators used were as follows:

1. **Leprosy prevalence** (registered cases per 100,000 inhabitants), a specific indicator useful for assessing the magnitude of the problem that is strongly influenced by past and present case registration procedures.

2. **Leprosy incidence** (cases detected annually per 100,000 inhabitants), an epidemiologic indicator of obvious value in assessing the current risk of contracting leprosy and the intensity of prior transmission.

3. **Leprosy incidence in children** (cases detected annually in the 1–14 year age group per 100,000 children), an indicator used for evaluating the intensity of pediatric transmission.

4. **Leprosy disability rate** (the proportion of newly detected leprosy cases with disability in a given year), an operational indicator for evaluating the effectiveness of efforts to obtain early diagnoses.

We also used four general health indicators, these being life expectancy at birth, infant mortality, communicable disease deaths (the proportion of all deaths attributed to the causes listed in Section I of the International Classification of Diseases, ninth revision, a figure influenced by the population's age structure and the quality of death certificates), and infant DPT vaccination (the proportion of all infants receiving three DPT vaccinations, an indicator relating to health service productivity that assesses immunization program coverage).

We sought to obtain average values of all these indicators from the sources cited for the years 1980 through 1983 (3–6). When appropriate data could not be obtained for this period, information from the last year with available data within this period was used, or an estimate for the 1980–1985 period was employed. Base data for the leprosy figures and the resulting indicators are shown in Tables 2 and 3.

Average values were then calculated for each of these eight indicators, and relative values of one, two, or three were assigned to each indicator as follows: leprosy prevalence and communicable disease deaths, immediately.
### Table 1. Apparent leprosy prevalences (cases per 100,000 inhabitants) in 12 countries of the Americas, according to works published in 1957, 1959, 1977, and 1983.

<table>
<thead>
<tr>
<th>Author of work, year of publication, and reference</th>
<th>Costa Rica</th>
<th>Cuba</th>
<th>Dominican Republic</th>
<th>Ecuador</th>
<th>Guyana</th>
<th>Mexico</th>
<th>Paraguay</th>
<th>Trinidad and Tobago</th>
<th>Venezuela</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bica et al., 1957 (8)</td>
<td>48.8</td>
<td>112.3</td>
<td>75.6</td>
<td>23.9</td>
<td>67.1</td>
<td>11.7</td>
<td>4.3</td>
<td>292.9</td>
<td>40.5</td>
</tr>
<tr>
<td>Souza Lima, 1959 (9)</td>
<td>51</td>
<td>202</td>
<td>72</td>
<td>47</td>
<td>72</td>
<td>9</td>
<td>4</td>
<td>280</td>
<td>42</td>
</tr>
<tr>
<td>Brubaker, 1977 (10)</td>
<td>37.5</td>
<td>125.6</td>
<td>82.1</td>
<td>26.0</td>
<td>49.7</td>
<td>53.3</td>
<td>40.9</td>
<td>105.2</td>
<td>25.0</td>
</tr>
<tr>
<td>Motta and Borges, 1983 (11)</td>
<td>42.9</td>
<td>148.9</td>
<td>69.1</td>
<td>26.1</td>
<td>58.8</td>
<td>87.3</td>
<td>26.2</td>
<td>58.6</td>
<td>21.9</td>
</tr>
</tbody>
</table>

### Table 2. Average values for population data and annual registered leprosy cases in the 12 selected countries as of 1980–1983.a

