TROPICAL DATA

Training system for trachoma prevalence surveys

VERSION 4

ICTC International Coalition for Trachoma Control

Contents

Please note

The Tropical Data training system includes this manual, a number of PowerPoint presentations and various other tools. These training system components are intended to complement each other and should be deployed as a complete system.

Please **contact admin@tropicaldata.org** for access to the complete training system.

Kate Holt/Sightsavers

Above
A pupil demonstrates the use of a leaky tin to wash their hands and face as part of their hygiene campaign that helps to prevent trachoma.

Foreword

In order to achieve trachoma elimination, it is important to know where interventions against trachoma are required and where they are no longer necessary. This is only possible with a comprehensive global map of trachoma that is updated as new data become available, and in which the district-level prevalence estimates have been generated using methodologies that are accurate and repeatable. Producing quality-marked data using internationally agreed survey systems and processes is essential.

The World Health Organization (WHO) recommends that the following trachoma prevalence surveys take place:

- Baseline surveys: to determine the need for trachoma elimination interventions (five years of "AFE" where TF is ≥30% in 1–9-year-olds, three years of "AFE" where TF is 10–29.9%, and one year of "AFE" where TF is 5–9.9%); public health-level S interventions are needed where the prevalence of trachomatous trichiasis (TT) unknown to the health system is ≥0.2% in ≥15-year-olds);
- Impact surveys: conducted 6-12 months after the last planned round of Mass Drug Administration (MDA), to guide the need for further interventions;
- Surveillance surveys: conducted at least two years after an impact survey has shown the TF prevalence to be <5% in 1–9-year-olds.
- TT-only prevalence surveys can also be conducted. These are standardised surveys that are rarely required, but are recommended in certain epidemiological contexts. Please refer to the Tropical Data TT-only survey manual for more information on these as they are not covered in this manual.

This training system is intended to be used to train, in a standardised way, the staff needed to complete such surveys, at baseline, impact and pre-validation surveillance stages. It provides the certified trainer with a complete programme for selecting and training field teams to undertake surveys of trachoma, together with selected water and sanitation indices, using cluster sampling methodology. Theoretical teaching has been kept to a minimum, focusing on what field staff "must" know.

This manual is primarily aimed at trainers and supervisors of survey field staff, but programme managers are also strongly encouraged to become familiar with the manual and, if possible, to attend the training programme.

This training system conforms with WHO trachoma survey guidelines. It is adapted from the training system of the Global Trachoma Mapping Project (GTMP), with new material and refinements added based on the GTMP and Tropical Data experience. Other previous publications informing the design are listed in the bibliography. We are extremely grateful to the people who contributed to those previous efforts and who added, revised or tested new material, without which this training system would have been much harder to produce. We have attempted to list all contributors to the development of new material in the acknowledgements.

Good luck with your training, and with your surveys!

Acknowledgements

The GTMP training system was drafted by Paul Courtright, Katie Gass, Susan Lewallen, Chad MacArthur, Alex Pavluck, Anthony Solomon and Sheila West. This Tropical Data training system is a revision of version 3 of the Tropical Data training system, with updates and refinements made by Ana Bakhtiari, Sarah Boyd, Michael Dejene, Emma Harding-Esch, Cristina Jimenez, Jeremy Keenan, Amir Bedri Kello, Caleb Mpyet, Jeremiah Ngondi, Anthony Solomon.

Other individuals who helped to plan the training system, created materials used to develop it, commented on drafts, participated in field testing, and provided technical expertise: Agatha Aboe, Liknaw Adamu, Wondu Alemayehu, Menbere Alemu, Neal Alexander, Robin Bailey, Berhanu Bero, Sophie Boisson, Simon Brooker, Chris Brown, Clara Burgert, Matthew Burton, Simon Bush, Kurt Dreger, Paul Emerson, Diana Paola Gómez Forero, Allen Foster, Solomon Gadisa, Teshome Gebre, Emily Gower, Esmael Habtamu, Danny Haddad, Erik Harvey, Jeremy Hoffman, PJ Hooper, Richard Johnston, Khumbo Kalua, Jonathan King, Elizabeth Kurylo, Tom Lietman, Colin Macleod, Silvio Mariotti, Patrick Massae, Richard Le Mesurier, Addis Mekasha, Tom Millar, Beatriz Muñoz, Nicholas Olobio, Stephanie Ogden, Joseph Pearce, Saul Rajak, Serge Resnikoff, Chrissy Roberts, Hillary Rono, Virginia Sarah, Alemayehu Sisay, Jennifer Smith, Hugh Taylor, Jo Thomson and Yael Velleman.

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Key updates in version 4 include: change in the grader certification process, using photography rather than relying on grading live cases with TF; improving TT diagnosis and data collection by counting the number of eyelashes, reemphasising the definition of a health worker for the management questions and adding a question about other eye conditions that may warrant treatment or referral.

Suggested citation: Courtright P, Dejene M, Gass K, Harding-Esch EM, Jimenez C, Kello A, Lewallen S, MacArthur C, Macleod CK, Mpyet C, Ngondi J, Pavluck AL, West SK, Willis R, Solomon AW (2023). Tropical Data: training system for trachoma prevalence surveys. Version 4. International Coalition for Trachoma Control: London.

Note for training coordinators: selecting and preparing trainers

Shea Flynn/RTI

Above A group of trainers in the field for practice in Ethiopia.

In addition to village guides, drivers and supervisory staff, the trachoma survey teams recommended in this training system include two cadres: graders and recorders. Training therefore requires at least two trainers: one to train the graders and one to train the recorders. To ensure quality, you should ensure that your grader trainees are trained by Tropical Data-certified grader trainers, and that your recorder trainees are trained by Tropical Data-certified recorder trainers. Tropical Data (www.tropicaldata.org) holds periodic training-of-trainer events, and will be pleased to help you train your trainers. But how should people be selected to be trained as trainers?

Candidate grader trainers should be very experienced in grading trachoma in the community using the WHO simplified grading system. They need not be ophthalmologists: experienced ophthalmic nurses or ophthalmic assistants may be ideal. Candidate recorder trainers should be experienced in data collection and be thoroughly familiar with the operation of a smartphone. However, being good at performing a task is not enough to qualify an individual to be a good teacher for that task.

*Choose candidate trainers who have both a strong skill set for the tasks at hand **and** an ability to impart that skill set to others*. Ideally, both grader and recorder trainers will have had previous experience in training others. Section 2 describes elements of being an effective trainer.

During the first two days of training (the grader qualifying workshop), one grader trainer will be required for every four grader trainees, as this is the maximum number that can be taught effectively by one trainer in the field. If there are not enough grader trainers to train all grader trainees at the same time, additional workshops may need to be held.

Even if they have experience in training teams for trachoma surveys, **both grader trainers and recorder trainers should ensure that they are completely familiar with all the details in this manual before commencing training**. This is likely to require up to six hours spent studying the manual.

Please ask your trainers to follow this training system as closely as possible.

Definitions of terms

Clusters: geographically defined collections of households used to construct a sampling frame in a cluster-sampling strategy.

Corneal opacity (CO, a sign in the WHO simplified trachoma grading system): easily visible corneal opacity over the pupil, so dense that at least part of the pupil margin is blurred when viewed through the opacity.

Data approver: the individual (at the health ministry or equivalent) with responsibility for reviewing and approving survey data.

District: for trachoma elimination purposes, a district is defined as the normal administrative unit for healthcare management, which for purposes of clarification (generally) consists of a population unit between 100 000–250 000 persons.

Epilation: plucking out/removal of eyelashes from the root using forceps. (Recent epilation may be indicated by empty eyelash follicles or broken eyelash shafts.)

Evaluation unit (EU): the population unit selected for implementation of trachoma surveys. This is a more politically neutral term than "district", and avoids the confusion that can arise when locally-defined administrative districts are much larger or smaller than the recommended population unit for surveys. EUs generally encompass a population of 100 000–250 000 persons.

Global Trachoma Mapping Project: the project, funded by the United Kingdom's Department for International Development and the United States Agency for International Development, that carried out global baseline mapping of trachoma from December 2012 to January 2016.

Grader: in this training system, an individual given responsibility for examining community residents for clinical signs of trachoma in a trachoma prevalence survey.

Impact survey: an EU-level trachoma prevalence survey done 6–12 months after completion of the last programmed round of azithromycin mass drug administration in that EU.

International Coalition for Trachoma Control (ICTC): a coalition of non-governmental, donor, private sector and academic organisations working together to support the WHO Alliance for the Global Elimination of Trachoma by 2020.

Inter-grader agreement (IGA): the degree of agreement among different graders. Cohen's kappa coefficient is a conservative statistical measure of inter-observer agreement for qualitative parameters that takes into account the agreement that would occur by chance.

Kappa: see Inter-grader agreement.

Objective Structured Clinical Examination (OSCE): a way of assessing clinical skills in a standardised way.

Pre-validation surveillance survey: an EU-level trachoma prevalence survey done two years after the last impact survey in that EU showed a TF prevalence in 1–9-year-olds of <5%.

Programme manager: the individual with overall responsibility for planning and executing activities related to trachoma elimination.

Recorder: in this training system, an individual given responsibility for ensuring that data collected in a trachoma survey is reliably captured for later analysis.

Supervisor: in this training system, an individual given responsibility for overseeing the work of a number of graders and recorders and supporting them where necessary.

Surveillance survey: see pre-validation surveillance survey.

Survey coordinator: the individual with responsibility for deploying trained graders and recorders to undertake trachoma surveys in one or more EUs, and ensuring that all necessary logistical arrangements are in place so that those surveys can be conducted successfully.

Trachomatous conjunctival scarring (TS, a sign in the WHO simplified trachoma grading system): the presence of easily visible scars in the upper tarsal conjunctiva.

Trachomatous inflammation—follicular (TF, a sign in the WHO simplified trachoma grading system): the presence of five or more follicles at least 0.5mm in diameter, in the central part of the upper tarsal conjunctiva.

Trachomatous inflammation—intense (TI, a sign in the WHO simplified trachoma grading system): pronounced inflammatory thickening of the upper tarsal conjunctiva obscuring more than half the normal deep tarsal vessels.

Trachomatous trichiasis (TT, a sign in the WHO simplified trachoma grading system): at least one eyelash from the upper eyelid touches the eyeball, or evidence of recent epilation of in-turned eyelashes from the upper eyelid.

Training coordinator: the individual with overall responsibility for identifying, inviting and preparing trainers and trainees; choosing and booking the training venue; choosing and preparing sites for field-based training sessions; and making other logistical arrangements necessary for this training system to be successfully implemented.

Trichiasis: at least one eyelash (from either the upper or lower eyelid) touches the eyeball, or evidence of recent epilation of in-turned eyelashes (from either the upper or lower eyelid).

Tropical Data: a service that helps countries to collect globally standardised, high quality data by providing epidemiological, training, logistical and data management support to national programmes carrying out all types of cross-sectional surveys on trachoma.

WHO simplified trachoma grading system: a trachoma grading system designed for use in population-based surveys or for the simple assessment of the disease at community level.

Index of abbreviations

CO	corneal opacity
EU	evaluation unit
GTMP	Global Trachoma Mapping Project
ICTC	International Coalition for Trachoma Control
IGA	inter-grader agreement
OSCE	Objective Structured Clinical Examination
SAFE	surgery, antibiotics, facial cleanliness, environmental improvement
TF	trachomatous inflammation—follicular
TI	trachomatous inflammation—intense
TS	trachomatous scarring
TT	trachomatous trichiasis
WHO	World Health Organization
WASH	water, sanitation and hygiene

1 Introduction

Trachoma is the leading infectious cause of blindness. It causes blindness by scarring the inner side of upper eyelids, which ultimately turns the eyelashes inwards so that they scratch the eye resulting in corneal opacity. Trachoma is controlled through the "SAFE" strategy, which comprises Surgery for in-turned eyelashes, Antibiotics to clear infection, and Facial cleanliness and Environmental improvement to reduce infection transmission. Using SAFE, the World Health Organization (WHO) and its partners plan to eliminate trachoma as a public health problem by 2030.

"S" is offered to individuals, while "A", "F" and "E" are community-based interventions applied to whole populations. WHO recommends that the population unit for these interventions should be the normal administrative unit for healthcare management, nominally "districts" of 100 000 to 250 000 people. "A", "F" and "E" are indicated for five years before re-survey in districts in which the prevalence of the inflammatory sign "trachomatous inflammation—follicular" (TF) in 1–9-year-old children is 30% or greater. Where the prevalence of TF in 1–9-year-olds is 10–29.9%, "A", "F" and "E" are indicated for three years before re-survey. Where the prevalence of TF in 1–9-year-olds is 5–9.9%, a single round of "A", plus "F" and "E", are recommended before re-survey. Knowing the prevalence of TF is therefore critical to allow programmes to plan where and for how long the community-based SAFE components are required. Knowing the prevalence of in-turned eyelashes (trichiasis) is important to allow programmes to plan requirements for surgical services. Trachoma surveys therefore need, as a minimum, to measure the prevalence of TF and trichiasis.

This training system was created to train graders and recorders for the collection of a minimum data set necessary to estimate the prevalence of TF and TT in baseline, impact, or pre-validation surveillance surveys for trachoma. Partly to help trachoma programmes establish the current need for the "E" component of SAFE, and partly reflecting interest from the WASH community to harness the power and reach of these surveys to inform efforts in their sector, data on WASH variables are also collected. Further data of interest to national programmes or their partners (such as information on other neglected tropical diseases) can also be incorporated, but detailed training materials for (and consideration of the logistical implications of) such additions are required.

This training system is designed to train teams to use electronic data collection on Android smartphones in the field. Doing this has significant advantages over recording data on paper forms with subsequent manual data entry.

The first two days in this trachoma survey training system are spent certifying graders and recorders to accurately carry out their roles. **Passing the tests can be difficult, and some trainees, even if they have previous trachoma grading or recording experience, will not pass.** Only those trainees who pass the full series of assessments in the first two days will go on to the team training on days 3, 4 and 5. If it is expected that the trainee will play another role in the survey, such as field coordinator, dependent on previous training and field experience, a trainee who does not pass may nevertheless be able to continue for the duration of the training. It is important to emphasise that even if such a trainee stays, as they have not been certified, they cannot act as grader or recorder. Trainees should be aware of this from the time they are invited to attend training; trainers and programme managers are responsible for informing trainees who do not pass the certification process that they are not qualified to continue.

Kate Holt/Sightsavers

Above
Mary Mureru holds out one of the azithromycin tablets she is taking as part of a mass drug administration programme for trachoma elimination.

As already mentioned, for programme decision-making purposes, the important parameters to measure are the prevalence of TT and the prevalence of TF. In this system, graders are asked to grade trichiasis, TF and TI. TI has been included so that graders are not tempted to diagnose TF if they see conjunctival inflammation but cannot see five or more follicles in the central part of the upper tarsal conjunctiva, and to guard against future changes in international guidelines. In an eye diagnosed as having trichiasis (upper or lower eyelid), the grader should count the number of eyelashes touching the eyeball and determine whether "trachomatous conjunctival scarring" (TS) is present or absent, as well as check for signs of previous surgical scar if it is possible to evert the eyelid. (In eyes that cannot be everted due to stiffness, the eyelid should be graded as "not able to grade".) Graders will also need to ask for information on previous management of trichiasis. These questions amongst other things, enable the trichiasis diagnosis to be confirmed by the grader and recorder and help future-proof against changes in international guidelines. We have also included a question relating to any other eye conditions. This has been included so that graders are not tempted to recordTT if they see a condition that they feel should be highlighted as needing treatment or referral (e.g. cataract).

2 Before training starts: being an effective trainer

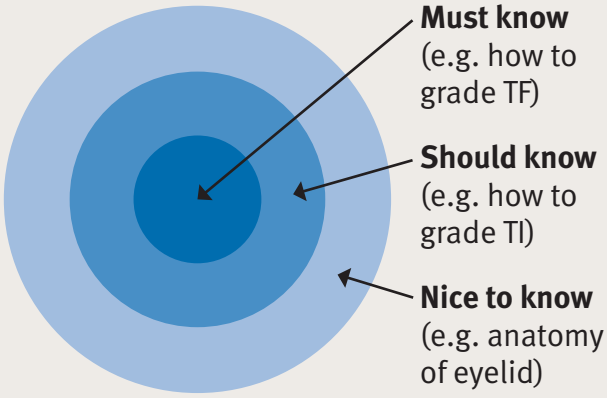
Use the methods and materials provided in this training system. The methods included in this training manual and accompanying PowerPoints have been developed in consultation with experts and field-tested in many different settings. We strongly recommend that you follow the procedures outlined here and use the accompanying tools provided. If you would like to propose updates or make training suggestions, we encourage you to get in touch (email admin@tropicaldata.org) so these can be discussed.

Train to meet the objectives, not to demonstrate your own skill set. Use a "trainee-centred" approach focused on the objectives of the training. An effective trainer will 1) consider what the trainee already knows; and 2) consider what the trainee needs to know in order to do the required task. This approach relies on the required task being well defined, so that objectives can be set for each step of training. In the case of trachoma surveys, the tasks required are well defined; it is up to you to make sure that trainees completing the course have the knowledge and skills they need to perform those tasks. Highly educated people sometimes tend to "over-train" others, that is, to try to teach trainees everything they know. Such an approach is not always the best way to meet training objectives.

The goal is not to turn the trainees into "trachoma experts," but into excellent trachoma graders and recorders.

Keep in mind the "target concept" of teaching, as shown in Box 1. For any particular skill or piece of information that you consider passing on to trainees, decide whether it is something that they must know, something they should know or something it would be nice for them to know.

Box 1 The target concept of teaching



Emphasise the things in the first and second category – and especially the first. This will be particularly important in training the recorders, some of whom may not come from the health sector, and who do not need to understand much about clinical trachoma to do their jobs well.

Use a variety of ways to share and impart knowledge. The learning objectives are based on tasks required in trachoma surveys and are defined for each day of training. The manual outlines several different teaching methods, including

- Discussions that can be highlighted with PowerPoint slides
- Role play scenarios for trainees
- Practical exercises for trainees
- A system for evaluation of and feedback to trainees

Wherever possible, avoid lecturing from slides; instead get the trainees involved and make them part of the training: this will be more effective than even the most articulate lecture. Skills are much more readily transmitted by demonstrating and doing, rather than by listening to a lecture.

Caitlin Mensah/RTI

Above A group of grader trainers at a workshop in Kenya.

Do not read slides to the class. When slide-based lectures are provided, it is still possible to involve trainees in interactive ways. For example, rather than simply going through a list of risk factors for trachoma, you could show the heading "Risk factors for trachoma" and then ask the class to suggest some. Following this interaction, a slide can be shown that lists the risk factors, for reinforcement. A trainer who knows the material will be able to guide the trainees, prompting them to suggest many correct responses without the trainer being intimidating or unkind. Asking your trainees questions requires them to be active in the learning process, and done politely and respectfully, it is a good technique to draw out the shy and to wake up the sleepy. It will also provide you with information as to whether your trainees understand the material or not.

Incorporate trainees' backgrounds and experience into the training experience. This acknowledges trainees' existing level of expertise, engages them in building on that knowledge, and creates a comfortable and respectful learning environment. Even if trainees' pre-course level is that they have only heard of trachoma, this can be a foundation.

Use every opportunity for role play and practice. Teaching trainees how to evert eyelids by practising on each other in the training setting helps avoid the possibility that grader trainees will inadvertently use rough techniques on children or adults. Handing out survey tools and having recorder trainees apply them to each other, and using role playing to practise tough situations provides an experience, rather than just a handbook of guidelines. Preparing some key scenarios ahead of time and (where available), using those already provided in this manual, can help guide the role play and allow for larger discussions to occur among the trainees. Allow enough time for debriefing and discussion on the learning or take-away points from the activity, this will help reinforce the key learning objectives and improve understanding of the key concepts. Role play can also highlight areas that need further reinforcement of learning.

It is important to consider the groups that you form for role play activities. Sometimes groups constructed arbitrarily will work well, but at other times you may consider purposefully pairing individuals together, such as a trainee who has participated in Tropical Data surveys before with a new trainee.

Role play can occur on several levels. Some examples include:

- One-on-one between two trainees
- Small group of trainees with some role playing and others observing and providing feedback within the group afterwards
- Larger group of trainees with guided discussion

Use evaluation tools to gauge progress. In this training system, a final evaluation tool to certify that the trainees are qualified to carry out the required tasks for their job is mandatory. It is possible that some trainees simply cannot perform those tasks. Trainers must certify that trainees who pass have met the standard, and thus are eligible to participate in the surveys as graders or recorders.

3 Before training starts: practical issues for trainers and the training coordinator

Trachoma surveys require considerable planning and preparation to ensure that the necessary official clearances have been obtained, field teams have everything that they need on hand at the time they need it, and the communities they intend to visit are prepared to welcome them.

Similar planning and preparation are required for the field-based component of training. These tasks are the responsibility of the training coordinator. Trainers should ensure that they have been completed, or field-based training sessions may be difficult or impossible.

Classroom-based training sessions also require considerable practical preparation.

