

WORLD HEALTH ORGANIZATION
GLOBAL PROGRAMME TO ELIMINATE
LYMPHATIC FILARIASIS

TRAINING IN MONITORING AND
EPIDEMIOLOGICAL ASSESSMENT
OF MASS DRUG ADMINISTRATION
FOR ELIMINATING LYMPHATIC
FILARIASIS

Effective monitoring and evaluation are necessary to achieve the goals of LF elimination. After mass administration of medicines according to the guidelines established by WHO, programmes must be able to assess whether the interventions have succeeded in lowering the prevalence of infection to a level at which transmission is no longer likely to be sustainable. Transmission assessment survey (TAS) is designed to provide a simple, robust survey design for documenting that the prevalence of lymphatic filariasis among 6–7 year old children is below a predetermined threshold; to provide the evidence base for programme managers that MDA can be stopped; and to assure national governments that national programmes have achieved their elimination goals.

This manual is designed to teach personnel of national programmes to eliminate lymphatic filariasis, including regional and district health personnel, the essential elements of monitoring and evaluating national programmes to eliminate LF. The focus is on planning and implementing TAS as an input to decide whether to move from MDA to post-MDA surveillance.

TRAINING IN MONITORING AND EPIDEMIOLOGICAL ASSESSMENT OF MASS DRUG ADMINISTRATION FOR ELIMINATING LYMPHATIC FILARIASIS

LYMPHATIC FILARIASIS

TAS

FACILITATORS' GUIDE

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Department of Control of Neglected Tropical Diseases (NTD)
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**World Health
Organization**

WHO Library Cataloguing-in-Publication Data

Training in monitoring and epidemiological assessment of mass drug administration for eliminating lymphatic filariasis: facilitators' guide.

Contains slides

1.Elephantiasis, Filarial – drug therapy. 2.Filariasis – drug therapy. 3.Filariasis – epidemiology. 4.Drug therapy - methods. 5.National health programs. 6.Program evaluation 7.Teaching materials. I.World Health Organization.

ISBN 978 92 4 150544 4

(NLM classification: WC 880)

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Printed in Italy.

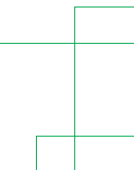
WHO/HTM/NTD/PCT/2013.8

Preparation of this document was supported by the Department for International Development of the Government of the United Kingdoms of Great Britain and Northern Ireland.



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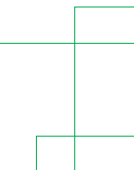


Acknowledgements

Training in monitoring and epidemiological assessment of mass drug administration for eliminating lymphatic filariasis—facilitators' guide was produced under the overall supervision of Dr Lorenzo Savioli, Director, and Dr Dirk Engels, Coordinator, Department of Control of Neglected Tropical Diseases.

WHO expresses its sincere thanks to all those who contributed to preparation of this document. Special thanks are due to the following individuals: Dr Steve Ault (WHO Regional Office for the Americas), Dr Riadh Ben-Ismaïl (WHO Regional Office for the Eastern Mediterranean), Ms Molly Brady (RTI International), Dr Eva-Maria Christophel (WHO Regional Office for the Western Pacific), Mr Brian Chu (Task Force for Global Health, USA), Dr Aditya Prasad Dash (WHO Regional Office for South-East Asia), Dr Amadou Garba (WHO Regional Office for Africa), Prof John Gyapong (University of Ghana), Dr Kaliannagounder Krishnamoorthy (Vector Control Research Centre, India), Dr Louise Kelly Hope (Centre for Neglected Tropical Diseases, Liverpool School of tropical Medicine, United Kingdom), Dr Patrick Lammie (United States Centers for Disease Control and Prevention), Dr Adiele Onyeze (WHO Regional Office for Africa), Dr Eric Ottesen (Task Force for Global Health, USA), Dr Reda Ramzy (National Nutrition Institute, Egypt), Dr Maria Rebollo (Centre for Neglected Tropical Diseases, Liverpool School of tropical Medicine, United Kingdom), Ms Angela Weaver (United States Agency for International Development), Ms Kimberly Won (United States Center for Disease Control and Prevention), Dr Hany Ziady (WHO Regional Office for the Eastern Mediterranean) and Ms Katie Zoerhoff (RTI International).

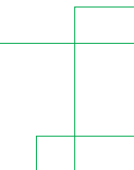
The training modules developed by Ms Kimberly Won (United States Center for Disease Control and Prevention) formed the basis for this document. Dr Aya Yajima (WHO Department of Control of Neglected Tropical Diseases) and Dr Kazuyo Ichimori (Focal Point for Lymphatic Filariasis Elimination, WHO Department of Control of Neglected Tropical Diseases) prepared the final draft.





Abbreviations

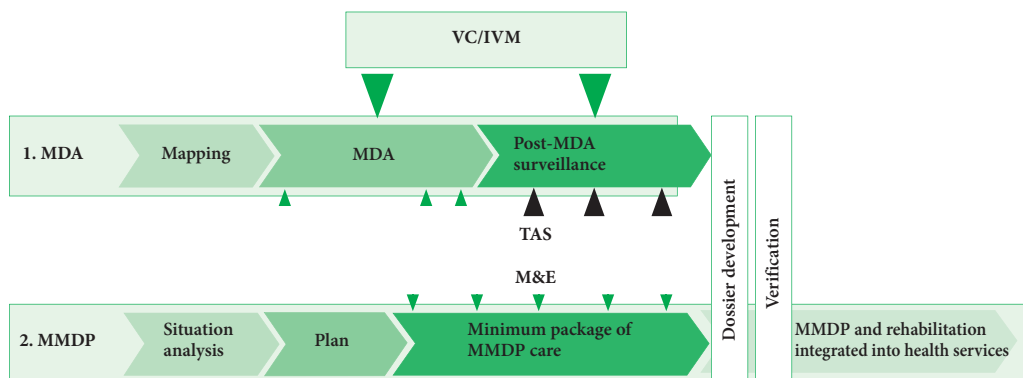
Ag	antigenaemia
ELISA	enzyme-linked immunosorbent assay
EU	evaluation unit
GPELF	Global Programme to Eliminate Lymphatic Filariasis
MDA	mass drug administration
Mf	microfilaraemia
ICT	immunochromatographic test
IU	implementation unit
PCR	polymerase chain reaction
RPRG	regional programme review group
TAS	transmission assessment survey
WHO	World Health Organization



Introduction

In 1997, the Fiftieth World Health Assembly resolved to eliminate lymphatic filariasis (LF) as a public health problem. In response, the World Health Organization (WHO) established the Global Programme to Eliminate Lymphatic Filariasis (GPELF) to assist Member States in achieving this goal by 2020. The two components of the GPELF are (i) to reduce the prevalence of infection to levels at which it is assumed that transmission can no longer be sustained and (ii) to manage morbidity and prevent disability (*Figure 1*).¹

Figure 1. Two components of the Global Programme to Eliminate Lymphatic Filariasis: interrupting transmission and preventing morbidity and managing disability among people with the disease



Arrows represent epidemiological assessment recommended as part of monitoring and evaluation of the national programme. VC/IVM, vector control and integrated vector management; MDA, mass drug administration; TAS, transmission assessment survey; M&E, monitoring and evaluation; MMDP, morbidity management and disability prevention.

¹ WHO Global Programme to Eliminate Lymphatic Filariasis (GPELF) progress report 2000–2009 and strategic plan 2010–2020. (WHO/HTM/NTD/PCT/2010.6). Geneva, World Health Organization, 2010.

To eliminate LF, WHO recommends delivery of combinations of two medicines to entire populations at risk, by a strategy known as ‘mass drug administration (MDA)’. This involves four steps: mapping, MDA, post-MDA surveillance and verification of elimination.²

Effective monitoring and evaluation are necessary to achieve the goals of LF elimination. After mass administration of medicines according to the guidelines established by WHO, programmes must be able to assess whether the interventions have succeeded in lowering the prevalence of infection to a level at which transmission is no longer likely to be sustainable. *The Progress report 2000–2009 and strategic plan 2010–2020 of the GPELF*,¹ which reviewed progress made in the first decade of the programme, highlighted the remaining challenges for the coming decade and proposed ways to reach the global goal of elimination by 2020. The milestone for 2011 was revision of WHO guidelines on interrupting transmission and conducting post-MDA surveillance. Accordingly, in 2011, WHO published a manual for monitoring and epidemiological assessment of MDA.³ The manual described a new, standardized method for measuring prevalence, the ‘transmission assessment survey (TAS)’, in which blood diagnostic test results are used to determine whether areas have reached a critical threshold of infection. The results of a TAS provide evidence for deciding whether to stop or continue MDA.

Objectives of training

The manual is designed to teach the essential elements of monitoring and evaluating national programmes to eliminate LF.³ The focus is on planning and implementing TAS as an input to decide whether to move from MDA to post-MDA surveillance.

After completing the course, learners will understand:

- the elements of a TAS,
- how to plan and implement a TAS in an evaluation unit (EU), and
- the actions required after implementation of a survey.

The procedure for conducting a TAS is illustrated in *Figure 2*. The training course is designed as a 3-day workshop to present the essential elements of monitoring and evaluation in the GPELF and to prepare a plan for conducting a TAS appropriately in accordance with WHO guidelines. The modules are structured into two parts (*Table 1*): the theory behind each chapter and a practical part, which introduces recommended practices for applying the theory in the field.

² WHO *Transmission assessment surveys in the Global Programme to Eliminate Lymphatic Filariasis*. WHO position statement. Geneva, World Health Organization, 2012.

³ WHO *Monitoring and epidemiological assessment of mass drug administration: a manual for national elimination programmes*. Geneva, World Health Organization, 2011.

Figure 2. Procedure for conducting a transmission assessment survey and corresponding modules

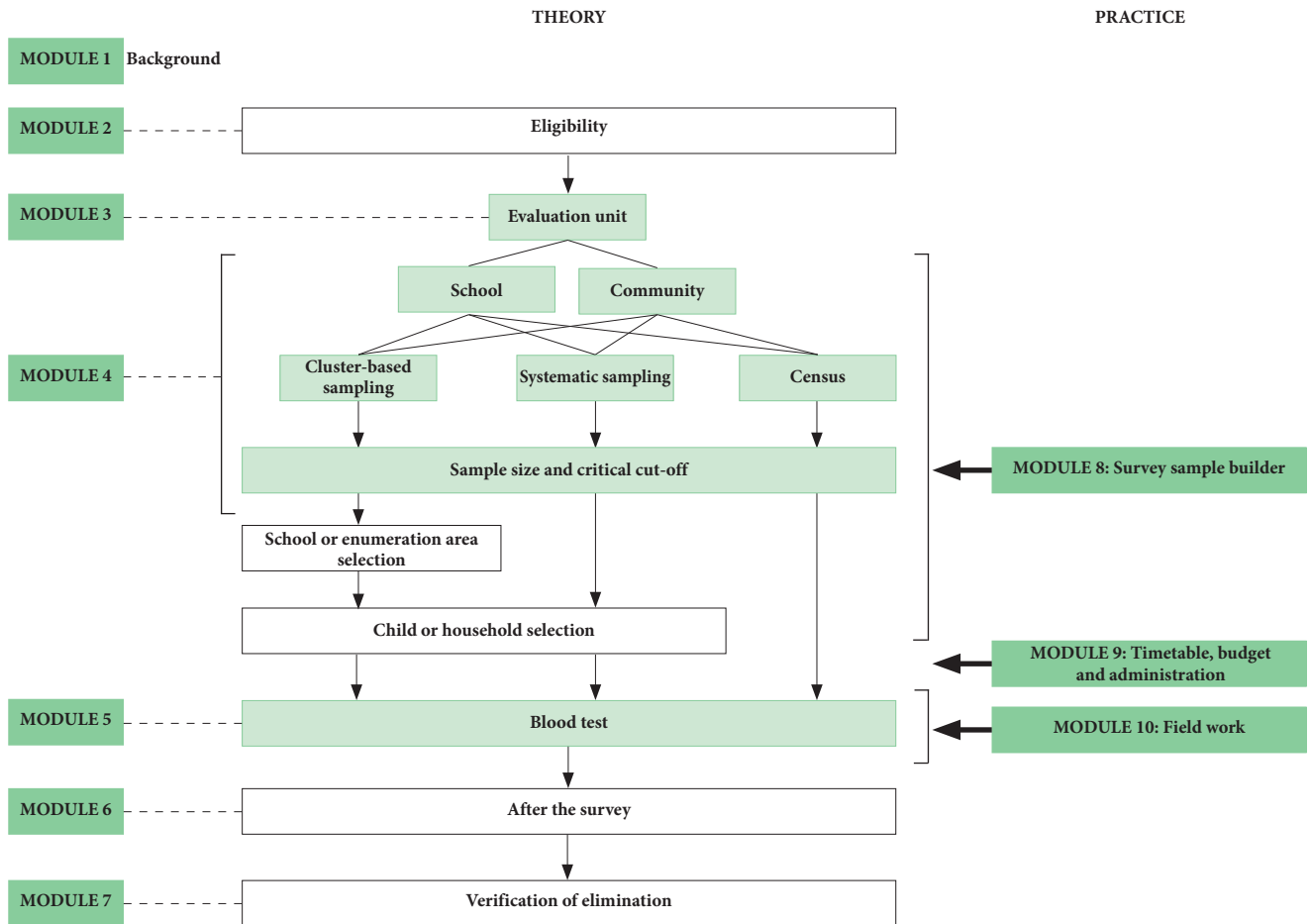


Table 1. Structure of training modules and relevant chapter of the 2011 WHO monitoring and evaluation manual³