<table>
<thead>
<tr>
<th>Population and leprosy case data in:</th>
<th>Argentina</th>
<th>Brazil</th>
<th>Colombia</th>
<th>Costa Rica</th>
<th>Cuba</th>
<th>Dominican Republic</th>
<th>Ecuador</th>
<th>Guyana</th>
<th>Mexico</th>
<th>Paraguay</th>
<th>Trinidad and Tobago</th>
<th>Venezuela</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population (in thousands)</td>
<td>28,930</td>
<td>125,708</td>
<td>26,973</td>
<td>2,304</td>
<td>9,766</td>
<td>5,666</td>
<td>8,799</td>
<td>892</td>
<td>72,132</td>
<td>3,320</td>
<td>1,075</td>
<td>14,519</td>
</tr>
<tr>
<td>Child population (0–14 years, in thousands)</td>
<td>7,340</td>
<td>50,754</td>
<td>10,898</td>
<td>882</td>
<td>3,604</td>
<td>2,698</td>
<td>3,987</td>
<td>358</td>
<td>33,081</td>
<td>1,419</td>
<td>353</td>
<td>6,122</td>
</tr>
<tr>
<td>Total no. of registered leprosy cases</td>
<td>11,675</td>
<td>191,292</td>
<td>20,612</td>
<td>588</td>
<td>5,726</td>
<td>5,039</td>
<td>2,368</td>
<td>597</td>
<td>15,915</td>
<td>4,881</td>
<td>501</td>
<td>13,348</td>
</tr>
<tr>
<td>Leprosy cases detected in one year (average)</td>
<td>1,027</td>
<td>16,806</td>
<td>897</td>
<td>46</td>
<td>337</td>
<td>356</td>
<td>92</td>
<td>91</td>
<td>586</td>
<td>293</td>
<td>28</td>
<td>353</td>
</tr>
<tr>
<td>Leprosy cases detected in children 0–14 in one year (average)</td>
<td>19</td>
<td>1,491</td>
<td>72</td>
<td>16</td>
<td>9</td>
<td>88</td>
<td>13</td>
<td>38</td>
<td>30</td>
<td>13</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>Leprosy cases with disability detected in one year (average)</td>
<td>11</td>
<td>−b</td>
<td>214</td>
<td>6</td>
<td>−b</td>
<td>30</td>
<td>6</td>
<td>6</td>
<td>78</td>
<td>47</td>
<td>4</td>
<td>45</td>
</tr>
</tbody>
</table>

Sources: Pan American Health Organization (3–6).

*aWhen data for the entire 1980–1983 period were not available, the figures corresponding to the most recent year of the cited period were used; and if the latter were not available either, then existing estimates for the 1980–1985 period were employed.

*bNo data.
Table 3. Average annual values of four specific leprosy indicators and four general health indicators in the 12 selected countries as of 1980–1983.\textsuperscript{a}

<table>
<thead>
<tr>
<th>Indicator values in:</th>
<th>Argentina</th>
<th>Brazil</th>
<th>Colombia</th>
<th>Costa Rica</th>
<th>Cuba</th>
<th>Dominican Republic</th>
<th>Ecuador</th>
<th>Guyana</th>
<th>Mexico</th>
<th>Paraguay</th>
<th>Trinidad and Tobago</th>
<th>Venezuela</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leprosy prevalence (known cases per 100,000)</td>
<td>40.4</td>
<td>152.2</td>
<td>76.4</td>
<td>25.5</td>
<td>58.6</td>
<td>88.9</td>
<td>26.9</td>
<td>66.9</td>
<td>22.1</td>
<td>147.0</td>
<td>46.6</td>
<td>91.9</td>
</tr>
<tr>
<td>Leprosy incidence (new cases detected annually per 100,000 inhabitants)</td>
<td>3.5</td>
<td>13.4</td>
<td>3.3</td>
<td>2.0</td>
<td>3.5</td>
<td>6.3</td>
<td>1.0</td>
<td>10.2</td>
<td>0.8</td>
<td>8.8</td>
<td>2.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Leprosy incidence in children (new cases detected annually in the 0–14 age group per 100,000 children)</td>
<td>0.3</td>
<td>2.9</td>
<td>0.7</td>
<td>1.8</td>
<td>0.2</td>
<td>3.3</td>
<td>0.3</td>
<td>10.6</td>
<td>0.1</td>
<td>0.9</td>
<td>1.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Leprosy disability rate (% of leprosy cases registered each year with disability)</td>
<td>1.1</td>
<td>–\textsuperscript{b}</td>
<td>23.9</td>
<td>13.0</td>
<td>–\textsuperscript{b}</td>
<td>8.4</td>
<td>6.5</td>
<td>6.6</td>
<td>13.3</td>
<td>16.0</td>
<td>14.2</td>
<td>12.7</td>
</tr>
<tr>
<td>Life expectancy at birth (years)</td>
<td>69.7</td>
<td>63.4</td>
<td>63.6</td>
<td>73.0</td>
<td>73.4</td>
<td>62.6</td>
<td>62.6</td>
<td>68.2</td>
<td>65.7</td>
<td>65.1</td>
<td>70.1</td>
<td>67.8</td>
</tr>
<tr>
<td>Infant mortality (deaths per thousand live births)</td>
<td>43.2</td>
<td>72.4</td>
<td>53.3</td>
<td>25.7</td>
<td>20.4</td>
<td>63.5</td>
<td>77.2</td>
<td>47.9</td>
<td>52.1</td>
<td>45.0</td>
<td>29.9</td>
<td>38.6</td>
</tr>
<tr>
<td>Communicable disease deaths (% of all deaths attributed to communicable diseases)</td>
<td>4.0</td>
<td>14.8</td>
<td>16.3</td>
<td>4.4</td>
<td>2.0</td>
<td>10.9</td>
<td>17.4</td>
<td>8.5</td>
<td>20.3</td>
<td>12.5</td>
<td>4.7</td>
<td>8.2</td>
</tr>
<tr>
<td>DPT vaccination (% of all infants having received 3 DPT vaccinations)</td>
<td>65.0</td>
<td>49.0</td>
<td>41.0</td>
<td>56.0</td>
<td>91.0</td>
<td>24.0</td>
<td>23.0</td>
<td>56.0</td>
<td>30.0</td>
<td>38.0</td>
<td>60.0</td>
<td>49.0</td>
</tr>
</tbody>
</table>