It is therefore recommended that, before training starts, you ensure that:

1. The necessary official clearances have been obtained

Requirements for ethical clearance for trachoma surveys will vary from country to country. Ethical clearance for surveys themselves may not be required because they can be conceptualised as being a programme activity; however, obtaining formal review of the protocol by an ethics committee in advance of fieldwork is best practice to ensure that the proposed methods are locally acceptable, will help make the results publishable, and is strongly recommended.

Ideally, the National Trachoma Task Force or Neglected Tropical Disease Task Force will have taken the lead in communication and coordination with all relevant national, regional, and district personnel; outlined the planned survey locations and schedules; and assisted in obtaining all the necessary ethical and political clearances.

2. Guidelines for obtaining consent for examination are understood

Official clearances do not equate to getting consent from individuals for clinical examination. Obtaining informed consent (in the local language) from each person to be examined is the responsibility of the survey team. In planning for surveys and survey training, it is important to discuss with local officials and decide who can give informed consent, and whether this consent can be verbal or must be written.

3. An appropriate training site has been selected

If possible, training should take place at a site where trachoma is endemic, to increase the likelihood of seeing live trachoma cases in the field. However, this is not a requirement as grader training now relies on photographs rather than the identification of live cases. A good training site has the following characteristics:

- Is close to some rural communities in trachoma-endemic areas.

Michael Duff/Sightsavers

Above Trachoma suveys in Sierra Leone.

- Has two rooms so that graders and recorders can be given role-specific training in parallel. At least one of these rooms should be able to be made dark to ensure that clinical slides of trachoma signs project clearly.
- Has enough chairs and tables for trainees and trainers.
- Has electricity (or a generator) for a laptop and projector.
- Has facilities for tea and lunch so that trainers and trainees do not have to travel long distances at break times.

4. Practice communities or villages are selected and prepared

This training system includes field-based assessment for graders and practice for graders and recorders. Locations for these activities need to be determined and arranged in advance. Village leaders and appropriate authorities need to be contacted and provide agreement to assist. For the grader field-based assessment, it will be necessary to bring together 5 preschool children, 3 school children, and 2 adults for each group of four trainees, as well as allowing graders sufficient time to practise their examination technique on others in that same community ahead of the assessment. Be sure to provide some form of gift for children (e.g. school supplies) who agree to be examined in practice and pilot settings. The team practice near the end of the training should take place in a community or village that is not part of the actual surveys, where teams can practise working together and will visit a minimum of three households each.

5. Android smartphones prepared for use

The Androids should be purchased in collaboration with Tropical Data. SIM cards also need to be purchased with data/airtime to facilitate the uploading of data. The Tropical Data app and project-specific forms should be downloaded and checked prior to the start of training (with the Tropical Data team's support). If there may be issues finding power to charge phones nightly, additional power banks should be considered.

6. Local officials are informed

Informing local officials of the training (and upcoming survey, if appropriate) is necessary. Ideally, they should be engaged in the process as much as possible.

7. Drivers and vehicles for field-based training sessions are arranged

The number of drivers and vehicles required will depend on the number of trainees and trainers that need to be taken to the field each training day.

8. All the materials required for training are available

Ensure that the following materials and equipment are ready for the training:

- Two LCD projectors (sometimes sessions running in parallel both need one)
- Two laptop computers (for projecting PowerPoints, using the LCD projector) with connecting cables, power adaptor and extension cords
- PowerPoint presentations
- Microphone and amplifier if the group (or the training space) is large
- Flip chart (or a whiteboard) and markers
- Photocopies of paper forms including:
  - Annex 1 (Follicle identification test) 1 per grader
  - Annex 2 (Grader qualifying tracker sheet) 1 copy per grader
  - For conducting the IGAs using slides rather than phones, Annex 3A - 1 per grader, Annex 3B, 2 per grader, plus spares for potential retakes.
  - Annexes 9 & 10 (Class and field based OSCE mark sheets) 1 of each per grader
  - TT & TS Assessment sheet (document F4 in training folder) 1 per grader
  - Annex 11 (Survey forms) 1 per recorder
  - Annexes 14A, 15A & 16 (Practice & test exercises and the absentee template) 1 copy per recorder
  - Annex 19 (Final quiz) 1 per trainee
  - Optional Tropical Data supervisor checklist (Annex 18) if no local equivalent, 1 per supervisor
- Torches (1 torch for each grader) and spare batteries
- 2.5x loupe (Optivisor recommended; 1 for each grader)
- 3D goggles (1 for each grader trainer and trainee)
- Alcohol gel hand disinfectant
- WHO trachoma simplified grading system cards (optional 1 per grader)
- Follicle size guide stickers
- Cotton swabs (for single use on individuals whose eyelids are very difficult to evert)
- Waste bag for appropriate disposal of all field litter
- Android smartphones (1 for each recorder and supervisor(s), plus 1 for the recorder trainer); with appropriate survey forms loaded and SD cards and SIM cards in place
- Extra battery packs (1 for each Android)
- Chargers (1 per Android) and surge protectors (1 per Android)
- Notebooks (1 for each grader and each recorder)
- Rain-proof carry bags (1 for each grader and recorder)
- If rain is likely, umbrellas or rain gear
- Pens (3 for each recorder)
- Tetracycline eye ointment (or azithromycin) to give to participants found to have active trachoma or presumed bacterial conjunctivitis
- Laminated photos of the water source and sanitation facility categories (1 copy of Annex 12 and 1 copy of Annex 13 for each recorder)
- Laminated sheet listing the trichiasis questions in the local language (if the forms on the Android are not in the local language)
- Laminated sheet of the surgical scar aide-memoire for each grader (Annex 7)

- Laminated copy of the Cluster sampling and household selection aide-memoire (Annex 17) 1 per team
- Referral forms – optional template in Annex 8 (for participants found to have trichiasis or other eye conditions the team feel warrant referral.
- Stamp and stamp pad for referral forms (if required locally; 1 for each team – or forms could be stamped after photocopying, in advance of fieldwork)
- Clip-boards (1 for each recorder)
- Sticky labels or name badges (to number individuals in field-based during IGA testing)
- Thank-you gift for participants participating in training field work (consider pencil, pen, soap; to be decided locally)
- Consent forms (if required)
- Certificates of attendance for trainees
- Personal items may also be necessary if trainers and trainees are expected to stay away from home overnight as part of training.

9. PowerPoint slide sets containing clinical images for grading have been checked on your computer and projector

Each set of clinical images has been graded by multiple expert graders, and the grades are supplied in this training system. The grader trainer(s) should check that they display well on the projection system that you have.

10. Pathways for referral of patients to medical services are defined

It is unethical to conduct a survey that identifies patients who have TT without offering appropriate follow-up. TT cases should be referred to a health facility with trained TT surgeons, so that TT cases can be assessed and managed appropriately. The training coordinator should identify local eye care and healthcare providers, determining to whom and how

RTI International/Shea Flynn

Above Thumbs up! Students line up to have their eyes examined for trachoma in the Solomon Islands.

patients with trichiasis, cataract or other medical problems diagnosed during training should be referred. A list of individuals discovered during training field work to have trichiasis should be generated, and a plan made for providing services to them. Responsibility for generating this list belongs to the graders. Arrangements should be made to treat trichiasis patients without cost to the patients themselves.

11. Per diem rates for fieldwork have been agreed and communicated to trainees in advance

There is no point in training individuals who do not want to undertake fieldwork at the set per diem rate. If no one wants to undertake fieldwork for the set per diem rate, the rate may be too low.

12. Sufficient trainees are invited

Because not all grader trainees will pass the grader qualifying workshop, you will need to invite ~30% more grader trainees than you anticipate needing for the actual survey work. See Section 4 for advice on selecting trainees. Grader trainees should bring their normal health service ID cards, if they have them, to wear during fieldwork. Recorders will also be required to pass a recorder reliability test, so you should also invite 10-20% additional recorder trainees than you anticipate needing. Close attention should be paid to the selection criteria for these roles to minimise any chances of failure.

13. Recorder trainees have been assigned Recorder IDs

These are four-digit numbers, one of which will be assigned to each recorder trainee. To obtain recorder IDs, please email a list of the recorder trainees' names to support@tropicaldata.org, at least five business days before the start of the training week. Alternatively these can be assigned by the recorder trainer, for which guidance is given in the relevant section of the manual.

14. Trainers are identified and kept informed or involved with organisation and coordination

Trainers should be identified and confirmed as early as possible, to aid planning and to maintain the necessary trainer to trainee ratios. If international trainers are attending the training, ensure plans are communicated in advance of their arrival. Ensure that time is allowed once they arrive and before the training starts for all trainers and coordinators to meet and finalise preparations.

4 Selection of personnel

Each survey team will include at a minimum one grader, one recorder, and a community guide. It is possible that other people (such as a driver) may also assist the team in the community. Local circumstances will dictate whether other people should be added to the team.

To ensure high quality standards are maintained, it is usually preferable for a country to train fewer teams and have them move around, rather than train many teams that all work in parallel.

However, the more teams you have, the faster the work can be completed.

A decision on the optimal number of teams must be made at country level.

1. Generic requirements

Conducting trachoma surveys requires people with a number of generic skills. All team members should know how to interact well with residents of rural communities. This means some fluency in the local language, an understanding of the importance of greetings, and good interpersonal communication with village leaders, individuals being examined and their families. Community residents volunteer their time to participate in training and surveys and must be considered our partners in this work: survey teams must treat them with respect.

RTI International

Above Mactar Sissoko, a Senegalese Principal Trainer, explains the purpose of the surveys to community leaders.

Both graders and recorders must be physically fit and able to walk long distances and work long hours in the field. Grader trainees should have good vision in both eyes, including near vision, using presbyopic spectacles if needed.

2. Requirements for grader trainees

Ideally, grader trainees will have already been trained and certified through the GTMP and/or Tropical Data. For previously trained graders who qualified over 6 months ago or who have not been active for over 6 months, a refresher training should be undertaken (please contact **admin@tropicaldata.org** to discuss). If certified graders are not available, individuals who have some previous experience grading trachoma may be easier to train than those without experience, but grader trainers must be prepared to “un-train” bad grading habits if necessary. General nurses or medical assistants, or other health care workers, can be trained as graders, but they may take longer than individuals with ophthalmic experience to demonstrate proficiency in everting an eyelid without touching the cornea.

Grader trainees should have good near vision, using presbyopic spectacles if needed. If possible, you may want to consider confirming this by asking for evidence, or conducting a brief visual acuity test. Grader trainees need to be informed in advance that the first two days of training are a grader qualifying workshop, and that not all will score well enough to qualify as trachoma graders for the survey. Grader candidates should also have excellent communication skills, so that they are able to put community members at ease and clearly explain the purpose of the surveys.

Anthony Solomon/WHO

Above Trachoma prevalence survey, Viet Nam.

3. Requirements for recorder trainees

Recorders must be able to read and write well, and have excellent attention to detail and communication skills. Prior experience with smartphones is strongly recommended. People selected for training as recorders need not be health care personnel, but experience working in a health or data related field, is helpful. A refresher training is advised for previously trained recorders who have not been active for over 6 months.

4. Requirements for supervisors

Ideally, a survey supervisor should be an ophthalmologist or other highly-skilled eye care worker who, by virtue of their skills, experience, and personal relationships, commands respect and authority. It is strongly recommended that supervisors have been certified as Tropical Data graders or recorders, or at a minimum they should have attended the full training. If they are expected to provide technical support specifically as a grader or recorder supervisor, rather than providing more general supervision, they must be certified in the relevant role. For example, someone who has previous ophthalmic experience but that is not certified as a Tropical Data grader should not be acting as a grader supervisor as they have not been trained or certified using Tropical Data methods. In addition to having attended the training, all supervisors should have studied the training manuals and survey protocol in detail to have the appropriate knowledge to ensure fieldwork is conducted in the right way. Ideally, they should also have previous field supervision experience.

Good supervisors should have the following skills:

- Ability to problem-solve quickly
- Ability to command respect
- Lack of fear of reprisal in the event that they need to “fire” a team member
- Good communication skills
- Good clinical skills (if a qualified grader)

5. Requirements for community guides

Within each survey community, a community guide will be needed to help the team. The guide’s role includes introducing the team to survey households, providing crowd control, and assisting the team in other ways, as needed.

6. Requirements for drivers

If as part of the rental agreement drivers are provided by the organisations that provide vehicles, there may be no possibility of choosing drivers who are willing to assist the survey teams with the survey work in the community. If drivers can be involved, it is likely to be helpful to have them join part of the training, in order to understand the purpose of and overall plans for the survey. Where possible, the driver may help the team in the community in the following ways:

1. Assist with introductions in the community
2. Assist with crowd control
3. Assist with holding children if guardians are not available
4. Encourage families or children from selected households who are not at home but who are in the village at the time of the team’s visit, to find the grader and recorder before the end of the day, with the help of local village residents.

5 Training schedule

The first two days are a grader and recorder qualifying workshops. Trainees who pass all the certification tests will go on to the team training on days 3, 4 and 5. Modules shaded yellow take place in the classroom; those shaded green take place in the field.

Day 1: Grader qualifying workshop I

Time	Activity	Module *(PowerPoint if applicable)*
0800-0900	Opening of training (including registration & brief introductions) ***with recorders***	A
0900-0915	Introduction to the grader qualifying workshop	B *(B)*
0915-1000	WHO simplified grading system for trachoma	C *(C)*
1000-1015	Break	
1015-1215	Trachoma grading and follicle identification test	D *(D1,D2,D3)*
1215-1300	Classroom IGA tests (IGA practice)	E *(E0 & E1)*
1300-1400	Lunch	
1400-1515	Classroom IGA tests (test sets)	E *(E2 & E3)*
1515-1530	Break	
1530-1615	TT & TS learning (Part 1)	F *(F1)*
1615-1700	TT & TS learning (Part 2)	F *(F2)*

Day 2: Grader qualifying workshop II

Time	Activity	Module *(PowerPoint if applicable)*
0800-0900	TT & TS learning (Part 3)	F *(F3)*
0900-0930	TT & TS learning (Exam)	F *(F4)*
0930-1100	Examination techniques (learning)	G *(G)*
1100-1115	Break	
1115-1200	Examination techniques (practical)	G
1200-1300	Class-based Observed Structured Clinical Examination (OSCE)	H
1300-1400	Lunch (if the field location is far away you may want to take a packed lunch)	
Field	Grading in the field: field-based practice (on children)	I
	Grading in the field: OSCE	I

Day 1: Recorder qualifying workshop I

Time	Activity	Module (*PowerPoint if applicable*)
0800-0900	Opening of training (including registration & brief introductions) ***with graders***	A
0900-0930	Introduction to the recorder workshop	J *(J)*
0930-1000	Review of the hard copy data collection forms	K *(K)*
1000-1015	Break	
1015-1300	Review of the hard copy data collection forms continued	K *(K)*
1300-1400	Lunch	
1400-1515	Review of hard copy of data collection forms continued	K *(K)*
1515-1530	Break	
1530-1700	Review of hard copy of data collection forms continued	K *(K)*

Day 2: Recorder qualifying workshop II

Time	Activity	Module (*PowerPoint if applicable*)
0800-1100	Using the Androids	L *(L1&L2)*
1100-1115	Break	
1115-1300	Using the Androids continued	L *(L1&L2)*
1300-1400	Lunch	
1400-1515	Recorder Reliability Test	L *(L3)*
1515-1530	Break	
1530-1700	Recorder Reliability Test continued	L *(L3)*

Day 3: Team training I

Time	Activity	Module (*PowerPoint if applicable*)
0830-0945	Overview of Tropical Data, trachoma and prevalence surveys	M *(M)*
0945-1115	Cluster sampling & household selection	N *(N)*
1115-1130	Break	
1130-1200	Recorders demonstrate androids to graders	O
1200-1300	Obtaining consent	P *(P)*
1300-1400	Lunch	
1400-1500	Supervision (for all trainees, proposed supervisors & coordinators)	Q *(Q)*
1500-1545	Practise working together	R
1545-1600	Break	
1600-1730	Practise working together	R

Day 4: Team training II

Time	Activity	Module
0830-1230	Field practice for teams	S1
1230-1330	Lunch	
1330-1500	Field practice for teams (review)	S2
1500-1600	Team training review	T

Day 5: Team training III: graduation and review of survey plans

6 Trainer's notes for each module

For each module the following have been included where relevant:

- Module summary
- Objectives
- Learning objectives
- Duration of module
- Location
- Materials for use during the module
- Handouts
- Training procedures

A. Opening of training

Module summary: This is the opening session for all participants.

It may be important to have officials formally open the training. This should be scheduled to occur during this session, along with brief introductions. Given the amount of material to be covered, if officials are delayed, it may be best to start the separate grader and recorder modules first, and then reconvene to accommodate a formal opening of the training when officials arrive.

Objectives:

1. To formally open the training.
2. To introduce trainers and trainees to each other.
3. To give the necessary logistical announcements for the week.

Duration: 45 minutes (day 1, 0800-0900)

Location: classroom

Training procedure:

1. Welcome participants to the training course.
2. Ask each participant (and trainer) to introduce themselves.
3. Ensure any necessary announcements are made regarding organisation and logistics for the week.

B. Introduction to the grader qualifying workshop

Module summary: Trainees attend workshops with a variety of expectations about the nature of the workshop and what they will gain from participating. These expectations may be different from the intentions of the organisers, and if not discussed at the beginning of the workshop may cause confusion or dissatisfaction, and hinder the learning process. This is particularly true for the grader qualifying workshop, where grader trainees will need to pass a certification process in order to continue on to further training as a grader as part of a survey team.

It is critical that participants understand that not all will qualify as a grader. For individuals who do not qualify, if it is expected that they will still play another role (such as field coordinator) in the survey, depending on previous training and field experience, they may be able to continue for the duration of the training. It is important to emphasise that even if such trainees stay, if they have not passed the certification they will not be certified as graders.

Dominic Nahr/Magnum/Sightsavers

Above Women line up to be examined for signs of trachoma, Ethiopia.

Objectives:

1. To determine the expectations trainees have in attending the workshop and their communication needs.
2. To present the agenda for the grader qualifying workshop.

Duration: 15 minutes (day 1, 0900-0915)

Location: classroom

Materials: pens, flip chart, computer, projector and PowerPoint B.

Training procedures:

1. Brainstorm expectations with the participants, recording responses on the flip chart paper. "Expectations" are what the trainee hopes to learn or achieve by attending the workshop.
2. When there are no more expectations, review each of the listed ones and discuss which will be met, which can be partially met and which will unfortunately not be addressed.
3. Show PowerPoint A, reinforcing the above by indicating where participants' expectations will be met, where adjustments can be made to try to meet other expectations, and how some expectations will not be met.

C. WHO simplified trachoma grading system

Module summary: This module presents the signs of the WHO simplified system for community assessment of trachoma. The module uses a PowerPoint presentation that will introduce grader trainees to the system, describing its five signs and indicating the role of each sign in the survey work.

Objectives:

1. To introduce trainees to the WHO simplified trachoma grading system, and its relevance to the survey.
2. To familiarise trainees with the clinical signs: trichiasis (upper or lower eyelid), TS, TF and TI, using slides.

Duration: 45 minutes (day 1, 0915-1000)

Location: classroom

Materials: computer, projector and PowerPoint C.

Training procedure:

1. This training will rely on PowerPoint C, which describes the WHO simplified trachoma grading system. Start the PowerPoint presentation.
2. Make sure the room is dark enough that the clinical pictures show up well. If the room cannot be made dark enough, then you will need to use a computer screen for the training. Depending on how many trainees you have, this may make it difficult for all of them to see the slides clearly.
3. Go through the slides one by one.
4. Ask frequently if the participants have any questions about the pictures or the WHO simplified trachoma grading system.

D. Trachoma grading and follicle identification test

Module summary: This module is the first step in the standardisation process. It provides further training on how to grade the trachoma clinical signs, with a particular focus on TF. It ends with a follicle identification test.

Objectives:

1. To train grader trainees to identify the clinical signs of trachoma in images, with a particular focus on TF.
2. To assist grader trainees to differentiate TF from other conditions.
3. To test trainees' ability to accurately identify individual follicles in images.

Learning objective: By the end of this module, the trainees should feel comfortable grading TF images, and achieve the necessary pass mark in the follicle identification test to pass to the next stage of the certification process.

Duration: 2 hours (day 1, 1015-1215)

Location: classroom

Materials: computer; projector; Powerpoints *D1, D2* and *D3*; 1 Android with images *D1*, *D2* and *D3* uploaded and loupes for each grader trainee; Follicle Identification test (Annex 1), Grader qualifying tracker sheet (Annex 2). (If there is an issue with using phones for the follicle identification test, PowerPoint *D3* may be used as a backup.)

