Leprosy in Colombia: Post Elimination Stage?

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Summary  Leprosy in Colombia is not considering as a public health problem since a prevalence rate less than 1/10000 was achieved more than ten years ago. Nevertheless, reports of 2012 from 11 of 27 departments (48%) showed incidence rates from 0.12 to 4.73 cases per 100000 inhabitants. The Ministry of Health and the National Institute of Health direct and organize the National Leprosy Program (NLP), which plan the activities for prevention, surveillance, and control at national level. The operational activities are delegated to the regional levels (municipalities, districts, departments) however in many areas poor hospital infrastructure, high costs, lack of health personnel trained, difficult access to the health services are some of the barriers that impede the development and access to the activities that the NLP publishes in guides. The above mentioned facts have as consequence late case detection with 30% of disability rates (grade 1 and 2) at the time of diagnosis. Also, there is not awareness in general population neither in health professionals about the existence of leprosy cases in Colombia. This is a review of the situation of leprosy in Colombia, taking into account not only statistical data, but also some aspects that influence late diagnosis and disability found in patients at the time of diagnosis. In this review may appear author’s personal perceptions that may differ from others.

Introduction

Colombia is located in the northwest of South America. It has borders with Venezuela, Brazil, Peru, Ecuador and Panama, and has coasts in the Atlantic and Pacific oceans.

Colombia is divided into six natural regions (Andean, Caribbean, Pacific, Amazonian, Orinoquia, and Insular). The total land area is 1,141,748 km². Colombia’s capital and the largest city is Bogotá; other major cities are Medellín, Cali, Barranquilla, and Cartagena. The most characteristic feature of Colombian geography is the Andes Mountains, located in the western, central, and east part of the country. The country’s highest point is the peak Christopher Columbus (5775 m) in the Sierra Nevada de Santa Marta. The rest of the geography consists of valleys and plains.¹

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The population of the country is 46 million. Colombia is a unitary and democratic republic, decentralised and organized in 32 Departments and one District Capital.\(^2,^3\)

Leprosy arrived in Colombia with the Spanish and Africans. It is believed that Gonzalo Jimenez de Quesada (1509–1579), founder of Bogotá, suffered from leprosy. The slave trade brought Africans to Cartagena, some of whom also had leprosy. The first lazaretto that existed in Colombia, Caño de Loro, was founded on the island of Tierra Bomba in Cartagena in 1806. In 1833, the Government began organising the leprosy patients as a matter of public hygiene. By 1891, leprosy was considered a serious problem, with 30,000 leprosy patients in a country of four million inhabitants, so that many authors considered Colombia as ‘the great leprosarium.’ This led to the foundation of other two lazarettos, Agua de Dios and Contratación, located in the central and eastern regions of the country, respectively. A law mandating detention of patients with leprosy was enacted in 1911, and eventually abolished in 1961. After 1961, Contratacion and Agua de Dios were recognised as municipalities; nevertheless the lazarettos are still offering free health services to leprosy patients, and many of them still live there.\(^4,^5\)

The WHO goal of a prevalence rate less than 1/10,000 was achieved more than 10 years ago in Colombia. However, in 2012 11 out of 27 Departments have a new case detection rate greater than 1/10,000. Of these 11 Departments, six Departments have a new detection rate greater than 2/10,000 with the highest detection rates found in the Departments of Arauca (4.73/10,000), Norte de Santander (3.86/10,000), Huila (3.15/10,000) and Santander (2.99/10,000). Table 1 shows the number of new cases and the new case detection rates reported in 2012 and Figure 1 shows the map with the geographical regions where the reported cases are located.\(^6\)

The National Leprosy Programme (NLP) began its activities on 1961 under the coordination of the Ministry of Health (MH) and the National Institute of Health (Instituto Nacional de Salud – INS),\(^7\) which organise activities for prevention, surveillance, and control of leprosy at national level, as well as reporting epidemiological indicators. The publication of the leprosy guides for diagnosis, treatment, and control are also the responsibility of MH and INS. The leprosy guides are distributed in all the Colombian local hospitals and health services that provide services to patients. The ‘Guía de Atención de la Lepra, GAL’ is an adaptation of the WHO Leprosy Guide.\(^8\) GAL is a translation in Spanish of the WHO adapted to the Colombian health system.

