

WHO Regional Office for Africa | ESPEN

## ESPEN-DP-SOP-02

# Lymphatic filariasis: processing of endemicity and mass drug administration data

Expanded Special Project for Elimination of Neglected Tropical Diseases (ESPEN)

|                           |                                                                                                                                                                                                                                             |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Document type</b>      | Standard operating procedure — data processing                                                                                                                                                                                              |
| <b>Reference</b>          | ESPEN-DP-SOP-02                                                                                                                                                                                                                             |
| <b>Version and status</b> | Draft v0.1, for internal review                                                                                                                                                                                                             |
| <b>Date</b>               | 19 October 2026                                                                                                                                                                                                                             |
| <b>Prepared by</b>        | ESPEN Data Team, WHO Regional Office for Africa                                                                                                                                                                                             |
| <b>Scope</b>              | Endemicity, population requiring PC, MDA delivered, coverage and cumulative rounds of lymphatic filariasis (LF) at implementation unit (IU), country and regional level, 2013–2025                                                          |
| <b>Data sources</b>       | Harmonised IU endemicity and population (SOP-01); JRF MDA data for four regimens; ESPEN contemporary IU endemicity (2020); historical record of MDA rounds (APOC); list of redistricted IUs; list of countries not implementing MDA by year |
| <b>Outputs</b>            | LF analytical tables at IU, country and regional level; LF MDA history                                                                                                                                                                      |
| <b>Processing scripts</b> | Steps 1.4 and 1.9 (Annex A)                                                                                                                                                                                                                 |
| <b>Related documents</b>  | SOP-00; SOP-01; SOP-07 (use of LF results in co-endemicity and country summaries)                                                                                                                                                           |

## Abbreviations

|             |                                                |            |                                                 |
|-------------|------------------------------------------------|------------|-------------------------------------------------|
| <b>ALB</b>  | Albendazole                                    | <b>JRF</b> | Joint Reporting Form                            |
| <b>APOC</b> | African Programme for Onchocerciasis Control   | <b>LF</b>  | Lymphatic filariasis                            |
| <b>DEC</b>  | Diethylcarbamazine                             | <b>MDA</b> | Mass drug administration                        |
| <b>IDA</b>  | Ivermectin, diethylcarbamazine and albendazole | <b>PC</b>  | Preventive chemotherapy                         |
| <b>IU</b>   | Implementation unit                            | <b>PTS</b> | Post-treatment (post-intervention) surveillance |
| <b>IVM</b>  | Ivermectin                                     | <b>TAS</b> | Transmission assessment survey                  |

## 1. Purpose and scope

This procedure describes how the LF data reported by countries are processed into the ESPEN LF analytical tables: the classification of each IU, the population requiring, targeted and treated, the MDA rounds and their effectiveness, and the summary indicators by country and region. The definitions follow the WHO guidance on the monitoring of MDA in the Global Programme to Eliminate Lymphatic Filariasis [1,2] and on alternative MDA regimens [3].

## 2. Data sources

Table 1. Data sources

| Source                            | Content used                                                                                                                                                                                                                                            |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Harmonised IU dataset (SOP-01)    | LF endemicity category, total population and population requiring PC by IU and year                                                                                                                                                                     |
| JRF, MDA sheets                   | Population targeted, population treated and coverage for four regimens: albendazole with ivermectin (ALB+IVM), albendazole with diethylcarbamazine (ALB+DEC), albendazole twice a year (ALBx2) and ivermectin, diethylcarbamazine and albendazole (IDA) |
| JRF, country information sheet    | Correspondence between administrative units and IU codes, used to link the MDA records to IUs                                                                                                                                                           |
| Contemporary IU endemicity (2020) | Reference classification of the LF status of each IU, updated at a regional workshop with national programme and data managers (end of 2019) on the basis of the survey data available                                                                  |
| Historical MDA record             | Number of MDA rounds of each IU in the historical record compiled from the records of the African Programme for Onchocerciasis Control (APOC); the processing assumes that the record includes the 2014 round                                           |
| List of redistricted IUs          | New IUs, their parent IU and year of creation                                                                                                                                                                                                           |
| Countries not implementing MDA    | Countries and years without MDA planned, for which no treatment report is expected                                                                                                                                                                      |