Sources: Pan American Health Organization (3–6).
\(\textsuperscript{a}\)When data for the entire 1980–1983 period were not available, the figures corresponding to the most recent year of the cited period were used; and if the latter were not available either, then existing estimates for the 1980–1983 period were employed.
\(\textsuperscript{b}\)No data.
ease death were assigned a value of one; leprosy incidence, leprosy disability, infant mortality, and infant DPT vaccination were assigned a value of two; and leprosy incidence in children and life expectancy at birth were assigned a value of three. The value for each indicator was assigned to each country where the data showed the indicator figure to be less favorable than the average, and the country's total score was derived by adding up the assigned values (Table 4).

The weights assigned to the various indicators were derived from their apparent importance in either (a) specific evaluation of leprosy epidemiology and control or (b) assessment of the population's general health status. Clearly, this weighting is somewhat arbitrary, but on the whole it is in line with the literature on the subject (12, 13, 15, 16).

With regard to the scoring concept, scoring systems are commonly used to assess risks in fields such as maternal and child health. We know of no instance in which general indicators of public health have been incorporated into scoring systems of this kind. However, in view of the increasing integration of leprosy programs into general public health programs and the known influence of general socioeconomic and health conditions on persistence of the endemic, we felt it appropriate to apply a scoring system that incorporated such indicators for evaluation of epidemiologic situations (15–21).

On the basis of the total scores received, the countries were placed in one of the three following groups: (1) countries with scores of five or less: Leprosy endemic probably receding during 1980-1983; (2) countries with scores of six to 10: Leprosy endemic probably "stationary" during 1980-1983; and (3) countries with scores of 11 or more: Leprosy endemic probably increasing during 1980-1983 (Table 5).

RESULTS AND COMMENTS

Countries Where the Leprosy Endemic Was Probably Receding

Argentina: Surveys conducted since the 1950s have generally shown overall prevalences below 50 cases per 100,000 inhabitants, which makes the country an area of moderate endemicity according to World Health Organization (WHO) guidelines (22).

Our data indicate the leprosy endemic was receding in 1980–1983. Argentina being one of two countries with a total score of 0. This observation is consistent with survey findings indicating a decline in leprosy prevalence since the 1950s (see Table 1).

Cuba: This country also has a leprosy prevalence in the intermediate range, with Table 1 data suggesting a decline since the 1950s. Our data, which give Cuba a total score of 0, are consistent with this picture.