Classification of leprosy patients is done according to WHO guidelines (MB and PB); the Ridley and Jopling classification is only used where there are dermatologists or leprologists available for diagnosis. Skin biopsy is not available in all areas.

In the context of decentralisation, Colombia has territorial levels in public health and health services; they are the national, departmental, district, and municipal levels. The country is divided into 32 Departments and four Special Districts. The operational activities of the NLP are the responsibility of the regional and local public health authorities who coordinate with the administrators of health (Empresas Prestadoras de Salud – EPS) to manage patients.\(^6,^8\)

Since 1993, the Colombian health system is based on disease prevention and primary health care with universal coverage through public and private health insurance companies.\(^9\) However, in many areas, poor hospital infrastructure, high costs, the difficult distribution of services, corruption and other factors, have caused a crisis in the health system in recent years. As a consequence, not all the departments and municipalities have health staff involved in public health activities for detection, diagnosis, treatment, and prevention of disabilities.
due to leprosy. This critical moment has prevented the adequate and timely access to health services for Colombians, especially for poor people.

Schools of Medicine and other health related schools include in their academic curricula infectious diseases produced by Mycobacteria in general, tuberculosis being the most important. Leprosy is not studied in depth, as it is not considered an important disease for public health. The diagnosis of leprosy is carried out in rural areas by physicians, nurses, and technicians that are in most cases performing their compulsory rural year service after finishing their professional studies. The staff is continually changing, making the continuity of activities and enforcement of training in leprosy difficult.

As the frequency of the leprosy cases is low, the diagnosis is not easily suspected. The NLP carries out an annual meeting to train the personnel in charge of local control programmes.

### Table 1. New leprosy cases and incidence rate reported in Colombia according to geographic distribution, 2012. Numbers of departments are the same as in Figure 1

<table>
<thead>
<tr>
<th>Department</th>
<th>New cases</th>
<th>Incidence/100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Arauca</td>
<td>12</td>
<td>4.73</td>
</tr>
<tr>
<td>2. North Santander</td>
<td>51</td>
<td>3.86</td>
</tr>
<tr>
<td>3. Huila</td>
<td>35</td>
<td>3.15</td>
</tr>
<tr>
<td>4. Vichada</td>
<td>2</td>
<td>2.99</td>
</tr>
<tr>
<td>5. Amazonas</td>
<td>2</td>
<td>2.71</td>
</tr>
<tr>
<td>6. Cesar</td>
<td>23</td>
<td>2.32</td>
</tr>
<tr>
<td>7. Magdalena</td>
<td>24</td>
<td>1.85</td>
</tr>
<tr>
<td>8. Santander</td>
<td>33</td>
<td>1.62</td>
</tr>
<tr>
<td>9. Tolima</td>
<td>21</td>
<td>1.5</td>
</tr>
<tr>
<td>10. Caquetá</td>
<td>6</td>
<td>1.31</td>
</tr>
<tr>
<td>11. Quindío</td>
<td>7</td>
<td>1.26</td>
</tr>
<tr>
<td>12. Atlántico</td>
<td>31</td>
<td>0.985</td>
</tr>
<tr>
<td>13. Bolívar</td>
<td>30</td>
<td>0.93</td>
</tr>
<tr>
<td>14. Risaralda</td>
<td>7</td>
<td>0.75</td>
</tr>
<tr>
<td>15. Caldas</td>
<td>6</td>
<td>0.61</td>
</tr>
<tr>
<td>16. Sucre</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>17. Valle</td>
<td>25</td>
<td>0.56</td>
</tr>
<tr>
<td>18. Cundinamarca</td>
<td>10</td>
<td>0.39</td>
</tr>
<tr>
<td>19. Cauca</td>
<td>5</td>
<td>0.37</td>
</tr>
<tr>
<td>20. Guajira</td>
<td>3</td>
<td>0.34</td>
</tr>
<tr>
<td>21. Boyacá</td>
<td>4</td>
<td>0.31</td>
</tr>
<tr>
<td>22. Putumayo</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>23. Nariño</td>
<td>4</td>
<td>0.24</td>
</tr>
<tr>
<td>24. Chocó</td>
<td>1</td>
<td>0.21</td>
</tr>
<tr>
<td>25. Córdoba</td>
<td>3</td>
<td>0.18</td>
</tr>
<tr>
<td>26. Antioquia</td>
<td>11</td>
<td>0.18</td>
</tr>
<tr>
<td>27. Bogotá DC</td>
<td>9</td>
<td>0.12</td>
</tr>
<tr>
<td>International case</td>
<td>1</td>
<td>NA</td>
</tr>
<tr>
<td>TOTAL</td>
<td>384</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Methods

The information for this paper was gathered from a national and international database review, documents of the NLP of Colombia, PAHO, and WHO. Web pages of the Colombian government, and public health were consulted on January and June 2013,
searching for population statistics, new case detection, disability Grade 2, gender, children, 
MB/PB, etc.

