Action plan to further advance towards leprosy elimination in Latin America and the Caribbean

Action lines for reaching regional goals and sustaining achievements, 2012-2015

Organización Panamericana de la Salud
Oficina Regional de la Organización Mundial de la Salud

110.º ANIVERSARIO

ENFERMEDADES INFECCIOSAS DESATENDIDAS
Control y eliminación en América Latina y el Caribe

Table of contents

LIST OF TABLES

LIST OF GRAPHS

Executive Summary

International policy and guideline framework regarding leprosy elimination

In 1991, the 44th World Health Assembly adopted Resolution WHA44.9 establishing the commitment to eliminate leprosy as a public health problem by the end of year 2000. The main strategy to achieve elimination is the regular administration of multidrug therapy (MDT) to all cases detected which ensures patients' cure and reduces transmission.

The goal of eliminating leprosy defined as achieving a prevalence of less than 1 case per 10,000 people was indeed reached worldwide in year 2000; since then, the number of new cases detected yearly has been constantly reducing, as well as the disease burden due to leprosy both in the world and in the Region of the Americas.

The *Global Strategy for Further Reducing the Leprosy Burden and Sustaining Leprosy Control Activities (2006-2010)*, updated by the World Health Organization in 2011 through the *Enhanced Global Strategy for Further Reducing the Disease Burden due to Leprosy 2011-2015*, has also greatly contributed to this achievement.

In October 2009, the Directing Council of PAHO adopted Resolution CD49.R19 for the *Elimination of Neglected Diseases and other Poverty-related Infections* establishing the commitment of Member States to eliminate leprosy as a public health problem (less than 1 case per 10,000 people) at the first sub-national political and administrative level by year 2015.

The United Nations General Assembly adopted in June 2010 Resolution A 65/215 on the *Elimination of Discrimination against Persons Affected by Leprosy and their Family Members* stating that persons affected by leprosy and their family members must be treated with dignity and respect for their human rights and fundamental freedoms and backing the principles and guidelines adopted in this sense by the United Nations Human Rights Council.

Situation of leprosy in the Americas

Out of the 24 countries reporting new cases during 2011, all of them except Brazil had already achieved leprosy elimination at national level and 18 of them had reached the goal at the first sub-national administrative level. In 18 countries and territories no leprosy cases were registered in 2010 and 2011. Since 2006 there has been a reduction in the number of registered new leprosy cases in the Region decreasing from 47,612 in 2006 to 36,494 in 2011 (Brazil reported 93.04% of all new cases). Likewise, registered prevalence reduced from 0.72 per 10,000 people in 2006 to 0.39 in 2011.

Despite these achievements, there are still significant challenges for the Region:

1. Sustaining political and technical commitment at national and sub-national levels, as well as the support from strategic partners in the elimination of leprosy; besides, the issue must be kept as a public health priority at a moment when it is even more necessary given the current disease elimination profile in the Region.
2. Developing and implementing strategies to facilitate the reduction of leprosy burden in countries reporting more than 100 new cases per year including a reduction of disabilities and complications.

3. Defining epidemiological surveillance activities to be continued in countries that are no longer reporting new leprosy cases.
4. Defining and implementing operational aspects required to integrate leprosy care in primary health care systems in those countries reporting less than 100 new cases per year.
5. Strengthening and extending case-finding coverage among contacts of persons affected by leprosy.
6. Ensuring that 99% of newly detected cases receive MDT and monitoring compliance with treatment in patient cohorts.
7. Developing and implementing actions aimed at eliminating stigma and social discrimination against persons affected by leprosy.

Plan goal and objectives

Goal

Achieve and sustain leprosy prevalence at less than 1 case per 10,000 people at national and first sub-national political and administrative levels in the Americas by 2015.

General objective

Establish priority action lines to preserve goals already achieved in the elimination of leprosy in the Region and accomplish the reduction of prevalence at the first sub-national political and administrative level (less than 1 case per 10,000 people) by 2015.

Specific objectives

1. Define priority actions to further reduce leprosy morbidity emphasizing epidemiological surveillance, case detection, case finding among contacts, supervised treatment, and identification and management of grade-2 disabilities, all of which should be reinforced according to the epidemiological profile of countries in the Region.
2. Identify actions to be implemented by countries to eliminate stigma and discrimination of persons affected by leprosy and their family members in the framework of the principles of equity and social justice.
3. Define actions to strengthen information systems aimed at facilitating decision making based on evidence in the Region, as well as at monitoring progress towards elimination goals.

Country classification

Based on the number of new cases diagnosed during years 2010 and 2011, two groups of countries were identified:

1. Countries with a low disease burden expressed in no or low reporting of new cases (less than 100 per year).

This group is divided in two categories:

a. Countries or territories reporting no cases during 2010 and 2011 (n=18): Anguilla, Antigua and Barbados, the Netherlands Antilles, Aruba, Bahamas, Belize, Chile, Dominica, Grenada, Cayman Islands, Turks and Caicos Islands, United States Virgin Islands, British Virgin Islands, Jamaica, Montserrat, Puerto Rico, Saint Vincent and the Grenadines.
b. Countries reporting less than 100 cases per year (n=17): Barbados, Costa Rica, El Salvador, Guadeloupe, Guatemala, Guiana, French Guiana, Haiti, Honduras, Martinique, ,Nicaragua, Panama, Peru, Saint Kitts and Nevis, Saint Lucia, Surinam, Trinidad and Tobago and Uruguay.

2. Countries with a high burden reporting 100 or more new cases per year (n=10): Argentina, Bolivia, Brazil, Colombia, Cuba, Ecuador, Mexico, Paraguay, Dominican Republic and Venezuela.

Programmatic action lines

The main action lines to strengthen programs are:

1. Epidemiological surveillance: Sustaining and strengthening surveillance systems to ensure timely detection of all leprosy cases and disability prevention.

2. Quality leprosy services: Warranting the provision of quality health care services for leprosy patients as part of primary health care systems.

Within each of these action lines differentiated activities should be implemented or strengthened in each country group according to their epidemiological profile in order to accomplish goals and sustain achievements towards the elimination of the disease.

Crosscutting action lines

These action lines involve coordination with other health programs and sectors.

1. Eliminating stigma and discrimination: In the framework of the *Principles and updated guidelines for the elimination of discrimination against persons affected by leprosy and their family members*, actions promoting respect, warranty and effective realization of the human rights and fundamental freedoms of leprosy patients and their family members at State level should be implemented.
2. Equity: Disparities and inequalities at the different health care levels for the general population, and especially for leprosy patients, should be avoided.
3. Gender: Eliminating discrimination against girls and women and promoting their empowerment in aspects related to household health should be fostered.
4. Community-based rehabilitation (CBR): Inclusion of patients with disabilities in work activities at community level should be sought aimed at warranting their rights and granting them opportunities regardless of their functional capacity.
5. Community awareness and education: Actions aimed at promoting social mobilization and community participation as an essential component of leprosy programs should be contemplated.
6. Role of persons affected by leprosy: Persons affected by leprosy and their family members should play an important role in the improvement of leprosy service delivery and patients' quality of life.

Other issues of interest

1. Drug resistance surveillance: Implement regular, multi-center surveillance with the participation of specialized centers and carry out regular data analysis to identify trends in resistance patterns.
2. Leprosy prevention through immunoprophylaxis and chemoprophylaxis: It is necessary to continue developing new and better methods to avoid infection among case contacts.

Monitoring and evaluation

Monitoring and evaluation should be a regular activity aimed at detecting advances and difficulties and facilitating decision making to shape program interventions according to national and sub-national realities; each of the main indicators defined and described in detail here should be taken into account by all national leprosy elimination programs.

Considering the goal of eliminating leprosy at national and first sub-national levels, it is important to emphasize leprosy elimination monitoring (LEM) activities in order to offer support to decision makers and program managers in their evaluation of progress towards leprosy elimination.

Introduction

The present *Regional Plan for Leprosy Elimination* is the result of the analysis of epidemiological and programmatic information provided by the countries in the Region and the annual reports presented by the Pan American Health Organization (PAHO) Member States. The analysis was conducted following the guidelines established by the World Health Organization (WHO) global leprosy program to identify action lines requiring strengthening at national and sub-national levels both to sustain gains accomplished in the Region and to reach the goals set by Member States through the resolutions adopted by PAHO's Directing Council in the case of leprosy, specifically Resolution CD49.R19 of October 2009. This Resolution expressed the commitment of countries to achieve leprosy elimination at the first sub-national political and administrative level by 2015 in the framework of the initiative for the control and elimination of neglected diseases and other poverty-related infections.

The plan was designed following the diagnosis of the situation in 45 Latin American and Caribbean countries and territories divided in two groups according to their disease burden.

Action lines are differentiated for these two country groups and they focus mainly on enhanced surveillance, timely case diagnosis, treatment with multidrug therapy (MDT), early detection of grade-2 disability, and the elimination of stigma and discrimination.

The plan has been designed based on previous experiences in control and elimination activities implemented in the Region, as well as on the renewed commitment to eliminate leprosy as a public health problem at the first sub-national political and administrative level, reach newly identified goals and sustain achievements.

1. Leprosy in the world and in the Americas

1.1. Leprosy in the world

In the 1990's, the World Health Organization (WHO) launched a campaign to eliminate leprosy as a public health problem by year 2000 (prevalence of less than 1 case per 10,000 people). In terms of world prevalence, this goal was achieved in year 2002, but 15 of the 122 countries where leprosy was endemic in 1985 still show prevalence levels over those set as goal.

In 2010, 228,474 new leprosy cases were detected worldwide (i.e., a detection rate of 3.93/100,000), while at the beginning of 2011 a total of 192,246 cases were reported (i.e., a prevalence of 0.34/10,000) in 130 countries or territories. Table 1 shows the prevalence and new case detection rates in each of the WHO regions confirming how, in the average, all of them have achieved the goal of keeping prevalence below 1 case per 10,000; the highest prevalence was registered in South-East Asia (0.64) and the lowest in the Western Pacific (0.05), while the Americas and Africa were in the third place with 0.38; the highest detection rates also corresponded to South-East Asia (8.77) and the Americas (4.25), while the lowest, again, correspond to the Western Pacific Region (0.28)[1].

Table 1. Registered prevalence of leprosy and number of new cases detected in 130 countries or territories, by WHO region, 2010 and end of first quarter of 2011

WHO region*	No. of cases registered (prevalence per 10,000 population) first quarter of 2011	No. of new cases detected (detection rates per 100,000 population) in 2010
Africa	27,111 (0.38)	25,345 (3.53)
Americas	33,953 (0.38)	37,740 (4.25)
South-East Asia	113,750 (0.64)	156,254 (8.77)
Eastern Mediterranean	9,046 (0.17)	4,080 (0.67)
Western Pacific	8,386 (0.05)	5,055 (0.28)
Total	**192,246 (0.34)**	**228,474 (3.93)**

*No reports from Europe available at global level
Source: Information provided by countries for WHO annual report.

Leprosy burden continues to decrease globally thanks to the sustained efforts of national leprosy programs and the support of national and international partners. The trend in new cases between 2004 and 2010 at global level shows a decline from 407,791 cases to 228,474[1].

One of the main monitoring indicators for leprosy at global level is the percentage of new cases with grade-2 disability. From 2005 to 2010 global rates showed little variation: from 0.23/100,000 (13,886 cases) to 0.23/100,000 (13,275). The profile of new cases in countries reporting 100 or more cases in 2010 regarding the proportion of new multibacillary cases, cases in women, cases in children and cases with grade-2 disability varied according to regions and countries (Table 2).