## 3. Definitions

Table 2. Terms and indicators

| Term                     | Definition                                                                                                                               |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Population requiring PC  | Population of an endemic IU that requires MDA, as reported by the country (Section 4.2).                                                 |
| Population targeted      | Population targeted by the MDA, as reported in the JRF (Section 4.4).                                                                    |
| Population treated       | Population that received the medicines, as reported in the JRF.                                                                          |
| Programme coverage       | Population treated / population targeted × 100; zero when the population targeted is below 100.                                          |
| Epidemiological coverage | Population treated / population requiring PC × 100; zero when the population requiring PC is below 100.                                  |
| MDA round                | IU-year with programme coverage above zero (epidemiological MDA round: epidemiological coverage above zero).                             |
| Effective MDA round      | IU-year with programme coverage of at least 65% (epidemiological: epidemiological coverage of at least 65%).                             |
| Cumulative rounds        | Number of MDA rounds and of effective rounds since 2013; cumulative MDA also includes the rounds of the historical record (Section 4.6). |

| Term                                            | Definition                                                                                                                                                                               |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Targeted treatment</b>                       | Endemicity category 15, "Stopped MDA (targeted treatments)": IU that has stopped MDA and delivers treatment in clusters with persistent transmission or hotspots instead of IU-wide MDA. |
| <b>Population no longer requiring treatment</b> | Population of IUs under post-intervention surveillance, or the part of the population of IUs under targeted treatment that does not require treatment (Section 4.9).                     |

## 4. Processing steps

### 4.1 Reconciliation of reported endemicity (2013–2019)

The contemporary IU classification (2020) results from a regional workshop held at the end of 2019, to which national programme managers and data managers were invited. At the workshop, the endemicity status of each IU was reviewed and updated on the basis of the survey data available. ESPEN uses the resulting classification as a benchmark and applies it retrospectively to the years before the workshop.

For 2013 to 2019, the category reported for each IU is compared with the contemporary IU classification and adjusted according to Table 3. A reported category "Unknown" takes the contemporary category when one exists. In the contemporary classification, an IU listed without a recognised category is treated as non-endemic; IUs not listed in it keep the category reported. From 2020 onwards the reported category is kept. The category originally reported is kept in the internal processing tables for traceability; it is not included in the published IU tables.

**Table 3. Reconciliation of reported LF endemicity, 2013–2019**

| Reported              | Contemporary (2020) | Category retained  |
|-----------------------|---------------------|--------------------|
| Endemic               | Non-endemic         | Non-endemic        |
| Endemic               | Unknown             | Unknown            |
| Non-endemic           | Endemic             | Endemic            |
| Non-endemic           | Under surveillance  | Under surveillance |
| Non-endemic           | Unknown             | Unknown            |
| Under surveillance    | Non-endemic         | Non-endemic        |
| Under surveillance    | Endemic             | Endemic            |
| Any other combination | –                   | Reported category  |

### 4.2 Population requiring PC

- Endemic IUs: the population requiring PC reported; when it is below 100, the total population of the IU (a missing value is set to zero).
- IUs under targeted treatment (category 15): the population requiring PC reported is kept.
- All other categories: zero.

### 4.3 Linkage of the MDA records

Each MDA record is assigned the IU code that corresponds to its country, first and second administrative units and year in the country information sheet of the JRF; correspondences that point to more than one IU are not used. When no single correspondence is found, the IU code reported in the MDA sheet is kept. The decisions taken on records sharing an IU code (SOP-01) are applied, records without IU code are removed, and one record is kept per IU, year and regimen: the one with the largest population treated.

### 4.4 Combination of the regimens

- The population targeted and the population treated of an IU-year are the largest values reported across the four regimens; values below 100 are set to zero.
- The regimen of the IU-year is the one with the largest population treated: ALB+IVM, ALB+DEC, ALBx2 or IDA; "Not delivered" when no treatment is reported.
- When people were treated but the population targeted is missing or below 100, the population targeted is set to the population requiring PC.
- The population targeted is set to zero for IUs that are neither endemic nor under targeted treatment.

