

WHO Regional Office for Africa | ESPEN

ESPEN-DP-SOP-03

Onchocerciasis: processing of endemicity and mass drug administration data

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

Document type	Standard operating procedure — data processing
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Prepared by	ESPEN Data Team, WHO Regional Office for Africa
Scope	Endemicity, population requiring PC, MDA with ivermectin, coverage, cumulative rounds and elimination-mapping flag of onchocerciasis at implementation unit (IU), country and regional level, 2013–2025
Data sources	Harmonised IU endemicity and population (SOP-01); JRF MDA data for ivermectin with albendazole and ivermectin alone; ESPEN contemporary IU endemicity (2020); historical record of ivermectin treatment; list of redistricted IUs
Outputs	Onchocerciasis analytical tables at IU, country and regional level; onchocerciasis MDA history
Processing scripts	Steps 1.5 and 1.9 (Annex A)
Related documents	SOP-00; SOP-01; SOP-02 (shared MDA records and linkage); SOP-07

Abbreviations

ALB	Albendazole	LF	Lymphatic filariasis
APOC	African Programme for Onchocerciasis Control	MDA	Mass drug administration
IU	Implementation unit	OEM	Onchocerciasis elimination mapping
IVM	Ivermectin	PC	Preventive chemotherapy
JRF	Joint Reporting Form	PTS	Post-treatment (post-intervention) surveillance

1. Purpose and scope

This procedure describes how the onchocerciasis data reported by countries are processed into the ESPEN onchocerciasis analytical tables: the classification of each IU, the population requiring, targeted and treated, MDA rounds and their effectiveness, the identification of IUs of unknown status that may require onchocerciasis elimination mapping (OEM), and the summary indicators by country and region. It uses the same linkage of MDA records and the same reconciliation of endemicity as the LF procedure (SOP-02). The WHO criteria for stopping MDA and verifying elimination provide the programmatic background [1].

2. Data sources

Table 1. Data sources

Source	Content used
Harmonised IU dataset (SOP-01)	Onchocerciasis endemicity category, population and population requiring PC by IU and year, and the national population growth multiplier by year
JRF, MDA sheets	Population targeted, population treated and coverage for ivermectin with albendazole (ALB+IVM, shared with LF) and ivermectin alone (IVM)
Contemporary IU endemicity (2020)	Reference classification of the onchocerciasis 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 treatment record	Number of years of ivermectin treatment of each IU in the historical record compiled from APOC records; the processing assumes that the record includes the 2014 round
List of redistricted IUs; countries not implementing MDA	As in SOP-02

3. Definitions

Population requiring PC, population targeted and treated, programme and epidemiological coverage and MDA round are defined as in SOP-02. The definitions specific to onchocerciasis are given in Table 2.

Table 2. Terms specific to onchocerciasis

Term	Definition
Effective MDA round	IU-year with programme coverage of at least 80% (epidemiological: epidemiological coverage of at least 80%).
Cumulative MDA	Years of ivermectin treatment of the historical record, minus the round of 2014, plus the rounds counted since 2013 (Section 4.5).
Unknown, to consider for OEM	IU of unknown endemicity with no population treated (100 or more) with ALB+IVM or IVM in any year from 2013 to 2025, including years after the year concerned.
Unknown, under LF MDA	IU of unknown endemicity in which a population treated with ALB+IVM or IVM has been reported in at least one year from 2013 to 2025.
Population no longer requiring treatment	For IUs under post-intervention surveillance: the population requiring PC of the last year before surveillance, carried forward with the national growth multiplier (Section 4.7).

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, which updated the endemicity status of each IU on the basis of the survey data available. It is used as a benchmark and applied retrospectively to the years before the workshop (SOP-02, Section 4.1). The reported category is

reconciled with the contemporary IU classification for 2013–2019 with the same rules as for LF (SOP-02, Table 3); an IU listed in the contemporary classification without a recognised category is treated as non-endemic. From 2020 onwards the reported category is kept. The category originally reported is kept in the internal processing tables; it is not included in the published IU tables.

4.2 Population requiring PC

Endemic IUs keep the population requiring PC reported; when it is below 100, the total population of the IU is used (a missing value is set to zero). All other categories have no population requiring PC.