Table 2. Profile of newly detected cases reported by countries with ≥100 new cases, by WHO region, 2010.

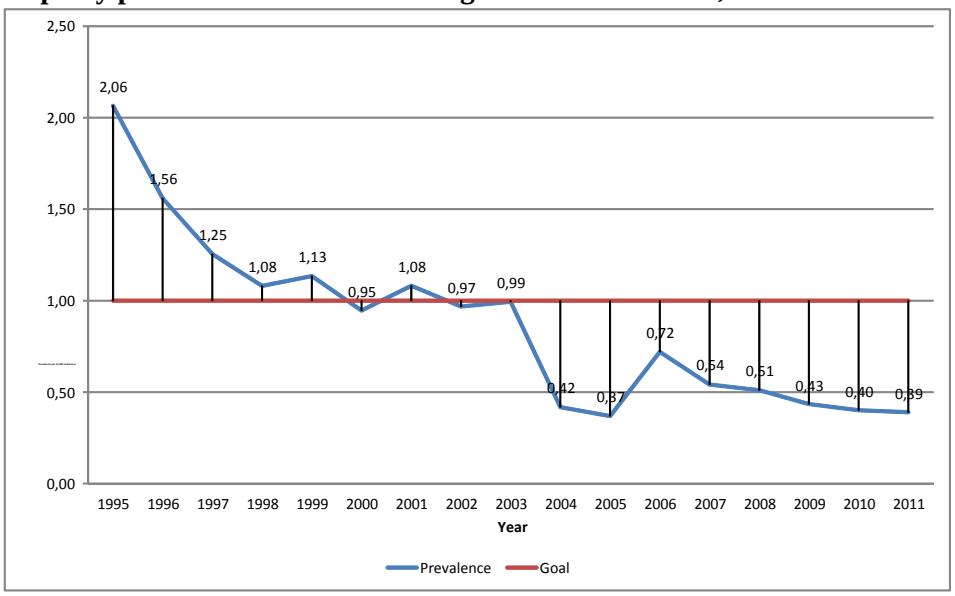
WHO regions*	Percentage of multibacillary leprosy among new cases	Percentage of females among new leprosy cases	Percentage of children under 15 years of age among new cases	Percentage of new cases with grade-2 disability
Africa	Democratic Republic of Congo: 61.72% Kenia: 99.21%	Mali: 20.11% Burkina Faso: 48.44%	Niger: 1.34% Liberia: 17.43%	Cameroon: 4.89% Madagascar: 21.64%
Americas	Brazil: 40.88% Cuba: 86.06%	Argentina: 24.86% Dominican Republic: 46.53%	Argentina: 0.85% Dominican Republic: 16.67%	Bolivia: 3.23% Paraguay: 13.01%
South-East Asia	Bangladesh: 42.33% Indonesia:80.96%	Myanmar: 33.24% Sri Lanka: 44.35%	Bangladesh: 5.46% Indonesia: 11.20%	Nepal: 2.82% Thailand: 14.81%
Eastern Mediterranean	Yemen: 61.95% Egypt: 88.38%	Egypt: 35.74% Sudan: 42.94%	Pakistan: 6.06% Yemen: 18.29%	Yemen: 7.37% Sudan: 22.81%
Western Pacific	Kiribati: 29.67% Philippines: 93.92%	Marshall Islands: 13.64% Kiribati: 45.60%	China: 2.95% Marshall Islands: 44.45%	Marshall Islands: 0.0% China: 22.55%

*No reports from Europe available at global level
Source: Information provided by countries for WHO annual report.

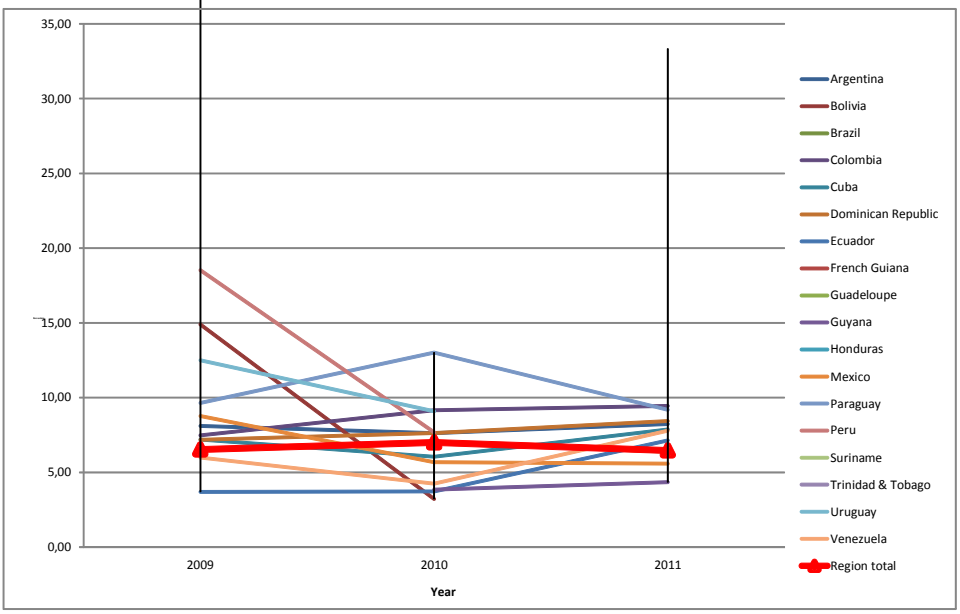
1.2. Leprosy in the Region of the Americas

Since 2006 there has been a reduction in the number of new cases reported by the Region from 47,612 in 2006 to 36,494 in 2011 (Brazil reported 93.04% of these new cases). The prevalence registered also decreased from 0.72 per 10,000 people in 2006 to 0.39 in 2011 (Graph 1). By 2011 all the countries in the Region had reached the elimination goal (>1 case per 10,000 population) except Brazil (1.51). In 2011, multibacillary cases, which have a greater risk of transmission to household and other contacts, were 62.05% of the total new cases; the number of cases among children under 15 years of age was 2,537 (6.95%) while among females there were 15,739 cases (43.13%). During that same year, new cases with grade-2 disability were 2,371 (6.50%) with no significant variation compared with data reported for 2009 (6.54%) (Graph 2). However, in 2011 Guadeloupe reported 33.3% of new cases with grade-2 disability, well above the Region's average, but only three new cases. A similar situation was registered in 2009 when Honduras reported 100% of disability, but only one new case. These data show that active transmission and late diagnosis persist in some countries.

Graph 1. Leprosy prevalence trends in the Region of the Americas, 1995-2011



Graph 2. Trend by country of the percentage of new leprosy cases with grade-2 disabilities in the Region of the Americas, 2009-2011



The prevalence registered during 2011 in countries reporting cases in treatment on December 31 are shown in Table 3.

Table 3. Leprosy prevalence in the countries of the Americas reporting cases in treatment at the end of 2011

Country	Cases registered at the end of 2011	Prevalence per 10,000
Honduras	3	0.004
Guatemala	13	0.01
El Salvador	6	0.01
Peru	32	0.01
Nicaragua	13	0.02
Barbados	1	0.03
Mexico	411	0.04
Uruguay	16	0.05
Martinica	2	0.05
Panama	20	0.06
Colombia	718	0.15
Guadelupe	8	0.17
Costa Rica	83	0.18
Argentina	723	0.18
Cuba	289	0.26
Dominican Republic	351	0.35
Venezuela	1.200	0.41
French Guiana	15	0.63
Surinam	36	0.68
Paraguay	497	0.76
Guiana	67	0.89
Brazil	29.690	1.51

Source: Information provided by countries for WHO annual report.

The profile of new cases differs among countries; tables 4 and 5 show Region countries divided in two groups: those reporting less than 100 cases and those reporting more than 100.

In 2011, a total of 14 countries reported less than 100 new leprosy cases (ranging from 1 to 34 cases) and although these countries contributed only a 0.41% of new cases in the Region, it is important to note that 82.67% of the cases in this group of countries were multibacillary (13 countries with percentages equal or above 50%); 34.67% corresponded to females (3 countries with percentages above 50%); 8% corresponded to children under 15 years of age, and 4.67% to cases with grade-2 disability (Table 4).

Table 4. Profile of new leprosy cases in the countries of the Americas reporting less than 100 new cases in 2011

Country	New cases	Multibacillary cases		Cases among females		Cases among children under 15		Cases with grade-2 disability	
		No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
El Salvador	1	1	100.00	0	0.0	0	0.00	0	0.00
Barbados	1	1	100.00	1	100.0	0	0.00	0	0.00
Honduras	2	1	50.00	2	100.0	0	0.00	0	0.00
Panama	2	2	100.00	0	0.0	0	0.00	0	0.00
Guatemala	3	1	33.33	1	33.3	1	33.33	0	0.00
Guadeloupe	3	2	66.67	0	0.0	0	0.00	1	33.33
Nicaragua	6	5	83.33	5	83.3	0	0.00	0	0.00
Saint Lucia	7	4	57.14	3	42.9	0	0.00		0.00
Uruguay	12	10	83.33	5	41.7	0	0.00	0	0.00
French Guiana	12	11	91.67	1	8.3	0	0.00	2	16.67
Costa Rica	16	16	100.00	4	25.0	0	0.00		0.00
Peru	21	20	95.24	7	33.3	1	4.76	0	0.00
Guiana	23	16	69.57	9	39.1	3	13.04	1	4.35
Surinam	41	34	82.93	14	34.1	7	17.07	3	7.32
Total	**150**	**124**	**82.67**	**52**	**34.67**	**12**	**8.00**	**7**	**4.67**

Source: Information provided by countries for WHO annual report.

In 2011, eight countries reported more than 100 new leprosy cases (ranging from 154 to 33,955 cases); it is worth noting that 61.96% of cases from this group of countries were multibacillary (all countries with percentages equal or above 60%); 43.16% occurred among females (seven countries with percentages above 30%); 6.95% among children under 15 years of age, and 6.50% were cases with grade-2 disability (Table 5).

Table 5. Profile of new leprosy cases in the countries of the Americas reporting more than 100 new cases in 2011

Country	New cases	Multibacillary cases		Cases among females		Cases among children under 15		Cases with grade-2 disability	
		No. of cases	%	No. of cases	%			No. of cases	%
Dominican Republic	154	101	65.58	72	46.75	19	12.34	13	8.44
Mexico	162	118	72.84	67	41.36	6	3.70	9	5.56
Cuba	254	203	79.92	118	46.46	10	3.94	20	7.87
Argentina	340	286	84.12	130	38.24	2	0.59	28	8.24
Colombia	434	309	71.20	-	-	13	3.00	41	9.45
Paraguay	468	372	79.49	146	31.20	15	3.21	43	9.19

Country	New cases	Multibacillary cases		Cases among females		Cases among children under 15		Cases with grade-2 disability	
		No. of cases	%	No. of cases	%			No. of cases	%
Venezuela	577	421	72.96	201	34.84	40	6.93	45	7.80
Brazil	33,955	20,710	60.99	14,953	44.04	2,420	7.13	2.165	6.38
Total	**36,344**	**22,520**	**61.96**	**15,687**	**43.16**	**2,525**	**6.95**	**2.364**	**6.50**

Source: Information provided by countries for WHO annual report.