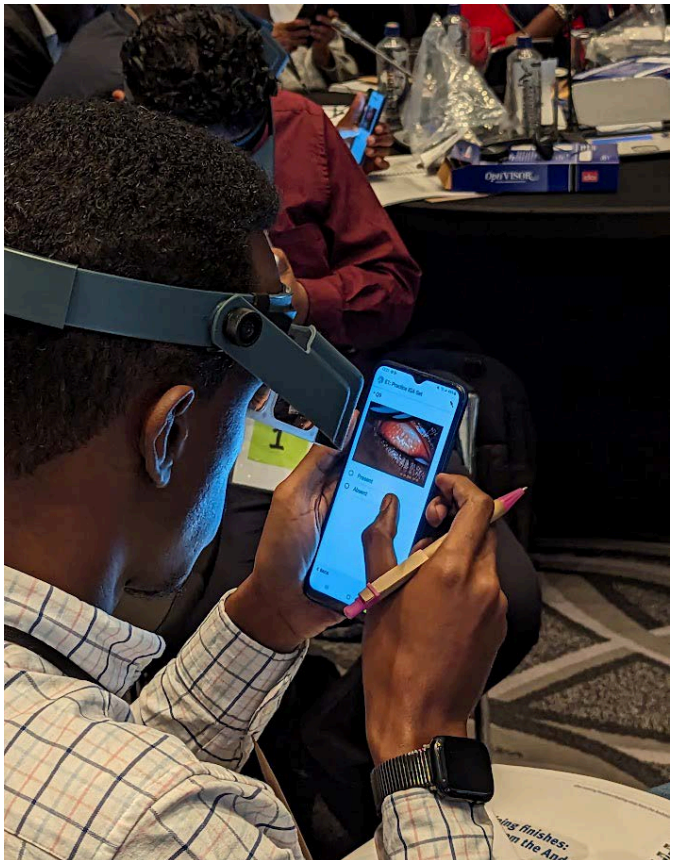
Training procedure:

1. Explain that this module will involve reviewing and grading photos, and will finish with a follicle identification test.
2. Explain to the trainees that in the first set of photos they will discuss the clinical signs together. These will be projected on the slides (PowerPoint D1) and trainees can view them in parallel on their phones using image set D1. Trainees should check that the phones are set to maximum brightness to ensure they can see the images properly.
3. After taking the trainees through the first few images of D1, begin to ask individual trainees to suggest what condition they think is being presented, and why.
4. At the end of D1, begin D2. Ask individual trainees to describe what they see and to justify their findings, including identifying individual follicles. Ask other trainees whether they agree with those opinions and if not, to explain why not.
5. At the end of D2, provide trainees with the paper-based answer sheet for the follicle identification test (Annex 1).
6. Use PowerPoint D3 to prepare the trainees for the follicle identification test, including showing them how to use the answer sheet.

7. Ask participants to look at the D3 images (set A) on their phones, using their loupe, and to draw where the follicles are on the form for each of the images. Ensure phones are set to maximum brightness.
8. Ask participants to hand in their answer sheets for marking. To pass, trainees should be able to identify the majority of follicles in approximately the right locations in all 5 photos. They must also correctly identify if TF is present or absent, showing a minimum of 5 follicles where TF is present and fewer than 5 follicles if TF is absent.
9. Review the answers using the slides at the end of PowerPoint D3. You may wish to explain to trainees that green follicles represent where at least two senior graders agreed on the presence of follicles and amber follicles represent where only one senior grader identified a follicle. Finish with the review slide to discuss the TF definition, the use of follicle size guides to help with accurate grading, and what actions graders could take in the field if they are unsure of a diagnosis.
10. Any trainee who does not pass will be permitted one opportunity to retake the test using the second set of D3 images (set B). Those who do not pass the retake cannot proceed to the next stage of the certification process.
11. Record each trainee's outcome on the grader qualifying tracker sheet.
12. If projected slides are used instead of Androids, use PowerPoint D3 to administer the follicle identification test.

E. Classroom IGA tests

Module summary: This module determines which grader trainees pass on to the next phase of the grader certification process and tests their TF grading accuracy. The module uses the images uploaded on Android phones to allow the trainees to practise and conduct inter-grader agreement (IGA) tests that assess the accuracy of trainees' TF grading. By using



Caitlin Mensah/RTI

Above A grader trainer completes the phone based IGA test.

phones, images of the eye are closer in size to a real eye, compared to the use of projected slides.

After completing a practice IGA, trainees will undertake two IGA tests. Each IGA test set tests a different competency and so it is important that trainees pass them both. If a trainee does not pass an IGA test, they will be allowed one retake. Additional training and review is encouraged before doing this. No more than one additional attempt to pass each set should be allowed.

Objectives:

1. To introduce grader trainees to the concept of IGA.
2. To prepare grader trainees for the IGA tests.
3. To determine, via IGA tests, which grader trainees can accurately grade TF and can pass to the next stage of the grader certification process.

Duration: 2 hours (day 1)

Location: classroom

Materials: PowerPoints *E0, E1*, *E2* and *E3*; 1 Android with images *E1*, *E2* and *E3* uploaded, loupes and the Grader qualifying tracker sheet (Annex 2) continued from the previous module.

If there is an issue with using the phones, trainers can conduct the IGAs by projecting the images using a computer and PowerPoints *E1*, *E2* and *E3*, printed copies of the relevant IGA test forms (Annexes 3A and 3B) and access to the Excel "Kappa calculator" spreadsheets (instructions in Annex 4).

1. Using PowerPoint *E0*, discuss with participants the meaning of IGA and the importance of standardisation within a survey.
2. Explain that this module will involve reviewing and grading photos, including a practice IGA as well as two IGA tests, to help ensure standardised and accurate field grading. For each IGA test, the trainees must achieve a certain kappa score to pass (≥0.7 for IGA 1, ≥0.6 for IGA 2).

   In addition, for IGA 2, the trainees must achieve an appropriate TF positivity difference score. The images in IGA 2 have been graded by multiple senior graders and a consensus grade assigned to each image. This has allowed us to determine the TF positivity in the IGA 2 image set(s). The participant must be within plus/minus 10% of the consensus grade TF positivity. This score checks that the trainee is not under- or over-calling TF.

IGA practice:

3. Prepare the trainees for the practice IGA on the phones (*E1*), which contains 100 images. Give each trainee an Android, and explain to the trainees that they will independently determine whether TF is present or absent in each image shown in the app. Make sure they understand what is being asked of them, and how to operate the Android. Ensure phone screen is set to maximum brightness.

   Stress to trainees that this is independent work, and they are not to look at others' Androids. Looking at others' Androids will result in dismissal from training. Remind them that in the field, no one will help them grade, and in any case, other trainees may not have the correct answers!
4. Each trainee will need to enter their full name in the field provided in the IGA form on the app. They will then need to grade each image (wearing their loupes). They should spend up to 20 seconds per image. As trainees progress through the images they may want to make a note of more difficult images they would like the trainer to review afterwards.
5. The trainee stops entering grades when they reach the final screen that displays "Please give your phone to the trainer: you have completed this exercise". They will need to give their phone to the trainer. The trainer will need to scroll to the next screen to see the score. The trainer will then close the form by clicking "save and send". Reassure the trainees that this practice score will not count, but is just to let them practise grading and completing the IGA process. The trainees' TF positivity difference score will indicate if they are tending to under or over call TF, which can be useful when reviewing photos ahead of the test.
6. Once the practice IGA has been completed, discuss as a class the images that trainees found difficult to grade.
7. **If projected slides are used instead of Androids**, use PowerPoint *E1* to administer the practice IGA. As each slide is presented, read out the number of the slide so that the trainees can be certain that they are recording their grades against the correct slide number.

Allow 20 seconds per slide; give a 5-second warning before changing slides. Each trainee should fill in a practice IGA test form (Annex 3B) as they look at each slide. At the conclusion of the IGA, trainers should enter each trainee's answers into the relevant kappa calculator spreadsheet sheet to calculate each

trainee's score and identify images that may need reviewing as a class. Full details of how to use the spreadsheet are given in Annex 3. Reassure the trainees that this practice score will not count, but is just to let them practise grading and completing the IGA process.

IGA tests:

1. Ensure trainees are comfortable with how the IGA tests will be conducted and how they will be scored, as previously discussed using PowerPoint *E0*. Using the phones, trainees will need to pass two separate photo-based IGA tests, each of which tests a different competency.
2. IGA test 1 (*E2*) has 50 images; to pass, trainees must achieve a kappa score of ≥0.7.
3. IGA test 2 (*E3*) has 100 images; to pass, trainees must achieve a kappa score of ≥0.6 and be within the acceptable range of the positivity score.
4. Trainees should open the first IGA test (IGA Test 1) on the Android phone and enter their name.
5. They will then need to grade each image (spending no longer than 20 seconds per image) and stop when they reach the final screen that displays "Please give your phone to the trainer: you have completed this exercise". Trainees should wear their loupes to grade images. Once all images have been graded, trainees will need to give their phone to the trainer. The trainer will need to scroll to the next screen to see the score, which they will record. The trainer will then close the form by clicking "save and send".
6. The trainer should then navigate to select the "Send finalized form" button in the app menu to confirm that no additional test forms were completed without their knowledge.
7. If a trainee accidentally closes a form before showing it to the trainer, the trainee will need to redo it. This should only be allowed once.
8. If the trainee passes IGA Test 1, they should then move to IGA Test 2 and repeat the process.
9. Trainees will need to pass both tests. They will be permitted one opportunity to retake each test (IGA Test 1 restake, and IGA Test 2 retake). Additional training is recommended before the retake. Those who do not pass both IGA tests cannot proceed.
10. Trainees who do not pass should be thanked for their participation and sent home, as their ongoing presence may be a distraction to the continuing trainees.

    However, if it is expected that the trainee will play another role (such as field coordinator) in the survey, the trainee may be able to continue for the duration of the training. It is important to emphasise that even if the trainee stays, if they have not passed the IGA tests they will not be certified as a grader.
11. Record each trainee's outcome on the grader qualifying tracker sheet.
12. If there are issues using the phones to complete the IGA tests, projected slides may be used as a last resort. These are not ideal as they are less similar in size to a real eye. In this scenario, use PowerPoints *E2* and *E3* to administer each IGA test set. As each slide is presented, read out the number of the slide so that the trainees can be certain that they are recording their grades against the correct slide number.
13. Allow 20 seconds per slide; give a 5-second warning before changing slides. Each trainee should fill in the relevant paper based IGA test form (Annex 3A and 3B) as they look at each slide. At the conclusion of each IGA, trainers should enter the trainee's answers into the relevant "Kappa calculator" spreadsheet to calculate their scores. Full details of how to use the spreadsheets are given in Annex 4.

F. TT & TS learning

Module summary: This module focuses on how to recognise trichiasis (upper and lower eyelid) and TS and to determine which grader trainees pass on to the next phase of the grader certification process.

Objectives:

1. To review diagnosis of trichiasis (upper and lower eyelid) and TS.
2. To learn how to use 3D goggles to view 3D images.
3. To determine which grader trainees can accurately grade trichiasis and TS using photos and can pass to the next stage of the grader certification process.

Learning objectives: By the end of this module, the trainees should be able to:

1. Accurately diagnose trichiasis (upper and lower eyelid) and recognise TS.
2. Pass a photo-based trichiasis and TS grading assessment.

Duration: 3 hours (split over days 1 & 2)

Location: classroom

Materials: computer, projector, PowerPoints F1-4, instructions for 3D goggles (these are in F1 but can also be found in Annex 5), Annex 6 printed if 3D images (F1) cannot be viewed on a laptop or computer screen, document F4 (the Trichiasis and TS assessment mark sheet), Grader qualifying tracker sheet (Annex 2), laptops to view images, 3D goggles (one for every 1-3 trainees), loupes, flip chart and markers.

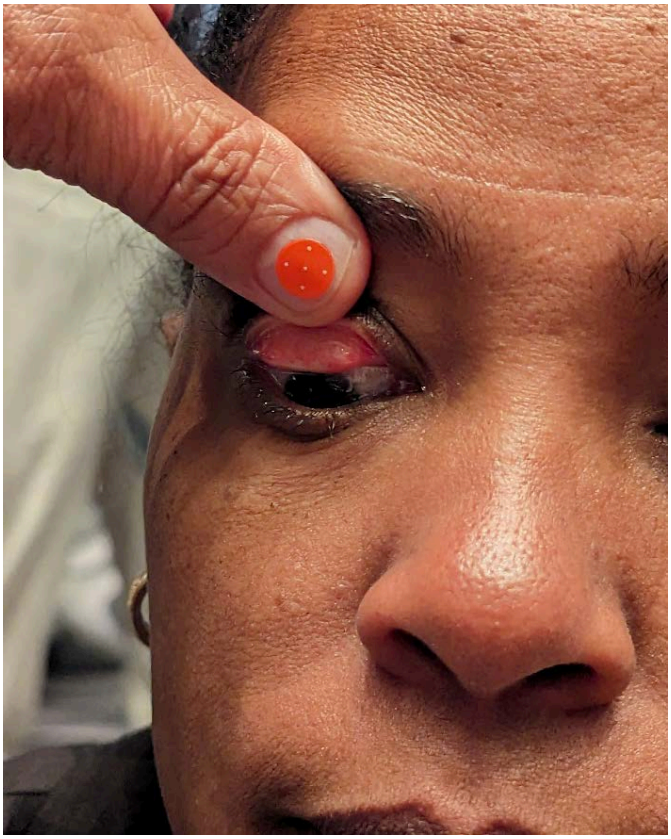
Note: If 3D goggles are not available, it is possible to view the left photograph of the two "split images" in 2D.

Training procedure:

1. For this module you will need to make sure the room is dark enough that the clinical pictures show up well. If the room cannot be made dark enough, then you will need to use a computer screen for the training, ideally having multiple screens or laptops set up so that trainees can clearly view the photos. Having these set up will also serve a dual purpose when it comes to viewing the 3D images, allowing them to more easily spend time viewing and diagnosing these.
2. Ask a participant to describe TT (at least one eyelash from the upper eyelid touches the eyeball, or evidence of recent epilation of in-turned eyelashes from the upper eyelid). Make sure that trainees have a full understanding of the definition of TT (upper eyelid trichiasis only) (PowerPoint F1, slide 2).
3. Ask a participant to describe lower eyelid trichiasis (one or more eyelashes from the lower eyelid touching the eyeball, or evidence of recent epilation of in-turned eyelashes from the lower eyelid). Make sure that trainees have a full understanding of the definition of lower eyelid trichiasis (PowerPoint F1, slide 3).
4. Explain that trichiasis is graded separately for the upper eyelid and the lower eyelid in both eyes. Inform the trainees that any eye identified with trichiasis (upper or lower eyelid) will require assessment of TS (trachomatous conjunctival scarring) in the everted upper eyelid (PowerPoint F1, slide 4).
5. Ask a participant to describe TS. Make sure that trainees have a full understanding of the definition (PowerPoint F1, slide 5).
6. Ask frequently if the participants have any questions about the pictures or the WHO simplified grading system.
7. Distribute the 3D goggles around the classroom. Talk through the instructions in PowerPoint F1, slides 6-10 for using the 3D goggles. Note that the 3D goggles can be used with or without glasses; if any trainees are using bifocals they should view through the upper part of the glasses.
8. Ask the trainees to practise viewing the images in slides 12-19 with the 3D goggles. These must be viewed on a laptop or computer screen, or if necessary can be printed from Annex 6 and a copy given to each trainee to use. 3D goggles cannot be used with projected slides. The 3D images

will work best if they are well-lit but not reflecting light into the 3D goggles. Ask the trainees what they can see and how this compares to viewing solely the 2D image (the left-hand image of the split 3D image).

9. Show PowerPoint F2 to the trainees. There are slides that show some examples of trichiasis (major and minor; upper eyelid and lower eyelid). There are also slides showing evidence of epilation. For the images presented in 3D, trainees will want to try viewing using the 3D goggles.
10. Show the slides of TS in PowerPoints F3, starting with the slides of a normal eyelid (3a). As conjunctival scarring can range from mild to severe, it is important to show a variety of slides. Mild TS is shown in slides 3b. Only moderate or severe scarring is considered an easily visible scar as per the WHO simplified grading system definition, and therefore mild TS should be marked as 'absent'. Moderate or severe scarring (3c) should be marked as 'present' where identified.



Caitlin Mensah/RTI

Above Practicing examination technique with the aid of a follicle size guide sticker.

Trichiasis and TS grading assessment:

11. The trainer will now establish assessment stations using a computer screen or laptop, showing PowerPointF4 (a and b). Depending on the number of trainees, you may want to have multiple stations set up to make the assessment quicker to administer, for example, one station between 1-4 trainees. If resources do not allow for this, one station for all trainees is possible, but will take longer.
12. The trainee will demonstrate their ability to identify the presence and absence of trichiasis in a series of 3D photographs (two slides per diagnosis, PowerPoint F4a), and identify the presence and absence of TS in a series of 2D photographs (PowerPoint F4b).
13. The trainee should be able to correctly identify the following (for both upper and lower eyelid):
    - No trichiasis
    - Minor trichiasis (1–5 eyelashes touching the eyeball and/or evidence of recent epilation)
    - Major trichiasis (≥6 eyelashes touching the eyeball and/or evidence of epilation)
    - Trachomatous scarring (TS)
14. The trainee will say their diagnosis out loud and the trainer will record the findings on the "Trichiasis and TS assessment" sheet (document F4).
15. The trainee must grade trichiasis and TS as absent or present correctly in all photos in order to pass. Additionally they must correctly identify the severity of trichiasis (major or minor) in at least 4 of the 5 photos to pass. If they do not reach this standard, further revision should be done prior to a retake.
16. The trainer should not share the correct diagnosis with trainees until all candidates have either passed, or attempted the test twice. This is to ensure that retake

candidates do not learn the correct diagnosis before their retest.

17. Record each trainee's outcome on the grader qualifying tracker sheet and do a final review of the photos with trainees if required.

G. Examination techniques

Module summary: This module prepares trainees for examining participants in the field. It will require grader trainees to examine the eyes of their fellow trainees using a loupe, follicle size guides and proper hand cleaning technique. Trainees will learn about correct positioning of adult and child participants for examination. They will learn to first look for trichiasis, before everting the eyelid to examine the tarsal conjunctiva.

Objectives:

1. To ensure the grader trainees know the necessary steps of cleaning hands and torch handles (where relevant) before examining an eye, and any other relevant infection control measures.
2. To ensure the graders know how to apply and use the follicle size guides.
3. To train the graders in the method for everting an eyelid.
4. To provide an opportunity for the graders to practise using a loupe and obtaining adequate lighting (torch/sunlight).
5. To ensure grader trainees know how to correctly position a participant for examination (adults and children).
6. To ensure trainees are aware of the appropriate methods of treatment and referral for active trachoma and trichiasis (upper and lower eyelid).

Learning objectives: By the end of this module, the trainees should be able to:

1. Demonstrate proper hand and torch cleaning techniques, and awareness of other relevant infection control measures.
2. Demonstrate application of the follicle size guides using the pre-bend and firming down actions, and their use for TF diagnosis.
3. Demonstrate the steps for examining eyes (starting with the right eye, assessing the eyelid, everting the eyelid; repeat with the left eye), including correct positioning of participants and collecting information about any previous trichiasis management.
4. Quickly and painlessly evert the right and left eyelid of a participant.
5. Demonstrate the use of loupes and obtaining adequate lighting, including using a torch, while examining the eyelid.
6. Explain how to treat someone who has been found to have TF or TI.
7. Explain how to refer patients.

Duration: 2 hours 15 minutes (day 2).

Location: classroom

Materials: loupes (at least one per pair of trainees), torches, alcohol gel, follicle size guides, surgical scar aide-mémoire (Annex 7), PowerPoint G, any other locally required materials to support infection control e.g. face masks

Training procedure:

1. Distribute a loupe, torch and a number of follicle size guides to each trainee. Trainees should put on their loupe, and keep it on for the rest of the module.
2. Show PowerPoint G to the trainees.
3. For slide 7, trainers should talk through the diagram which shows ways that children can be held to examine them safely. Practise the techniques of safely holding a child for an examination.
4. What if a young child is asleep? If their mother gives consent for examination, sometimes it's possible to examine the child without waking them if the grader is very gentle. This is often much less traumatic than deliberately waking them up for examination.
5. Continue through the slides, covering the process for trichiasis examination. For slide 10, note that for individuals with trichiasis,

both the number of eyelashes touching the eyeball and the number of eyelashes recently epilated are recorded for the upper and lower eyelid, separately, for each eye.

6. The video on slide 12 shows the correct examination technique. While the video is playing, the trainer should read the script in the notes section to narrate what is happening in the video.
7. Before starting slide 13, ask the participants what might be some of the possible histories among those diagnosed with trichiasis (upper or lower eyelid). Make a list of possible patient histories, including options such as, "I didn't know I had trichiasis", "I've never seen a health worker about my in-turned eyelashes", "I was told I had trichiasis and should have surgery but didn't want it", "I was told to have surgery and agreed, but couldn't go", "I was told to pull out the eyelashes", "I have been pulling out eyelashes for years", "I had surgery in the past", etc.
8. The trainees may think of many other possible histories. Explain that we need to record the history by answering specific questions. Show slide 13, which lists the specific questions they must ask and the response options. Discuss how each of the possible histories they have listed would be entered in the Android. Note that some patients will fit response (d), which covers all cases in which a health worker has never seen the upper or lower eyelid trichiasis, or the patient was not aware that they had upper or lower eyelid trichiasis.
   - Q1. Have you ever been offered surgery by a health worker to correct the trichiasis (in-turned eyelashes) in this eye? [This question will be asked separately for the upper eyelid and lower eyelid, and left and right eye.]