Regarding the lack of leprosy disability data (see Table 4), even if Cuba were found to be above the average, the resulting score of 2 would still place it among those countries where the leprosy endemic appears to be declining.

Costa Rica: Previous surveys generally indicated a moderate and stable leprosy prevalence. Our assessment showed favorable (zero) values for all indicators except that relating to the proportion of diagnosed cases with disability.

Trinidad and Tobago: The leprosy prevalence here has declined since the 1950s from high to moderate levels (see Table 1). Like Costa Rica, the country had favorable (zero) values for all indicators except that relating to disability.

Venezuela: Prior surveys have pointed to a notable decline in the high leprosy
Table 4. Indicator values\(^a\) and scores derived for the 12 selected countries from the figures shown in Table 3.

<table>
<thead>
<tr>
<th>Country</th>
<th>Leprosy prevalence</th>
<th>Leprosy incidence</th>
<th>Leprosy incidence in children</th>
<th>Leprosy disability</th>
<th>Life expectancy at birth</th>
<th>Infant mortality</th>
<th>Communicable disease deaths</th>
<th>DPT vaccination</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brazil</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>12(^c)</td>
<td>12(^c)</td>
</tr>
<tr>
<td>Colombia</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cuba</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Ecuador</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Guyana</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Mexico</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Paraguay</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

\(^a\)Assigned indicator value of 1—leprosy prevalence and communicable disease deaths; assigned indicator value of 2—leprosy incidence, leprosy disability, infant mortality, and DPT vaccination; assigned indicator value of 3—leprosy incidence in children and life expectancy at birth.

\(^b\)No data.

\(^c\)Possible leprosy disability score not included.
Table 5. Classification of the 12 selected countries into three categories according to their scores.

<table>
<thead>
<tr>
<th>Category</th>
<th>Country</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score ≤ 5</td>
<td>Argentina</td>
<td>0</td>
</tr>
<tr>
<td>(leprosy endemic</td>
<td>Cuba</td>
<td>0</td>
</tr>
<tr>
<td>probably receding</td>
<td>Costa Rica</td>
<td>2</td>
</tr>
<tr>
<td>Score 6–10</td>
<td>Guyana</td>
<td>7</td>
</tr>
<tr>
<td>(leprosy endemic</td>
<td>Ecuador</td>
<td>8</td>
</tr>
<tr>
<td>probably stationary</td>
<td>Mexico</td>
<td>10</td>
</tr>
<tr>
<td>Score ≥ 11</td>
<td>Colombia</td>
<td>11</td>
</tr>
<tr>
<td>(leprosy endemic</td>
<td>Paraguay</td>
<td>11</td>
</tr>
<tr>
<td>probably increasing</td>
<td>Brazil</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Dominican Republic</td>
<td>14</td>
</tr>
</tbody>
</table>

prevaleces of the 1950s (see Table 1). However, our data showed an average prevalence in 1980–1983 (91 cases per 100,000) that was still above the average of 70 per 100,000 in the 12 selected countries. The only other indicator not yielding a favorable (zero) value was the proportion of diagnosed cases with disability. However, this unfavorable finding could have been influenced by the fact that leprosy disability is diagnosed and treated at all levels of care under Venezuela’s control program—a procedure not followed in any of the 11 other countries and one that could account for the high percentage of patients with recorded disability.

On the whole, the 1980–1983 results for the countries in this group were similarly favorable with regard to the four specific leprosy indicators and the four general health indicators, and were also in agreement with prior prevalence survey data. Indeed, the sole unfavorable indicator (aside from the relatively high leprosy prevalence in Venezuela) was the proportion of newly diagnosed leprosy cases with disability. Of course, this indicator is strongly affected by whether or not the leprosy control program was directing its attention to diagnosing disability. It was known to do so in Venezuela, a circumstance partly accounting for the high figures observed in that country. The reasons for the high percentages of cases with disability in Costa Rica and Trinidad and Tobago are less clear, more information about such things as the clinical forms of the detected cases being required in order to assess this matter. Also noteworthy is the fact that basic information about the proportion of diagnosed cases with disability was not available for Cuba.