Cure rates for multibacillary and paucibacillary cases were reported by 13 countries in 2011 (Table 6). Treatment cohorts for the report year were not standardized by countries and it is believed that there may be some inconsistencies; however, this information has not been verified yet by PAHO regional leprosy program.

Table 6. Cure rates among paucibacilllary and multibacilllary leprosy cases in the countries of the Region, 2011

Country	Cure rates for paucibacillary cases (cohort year)	Cure rates for multibacillary cases (cohort year)
Honduras	100% (2010)	100% (2006)
El Salvador	0	100% (2009)
Peru	100% (2010)	75% (2009)
Nicaragua	0% (2010)	0% (2009)
Mexico	100% (2011)	100% (2009)
Uruguay	100% (2010)	100% (2009)
Costa Rica*	0	15%
Cuba	100% (2010)	99.5% (2009)
Dominican Republic	40.4% (Sept. 2010)	59.6% (Sep. 2008)
Surinam	75% (2010)	72.2% (2009)
Paraguay	93% (2010)	83% (2009)
Guiana	100% (2010)	90% (2008)
Brazil	84.4% (2010)	81.6% (2009)

Source: Information provided by countries for WHO annual report.
*No report from Costa Rica for the cohort in the report year

In 2011, a total of 23 countries reported data on relapses; out of them, 12 reported 1,652 cases of which 90.1% corresponded to Brazil (Table 7).

Table 7. Number of registered relapsed cases in LAC countries, 2011

Countries	Number of relapses
Barbados	0
Belize	0
Chile	0
El Salvador	0

Countries	Number of relapses
Guatemala	0
Honduras	0
Martinica	0
Nicaragua	0
St. Kitts and Nevis	0
Uruguay	0
Peru	1
Dominican Republic	2
French Guiana	2
Guadeluope	2
Guiana	4
Surinam	4
Costa Rica	11
Cuba	14
Paraguay	14
Venezuela	15
Mexico	27
Colombia	58
Brazil	1,498
Total	**1,652**

2. Progress in leprosy elimination in the Region

The achievements accomplished until now by the Region in reducing leprosy burden (2012) are the result of multidrug therapy (MDT) administration for leprosy control recommended by WHO as regular treatment[2], as well as of the global mandate addressed to WHO Member States included in Resolution WHA44.9 adopted by the 44th World Health Assembly concerning their commitment to eliminate leprosy by the end of year 2000. On the average, the Region reached the goals set, but some challenges remain regarding prevalence, especially in Brazil.

One of WHO tools that helped achieving the goals was the *Global Strategy for Further Reducing the Disease Burden due to Leprosy and Sustaining Control Actions (2006-2010)*[3], which facilitated the implementation of actions aimed at the timely detection of cases and the provision of free treatment to all cases (MDT). To further develop this framework, WHO, together with national leprosy programs and several partners, designed the *Enhanced Global Strategy for Further Reducing the Disease Burden due to Leprosy: 2011-2015* [4] to give continuation to the main action lines, this time emphasizing initiatives to sustain the provision of quality health care services for persons affected by leprosy and thus reduce the disease burden not only in terms of new cases detected, but also of the reduction of disability, stigma and discrimination, including social and economic rehabilitation of persons affected by the disease.

The countries of the Region gradually included the main objectives of the *Enhanced Strategy* in their programs giving special emphasis to strengthening monitoring, surveillance systems and health workers' technical capacity in the context of integrated primary health care. Through its implementation, countries managed to further reduce disease burden, but in some of them, case and population clusters not covered by control programs were still to be found, especially in those registering low prevalence.

To sustain achievements and further close the gaps regarding the disease at sub-national level, PAHO Directing Council adopted in October 2009 Resolution CD49.R19[5] regarding the elimination of neglected diseases and other poverty-related infections. The Resolution included the elimination of leprosy as a public health problem (less than 1 case per 10,000 people) at the first sub-national political and administrative levels by 2015 through the implementation of the following strategies:

- Enhanced surveillance of contacts
- Timely administration of multidrug therapy (MDT) to at least 99% of all patients
- Definition of adequate introduction of chemoprophylaxis
- Early detection of grade-2 disability.

Both the goal and the strategies were based on the already mentioned global guidelines established by WHO.

The following are the main advances achieved by the Region until 2011:

- All countries had reached the goal of eliminating leprosy at national level except Brazil, and only five countries had not achieved this goal at the first sub-national political and administrative level (Argentina, Bolivia, Dominican Republic, Paraguay and Venezuela).
- 18 countries and territories did not report leprosy cases between 2010 and 2011; 17 countries and territories reported less than 100 new cases and 10 reported 100 or more new cases during 2010 or 2011.

- A steady reduction of leprosy prevalence from 0.72/10.000 in 2006 to 0.36/10,000 in 2011.
- Progressive reduction in the number of new detected cases from 47,612 in 2006 to 36,494 in 2011.
- Brazil has renewed its commitment to reduce leprosy prevalence as a priority within its National Plan for the Elimination of Neglected Infectious Diseases, and has launched a leprosy elimination monitoring (LEM) process.
- Continued provision of drugs required by all endemic countries, as well as drug resistance surveillance in Brazil and Colombia.

Based on the Enhanced Global Strategy, 2011-2015, efforts during 2012 have focused on maintaining the reduction in leprosy burden by increasing actions to ensure early diagnosis, timely treatment and the reduction of disability, stigma and discrimination; these efforts are being waged mainly in priority countries. Countries have also sustain their efforts regarding the strengthening of health personnel capacity at primary health care level in the context of the commitment of the Region to formulate and implement integrated action plans for neglected infectious disease control and elimination[6].

The following are the main challenges for the Region:

- Sustaining political and technical commitment at national and sub-national levels, and the support of strategic partners in leprosy elimination, as well as keeping the issue as a public health priority, which is all the more necessary given the disease elimination profile in the Region at present.
- Developing and implementing strategies to facilitate the reduction of leprosy burden in countries reporting more than 100 new cases per year including the reduction of disabilities and complications.
- Defining the epidemiological surveillance activities that should be continued in countries where no new leprosy cases are being reported.
- Defining and implementing those operational components required for the integration of leprosy services in primary health care systems in those countries reporting less than 100 new cases per year.
- Strengthening and extending case finding coverage among leprosy patients' contacts.
- Ensuring that 99% of new detected cases receive MDT and implementing monitoring actions regarding treatment compliance among patient cohorts.
- Developing and implementing operational activities to eliminate stigma and social discrimination due to leprosy.

3. Action framework for leprosy elimination in the Americas

3.1. Context in the framework of the elimination of neglected infectious diseases

In the framework of the Global Plan to Combat Neglected Tropical Diseases, 2008-2015 (WHO, 2007), neglected tropical diseases (NTD) and zoonoses are described as a devastating obstacle for populations and their social and economic development in already underserved communities. There is growing evidence that the control of such diseases can directly contribute to the achievement of several Millennium Development Goals (MDG). Interventions to combat NTDs and zoonoses have already benefitted millions of people offering them relief from physical pain, disability and poverty[7].

The majority of NTDs affect exclusively poor and marginalized populations living in environments where poverty is generalized and resources, or access to opportunities to improve their quality of life, are scarce. These diseases have an enormous impact on individuals, families and communities in developing countries in terms of disease burden, loss of productivity, worsening of poverty and high costs of health care in the long term. They also hinder economic development in endemic countries and affect the quality of life at all levels[7].

Around 582 million people live in Latin America and the Caribbean, 78.8% of them in urban areas, and their life expectancy at birth is 73.5 years[8]. About 127 million people live in poverty (income below two dollars a day), and 50 million live in extreme poverty (income below a dollar per day). The majority of these people, including traditionally vulnerable groups such as native populations, rural populations, poor elderly people, women and children, live in conditions that favor high disease burden[9]. The population with access to improved drinking water sources in 2006 was 91% and those with access to improved sanitation facilities barely corresponded to 78%.

The importance of neglected diseases and other poverty-related infections becomes evident when the plan is to improve health and living conditions in the Americas by reducing the disease burden due to infectious diseases. If the goal is to control or eliminate these diseases, it is necessary to count not only with the joint WHO/PAHO effort, but also with the unwavering commitment of Member States, as well as of stakeholders and partners from the different sectors and organizations and the participation of affected communities. There are high probabilities of reducing these diseases to levels where they no longer represent public health problems, which further justifies the additional efforts required to eliminate them. The availability of new technologies and strategies, particularly if support focuses on improving primary care, make their control and eventual elimination feasible. The goal of eliminating or significantly reducing neglected diseases by 2015 at regional, sub-regional and national levels was highlighted by Dr. Mirta Roses in February 2008 in the opening speech of her second period as PAHO Director. Since then, different types of efforts have been intensified in the Region of the Americas to further advance in the struggle against Neglected infectious diseases (NIDs), a term that PAHO uses to refer to NTDs and other infectious diseases related to poverty..

Neglected diseases mainly affect population groups living in poor social and economic conditions with low income and education levels, poor housing, lack of access to basic services such as drinking water and basic sanitation, in conflict areas or in deficient environmental conditions, and with access barriers to health care services. As they have common social and environmental determinants, neglected diseases often overlap in the same geographic areas[10].

In October 2009, through Resolution CD49.R19, the Directing Council of the Pan American Health Organization (PAHO) defined those NIDs whose control or elimination as public health problems is feasible by 2015 and established guidelines for the design of integrated action plans. Twelve diseases divided in three groups were included:
1) ten diseases with set elimination goals (onchocerciasis, lymphatic filiarasis, Chagas disease, malaria, trachoma, congenital syphilis, leprosy, dog-transmitted rabies, plague and neonatal tetanus);
2) two diseases with control goals (soil-transmitted helminthiasis and schistosomiasis), and
3) diseases for whose control there are no sufficient tools, but whose morbidity should be reduced (for example, leishmaniasis, fascioliasis, etc.)[11].

In the context of inter-programmatic and inter-sector approaches, a change of paradigm has been introduced in the fight against NIDs shifting from a disease-centered approach to an approach focused on the needs of underserved populations. The priority, then, is to translate this new approach into a strategy aimed at joining efforts and optimizing existing resources in the poorest communities that are usually the most affected by this group of diseases. This is an integrated approach resorting to actions aimed at improving both health and living conditions of affected populations through multidisciplinary and intersectoral interventions on social determinants without disregarding those that are proper of the health sector. [12]

3.2. Conceptual context for the elimination of leprosy as a public health problem in the Region of the Americas

Resolution CD49.R19 included leprosy as one of the neglected infectious diseases and set its elimination goal at the first sub-national level in 2015 taking into account that the elimination goal at the national level (less than 1 case per 10,000 population) had been reached in all countries except Brazil.

Although leprosy elimination at national level has been an important achievement, the challenge now is to sustain gains accomplished in terms of prevalence and reach the goals set for the sub-national level, keeping the existing installed capacity for diagnosis and timely treatment of persons affected by leprosy in primary health care, as well as maintaining leprosy in the public health agenda at country level. Global positioning of leprosy issues in the framework of human rights in order to combat stigma and discrimination has opened an important action line that requires preserving country capacity to face this challenge.