The data was analysed by country level, considering differences in new case detection, 
and prevalence according to geographic regions.

Figure 1. Geographical distribution of new leprosy cases in Colombia reported in 2012. Departments shaded in grey 
are the 11 more endemic areas: see details in Table 1.

Leprosy in Colombia

searching for population statistics, new case detection, disability Grade 2, gender, children, 
MB/PB, etc.

The data was analysed by country level, considering differences in new case detection, 
and prevalence according to geographic regions.
Results

TRENDS IN THE EPIDEMIOLOGY OF LEPROSY

According to the report published in 1980 by PAHO-WHO, 20,669 leprosy cases were registered in Colombia (1 case/1000 inhabitants). Multidrug therapy (MDT) was introduced in Colombia in 1985, when the prevalence of leprosy was 5.5/10,000. In 1999 Colombia achieved the goal of elimination proposed by WHO with a prevalence of 0.5/10,000. In 2012, the reported prevalence was 0.2/10,000. In contrast, case detection has declined more slowly; Figure 2 shows the new leprosy cases, case detection rate, and trend of new cases reported in Colombia, during the period 2000–2012.

Figure 3 shows the prevalence trend during the same period.

The departments and cities that have historically reported more cases of leprosy in the last 10 years have not changed, according to the 2012 report. They are: Barranquilla, Bogota, Bolivar, Cartagena, Cesar, Huila, Magdalena, Tolima, Valle, Santander and Norte de Santander. There are 87 towns in Colombia that still have a leprosy prevalence above 1 case per 10,000. See Figure 1 and Table 1.

Actions to improve early detection include the examination of contacts of leprosy patients. The follow up of this population, however, has not been documented.
Additionally, BCG vaccination is provided, even if HHC has a BCG scar. If the HHC has not previously been vaccinated, he/she receives one dose and a booster dose 6 months later. The reports show that 50% of HHC are examined and vaccinated. With regard to gender, the majority of cases are found in men, 66%, as is frequent in other countries.

The proportion of children detected among new cases reported in 2008 was 2.35%. However, in previous research from 2004, it was found that 7% of new leprosy cases occurred in children less than 15 years old, and 59% of these cases were found in children aged 10–14 years of age.

TRENDS IN DISABILITY RATES AND INFORMATION ABOUT THE MANAGEMENT OF REACTIONS AND THE PREVENTION OF DISABILITY IN THE COUNTRY

Disability rates: 30% of new cases reported present a Grade 1 or 2 disability at the time of diagnosis, and one in 10 has disability Grade 2. Grade 2 disability among new cases at diagnosis has not shown significant variations in recent years. The largest proportion of disability is observed among multibacillary cases, which corresponds to the most frequent form (75%).

Prevention of disability: there is no specific physiotherapy, ophthalmology, psychology, or surgery service supporting the NLP. Patients can receive these services only if the physician makes a special referral, and also if the service is available in the region where the patient is located. While in Colombia the NLP provides annual information on the number of new cases and treatment, there is no systematic recording of reactions and disability caused by leprosy. The NLP does not have any compulsory guidelines for preventing disabilities or for rehabilitation programmes, except in a few places, such as Agua de Dios, Contratación, and Federico Lleras Hospital, which have specialised services given free by nurses and physicians. Because of this, some patients are referred from other regions of the country to these services.

Laws from 1964 and 1997 stipulate the provision of the legal minimum salary (US$250) to those leprosy patients with severe degrees of disability incompatible with the exercise of gainful activity. This subsidy has existed since 1911, when the law mandating detention of patients with leprosy was enacted. Simulation of neurological and skin symptoms are a common practice to get the subsidy in communities as Agua de Dios and Contratación where the understanding of the disease and its clinical symptoms are generally known by the population.