Another significant point is that all the countries except Venezuela exhibited prevalences below the 12-country average, and all had either low levels of endemicity or a downward trend with regard to past prevalences.

Countries Where the Leprosy Endemic Was Probably “Stationary”

Guyana: Past surveys have shown a substantial decline in the prevalence of leprosy from a high level to an intermediate one in recent decades (see Table 1). Besides an above-average incidence of leprosy, the country exhibited unfavorable data for two indicators, both child-related, these being leprosy incidence among children and infant mortality.

Ecuador: The available data appear open to question. For one thing, the two surveys conducted in the 1950s and noted in Table 1 showed very low prevalences, while the two conducted later showed substantially higher intermediate-level prevalences. In addition, our 1980–1983 data showed Ecuador to have below av-
average (favorable) values for all four leprosy indicators and above average (unfavorable) values for all four general health indicators. It seems likely that this internal inconsistency can be attributed to artifacts generated by operational factors in Ecuador’s leprosy control program.

**Mexico:** Leprosy prevalence has been declining in Mexico since the 1950s and now stands at relatively low levels. Despite this general trend, however, there was little agreement between our leprosy and general health indicators—all the leprosy indicators except leprosy disability appearing favorable and all the general health indicators appearing unfavorable. These findings could have a variety of explanations, one probably important factor being the leprosy control program’s lack of integration into the general health care system.

... Ecuador and Mexico showed a clear discrepancy between scores for specific leprosy indicators and general health indicators. In contrast, Guyana exhibited generally favorable indicator values aside from a relatively high leprosy incidence and unfavorable child-related indicators.

It thus seems likely that operational factors had an important influence in the first two countries, while epidemiologic factors associated with leprosy transmission levels played a key role in Guyana. In all three cases, it seems reasonable to conclude that the apparently stationary status of the endemic derived not so much from a stable equilibrium as from interaction of opposing trends.

**Countries Where the Leprosy Endemic Was Probably Increasing**

**Colombia:** In general, past surveys have shown an intermediate leprosy prevalence that may have declined slightly since the 1950s (Table 1). As of 1980–1983, unfavorable values for all four general health indicators and two leprosy indicators suggested an unfavorable situation. Within this context, the favorable scores for low leprosy incidence and low leprosy incidence among children seem likely to be artifacts derived from poor integration of the leprosy control program into the general health system.

**Paraguay:** This country has had a high leprosy prevalence since the 1950s (Table 1). Regarding our eight 1980–1983 indicators, favorable scores were obtained for only two, both relating to the child population (leprosy incidence in children and infant mortality). As in Guyana, it seems likely that epidemiologic factors associated with leprosy transmission were mainly responsible for this finding.

**Brazil:** Like Paraguay, Brazil has had a high leprosy prevalence since the 1950s (Table 1). Regarding our 1980–1983 data, Brazil had unfavorable values for all the indicators except infant DPT vaccination. The country also accounted for 70% of all registered leprosy cases in the 12 selected countries and for 80% of all the new leprosy cases diagnosed in these countries during 1980–1983. While the proportion of newly diagnosed cases with disability in the study period is unknown, a favorable score would not have changed the country’s classification.

**Dominican Republic:** Previous surveys have indicated an upward trend from low prevalences in the 1950s to intermediate prevalences in the 1970s and 1980s (Table 1). Except for the proportion of newly diagnosed leprosy cases with disability (an indicator influenced by the control program’s degree of discrimination and sophistication), the values ob-
tained for all our indicators using 1980-
1983 data were unfavorable.

These countries where the endemic is
probably increasing seem similar with re-
spect to both leprosy-specific and general
health indicator scores, and also with re-
gard to trends in leprosy's long-term
prevalence. Nevertheless, Brazil consti-
tutes a special case because of the enor-
mous importance of its contribution to
the epidemiologic profile of leprosy in the
Americas, the highly irregular distribu-
tion of leprosy within Brazil's vast and
varied territory, and the complexity of
Brazil's extensive health system—a com-
plexity that increases the difficulty of ana-
lyzing the leprosy problem.