Given the above mentioned, the regional goal for leprosy elimination can be reached if the action lines and recommendations included in the *Enhanced Global Strategy for Further Reducing the Disease Burden due to Leprosy: 2011-2015* and the updated *Operational Guidelines*[13] are implemented accordingly: [4]:

- Sustaining political commitment at the national and local government levels in all endemic countries.
- Strengthening routine and referral services within the integrated health systems in all endemic countries.
- Using the rate of new cases with grade-2 disabilities among new cases per 100,000 population as a key indicator to monitor progress in addition to the current list of indicators.
- Implementing innovative approaches for case-finding in order to reduce the delay in diagnosis and the occurrence of grade-2 disabilities among new cases, including examination of household contacts at the time of diagnosis or within a time span close to

the same and incorporating special efforts to improve control activities for populations living in inaccessible and hard to reach areas.

- Improving quality of clinical services for diagnosis and for the management of acute and chronic complications, including prevention of disabilities/impairments, and enhancing the provision of rehabilitation services through a well organized referral system.
- Supporting all initiatives to promote community-based rehabilitation (CBR) with special attention given to activities aimed at reducing stigma and discrimination against persons affected by leprosy and their families.
- Ensuring a free supply of drugs for multidrug therapy (MDT) and effective distribution systems in all endemic countries.
- Establishing and maintaining a surveillance system to prevent and limit development and of resistance to anti-leprosy drugs and transmission of resistant strains.
- Promoting development of more effective drugs/regimens to treat leprosy and its complications.
- Developing sustainable training strategies at the global and national levels to ensure the availability of leprosy expertise in all endemic countries.
- Exploring the use of chemoprophylaxis and immunoprophylaxis as a tool to prevent the occurrence of new leprosy cases among household contacts.
- Fostering supportive working arrangements with partners at all levels.

Besides the *Enhanced Global Strategy* and its updated *Operational Guidelines*, there are three important documents regarding actions for strengthening efforts to combat leprosy in the Region of the Americas, all of them in agreement with the mandate of member States and their commitment to eliminate this disease:

- *Principles and Guidelines for the Elimination of Discrimination against Persons Affected by Leprosy and their Family Members*, adopted by the United Nations Human Rights Council in June 2010[14]. The document mentions, in the first place, the human rights and fundamental freedoms of persons affected by leprosy and their family members and then it establishes guidelines so that States respect, guarantee and realize those rights and freedoms.
- Resolution A/RES/65/215 for the *Elimination of Discrimination against Persons Affected by Leprosy and their Family Members*, adopted by the United Nations General Assembly in December 2010, calls on governments, institutions, specialized agencies, and UN funds and programs, as well as other intergovernmental organizations and all relevant human rights national bodies, to pay due attention to these principles and guidelines when formulating and implementing policies and measures related to persons affected by leprosy and their family members[15].
- The *Guidelines for Community Based Rehabilitation*[16] designed and published in 2010 by the World Health Organization-WHO/PAHO, the International Labor Organization (ILO), the United Nations Organization for Education, Science and Culture (UNESCO) and the International Disability and Development Consortium (IDDC) include a chapter dedicated exclusively to leprosy establishing criteria to improve the quality of life of poor people with disabilities. These guidelines involve all sectors of society: governments, social organizations, persons affected, their families and their communities.
- The *Guidelines for Strengthening the Participation of Persons Affected by Leprosy in Leprosy Services*[17], produced in 2011 by WHO together with stakeholders, partners and persons affected by leprosy, focus mainly on acknowledging the experience of individuals who have had leprosy and who can establish partnerships to deliver quality services. The document establishes guidelines to combat stigma and discrimination in a framework of equity, social justice and human rights including gender issues. It also establishes strategies to improve information,

communication and education, as well as advocacy, counseling, training and capacity building, referral systems, disability prevention, rehabilitation, health care planning and management, resource mobilization, research, monitoring and evaluation.

3.3. Country groups according to disease burden

Country classification

Taking into account that the epidemiological situation and the progress towards elimination goals in the Region vary among countries, it is necessary to differentiate them in order to propose specific types of intervention channelling efforts to sustain advances and achieve goals where they are still to be reached.

Entering the elimination stage involves a clear identification of those actions that should be sustained so as not to forfeit achievements and reduce the risk of losing leprosy expertise and, therefore, face the re-emergence of cases that are not identified in time and that very likely will present with disabilities once they are detected. This becomes even more relevant in the case of a disease such as leprosy whose chronic condition progresses slowly and that differs from other communicable diseases in the sense that it poses additional challenges for its control and elimination. Consequently, when the stage of elimination is finally reached, there is a risk that countries may reduce their efforts and lose their capacity and expertise, so that if there is need to resume actions they will face serious obstacles to reorganize their programs quickly.

This elimination stage implies assigning human, technical and financial resources without which achievements would be surely lost. In this stage, the chances that doctors, nurses, health promoters or ordinary people would be able to detect a leprosy case reduce, so it is necessary to innovate strategies to ensure the sensitivity of the system for leprosy diagnosis and make sure that the absence of cases responds to a real situation of reduced prevalence and not to the fact that they are not being detected.

In the context of registered new cases in Latin America and the Caribbean (45 countries and territories excluding North America with Bermuda, Canada and the United States), there are two groups of countries:

1. Countries with a low disease burden expressed in the absence or low report of new cases (less than 100 per year).
2. Countries with a high disease burden reporting 100 or more new cases per year including a country that has not reached the elimination goal at national level (Brazil reported 33,955 new cases in 2011).

Based on these data, it is necessary to identify differentiated actions to be implemented or strengthened in these two groups of countries to reach and sustain goals in the framework of disease elimination.

The countries in each of these two groups and their prevalence indicators, as well as the features of new cases, are shown in tables 8, 9 and 10.

In the first group there is a total of 18 countries and territories that have not reported new leprosy cases in the last 2 years; it is worth noting that in this group there may be countries reporting no cases, but also others that did not send the reports requested for 2010 and 2011. In this same group

there were 17 countries and territories reporting less than 100 new cases in 2010 or 2011 (some reported cases in 2010 but not in 2011 or vice versa; in any case, the latest data reported was included). It is also important to underline that some countries may have not reported in one of the two years, so there may be uncertainty regarding some of the data and even problems concerning information registration and collection.

Table 8. Latin American and Caribbean countries and territories not reporting new leprosy cases in the last 2 years

Country	National prevalence	New cases (2010-2011)
Anguilla	0	0
Antigua and Barbuda	0	0
Netherlands Antilles	0	0
Aruba	0	0
Bahamas	0	0
Belize	0	0
Chile	0	0
Dominica	0	0
Grenada	0	0
Cayman Islands	0	0
Turks and Caicos Islands	0	0
American Virgin Islands	0	0
British Virgin Islands	0	0
Jamaica	0	0
Martinique	0	0
Montserrat	0	0
Puerto Rico	0	0
Saint Vincent and the Grenadines	0	0

Source: Information provided by countries for WHO annual report.

Table 9. Latin American and Caribbean countries and territories reporting less that 100 new leprosy cases in 2011

Country	New cases	Percentage of multibacillary cases	Percentage of cases among females	Percentage of cases among children under 15 years of age	Prevalence
Barbados	1	100.00	100.00	0.00	0.03
Costa Rica	16	100.00	25.00	0.00	0.18
El Salvador	1	100.00	0.00	0.00	0.01
Guadeloupe	3	66.67	0.00	0.00	0.17
Guatemala	3	33.33	33.33	33.33	0.01
Guyana	23	69.57	56.25	18.75	0.89
French Guyana	12	91.67	8.33	0.00	0.63
Haiti*	26	65.38	0.00	50.00	0.03
Honduras	2	50.00	100.00	0.00	0.00
Nicaragua	6	83.33	83.33	0.00	0.02

Country	New cases	Percentage of multibacillary cases	Percentage of cases among females	Percentage of cases among children under 15 years of age	Prevalence
Panama	2	100.00	0.00	0.00	0.06
Peru	21	95.24	33.33	4.76	0.01
Saint Kitts and Nevis	0	0.00	0.00	0.00	0.20
Saint Lucia	7	57.14	42,86	0.00	0.00
Suriname	41	82.93	34.15	17,07	0.68
Trinidad and Tobago*	17	52.94	52.94	17.64	0.34
Uruguay	12	83.33	41.67	0.00	0.05

*2010 data because no data were available for 2011
Source: Information provided by countries for WHO annual report.

One of the challenges for countries in this group is reassessing their situation to identify their needs in terms of service delivery and the resources required according to their epidemiological situation, especially in those countries not reporting new cases in the last two years. It is necessary to verify if reports respond to an adequate surveillance backed by evidence regarding the absence of cases or if it is the result of lacking or weak surveillance systems preventing the detection of new cases.

It is important to underline that the majority of countries reporting less than 100 new cases per year show percentages of multibacillary cases above 50%; three countries show percentages above 15% and only two countries register a significant percentage of cases with grade-2 disability. These indicators show that there are delays in case detection and initiation of treatment and thus a higher probability of having cases already presenting with grade-2 disability or evolving towards disability due to delays in or non adherence to treatment, or untimely management of reactions. In this group of countries it would not be sustainable (in fact it would be very expensive) to keep the same range of activities required for high disease burden profiles, especially regarding the offer of services and professional expertise all throughout the territory or the health care service delivery network. In this low burden context, the chance of local health care services detecting 1 leprosy case per year is very low.

The strategies to sustain case detection are essential for this group of countries and they should be similar to those implemented when they were countries with a high disease burden. Equally, it is important to foster activities such as the strengthening of the capacity of all categories of health personnel according to the epidemiological situation focusing, for example, on those points in the network where it is more likely to have persons affected by leprosy instead of training all health workers in all health facilities. It is important to ensure the access of the population to these service delivery units. Actions to establish and sustain an adequate number of referral centers for the management of persons affected by leprosy at regional and national levels should be included in action plans to ensure the expertise availability required by each country[4].

The second group corresponds to the ten countries reporting 100 or more new cases of leprosy per year (2010 or 2011). Just as may happen with countries in the previous group, it is important to note that some countries in this group may have not reported cases, so information may be inaccurate and there may even be problems with data registration and collection.

Table 10. Latin American and Caribbean countries and territories reporting ≥100 new leprosy cases in 2011

Country	New cases	Percentage of multibacillary cases	Percentage of cases among females	Percentage of cases among children under 15 years of age	Prevalence
Bolivia*	124	46.77	37.90	5.64	0.4
Ecuador*	134	45.52	44.02	2.98	0.18
Dominican Republic	154	65.58	46.75	12.34	0.35
Mexico	162	72.84	41.36	3.70	0.04
Cuba	254	79.92	46.46	3.94	0.26
Argentina	340	84.12	38.24	0.59	0.18
Colombia	434	71.20	-	3.00	0.15
Paraguay	468	79.49	31.20	3.21	0.76
Venezuela	577	72.96	34.84	6.93	0.41
Brazil	33.955	60.99	44.04	7.13	1.51

(*) 2012 data
(-) Data not reported
Source: Information provided by countries for WHO annual report.

This group of countries is subdivided in two subgroups: 1) Nine countries reporting less than 600 new cases per year, but that have complied with the goal of leprosy elimination at national level, five of which have not yet reached the goal of elimination at first sub-national level (Bolivia, Dominican Republic, Argentina, Venezuela and Paraguay), and 2) Brazil that reported more than 33,000 new cases and has not yet reached the goal of elimination at national level.

Eight of these 10 countries report more than 60% of their new cases as multibacillary cases while the other two report about 45% of this type of cases. Except Dominican Republic, all of them report less than 10% of new cases among children. Although grade-2 disability is below 10% in all countries, it is not certain if all new cases were evaluated for disability.