Relapses: there is no clear guideline addressing the criteria for diagnosis and management of relapses, so there are discrepancies in the classification of these events, which has resulted in a lack of information and uncertainty in the data. In 2010 and 2011, a total of 69 cases of relapse were reported. An extended review of these patients was done in 2012. Follow-up of the 69 relapsed patients was difficult due to several factors, such as migration, or the non-availability of the patient when contacted. Finally, 38 relapsed patients were evaluated, of whom 24 were BI positive, but only seven of these cases were confirmed as relapses, indicating the lack of knowledge that health teams have on the diagnosis of relapse (data not published). Antibiotic resistance in leprosy has been the cause of relapse in few cases in Colombia.

Management of reactions: Colombia receives from the World Health Organization the drugs for the treatment of all the leprosy cases reported in the country. The medicaments for the treatment of reactions are supplied by the Ministry of Health. Thalidomide is not widely
available and corticosteroid therapy has to be paid for by the patients, in the majority of the cases. Reactions are frequently misdiagnosed as relapses.\textsuperscript{6}

**OTHER NON-GOVERNMENTAL ORGANIZATIONS**

The Deutsche Lepra und Tuberkulosehilfe (DAHW) established an agreement with the Ministry of Health in Colombia in 1974, to advise the NLP and support the physical rehabilitation of patients in sanatoria located in Agua de Dios and Contratación. Also, DAHW performs activities for education for health workers, students and the wider community.\textsuperscript{7,15}

DAHW is the only ILEP member directly involved in Colombia. In 1996 DAHW extended its aid to tuberculosis. Since then, DAHW has been actively supporting Leprosy and TB National Committees carrying out training for health staff, technical assistance to programmes coordinators, contributing to active leprosy case finding in endemic areas, supporting rehabilitation of people affected by leprosy and producing and distributing teaching material.\textsuperscript{7}

**DIFFERENCES BETWEEN WHO LEPROSY CONTROL GUIDES AND GAL (GUIAS DE ATENCION EN LEPRA)**

As already mentioned, the MH and the INS translated and adapted the WHO guides to the Colombian situation. This adaptation illustrates certain unique characteristics of the leprosy programme in Colombia, especially related to the bacillary index (BI). In Colombia, BI is determined using five samples: two from the earlobes and two from the elbows, and a nasal swab.\textsuperscript{18} In cases with skin lesions suspected of leprosy, elbow samples are replaced by samples from the lesions. To quantify and report the BI, a different, semi-quantitative scale is used, whose categories are not comparable with the BI method used elsewhere.\textsuperscript{18,19}

The leprosy BI scale used in Colombia quantifies the presence of bacilli in every one of the five samples tested, including the nasal mucus, from 0 to 3+. The mean BI results of the five samples vary from 0 to 3+.\textsuperscript{18}

Comparison of Ridley vs. Colombian reading scales based on the results of ROC curves, showed agreement between the results of high and low bacterial load with a kappa coefficient of 0.9992 (95% CI: 0.9972 to 1.000). However, direct comparison of the two scales is not possible.\textsuperscript{18}

**WHAT IS THE SITUATION REGARDING LEPROSY RESEARCH IN THE COUNTRY?**

Leprosy research in Colombia is not a priority. The conditions for leprosy research in Colombia are determined by several facts: the low number of patients, most of them living in poor conditions, far away from health centres; there are internal migrations of people due to violence and difficult access to the endemic regions (geography, guerrillas).

Beside the NLP and the Instituto Nacional de Salud (INS) there are several institutions that undertake leprosy research in the country. One of them is the Centro Dermatológico Federico Lleras Acosta, funded in 1934, located in Bogotá, which is a traditional hospital for the care of leprosy patients.

The Colombian Institute of Tropical Medicine – CES (Instituto Colombiano de Medicina Tropical – CES), is a non-profit research institution that started research in leprosy 18 years
ago. Several Faculties of Medicine and Health Sciences, such as Universidad de la Sabana (Chía, Cundinamarca), Universidad Industrial de Santander (UIS), Universidad del Cauca, and others around the country have carried out studies in leprosy.

Research funding is scarce but available within the country through Colciencias (Instituto Colombiano para el Desarrollo de la Ciencia y Tecnología), an institution that has a call for research proposals in health once or twice every year.