Training module	Relevant chapter of manual	Suggested learners	
		National programme personnel	Subnational programme personnel
THEORY			
Module 1. Background	<ul style="list-style-type: none"> Chapter 1. Eliminating lymphatic filariasis Chapter 2. Recommended strategy for interrupting transmission Chapter 4. Mapping 	√	√
Module 2. Eligibility for a TAS	<ul style="list-style-type: none"> Chapter 5. Monitoring coverage of mass drug administration Chapter 6. Assessing the impact of mass drug administration through sentinel and spot-check sites Chapter 7.2. When should surveys occur? 	√	√
Module 3. Evaluation unit	<ul style="list-style-type: none"> Chapter 7.1. What geographical area should be used? 	√	
Module 4. Survey design	<ul style="list-style-type: none"> Chapter 7.3 How should the surveys be implemented? 	√	
Module 5. Diagnostic tests	<ul style="list-style-type: none"> Chapter 3. Diagnostic tools 	√	√
Module 6. After the survey	<ul style="list-style-type: none"> Chapter 8. Implementing activities and surveillance after mass drug administration has stopped 	√	√
Module 7. Verification of elimination	<ul style="list-style-type: none"> Chapter 9. Verifying the absence of transmission 	√	
PRACTICE			
Module 8. Survey sample builder	<ul style="list-style-type: none"> Annex 5. Detailed protocol for transmission assessment survey 	√	
Module 9. Timetable, budget and administration	None	√	√
Module 10. Field-work	<ul style="list-style-type: none"> Annex 5. Detailed protocol for transmission assessment survey 	√	√

For whom are these training modules intended?

These training modules are intended for personnel at two levels:

- personnel of national programmes to eliminate LF who are responsible for planning, implementing and reporting on TAS and for training subnational personnel. The learners should include a national programme manager, a monitoring and evaluation officer and a laboratory officer. They might also include subnational health personnel.
- regional or district health personnel who will prepare and implement field-work and report to the national programme manager.

Why provide a facilitators' guide?

This guide is intended to assist teaching of the fundamental elements of TAS and the practical skills that are required to prepare a national action plan (or workplan) for conducting a survey. It ensures that standard messages are delivered to learners and thus that the plans for and implementation of a survey in a national programme conform to WHO's guidelines in all countries endemic for LF.

When should the training be done?

A national workshop should be conducted when the national programme manager anticipates completion of five rounds of MDA with $\geq 65\%$ coverage in one or more implementation units (IUs). Subnational training could be planned when a district (i.e. IU) anticipates or has completed five rounds with $\geq 65\%$ coverage.

Who should conduct and facilitate the training?

Both national and subnational workshops should be organized by the national programme manager. The workshops should be facilitated by personnel from the national programme, including the programme manager, the monitoring and evaluation focal point, scientists and laboratory technicians. Alternatively, workshops might be facilitated by previously trained technical partners.

How should the workshop be designed and run?

As a facilitator, you are responsible for selecting and arranging the modules to suit the type of workshop and the learners. You will also set the timetable, organize and run the workshop, explain the learning objectives of each module and help learners as needed. For suggested learners for each module, see *Table 1*.

You should read both the learners' guide⁴ and this facilitators' guide before planning your workshop to obtain an overall picture. The learning objectives are listed at the beginning of each module in both guides. These summarize the knowledge and skills that each learner should have acquired by the end of that module. In general, interactive learning encourages active participation and is more effective than lectures, which are kept to minimum in this training course. Each module in the facilitators' guide gives instructions on use of demonstrations, role-play involving the learners and practical exercises, as appropriate (see 'Teaching methods'). Facilitators should ensure that each learner has achieved the stated objectives of each module before proceeding to the next.

⁴ WHO. *Training in monitoring and epidemiological assessment of mass drug administration for eliminating lymphatic filariasis. Learners' guide*. Geneva, 2013.

Training facilities and equipment required

Training facilities

Basic facilities and equipment must be organized before training can begin. Bear in mind that there might be long intervals between ordering supplies and receiving them. The workshop should take place in a room equipped with chairs and tables to accommodate all participants and allow group discussion. A personal computer and projector should be available to project the slides on a screen. Everyone should have a clear view of the screen. At least one personal computer per group of learners will be required in order to prepare a TAS plan with the survey sample builder.

Use of diagnostic tests can be demonstrated by facilitators or laboratory technicians in the same room or in a separate laboratory, depending on the facilities.

Teaching equipment

The following equipment should be available for training sessions and group work:

- a personal computer with Microsoft Power Point and Microsoft Excel
- a projector
- a projector screen
- a flipchart and marker pens, blackboard and chalks or whiteboard and marker pens for group discussions
- electric extension cords and plugs.

Learners' equipment

The following items should be available for each learner.

- the 2011 WHO monitoring and evaluation manual³
- the learners' guide⁴
- stationery (e.g. notepads, pencils)
- at least one personal computer with Microsoft Excel and Microsoft Power Point per group of learners
- the survey sample builder (Downloadable from: <http://www.filariasis.us/resources.html>)

Supplies for demonstration of diagnostic tests

The materials and equipment shown in *Figure 3* should be available, and a suitable room if necessary.

Figure 3. Supplies needed for a transmission assessment survey

<p>Blood collection</p> <ul style="list-style-type: none"> • ICTs or Brugia Rapid™ tests • Positive control for ICT cards • Calibrated capillary tubes • Gloves • Lancets • Cotton • Alcohol swabs • Sharps container • Absorbent underpads • Markers or pens • Garbage bags • Watch or timer • Registration books or paper forms • Clipboards • Bags or backpacks to carry supplies and paperwork to the field • Paper clips, rubber bands or envelopes to secure written consent forms 	<p>ADDITIONAL SUPPLIES NEEDED FOR Diagnostic tests performed at a central location:</p> <ul style="list-style-type: none"> • Blood collection tubes • Cooler (for transporting blood samples) • Plastic bags • Tissue or toilet paper • Micropipettes (P200) and pipette tips • Rack to hold blood collection tubes • Positive control 	
	<p>Performing microfilariae testing:</p> <ul style="list-style-type: none"> • Slides • Slide folders and boxes • Giemsa stain • Methanol 	<p>Collecting filter paper blood spots:</p> <ul style="list-style-type: none"> • Filter paper disks • Plastic bags • Pencils • Styrofoam
	<p>Treatment for positive cases:</p> <ul style="list-style-type: none"> • Diethylcarbamazine (DEC) or ivermectin plus albendazole <p>Procurement of medicines should be prepared in advance of a TAS to ensure a supply of medicines to treat positive cases.</p>	

Teaching methods

The following methods can be used in a training workshop. The recommended methods are indicated in each module.

Presentations

Presentations in the form of lectures provide theoretical and practical information for staff of national programmes for planning and implementing TAS. Lectures are usually followed by group work or practical exercises. The slides for the modules are downloadable from http://www.who.int/lymphatic_filariasis/resources/TAS_training_materials/en. These can be used by learners for preparatory reading, as hand-outs during training and as practical resources during a survey.

Practical exercises and group work

At the end of most modules, learners are given exercises to help them gain practical experience, e.g. preparing a budget and timetable for conducting a survey and designing a survey with the 'survey sample builder'. Learners will work in small groups, ideally with colleagues from the same country, to apply the theory to their country situation. The outcomes of the practical exercises should form part of the country presentations at the end of the workshop and can also be included in the national TAS plan.

Demonstration

In module 5, 'Diagnostic tests', the preparation, use and reading of diagnostic tests will be demonstrated by the facilitators.

Role-play

In the role-play exercise, learners are asked to simulate field situations, such as playing the part of a field team in module 10. For example, they might determine the ideal work flow for a phlebotomist taking a blood sample from a child and preparing a diagnostic test or for a person reading a diagnostic test. The learners should then discuss their observations to identify the most effective organization of field-work.

Preparation

In order to obtain maximum benefit from the course, facilitators should send out the following documents well in advance of the workshop and ask learners to arrive with information that will allow preparation of a workplan:

- Pertinent data on eligibility for conducting a TAS should be collected and entered on the 'INTRO' and 'ELIGIBILITY' worksheets of the **TAS Eligibility and Reporting Form**. These data include information on implementation units (IU), MDA coverage and sentinel site and spot-check survey results. The workplan prepared during the workshop will be for at least one EU, so data entered onto the worksheet should be for an area in which a TAS is likely to be conducted soon.
- Pertinent data for preparing a TAS should be collected and entered on the 'Sampling frame' section in the 'SURVEY DESIGN' worksheet of the **TAS Eligibility and Reporting Form** for each EU. These data include the number of 6–7-year-old children and net primary school enrolment rates.
- While some of the actual costs may not be known, general estimates will help to prepare an overall budget. A **budget template** with general budget categories is provided.
- Country maps indicating endemic IUs are helpful for defining EUs and can be used for country presentations at the end of the course.
- A complete list of public and private primary schools or census enumeration areas for the area defined on the 'SURVEY DESIGN' worksheet of the **TAS Eligibility and Reporting Form** should be available.

Annex 1 provides an example of the information sheet on a TAS training workshop, which can be sent to the participants together with timetable of the workshop and the above-mentioned documents (i.e. the **TAS Eligibility and Reporting Form** and a budget template) for their preparation before the workshop.

Evaluation

Evaluation of learners

A test to be taken before and after training is provided in *Annex 2* to allow learners to evaluate their own progress. The results can also be used by the facilitators to evaluate the effectiveness of the workshop.

Evaluation of the training by the learner

Facilitators should evaluate the quality of the workshop by means of responses to a questionnaire at the end of each day. This type of feedback is useful for improving future training. Frankness can be encouraged by allowing learners to respond anonymously. A sample questionnaire is shown in *Annex 3*.

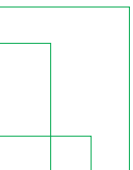
Timetable

Evaluation of learners

The timetable in *Table 2* for the 3 days of a national training workshop is proposed as a guide only, which is designed to follow the procedure for conducting a TAS (*Figure 2*). The order of the modules can be rearranged to best fit the objectives of the workshop. A workshop at subnational level might focus on planning and implementation of field-work (i.e. modules 1, 2, 5, 6, 9 and 10), for which fewer than 3 days might suffice. A field visit might be arranged. Also, as the workshop progresses, more or less time can be allocated to topics that the learners find either particularly difficult or easy to understand.