These countries should analyze their epidemiological situation both at national and sub-national levels to identify areas or population groups where a high number of untreated cases or undetected new cases may occur, or even a high percentage of cases with grade-2 disability. A high percentage of multibacillary cases and the possibility of not detecting all new cases place a significant challenge that may be reflecting delays in case detection and diagnosis thus resulting in a pattern of extended transmission in communities. This may be explained by some factors such as the following[4]:

- Lack of capacity of health personnel for adequate diagnosis.
- High levels of stigma in communities resulting in the concealment of cases.
- Poor case-finding efforts by programs.
- Ineffective or inappropriate information, education and communication strategies in affected areas.
- Access difficulties and costly health care services.
- Limited community participation and involvement.

In this context, the answer should be re-establishing sustainable leprosy control programs to offer treatment and support to new cases as long as they keep occurring among the population. Programs should implement actions to promote self-reporting and ensure referral of cases resulting from the dissemination of information about the program. The identification and voluntary examination of household contacts, that should be done as close as possible to the diagnosis date, is essential to ensure that no cases associated to the index case emerge. Only in special situations would it be advisable to carry out screen-like case finding among the population to detect new cases that have gone undetected[4].

4.0 Action lines for achieving regional goals and sustaining gains, 2012-2015

Specific action lines for each one of the two groups of countries are presented to contribute to the achievement of leprosy elimination goals at national and first sub-national levels (departments, states, provinces, cantons, etc.) as set by the Member States of the Pan American Health Organization through Resolution CD49.R19 of the Directing Council adopted in October 2009.

These action lines are based on the *Enhanced Global Strategy for Further Reducing the Disease Burden due to Leprosy, 2011-2015*, as well as its *Operational Guidelines*. Additionally, crosscut actions are included aimed at the elimination of stigma and discrimination and for the participation of persons affected by leprosy in leprosy services.

The epidemiological situation and the disease burden vary among the groups of countries in the Region described before. Action lines regarding epidemiological surveillance and quality of health care services will be presented separately for each of these two groups. This is to ensure that they respond to their specific situation maximizing the use of resources and ensuring the sustainability of the progress towards elimination.

A country or territory may change its status regarding leprosy burden, in which case it will have to implement those epidemiological surveillance activities and health care services corresponding to the new profile as set in the present document.

4.1. Action lines for countries with a low disease burden

As described in the previous chapter, there are 35 countries and territories in this group, of which 18 did not report new leprosy cases in 2010 and 2011, and 17 reported less than 100 new cases in 2010 or 2011 (depending on the most recent report year) (Table 11).

Table 11. Countries and territories included in the group of countries with a low disease burden, 2010-2011

Countries and territories with no report of leprosy cases (2010-2011)	Countries and territories reporting less than 100 new leprosy cases (2010 o 2011)
Anguilla	Barbados
Antigua and Barbuda	Costa Rica
Netherland Antilles	El Salvador
Aruba	Guadeloupe
Bahamas	Guatemala
Belize	Guiana
Chile	French Guiana

Countries and territories with no report of leprosy cases (2010-2011)	Countries and territories reporting less than 100 new leprosy cases (2010 o 2011)
Dominica	Haiti*
Grenada	Honduras
Cayman Islands	Nicaragua
Turks and Caicos Islands	Panama
American Virgin Islands	Peru
British Virgin Islands	Saint Kitts and Nevis*
Jamaica	Saint Lucia
Martinique	Suriname
Montserrat	Trinidad and Tobago*
Puerto Rico	Uruguay
Saint Vincent and the Grenadines	

*2010 data
Source: Information provided by countries for WHO annual report.

4.1.1. Countries with no report of new cases between 2010 and 2011

Countries in this group require evaluation or reassessment of their epidemiological situations and verify the following:

Epidemiological surveillance

- An updated protocol for leprosy surveillance adapted to the post-elimination phase.
- The implementation and use of the surveillance protocol throughout the health care service network especially in geographic areas or zones with a history of leprosy.
- That geographic zones or areas with a history of leprosy are reporting cases (including negative reporting or absence of cases).

Recommendation:

In geographic zones or areas with a history of leprosy it would be useful to implement a quality assurance plan that assures adequacy of differential diagnosis of skin diseases during the previous year in randomly selected health care units by reviewing medical records chosen at random and checking if within the health care algorithm there was any suspicion of leprosy and what criteria were used for discarding leprosy diagnosis.

Quality of leprosy services

- Availability of updated guidelines for leprosy care in health facilities.
- Availability of education materials and training methodologies for health care workers in geographic areas or zones with a history of leprosy as part of the general training they receive for the diagnosis and treatment of skin diseases, including their ability to evaluate disability.
- In geographic zones or areas with a history of leprosy it would be useful to implement a quality assurance plan that assures adequacy of differential diagnoses of skin diseases during the previous year in randomly selected health care units by

reviewing medical records chosen at random and checking if within the health care algorithm there was any suspicion of leprosy and what criteria were used for discarding leprosy diagnoses.

- Verification of laboratory capacity for testing skin smears in geographic areas or zones with a history of leprosy (including availability of supplies). Given there is a very low probability of detecting a leprosy case in these countries or territories, quality control in laboratory networks requires the implementation of new methodologies to check if laboratory workers have kept their expertise for skin smear reading. (For example, this might be done by sending photos of microscopic fields to the laboratories asking them to report their findings, as well as sustaining activities to verify if laboratory personnel know how to take samples and skin smears for leprosy).
- All health care services in geographic areas or zones with a history of leprosy must have the contact information at national or sub-national level to request treatment in case they have a leprosy patient.
- Maintenance and review of leprosy case referral procedures.
- Strategic partnerships with dermatologists belonging to the public and private health care service network are required in order to detect cases being identified in specialized centers but not reported to the national program and that may be receiving non-standardized treatment.

4.1.2. Countries reporting less than 100 new leprosy cases in 2010 or 2011

This group of countries and territories may face two types of situations: 1) confined geographic areas or zones regularly reporting leprosy cases (i.e., they no longer have a dispersed pattern throughout all the territory), and 2) geographic areas or zones that do not report cases but have a history of leprosy; *in this second case we recommend implementing the aforementioned actions suggested for the group of countries with no report of cases*.

This group of countries has achieved the elimination goal at national level, but need further analysis of leprosy indicators at the first sub-national political and administrative level (departments, states, provinces or cantons depending on each country's structure), and even at the second sub-national political and administrative level (municipalities and districts depending on each country's structure) to measure disease burden and focus on actions required for specific situations within the country. This is also relevant because this group of countries and territories has a high percentage of multibacillary cases (more than 50% in all countries and territories), some of them report more than 15% of cases among children under 15 years of age and there is no certainty whether disability has been evaluated in all diagnosed cases. These data reveal that there are important challenges regarding timely case detection which also puts at risk the goals already achieved. Leprosy national programs should have the capacity to identify differentiated actions and implement them according to their requirements.

Epidemiological surveillance

- Updated leprosy surveillance protocol: including the availability of case recording forms (or system).
- Monitoring of leprosy case reporting: If reporting is mandatory, it should be verified that it is being done in all the facilities belonging to the reporting network and that negative reporting is included.
- Mapping case detection and prevalence at sub-national level (first and second levels): This mapping will help to establish differences in the epidemiological situation and to have a picture of the disease burden to help identify and implement specific actions within the country.
- Surveillance on side effects: The countries and territories in this group should integrate surveillance of adverse reactions caused by MDT into the general surveillance system adjusting the corresponding protocol to ensure this surveillance is being implemented in those areas or zones reporting and treating cases.

Quality of leprosy services

Case detection in this group of countries and territories should be readjusted, as their epidemiological situation has changed and leprosy cases are only reported in some confined areas. Countries in this group have a bigger challenge today when they register few leprosy cases, a situation which usually leads to a loss of expertise which has an impact on persons affected by leprosy. Therefore, detection efforts should focus on these areas emphasizing the following components:

- Leprosy service network: Assure the availability and adequacy of health care facilities in geographic areas where persons affected by leprosy are more likely to be found. For

example, identify and map the health care facilities (including the number of health workers, laboratories, etc). This includes clearly identifying reference centers and their link with first level health care services and implementing actions aimed at strengthening them.

- Updated guidelines for leprosy case detection and treatment should be available in all areas reporting cases and in those with a history of leprosy. These guidelines should include the algorithm for referral to specialized centers.
- Health personnel capacity building and training activities should be planned, implemented and evaluated to ensure case detection, disability assessment and treatment in those geographic areas or zones where the occurrence of cases is more likely. This capacity will be differentiated according to disease burden within the country.
- Health personnel training and retraining methodologies should be adopted, as well as evaluation methods to measure expertise.
- The involvement of specialized services and personnel such as dermatologists is essential as part of an integrated health care network, to improve communication between basic health care level and specialists.
- Disability prevention and management services will be integrated into the country's health care system, especially in those geographic areas or zones still reporting leprosy cases.
- The management of disabilities resulting from leprosy should include the following:
  - early leprosy diagnosis and adequate management;
  - early detection and intervention to prevent disabilities due to leprosy reactions;
  - integrated and continuing interventions to prevent deterioration due to disabilities including self-care;
  - use of protective aids and reconstructive surgery;
  - the involvement of communities, civil society, the government and the private sector to promote the inclusion of people with disabilities.
- Laboratory capacity for skin smear tests (including availability of supplies): Actions should be implemented to maintain a certain level of expertise in health care facilities including laboratories' capacity to classify cases based on skin smear test results.
- Laboratory networks should have quality assurance plans to check on the quality of skin smears for leprosy by implementing direct and indirect quality control procedures..
- Treatment availability in health care services: All countries and territories must ensure that no person with leprosy is subject to delayed treatment or to its interruption due to drug shortage, as this has a negative impact on the person's health and also on the credibility of health care services. This must be done by keeping an adequate stock and distribution system of drugs both for multibacillary and paucibacillary cases (for adults and children).
  - Annually, the WHO Global Leprosy Program requests through regional and country offices (in the case of the Americas through PAHO) information on drug stocks and requirements for the following year.
  - Each country or territory is responsible for regularly checking on the availability of drugs at national and sub-national levels to ensure no drug shortage occurs.
- Supervised treatment: In all paucibacillary and multibacillary cases treatment should be supervised (at the beginning of every month for blister delivery), and follow up should be provided once the treatment course is completed.
- Management of side effects and complications: Countries should ensure that geographic areas or zones still reporting leprosy cases maintain their expertise and best practices for the management of acute and chronic complications. It is equally important to establish an effective reference network, as well as personnel training, continuing education and supervision, to reduce the impact of complications. Counseling:

- All those responsible for leprosy programs in the geographic areas or zones still reporting cases should be capable of focusing actions in communities aimed at answering questions, clarifying misunderstandings and myths and helping communities to overcome prejudice against persons affected by leprosy.
- Implement actions to empower persons affected by leprosy and their family members to face daily challenges regarding discrimination, unsympathetic attitudes and communication problems.