CONCLUDING REMARKS

As may be seen from the foregoing, the
leprosy endemic in the Americas is
highly diverse. This diversity arises from
epidemiologic factors, including vari-
atations in the intensity of transmission, as
well as from the nature and effectiveness
of control measures.

However, it has proved difficult to ob-
tain reliable statistical data on the leprosy
situation in particular areas, and hence
the soundness of criteria commonly used
to estimate endemic levels is question-
able. Improving systems for collecting
and analyzing basic epidemiologic data
on leprosy is therefore a matter that de-
serves attention. It is particularly impor-
tant that such systems apply unified stan-
dards so that effective comparisons can
be made between specific indicators in
different areas (14, 23).

With regard to the work reported here,
two of the specific leprosy indicators em-
ployed seem especially deserving of fur-
ther study. These indicators are the pro-
portion of newly diagnosed leprosy cases
with disability and the recorded inci-
dence of leprosy cases among children,
the first because of the insight it provides
into the success of case detection and
control efforts, and the second because of
its relevance to epidemiologic trends.

Also, it would appear highly worth-
while to make a more thorough study of
criteria that could be used to evaluate the
leprosy situation—criteria reflecting eval-
uation of the endemic as well as general
health and socioeconomic indicators.

In general, it appears that the leprosy
situations in the countries where the en-
demic seemed to be receding are fairly
similar, and the same can be said in most
countries where the endemic is increas-
ing. However, the leprosy situations do
not appear similar in those countries
where the endemic seems more or less
stationary, these situations apparently in-
volving opposing trends and in some
cases aberrent data.

Overall, certain basic changes in the
Americas, most notably intense urban-
ization and attempted implementation of
the primary health care strategy (in
which leprosy control may be integrated
to a greater or lesser degree) need to be
considered in undertaking efforts to
more clearly define the true epidemi-
ologic situation (17). Also, the advent of
new multiple drug treatment regimens
now coming into use in the Americas de-
mands quick development of monitoring
systems that can evaluate the impact of
these regimens (13, 21, 22). In addition,
because leprosy strikes mostly at the so-
cioeconomically deprived and because it
stigmatizes its victims, epidemiologic
study of relevant social factors is of cen-
tral importance.

By way of general recommendations,
the following steps appear advisable:

- Adoption of the OMSLEP leprosy
  patient registration and reporting
system (23) by PAHO's Member Countries;

- Formation of an advisory working group to examine unified criteria for the establishment of treatment regimens in the countries of the Region;

- Pursuit of epidemiologic research—including descriptive studies (especially historical study of relevant factors, retrospective study of long-term trends, and disability incidence and prevalence surveys); operational studies of such things as health service delivery models, integration of the primary health care system, assimilation of leprosy control into the social security system, and health care models that incorporate disability prevention; and identification of high-risk groups and risk factors (including socioenvironmental, demographic, and sociocultural factors); and

- Promotion of training through such actions as designing teaching modules for in-service training of basic health services personnel, participating in leprosy control programs, and developing a course in leprosy control epidemiology for those in charge of leprosy control programs throughout the Region.

REFERENCES


International Meeting to be Held on Lung Health

A World Conference on Lung Health will be held from 20 to 24 May 1990 in Boston, Massachusetts. The conference is a unique collaborative effort combining the annual meeting of the American Lung Association/American Thoracic Society and the quadrennial meeting of the International Union Against Tuberculosis and Lung Disease. The latter is the only international voluntary organization dedicated to the fight against respiratory disease and has membership in 113 countries. The conference will present an opportunity for scientists, clinicians, and public health educators from around the globe to exchange vital information about the prevention and control of lung disease. Themes discussed will be of international interest and will be presented in a variety of interactive sessions. Simultaneous interpretation into French, Spanish, and English will be provided for selected sessions. For more information write to Richard P. Grimes, Director, World Conference on Lung Health, American Lung Association, 1740 Broadway, New York, NY 10019-4374, USA.