Responses options:

- Yes, a health worker informed me and offered me surgery, and I had surgery
- Yes, a health worker informed me and offered me surgery and I accepted the offer but I did not get surgery
- Yes, a health worker informed me and offered me surgery, but I declined it
- No health worker informed me and offered me surgery
- Don't know

9. Using Slide 14, discuss the importance of the trichiasis management questions. Pay particular attention to the wording of the question, and ensure everyone shares a common understanding of a 'health worker'. This definition should have been articulated in the survey protocol.
10. Using slides 15-23, review the process for verifying the responses to the health management questions by checking for evidence of a surgical scar. Distribute Annex 7 to be used as an aide-mémoire to support the process and show what questions to ask.
11. Explain that we also need to ask specifically about epilation. Show slide 24. Explain again that both trichiasis management questions, 1 and 2, must be asked and answers recorded, regardless of the response to question 1.
    - Q2. Have you ever been offered epilation by a health worker to correct the trichiasis (in-turned eyelashes) in this eye? [This question will be asked separately for the upper eyelid and lower eyelid, and left and right eye.]

Responses options:

- Yes
- No
- Don't know

12. Using slide 25, discuss how to treat people who have trachoma. Discuss who should be treated with antibiotics. Discuss what to do with a person found to have trichiasis, including where patients will go for treatment, how they will get there, and the costs they may incur. You may use Annex 8 as a template for referrals (slide 26).
13. Using the final slide on other eye conditions (the final question in the data collection form), discuss how this field can

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Above Children waiting to be examined in Tanzania.

be used to record non-trachomatous related conditions that trainees feel should be highlighted as needing treatment or referral e.g. cataract. This will depend on the individual grader's skills and experience. Ensure everyone has a common understanding of local referral practices and what should be done in these cases. For example, can the trachoma referral form (Annex 8) also be used ?

14. Once the PowerPoint is complete, move on to practical demonstrations and practice.
15. Demonstrate cleaning your hands with alcohol gel. Emphasise: a) thorough cleaning of hands and torch handle (if used) prior to examination and between participants, b) the necessity of letting hands dry prior to touching the eyelid, and c) improper hand cleaning technique poses a risk to people being examined, and is therefore grounds for dismissal.
16. Demonstrate application of the follicle size guides to your thumb nails. This should be done on clean nails. The follicle size guide is removed from the sheet, and bent using the thumb and index finger. It is then stuck to the thumbnail and the edges firmed down with the nail of the opposite thumb. The follicle size guide will then stay firmly attached to the nail, and withstand washing with soap, water and alcohol gel.
17. Trainees should put a follicle size guide on each thumbnail. Highlight that follicle size guides can stay on for several days without falling off and so to reduce wastage, encourage trainees to keep them on for the duration of the training if possible. When in the field, they should wear them for multiple days before replacing with new ones.
18. Ask for a volunteer to come to the front of the room. Demonstrate putting the loupe on, before cleaning your own hands.

Explain that the eyelids (upper and lower eyelid) are always examined for trichiasis before everting the upper eyelid, since eversion of the eyelid may make later detection of mild trichiasis more difficult.

19. Always examine the right eye first, then the left eye. This helps to avoid confusion in recording results.
20. While examining the uneverted eyelid, ask the trainees what they should be looking for, based on the slides seen previously (eyelashes touching the eyeball, or evidence of recent removal of in-turned eyelashes, differentiating between upper and lower eyelid trichiasis).
21. Demonstrate how to evert the eyelid using your fingers. (Use of a cotton swab, stick, or any other foreign implement as a fulcrum for eversion should be strongly discouraged. In participants whose eyelids are very difficult to evert, a cotton swab can be used; it should be discarded appropriately after use, and never used on more than one participant.)
22. To evert a participant's right eyelid, place the 4th and 5th fingers of your left hand on the participant's right temple, in order to align your hand with any movement of the participant's head. Ask the participant to look down. Use your 3rd finger to push the participant's right eyebrow slightly upwards, so that the eyelashes are lifted. Grasp the central eyelashes between your thumb and index finger, and gently pull them out and down so that a small space forms between the eyelid and the eye. Using the tip of the index finger of your right hand placed in the middle of the eyelid as a fulcrum, pull upwards gently on the grasped eyelashes so that the eyelid everts.
23. To evert a participant's left eyelid, the fingers of your right hand should align, push, grasp, pull and lift, while the tip of the index finger of your left hand should be used as a fulcrum.
24. While examining the everted eyelid, ask the trainees what they should be looking for in the conjunctiva (TS and surgical scar in individuals with trichiasis (upper or lower eyelid); TF and TI in everyone), based on the slides seen previously and using the follicle size guides.
25. Ensure that the eyelid is returned to the normal position after examination.
26. Ask the trainees to form pairs.
27. Invite trainees to practise on their partners, with each person examining their partner's eyelids and then everting each of their partner's eyelids. Remind trainees to clean hands and ensure they are always using their loupes and have a follicle size guide fixed to each thumbnail before examining their partner's eyes.
28. Trainees should practise on their partner and move around the room as necessary to practise on others until they are comfortable in the full examination technique process. The trainer should also be satisfied with the trainees' performance.
29. Strongly recommend that trainees ensure that their fingernails are cut short: long fingernails are more likely to pinch the eyelid skin.

H. Class-based Observed Structured Clinical Examination (OSCE)

Module summary: Following training in trachoma grading and examination techniques, the trainees will undergo objective structured clinical examinations (OSCEs) to assess their grading skills.

This module determines which grader trainees can continue to the next stage of the training (field-based OSCE).

Objectives:

1. Trainees will demonstrate proper clinical grading of trichiasis, TS, TF and TI.
2. Trainees will demonstrate proper hand washing techniques.

3. Trainers will be able to evaluate if trainees follow the correct sequence for examination and data recording, and whether they are ready to proceed to field practice, whether re-training and a repeat OSCE is required, or whether training should be discontinued.

Duration: 1 hour (day 2, 1200-1300)

Location: classroom

Materials: Loupes, torch, follicle size guides, alcohol hand gel, Class-based OSCE mark sheet (Annex 9) and continued Grader qualifying tracker sheet.

Training procedures:

1. The trainee will be examining the trainer or another trainee, as if they are a member of a household.
2. Trainees will follow the standard sequence for examination, assuming the examinee has a trachoma diagnosis as per the OSCE mark sheet.
3. Evaluate whether the trainee follows the correct sequence for examination and demonstrates their ability to evert both right and left eyelids of a normal individual.
4. Record each trainee's OSCE outcome on the grader qualifying tracker sheet.

The correct sequence for examination is:

1. Put a follicle size guide on each thumbnail.
2. Put on loupes and ensure that you have good illumination. Ideal practice is to place your chair in the shade on the edge of the sunlight, so that you can sit to examine children whose eyes are directly illuminated by the sun, and stand up to examine adults who are also standing in the shade. For trichiasis diagnosis, use of a torch for adequate lighting is recommended.
3. Clean your hands and torch handle with alcohol hand gel.
4. Ensure the grader and participant are properly positioned.
5. Ask the participant to look straight ahead.
6. Use illumination and loupes to examine the right eye, as follows (steps 7-19).
7. Start with the **right upper eyelid**. Locate the eyelid margin and eyelashes, and using the torch and looking from different angles (below, temporal and nasal sides), determine if any eyelashes from the upper eyelid touch the eyeball, or if there is evidence of recent removal of in-turned eyelashes from the upper eyelid.
8. Ask the participant to look to the extremes of gaze on either side to see if the upper eyelid eyelashes move with the eyeball.
9. Use the thumb of your left hand to exert mild pressure on the participant's right upper eyelid, so that the eyelid lifts slightly. Determine whether any eyelashes touch the eyeball or if there is evidence of removal of in-turned eyelashes from the upper eyelid.
10. Say the trichiasis diagnosis out loud for the recorder to enter in the data collection form.
11. For the **right lower eyelid**, examine the eyelid margin and eyelashes from different angles (above, temporal and nasal sides) using the torch.
12. Ask the participant to look to the extremes of gaze on either side to see if the lower eyelid eyelashes move with the eyeball.
13. Use the thumb of your left hand to exert mild pressure on the participant's right lower eyelid, so that the eyelid lowers slightly. Determine whether any eyelashes touch the eyeball or if there is evidence of removal of in-turned eyelashes from the lower eyelid.
14. Slightly lift the chin of the person you are examining. Place the fourth and fifth fingers of your left hand on the participant's right temple, stabilising your hand in relation to the participant's head. Ask the participant to look down without moving their head.
15. Use the middle finger of your left hand to exert mild upward pressure on the participant's right upper eyelid, so that the

eyelid margin and eyelashes are pulled slightly upwards and outwards.

16. Ask the participant to look down, and grasp the eyelashes between the index finger and thumb of your left hand. Gently pull the eyelashes out and down so that a small space forms between the eyelid and the eyeball.
17. Use the index finger of your right hand placed in the middle of the eyelid as a fulcrum over which to evert the participant's right upper eyelid, then examine the conjunctiva.
18. Report findings to the recorder.
19. Ensure that the eyelid is returned to the normal position after examination.
20. Use follicle size guides, illumination and loupes to examine the left eye (repeating steps 7-19, but this time using your right thumb in step 8, the fingers of your right hand in steps 13-16, and the index finger of your left hand in step 17).
21. Where trichiasis (upper or lower eyelid) is observed, look for evidence of a surgical scar, ask the surgical management question and the epilation management question. Make sure to use the local definition of a health worker. Offer referral for surgery for TT.
22. Where TF is observed, offer antibiotics.
23. Let the recorder know if there are any additional notes you would like recorded.
24. Let the recorder know if you have identified other eye conditions that you feel need treatment or referral.

I. Grading in the field: field-based practice and OSCE

Module summary:

This module takes the trainees out into a community setting to examine participants for trachoma. It provides them with an opportunity to practise their skills in a field setting and to complete a final assessment to qualify as a grader. Prior to this module, the training coordinator should have identified a site for this activity, discussed the training visit with local officials and village leaders, and arranged for transport.

Objective: To provide the trainees with an opportunity to: i.) practise eyelid eversion and examination of children for trachoma in a community setting and, ii) to assess their examination skills through a field-based OSCE.

Learning objectives: By the end of this module, the trainees should be able to:

1. Demonstrate proper trachoma examination techniques of children, including use of loupes, torches, follicle size guides and proper hand cleaning, and feel confident in examining children of all ages.
2. Pass a field-based OSCE with participants in a community setting.

Duration: 2-4 hours (depending on distance to field site; afternoon of day 2)

Location: community setting such as a village, with access to children of various ages.

Materials: alcohol gel, loupes, follicle size guides, torches, antibiotics, Field-based OSCE mark sheet (Annex 10) and grader qualifying tracker sheet.

Training procedure:

Practice:

1. Before leaving for the field, explain to the trainees what they will be doing and how it will be organised.
2. Ask the trainees what they expect from this practice and what challenges they may face.
3. If possible challenges are identified, discuss with the trainees how these might be dealt with.
4. Ask the trainees to collect the supplies they will need and check that they have sufficient materials for the module. When in the field, trainees should follow correct procedures including using their loupes and follicle size guides, ensuring good illumination and positioning, and washing

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Above Dr Michael Dejene showing families how to apply tetracycline after diagnosis of trachoma, Ethiopia 2018.

hands and torch handles (where appropriate) between participants.

5. Upon arrival, meet with the person in charge of the village, explain the work and ensure things are organised as needed.
6. Examine the eyes of the first 5-10 children yourself, with the trainees looking on. Discuss each of the cases with the trainees.
7. Invite trainees to examine children's eyes with other trainees looking on. Have the examining trainee relate what they see. Please note that no child should be examined more than five times (including by the trainer).
8. Ensure to arrange for younger children to also participate so that graders get experience with young children, in particular their correct positioning for examination.
9. The grader trainees should then begin examining children on their own. Supervise the trainees, spending some one-on-one time with each of them, and verify any cases of trachoma that trainees identify.
10. If trainees have difficulties in everting the eyelid, spend time one-on-one to guide the trainee, and ensure they are ready for the final assessment and work in the field.
11. While trainees practise, you can prepare the assessment. For every 4 trainees, you should line up 10 participants: 5 preschool-aged children, 3 school-aged children, and 2 adults.
12. Move onto the assessment when you feel the trainees are ready.

Assessment:

13. Participants should be numbered 1-10 on stickers fixed to their clothing or on cards hung around their neck. While the order of examination is not important, the numbering will help keep track and ensure all 10 are examined.
14. Trainers will then observe each trainee examine the ten participants following the full taught examination procedures (as detailed in previous modules, covering both trichiasis and everted eyelid examination) and ensure they can do it successfully on the participants of different ages.
15. Trainers will use Annex 10 to track the progress of the examinations and confirm that the trainee has followed the procedure and meets expectations at every step. If trainee graders pass this final assessment, they will qualify as graders and graduate to the team training.
16. Any trainee who does not pass will be permitted one opportunity to retake the OSCE; additional training and review is encouraged before doing this.
17. Record each trainee's OSCE outcome on the grader qualifying tracker sheet.

18. Give each participant a thank-you gift for their time and patience. Any participant found to have active trachoma should be given treatment, and a responsible adult told how to apply it. Any participant found to have trichiasis should be referred for surgery.
19. Finding and demonstrating live cases of TF or trichiasis is not a formal requirement of the training. Doing so would be practically difficult given that they are increasingly rare. However, if it is possible, trainers/coordinators should discuss with the community (while doing field practice or during sensitisation for field practice), if there are any known local cases. If yes, ask if those individuals would be happy to be examined by the trainees as part of the practice, in order to be able to demonstrate live examples to complement the training.

J. Introduction to the recorder workshop

Module summary: Trainees attend workshops with a variety of expectations about the nature of the workshop and what they will gain from participating. These expectations may be different from the intentions of the organisers, and if not discussed at the beginning of the workshop may cause confusion or dissatisfaction, and hinder the learning process. Trainees should also understand that not all may qualify as a recorder. For individuals who do not qualify, if it is expected that they will still play another role (such as field coordinator) in the survey, dependent on previous training and field experience, they may be able to continue for the duration of the training. It is important to emphasise that even if such trainees stay, if they have not passed the recorder reliability test, they will not be certified as recorders.

Objectives:

1. To determine the expectations trainees have in attending the workshop and their communication needs.
2. To present the agenda for the recorder workshop.
3. To complete introductions.

Duration: 30 minutes (day 1, 0900-0930)

Location: classroom

Materials: pens, flip chart, computer, projector and PowerPoint J

Training procedures:

1. Conduct more detailed introductions to better get to know the trainees and their relevant skills and experience following the opening session.
2. Brainstorm expectations with the participants, recording responses on the flip chart paper. "Expectations" are what the trainee hopes to learn or achieve by attending the workshop.
3. When there are no more expectations, review each of the listed ones and discuss which will be met, which can be partially met and which will not be addressed.
4. Show PowerPoint J, reinforcing the above by indicating where participants' expectations will be met, where adjustments can be made to try to meet other expectations and how some expectations will not be met.

K. Review of the hard copy data collection forms

Module summary: This module prepares recorders for the interviews they will conduct at the household that capture information on water, sanitation and hygiene (WASH). In this module, they learn exactly what information is supposed to be captured and what each of the questions actually means. It also introduces them to the other data collection forms they will be using in the field to ensure they have a good understanding of the data to be collected.

Objectives:

1. Review the different questions included in the data collection forms and discuss the response options.
2. Ensure trainees have a good understanding of the survey's WASH elements.

Learning objective: By the end of this module the trainees should be able to explain what data will be entered into each field of the forms.

Duration: 6 hours (day 1)

Location: classroom

Materials: survey forms (Annex 11, 1 for each trainee), laminated sheets with photos of water source and sanitation facility categories (Annexes 12 and 13), PowerPoint K

Training procedures:

1. Introduce the three levels of data collection (slide 2) and go through the cluster form, detailed in Section A below. Ensure everyone has a paper copy of the form (Annex 11) and project it from the PowerPoint, slide 4.
2. Introduce the household form (Annex 11). Give everyone a paper copy of this to look at so that they get an idea of what will be asked and project this using slides 6-8.
3. Explain that consent must have been given before GPS recording begins with the Android.
4. Go through PowerPoint K and the household form, using the following sections of the manual as the trainer reference.
5. As you go through the slides relating to the WASH questions, encourage discussion and ensure that all trainees develop a common understanding of the differences between the various responses to each question, including agreeing on key terminology in any relevant local languages.
6. Once trainees are comfortable with the contents of the household form, you can briefly introduce them to the resident form on slide 43 (also part of Annex 11). If trainees are not familiar with trachoma you can outline what the graders will be examining for using slide 42, and reassure them that they will learn more about these during the team training. The notes in Section C below also provide a useful summary.

For the purposes of this session, trainees just need to know what data need to be collected and in what order. They will go through this further when using the Android phones in the next module.

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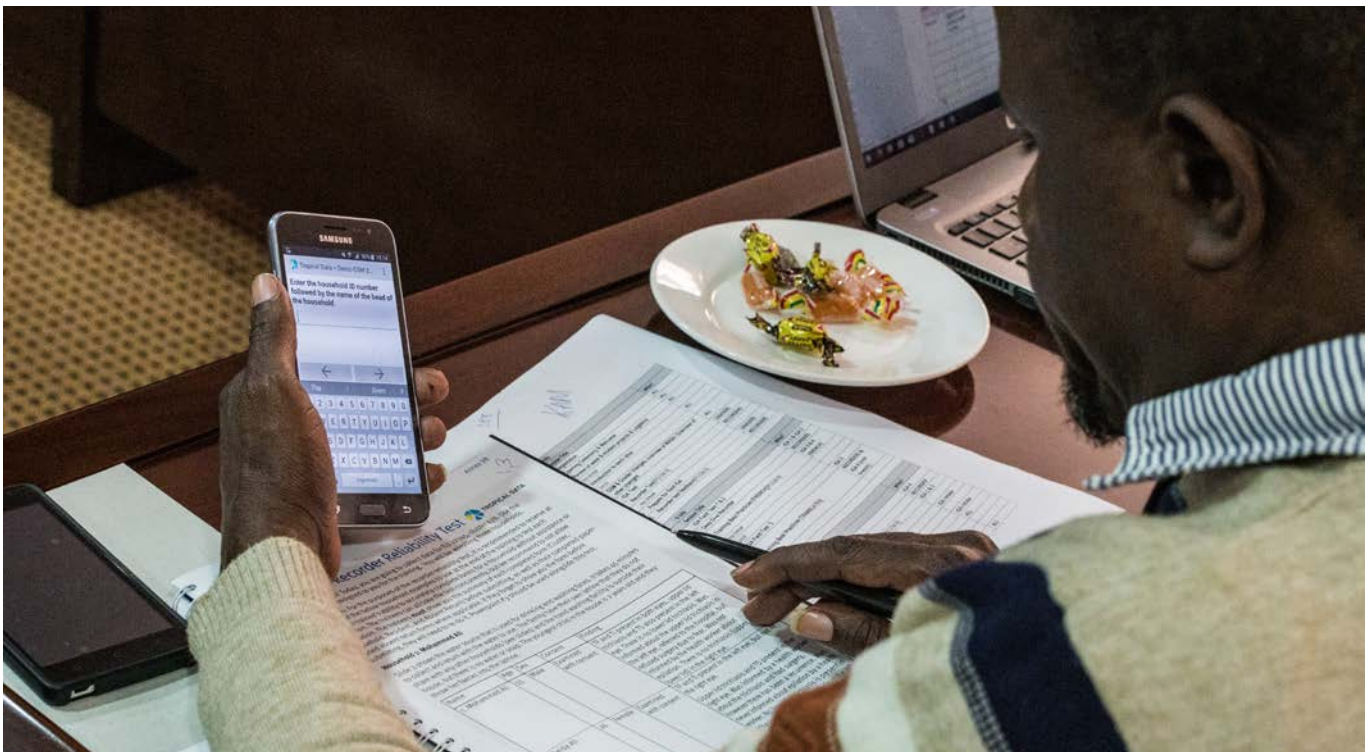

Above Recorder training in Tanzania.

Section A: Cluster form

The details of the cluster form are as follows:

Date	Day/month/year that the form is completed (this will be automatically entered by the Android)
Recorder	A four-digit numeric code unique to you (provided by the supervisor/coordinator/trainer)
Evaluation Unit	A five-digit numeric code (provided by the supervisor/coordinator)
Cluster	A three-digit numeric code (provided by the supervisor/coordinator)
Number of households	The estimated total number of households in the cluster. As this is completed in the field at the start of each cluster, teams should use the most accurate number available to them. If this has not been shared, they should ask the village leader or guide for an estimate. If random sampling is to be used for selecting households, the number may have been communicated to the team prior to their arrival in the village.
Household selection method	The sampling method used to select households in the cluster. **Responses** 1 = Compact segment sampling 2 = Simple random sampling 3 = Systematic random sampling 99 = Other The different methods are discussed in detail during the team training, and the teams will be made aware of the method they should be using during the survey along with how to do it.
Number of segments	The number of segments the cluster was divided into. This question will only appear if the household selection method above is 1 = Compact segment sampling. If this is how household selection is to be done, the team will learn how to work out the number of segments during the team training.