- Ensure that there is a guide or protocol for counseling which should be implemented in health care services with the corresponding training, monitoring and supervision components. Focus on how to transform health workers' knowledge to transmit clear, useful and understandable information to persons affected by leprosy. Case finding and examination among household contacts. Every new case diagnosed with leprosy should be immediately followed by an active search and examination of household contacts. This will help to the timely detection of other cases and the initiation of their treatment if it is necessary, thus reducing the probability of transmission in the residence.
  - Case-finding: The most effective and efficient case-finding strategy focuses on having health care services in zones with a history of leprosy and in those still reporting cases.
  - Large case-finding campaigns are no longer cost-effective or sustainable unless they are restricted to a specific area and time, if there is evidence that there may be undetected cases.
  - Voluntary reporting in communities is also useful and it could be promoted in areas where leprosy cases are still occurring; in this sense, programs should identify and implement the strategies they deem adequate. Case detection may be affected by some barriers:

    1) Ignorance of the community regarding leprosy and the fact that it can be treated successfully and free of charge;
    2) fear is closely linked to stigma and discrimination, (fear of the diagnosis, future deformity, being exposed as having leprosy, fear that the patient's family will suffer due to leprosy). ;
    3) gender, ethnic origin and poverty;
    4) access to health care services (geographic or cost-related),and
    5) security problems in the area preventing people from reaching health care facilities (conflicts, war, etc.).

Recommendations:

1. Disability evaluation, prevention and management: It is necessary that countries and territories in this group evaluate or reassess their situation regarding disability levels in all diagnosed cases

   - Consider moving this sentence to another section of the Action Plan.

2. The management of disabilities resulting from leprosy should include the following:

   - early leprosy diagnosis and adequate management;
   - early detection and intervention to prevent disabilities due to leprosy reactions;
   - integrated and continuing interventions to prevent deterioration due to disabilities including self-care;
   - use of protective aids and reconstructive surgery;

- the involvement of communities, civil society, the government and the private sector to promote the inclusion of people with disabilities.

- This item should be re-written as outlined above, to provide users more fluidity or ease of understanding of the information.

3. Laboratory capacity for skin smear tests (including availability of supplies): Actions should be implemented to maintain a certain level of expertise in health care facilities including laboratories' capacity to classify cases based on skin smear test results.

   - *The chance of a leprosy case occurring in some geographic areas in this group of countries and territories will gradually reduce, and, therefore.* - This sentence should be completely omitted from this portion of the text.

4. Laboratory networks should have quality assurance plans to check on the quality of skin smears for leprosy by implementing direct and indirect quality control procedures.

   - This portion of the text was omitted *including the sending of negative and positive plates to higher monitoring levels and from reference levels to network labs. Monitoring and supervision systems should be adapted to the differentiated disease burden profiles within each country. Strategies to integrate leprosy and tuberculosis lab networks may be included in national action plans, especially in geographic areas where accessibility limitations are more evident* - and as such should be re-written in the Action Plan to reflect the wording as outlined in the statement above.

5. Treatment availability in health care services: *All countries and territories must ensure that no person with leprosy is subject to delayed treatment or to its interruption due to drug shortage, as this has a negative impact on the person's health and also on the credibility of health care services.* This must be done by keeping an adequate stock and distribution system of drugs both for multibacillary and paucibacillary cases (for adults and children).

   - Annually, the WHO Global Leprosy Program requests through regional and country offices (in the case of the Americas through PAHO) information on drug stocks and requirements for the following year.
   - Each country or territory is responsible for regularly checking on the availability of drugs at national and sub-national levels to ensure no drug shortage occurs.

   - The text in italics was recommended by all participants for inclusion in the associated bullet point within section of the Action Plan.
   - Additionally, the third statement previously included in the above text: *equally, leprosy national programs should ensure there is an adequate drug storage,*

distribution and delivery system at all sub-national levels which is most crucial when the number of cases starts reducing. All countries and territories must ensure that no person with leprosy is subject to delayed treatment or to its interruption due to drug shortage, as this has a negative impact on the person's health and also on the credibility of health care services was recommended for omission from the text.

4.2.3. Geographical areas or zones with no history of leprosy

Countries with varying leprosy epidemiological situations within their territory should monitor carefully those geographic areas or zones with no history of leprosy and that have never reported cases. Migrations due to labor situations or seasonal activities, internal conflicts and civil wars or natural disasters may result in the possibility of persons affected by leprosy being undetected and untreated. Hence, these persons may arrive to areas with no history of leprosy where it would be important to have an adequate epidemiological surveillance and include leprosy in differential diagnosis for skin diseases. In this situation, the same actions mentioned for countries not reporting recent cases can be implemented.

Recommendations:

1. Participants recommended that the words *and that have never reported cases* be omitted from the title of this section.

2. Countries with varying leprosy epidemiological situations within their territory should monitor carefully those geographic areas or zones with no history of leprosy and that have never reported cases. Migrations due to labor situations or seasonal activities *within a country, for example in agriculture, mining and infrastructure works, among others, or due to* internal conflicts and civil wars or natural disasters *imply* may result in the possibility of persons affected by leprosy being undetected and untreated. Hence, these persons *in their places of origin, arriving* may arrive to *new* areas with no history of leprosy where, *therefore,* it would be important to have *a proper* an adequate epidemiological surveillance and include leprosy in differential diagnosis for skin diseases. In this situation, the same actions mentioned for countries not reporting recent cases can be implemented.

- The segments of text shown in italics were also recommended for omission from the original paragraph under section 4.2.3. in the Action Plan.

3. A recommendation was also made by participants for further clarification of this intervention for areas with this profile (4.2.3), that is, no history of leprosy; if it is to be included in the final version of the Action Plan.

4.5. Monitoring and evaluation indicators

Every national program should have a monitoring and evaluation component as part of its regular operation. This means assigning resources (human, financial, technical and material) to measure progress towards goals, to detect problems on time and to implement actions to ensure effective

accomplishment of action plans. Additionally, this component will help accruing evidence for decision making and for adjusting program interventions to national and sub-national realities
This component requires planning and implementing training activities for all those involved in data collection so they can estimate indicators and know what they mean, what are they useful for and how the result of their analysis can be reflected in their activities, as well as in detecting limitations.

There are at least three types of indicators that must be part of leprosy program monitoring at national and sub-national levels:

a. Indicators for monitoring progress.
b. Indicators for evaluating case detection.
c. Indicators for assessing the quality of services.

In the following section we describe each of them.

4.5.1. Indicators for monitoring progress

This group of indicators is influenced by four main factors: 1) Effectiveness of IEC activities in promoting awareness and self-reporting; 2) health workers' competence in making an accurate and timely diagnosis; 3) quality of monitoring and supervision by program managers, and 4) program coverage to ensure that all inhabitants are reached[4].

- *Number and rate per 100,000 inhabitants of new cases detected per year*

The number of new cases shows the extent of leprosy in a given area and indicates how much MDT can be administered in the area during the following year. Given the consistent procedures for case detection, annual statistics over a period of several years will show if there is an increase or reduction and, therefore, account for the effectiveness of activities implemented[13].

Definition	Calculation method
-Detection = number of new cases detected and never treated before during a given year	-Detection = number of new patients detected from January 1 to December 31 in a given year
-Detection rate = number of new cases detected per 100,000 inhabitants and never treated before in a given year	-Detection rate: (Detection / population of given area) x 100,000

Remember that detection must be registered for paucibacillarry and multibacillary cases (in adults and children), information that is also necessary to establish MDT drug requirements.

Interpretation	Analysis/Potential solutions
*A **high detection rate** may be interpreted in the following way*:	
-High transmission in a given area	This should be analyzed together with other indicators as the proportion of cases among children under 15 years of age and of new cases with grade-2 disability
-Results of over-diagnosis	-Diagnosis quality evaluation must be based on sampling
-Results of already fully treated or partially treated cases	-Make sure that the definition for new leprosy case is well understood and applied, particularly

Interpretation	Analysis/Potential solutions
	at local level -Partially treated persons should receive complete treatment at this moment
-Community awareness is increasing	-This should be confirmed by the analysis of the percentage of self-reported cases

Remember that case-finding should be focused on promoting self-reporting with adequate clinical examination and taking into account patients' records to avoid wrong diagnosis and registration problems (case-finding large campaigns in communities are no longer efficient).

Interpretation	Actions/Potential solutions
*A **decreasing trend in detection** may be interpreted in the following way*:	
-Transmission is reducing	-This should be interpreted taking into account other indicators such as percentage of new cases among children under 15 years of age, new multibacillary cases, registration and examination of household contacts.
-Health care services are not active enough in detecting leprosy cases (sub-detection)	-Verify if health care services are including leprosy in differential diagnosis for skin diseases and leprosy algorithms are known and applied. -Check other indicators such as patient care and management to make sure leprosy cases are not declining. -This should be interpreted together with other indicators such as percentage of new cases among children under 15 years of age, multibacillay cases, and registration and examination of household contacts.
-Leprosy perception in the community is not adequate	-Lack of community awareness and education regarding leprosy and self-reporting.
	-Review information, education and communication (IEC) strategies and materials and interview patients and community members

Remember that if data from previous years is available, it should be analyzed to check detection trends and rates; carry out the analysis together with other indicators to understand changes in detection trends.

Recommendations:

1. The word new was added to the calculation method statement – Detection= number of *new* patients detected from January 1 to December 31 in a given year to emphasize clarity regarding the term "patients".

2. Recommendation was made for the removal of the sentence *Goals and incentives for case finding, in case they have been set, should be suspended* under the Analysis/Potential solutions section of the above table.

- *Leprosy prevalence per 10,000 population*

Leprosy burden may be related to the registered prevalence of the disease, i.e., the number of people in treatment at a given time. Leprosy prevalence has reduced worldwide during the last 20 years thanks to the administration of multidrug therapy (MDT) by leprosy programs.

Due to the reduction of treatment duration, MDT has resulted in a very significant reduction of patients in treatment at a given time and, therefore, in a reduction of the "burden" on health care services. However, this decrease has considerably slowed in recent years because what was deemed as treatment backlog has now been overcome. Today, most of the registered prevalence corresponds to the number of new cases detected per year and treated with MDT. Although it is true that progress cannot be evaluated solely by monitoring prevalence, it is necessary to include this indicator as part of the set of indicators for monitoring progress and to comply with the commitment expressed by PAHO Member States of not only reaching leprosy elimination as a public health problem at national level, but also at the first sub-national political and administrative level (less than 1 case per 10,000 population).

Definition	Calculation method
-Cases in treatment at a specific point in time. -Prevalence: Number of cases in treatment per 10,000 population at a specific point in time divided by the total population of a given area.	- Leprosy cases in treatment registered by December 31 of report year = (A) - Total population in the specific area in the same year = (B) -Prevalence: (A) / (B) * 10,000

When calculating prevalence take into account that the following cases should not be included: 1) cases who finished treatment before December 31, 2) defaulters, 3) cases referred to other geographic areas that did not complete treatment, 4) deaths occurred before completing treatment, 5) previously treated cases or cases registered more than once in the system.

Interpretation	Action/Potential solutions
-National prevalence equal or over 1 case per 10,000 population	-National programs should clearly identify the trends of indicators for case detection, cases with grade-2 disabilities, MB cases and cases in children to establish which program activities should be strengthened. -A detailed mapping of indicators should be done at sub-national level to identify clusters of new cases.
-National prevalence less than 1 case per 10,000 population	-Verify prevalence at first sub-national political and administrative level. - National programs should clearly identify the trends of indicators for case detection, cases with grade-2 disabilities, MB cases and cases in children in each sub-national level and closely monitor them to make sure that detection activities and health care services have the proper quality.

- *Rate of new cases with grade-2 disability per 100,000 population*

This is a quality indicator for case detection. Detecting new cases with grade-2 disabilities shows that there is sub-detection of new cases. It is expected that changes in the rate of new cases with grade-2 disabilities per 100,000 population reflect the changes in new case detection rate.