Table 2. Proposed timetable for 3/day national training workshop

Time	Activity	Teaching method
Day 1		
30 min	Introduction and pre-training test	Test
1 h	Module 1: Background	Presentation
1 h	Module 2: Eligibility for a TAS	Presentation
Break		
2 h	Module 3: Evaluation unit	Presentation, group work
Lunch		
2 h	Module 4: Survey design	Presentation, demonstration, practical exercise
Break		
1.30 h	Module 8: Survey sample builder	Presentation, practical exercise, group work
10 min	Evaluation of day 1	Questionnaire
Day 2		
15 min	Review of day 1	General discussion
1.30 h	Module 5: Diagnostic tests	Presentation, group work
Break		
1 h	Module 9: Timetable, budget and administration	Presentation, practical exercise, group work
Lunch		
1.30 h	Module 10: Field-work	Presentation, role-play
1 h	Module 6: After the survey	Presentation
Break		
1 h	Module 7: Verification of elimination	Presentation
10 min	Evaluation of day 2	Questionnaire
Day 3		
2 h	Group presentations: Work plan for one evaluation unit	
Break		
2 h	Group presentations: Work plan for one evaluation unit	
Lunch		
2 h	Group presentations: Work plan for one evaluation unit	
30 min	Post-training test	
30 min	Discussion of outstanding issues	
30 min	Closing remarks	





■ *THEORY OF
TRANSMISSION
ASSESSMENT SURVEYS
(TAS)*

MODULE 1

Background

DURATION: 1 HOUR

Learning objectives:

By the end of this module, learners should be able to answer the questions:

- What is lymphatic filariasis (LF)?
- What is the Global Programme to Eliminate LF (GPELF)?
- What is a transmission assessment survey (TAS)?
- How does a national programme report to the GPELF?

Relevant sections of *the 2011 WHO monitoring and evaluation manual*³

- Chapter 1. Eliminating lymphatic filariasis
- Chapter 2. Recommended strategy for interrupting transmission
- Chapter 4. Mapping

Teaching method: Presentation

This module provides an overview of LF and the GPELF. The programme steps and strategy will be described, with an emphasis on monitoring and evaluation. The limitations of the previous WHO monitoring and evaluation guidelines will be presented, and the TAS will be introduced.

Present the learning objectives and an overview of the module (slides 2 and 3).

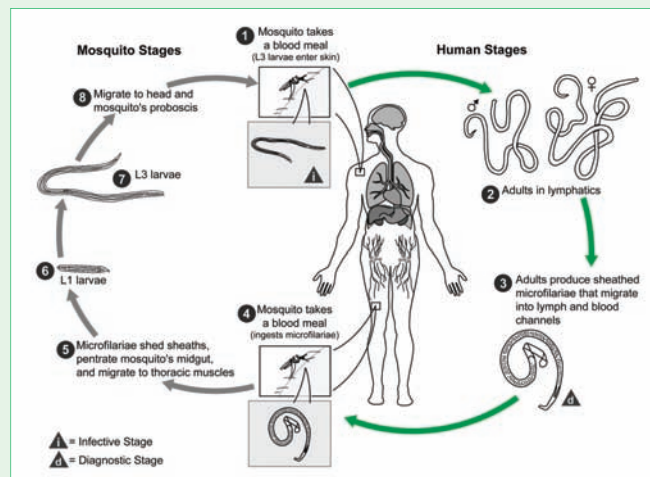
What is lymphatic filariasis (LF)? (slides 4–6)

The photographs on slide 4 are images of microfilariae of three filarial worms, *Wuchereria bancrofti*, *Brugia malayi* and *B. timori*, that can be observed in blood films stained with Giemsa.

The map of endemic countries on slide 6 should be updated as necessary. An updated map will be available from WHO Global health observatory map gallery at <http://gamapserver.who.int/mapLibrary/app/searchResults.aspx>.

Box 1. Life-cycle of lymphatic filariasis

Figure 4 shows the development stages of both the vector (mosquito) and the host (human):



- Third-stage filarial larvae (L3) are dropped onto the skin of a human host chosen by an infected female mosquito during its blood meal.
- The larvae subsequently penetrate the bite wound, invade the lymphatic system and develop into adults.
- The adult worms (male and female) reside in the lymphatic system, and, after mating, produce microfilariae, which circulate in the bloodstream.
- Microfilariae actively migrate between the lymphatic system and the bloodstream to reach the peripheral blood vessels.
- When another female mosquito ingests a blood meal, the microfilariae are taken into the stomach with the blood.
- Some microfilariae develop into infective third-stage larvae (L3), which migrate to the mosquito's proboscis, where they can continue to infect another human host when the mosquito takes a blood meal.

Global Programme to Eliminate Lymphatic Filariasis (GPELF) (slides 7 and 8)

You can refer to *Figure 1* in the Introduction, which shows that a LF elimination programme consists of two components: (i) mass drug administration (MDA) and (ii) morbidity management and disability prevention. This training module addresses MDA, as the TAS is a standard method for deciding whether to stop MDA and to initiate post-MDA surveillance.

Programmatic steps for interrupting transmission (slide 9)

Slide 9 illustrates the programme steps to be taken by the national programme to interrupt transmission of LF by implementing MDA. Explain the four steps, which are illustrated in detail in subsequent slides.

Remind the participants that mapping and MDA are done by the implementation unit (IU) and TAS and post-MDA surveillance by the evaluation unit (EU). A dossier for verification of elimination can be submitted only when all the EUs containing all the endemic IUs in the country have completed post-MDA surveillance.

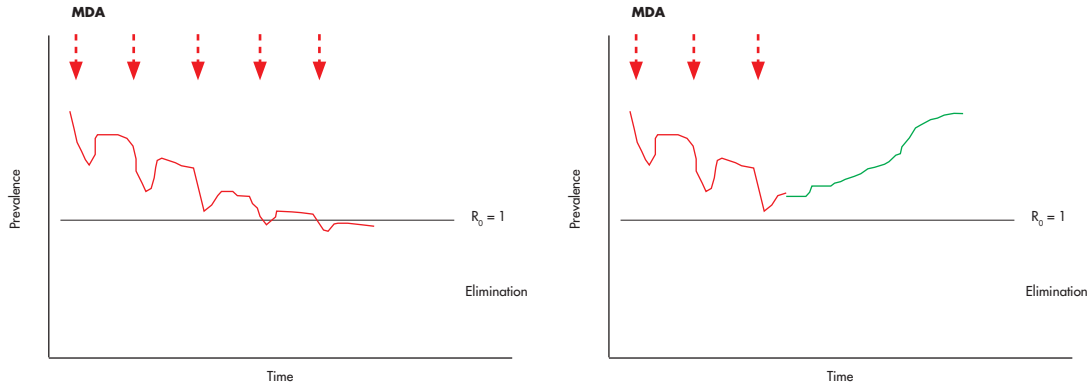
Mapping (slide 10)

Mapping provides a quick estimate of prevalence in at least two areas considered to be at higher risk than other areas in the IU, in order to assess whether the prevalence of infection is high enough to sustain transmission. It is not conducted to measure the prevalence of microfilaraemia (Mf) or antigenaemia (Ag) in an IU. Mapping can be done either by reviewing existing information on morbidity due to LF, or by conducting a mapping survey. The results are used to classify the IU as endemic ($\geq 1\%$ prevalence of Mf or Ag) or non-endemic.

MDA (slide 11)

The objective of annual MDA in an endemic community for at least 5 years with coverage of at least 65% of the total population is to reduce (i) the density of microfilariae circulating in the blood of infected individuals and (ii) the prevalence of infection in the entire community to levels at which it is assumed that microfilariae can no longer be transmitted by mosquito vectors to new human hosts. In the absence of intervention, the prevalence of LF is expected to remain stable (*Figure 5, left*).² Theoretically, there is a threshold (R_0) below which transmission is likely not to continue even in the absence of intervention (e.g. MDA). The purpose of MDA is to reduce the microfilariae density or load in infected individuals below this threshold. As withdrawing treatment too early can result in recrudescence (*Figure 5, right*), it is essential that MDA be stopped at the appropriate time.

Figure 5. Theoretical impact of effective mass drug administration on the prevalence of microfilaraemia in infected individuals to a threshold below which transmission is no longer likely to continue in the absence of intervention (left) and recrudescence with insufficient rounds of mass drug administration (right)



MDA, mass drug administration; R_0 , threshold below which transmission is likely not to continue even in the absence of intervention

The effectiveness of MDA in reducing the prevalence of infection depends on the proportion of the population that ingests the medicines every year. The minimum effective coverage is considered to be 65% of the total population; however, the number of rounds required to achieve this goal depends on factors such as:

- the baseline prevalence of infection
- the baseline intensity of transmission
- the efficacy of the medicines
- parasite and vector combinations
- vector abundance and transmission potential.

Monitoring and evaluation during MDA (slide 12)

Once MDA has been initiated, national programmes must effectively monitor the performance, appropriately assess when infection has been reduced to levels at which transmission is likely no longer sustainable (impact) and subsequently conduct adequate surveillance. Slide 12 summarizes the monitoring and evaluation activities required in national programmes.

The eligibility of each IU for a TAS is assessed from the outcomes of monitoring and evaluation in the MDA phase, the details of which are explained in module 2.

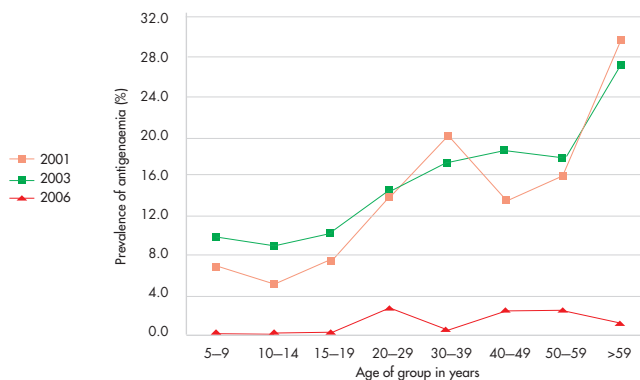
Transmission assessment survey (TAS) (slide 13)

It is important to emphasize that the TAS is a standardized method based on blood tests that is used to decide whether to stop MDA. 'Passing' a TAS means that the prevalence of LF in the EU has been lowered to a level at which transmission is probably no longer sustainable and recrudescence is unlikely to occur even in the absence of MDA.

The target population of a TAS is children aged 6–7 years. The rationale is that children in this age group should have lived most (or all) of their lives during MDA in the area being surveyed. If adequate drug coverage was achieved, the infection rate in the population should have decreased, with little potential transmission, so that young children are probably protected from infection. Therefore, any positive results in young children in areas in which MDA was successful are likely to indicate recent transmission.

Figure 6 shows the age-specific prevalence of filarial antigen in American Samoa in relation to annual rounds of MDA. Data from sentinel sites in the early stage of the programme (green and orange lines) indicate that the prevalence of Ag was relatively high, even in the youngest children, and increased with age. After multiple rounds of MDA, the prevalence decreased significantly in all age groups. In 2006 (red line), no positive individuals (aged 5–19 years) were identified, while residual Ag was found in adults (≥ 20 years). This figure therefore shows the impact of MDA and the rationale for using young children in TAS.

Figure 6. Age-specific prevalence of filarial antigen in American Samoa, 2002/2006



From Liang JL et al. Impact of five annual rounds of mass drug administration with diethylcarbamazine and albendazole on *Wuchereria bancrofti* infection in American Samoa. *American Journal of Tropical Medicine and Hygiene*, 2008, 78:924–928

Limitations of the previous guideline (slide 14)

In the 2005 WHO monitoring and evaluation manual⁵, a decision to stop MDA was based on the results of a ‘lot quality assurance survey’ of 3000 young children. Such surveys were difficult to conduct, and an extremely conservative threshold was used for making a decision. Two main difficulties were encountered. The first was that many schools had to be visited to obtain a systematic sample of 3000 children, which had significant implications on the time and resources for the survey. The second was the conservative threshold: if one positive child was found, it was recommended that MDA be continued. Thus, the probability of ‘passing’ the survey was very low.

⁵ *Monitoring and epidemiological assessment of the programme to eliminate lymphatic filariasis at implementation unit level*. Geneva, 2005. (WHO/CDS/CPE/CEE/2005.50).

The 2011 WHO monitoring and evaluation manual³ was prepared to simplify the method. The main changes between two editions of the manual on monitoring and epidemiological assessment of mass drug administration (2005 and 2011) are summarized in *Annex 2* of the learners' guide⁴.

Post-MDA surveillance (slide 15)

A TAS is not only important in deciding to stop MDA but is also a method recommended in post-MDA surveillance to detect recrudescence of transmission. Surveys should be repeated at least twice after MDA, at an interval of 2–3 years, to ensure that recrudescence has not occurred and that transmission can therefore be considered interrupted.