Section B:

The details of the household questions are as follows:

Date	Day/month/year that the examination is done (this will be automatically entered by the Android)
Recorder	A four-digit numeric code unique to you (provided by the supervisor/ coordinator/trainer)
Evaluation Unit	A five-digit numeric code (provided by the supervisor/coordinator)
Cluster	A three-digit numeric code (provided by the supervisor/coordinator)
Household ID	Enter the number of the household within the cluster (in other words, if it's the second house visited in the cluster, write "2"), then the full name of the head of the household. This is to help you return if any family members are missing and to identify the household. If the name of the head of the fifth household visited is "Anthony Solomon", you would enter, "5 Anthony Solomon". If many household heads share a common name, it also ensures that the records are easily differentiated. Definition: a discussion should be had to ensure all trainees share a common definition of what a household is. Some definitions include: all those who eat from the same pot, or those who live under the same roof.
GPS	These fields will be automatically entered by the Android upon clicking the "Record location" button. The Android may take up to 60 seconds to do this. You should stay outside the house while the Android does so.

W1. In the dry season, what is the main source of drinking water for members of your household?	**Responses** 1 = Piped water into dwelling 2 = Piped water to compound, yard, or plot 12 = Piped water to neighbour 3 = Public tap/standpipe 4 = Tubewell/borehole 5 = Protected dug well 6 = Unprotected dug well 7 = Protected spring 8 = Unprotected spring 9 = Rainwater collection 10 = Delivered water (water vendor) 13 = Water kiosk 14 = Packaged water (bottled water, sachet water) 11 = Surface water (e.g. river, dam, lake, pond, stream, canal, irrigation channel) 99 = Other (specify) Note: Responses to these questions should focus on the mode of delivery, not the actual source if this is known and different. For example, the piped water to dwelling in option 1 could come from an unprotected well: for the purposes of this survey we are interested in it being piped into the dwelling. The same applies to option 10 delivered water: even if the source that the vendor gets the water from is known, this detail is not required and option 10 should be selected if it is purchased from a vendor. Definition: a discussion should be had to ensure all trainees share a common definition of what the "dry season" is. **Response descriptions** **1. Piped water into dwelling,** also called a "household connection", is a piped water supply connected with in-house plumbing to one or more taps (for example in the kitchen or bathroom). **2. Piped water to compound, yard, or plot**, also called a "yard tap", is a piped water supply connected to a tap in the compound, yard or plot outside the house. **12. Piped water to neighbour,** refers to a household obtaining drinking water from a neighbour's piped water supply (household connection or yard tap). Definition: a discussion should be had to ensure all trainees share a common definition of what a neighbour is.

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W1. In the dry season, what is the main source of drinking water for members of your household? *(Continued)*	**3. Public tap or standpipe,** also known as a public fountain, is a public water point from which people can collect water. Public taps or standpipes can have one or more taps. They are typically made of brickwork, masonry or concrete and located in public spaces. Households using privately owned taps in a neighbour's yard should be classified as **"piped to neighbour"**. **4. Tubewell or borehole,** is a deep hole that has been driven, bored or drilled, with the purpose of reaching groundwater supplies. Boreholes and tubewells are constructed with casing, or pipes, which prevent the small diameter hole from caving in and protect the water source from infiltration by run-off water. Water is delivered through a pump, which may be powered by human, animal, wind, electric, diesel or solar means. (Boreholes from which water is pumped into an overhead tank which supplies households in the same compound, should be classified as **"borehole or tubewell"**. However, boreholes delivering water to an overhead tank which supplies multiple compounds through a reticulated piped system should be classified as one of the types of "piped water", depending on where the household collects the water.) **5. Protected dug well**, is a dug well that is protected from runoff water by a well lining or casing that is raised above ground level to form a headwall and an apron that diverts spilled water away from the well. A protected well is also covered so that contaminated materials (including bird droppings and small animals) cannot enter the well. Water is delivered through a pump or manual lifting device. **Protected wells** may be fitted with a range of lifting devices (for example motorised pumps, hand pumps, ropes and windlasses with buckets), but if the well lacks a cover then it should be classified as **"unprotected well"**. **6. Unprotected dug well**, is a dug well that lacks any of the following: a lining or casing that is raised above ground level to form a headwall; an apron that diverts spilled water away from the well; a cover which prevents contaminated materials (including bird droppings and small animals) from entering the well; or a pump or manual lifting device. **7. Protected spring**, is a natural spring protected by a "spring box", made of brick, masonry, or concrete, that is built around the spring so that water flows directly out of the box into a pipe or cistern, without being exposed to runoff or other sources of contamination. **8. Unprotected spring**, is a natural spring that lacks a "spring box" to protect against run off and other sources of contamination (including bird droppings and animals). **9. Rainwater collection**, refers to a system whereby rain is collected or harvested from large surfaces (by roof or ground catchment) and stored in a container, tank or cistern until used. Rainwater collection comprises a range of different technologies designed to capture and store rainwater for drinking. Groundwater catchments requiring filtration and unfiltered surface water should be classified as "surface water".

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W1. In the dry season, what is the main source of drinking water for members of your household? *(Continued)*	**10. Delivered water (water vendor)**, refers to water sold by a provider who transports water into a community, either in a small tank/drum or in a tanker-truck. **Small tank/drum** refers to water sold or distributed by a provider who transports a tank or drum with small quantities of water into a community using donkey carts, small motorised vehicles and other means. **Tanker-truck** refers to water sold or distributed by a provider who transports large quantities of water into a community using a motorised truck with a tank. When water is purchased, even if the original source is known, this option should be selected. The only options that would not apply for buying water and that come under a separate category ("packaged water") are bottled water, water sachets and water refill stations. **13. Water kiosk**, refers to a water point from which water is sold in small quantities. Households typically bring their own containers to be filled. Water kiosks are similar to public standpipes, but with a more commercial approach to collecting fees. **Water refill stations** are similar to water kiosks, but operators typically provide households with dedicated containers that are then sanitised before being refilled. These should be classified as **"bottled water"**. **14. Packaged water**, refers to water sold by a provider in the form of bottled water or sachet water. **Bottled water** is sold by commercial providers in small or large bottles or refillable containers. This does not include water from other sources stored in plastic bottles. **Sachet water** is similar to bottled water but is packaged in a plastic bag rather than a bottle. **11. Surface water** refers to open water sources located above ground including rivers, dams, reservoirs, lakes, ponds, streams, canals, and irrigation channels. **99. Other**: Any other source of water not included in the above.
W2. How long does it take to go there, get drinking water, and come back?	Enter the number of minutes required to collect drinking water. If the water source is in the yard or the dwelling, enter 0. If you do not know how long it takes, enter 999. This question refers to the time taken by the person or persons who usually fetch the water. Note that the question refers only to a single water-hauling trip and does not consider multiple trips in a single day. **Where option 1 or 2 was the answer given for the question W1, 0 should be given as the response.** **Definitions** Number of minutes refers to the amount of time needed to get to the water source, obtain water, and return to the household. Socialising time should not be included in the minute value given, unless it is done while queuing for water without extending the queuing time. The minute value is the time for one round trip, not the total time spent per day hauling water. If this amount of time is variable, the respondent's estimated average time is recorded here.

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W2. How long does it take to go there, get drinking water, and come back? *(Continued)*	Because rural residents may not own watches, it may be useful to compare different time intervals with the time taken for household activities that are local customs, such as boiling rice or completing a coffee ceremony.
W3. In the dry season, what is the main source of water used by your household for washing faces?	Use the response descriptions for drinking water above.
W4. How long does it take to go there, get face-washing water, and come back?	This question refers to the time taken by the person or persons who usually fetch the water. Record the number of minutes required, as described above for W2. If the water source is in the yard or the dwelling, enter 0. If all face washing is done at the water source, enter 888. If you do not know how long it takes, enter 999.
S3. If you have one or more children under 3 years of age residing in the household, the last time the youngest child passed faeces, what was done to dispose of the faeces?	**Responses** 1 = Child used latrine/toilet 2 = Put into latrine/toilet 3 = Put into drain or ditch 4 = Thrown into garbage 5 = Buried 6 = Left in the open 7 = Don't know 9 = Other 999 = There is no child under 3 years of age residing in the household
S1. Where do you and other adults in the household usually defecate?	**Responses** 1 = Shared or public latrine/toilet 2 = Private latrine/toilet 3 = No latrine/toilet, outside somewhere 9 = Other

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S1. Where do you and other adults in the household usually defecate? *(Continued)*	**Response descriptions** **1. Shared or public latrine/toilet:** a shared latrine is any latrine shared between households of non-family units. A shared sanitation facility is a latrine/toilet used by a restricted number of households. In urban areas and apartment buildings, in particular, several families often share a facility. **2. Private latrine/toilet:** A private latrine/toilet is any facility, improved or unimproved, used predominantly by a single family or household. If you allow your neighbours to use your latrine, option 1 should be selected. **3. No latrine/toilet, outside somewhere:** This refers to defecation in the yard or plot, in the bush, field or in bodies of surface water. **9. Other:** This refers to any other site of regular defecation. This may include "chamber pots" or buckets.
S2. What type of latrine/toilet do the adults in the household use? If private, observation: ask to see latrine/toilet; If shared, question: ask latrine/toilet type.	Note that if the household has more than one latrine/toilet, ask which one the adults normally use, and provide responses for that latrine/toilet. **Responses** 1 = Flush/pour flush to piped sewer system 2 = Flush/pour flush to septic tank 3 = Flush/pour flush to pit latrine 4 = Flush/pour flush to open drains 5 = Flush/pour flush to unknown place 6 = Ventilated improved pit latrine (VIP) 7 = Pit latrine with slab 8 = Pit latrine without slab/open pit 9 = Composting toilet 10 = Bucket 13 = Container based sanitation 11 = Hanging toilet/hanging latrine 12 = No latrine/toilet (i.e. using bush or field or surface water) 14 = Not able to access (only select if unable to observe a private latrine/toilet) 99 = Other (specify) **Definitions** **A flush toilet** has a cistern or holding tank to store water for flushing and has a water seal (which is a U-shaped pipe below the seat or squatting pan) to prevent the passage of flies and odours. **A pour flush toilet** also has a water seal, but has no cistern and water is poured by hand for flushing.

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S2. What type of latrine/toilet do the adults in the household use? If private, observation: ask to see latrine/ toilet; If shared, question: ask latrine/toilet type. *(Continued)*	**1. To a piped sewer system:** is a toilet that flushes excreta to a system of sewer pipes, also called sewerage, which is designed to collect human excreta (faeces and urine) and wastewater and remove them from the household environment. Sewer systems consist of facilities for collection, pumping, treating and disposing of human excreta and wastewater. Losses that occur during transport and treatment cannot be monitored through household surveys. **2. To a septic tank:** is a toilet that flushes excreta to a water-tight container, normally buried underground away from the dwelling, designed to separate liquids from solids which are then allowed to settle and decompose. Septic tanks are designed to contain and treat excreta in situ and should have at least two chambers separated by a baffle and a T-shaped outlet pipe to reduce the scum and solids that are discharged. The effluent should infiltrate into the subsurface through a soak pit or leach field, or discharge to a sewer system. However most household survey respondents are not able to provide technical information on the design of and construction of storage tanks. **3. To a pit latrine:** is a toilet that flushes excreta to a covered pit which retains solids. The base and sides of latrine pits may be permeable to allow liquids to percolate into the soil. **4. To open drains or elsewhere:** refers to households using toilets that discharge into uncovered drains which do not effectively contain excreta thereby exposing the community to faecal pathogens. Flush/pour flush to elsewhere suggests that excreta is not being discharged into a sewer, septic tank or pit latrine), but into the local environment. **5. To unknown place:** household has a flush or pour flush toilet, but respondent is unsure where the water is taken. **6. Ventilated improved pit latrine (VIP):** is a dry pit latrine ventilated by a pipe that extends above the latrine roof. The open end of the vent pipe is covered with gauze mesh or fly-proof netting and the inside of the superstructure is kept dark. **7. Pit latrine with slab:** is a dry sanitation system that collects excreta in a pit in the ground. The pit is covered by a squatting "slab" or platform that is constructed from materials that are durable and easy to clean (e.g. concrete, bricks, stone, fibreglass, ceramic, metal, wooden planks or durable plastic). The "slab" has a small drop hole, or is fitted with a seat, allowing excreta to be deposited directly into the pit. **8. Pit latrine without slab/open pit:** is a dry sanitation system that uses a pit in the ground for excreta collection and does not have a squatting slab, platform or seat; has a slab that only partially covers the pit; or a slab constructed from materials that are not durable and easy to clean (e.g. sticks, logs or bamboo), even if they are covered with a smooth layer of mortar, clay or mud. An open pit is a rudimentary hole in the ground where excreta is collected.

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S2. What type of latrine/toilet do the adults in the household use? If private, observation: ask to see latrine/toilet; If shared, question: ask latrine/toilet type. *(Continued)*	**9. Composting toilet:** is a dry toilet into which carbon-rich material (vegetable wastes, straw, grass, sawdust, ash) is added to the excreta and special conditions maintained to produce inoffensive compost. A composting latrine may or may not have a urine separation device. **10. Bucket** refers to the use of a bucket or other container for the retention of faeces (and sometimes urine and anal cleaning material), which are periodically removed for treatment, disposal, or use as fertiliser. **13. Container based sanitation** refers to a system where toilets collect excreta directly in sealable, removable containers (also called cartridges) which are regularly collected by commercial service providers and delivered to treatment. **11. A hanging toilet or hanging latrine** is a toilet built over the sea, a river, or other body of water, into which excreta drops directly. **12. No latrine/toilet (i.e. using bush or field or surface water)** includes defecation in the bush or field or ditch; excreta deposited on the ground and covered with a layer of earth (cat method); excreta wrapped and thrown into garbage; and defecation into surface water (drainage channel, beach, river, stream or sea). **14. Not able to access** should be selected where teams are unable to observe a private latrine/toilet (for example if the household refuses). This option should not be selected if the response to the previous question was a public or shared latrine and so the toilet type is being asked instead of observed.
H1. Observation: Is there a handwashing facility in the yard/plot/premises?	**Responses** 0 = No 1 = Yes **Definitions** **A handwashing facility** refers to any facility, formal or informal, that holds water that is used for handwashing. Formal facilities are permanent facilities that may include a sink or reservoir with a tap or bucket, or mobile reservoirs. Informal facilities may include bottles, buckets, or other temporary reservoirs filled with water and arranged for handwashing (tippy tap), or other water sources and reservoirs that are used for multiple uses, including handwashing. **0. No:** There is no formal or informal handwashing facility in the yard/plot/premises. **1. Yes:** a formal or informal handwashing facility is present in the yard/plot/premises.

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H2. *Observation:* At the time of the visit, is water available at the handwashing facility? (If there is no handwashing facility, this question will be skipped by the app.)	**Responses** 0 = No 1 = Yes **Definitions** **0. No**: Though there is a formal or informal handwashing facility present, there is no water available at the facility at the time of observation. This may mean that taps are not working, or sinks, buckets, mobile reservoirs, or tippy taps are present but do not have water in them. **1. Yes:** water is available at the formal or informal handwashing facility at the time of observation.
H3. *Observation:* At the time of visit, is soap, detergent, or other cleaning agent available at the handwashing facility? (If there is no handwashing facility, this question will be skipped by the app.)	**Responses** 0 = No 1 = Yes: soap or detergent (in bar, liquid, or paste form) 2 = Yes: ash, mud or sand **Definitions** **0. No:** Though there is a formal or informal handwashing facility present, there is no soap present at the time of observation **1. Yes, soap or detergent (in bar, liquid or paste form):** Soap or detergent is present at the handwashing facility at the time of observation. Soap or detergent can be any bar soap, liquid detergent, liquid soap mixture, soap flakes or detergent paste that can be used to clean hands. **2. Yes, ash, mud or sand:** Ash, mud or sand to assist with handwashing is present at the handwashing facility at the time of observation.

Section C: Census and examination findings

Every resident of the household aged one year and above should be listed in the census. Every resident of the household aged one year and above should be asked to take part in the survey by being examined, providing informed consent is given. Children below the age of one year will not be included.

Recorders should discuss and agree on the definition of a resident (this may also be detailed in the protocol) to ensure everyone shares a common understanding.

During the survey, the grader will report to the recorder their clinical findings for each examined household resident, usually starting with the head of the household. The recorder will need to record the presence or absence of trichiasis (upper and lower eyelid separately), TF and TI for the right eye, then the presence or absence of trichiasis (upper and lower eyelid separately), TF and TI for the left eye. In eyes that have trichiasis (upper or lower eyelid), the grader will count the number of trichiatic eyelashes. Additionally, the answers to two questions about previous trichiasis management and the presence or absence of TS need to be recorded.

The presence or absence of CO is not recorded. If the grader/recorder cannot evert an eyelid, they should record TS (where applicable), TF and TI as "not able to grade". Do not leave any questions blank. The grader should tell the recorder "absent" or "present" for each sign, in each eye. If the grader does not specify their findings for a sign, they must be reminded to do so to ensure that all necessary information is collected.

Shea Flynn/RTI

Above A child being examined during a training workshop in Tanzania.

Name	It is not necessary to include the full name of the person being examined: the first name or initials may be all that is necessary. The goal is to be able to identify who has been examined in each household.
Gender	Male or Female
Age	In years at last birthday (range is ≥1 year). Note: discussion may be useful on how to help gauge the ages of individuals who are unsure of their age. A calendar of well-known national or local events may be a useful guide, for example a great flood or a political milestone.
Examined	Yes (with consent) This option will enable further information to be collected. Absent; Refused; or Other If any of these options are selected, the next field will ask the recorders to write a note to explain why consent was not given and will end the resident form.
Trichiasis: Right eye (upper eyelid)	If trichiasis (upper eyelid) is present, the grader will assess the number of eyelashes touching the eyeball, the number of eyelashes recently epilated, and the presence or absence of TS in that eye (right eye). Additional questions will need to be asked about whether surgery for trichiasis and whether advice to epilate have been offered by a health worker, and taken up.
Trichiasis: Right eye (lower eyelid)	If trichiasis (lower eyelid) is present, the grader will assess the number of eyelashes touching the eyeball, the number of eyelashes recently epilated, and the presence or absence of TS in that eye (right eye). Additional questions will need to be asked about whether surgery for trichiasis and whether advice to epilate have been offered by a health worker, and taken up.
TF (right eye)	Sign absent; Sign present; or Not able to grade
TI (right eye)	Sign absent; Sign present; or Not able to grade
Trichiasis: Left eye (upper eyelid)	If trichiasis (upper eyelid) is present, the grader will assess the number of eyelashes touching the eyeball, the number of eyelashes recently epilated, and the presence or absence of TS in that eye (left eye). Additional questions will need to be asked about whether surgery for trichiasis and whether advice to epilate have been offered by a health worker, and taken up.
Trichiasis: Left eye (lower eyelid)	If trichiasis (lower lid) is present, additional questions will need to be asked about whether surgery for trichiasis and whether advice to epilate have been offered and taken up, and a further eye examination to assess the presence or absence of TS in that eye (left eye)
TF (left eye)	Sign absent; Sign present; or Not able to grade
TI (left eye)	Sign absent; Sign present; or Not able to grade
Additional notes	This can be used if there are notes related to trachoma diagnosis (e.g. tetracycline eye ointment given, or surgery referral given) or any other relevant data and/or notes related to that individual
Are there any other eye conditions graders wish to highlight for treatment or referral?	This optional field is to record any non-trachomatous related conditions that graders may identify, that they feel should be highlighted as needing treatment or referral e.g. cataract.

L. Using the Androids & the recorder reliability test

Module summary: This module provides recorder trainees with an introduction to the Androids that will be used to collect, store and transfer data, and provides an opportunity to practise data entry ahead of a final recorder reliability test. Though most trainees will probably be familiar with smartphone technology, do not assume that everyone is: cover the basics thoroughly.

Objectives:

1. To introduce the Android phones to the trainees.
2. To ensure trainees can accurately collect, enter and upload data.

Learning objectives: By the end of this module, recorder trainees will be able to:

1. Demonstrate how to turn the Android on and off.
2. Demonstrate the use of "Home" "Menu" and "Back" buttons.
3. Demonstrate how to collect GPS data, and how to troubleshoot basic problems (e.g., check that GPS is switched on; check that the Android is not indoors or completely concealed from the sky by trees).
4. Demonstrate how to enter data on households and individuals.
5. Demonstrate how to upload data.
6. Explain the recorder's responsibility for maintaining and charging the phone between survey days.

Duration: 7.5 hours (day 2)

Location: classroom

Materials: 1 Android for each trainee or pair of trainees; recorder IDs; laptop; projector; Annexes 14A-B, 15A-B, 16; PowerPoints *L1*, *L2* & *L3*.

Training procedure:

Part 1: Introducing the phones & the Tropical Data app

1. Distribute the Androids.
2. Give the trainees 5 minutes to familiarise themselves with their Android.
3. Give each trainee their recorder ID. These are 4 digits and should be unique to each individual. It may be easier to assign them in a sequence such as 1122,1144,1166 etc.
4. Use PowerPoint *L1* to cover the below points.
5. Explain that during the surveys, the Android must be checked **every night** to make sure that the data have been sent, then **switched off** and **charged through the surge protector**. Before leaving for the field in the morning, recorders must switch the Android on briefly to make sure that it is fully charged, then switch it off until it is needed.
6. Explain that recorders should not download other apps to the Android, use it for email or Facebook, or otherwise employ it for anything other than collecting trachoma survey data.
7. Explain that recorders should not put a password on the phone.
8. Demonstrate how to turn the Android on and off.
9. Demonstrate how to turn on GPS and ensure trainees are able to do this. (In the location settings, it is advisable to turn on "improve location accuracy", "Wi-Fi scanning", and "Bluetooth scanning", as it has been shown to make GPS readings easier to obtain.)
10. Demonstrate how to put the Android in "Aeroplane Mode." This helps to save battery in the field as it disables any mobile, data or Wi-Fi connections. When the Android is in Aeroplane Mode, the GPS function will still work. Ensure that trainees are able to turn this setting on and off.
11. Ask trainees to check whether they are connected to the mobile network or Wi-Fi. This will be essential during training and for sending data whilst in the field.
12. Ask trainees to check that the date and time settings on the Android are accurate and ensure they all know how to do this. This should be done on any new phone they use to ensure there is an accurate

time stamp on each completed form. Remind trainees that they should check the time and date on the phone every morning before data collection.