Discussion

SUM UP THE CURRENT SITUATION

Leprosy is endemic in specific areas of Colombia, but is not considered a public health problem. More than 10 years ago the country achieved the elimination goal with a prevalence of < 1/10 000, but new cases have not decreased as expected. Since then control activities and health staff training have decreased, along with the national budget for such purposes. Currently there is a loss of expertise in clinical and laboratory diagnosis for leprosy in Colombia, due to the low number of cases. It is also difficult to maintain good referral services because lack of funding and trained personnel.

The late diagnosis of leprosy has a variety of causes, including lack of training of health personnel in diagnosis, scarce medical services in remote regions, and the social perception of the disease (the patient does not feel any limitations and believes that the initial skin lesions of leprosy are not important). Many patients only consult when the disease causes pain or limits their ability to work.

Late diagnosis contributes to the frequency of disabilities; as was mentioned 30% of new cases have disability at the moment of diagnosis, 10% of them with Grade 2. The LNP in Colombia has no mandate to prevent disabilities; in contrast, there is a subsidy for the patients with Grade 2 disability. This fact affects any effort to develop an education programme for disability prevention, since the monetary benefit is very well accepted by patients. There are rehabilitation programmes in some specialised centres, such as the Agua de Dios and Contratación leprosarium and Hospital Federico Lleras, supported by DAHW.

The compulsory plan for health care in Colombia includes the clinical examination of household contacts (HHC) at the time of diagnosis of a case of leprosy; however, only 50% of HHC are examined. While this is a sound concept for surveillance, leprosy has a long latency period, and several years of follow-up are necessary to detect early stages of the disease. Research activities had been performed for active search, early diagnosis, and follow up of HHC of leprosy cases.

Leprosy in children is an important epidemiological signal, which can be considered as an indicator of transmission. Good data about leprosy in children is lacking, and figures vary from 2 to 7% children among new leprosy cases reported.

Misdiagnosis of relapse is frequent; one of the causes is the misinterpretation of the WHO relapse definition that is directly linked with the BI. According to WHO relapse in MB leprosy, is defined as the multiplication of \( M. leprae \), suspected by the marked increase (at least \( 2^+ \) over the previous value) in the BI at any single site, usually with evidence of clinical deterioration (new skin patches or nodules and/or new nerve damage). With the Colombian BI system, the relapse definition becomes confusing for clinicians and laboratories, because the BI is not comparable. Reactions, persistence of a positive
BI after treatment, non-compliance with treatment, disabilities after treatment, and other medical complications of leprosy are misinterpreted as relapse.

SUMMARISE THE MAIN CHALLENGES BEING FACED

Improve the collection and dissemination of information about leprosy in Colombia.

Address the training of health personnel and education for the general population.

Develop programmes for prevention of disabilities and rehabilitation of those affected.

Monitoring household contacts would be a productive strategy to achieve the goal of eradication.

Standardise the BI scale as recommended by WHO (Ridley and Jopling system) to allow comparison with other studies worldwide, follow-up of patients, clinical trials, and support the diagnosis of relapse.

Monitor and evaluate local programmes of control leprosy in the workplace.

Integrated care of leprosy patients with both physical and psychological support\textsuperscript{18,19} is not contemplated in the NLP. Psychological support is necessary for patients since the stigma and emotional involvement is present in all leprosy patients independent of the grade of disabilities. The leprosy diagnosis represents a calamitous event in the life; it is necessary to consider this fact in leprosy programmes. This integrated care is a challenge for the Colombian NLP and other leprosy programmes worldwide.

SUGGEST RECOMMENDED STEPS NEEDED TO ENSURE THAT APPROPRIATE LEPROSY CONTROL MEASURES ARE IN PLACE AND MAINTAINED OVER THE NEXT FIVE YEARS

The recommended steps needed to ensure that appropriate leprosy control measures are maintained over the next 5 years in Colombia are:

1. The Ministry of Health has to consider leprosy eradication as an economic and public health effort and the budget for control activities has to be increased.
2. Establish a continuous training programme for health personnel and those responsible for local programmes of leprosy control.
3. Implement active new case detection.
4. Follow up household contacts at least for 5 years after the index case is diagnosed.
5. Use of diagnostic tools, such as PCR and IgM anti-PGL1 to improve detection of infection and early diagnosis.
6. Test relapse patients for drug resistance and other cases related to resistant cases.
7. Raise awareness that leprosy is an existing health problem in Colombia.

References

\textsuperscript{3} http://www.dane.gov.co/files/censo2005/PERFIL_PDF_CG2005/00000T7T000.PDF