Additional surveillance activities may be conducted, in addition to periodic TAS. The details are explained in module 6.

Reporting from a national programme to the GPELF (slide 16)

The slide illustrates a proposed mechanism for a national programme to report its TAS plan as a part of its annual workplan, via WHO, to regional programme review groups (RPRG). This will allow the RPRG to review the plan and provide guidance if necessary, and GPELF to forecast future resource needs and monitor the progress of national programmes at regional and global levels.

Annex 3 of the learners' guide gives the WHO TAS Eligibility and Reporting Form. Providing the information on eligibility for a TAS helps national programme managers to summarize and review eligibility systematically before planning the survey. Encourage participants to use the form. The eligibility criteria for a TAS are explained in module 2.

MODULE 2

Eligibility for a TAS

DURATION: 1 HOUR

Learning objectives:

By the end of this module, learners should understand how to assess the eligibility of an IU for a TAS on the basis of:

- epidemiological drug coverage (programme coverage)
- prevalence of infection at sentinel sites
- prevalence of infection at spot-check sites

Relevant sections of the 2011 WHO *monitoring and evaluation manual*³

- Chapter 5. Monitoring coverage of mass drug administration
- Chapter 6. Assessing the impact of mass drug administration through sentinel and spot check sites
- Chapter 7.2. When should surveys occur?

Teaching method: Presentation

This module explains how to assess an IU for its eligibility for a TAS. Epidemiological drug coverage is defined; the method for conducting sentinel and spot-check surveys is described, and the importance of reporting the results to WHO and the RPRG is emphasized.

Although most of the material in this module will be familiar to many participants, the importance of monitoring and evaluation should be emphasized. Monitoring and evaluation before a TAS are critical for making an appropriate decision on when to start the survey. As significant programme decisions are made on the basis of the results of the TAS and these surveys are resource-intensive, the national programme should be as confident as possible that an appropriate time has been chosen to conduct the survey.

Present the learning objectives and overview of the module (slides 2 and 3).

Eligibility criteria for a TAS (slide 4)

Before a TAS is conducted, each IU must meet all the eligibility criteria listed on slide 4. Point out that the reported coverage will usually be used to assess 'effective' coverage. Surveyed coverage data can be used if available.

Epidemiological drug coverage (slide 5)

A number of indicators are available to measure the coverage of MDA.

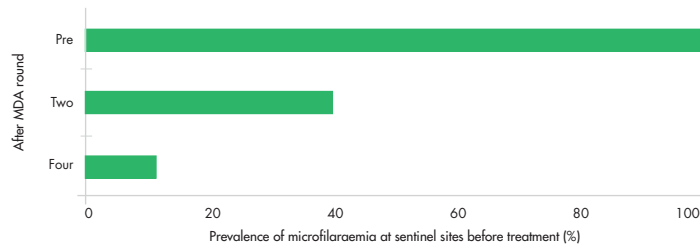
- geographical coverage
- epidemiological drug coverage (programme coverage)
- surveyed coverage
- national coverage

In this training material, only epidemiological drug coverage is included as an eligibility criterion. Geographical coverage, national coverage and surveyed coverage and suggested methods for a coverage survey are described in *Annex 4*.

Sentinel and spot-check surveys (slide 6)

Slide 6 defines sentinel sites and spot-check sites. The graph in *Figure 7* shows the progressive decrease in the prevalence of Mf expected after multiple rounds of MDA observed at 27 sentinel sites in 11 countries. It indicates that the epidemiological data collected at sentinel sites should indicate whether MDA is having the expected impact.

Figure 7. Decreasing prevalence of microfilaraemia at sentinel sites after rounds of mass drug administration



Source: Modified from World Health Organization. Report on the mid-term assessment of microfilaraemia reduction in sentinel sites of 13 countries of the Global Programme to Eliminate Lymphatic Filariasis. *Weekly Epidemiological Record*, 2004, 40(79):358–365.

MDA, mass drug administration

When should surveys be conducted? (slide 9)

Sentinel and spot-check site surveys should be conducted at least 6 months after MDA in order to allow microfilaria levels to rebound from drug pressure. Even if programmes are assessing the prevalence of Ag, they should wait for 6 months, as any Ag-positive cases will have to be followed up by testing for Mf.

Confirming eligibility to conduct a TAS (slide 11)

Annex 3 of the learners' guide⁴ contains the **TAS Eligibility and Reporting Form**. Filling in information on eligibility for a TAS helps national programme managers to summarize this aspect systematically before planning a survey. Encourage the participants to use the form and send it to the RPRG via WHO for advice. Emphasize that the Form is required for each EU, as explained in module 3.

Q&A

Can a MDA round be counted as effective if coverage is < 65% but > 80% of the eligible population?

No. For epidemiological purposes, it is important to have a coverage $\geq 65\%$ of the total population. The groups that are ineligible for treatment with diethylcarbamazine and albendazole are pregnant women, children under 2 years and the severely ill; those ineligible for treatment with ivermectin and albendazole are pregnant women, lactating women in the first week after birth, children < 90 cm in height and the severely ill. In many countries, however, people with chronic conditions are also counted as ineligible, which can make it difficult to reach the 65% total population target. Programmes should work with the health system to determine how best to treat people with chronic conditions safely.

What if an IU had seven rounds of MDA, but only four achieved coverage > 65%?

In situations that do not conform to the guidance above, the RPRG should be consulted. In general, if the prevalence of Mf has decreased over time at sentinel and spot-check sites and was < 1% at all sites after the last MDA, a TAS might be appropriate.

What if the results of the sentinel site and spot-check site surveys are discordant?

If any of the sites have $\geq 1\%$ Mf or $\geq 2\%$ Ag, MDA should continue, and information should be collected at sentinel and spot-check sites again after two more rounds. An assessment should be made of why the criteria were not met, in order to better plan for subsequent rounds.

What if there have been five or more effective rounds and the government has stopped MDA, without examining eligibility or conducting a TAS?

Sentinel site and spot-check site surveys should be conducted, particularly if MDA was stopped many years previously, to ensure that the requirements for a TAS are met in the current situation. Programme managers should also seek the advice of WHO or the RPRG and other experts.

What kind of survey should be done to verify reported MDA coverage?

The type of coverage survey depends on the drug distribution strategy. Community cluster surveys are usually recommended to determine any difference between reported coverage (from distribution records) and true coverage. Questions other than coverage can be included, such as why people don't take drugs and how often they took or did not take drugs in past rounds. Coverage surveys should be implemented within 1–2 months of MDA. If house-to-house distribution is used, programmes might use a method such as the rapid coverage assessment of the Expanded Programme on Immunization. (Learners can refer to *Annex 4* of the 2011 WHO monitoring and evaluation manual³ for an example of a cluster survey protocol for assessing MDA coverage.)

MODULE 3

Evaluation unit

DURATION: 2 HOURS

Learning objectives:

By the end of this module, learners should understand how to define a survey area, known as an evaluation unit (EU).

Relevant sections of the 2011 *WHO monitoring and evaluation manual*³

- Section 7.1 What geographical area should be used?

Teaching method: Presentation and group work

The In LF elimination programmes, most decisions on MDA have been based on the concept of IU, the administrative areas designated for such activities. After multiple rounds, a TAS can be conducted to provide evidence to help national programmes decide whether to stop MDA. The study area selected for the survey is called an 'evaluation unit (EU)', which may comprise several IUs, be an IU or be part of an IU. This module describes the difference between IUs and EUs and the characteristics of an EU. The importance of selecting appropriate EUs is discussed.

Present the learning objectives and the overview of the module (slides 2 and 3).

Survey area for a TAS (slides 4 and 5)

Once it has been confirmed that the IUs are eligible for a TAS, planning can begin. The first step is to define the survey area. An EU can be defined by the programme manager and is not necessarily identical to an IU. Although there is flexibility in defining an EU, the decision should be made carefully and thoughtfully.

Defining an EU (slide 6)

An IU can be a district, sub-district or village. The areas in an EU do not have to be contiguous but should have similar characteristics. IUs must be divided if the population exceeds 2 million; however, all factors should be carefully considered before combining or dividing IUs. All the IUs in which MDA has been implemented in a country will be eventually included in a TAS.

Combining IUs (slide 7)

The table and map in slide 7 illustrate a situation in which combining IUs might be appropriate. Explain that the eligibility criteria for the three IUs are similar using the data in the table, as summarized in the learners' guide⁴.

While combining IUs will reduce the number of surveys to be conducted, there may be risks:

- If the critical threshold is exceeded, all the IUs that comprise the EU will have to continue MDA.
- The prevalence of infection might be diluted. The EU might 'pass' the TAS even though the prevalence in some hotspots is above the threshold, potentially allowing recrudescence of transmission.

Dividing an IU (slide 8)

The table and map in slide 8 illustrate a situation in which dividing an IU into several EUs might be appropriate. Explain that dividing the IU into three EUs by sub-district makes sense, because the total population is over 2 million people. The options are either to combine sub-districts 1 and 3 because they have similar baseline Mf prevalences or to use each sub-district as an EU, thus requiring three surveys.

Emphasize that dividing an IU into several EUs increases the number of surveys to be conducted (and therefore the resources required); however, it may allow a more focused assessment of the situation.

Exercise (slide 10)

- Tell participants to use the country data they brought to the workshop for this exercise.
- Ideally, the data will be for areas in which a TAS is likely to be conducted soon.
- Much of the necessary data should have been entered onto the 'ELIGIBILITY' worksheet of the TAS Eligibility and Reporting Form before the workshop.
- Facilitators should assist participants in defining appropriate EUs, especially if IUs are to be combined.
- The facilitator should also present the rationale for defining EUs.

Q & A

Should a TAS be conducted in a cluster of IUs that meets all the eligibility criteria but is surrounded by units that are currently being mapped or receiving MDA?

The situation varies by country. Programme managers should seek advice from WHO or the RPRG, particularly when there is intense movement of people (or vectors) from areas of active transmission to an EU eligible for a TAS.

MODULE 4

Survey design

DURATION: 1.30 HOURS

Learning objectives:

By the end of this module, learners should understand how to determine:

- survey site
- sampling strategy
- sample size
- critical cut-off

Relevant sections of the *2011 WHO monitoring and evaluation manual*³

- Section 7.3. How should the surveys be implemented?

Teaching methods: Presentation and group work

This module addresses the factors involved in selecting the location at which the target population will be sampled, sampling strategies, methods for sample size calculations, the concept of a critical cut-off and interpretation of this threshold.

Present the learning objectives and overview of the module (slides 2 and 3).

Determining survey site, sampling strategy and sample size (slide 4)

Slide 4 illustrates the steps in designing a survey. The subsequent slides explain it step by step.

Target population (slide 5)

Referring to module 1 of this guide, explain again the rationale for selecting children aged 6–7.

Survey site (slide 6)

The facilitator should emphasize that, in general, it is easier to conduct school-based surveys than community-based surveys, as less time and fewer resources are required. As it is often difficult to identify all 6–7-year-old children in schools, however, grades or classes can be used as proxies for this age group. The grades most likely to contain the majority of 6–7-year olds (usually grades 1 and 2) should be selected for the survey. Once the grades have been selected, every child enrolled in those grades is eligible for the survey regardless of age, so the sample may contain children aged 5, 8, 9 or more years.

In community-based surveys, teams must identify 6–7-year-old children living in the communities. This often requires going from house to house to find children in this age range. In general, community-based surveys take more time and resources than school-based surveys.

Sampling strategy (slides 7 to 11)

The choice of sampling method depends on the number of children aged 6–7 years and the number of clusters (schools or enumeration areas) in the EU. The enumeration area is the smallest area for which census results are available and is usually a village or ward. A census should be used in areas where the total target population is small (< 400 children in areas where *Anopheles* or *Culex* is the principal vector; < 1000 children in areas where *Aedes* is the principal vector).

Slides 9–11 illustrate three sampling methods. Explain the concept of each. Briefly, cluster sampling involves two levels of random selection—first of clusters,

then of children—and is applicable when the population or the number of schools or enumeration areas in the EU is large. In systematic sampling, all the schools or enumeration areas are visited but only a fraction of randomly selected children are tested. In census sampling, no sampling is required; all the children in the EU will be tested.