Trainer note: For the following steps it is advised to use PowerPoint *L1* to demonstrate how to use the Android, ensuring all trainees are following what the trainer is doing on their own Android. An alternative is to connect the trainer's Android screen to the laptop projector to demonstrate the different forms and actions, ensuring the trainees follow on their own Androids.

Whichever method is used, do ensure that all trainees are following you at each stage.

For small groups, you could have them hold up their Androids and show you. Another method is to ask trainees to show the person next to them at each stage.

13. Ask trainees to open the Tropical Data app.
14. A menu will appear with the following items:
    - Fill blank form
    - Send finalised form
    - View sent form
15. Explain briefly what each of these items refers to.
    - 'Fill blank form' is used when wanting to start a new form
    - 'Send finalised form' is for sending data
    - 'View sent form' allows you to view any previously uploaded forms. This may be helpful if you suspect any errors and wish to check. If any errors are identified, these need to be reported to the supervisor to inform the data team.
16. Ask trainees to select Fill Blank Form by touching that menu item.
17. Another menu appears with the following five options:
    - ‹Project name› CLUSTER (where "‹Project name›" may be the name of your country, region [in Ethiopia], or state [Nigeria])
    - ‹Project name› HOUSEHOLD
    - ‹Project name› RESIDENT
    - ‹Project name› ABSENT RETURN
    - ‹Project name› SUPERVISOR
18. Explain to the trainees what each item is.
19. Ask trainees to choose ‹Project name› CLUSTER.
20. The first screen asks the recorder to enter their recorder ID (and the keyboard immediately appears).
21. Take the trainees through completion of each of the forms, in the order CLUSTER, HOUSEHOLD, RESIDENT, ABSENT RETURN, encouraging questions. **During this stage of the training, the Evaluation Unit code used should be 00000, and the Cluster code used should be 000.**
22. Instruct the trainees that, in the HOUSEHOLD form, when the Android prompts to "Capture GPS data", the recorder should stand outside the main door of the house and press the "Record Location" button. This function requires that the Android receives signals from satellites, which is harder if there is a roof or trees overhead. (GPS data should be captured after consent is obtained from the head of the household, this will also be covered in module P.)
23. Note: If the trainee experiences difficulty in capturing GPS data, ensure they are not indoors and instruct them to check the "Location" access in the "Settings" of the Android, to be sure that these settings are activated. Where possible, "Location accuracy" should be set to "Improve location accuracy", as well as turning on "Wi-Fi scanning" and "Bluetooth scanning", even when working in aeroplane mode, as this often results in a better reading.
24. Once the "Record Location" button is pressed, a "Getting Location" box appears. Once the accuracy is ‹5m, the phone

should save the reading automatically. However, if **after 60 seconds** (there is a timer on the screen), the phone struggles to reach ‹5m, the recorder can manually click 'Save' to capture the current reading, ideally waiting until it reaches ‹10m. If trainees do not succeed in capturing a reading after 60 seconds, they should try again. If the attempt fails a second time, they can click 'Cancel' and will be able to move to the next question. The recorder should report this issue to their supervisor who will likely need to check the phone settings. GPS capture issues should also be reported to the data team.

25. Instruct trainees that the way that resident records are linked to household records, and household records are linked to cluster records, only works within a single Android. It's therefore important that one Android is used to enter all the data from any one cluster. If, for some reason, more than one Android is used for a cluster, the team will need to enter CLUSTER data into the new Android to be able to select that cluster in a new HOUSEHOLD form.
26. Instruct trainees that the ABSENT RETURN survey is only for enrolling individuals who are both: a) previously entered as being "absent" or "refused" on the Android in use, and b) now available for examination.
27. Ask the trainees to think about possible ways to arrange to later examine those who are currently absent, but who will be available later in the day. Answers are likely to include: a) revisit the households later in the day, b) visit children at school, and c) have people come to a central site.
28. A paper record should be used to keep track of people who are absent and expected to return before the team leaves the community. An example form can be found in Annex 16 – this can be photocopied (at least one per day) or recorders can keep a similar record in their notebooks.
29. When completing a Household form, remind trainees that **the Household ID entry must be unique for each household within a cluster.** This is one reason for entering the number of the household, as well as the full name of the head of the household, in the "Household ID" field. When a new cluster is started, the household numbering should re-start from the number "1".
30. When completing a Resident form, the "Additional notes" field should be used to record and confirm any trachoma-related referrals or medication given, as well as any other information deemed relevant, for example "tetracycline eye ointment given". Remind trainees that the final question around any other eye conditions is optional to complete. This has been included so that graders are not tempted to record TT if they see a condition that they feel should be highlighted as needing treatment or referral (e.g. cataract).
31. Practise recording survey data with the Androids using all the different forms.

Michael Duff/Sightsavers

Above A recorder in Sierra Leone.

Suggest that trainees demonstrate through role play that they can do all these tasks. Observe them and critique, sometimes taking the role of a grader so that recorder trainees can practise entering clinical data. You can also write scenarios on a flip chart for them to enter.

Part 2: Completion of the practice exercises

32. Following the more general practice and roleplay, you should have trainees work through the practice exercises, recording data for entire households.

    There are 5 practice households in total. Three of these are presented in written format in Annex 14A and using the photos found in PowerPoint L2. Annex 14A should be printed for trainees, allowing them to read through the information and enter the data into the relevant forms on the phone.

    Households 4 and 5 are available in Annex 14B as a script for the trainer to read aloud whilst the trainees enter the data. (PowerPoint L2 will still need to be projected.) Completing households in this way better reflects how trainees will receive information in the field, whilst the initial method where they must read the text and pick out the relevant information will test their attention to detail.

    For both formats, trainees will need to go outside to capture GPS.

33. **We suggest choosing at least 2 households from Households 1-3 (Annex 14A), and at least 1 of the scripted households 4-5 (Annex 15B) to be completed. EU ID 00000 and cluster code 001 should be used for these households.** All five households may be completed if the trainer feels the trainees need further revision.

34. As trainees work through the exercises, before submitting each form, they should show these to the trainer and the number of incorrect answers highlighted so they can go back to try and correct these.

    By the end of the exercises the trainees should feel comfortable with the system and should be ready for the final test which follows a similar format to the practice exercises.

Part 3: The Recorder reliability test

35. Similar to the practice exercises, there are 5 potential test households available in the manual. Three of these are presented in written format in Annex 15A and using the photos found in PowerPoint L3. Annex 15A should be printed for trainees, allowing them to read through the information and enter the data into the relevant forms on the phone.

    Households 4 and 5 are available in Annex 15B as a script for the trainer to read aloud whilst the trainees enter the data. (PowerPoint L3 will be used alongside to show the WASH elements.)

36. **For the test, trainers should select 2 households from written households 1-3 and 1 scripted household from households 4 or 5 for the trainees to complete using EU 12345 and cluster code 678.**

37. For the written households, trainees will be given printed copies of Annex 15A to review alongside PowerPoint L3. For the scripted household, the trainer will read aloud the information in Annex 15B while showing PowerPoint L3, during which trainees will enter the data in their phones.

38. For both formats, trainees will need to go outside to capture GPS, and in the case of absentees, trainees must also show their completed paper-based "absent return form" (Annex 16) to earn the necessary marks.

39. Require all the trainees to show you the summary of each form before they save it in order to check their responses. No additional marks can be given for corrections this time. Trainees that don't show you their responses must be required to re-enter the data.

40. The Excel-based recorder test mark sheet should be used by the trainer to track and

calculate the trainees' scores. The scores can be entered as soon as the trainer reviews a form and full instructions for using the sheet are contained within it. If required, a 'correct responses' sheet is also available to support the trainer with marking. This can be found in the folder of trainer materials.

41. **A score of at least 90% is required for trainees to pass as a recorder and graduate to the team training.** Given the ample time allowed for practice ahead of the test, it is not recommended to let a recorder candidate retake during that same workshop if they fail. However, if they get close to the pass mark, the trainer can use their discretion as to whether they should be permitted to pass and qualify as a recorder.
42. Following the test, remaining time should be used to review the responses, discuss any areas of concern or difficulty, answer final questions, and highlight what was done well before the team training continues.

M. Overview of Tropical Data, trachoma and prevalence surveys

Module summary: This module provides the trainees with the overall context for the survey work. The basics of trachoma and the WHO-endorsed SAFE strategy for eliminating trachoma as a public health problem will be presented and discussed. It is important that the trainees understand the different components of the SAFE strategy. Though the module relies on a PowerPoint presentation, it is important that you recognise the trainees' previous knowledge and experience by asking them questions prior to presenting information. This also helps you understand their baseline knowledge level, enabling you to tailor the presentation. The surveys for which you are training these trainees are part of a much larger initiative to maintain up-to-date epidemiological information on trachoma globally, and are key to the drive to eliminate trachoma as a public health problem by the year 2030. It is important to inspire the teams with this vision so that they will realise the importance of their work.

PowerPoint *M* has been prepared to facilitate this. Objectives:

1. To provide an overview of Tropical Data and explain the importance of standardisation.
2. To present an overview of trachoma, the SAFE strategy, and the indications for undertaking baseline surveys, impact surveys and surveillance surveys for trachoma.
3. To ensure that survey teams understand the global importance of the work for which they are being trained.
4. To present the agenda for team training.

Duration: 1 hour 15 minutes (day 3, 0830-0945)

Location: classroom

Materials: computer, projector, PowerPoint *M*

Learning objectives: By the end of this module, the trainees should be able to:

1. Describe Tropical Data and how it supports health ministries to collect high quality data.
2. State what trachoma is and describe at least three factors that predispose communities and individuals to the disease.
3. Name and describe the clinical manifestations of trachoma.
4. Describe the four components of the SAFE strategy and why each is important to the elimination of trachoma.
5. Understand the indications for undertaking baseline surveys, impact surveys and surveillance surveys for trachoma.

Training procedure:

1. Start PowerPoint *M*.
2. Describe Tropical Data, using slides 2-4.
3. The use of Androids to collect data in the field may be new to some trainees. Ask those who have experience using Androids for data collection to describe their experiences. In particular, ask them to

describe some of the advantages of using electronic data capture.

4. Ask recorders if they had heard of trachoma prior to the training. Some will and some will not have. Ask the participants who are familiar with trachoma to explain briefly to the others what trachoma is. Explain that more information will be provided in this module.
5. Go through the materials on PowerPoint M, slides 5-12.
6. Ask what the clinical signs of trachoma are, again recording responses (slides 13-19).
7. Ask how trachoma can be eliminated as a public health problem. If the SAFE strategy is mentioned, ask what each component is, noting the responses. You can then discuss slides 20-24 to ensure a thorough understanding
8. Use slide 25 to point out districts in which trachoma elimination activities are required. In all of the yellow, orange and red districts, impact and surveillance surveys will be needed. Find the country you are in and see what is known about trachoma elimination, baseline surveys, impact surveys, and surveillance surveys there.
9. Discuss the WHO criteria for elimination of trachoma as a public health problem, as shown on slide 26. Discuss when baseline surveys, impact surveys and surveillance surveys are required (slide 27).
10. Go through each objective of the training (slide 28). Ask for questions.
11. Discuss what will happen over the next three days (slide 29).
12. Ask if this fits their expectations and encourage questions and discussion.

N. Cluster sampling & household selection

Module summary: This module provides an overview of trachoma survey principles and begins to focus the information from the previous module into the immediate task at hand, i.e.,

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Above Teams selecting clusters.

conducting surveys. This module looks at the two stages of sampling, the first stage of cluster selection and the second stage where households are selected. Annex 17 is designed to complement this module and to provide an aide-mémoire for those working in the field.

Objectives:

1. To introduce the trainees to the basic principles of prevalence survey methodology and key components of a trachoma survey.
2. To introduce the roles and responsibilities of the various members of the trachoma survey team.
3. To ensure teams have a thorough understanding of the different methods for selecting households in a village and understand why a particular method has been chosen for their national/local context.

Learning objectives: By the end of this module, the trainees should be able to:

1. State the most important principle of sampling in a survey.
2. Explain why sample selection is critical in surveys.
3. Describe the roles and responsibilities of the various members of a trachoma survey team.
4. Demonstrate good etiquette with both village leaders and villagers.
5. Define "household" in their local context.
6. Know how and be able to select households in villages using appropriate methodologies.

Duration: 1 hour 30 minutes (day 3, 0945-1115)
Location: classroom

Materials: flip chart (or white board), markers, computer, projector, PowerPoint *N*

Training procedures:

1. Ask the trainees if they have ever been a part of a survey team. If yes, elicit from them what they feel are the basics of surveys and sampling. For those that have not, ensure they are given the chance to input.
2. Present PowerPoint *N*, slides 2-4, referring to any of the trainees' responses where appropriate and ensuring to promote discussion on each slide. Ensure the multi-stage sampling technique, and who is responsible for each step, is understood.
3. Discuss with trainees what is meant by a "household" locally. For example: "a unique doorway for people who sleep in the same house"; "people who have slept in the house in the last month"; "people who usually share their meals together". Be sure to refer to the survey protocol to confirm what the nationally agreed definition is. (This was discussed by both graders and recorders in earlier modules prior to the team training; now is an opportunity to ensure a shared understanding.)
4. Discuss with the trainees what "good etiquette" means when interacting with village leaders and villagers.
5. Using slide 6, ask trainees if they know what the different methods of household selection are. Then go through slides 7-11, asking frequent questions at each stage and using the flip chart and markers to demonstrate examples.
6. Ensure trainees are in agreement that the method of household selection chosen for their national/local context is appropriate.
7. Using slide 12, outline how data relating to household selection are collected in the Android cluster form.
8. Using slides 13-15, review problems that may be encountered in the field and discuss how teams would address these.
9. Use slide 16 to support a classroom practice, using the classroom as a village. Have the trainees work through each scenario/sampling methodology.
10. Use slide 17 to do a final review of the module, ensuring that all trainees are confident in all learning outcomes, and that each question has been fully discussed.
11. Note that there is a "Cluster sampling and household selection" aide-mémoire in Annex 17. This can be printed for teams to take into the field to remind them of the proper methods.

O. Recorders demonstrate Androids to graders

Module summary: This brief module, is an opportunity for the recorders to demonstrate and introduce the working of the Androids to the graders, before more in-depth team modules are covered where some basic knowledge would be helpful. There is some flexibility in how to deliver this module, depending on the confidence and ability of the recorder trainees.

Objectives:

To introduce graders to the role and work of the recorder and to the Androids used for data collection.

Duration: 30 minutes (day 3, 1130-1200) Location: classroom

Materials: Android phones, flip chart, markers

Materials: Androids Training procedures:

1. A recorder trainer or trainee should outline the different types of forms and how these are connected to each other. Have different recorder trainees give a brief explanation of each form. They may wish to use a flip chart.
2. Allow graders the opportunity to ask questions and consider pairing up graders and recorders to give graders the opportunity to be shown how the Androids work. This basic understanding will reinforce both team members' knowledge and understanding ahead of the remaining team modules.

P. Obtaining consent

Module summary: This module prepares trainees to introduce themselves at the household and to obtain consent for the examinations and interview.

Objectives:

1. Review the necessary steps in obtaining consent.
2. Review who has which roles and responsibilities in this process.

Learning objective: By the end of this module the trainees should be able to demonstrate how to make introductions and ask for consent at the household.

Duration: 1 hour (day 3, 1200-1300)

Location: classroom

Materials: flip chart (or whiteboard), markers, computer, projector, PowerPoint *P*

Training procedure:

1. Introduce the module by commenting on how access to the household and obtaining consent is critical to the survey. Ask the participants what the first step of this process would be. Use this to lead into introductions.
2. PowerPoint P slide 2 can be used as a reminder of the points to cover and discuss.
3. Start a discussion of how introductions will be made. Discuss locally appropriate ways to make introductions.
4. Verbal consent for inclusion in the survey must be obtained at each household. Discuss appropriate ways to ask for verbal consent to enrol the household.
5. Verbal consent for examination must also be obtained for each individual that is examined. Only adults can give valid consent. For the purposes of trachoma surveys, an adult is usually defined as a person aged 15 years or above, though this may be adjusted according to national requirements.
6. Discuss with trainees if there are other local requirements, aside from age, for being able to give consent.
7. Determine if there is anyone aged 15 years or above present at the household who is able to give consent. If there is a suitable person, the first step is to obtain consent for the examination and interview in that household. If there is no suitable person present, consent cannot be obtained. An informal (paper) record will need to be made of this household and the team should try and visit it again later if they have time and if a suitable person is likely to be present. If, on returning, there is still no suitable person, the team is advised not to replace that household and to inform the supervisor/data team.
8. If the individual asked to provide consent refuses to give consent, it is advised to move onto the next household and to not replace the household with another. The team should report this to the supervisor by the end of the day so the data team can be informed of the reason for not meeting the set number of households.

9. Recap household-level survey procedures using slide 3.
10. Get trainees to list the essential elements that should be included in the verbal consent process. Write these on the flip chart as they are suggested. Be sure that the following are all included:

- Here is what is going to happen during the survey
  - The household GPS coordinates will be collected
  - You will be asked to answer some questions
  - The eyes of household members (those aged 1 year and above) will be examined for trachoma
  - Antibiotic treatment will be offered to anyone found with active trachoma
  - People with trichiasis (upper or lower eyelid) will be referred for surgery
- You have the right to refuse to participate.
- You will have access to the same services regardless of whether or not you decide to participate.

You may show PowerPoint *P* slide 4 as a reminder of these elements that must be included when obtaining consent.

Once the list above is agreed on, have each grader practise (using role play) what they will say at the household. Others can critique.

Q. Supervision (for all trainees, proposed supervisors & coordinators)

Module summary: This module outlines the importance of supervision in ensuring survey quality, the steps needed so that the survey proceeds well, and ensures that both the supervisors and team members understand the role of the supervisor.

Objectives:

1. All team members appreciate the importance of good quality data collection and the role of the supervisors to assist them in achieving high-quality survey findings.
2. Supervisors to know what they are supposed to do to support teams and to have the necessary knowledge and skills to develop a more detailed supervision plan prior to surveys starting.

Duration: 60 minutes (or more time as required, especially for the supervisors to review the checklist), (day 3, 1400-1500)

Location: classroom

Materials: PowerPoint *Q*, flip chart (or whiteboard). Phone based supervisor checklist, Annex 18 Supervisor checklist

Note: PowerPoint *Q* provides an overview and examples to facilitate discussion. It will not include every possible task that requires supervision or all supervision methods.

Supervisors will also need to allocate time before the field work starts to develop and finalise a supervision plan if they have not done so already.

If supervisors are trained as either graders or recorders (as recommended), they will also need to take time to review the modules of the other relevant role to be able to support with any issues that arise in the field. For example, a grader-qualified supervisor should be able to check if data are being collected accurately and be able to use the phones to a basic level. A recorder-qualified supervisor is not expected to be able to verify clinical diagnosis, but can ensure the examination process is followed, e.g. using hand gel, using follicle size guides, and examining the right eye first, followed by the left eye.

Training procedures:

1. Ask participants to discuss why supervision of field work is important and note their points on the flip chart. Afterwards, the facilitator can show slide 2 to confirm that the main points have been covered.
2. Ask participants to define supervision and the role of a supervisor in the context of survey work. Write these on the flip chart.

The facilitator should show slide 3 on the role of a supervisor to confirm that these points have been covered.

3. Ask participants to suggest all possible supervision methods that can be used during surveys and discuss the practicality of each. Slide 4 can be shown to confirm some key strategies.
4. Ask participants to make a list of specific critical tasks that must happen *during start up* to ensure a high-quality survey, as well as the types of issues that may be encountered. Write this list on the flip chart or board. Encourage proposed supervisors to also note these down separately, to later feed into their supervision planning. Some suggestions are given on slide 5.
5. Ask participants to make a list of specific critical tasks that must happen *throughout the fieldwork*, as well as the types of issues that may be encountered. Write this list on the flip chart. Encourage proposed supervisors to also note these down separately, to later feed into their supervision planning. Some suggestions are given on slide 6.
6. Ask participants to identify challenges in relation to following the survey protocol. Compare these to those listed on slide 7.
7. Ask trainees if they have any experience of using photography in surveys. If yes, have them explain what it was used for and whether it was useful. Then show slide 8 that outlines the increasing use of photography to support supervision efforts and the resources available to support training of photographers to take good quality pictures.
8. Discuss whether photography will be used to support supervision in the upcoming surveys and how that will be done. For example, will teams be expected to share pictures of all cases they are unsure of in a WhatsApp group? If there are differences in diagnosis between graders and supervisors/trainers, be clear on how these will be dealt with. If additional training on photography has not yet been considered, is there any additional time to dedicate to this prior to the start of fieldwork?

