



Sasakawa-India Leprosy Foundation
Restoring Dignity

Leprosy Elimination: Indicators to be Monitored & Post-Elimination Surveillance

Global Consultation, Virtual, October 2020

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Categories of indicators

- **Interruption (elimination) of transmission**
- **Elimination of leprosy disease**
- Burden of leprosy

- Definitions & formulas taken/adapted from WHO Monitoring & Evaluation Guide 2016-2020
- Importance of analysing trend data of at least 10 years

Indicators for Interruption (Elimination) of Transmission

I. Number of new autochthonous child cases detected

- **Definition:** Number of new autochthonous child cases (<15 years) detected in a given population in the reporting year
- **Importance:**
 - Reflects recent transmission
 - Used to calculate MDT requirement for children
 - More suitable indicator when denominators are small (<50)

II. Child proportion among new cases

- **Definition:** Proportion of new **autochthonous** child cases (<15 years) among total new **autochthonous** cases (M&E Guide p.33)
- **Formula**

$$\frac{\text{Number of new autochthonous child cases detected}}{\text{Total number of new autochthonous cases detected in the reporting period}} \times 100$$

- **Importance:** Represents recent transmission; indicates effectiveness of detection & diagnosis
- **Issue:** In low-endemic areas (<50 new cases/year), number of new child cases is likely to be very small- preferable to use absolute number of new child cases

III. New case rate among children

- **Definition:** Number of new **autochthonous** child cases (<15 years) detected in a given population in a year expressed as rate per million
- **Formula**

$$\frac{\text{Number of new autochthonous child cases (<15) detected in the reporting year}}{\text{Midyear child population (<15)}} \times 1\,000\,000$$

- **Importance:**
 - Represents recent transmission
 - Provides a more stable indicator than ‘Child proportion among new cases’, especially when number of new cases is small (<50)
 - Ensures comparability across settings

Table 1: Indicators related to child cases (2019)

Region	Absolute number of new child cases	Proportion of all new cases	Rate of child cases (per million child population)
South-East Asia (India)	7859	6.8%	21.2
Americas (Brazil)	1545	5.5%	33.7
Africas (Ethiopia)	507	15.8%	12.0
Eastern Mediterranean (Yemen)	51	16.1%	4.7
Western Pacific (Papua New Guinea)	180	31.3%	60.7
European	0		
TOTAL	14981	7.4%	7.8

Source: Weekly Epidemiological Record, No 36, 4 September 2020

IV. (Trend in) Age at detection

- **Definition:**

- Mean age at detection among new autochthonous cases detected in a given country in a reporting year OR
- Frequency distribution of new cases according to age group in a given country in a reporting year

- **Importance:** Increase in mean age at detection, shift in mode towards older age groups & decreasing proportion of children among new cases (or child rate)- suggestive of moving towards elimination of transmission

V. (Trend in) MB proportion among new cases

- **Definition:** The (trend in) proportion of MB cases among total new cases detected (M&E Guide p.36)
- **Formula**

$$\frac{\text{Number of new MB cases detected}}{\text{Total number of new cases detected in the reporting period}} \times 100$$

- **Importance:** Patients with leprosy due to recent infection are more likely to have PB disease- an increase in MB% might indicate decline/ interruption in transmission

VI. Proportion of new autochthonous cases with a known leprosy contact in the family

- **Definition:** Proportion of new cases known to have (had) a leprosy case in the same family or household within the past 10 years among all new cases detected in a reporting year

- **Formula**

$$\frac{\text{Number of new cases with a leprosy case in the same family or household within the past 10 years}}{\text{Total number of new cases detected in the reporting period}} \times 100$$

VII. Seroprevalence for anti-M. leprae PGL-1 IgM antibodies among children

- **Definition:** Number of children (<5?) who test positive for anti-M. leprae PGL-1 IgM antibodies expressed as proportion of total number of children (<5?) in the sample

- **Formula**

$$\frac{\text{Number of children (<5?) who tested positive for PGL-1}}{\text{Number of children tested}} \times 100$$

- **Importance:** Positive serological test indicates exposure to M. leprae infection- might serve as sensitive indicator of recent transmission
- **Issues:** Sampling: who is tested & when, age-group & criterion for positivity to be decided

Indicators for Elimination of Leprosy Disease

I. Number of new autochthonous cases detected

- **Definition:** Number of new autochthonous cases detected in a given population in a year
- **Importance:**
 - Target for elimination of leprosy disease in a given area is zero new autochthonous cases
 - Especially useful when new case numbers become very small

II. New case detection rate (autochthonous cases only)

- **Definition:** Number of new autochthonous cases detected in a given population in a year expressed as rate per million (M&E Guide p.27)
- **Formula**

$$\frac{\text{Number of new autochthonous cases detected in (year)}}{\text{Midyear population (year)}} \times 1\,000\,000$$

- **Importance:** Proxy for incidence rate; rate reflects more accurately burden & transmission (M&E Guide p.27-28)

III. Proportion of foreign-born among total new cases detected

- **Definition:** Proportion of new cases born abroad among the total new cases detected (M&E Guide p.35)
- **Formula**

$$\frac{\text{Number of new foreign-born cases detected in the reporting year}}{\text{Total number of new cases detected in the reporting year}} \times 100$$