Algorithm for survey site and sampling strategy (slide 12)

This algorithm (*Annex 5* of the learners' guide⁴) can be used to determine where surveys should be conducted (school or community) and the appropriate sampling strategy (cluster, systematic or census). Facilitators should use a hypothetical example that the participants will follow in the algorithm.

If more explanation is requested, such as the theory or rationale behind these options, *Background and technical notes for filarial antigenaemia surveys to decide if mass drug administration to eliminate lymphatic filariasis can be stopped can be used as a reference.*⁶

Sample size (slides 13 and 14) and critical cut-off (slides 15 and 16)

The sample size for a TAS can be determined either from *Table A.5.1* and *Table A.5.2* in *Annex 5* of the 2011 WHO monitoring and evaluation manual or with the 'survey sample builder'. This module explains how to use *Table A.5.1* and *Table A.5.2*, while use of the survey sample builder is explained in module 8. Note that *Table A.5.1* is for areas where *Anopheles*, *Culex* or *Mansonia* predominates, and *Table A.5.2* for areas with *Aedes*.

In areas where *W. bancrofti* is endemic and *Anopheles* or *Culex* is the principal vector, the target threshold for the prevalence of Ag is < 2%. Sample sizes and critical cut-off values are calculated so that there is a high chance of passing the survey if the true prevalence of Ag is 1% and low chance of passing if the true prevalence of Ag is >2%.

In areas where *W. bancrofti* is endemic and *Aedes* is the principal vector, the target threshold for the prevalence of Ag is < 1%, because *Aedes* spp. are more efficient vectors. Sample sizes and critical cut-off values are calculated so that there is a high chance of passing the survey if the true prevalence of Ag is 0.5% and low chance of passing if the true prevalence of Ag is >1%.

In areas where *Brugia* spp. are endemic, the target threshold antibody prevalence is < 2%. Sample sizes and critical cut-off values are calculated so that there is a high chance of passing the survey if the TRUE antibody prevalence is 1% and low chance of passing if the true antibody prevalence is >2%.

⁶ Lee H, Deming M. *Background and technical notes for filarial antigenemia surveys to decide if mass drug administration to eliminate lymphatic filariasis can be stopped: a manual for survey planners*. Atlanta, Georgia, Lymphatic Filariasis Support Center, 2009. <http://www.ntdsupport.org/resources/lymphatic-filariasis-transmission-assessment-survey>

Using slides 14 and 16, give the following example. When the population of 6–7-year-old children or of first- and second-year primary school children in the EU is 24 000 and cluster sampling was used, the sample size will be 1 156 children (slide 14). If the number of Ag- or antibody-positive children is ≤ 18 , the EU will ‘pass’ the TAS.

Critical cut-off in census (slide 17)

When a census is used as a sampling method, the sample size need not be calculated, as all the children in the EU will be tested. The critical cut-off will be the prevalence of Ag- or antibody-positive children among all the children in the EU:

An EU ‘passes’ the survey if the prevalence is $< 2\%$ in areas with *Culex*, *Anopheles* or *Mansonia* and $< 1\%$ in areas with *Aedes*.

MODULE 5

Diagnostic tests

DURATION: 2 HOURS

Learning objectives:

By the end of this module, learners should understand how to:

- procure diagnostic tests
- collect blood
- prepare, conduct and interpret ICTs
- prepare, conduct and interpret Brugia Rapid™ tests

Relevant sections of the 2011 WHO monitoring and evaluation manual³

- Section 3. Diagnostic tools

Teaching methods : Presentation, demonstration and practical exercise

The choice of diagnostic tests for monitoring and evaluating national programmes depends on the sensitivity and specificity of the tests, their feasibility for use in the field, the necessary technical skills and their cost. Several tests are available for assessing the effectiveness of MDA. This module briefly introduces the tests recommended for a TAS. As significant programme decisions are made on the basis of the results of such surveys, practical exercises are conducted to demonstrate proper procedures for the ICT and Brugia Rapid™ tests. Present the learning objectives and overview of the module (slides 2 and 3).

Diagnostic tests for TAS (slides 4–6)

Slide 4 illustrates the diagnostic tests recommended for different phases of a national programme.

- blood tests to detect the presence of: microfilariae, antigen and antibody;
- for mapping, monitoring and evaluation during MDA at sentinel and spot-check sites,
 - in areas where *W. bancrofti* is endemic, blood films to detect the presence of microfilariae or ICT to detect antigen to *W. bancrofti*;⁷
 - in areas where *Brugia* spp. is endemic, blood films to detect the presence of microfilariae; and
- for TAS, only ICTs (in *W. bancrofti* areas) and Brugia Rapid™ tests (in *Brugia* spp. areas).

The characteristics of the three tests are summarized in *Table 3*. The advantages and disadvantages of the different tests are summarized in *Annex 5*.

Table 3. Characteristics of the three diagnostic tests for lymphatic filariasis

Test	Target	Characteristics
Blood film	Microfilaria	Low sensitivity for detection of microfilariae. A significant limitation is the requirement to collect blood at night in areas with nocturnal periodicity. Night blood collection necessitates community surveys, with no option for school surveys.
ICT	Filarial antigen	Antigen detection tests eliminated the requirement for night blood collection. They can be performed with blood collected at any time and are relatively easy to use. Antigen tests are more sensitive than microfilariae detection tests. The results are not stable after 10 min. ICTs are used in TAS only in areas endemic for <i>W. bancrofti</i> . Antigen detection tests are available only for <i>W. bancrofti</i> and not for <i>Brugia</i> spp.
Brugia Rapid™ test	Antifilarial antibody	Antibody tests are more sensitive for the detection of microfilariae and antigen. As no antigen detection tests are available for <i>Brugia</i> spp., the Brugia Rapid™ test is used for TAS in areas endemic for this species.

⁷ A new diagnostic test to detect antigen to *W. bancrofti* is being developed and is expected to be available in 2014 (see *Annex 12* of the learners' guide⁴).

Procurement of diagnostic tests (slide 7)

Slide 7 lists the companies from which the recommended diagnostic tests for TAS can be procured. Emphasize the need to procure positive controls for quality control (see slide 8) before field-work.

Quality control (slide 8)

Slide 8 summarizes the main aspects of quality control of diagnostic tests. As diagnostic tests are mass-produced, some batches may have defects. Testing one or two diagnostic tests per batch with a positive control ensures the validity of the test outcomes. A positive control is currently available free of charge only for ICTs, from the Filariasis Research Reagent Repository Center (www.filariasiscenter.org).

Blood collection technique (slide 9)

Slide 9 demonstrates the blood collection technique to be used before application of the sample onto an ICT or Brugia Rapid™ test.

Facilitators should tell learners to collect slightly more than the required volume of blood in order to ensure an adequate volume in case of clotting or spillage.

ICT (slides 10–15)

This section can be omitted if the participants are from areas endemic only for *Brugia* spp.

Procedure (slides 12–14)

Emphasize that:

- The volume of blood taken should be exactly 100 µl.
- Blood must not be placed on the card directly from the finger.
- Blood should not be placed on the pink portion of the sample pad.
- The start and end time of collection should be written on the card.
- The result read at 10 minutes should be marked on the card.

Interpretation (slide 15)

- For all valid tests, any evidence of a test line (regardless of intensity) should be considered a positive result.
- A valid test is one in which there is evidence of a control line and the proper procedures were followed.
- If the ICT is the only diagnostic test that will be used in the region, testing of the positive control should be demonstrated at this point. For the other regions, go to the key points of the Brugia Rapid™ test, followed by the practical session.

Brugia Rapid™ test (slides 16–22)

This section can be omitted if the participants are from the areas endemic only for *W. bancrofti*.

Procedure (slides 18–21)

Emphasize that:

- Different sample volumes are required for serum and for whole blood. In a TAS, whole blood collected from a finger prick is usually used.
- To facilitate the flow of whole blood onto the sample pad, allow the pipette tip to touch the sloping side of the square well.
- If whole blood is delivered onto the square well as drops, it takes longer for the sample to seep into the pad, increasing the time needed for the sample to reach the blue line.
- Do not remove the clear tab completely from the cassette when pulling it out, as this may make the cassette unusable.

Exercise (slide 23)

Demonstrate use of the diagnostic tools if necessary. You can demonstrate finger-prick blood collection and use of the diagnostic test before participants practise on each other.

- Blood collection + ICT with positive control
- Blood collection + Brugia Rapid™ test (a positive control is currently not available for this test)

Ensure that all of the necessary supplies and the appropriate setting are available (see 'Supplies for demonstration of diagnostic tests' in Introduction of this guide).

The test procedure and interpretation of blood films and confirmatory testing are described in annexes 6 and 7 of the learners' guide⁴.

MODULE 6

After the survey

DURATION: 1 HOUR

Learning objectives:

By the end of this module, learners should understand how to:

- interpret the results of a TAS
- report to decision-makers and the GPELF
- follow up positive cases
- conduct post-MDA surveillance after MDA

Relevant sections of the 2011 WHO monitoring and evaluation manual³

- Section 8. Implementing activities and surveillance after mass drug administration has stopped

Teaching method: Presentation

This module describes the actions to be taken by national programme managers after completion of a TAS. As significant programme decisions are based on the results of the survey, correct interpretation of critical cut-offs will be reviewed. The survey will result in a choice between continuing MDA or moving to post-MDA surveillance.

Present the learning objectives and overview of the module (slides 2 and 3).

Interpreting the results (slides 4 and 5)

'Passing' the TAS

If the next round of MDA has already been planned, it should be conducted even after an EU 'passes' the survey.

'Failing' the TAS

If an EU 'fails' the survey, sustainable transmission is probably still occurring and MDA should be continued for at least 2 more years. An evaluation could be conducted to determine why the expected results were not achieved.

If the next round of MDA has already been planned, it can be counted as one of the two additional rounds required after an EU 'fails' a TAS.

After 2 years, sentinel and spot-check surveys should be conducted. If the Mf prevalence is $< 1\%$ or that of Ag is $< 2\%$, the transmission assessment survey should be repeated. Programmes should explore additional means of reducing transmission, such as vector control.

Example (slide 6)

In this example, the number of positive cases (14) is below the critical cut-off of 18, and the EU 'passes' the TAS. All the positive cases, however, were found in 2 of 38 schools and might therefore indicate on-going transmission in the area in which the two schools are located or migration from an endemic area. If resources allow, these cases should be followed up. An algorithm for following up positive cases is given on slide 12.

Box 2. Identifying reasons for 'failing' a TAS (slide 7-9)

Slide 7 lists the potential reasons for 'failing' a survey. Slide 8 gives a definition of systematic non-compliance, and slide 9 gives guidance on addressing it.

Reporting to decision-makers and the GPELF (slide 10)

As stopping MDA is a significant decision for a national programme to eliminate LF, programme managers should communicate the results of the survey to decision-makers, with the action they expect to take. Remind programme managers that they should also inform WHO and the RPRG of the results of the survey and obtain advice if necessary. Slide 10 illustrates the proposed mechanism for reporting results to WHO and the RPRG. Encourage use of the WHO Eligibility and Reporting Form in *Annex 3* of the learners' guide⁴.

Following up positive cases (slides 11 and 12)

The algorithm in slide 12 shows the recommended steps for following up positive cases and investigating the presence of focal transmission. This can be done when the resources are available.

Post-MDA surveillance (slide 13)

Slide 13 presents the two approaches currently recommended for post-MDA surveillance.

- All EUs should implement TAS 2–3 and 4–6 years after stopping MDA. Other surveys could be conducted in the interim in areas in which recrudescence is a concern, such as those in which there is a threat of reintroduction through migration.⁸ If limited resources preclude additional surveys, active surveillance for LF could be combined with surveillance for other diseases.
- Routine surveillance should continue between surveys in all previously endemic areas. For example, blood collected routinely from military recruits or blood donors could be tested for Mf or Ag. Routine surveillance for recrudescence should be continued in all areas, even after the third TAS.

Post-MDA surveillance requires planning, as it can be challenging for two reasons. Unlike other infectious diseases, such as malaria and dengue, LF has no early clinical signs, and indicators like antibody, Ag or Mf often appear many months to years after exposure. Additionally, limited resources often mean that surveillance is not adequately supported.

Potential future surveillance strategies (slide 14–17)

These slides summarize surveillance strategies that are undergoing operational research, namely antifilarial antibody testing and xenomonitoring. Indicate that such strategies might become available in the future to complement the current strategies.