### 4.5 MDA rounds and coverage

Programme and epidemiological coverage, MDA rounds and effective rounds are calculated as defined in Table 2. Treatment delivered in IUs under targeted treatment (category 15) is kept in the population treated and coverage, but is not counted as an MDA round or an effective round. Because the population targeted is zero outside endemic IUs, MDA rounds are counted only in endemic IUs. At most one round is counted per IU and year.

### 4.6 Cumulative rounds

For each IU, the numbers of MDA rounds, effective rounds and their epidemiological equivalents are accumulated year by year from 2013. The cumulative number of MDA rounds (cumulative MDA) is the number of rounds in the historical MDA record, minus the round of 2014 (which the historical record is assumed to include), plus the rounds counted since 2013. The 2014 round is subtracted for every IU, including IUs without a historical record; for these IUs the cumulative MDA can be one round lower than the rounds counted since 2013. When the calculation gives a negative or missing value in any year, only the rounds counted since 2013 are used for that IU.

### 4.7 Post-intervention surveillance

For 2013 to 2019, an IU reported as endemic is classified as under post-intervention surveillance when the contemporary classification places it under surveillance, its cumulative MDA, including the historical record, is at least five and no MDA was delivered in the year. The population requiring PC and the population targeted are set to zero for all IUs under surveillance.

### 4.8 IUs created by redistricting

IUs created by the division of a parent IU (redistricting type 1) from 2014 to 2025 add the rounds, effective rounds and epidemiological rounds counted in their parent IU in the year before their creation to their own, in every year. In the first year of a new IU, its cumulative MDA is the larger of its own cumulative MDA and that of the parent IU in the year before, plus the round of that year; the rounds of later years are then added. Only the first parent of a new IU is used. A parent IU without a record in the year before the creation adds no rounds. When the parent IU was itself created during the period, only the rounds counted in it since its creation are passed on.

## 4.9 Final classification and population no longer requiring treatment

Each IU-year receives one of the output categories of Table 4. In countries validated by WHO as having eliminated LF as a public health problem (Malawi and Togo in the current processing), IUs reported as non-endemic that were under post-intervention surveillance in any year are kept under post-intervention surveillance. The population no longer requiring treatment equals the total population for IUs under post-intervention surveillance, the total population minus the population requiring PC for IUs under targeted treatment, and zero otherwise.

**Table 4. Output categories of the LF tables**

| Category                                       | Condition                                         |
|------------------------------------------------|---------------------------------------------------|
| Endemic (under MDA)                            | Endemic, with an MDA round in the year            |
| Endemic (MDA not delivered)                    | Endemic, without MDA round in the year            |
| Endemic (under post-intervention surveillance) | Under surveillance (Sections 4.1, 4.7 and 4.9)    |
| Endemic (under targeted treatment)             | Category 15, stopped MDA and targeted treatment   |
| Endemicity unknown                             | Unknown                                           |
| Non-endemic                                    | Non-endemic, including countries listed in SOP-01 |
| Not reported                                   | No JRF or JRSM record for the IU-year             |

## 4.10 Country and regional indicators

Country tables are built for each country and year by summing the IU values (Table 5). Treatment indicators are summed over the IUs under MDA, with MDA not delivered, under post-intervention surveillance and under targeted treatment. Regional tables sum the country values by United Nations subregion (within each WHO region) and year, and recalculate coverage from the summed populations; no total for the whole region is calculated. A country is counted as having submitted its JRF in a year when it reported at least one IU, or when it is listed as not implementing MDA that year.