4.3 Linkage and combination of the MDA records

- The ALB+IVM records are those imported for LF; the IVM records are imported with the same linkage to IUs, the same application of the decisions of SOP-01 and the same rule of one record per IU, year and regimen (largest population treated).
- For each IU-year, the population targeted, the population treated and the coverage are taken from ALB+IVM when that value is reported and non-zero, and from IVM otherwise; values below 100 are set to zero. The regimen is the one with the larger population treated.
- When people were treated but the population targeted is missing or below 100, the population targeted is set to the population requiring PC. It is set to zero for IUs that are not endemic.
- When the population treated with ALB+IVM exceeds the population requiring PC of an endemic IU, both the population targeted and the population treated are limited to the population requiring PC.

4.4 MDA rounds and coverage

Programme and epidemiological coverage are calculated as for LF. An MDA round is counted when coverage is above zero and an effective round when it reaches 80%. MDA rounds are counted only in endemic IUs, at most one per IU and year.

4.5 Cumulative rounds

Rounds and effective rounds are accumulated for each IU from 2013. The cumulative MDA is the number of years of ivermectin treatment of the historical record, minus the round of 2014 (which the 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, whose cumulative MDA can therefore 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.

4.6 IUs created by redistricting

New IUs add the rounds and effective rounds counted in their first parent IU in the year before their creation to their own, and their cumulative MDA starts from the larger of their own value and that of the parent IU, with the same rules as in SOP-02 (Section 4.8).

4.7 Final classification and population no longer requiring treatment

Each IU-year receives one of the output categories of Table 3. For IUs under post-intervention surveillance, the population no longer requiring treatment starts from the population requiring PC of the last year before surveillance and is carried forward each year with the national growth multiplier (value of the previous year $\times$ multiplier of the year); it is never larger than the total population, and equals the total population when the carried value is zero. When the multiplier of a year is missing, or no population requiring PC is available for the year before surveillance, the total population is used from that year onwards.

Table 3. Output categories of the onchocerciasis 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
Unknown (consider Oncho Elimination Mapping)	Unknown, no population treated (100 or more) with ALB+IVM or IVM in any year from 2013 to 2025
Unknown (under LF MDA)	Unknown, otherwise
Non-endemic	Non-endemic, including countries listed in SOP-01
Not reported	No JRF or JRSM record for the IU-year

4.8 Country and regional indicators

Country and regional tables are built as for LF (SOP-02, Table 5); regional tables are by United Nations subregion within each WHO region. Treatment indicators are summed over the IUs under MDA, with MDA not delivered and under post-intervention surveillance; IUs requiring MDA are those under MDA or with MDA not delivered; IUs are counted by regimen (ALB+IVM, IVM, not delivered); coverage is recalculated from the summed populations.

4.9 Finalisation and publication

Categories are given their standard identifiers, values are rounded (coverage to two decimals) and the IU, country and regional tables and the MDA history are written to the ESPEN analytical database.

5. Quality assurance

- The number of IU-years whose endemicity was changed by the reconciliation is reported at each run.
- For the IVM records, the results of the linkage (codes completed or replaced, records not found, removed or duplicated) are reported.
- For IUs created by redistricting, the records whose cumulative MDA is lower than their rounds since 2013 are identified for review (not corrected automatically); a warning is given if a country has more than one growth multiplier in a year.
- Categories found in the data but not foreseen in the country tables are reported.

6. Limitations

- The reconciliation with the contemporary classification is applied to 2013–2019 only.
- Loiasis co-endemicity is not used in this procedure; it is taken into account in the co-endemicity tables (SOP-07).
- The OEM flag is based on the absence of any treatment with ALB+IVM or IVM reported from 2013 to 2025, including years after the year concerned; it is an indication for review, not a programmatic decision.
- Ivermectin delivered as IDA for LF is not counted for onchocerciasis (treatment, rounds, coverage or OEM flag).

- Treatment reported in IUs under post-intervention surveillance is kept in the population treated, so country coverage can exceed 100%.
- The population no longer requiring treatment of IUs under surveillance is an estimate based on national growth rates.

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-03, prepared from the code of the processing scripts.

References

1. World Health Organization. Guidelines for stopping mass drug administration and verifying elimination of human onchocerciasis: criteria and procedures. Geneva: World Health Organization; 2016. Available from: <https://www.who.int/publications/i/item/9789241510011>

Annex A. Processing scripts

Step	Script	Role in this procedure
1.5	Oncho_AT_v05.R	Sections 4.1 to 4.8
1.9	ESPEN_AT_Transpose_v02.R	Section 4.9
–	Functions/JAP_functions.R	Import of the IVM records (import_mda_scheme); population carried forward (carry_forward_pop)