Definition	Calculation method
-New cases with grade-2 disability = number of new cases detected with grade-2 disability	- New cases with grade-2 disability = number of new cases detected with grade-2 disability from January 1 to December 31 of a given year.
-Rate of new cases with grade-2 disability = number of new cases detected with grade-2 disability per 100,000 population during a given year.	- Rate of new cases with grade-2 disability: (New cases with grade-2 disability / population in the specific area) x 100,000

Interpretation	Actions/Potential solutions
-There are quality problems in new case detection.	The rate of new cases with grade-2 disability, together with other indicators, will help to: 1) estimate sub-detection, 2) measure social and physical rehabilitation needs, 3) implement advocacy to develop disability prevention activities, and 4) promote collaboration with other sectors. Additionally, these types of indicators help to highlight the problems of persons affected by leprosy before governments, non-governmental organizations, donors and other partners and stakeholders[4].

Recommendations:

1. A clarification note should be made specifically for leprosy noting that prevalence refers to point prevalence as opposed to the general epidemiological definition for the term prevalence within the Action Plan.

2. A recommendation was made for clarification of what was meant by *a high number of MB cases*, under the Action/Potential solutions section of the table below.

- *Completion rate/Cure rate*

Cure rate can be measured when patients have completed their treatment; additionally, this ensures that patients will be examined to check the absence of exacerbations or the appearance of new lesions which would require a much more detailed exam after a longer follow up period. For practical purposes, the rate of completed treatments can be used in the field as a proxy for cure rate[4].

The two most important components of a leprosy program are:

- Timely detection of new cases, and
- Completion of treatment in set time among all new cases that started MDT.

Completion rate should be calculated separately for PB and MB cases through what is known as a "*cohort analysis*". A cohort is simply a group of patients who started their treatment in the same group or batch, which usually corresponds to the same year[13]. Completion of treatment means that a person with PB leprosy will take six monthly PB-MDT doses within a period of maximum 9 months, and a person with MB leprosy will complete 12 monthly MB-MDT doses in a period of maximum 18 months[4]. All national leprosy programs should undertake cohort analysis and estimate completion rates for PB and MB cases (in special situations, programs may at least calculate these rates based on a sample, although it is necessary to register and follow up cohorts)[4,13].

Definition	Calculation method
Number of new cases who completed their MDT treatment divided by the number of new cases who started MDT treatment in the same cohort (differentiating PB and MB cases).	- The report date will normally be at the beginning of a new report year and the annual report will refer to the year just completed (Year "Y"). For completion statistics, the PB cohort will be from year Y-1; the MB cohort will be from year Y-2. This means that, for example, the report for year Y = 2011 will include complete statistics of PB cases registered during 2010 (Y-1) and MB cases registered during 2009 (Y-2). Completion rate for PB cases: - Identify all the PB patients who are new cases in the register and who started MDT in year Y-1. Note this number = (B) - From this cohort, count the number who completed treatment within nine months of registration = (A) - The PB treatment completion rate is calculated as follows: (A) / (B) * 100 Completion rate for MB cases: - Identify all the MB patients who are new cases in the register and who started MDT in the year Y-2. Note this number = (B) - From this cohort, count the number who completed treatment within 18 months of registration = (A) -The MB treatment completion rate is calculated as follows: (A) / (B) * 100 Note that each cohort includes all new cases that started treatment during the year, including any who became defaulters or who died before completing treatment.

Interpretation	Actions/Potential solutions
- Completion rate is satisfactory	-A satisfactory completion rate indicates efficient case retention for treatment, as well as satisfaction of patients with counseling and health care services[4]
-Completion rate is not satisfactory	-A not satisfactory completion rate shows that program managers and officials should look for more detailed information on treatment results at

Interpretation	Actions/Potential solutions
	sub-national level, especially in municipalities and health care facilities, to identify problems and implement corrective actions including a more strict MDT follow up among specific groups of patients, for example those who cannot go regularly to health care services[4].

Recommendation:

1. Cure rate can be measured when patients have completed their treatment; additionally, this ensures that patients will be examined to check the absence of exacerbations or the appearance of new lesions which would require a much more detailed exam after a longer follow up period. For practical purposes, the rate of completed treatments can be used in the field as a proxy for cure rate.

    - A revision should be made of the above statement; with the wording being adjusted to better reflect the meaning expressed by the Latin American (Spanish) version of the Action Plan.

4.5.2. Indicators for evaluating case detection

- *Number and proportion of new cases with grade-2 disability*

The proportion of new cases with grade-2 disability among all new cases detected during the year is used to assess the delay in diagnosis as an indicator of the quality of case detection activities[13].

Definition	Calculation method
-Number of new cases diagnosed with grade-2 disability = number of new cases found to have grade-2 disability -Proportion of new cases diagnosed with grade-2 disability = number of new cases diagnosed with grade-2 disability divided by the number of new cases *in which disability was evaluated and registered* expressed as a percentage (this evaluation should be done following the parameters established in leprosy case management guides).	-Number of new cases detected during the year that were evaluated to check disability grade (the evaluation must appear in registers) = (A) -Number of new cases with grade-2 disability at diagnosis among (A) = (B) -Proportion of new cases with grade-2 disability = (B) / (A) x 100.

Interpretation	Analysis/Potential solutions
*A **high proportion of cases with grade-2 disability** may be interpreted in the following way*:	
Delays in diagnosis due to: -Low level of awareness in communities: People are not familiarized with early leprosy signs, they ignore leprosy is cured and treatment is free of charge and available in health care services in their area	-Strengthen community awareness and education activities regarding self-reporting -Strengthen IEC activities -Analyze the capacity of health care service networks and accessibility of population to identify barriers and implement required

Interpretation	Analysis/Potential solutions
-Stigma -Difficult access to health care services due to geographic or economic barriers.	solutions
-Registering cases previously detected and evaluated.	-Verify that the definition of new leprosy case and the disability evaluation scale are well known by health personnel.

Interpretation	Analysis/Potential solutions
*A **low proportion of new cases with grade-2 disability** may be interpreted in the following way*:	
-No evaluation of disability at diagnosis	-There may have been personnel turnover and the new staff is not trained -Check if health workers know how to make quality disability evaluation applying the methods and procedures established in case management guides.
-No evidence of disability evaluation in health care service registers	-It may be that disability evaluation forms are not available, or that if available, they are not being used by health personnel. -Verify that disability evaluation forms are available in health care facilities, that health professionals know how to use them and that they are included in the medical records of new cases.
-There is timely diagnosis of cases before they develop grade-2 disability	A comprehensive analysis should be undertaken together with other indicators such as the proportion of new MB cases and new cases among children under 15 years of age

- *Number and proportion of children (under 15 years of age) among new cases*

Definition	Calculation method
-Number of new cases among children under 15 years of age -Proportion of new cases in children under 15 years of age: Number of new cases in children under 15 years of age divided by the total number of new cases detected in a given period of time expressed as percentage	-Number of new cases detected during the year among children under 15 years of age = (A) -Total number of new cases detected in the same year = (B) -Proportion of new cases in children under 15 years of age = (A) / (B) x 100

Interpretation	Analysis/Potential solutions
-Reduced proportion of children under 15 years of age with leprosy	-Such reduction may be seen in areas where transmission is declining, but in any case, the trend should be analyzed along several years and taking into account other indicators such as new case detection rate and proportion of new MB cases -If after this analysis it is believed that there are awareness problems among population under 15 years of age regarding leprosy, actions should be

Interpretation	Analysis/Potential solutions
	implemented to focus attention on this group and to check if health services are including leprosy in differential diagnosis for skin diseases among this population group.
-Increased proportion of children under 15 years of age with leprosy	-This can be seen in areas where transmission has been high in recent years; the trend should be checked along several years and examined together with other indicators such as new case detection rate and proportion of new MB cases. Active contact surveillance within households.

Remember that this indicator will enable programs to obtain additional information on drug stock requirements for the treatment of child MB and PB cases.

Number and proportion of female cases among new cases

Many programs diagnose leprosy more frequently in men than in women, but there is concern that women may have less access to health care in some situations. Thus a ratio of 2 males to every 1 female is commonly seen.

Definition	Calculation method
-Number of female cases among new cases- Proportion of new female cases: Number of new female cases divided by the total number of new cases detected during a given period of time expressed as a percentage.	-Number of new female cases detected during the year = (A) -Total number of new cases detected in the same year = (B) -Proportion of new female cases = (A) / (B) x 100

Interpretation	Analysis/Potential solutions
-Decrease in the proportion of female cases amongst the total new cases.	-Make sure that women have adequate access to health services. Supervision must be undertaken at local level and in health service facilities to identify social and cultural conditions that may be influencing in this situation.
-Increase in the proportion of female cases amongst the total new cases.	-Make sure that this responds to a better access of women to health care services without affecting men's access. - Supervision at local level and in health care facilities should be undertaken to identify social and cultural conditions that may be influencing this situation.

Recommendation:

1. *Number of new cases detected in women* was omitted from the definition section of the above table.

2. Both comments under the Interpretation section of the above table were re-worded for better accuracy of the information included under this section; and should be reflected as such in the final version of the Action Plan.

- *Number and proportion of new multibacillary cases*

Definition	Calculation method
-Number of new multibacillary cases: Number of new cases detected and classified as MB -Proportion of new MB cases: Number of new cases classified as MB divided by total number of new cases detected during the period expressed as percentage.	-Number of new cases detected during the year and classified as MB = (A) -Total number of new cases detected during the same year= (B) -Proportion of new cases classified as MB = (A) / (B) x 100

Interpretation	Analysis/Potential solutions
-Increase in the proportion of MB cases	-It may reflect a delayed detection of cases which implies a higher risk of persons developing complications. -Verify that health care services are including leprosy in differential diagnosis for skin diseases. -Verify that health care services are correctly using leprosy case classification methods and procedures according to case management guidelines. -Verify that health education activities are being implemented among the population to increase their level of awareness regarding self-reporting.
-Decrease in the proportion of MB cases	-This should be examined together with other indicators such as new case detection rate, as well as the trends at national and sub-national levels. -Verify that health care services are correctly using leprosy case classification methods and procedures according to case management guidelines.

Remember that this indicator enables programs to obtain additional information on drug stock requirements for MB cases both for adults and children.

Recommendations:

1. Greater specificity is required when stating that there are more MB cases. Member countries recommended that these should be included in this section of the Action Plan, as examples which could be utilized as best practices for countries within the LAC.

    a. Raising public awareness towards the appearance of nose bleeds, nodules, numbness and dryness of the skin; besides patches to aid in the detection of MB cases.

b. Mention should be made of the importance of MB cases in both the transmission and increased possibility of having grade-2 disabilities; since nerve injury can occur in both PB and MB cases if left unattended.

4.5.3. Indicators for assessing service quality

Leprosy programs can collect these indicators to evaluate the quality of leprosy services on a ***sample basis*** as part of regular supervision activities and processes.

- *Proportion of new cases correctly diagnosed*

Accuracy in diagnosis should be evaluated through regular technical supervision. This indicator can be measured if over-diagnosis is suspected.