- **Importance:** Indirect indicator- If in a country all new cases are foreign-born, elimination of leprosy disease may already have been achieved

Table 2: Proportion of Foreign-born cases (2019)

Region	Total new cases	Foreign born	Example
South-East Asia	143787	582	Nepal (562 out of 3844= 15%)
Americas	29936	49	Paraguay (13 out of 348= 3.7%)
Africas	20205	5	Senegal (4 out of 189= 2.1%)
Eastern Mediterranean	4211	58	Qatar (22 out of 22= 100%)
Western Pacific	4004	118	Malaysia (71 out of 195= 36%)
European	42	24	France (10 out of 10= 100%)
TOTAL	202185	836	0.41%

Source: Weekly Epidemiological Record, No 36, 4 September 2020

IV. Rate of new cases with Grade 2 disability

- **Definition:** Number of new cases with G2D detected among new cases in a given population in a year expressed as rate per million population (M&E Guide p.19)

- **Formula**

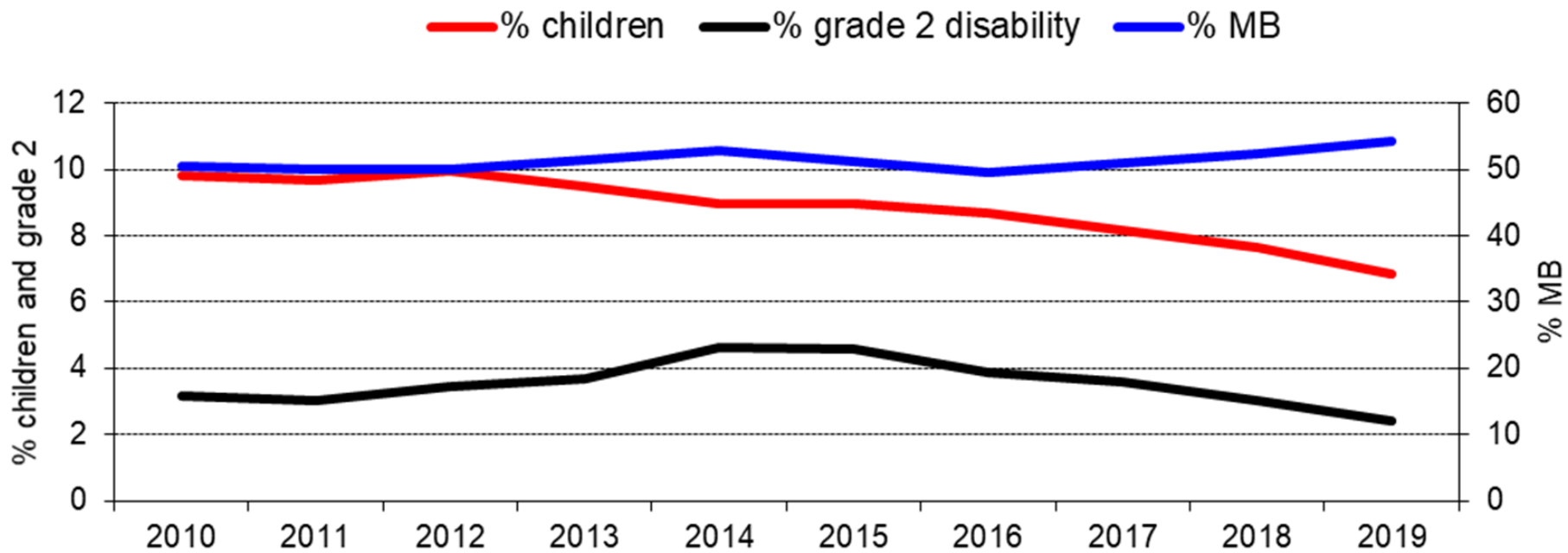
No. of new cases detected with G2D * 1000000

Mid-year Population (reporting year)

- **Importance:**

- Reflects both delay in diagnosis & incidence of leprosy- decreases as case detection improves, e.g. through active case detection & as incidence of leprosy decreases
- Applicable at global, national & subnational levels

Figure 1: Trend of indicators, India (2010-2019)



Post Elimination Surveillance

- Absolute numbers would be appropriate
- Contacts of such cases should also be screened (preferably annually for 5 years) to rule further transmission
- One or more centres in the country needed to maintain leprosy expertise, since sporadic cases can be expected to occur for years after this phase has started
- Besides such sporadic autochthonous cases, there may be ‘imported’ cases also

Summary of Indicators

Interruption (Elimination) of Transmission

- Number of new autochthonous child cases detected
- Child proportion among new cases
- New case rate among children
- (Trend in) Age at detection
- (Trend in) MB proportion among new cases
- Proportion of new autochthonous cases with a known leprosy contact in the family
- Seroprevalence for anti-M. leprae PGL-1 IgM antibodies among children

Elimination of Disease

- Number of new autochthonous cases detected
- New case detection rate (autochthonous cases only)
- Proportion of foreign-born among total new cases detected
- Rate of new cases with Grade 2 disability

Thank you