⁸ Conclusions of the meeting of the Technical Advisory Group on the Global Elimination of Lymphatic Filariasis, November 2007. *Weekly Epidemiological Record*, 2008, 83(37):341-347.

Q & A

Should national programmes report the results of a TAS to WHO?

Yes. A proposed mechanism is for a national programme to submit the results of a survey in the WHO Eligibility and Reporting Form to WHO whenever the survey has been completed. This will allow:

- the RPRG to review the progress of national programmes and provide any necessary guidance and
- the GPELF to forecast resource needs and monitor the progress of national programmes.

What happens if an EU 'fails' a post-MDA surveillance survey?

If an EU 'fails' a TAS after MDA has stopped, the programme should consult WHO or the RPRG about the next steps. 'Failure' could indicate that transmission is occurring. The plan for responding to potential recrudescence will be determined case-by-case.

MODULE 7

Verification of elimination

DURATION: 1 HOUR

Learning objectives:

By the end of this module, learners should understand how to:

- compiling and analysing all data on LF in the country
- preparing a national dossier
- submitting the dossier to the RPRG

Relevant sections of the 2011 WHO monitoring and evaluation manual³

- Section 9: Verifying the absence of transmission

Teaching method: Presentation

This module introduces the requirements for verification of elimination of LF and submitting the dossier for official recognition. Only one dossier is submitted per country. Because EUs in the country may complete their programme activities at different times, it is important to maintain good data management throughout the programme.

Present the learning objectives and overview of the module (slides 2 and 3).

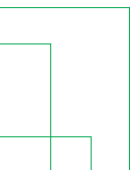
Timing (slide 17)

Facilitators should emphasize the importance of good organization and maintenance of data throughout the programme. Participants should be encouraged to start data collection and archiving early, without waiting until the end of the programme, in order to collect all the necessary data to complete the dossier.

Q & A

Should an EU that has completed two rounds of post-MDA surveillance without recrudescence of transmission wait to submit a dossier until all the EUs in the country have completed surveillance?

Yes, the dossier cannot be submitted until all the EUs in the country have completed post-MDA surveillance.



A photograph of four young children, likely in a school setting, standing in a line against a wall made of corrugated metal. They are wearing red and white checkered short-sleeved shirts. The child on the far right is wearing a dark blue skirt, while the others are wearing light-colored skirts. They are all wearing sandals. A semi-transparent text box is overlaid on the image, containing the title.

■ *PRACTICAL ASPECTS
OF TRANSMISSION
ASSESSMENT SURVEYS*

MODULE 8

Survey sample builder

DURATION: 1.30 HOURS

Learning objectives:

By the end of this module, learners should understand how to:

- how to use the survey sample builder to:
 - determine the design of the survey
 - select random clusters and children or households
- the protocol for TAS

Relevant sections of the 2011 WHO monitoring and evaluation manual³

- Annex 5: Detailed protocol for a transmission assessment survey

Teaching methods: Presentation, practical exercise and group work

This module addresses a few logistical components that will facilitate the planning of a TAS. The ‘survey sample builder’ is introduced. This is a Microsoft Excel-based application developed to help determine the appropriate survey design and randomized sample selection. The entire protocol for a TAS is reviewed.

Present the learning objectives and overview of the module (slides 2 and 3).

To use the survey sample builder, macros must be enabled in Microsoft Excel. The method for enabling macros is explained in *Annex 6*. The survey sample builder does not work with Mac computers.

Survey sample builder (slide 4)

Slide 4 illustrates the two processes in planning a TAS that can be facilitated by the survey sample builder: determining the survey design and random selection.

Facilitators should emphasize that it may take several weeks to collect the necessary information for planning a TAS.

Facilitators should have a good working knowledge of use of the survey sample builder. After presentation of the slides, most of the session will consist of using the survey sample builder with data prepared by the participants. Facilitators should assist them in understanding the input and output generated with the tool.

The survey sample builder simplifies determination of the appropriate survey design. The survey design algorithm and tables presented in module 4 are not needed to use it.

Preparation before sample selection (slides 5 and 6)

These slides list the information that should be obtained before using the survey sample builder for a school-based survey or a community-based household survey.

Determining the survey design (slides 7–10)

Slide 8 presents a screenshot of the first data entry page of the survey sample builder. When you click once, the button “Define terms” is highlighted with a red circle. After the second click, definitions of the various terms used appear.

Slide 9 presents a screenshot of the second data entry page.

Slide 10 presents a screenshot of the output page, derived from the data entered into the program, including.

- sample size
- number of clusters
- sampling fraction

- sampling interval
- critical cut-off

Selecting randomized clusters and children or households (slide 11)

Once the appropriate survey design has been determined, clusters, children or households must be selected randomly. Slide 11 gives a schematic diagram of the targets of random selection for different survey designs.

Slides 12–16 present the steps in selecting randomized clusters with the survey sample builder. Facilitators should stress that additional clusters should be selected in case the actual sample size does not reach the target after all the selected clusters have been surveyed, for instance because there were fewer target-age children than expected in the schools or enumeration areas.

The additional clusters should be used only after all of the originally selected clusters have been visited. The additional clusters should be visited one by one in the order selected until the target sample size has been reached.

Cluster selection is not required for systematic or census sampling.

Slides 15 and 16 illustrate the use of two lists to select children or households for random testing. Facilitators should note that in a community-based survey the lists are used to select households, not children, but that all the children of the target age in all the selected households should be tested. Two lists are used:

- because, if the random starting number (of child or house) in the sampling-interval range is high, the sample might be too small if the number used in every school or enumeration area (the starting number in list B is equal to the sampling interval minus the starting number in list A);
- to prevent the survey team from knowing in advance which children or houses to select for the sample. More details can be found in technical notes reported in 2009⁴.

Example 1 (slides 17–20)

- The first slide (Slide 17) should remain on the screen, and the participants should be given time to work through the example using the survey sample builder at their work stations until they have selected a randomized cluster.
- Once enough time has been given, the solution slides should be reviewed together.
- Participants should be asked if they obtained the same results as on slide 18.
- Common mistakes include entering the incorrect vector (*Aedes* will yield a larger sample size) or an incorrect non-response rate.

- Slide 19 shows a list of randomly selected schools. Slide 20 shows the schools correctly selected from the list. If there is time, a volunteer can share the first few numbers on his or her random number list and cross-reference with the school list in this example.

Example 2 (slides 21–23)

- The first slide (slide 21) should remain on the screen, and the participants should be given time to work through the example using the survey sample builder at their work stations up to randomized child selection.
- Once enough time has been given, the solution slides should be reviewed together.
- Participants should be asked if they obtained the same result as on slide 22.
- Slide 23 shows the households selected correctly if list A is chosen. If there is time, a volunteer can share the first few numbers on his or her list A and cross-reference with the list of households in this example.
- Facilitators should remind participants that once households to be visited have been selected, all the children of the target age in all the selected households should be tested.

Example 3 (slides 24 and 25)

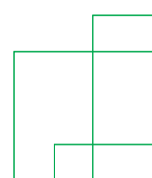
- The first slide (slide 24) should remain on the screen, and the participants should be given time to work through the example using the survey sample builder at their work stations up to survey design.
- Once enough time has been given, the solution slides should be reviewed together.
- Participants should be asked if they obtained the same results as on slide 25.
- This example illustrates the case in which every school in the evaluation EU is to be visited. Facilitators should explain that this does not mean that every child in each school will be tested.
- Module 10 gives the recommended method for random selection of children in the selected schools.

Protocol for TAS (slide 26)

Slide 26 reviews the steps in designing a TAS. Facilitators can introduce the checklist in *Annex 9* of the learners' guide⁴ as a guide for planning and implementing a TAS in accordance with the protocol.

Exercise (group work) (slide 27)

- Participants should use country-specific data to define an appropriate survey design. The results from the survey sample builder will be used in country presentations on the last day of the workshop.
- Macros must be enabled in Microsoft Excel in order for the survey sample builder to function.
- Participants should preferably work in country groups, and facilitators should walk around to assist the groups as necessary.



MODULE 9

Timetable, budget and administration

DURATION: 1 HOUR

Learning objectives:

By the end of this module, learners should understand how to:

- preparing a timetable
- preparing a budget
- procuring supplies
- obtaining ethical clearance
- obtaining informed consent
- preparing public notification
- preparing data collection and management

Relevant sections of the 2011 WHO monitoring and evaluation manual³

None

Teaching methods: Presentation, practical exercise and group work

This module reviews approaches to the administrative planning of a TAS. The aspects addressed are planning a timetable and budget, obtaining ethical clearance and informed consent, procuring supplies and collecting data. Templates for planning a timetable and budget are presented.

Facilitators should emphasize that poor planning can result in an incomplete survey, which may have implications for the resources available for future activities.

Present the learning objectives and overview of the module (slides 2 and 3).

Preparing a timetable (slides 4 and 5)

The time required for designing and conducting a TAS depends on the time it takes to complete each step. Therefore, it is important to plan each step and estimate the time required to complete a survey. Some activities can be carried out simultaneously, but others depend on earlier steps. An example of a timetable is given in *Annex 8* of the learners' guide⁴.

Preparing a budget (slides 6–8)

Facilitators should guide the participants in using the budget template in *Annex 10* of the learners' guide⁴ to estimate the budget required, in the following steps:

- i. Identify the types of resources required: human, transport and supplies.
- ii. Estimate the quantity of each resource required, e.g. three field staff for 3 days.
- iii. Identify the unit cost of each item, e.g. per diem for field staff.
- iv. Multiply (ii) by (iii).

Supply list (slide 10)

Facilitators should remind learners that the appropriate medicines must be available to treat cases identified during a TAS.

Ethical clearance (slide 11)

Facilitators should inform learners that a TAS is a programme activity. They might ask them what the ethical clearance requirements are in their countries.

Informed consent (slide 12)

Facilitators can ask participants about the requirements in their countries. If only a fraction of children are to be sampled in a school-based survey, they should be selected and consent for testing them obtained in advance of the survey. This will

avoid confusion about the exclusion of some children from testing. For community-based surveys, consent can be obtained at the time of the survey.

Public notification (slide 13)

Facilitators should continue to emphasize the importance of allowing ample time for many aspects of TAS.

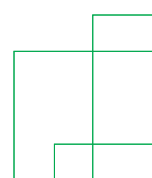
Preparation of data collection and management (slides 14 and 15)

Precautions should be taken to ensure that data are managed properly, so that all ethical requirements are met. The facilitator should recall that identities and test results should be made available only to authorized personnel.

An example of a data collection form for school-based surveys is presented in *Annex 11* of the learners' guide⁴.

Exercise (group work) (slide 16)

Facilitators should remind participants to include the estimated timetable and budget prepared in this exercise in their country presentations at the end of the workshop.



MODULE 10

Field work

DURATION: 1.5 HOURS

Learning objectives:

By the end of this module, learners should understand how to:

- field team organization
- specimen collection and testing in school-based surveys
- specimen collection and testing in community-based surveys

Relevant sections of the 2011 WHO monitoring and evaluation manual³

- Annex 5. Detailed protocol for transmission assessment surveys

Teaching methods: Presentation and role-play

Field activities in a survey will be more efficient if field teams are organized and their roles and responsibilities designated before the survey. This module addresses approaches for implementing a TAS in the field. Suggestions for field team composition and daily work flow are given, and an algorithm for following up identified cases is presented.

Present the learning objectives and overview of the module (slides 2 and 3).

Facilitators can introduce the checklists in *Annex 9* of the learners' guide⁴ for planning field-work.

School-based surveys (slides 6–10)

The slides outline an approach for specimen collection and testing in schools. Facilitators should explain that the participants should determine the best approach to their situations, which differ by country and area.

Emphasize that every child enrolled in the grade(s) that have been selected for the survey is eligible, regardless of age. Children aged 5, 8, 9 or more years may therefore be included in the sample.

Option: Reference to school-based surveys can be omitted if not relevant.

Community household surveys (slides 11–15)

The slides suggest an approach to sample collection and testing in communities. Facilitators should explain that the participants should determine the best approach in their situations, which differ by country and area.

Option: Reference to community-based household surveys can be omitted if not relevant.

Non-respondents (slide 17)

Facilitators should review with participants the definition of 'non-response', which includes absence, refusal to participate and failure of a diagnostic test..