Definition	Calculation method
-Number of new cases correctly diagnosed during a specific period: Number of new cases where diagnosis was confirmed as correct (this may be done by reviewing the number of cases diagnosed during the last three months). -Proportion of new cases correctly diagnosed: Number of new cases confirmed as correctly diagnosed divided by the total number of new cases detected in the period (usually during the first three months after diagnosis) expressed as percentage.	-Number of new cases confirmed as correctly diagnosed in a specific period = (A) -Total number of new cases detected in the same period = (B) -Proportion of new cases correctly diagnosed = (A) / (B) x 100 (**Remember** this is normally done checking a number of patients diagnosed during the three months following the supervision; the number of cases to be reviewed will depend on the number of cases diagnosed, and the personnel and resources available for this task).

Interpretation	Analysis/Potential solutions
-Case over-diagnosis	- There may have been personnel turnover and the new staff is not properly trained -Check if training activities are being implemented regularly and that there are procedures to verify diagnosis and patient classification quality at local level, which involves implementing the methods and procedures established in patient management guides.

- *Proportion of treatment defaulters*

This indicator requires verification only when treatment rates are low.

Definition	Calculation method
-Number of treatment defaulters: A defaulter is an individual who fails to complete treatment within the maximum allowed time-frame (nine months for PB cases and 18 months for MB cases). These cases are estimated per cohort. -Proportion of new defaulters per cohort:	- The report date will normally be at the beginning of a new report year and the annual report will refer to the year just completed (Year "Y"). For completion statistics, the PB cohort will be from year Y-1; the MB cohort will be from year Y-2. This means, for example, that the

Definition	Calculation method
number of new cases that abandoned treatment (PB or MB) divided by the total number of new cases that started treatment in a given cohort expressed as a percentage.	report for the year Y= 2010 will include completion statistics for PB cases registered in 2010 (Y-1) and MB cases registered in 2009 (Y-2). *Proportion of treatment defaulters among PB cases:* -Identify all PB patients who are new cases in the register and started MDT in Y-1. Write down this number = (B) -From this cohort count the number of those who did not complete treatment within nine months of registration = (A) -The proportion of treatment defaulters among PB cases is calculated as follows: (A) x 100/ (B) *Proportion of treatment defaulters among MB cases:* -Identify all MB patients who are new cases in the register and who started MDT in Y-2. Write down this number = (B) -From this cohort, count the number who did not complete treatment within 18 months of registration = (A) -The proportion of treatment defaulters among MB cases is calculated as follows: (A)) x 100/ (B)

Interpretation	Actions/Potential solutions
-No defaulters or very low proportion of defaulters	-No defaulters or very low proportion of defaulters indicates efficiency in case retention for treatment, adequate counseling and patient satisfaction regarding services[4]
- High proportion of defaulters	-It indicates that program managers and officials should collect more detailed information on treatment results at sub-national level, especially in municipalities and health care facilities, to identify problems and implement corrective actions including more strict MDT follow up in specific groups of patients such as those who cannot regularly access health care services[4]. -A person who does not adhere properly to treatment and who continues being a defaulter after receiving adequate support requires specialized management by more experienced health personnel.

- *Proportion of registered relapses per year*

Relapses are not frequent and generally they do not belong to any recent cohort and, therefore, these numbers are difficult to analyze. If there is a high report of relapses in a given geographic area, a specific study should be undertaken to check on the situation[13]. In any case, it is necessary to verify that the country's case management guidelines includes clear criteria on relapse identification and differentiation of leprosy reactions, and that health workers are properly applying the parameters established.

- *Proportion of patients who develop new or additional disability during MDT*

This indicator is a measure of how well new nerve damage is detected and treated by the program. There are two ways in which information may be gathered in health care services: Through the EHF score that evaluates eye-hand-foot and the Impairment Summary Form (ISF). For further details on these grading systems you can consult the Operational Guidelines of the Enhanced Global Strategy for Further Reducing the Disease Burden due to Leprosy[13].

4.6. Monitoring leprosy elimination[18]

Although monitoring prevalence as an indicator to follow up leprosy elimination as a public health problem at national and first sub-national levels is relatively easy, evaluating if disease transmission trends are really changing is much more difficult due to the epidemiological characteristics. It is a fact that in the last decade, experts have detected changes in the epidemiological patterns of the disease. These changes can be seen in the clinical profile of new cases detected, in the increased proportion of cases diagnosed with fewer lesions, in the variations in MB case proportion and in the reduced proportion of cases with grade-2 disability. Additionally, changes have been seen in disease prognosis during treatment, as well as a significant reduction in the risk of developing disability. All these changes are the result of a combination of factors such as the historical trend of the disease, the impact of interventions, the effectiveness of chemotherapy and the role of improved health care services.

The most obvious impact of MDT is a reduction in the risk of transmission from one person to another. It is generally accepted that an MDT dose eliminates enough bacilli so as to render PB and MB patients non infectious. It is believed that leprosy control programs based on the use of MDT improve case detection effectiveness and offer a better understanding of the extent of leprosy. The use of standardized tested procedures to correct case detection (according to program coverage), program duration, indirect indicators (proportion of new cases with grade-2 disability), and the standardization of cohort analysis by age and sex could add value to the information used for evaluating transmission levels in a community.

In many programs, MDT implementation has improved case finding and treatment adherence as a result of improved community awareness and patients' trust in health services. However, MDT and leprosy services geographical coverage is very low in some cases (particularly in those countries where there is still a significant number of cases), and in some cases diagnosis is not done or it is late.

All these factors change according to the disease burden profile in the different countries; in the Americas there are countries that have already reached leprosy elimination as a public health problem at national and first sub-national political and administrative levels (except Brazil) while others have reached the goal at national level, but not at first sub-national level; this implies a challenge for monitoring and follow up systems, especially in countries still reporting cases and in those reporting less than 100 cases whose program actions against leprosy have been suspended.

In this elimination context, evaluating country interventions is even more important. For this reason, PAHO/WHO is promoting Leprosy Elimination Monitoring (LEM) exercises. The aim of LEM is to back decision makers and program managers to evaluate progress towards leprosy elimination, design action plans, implement them and then measure their impact. The choice of monitoring indicators must be careful and it should be done taking into account leprosy epidemiological characteristics and its extent in gray zones for a better understanding of the disease. Prevalence varies not only based on disease burden, but also on intervention operational components.

LEM methodology includes standardized indicators used in many countries for years and well known by program managers. The information collected through LEM comes from patients' existing medical records, program registers, report forms and patient registration cards in health care facilities, as well as from interviews with patients. The choice of health care services reflects the situation that prevails in a specific geographic or administrative area at a given time, so the random selection of health care facilities and their amount is essential to enable result extrapolation.

LEM may be repeated later to evaluate advances in interventions and, therefore, analyze changes through time. This exercise is carried out with independent experts who are responsible for visiting each of the heath care facilities selected to collect the information through the standardized methods and report compiled findings for countries and PAHO/WHO. The exercise should not exceed four weeks of duration. Further information on this methodology can be consulted in the LEM Guidelines for Monitors published by WHO[18].

4.

Bibliography

[1] World Health Organization. Leprosy update, 2011. Weekly Epidemiological Record, 389-400.

[2] World Health Organization. Chemotherapy of leprosy for control programmes. Report of a WHO Study Group. Technical report series, 675. Geneva, 1982. Consulted on July 16th 2012. Available at: http://whqlibdoc.who.int/trs/WHO_TRS_675.pdf

[3] World Health Organization. Global strategy for further reducing the leprosy burden and sustaining leprosy control activities. Plan period 2006-2010. Geneva, 2005. *WHO/CDS/CPE/CEE/2005.53*. Consulted on: July 16th 2012. Available at: http://www.who.int/lep/resources/GlobalStrategy.pdf

[4] World Health Organization. Enhanced global strategy for further reducing the disease burden due to leprosy. Plan period 2011-2015. Geneva, 2009. SEA-GLP-2009.3. Consulted on: July 16th 2012. Available at: http://www.searo.who.int/LinkFiles/GLP_SEA-GLP-2009_3.pdf

[5] Organización Panamericana de la Salud. Resolución CD49.R19 para la eliminación de las enfermedades desatendidas y otras infecciones relacionadas con la pobreza. Washington, DC., 2009. Consultada el 16 de Julio de 2012. Disponible en: http://new.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=14190&Itemid=

[6] Organización Panamericana de la Salud. Guía para el desarrollo de Planes Integrados de acción para la prevención, control y eliminación de las Enfermedades Infecciosas Desatendidas. Washington, DC., 2011. Consultado el 16 de julio de 2012. Disponible en: http://new.paho.org/hq/index.php?option=com_content&task=view&id=6407&Itemid=39342

[7] World Health Organization. Global plan to combat neglected tropical diseases, 2008-2015. Geneva, 2007. WHO/CDS/NTD/2007.3

[8] Organización Panamericana de la Salud. Situación de Salud en las Américas. Indicadores básicos 2009.

[9] Organización Panamericana de la Salud. Perfiles epidemiológicos de las enfermedades desatendidas y otras infecciones asociadas con la pobreza en América Latina y el Caribe.

[10] Schneider MC, Aguilera XP, Barbosa da Silva Junior J, Ault SK, Najera P, Martinez J, Requejo R, Nicholls RS, Yadon Z, Silva JC, Leanes LF, Roses M. Elimination of Neglected Diseases in Latin America and the Caribbean: A Mapping of Selected Diseases. PLoS Negl Trop Dis 5(2): e964. doi:10.1371/journal.pntd.0000964.

[11] Organización Panamericana de la Salud. Resolución CD49.R19 para la eliminación de las enfermedades desatendidas y otras infecciones relacionadas con la pobreza. Washington, DC., 2009. Consultada el 16 de Julio de 2012. Disponible en: http://new.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=14190&Itemid=

[12] Organización Panamericana de la Salud. Guía para el desarrollo de planes integrados de acción para la prevención, control y eliminación de las enfermedades infecciosas desatendidas en Latino América y el Caribe". Washington, D.C. 2011.

[13] World Health Organization. Enhanced global strategy for further reducing the disease burden due to leprosy (2011-2015). Operational Guidelines (updated). New Delhi, 2009. SEA-GLP-2009.4

[14] Consejo de derechos humanos de Naciones Unidas. Principios y Directrices revisadas para la eliminación de la discriminación contra las personas afectadas por la lepra y sus familiares. Agosto 2010. A/HRC/AC/5/2. Consultado el 17 de julio de 2012. Disponible en: http://www2.ohchr.org/english/bodies/hrcouncil/advisorycommittee/session5/docs/A.HRC.AC.5.2_sp.pdf

[15] Asamblea General de las Naciones Unidas. Resolución A/RES/65/215 para la Eliminación de la discriminación contra las personas afectadas por la lepra y sus familiares. Diciembre 2010. Consultada el 17 de julio de 2012. Disponible en: http://www.ilep.org.uk/fileadmin/uploads/Documents/UN_Publications/unLeprosyDiscriminationEliminationSp.pdf

[16] Organización Mundial de la Salud. Guías para la rehabilitación basada en la comunidad. 2011. Consultado el 16 de julio de 2012. Disponible en: http://www.who.int/disabilities/cbr/guidelines/en/index.html

[17] World Health Organization. Guidelines for strengthening participation of persons affected by leprosy in leprosy services. India, 2011. SEA-GLP-2011.2. Consultada el 17 de Julio de 2012. Disponible en: http://www.searo.who.int/LinkFiles/GLP_Leprosy-SEA-GLP-2011.pdf

[18] World Health Organization. Leprosy Elimination Monitoring (LEM). Guidelines for monitors. Geneva 2000. WHO/CDS/CPE/2000.17.