Photographer: Tawfik Al-Khatib

Above Dr Tawfik, a trainer, explaining how to select households in the field, Zambia, 2017

9. Note that if photography is used to support supervision and verification of cases, teams should take photos of all cases they are uncertain of, not just to confirm TF or TT cases, as this could lead to bias in the results.
10. Ask participants to consider logistical and coordination challenges they may face. Note these on the flip chart and discuss ways to overcome them. Supervisors and coordinators can use this section to further develop their notes to feed into their plans. Compare responses to slides 9 and 10.
11. Discuss and confirm teams know what issues should be reported to their supervisor. Compare responses with those on slide 11.
12. The remaining slides (slide 12 onwards) are supervisor-focused rather than for the trainees, so if running low on time in the session you can save the remaining slides to be discussed separately with just the supervisors at another point. However, if there is time you can continue so all participants have a good understanding of supervision.
13. Use slide 13 to highlight and discuss who should be acting as supervisor and the qualities and experience they should have. Participants may have other ideas to share, including discussing their local setting.
14. Slide 14 can be used to aid discussion on the ideal number of supervisors in a given context and how this might be managed at different stages of the project.
15. Slide 15 outlines how supervisors can take their notes from this session to put together a supervision plan before the fieldwork commences.
16. Participants should be paired up, and each pair given both the paper-based checklist (Annex 18) and an Android smartphone with the electronic version of the supervisor form, so that both can be talked through, enabling participants to understand what they contain. Inform supervisors that the paper version (or an equivalent of their own design) should be used as a minimum. The electronic form is an optional extra that mirrors the Tropical Data paper version. Explain that if the electronic one is used, any data collected will be uploaded to the server alongside the survey data, allowing a formal record of any issues and relevant observations. Review and discuss these options with reference to slide 16.

R. Practise working together

Module summary: This module is a chance for graders and recorders to show that they understand all the survey procedures before they go into the field. They will be paired up and the trainers will describe various situations to them to be sure they agree on how to handle them.

Objective: To provide an opportunity for the teams to work together and develop an effective working relationship.

Learning objective: By the end of this module, graders and recorders should be able to demonstrate that they know their roles, know how to deal with difficult situations, and are able to work together within a team.

Duration: 2 hours 15 minutes (day 3) Location: classroom

Materials: all materials needed for the survey

Training procedure:

1. Get the trainees to describe all the problematic situations they can imagine and list these on a flip chart. Discuss what to do in each case. Ensure to include all the following situations:
    a. When you first arrive in the village, the village leaders say that they are not interested in being included in the survey.

       [Make sure the village leaders have understood the purpose of the survey. If they still refuse, move to the next closest village and inform the supervisor of the change. Ensure that advance sensitisation has been planned in all communities to be surveyed.]

b. At the household, there is no one over 15 years of age present.

   [An informal (paper) record will need to be made of this household and the team should try and visit it again later if they have time and if the adults are likely to be present. If they are still absent, do not try to replace this household.]

c. The head of the household completely refuses to allow any member of the household to participate.

   [Move onto the next household. It is not recommended to replace the household with another. The team should report this to the supervisor at the end of the day so they can inform the data team of the reason for not meeting the target number of households.]

d. No one is sure of the age of the grandmother.

   [Recorders would have discussed how a calendar of nationally significant events may be helpful in these scenarios to help people be able to work out their age. For example, the date of a great storm or significant political event.]

e. The head of household wants to include someone who does not live in the household; they are just visiting for a few days.

   [You can examine them, but don't enter the data in the Android, because they are not a resident of the selected household.]

f. The protocol defines a resident as a person who has been living in a household for the last month. At the household you find a child who is not from the household but has been living with the family for the last 2 months in order to go to school in that village.

   [Based on the protocol, this child is a resident in the household.]

g. Mother says there is a latrine but you cannot see one.

   [Probe for more information. If the latrine is a public or shared latrine, record the verbal responses on latrine presence and type of latrine. If the latrine is private, ask to see it. If the mother does not want to allow this, select "Not able to access".]

h. The son, who is providing most of the responses, says he can reach the water source in 30 minutes but the daughter, who usually fetches water, says she needs 60 minutes.

   [Clarify that the round trip, including collection time, is being discussed. If there is still disagreement, use the response from the person who fetches the water.]

i. At the household, the village guide is answering the questions for the household instead of the household head or other adult household member.

   [Respectfully ask if it would be possible to have the household head or other adult household member answer the questions.]

j. During the rainy season, it takes 10 minutes to get the water, but now during the dry season, it takes 30 minutes.

   [We are interested in the information from the dry season.]

k. The family has no idea how long it takes to fetch water.

   [Using guidance from the recorder training, try and compare the time periods to local customs or activities to get an answer, for example the time it takes to complete a coffee ceremony.]

l. The grader fails to give the grade for TI for the right eye.

   [The recorder should ask!]

m. The grader fails to clean their hands after examining a child.

[The recorder should remind the grader.]

n. An 8-year-old child is not present in the household, but will be back later.

[They will be recorded as absent in the initial form and their details added to the paper record (absent return form) kept by the recorder. This paper record will make it easier for teams to plan where they might return, should they have enough time at the end of the day. Priority is given in these circumstances to 1–9-year-olds.]

o. The 10-year-old is not present in the household but will be back later.

[Return to examine if time allows, but priority should be given to 1–9-year-olds.]

p. A selected village is inaccessible (e.g. due to insecurity or flooding).

[The team should report this to their supervisor, who will notify the national programme and Tropical Data. Tropical Data and the national programme will then discuss options for going forward.]

q. There are not enough households in the village to meet the required number of households as set out in the protocol.

[The team should report this to their supervisor, who will notify the national programme and Tropical Data. Tropical Data and the national programme will then discuss options for going forward.]

r. A household resident identified with trichiasis says they were offered surgery in response to the health management question. But following further discussion, you find that it was a neighbour who "offered" surgery.

[Make sure that the local definition of a health worker is explained when you ask the health management question, so that it is possible to differentiate between TT cases known and unknown to the health system.]

2. Start a role play exercise with the trainer acting as a non-communicative household head. Get the trainees to probe for information.

3. Break trainees into groups and have them take turns playing the role of household members and survey teams, practising the full survey process. This should include introductions, requesting consent and the examination and recording processes. Use some of the discussed 'problem' scenarios, ensuring all trainees are confident with how to deal with the various situations. The trainer needs to be sure that all teams respond the same way to "problems".

Shea Flynn/RTI

Above A child being examined during survey training.

S. Field practice for teams

Module summary: This module will take place in a village to allow practice in household selection, data collection and examination of the children and adults in the household.

Note: This module does not need to take place in a trachoma-endemic village, as the goal is to practise working together in the field.

Objectives:

1. To enable graders and recorders to practise working together in the field.

2. To ensure graders and recorders are demonstrating compliance with survey protocols.
3. To allow trainers and trainees to review the field practice, highlighting problems and their solutions, as well as what went well.

Learning objective: By the end of this module, graders and recorders should be able to demonstrate compliance with survey protocols.

Duration:

S1: 4 hours (day 4, 0830-1230)

S2: 1 hour 30 minutes (day 4, 1330-1500)
Location: S1: field; S2: classroom

Materials: all materials needed for survey, including a list of households in the village (if available).

S1 Training procedure:

1. In preparation for recording data, agree with recorders which cluster code to use, and ensure phones are ready for field data collection (i.e. recorders have checked the date/time and turned the phone to aeroplane mode).
2. Remind teams that it is critical that they work efficiently, not wasting time at any household. For example, if 1–9-year-olds are absent and due to return later, they should make arrangements to examine them later, rather than waiting at the household for them to return. Also remind teams that they should examine all consenting household residents aged 1 year and above.
3. At the village, one team should greet the village head and discuss the survey.
4. Have the teams discuss how households could be selected and be sure everyone understands the procedures. Discuss any disagreements.
5. For this practice, two or three teams may work together, taking turns to "take the lead" in making introductions and doing the interviews while others critique and time the visit.
6. Trainers should observe and supervise the teams, ensuring that each team is observed carrying out the survey in at least two households, ideally more, depending on the trainer to team ratio. Ensure teams follow the protocol, be prepared to correct issues (such as graders not washing their hands ahead of each examination) and to give feedback.
7. Every group of teams should visit as many households as possible in order to get practice and uncover any problems. Individual teams should aim to examine at least 3 in the given time.
8. Teams should each complete at least one ABSENT RETURN form, to allow the recorder to practise using it.
9. Depending on how many households are selected, it is possible that not all households in the village will be visited during this session, but every team should have as much practice as possible.
10. It might be useful for teams to time how long they spend at each household to show them how long they would need to finish all sampled households in a cluster.

S2 Training procedure:

1. Once returned from the field, it is good practice for the recorders to upload their data.
2. Give feedback on how the trainees performed. Discuss as a group the problems that were encountered and how these were, or should have been, resolved. Ensure to highlight what was done well by the teams.
3. Give trainees the opportunity to ask final questions about any aspects of the survey, and take the time to revise or revisit any outstanding areas of concern, as highlighted by the practical exercise.

T. Team training review

Module summary: This module provides a final opportunity for reflection. Graders and recorders will have the opportunity to provide feedback on

the training, and to demonstrate their knowledge of survey methodologies.

Objectives:

1. To enable graders and recorders to demonstrate their knowledge of survey methodologies.
2. To enable graders and recorders to feedback on the training.

Duration: 1 hour (day 4, 1500-1600)

Location: classroom

Materials: flip chart, Annex 19 team training quiz

Training Procedure:

1. Ask participants to provide their feedback on the training, outlining what went well and what did not go well. List these on a flip chart.
2. Using Annex 19, ask participants to complete the team training final quiz.
3. To mark the quiz, ask participants to swap their paper with their neighbour to mark each other's responses. Read out the question and ask a different volunteer for each question to share their response. Discuss and agree on the correct responses (some may be context specific).
4. Ask participants to return their quiz to you and review the results. While there is no formal pass mark, this will help confirm that participants have acquired the required knowledge to conduct the surveys, and also highlight any topics that may require further discussion.

U. Graduation and review of survey plans

1. A graduation ceremony may be held if desired. (A template certificate is stored alongside the other electronic training materials.)
2. As a first step for planning surveys, discuss who should be (or appoint) the team leader for each team.
3. The team leader is responsible for making sure that their team has all of the materials needed before going to the field each day. In addition to the materials that have become familiar to you during training, team members may need to take bottles of water, food, sleeping bags, mosquito nets, car chargers or solar chargers for the Androids, a spare battery for the Android, and so on.
4. Ensure teams know which Evaluation Units (EUs) and clusters they are visiting, and the number of households to survey per cluster, as per the protocol.
5. Discuss survey logistics which include:
    a. Timing of deployment of teams
    b. Supervisors assigned to teams
    c. Drivers assigned to teams
    d. Materials given to teams
    e. Communications plan: to include how any field issues will be shared between the field, supervisors, coordinators and data team
6. Remind teams not to enter any more practice data into the Androids.
7. Distribute the first round of per diems.
8. Any other preparations or final planning for the field.

7 After training finishes: clearing data from the Androids

Before the Androids used for training are taken to the field to collect data in real surveys, it is important to delete any data entered during training. To avoid accidental deletion of real survey data, the screen to remove the data requires a password. This step will therefore need to be done by the training coordinator or survey coordinator, who will be given a password to carry out this task.

A. Click the menu button from the main Tropical Data app screen.

B. Select Admin Login and enter the password.

C. Click the "Delete saved form" button.

D. Under the Saved Form tab (underlined blue when selected) there is a "Toggle all" button. Click Toggle All, then click Delete Selected. This will remove all saved forms and clear the local database.

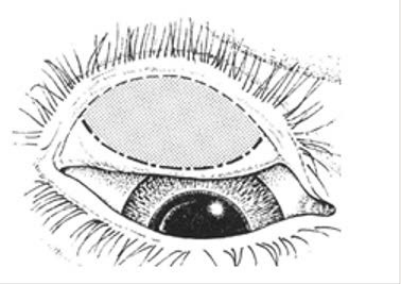
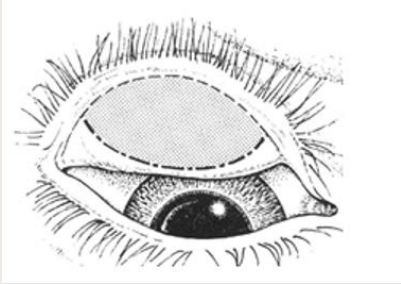
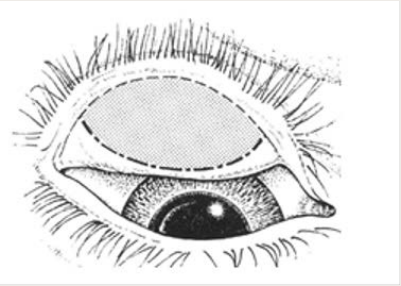
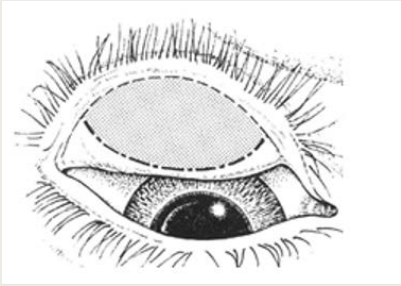
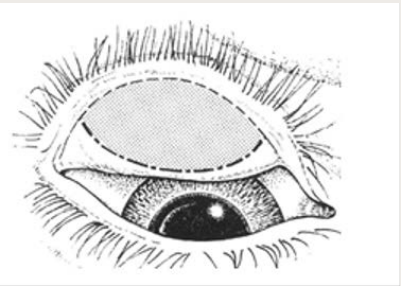
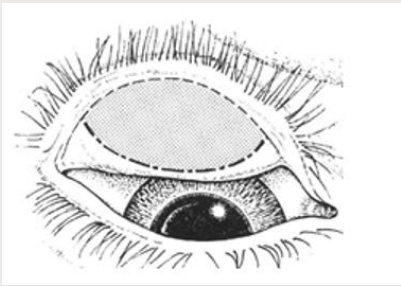
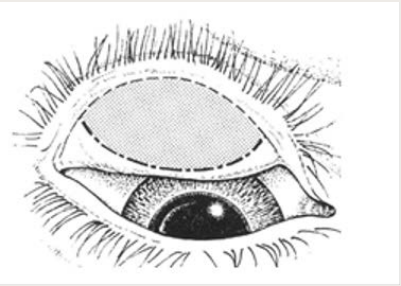
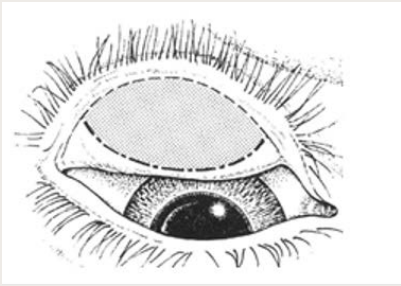
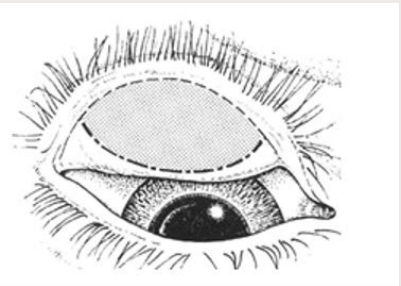
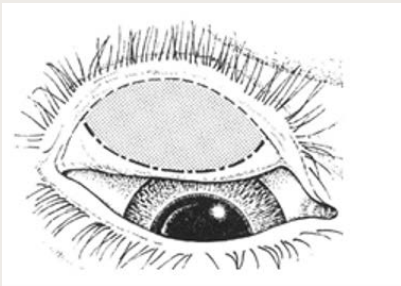
Do *not* enter any training data after the real surveys have begun, and please do *not* give field teams the admin password!

Sumon Ray/International Trachoma Initiative

Above Capturing survey findings in Ethiopia.

Annex 1 Follicle Identification Test

Draw small circles to show where you can see follicles on the test photos shown on your phone. Ensure phone is set to maximum brightness to view these properly. Please use your loupes to view these. If you draw a follicle by mistake, cross it out and continue.

 1A	 1B
 2A	 2B
 3A	 3B
 4A	 4B
 5A	 5B

Annex 2 Grader qualifying tracker sheet

This sheet is to help the trainer keep track of the grader trainees' progress and confirm they pass all stages of the training. Once an assessment is passed the trainer should complete the appropriate box.

Trainees have the opportunity to retake each assessment one further time. If a trainee does not pass an assessment after retake, this should be recorded in the appropriate box and their training discontinued. Trainees should make full use of all opportunities to practise and ensure they are ready before committing to assessment.

Trainee name	**Follicle identification test (module D)**		**Classroom IGA 1 (module E2)** *Record kappa score*		**Classroom IGA 2 (module E3)** *Record kappa score & positivity score*		**Trichiasis & TS Assessment (module F)**		**Class-based OSCE (module H)**		**Field-based OSCE (module I)**		**Additional notes**
	Test 1	Retake	Test 1	Retake	Test 1	Retake	Test 1	Retake	Test 1	Retake	Test 1	Retake	
Example person	*Fail*	*Pass*	*0.76*	-	*0.67 +15%*	*0.68 +8%*	*Pass*	-	*Fail*	*Pass*	*Pass*	-	

Annex 3A IGA test form for slides (50)

Your name:	Date:

There are 50 slides to examine, each with a unique number. Record your findings by writing "0" if the sign is absent and "1" if the sign is present. Do not leave any blanks. If you need to change your answer, strike it out completely and write the new answer to the right of the old answer.

Number	TF	Number	TF
1		26	
2		27	
3		28	
4		29	
5		30	
6		31	
7		32	
8		33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Annex 3B IGA test form for slides (100)

Your name:	Date:

There are 100 slides to examine, each with a unique number. Record your findings by writing "0" if the sign is absent and "1" if the sign is present. Do not leave any blanks. If you need to change your answer, strike it out completely and write the new answer to the right of the old answer.

Number	TF	Number	TF	Number	TF	Number	TF
1		26		51		76	
2		27		52		77	
3		28		53		78	
4		29		54		79	
5		30		55		80	
6		31		56		81	
7		32		57		82	
8		33		58		83	
9		34		59		84	
10		35		60		85	
11		36		61		86	
12		37		62		87	
13		38		63		88	
14		39		64		89	
15		40		65		90	
16		41		66		91	
17		42		67		92	
18		43		68		93	
19		44		69		94	
20		45		70		95	
21		46		71		96	
22		47		72		97	
23		48		73		98	
24		49		74		99	
25		50		75		100	

Annex 4 Using the kappa calculator

If phones are not available on which to conduct the IGAs, the photo slides can be used instead. To calculate the necessary Kappa scores the Kappa Calculator Excel files will be needed, instructions for which are here below.

Scores can be entered quickly if one person reads responses while another enters the data.

1. Open the relevant Kappa Calculator Excel template and save it with a new name. One Excel file will be used for each set of slides. Within that file, one sheet will be used for each trainee grader. Ensure that macros are enabled in Excel.
2. The first sheet is called “Template”. Click on “Create new trainee evaluation” and a new sheet will open, with the TF (gold) answers already filled in for that set of photos. You will be asked to enter the trainee’s name. Enter the trainee’s answers in the column headed “TF (trainee)”.
3. The kappa will be calculated automatically.
4. For photo sets with 100 images an additional ‘positivity score’ will also be calculated. The score is automatically calculated and if within an acceptable range (plus/minus 10%) it will show as a 'pass,' and if a fail it will show as 'unsuccessful.'
5. Click “Create new trainee evaluation” to create a new tab for the next candidate and repeat the process.
6. Keep track of trainee kappa scores either in one document (ready to be inserted in the trainer report) or by noting it in the candidate’s ‘Grader qualifying tracker sheet.’
7. If the trainer does not reach the required score(s), but you think they may pass with a little more instruction and a retest you may administer the retake photo sets.

Summary of photo sets that correspond with the kappa calculator Excel files:

E1: Practice IGA 1 (100 photos)

Practice IGA 2 (100 photos)

E2: IGA test 1 (50 images)

IGA test 1 retake (50 images)

E3: IGA test 2 (100 images)

IGA test 2 retake(100 images)

Annex 5 Instructions for viewing 3D images

Images have been photographed using a special lens that splits each image into two, taken from two slightly different angles. When these are viewed without 3D glasses, one can see two very similar images, side-by-side.

If one wears the 3D glasses, it is possible to view these images stereoscopically, i.e. in 3D, so that elements in the image that are projecting forwards, such as eyelashes, look like they are projecting forwards, as they do in real-life.

These images can be viewed either on a computer screen or as print outs. For optimal results, the photograph being viewed needs to be 10–13 inches / 25–33 cm wide. Any larger or smaller than this will not work well.

To view the image, take the 3D viewers out of the cardboard case. Ensure you don't touch the lenses as this will make marks and make the image harder to see. Hold the lenses with both hands, gently squeezing the cardboard so that it creates a rectangular box (Figure 1). Hold these in front of both your eyes as if you were wearing glasses. There are two elastic loops that you can loop around your ears (optional – if you find this uncomfortable it will not help with the viewing).