Exercise (role-play)

This exercise is best conducted in a large group, with participants playing the roles of children, teachers, household members and the field team.

Ask the participants to set up mock field stations, and encourage them to think about how they would organize the station to ensure the most efficient work flow.

It is often helpful to demonstrate lining up children and selecting the required sample from one of two lists.

Q & A

What should be done if children are absent on the day of the survey?

In the census design, the recommended maximum acceptable non-response rate is 15%. At least one attempt should be made to capture non-responders by revisiting schools or homes, if practicable. A non-response rate > 15% non-response is assumed to make a sample non-representative; however, this percentage should be confirmed by field research.

In cluster design, the survey sample builder accounts for a potentially high absentee rate by including a term for the projected rate of absenteeism in schools. This inflates the first- and second-grade population estimates by the expected absentee rate. Nevertheless, at least one attempt should be made to capture non-respondents by revisiting schools or houses. If, after this attempt, the required sample size is not met, additional clusters can be added. It is for this reason that 'extra' clusters should be selected before the survey.

What if the original sample size is exceeded in the original clusters (or in extra clusters)?

If the sample size is exceeded before all the original clusters have been sampled, you should still continue until you have sampled all the original clusters. When preparing for the survey, therefore programmes should be sure to have 'buffer' stocks of ICTs or Brugia Rapid™ tests and supplies. If the sample size is not met in the original clusters, the survey team should sample all selected children in the first additional cluster. If the sample size is still not met, the team should move to the second additional cluster and so on.

What happens if the survey team runs out of ICTs or Brugia Rapid™ tests?

Programmes should always ensure a slightly higher supply of ICTs or Brugia Rapid™ tests and supplies than is required for the sample size. If the survey team runs out, they can have serum or blood spots tested in a laboratory.

If we find positive cases, should we treat them?

Yes. The 2011 WHO monitoring and evaluation manual states that all cases positive by one of the two tests should be treated.³ This information should be included on the informed consent form. A stock of medicines should be prepared in advance to treat positive cases after a TAS.

How should positive cases be followed up?

If resources allow, programme managers can test for Mf during the hours of peak microfilariae circulation to follow up positive cases. This should be done before the cases are treated. In addition, the history of exposure to microfilaria

of individuals with positive results should be investigated. If local exposure or secondary transmission is likely, friends and neighbours should be tested with ICTs or Brugia Rapid™ tests or for *Mf*. If any positive results are found, a community survey should be conducted.

Microfilaria are most easily assessed by blood films. Alternatively, filter paper blood spots can be collected for assessment by PCR. Residence can be checked to detect any significant migration to the area that might have affected the impact of mass drug administration rounds. A non-resident can be defined as someone who has lived in an area for < 1 year.

Should mobile populations be included in MDA campaigns and reporting?

The importance of mobile populations in the transmission of LF is not yet known and is specific to each country. If, however, the mobile population is from an area highly endemic for the disease, means should be found to reach them and ensure that they are treated during a campaign. The programme must have enough medicines to treat mobile populations, who might not be included in census figures.

Lessons learnt from field research for implementing a TAS

- Community-based household surveys are generally more expensive and time-consuming than school-based surveys. Teams can spend 2–3 days in each enumeration area and work late into the evening to test children returning from school.
- Enumerating households in urban areas is difficult because some houses are uninhabited, several visits may have to be made to find residents at home and difficulty in obtaining consent. Teams often take 2 days to complete enumeration and census in each enumeration area.
- A survey can take from 10 days to 4 weeks.
- A TAS should be planned as far in advance as possible to ensure enough time to procure supplies, obtain necessary clearances, etc. Sufficient preparation can help national programmes avoid obstacles to implementing a survey, such as the rainy season and school holidays.
- Training in the proper use of ICTs and Brugia Rapid™ tests is essential. Improper use of these diagnostic tests is often the primary reason for questionable results.




Annexes

Annex 1. Example of information sheet on a transmission assessment survey training workshop

Background

In 1997, the Fiftieth World Health Assembly resolved to eliminate lymphatic filariasis (LF) as a public health problem. In response, the World Health Organization (WHO) established the Global Programme to Eliminate Lymphatic Filariasis (GPELF) to assist Member States in achieving this goal by 2020. The two components of the GPELF are (i) to reduce the prevalence of infection to levels at which it is assumed that transmission can no longer be sustained and (ii) to manage morbidity and prevent disability.

To eliminate LF, WHO recommends delivery of combinations of two medicines to entire populations at risk, by a strategy known as ‘mass drug administration (MDA)’. This involves four steps: mapping, MDA, post-MDA surveillance and verification of elimination.

Effective monitoring and evaluation are necessary to achieve the goal of LF elimination. After mass administration of medicines according to the guidelines established by WHO, programmes must be able to assess whether the interventions have succeeded in lowering the prevalence of infection to a level at which

transmission is no longer likely to be sustainable. In 2011, WHO published a manual for monitoring and epidemiological assessment of MDA. The manual described a new, standardized method for measuring prevalence, the ‘transmission assessment survey (TAS)’; in which blood diagnostic test results are used to determine whether areas have reached a critical threshold of infection. The results of a TAS provide evidence for deciding whether to stop or continue MDA.

Objectives

The training workshop is designed to teach the essential elements of monitoring and evaluating national programmes to eliminate lymphatic filariasis. The focus is on planning and implementing TAS as input to decide whether to move from MDA to post-MDA surveillance.

After completing the course, learners will understand:

- the elements of a TAS,
- how to plan and implement a TAS in an evaluation unit (EU) and
- the actions required after implementation of a survey.

Preparation

- In order to obtain maximum benefit from the course, learners should arrive with information that will allow preparation of a workplan:
- Pertinent data on eligibility for conducting a TAS should be collected and entered on the ‘INTRO’ and ‘ELIGIBILITY’ worksheets of the TAS Eligibility and Reporting Form. These data include information on implementation units (IU), MDA coverage and sentinel site and spot-check survey results. The workplan prepared during the workshop will be for at least one EU, so data entered onto the worksheet should be for an area in which a TAS is likely to be conducted soon.
- Pertinent data for preparing a TAS should be collected and entered on the ‘Sampling frame’ in the ‘SURVEY DESIGN’ worksheet of the TAS Eligibility and Reporting Form for each EU. These data include the number of 6–7-year-old children and primary school enrolment rates.
- While some of the actual costs may not be known, general estimates will help to prepare an overall budget. A budget template with general budget categories is provided.
- Country maps indicating endemic IUs are helpful for defining EUs and can be used for country presentations at the end of the course.

- A complete list of public and private primary schools or census enumeration areas for the area defined on the 'SURVEY DESIGN' worksheet of the TAS Eligibility and Reporting Form should be available.
 - School-based surveys are recommended in areas where net primary school enrolment rate is $\geq 75\%$. If school enrolment rate is $< 75\%$, community-based household surveys are recommended. In a school-based survey, a list of public and private primary schools is required. It can be obtained through the Ministry of Education. In a community-based survey, a complete list of households within the community will be required.

Materials

- At least one personal computer with Microsoft Excel and Microsoft Power Point is required per group of learners.
- Stationery (e.g. notepads, pencils)
- Survey Sample Builder 2.0
 - Downloadable from: <http://www.ntdsupport.org/resources/> (If the participants are unable to download it, it will be provided at the training workshop)

Note: PC computers are required to use Survey Sample Builder. The programme currently does not work on Mac computers.

Reference document

- *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.
 - Downloadable from: http://whqlibdoc.who.int/publications/2011/9789241501484_eng.pdf

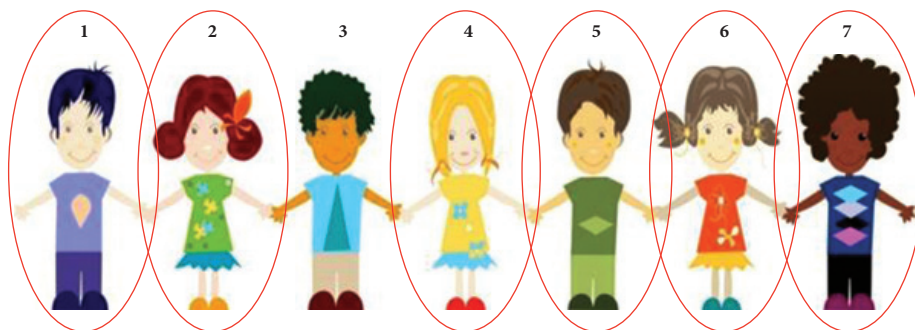
Annex 2. Test to be taken by participants before and after training (with answers)

1. Requirements for conducting a transmission assessment survey (TAS) include:
 - a. At least 5 rounds of effective mass drug administration (MDA)
 - b. Epidemiological drug coverage of at least 65% during each round of MDA
 - c. Sentinel site: Microfilariaemia prevalence of < 1% or antigenaemia prevalence of < 2%
 - d. Spot-check site: Microfilariaemia prevalence of < 1% or antigenaemia prevalence of < 2%
2. A TAS should be conducted at least 6 months after the most recent round of effective MDA.
3. True or false:
 - a. An evaluation unit (EU) must be the same as a MDA implementation unit (IU). False
 - b. The total population of an EU should not exceed 2 million. True
4. The diagnostic test used for TAS in areas endemic for:
 - a. *W. bancrofti* is ICT
 - b. *Brugia* spp. is Brugia Rapid™ test
5. What is the target age group for a TAS, and what is the rationale for selecting this age group?
Children aged 6–7 years. Young children should have been protected from infection if MDA was successful in interrupting transmission. Positive test results in this age group are therefore likely to indicate recent transmission.
6. The net primary school enrolment ratio must be at least 75% for a TAS to be conducted in schools.
7. Identify the type of sampling strategy for:
 - a. selecting children to test in all schools per enumeration area in an EU at a fixed interval: Systematic sampling

- b. first randomly selecting clusters (schools per enumeration area) then systematically selecting children to test only in selected clusters: Cluster sampling
- c. no sampling required; test all children in target age range: Census
8. True or false: The choice of sampling strategy depends on the total population in the target age range and the total number of clusters in the EU. True
9. In a TAS, the threshold of infection prevalence below which transmission is probably no longer sustainable even in the absence of MDA is called the critical cut-off.
10. The survey sample builder generated the following list of randomized numbers for clusters 2, 6, 8, 9 and 10. Circle the schools to visit on the list, which is ordered according to geographical proximity.

Complete list of schools

1. Austin Elementary
 2. Dunwoody Elementary
 3. Henderson Mill Elementary
 4. Oakcliff Elementary
 5. Jolly Elementary
 6. Columbia Elementary
 7. Ashford Park Elementary
 8. Dresden Elementary
 9. Stone Mill Elementary
 10. Snapfinger Elementary
11. The survey sample builder calculated a sampling interval of 1.19 and generated list A: 1, 2, 4, 5, 6, 7. Circle the children who should be tested in this cluster.



12. In order to obtain primary school enrolment ratios for a TAS, communication is often required with the Ministry of _____ **Education**_____.
13. The maximum acceptable non-response rate for a TAS is __ **15**__%.
14. If the number of positive results is below the established threshold, the recommendation is to ___**stop MDA or continue with post-MDA surveillance**___ .
15. If the number of positive results exceeds the established threshold, the recommendation is to __**continue MDA (at least two more rounds) or consult the RPRG to determine the next steps**__ .
16. What are the current WHO recommendations for post-MDA surveillance?
___**Periodic surveys: Repeat the TAS twice, 2–3 and 4–6 years after the initial survey.**
On-going surveillance: should cover the entire country, except in areas with no risk for transmission. Can survey military recruits, university students, blood donors, hospitalized patients_____ .
17. True or false: A dossier for verification of the interruption of lymphatic filariasis transmission can be submitted by each EU. __ **False**__ .

Annex 3. Post-training evaluation questionnaire

Workshop evaluation form (day 1)

Instructions: Please give your answers or comments in writing, or indicate the extent to which you gained confidence in the topics you learnt today on a scale of 1 to 5.

1. Overall evaluation of day 1	
1.1	Today, what impressed me or interested me most was ... (please explain why)
1.2	Today, what facilitated my learning was ...
1.3	The topics or issues that were not clear to me today were ...
1.4	I would like the following topics to be discussed in this or future workshops: ...
1.5	My recommendations for tomorrow are ...