**Table 5. Indicators of the LF country and regional tables**

| Indicator                                       | Definition                                                                                                                                                                                       |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IUs by category</b>                          | Number of IUs in each category of Table 4                                                                                                                                                        |
| <b>Population requiring PC</b>                  | Sum over IUs under MDA, with MDA not delivered and under targeted treatment                                                                                                                      |
| <b>Population no longer requiring treatment</b> | Sum over IUs under post-intervention surveillance and targeted treatment                                                                                                                         |
| <b>Population targeted, treated</b>             | Sums over the treatment categories                                                                                                                                                               |
| <b>IUs requiring MDA</b>                        | IUs under MDA or with MDA not delivered (IUs under targeted treatment excluded)                                                                                                                  |
| <b>IUs with MDA, with effective MDA</b>         | Number of IUs with an MDA round, with an effective round                                                                                                                                         |
| <b>Programme and epidemiological coverage</b>   | Summed population treated / summed population targeted (or requiring PC) × 100                                                                                                                   |
| <b>IUs by regimen</b>                           | Number of IUs under MDA, with MDA not delivered or under post-intervention surveillance, by regimen (ALB+IVM, ALB+DEC, ALBx2, IDA, not delivered); IUs under targeted treatment are not included |

| Indicator     | Definition                                                                                                          |
|---------------|---------------------------------------------------------------------------------------------------------------------|
| JRF submitted | Country submitted the JRF or was not implementing MDA (country level);<br>number of such countries (regional level) |

### 4.11 Finalisation and publication

Before publication each category is given its standard numeric identifier, coverage is rounded to two decimals and other values to whole numbers, and the IU, country and regional tables are written to the ESPEN analytical database. The IU MDA history used in the processing is published for reference.

## 5. Quality assurance

- The number of IU-years whose endemicity was changed by the reconciliation is reported at each run, with a cross-tabulation of reported and retained categories.
- For each regimen, the number of records whose IU code was completed or replaced, not found, removed by the decisions of SOP-01 or duplicated is reported.
- The IUs under targeted treatment are listed by country and year, with a warning when none is found.
- New IUs and inconsistent parent names are written to log files. For IUs created by redistricting, the records whose cumulative MDA is lower than their rounds since 2013 are identified for review; they are not corrected automatically.
- The number of records stored in the database is checked against the number prepared.

## 6. Limitations

- The reconciliation with the contemporary classification is applied to 2013–2019 only; later years rely on the category reported.
- When several regimens are reported in the same IU and year, the largest figures are retained rather than their sum, and at most one round is counted per year.
- Treatment reported in IUs under post-intervention surveillance is kept in the population treated, while their population targeted is zero; country coverage can therefore exceed 100%.
- The inheritance of rounds by new IUs assumes that MDA was delivered uniformly in the parent IU.
- Cumulative MDA depends on the completeness of the historical record and on the assumption that it includes the 2014 round; the period covered by the historical record is under review.

## 7. Revision

This procedure describes the processing as implemented in the versions of the R scripts listed in Annex A (October 2026). It is revised whenever a decision rule, threshold, category or data source changes, and at least once a year before the new reporting cycle. Each revision is recorded in the table below.

| Version | Date            | Changes                                                                  |
|---------|-----------------|--------------------------------------------------------------------------|
| 0.1     | 19 October 2026 | First draft of SOP-02, prepared from the code of the processing scripts. |

## References

1. World Health Organization. Monitoring and epidemiological assessment of mass drug administration in the global programme to eliminate lymphatic filariasis: a manual for national elimination programmes. Geneva: World Health Organization; 2011. Available from: <https://www.who.int/publications/i/item/9789241501484>
2. World Health Organization. Monitoring and epidemiological assessment of mass drug administration in the global programme to eliminate lymphatic filariasis: a manual for national elimination programmes. 2nd ed. Geneva: World Health Organization; 2025. Available from: <https://www.who.int/publications/i/item/9789240105959>
3. World Health Organization. Guideline: alternative mass drug administration regimens to eliminate lymphatic filariasis. Geneva: World Health Organization; 2017. Available from: <https://www.who.int/publications/i/item/9789241550161>

## Annex A. Processing scripts

| Step | Script                    | Role in this procedure                                       |
|------|---------------------------|--------------------------------------------------------------|
| 1.4  | LF_AT_v05.R               | Sections 4.1 to 4.10                                         |
| 1.9  | ESPEN_AT_Transpose_v02.R  | Section 4.11: standard identifiers, rounding and publication |
| –    | Functions/JAP_functions.R | Import and linkage of the MDA records (import_mda_scheme)    |