2. To what extent did you gain confidence in the following topics you learnt today?

Module 1: Background		Not at all	Not well	Neutral	Well	Very well
2.1.1	The rationale of stopping MDA in relation to prevalence	1	2	3	4	5
2.1.2	The key differences between the 2005 and 2011 editions of the WHO monitoring and evaluation manuals for stopping MDA	1	2	3	4	5
2.1.3	The overall programme steps from mapping to verification	1	2	3	4	5
2.1.4	How can we improve this module or support you?					

Module 2: Eligibility for a TAS		Not at all	Not well	Neutral	Well	Very well
2.2.1	How to calculate the programme coverage used in monitoring MDA	1	2	3	4	5
2.2.2	The different purposes of sentinel site and spot-check site surveys in monitoring and evaluation of a national programme to eliminate LF	1	2	3	4	5
2.2.3	The pre-requirements for planning a TAS	1	2	3	4	5
2.2.4	How can we improve this module or support you?					

Module 3: Evaluation unit		Not at all	Not well	Neutral	Well	Very well
2.3.1	The criteria for defining and selecting an EU	1	2	3	4	5
2.3.2	How can we improve this module or support you?					

Module 4. Survey design		Not at all	Not well	Neutral	Well	Very well
2.5.1	The rationale for selecting children aged 6–7 years for a TAS	1	2	3	4	5
2.5.2	How to choose a survey design and calculate sample size	1	2	3	4	5
2.5.3	How to use the critical cut-off threshold for making programme decisions	1	2	3	4	5
2.5.4	How can we improve this module or support you?					

Module 8: Survey sample builder		Not at all	Not well	Neutral	Well	Very well
2.6.1	How the survey sample builder is used to select the sampling strategy and sample size	1	2	3	4	5
2.6.2	The method of randomized site selection from a numbered list of all primary schools or enumeration areas before the survey	1	2	3	4	5
2.6.3	How to prepare a protocol for a TAS in your country	1	2	3	4	5
2.6.4	How can we improve this module or support you?					

3. How good was the facilitation?

		Not at all	Not well	Neutral	Well	Very well
3.1	The facilitators knew the subject matter well	1	2	3	4	5
3.2	The facilitators gave clear explanations of the topics	1	2	3	4	5
3.3	The speed of the lectures was appropriate	Too slow 1	Slow 2	Yes 3	Fast 4	Too fast 5
3.4	The facilitators welcomed questions and responded to them appropriately	1	2	3	4	5
3.5	How can we improve our facilitation?					

Workshop evaluation form (day 2)

Instructions: Please give your answers or comments in writing or indicate the extent to which you gained confidence in the topics you learnt today on a scale of 1 to 5.

1. Overall evaluation of day 2	
1.1	Today, what impressed me or interested me most was ... (please explain why)
1.2	Today, what facilitated my learning was ...
1.3	The topics or issues that were not clear to me today were ...
1.4	I would like the following topics to be discussed in this or future workshops: ...
1.5	My recommendations for tomorrow are ...

2. To what extent did you gain confidence in the following topics you learnt today?

Module 5: Diagnostic tests		Not at all	Not well	Neutral	Well	Very well
2.4.1	How to use ICT cards and interpret the results	1	2	3	4	5
2.4.2	How to use Brugia Rapid™ tests and interpret the results	1	2	3	4	5
2.4.3	How can we improve this module or support you?					

Module 9: Timetable, budget and administration		Not at all	Not well	Neutral	Well	Very well
2.7.1	The importance of allowing time to obtain ethical clearance and informed consent before a TAS	1	2	3	4	5
2.7.2	All the information needed for a school- or community-based survey	1	2	3	4	5
2.7.3	How to prepare a supply list and estimate the time and budget required to implement a survey					
2.7.4	All the activities required for a survey and constructing a timetable					
2.7.5	How can we improve this module or support you?					

Module 10: Field-work		Not at all	Not well	Neutral	Well	Very well
2.8.1	Composition of the team for a TAS and allocation of tasks	1	2	3	4	5
2.8.2	Daily work flow for school and village surveys	1	2	3	4	5
2.8.3	Method for following up cases found during a survey					
2.8.4	How can we improve this module or support you?					

Module 6: After the survey		Not at all	Not well	Neutral	Well	Very well
2.10.1	The activities to be conducted after 'passing' or 'failing' a TAS	1	2	3	4	5
2.10.2	How should post-MDA surveillance be planned, assuming that the target EU 'passed' the survey?	1	2	3	4	5

Module 6: After the survey		Not at all	Not well	Neutral	Well	Very well
2.10.3	How can we improve this module or support you?					

Module 7: Verification of elimination		Not at all	Not well	Neutral	Well	Very well
2.11.1	The information that must be collected for verifying interruption of transmission	1	2	3	4	5
2.11.2	The process from a TAS to verification of LF elimination	1	2	3	4	5
2.11.3	Please identify and explain the main challenges during preparation of a dossier.					

3. How good was the facilitation?

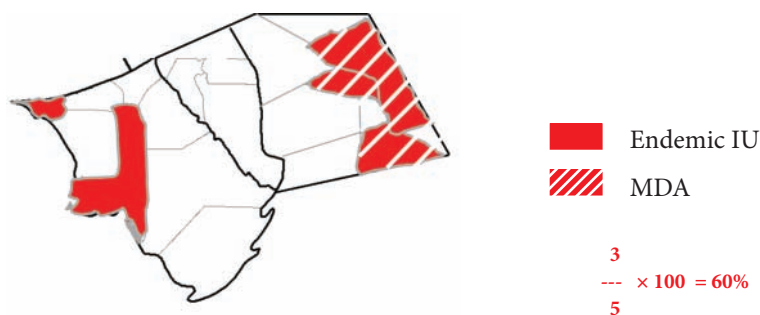
		Not at all	Not well	Neutral	Well	Very well
3.1	The facilitators knew the subject matter well	1	2	3	4	5
3.2	The facilitators gave clear explanations of the topics	1	2	3	4	5
3.3	The speed of the lectures was appropriate	Too slow 1	Slow 2	Yes 3	Fast 4	Too fast 5
3.4	The facilitators welcomed questions and responded to them appropriately	1	2	3	4	5
3.5	How can we improve our facilitation?					

Annex 4. Geographical, national and surveyed coverage

Geographical coverage

Geographical coverage is the proportion of endemic IUs covered by MDA in a country, or the proportion of endemic villages or urban areas covered by MDA in the targeted IU during the reported year:

$$= \frac{\text{Number of endemic IUs in which MDA is implemented}}{\text{all individuals targeted for treatment in IU}} \times 100$$

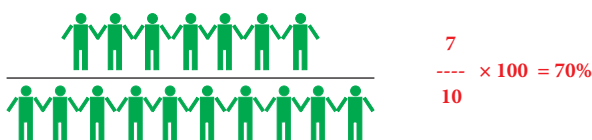


In this example, there are five IUs endemic for LF, but only three are implementing MDA. The geographical coverage in this example is 60%.

National coverage

National coverage is the proportion of individuals in an endemic country in which MDA for LF is required who ingested the appropriate medicines in the preventive chemotherapy package.

$$= \frac{\text{Number of people reported to have ingested the medicines}}{\text{Total population in all endemic IUs requiring MDA}} \times 100$$

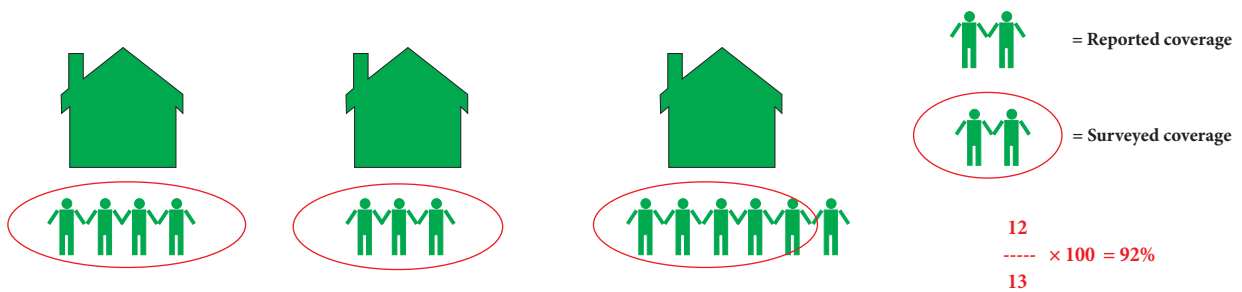


In this example, 7 of 10 people in the country were reported to have ingested the drugs. The national coverage is therefore 70%.

Surveyed coverage

Surveyed coverage complements and verifies the coverage found by a population-based cluster survey method.

$$= \frac{\text{Total number of individuals identified in household surveys as having ingested the medicines}}{\text{Total number of individuals in all the surveyed households for whom there is information on ingestion of medicines}} \times 100$$



In this example, 12 of 13 people who were asked about their participation in MDA had actually ingested the medicines. The surveyed coverage is therefore 92%.

Annex 5. Advantages and disadvantages of LF diagnostic tests

Microfilariae

Assay	Sample type	Pros	Cons
Blood film	Whole blood	Closest to gold standard assay Inexpensive	Low sensitivity Requires night blood collection in areas with nocturnal periodicity Trained microscopist needed
PCR	Whole blood Dried blood on filter paper	Well established quality control procedures Can be performed with dried blood samples collected on filter paper	Requires technical laboratory capacity Requires night blood collection in areas with nocturnal periodicity Expensive

Filarial antigen

Assay	Sample type	Pros	Cons
ICT	Whole blood	Point-of-care	Expensive (current format)
	Serum	No laboratory equipment needed	Subject to inter-observer variability
	Plasma	More sensitive than microfilariae detection Can use daytime blood	Results not stable after 10 minutes Availability only for <i>W. bancrofti</i>
Og4C3 ELISA	Serum	Can be performed with dried blood samples collected on filter paper	Requires skilled technician and technical equipment Variability in commercially manufactured kits
	Plasma		
	Dried blood on filter paper	More sensitive than microfilariae detection and ICT	

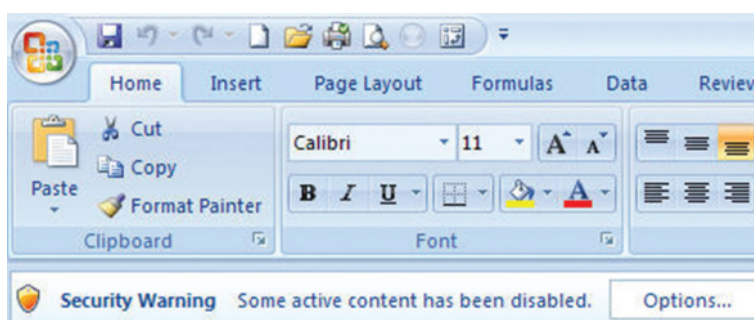
Antifilarial antibody

Assay	Sample type	Pros	Cons
Brugia Rapid™ test	Whole blood	Point-of-care	Variability in commercially manufactured kits
	Serum	More sensitive than microfilariae and antigen detection	Detect only <i>Brugia</i> spp.
	Plasma		
Bm14 ELISA	Serum	More sensitive than microfilariae and antigen detection	Low sensitivity
	Plasma		Requires technical laboratory capacity
	Dried blood on filter paper	Can be performed with dried blood samples collected on filter paper	

Annex 6. Enabling macros in Excel

Microsoft Excel 2007

On opening the file, you should see the following bar at the top of your screen. Click “Options”, then “Enable this content” and then “OK.”



If you do not see the dialog box, you must change your trust settings.

- Click the Office button (large button at the top left) > Excel options > Trust center > Trust center settings
- Under Macro settings, choose “Disable all macros with notification”
- Under ActiveX settings, choose “Prompt me before enabling all controls with minimal restrictions”
- Then, close and re-open the file.

Microsoft Excel 2003

When you see a dialog asking to disable or enable macros after opening the file, click “Enable macros.”

If you do not see this dialog box, you should set your security settings to “Medium”, as follows.

1. Click Tools > Macro > Security
2. Change the “Security level” to “Medium.”
3. You should then close and re-open the file, clicking the “Enable Macros” button this time.