Start at about 60 cm from the image being viewed, gently moving forwards until the image comes into sharp focus, usually at around 43 cm (Figure 2). You should then be able to see the image in 3D. You can try getting a little closer to see more detail but if you get too close, the 3D effect will be lost. It is possible to move around the image as if examining a patient to view it from slightly different angles.

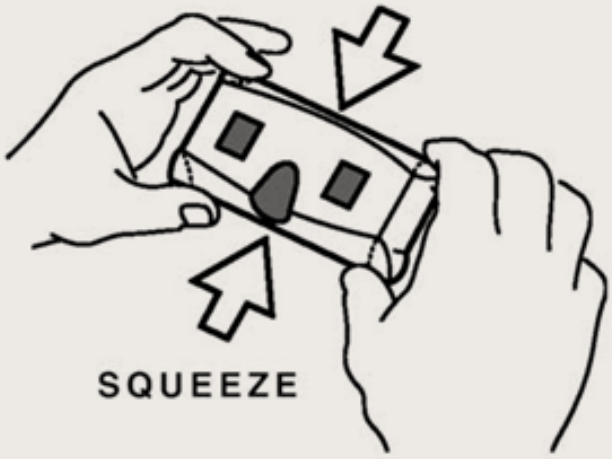


Figure 1: Gently squeeze the 3D viewer to create a rectangular box

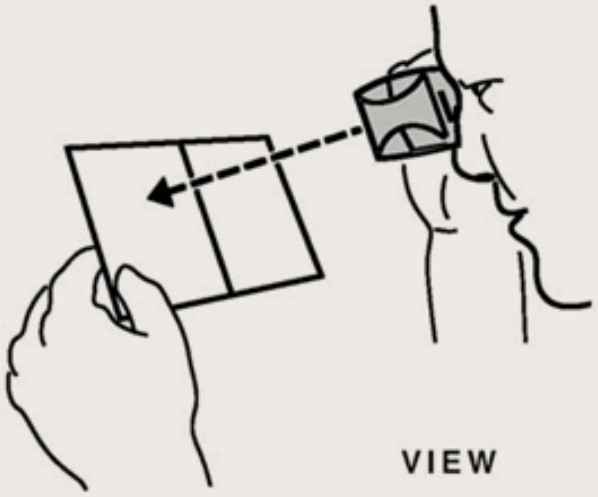


Figure 2: View the images, starting at about 60 cm and coming forwards until the photo comes into 3D focus

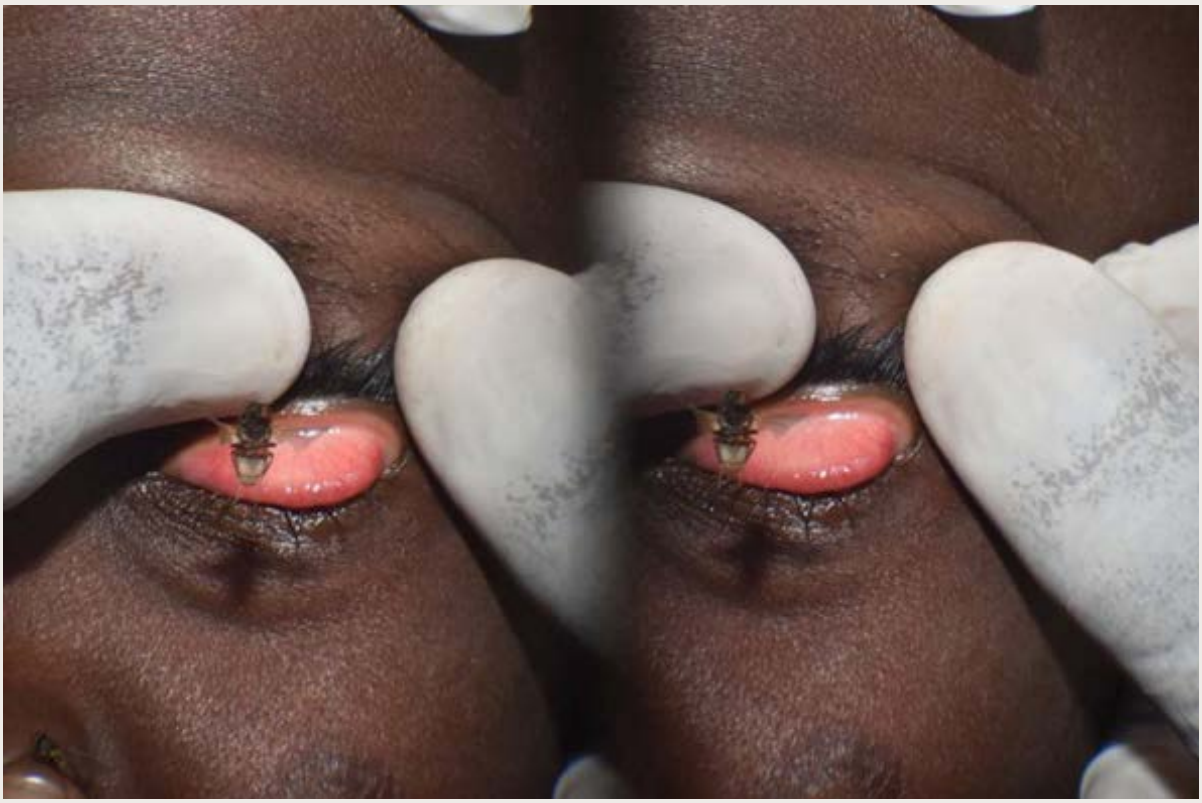
Tips from the 3D viewers' manufacturer:

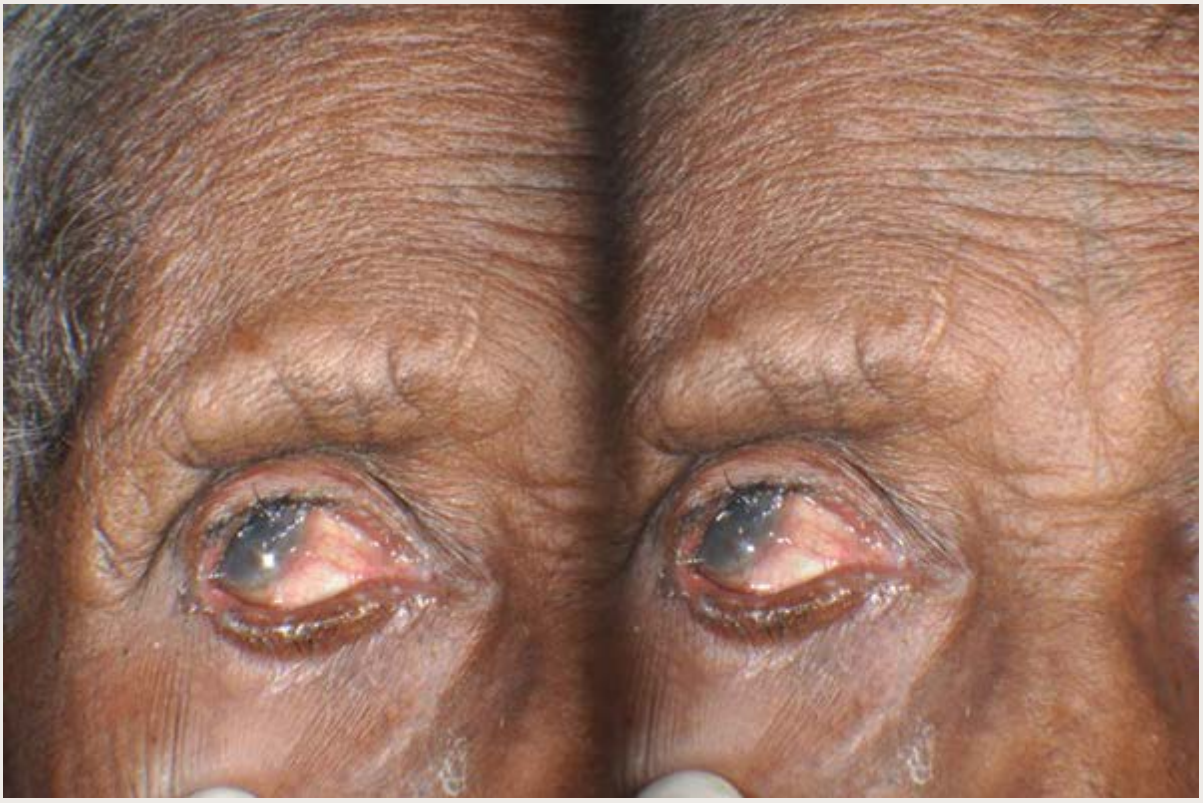
1. The viewer may be used with or without eyeglasses. If you are severely long or short sighted it is recommended that you keep your glasses on.
2. Please note that this is not a "back-lighted" viewer. It works best when the 3D prints are well lit but not directly reflecting light into the viewer.
3. If you use bifocals please view the image through the upper part of your eyeglasses, not the lower part, which is for reading. Viewing the pictures appears to be a close-up task, but viewing 3D images through this viewer will not work well if you use the reading lens.

Example image showing fly flying towards the camera (taken in Kilimanjaro region, Tanzania) (courtesy J Hoffman).

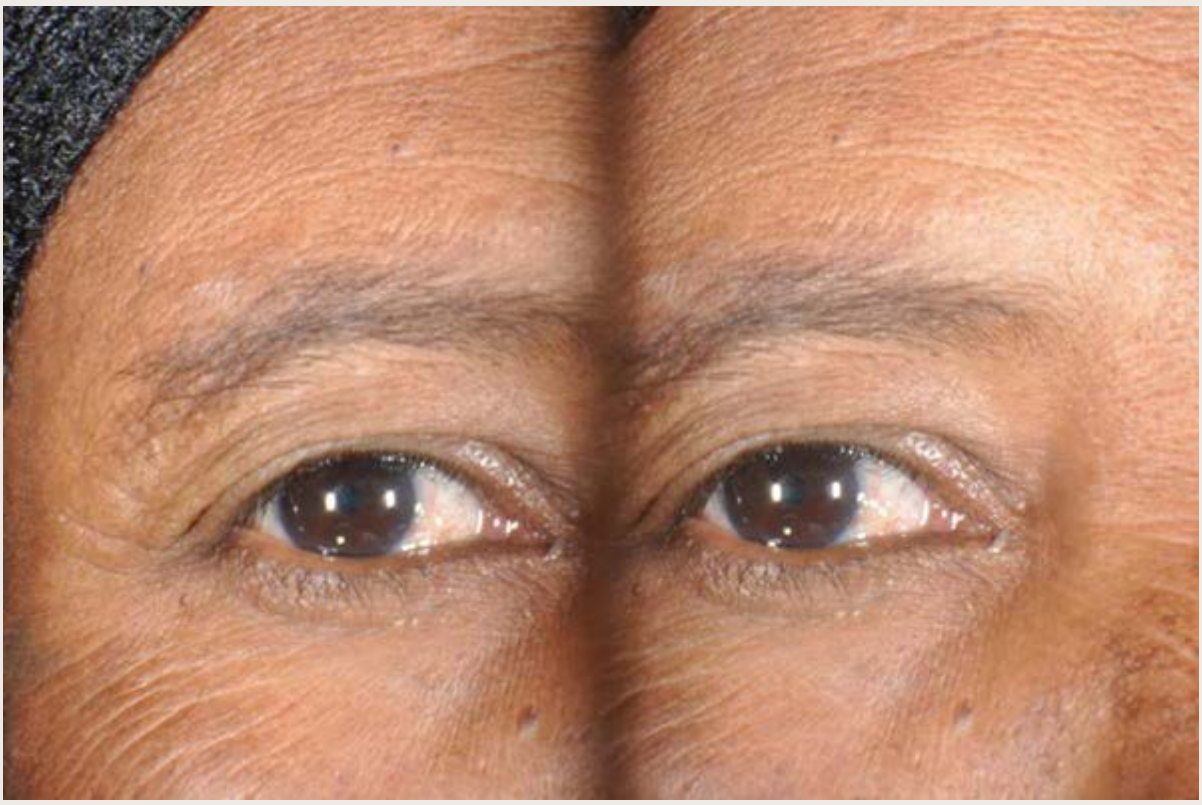
Annex 6 3D Photo & Trichiasis Diagnosis Practice

Above and below: examples of 3D images. An everted upper eyelid with flies flying in foreground

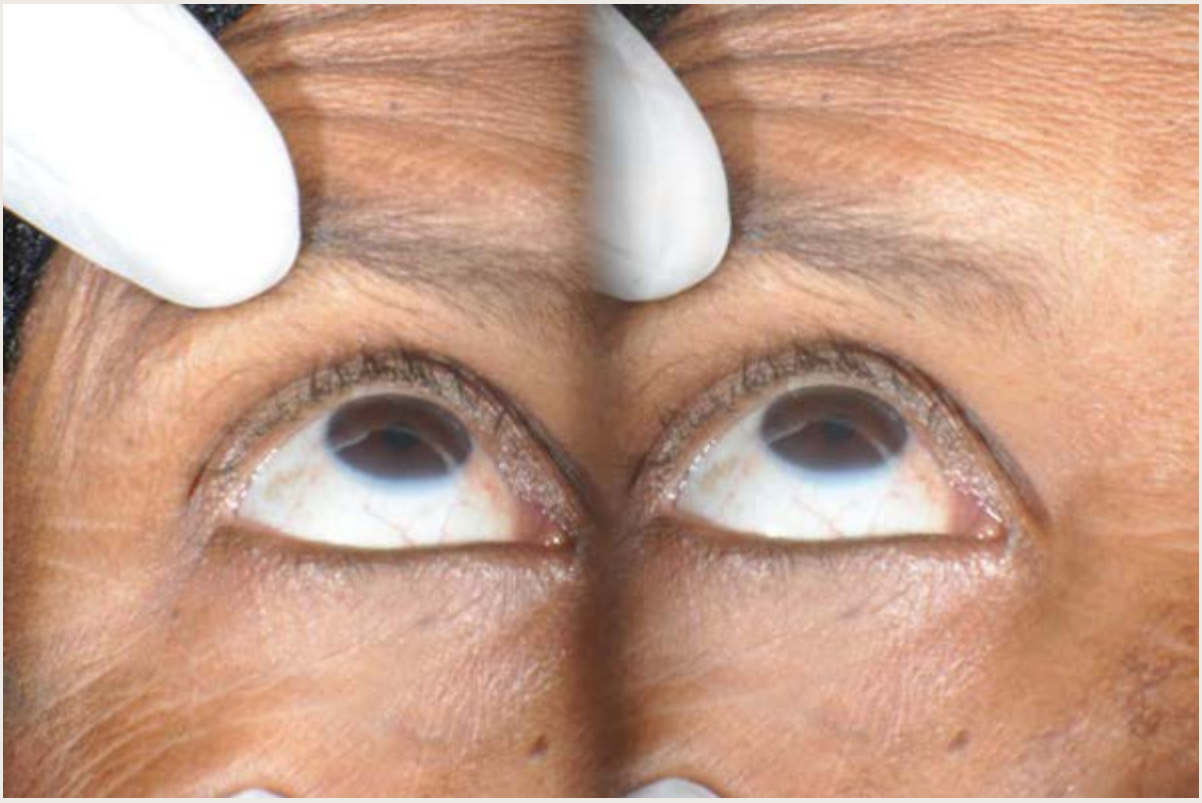


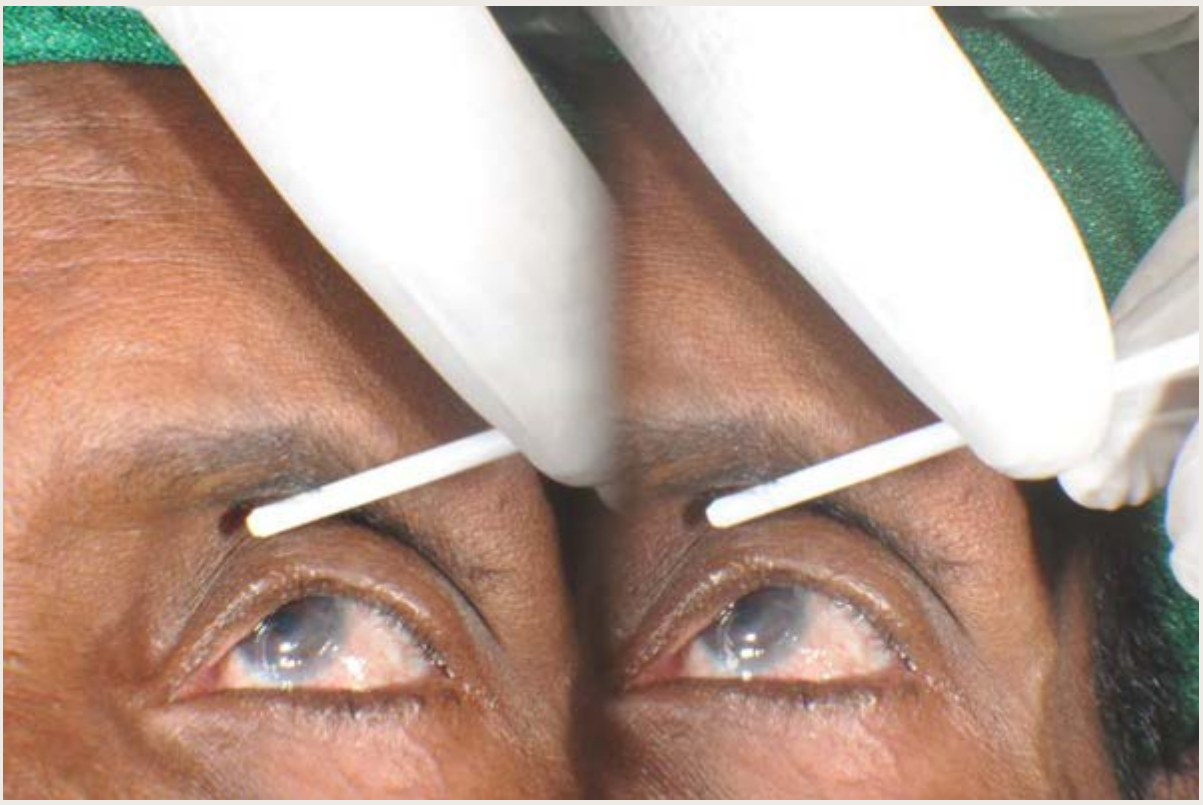


Above: severe trichiasis and corneal opacity. Below: mild trichiasis



Above and below: 1 eyelash touching the eye (primary gaze, above; upgaze, below)





Above: Epilated lashes. Below: Multiple lashes touching the eye (different patient)

Annex 7 Surgical Scar aide-mémoire

Trichiasis surgical scar ascertainment process

To help with quality assurance of the trichiasis management responses, the grader will also check for the presence of surgical scar:

- Grader observes trichiasis in participant
- Grader checks/pays attention to presence of trichiasis surgical scar while everting eyelid to look for TF, TI & TS
- Grader asks participant health management questions
  - **If participant answers "don't know" to having received surgery, and grader did not see a surgical scar**, no further action is required.
  - **If participant answers "yes" to having received surgery, but grader did not see a surgical scar**, a discussion is held to confirm it was trichiasis surgery. Appropriate questions to ask would include:
    - "Do you remember why you had the surgery – was it because you had eyelashes rubbing against the eyeball (painful), or because your eyesight gradually deteriorated without pain?" [If it was without pain, it is more likely to have been due to glaucoma, cataract or pterygium which are generally painless)
    - "Did you get an injection into the eyelid before surgery?" [A patient would likely not easily forget if they got an injection into the eyelid. This question would also help us distinguish from other management intervention such as epilation.]
  - **If participant answers "no" or "don't know" to having received surgery, but grader sees a surgical scar**, a discussion is held to confirm whether trichiasis surgery took place. Appropriate questions to ask would include:
    - "It looks as though you have a surgical scar in this eyelid. Do you remember having had surgery?"
      - **If NO:**
        - The grader should use their discretion. The usual decision should probably be to record the eyelid as not having previously had trichiasis surgery, unless the scar looks very clearly to be the result of surgery to correct trichiasis and the examiner has some reason to suspect that the patient is unwilling or unable to recall a previous operation.
      - **If YES:**
        - "Do you remember why you had the surgery – was it because you had eyelashes rubbing against the eyeball (painful), or because your eyesight gradually deteriorated without pain?" [If it was without pain, it is more likely to have been due to glaucoma, cataract or pterygium which are generally painless)
        - "Did you get an injection into the eyelid before surgery?" [A patient would likely not easily forget if they got an injection into the eyelid. This question would also help us distinguish from other management intervention such as epilation.]
        - If grader is satisfied it was trichiasis surgery, they record the participant as having had trichiasis surgery, even when they are unable to observe a surgical scar.

Annex 8 Referral form

TROPICAL DATA

Feel free to modify this or to substitute with any official referral form. An electronic copy is available so that it can be modified to your requirements.

Patient referral

Date:

Name of patient:

To:

During a community survey in the area, this patient was discovered to have

I would be grateful if you could please assess and manage as you think appropriate.

Thank you.

Yours sincerely,

Annex 9 Class-based OSCE mark sheet

Name of Candidate:	Date:

The grader trainee will examine a participant following the standard sequence for eyelid examination, narrating the process to demonstrate their understanding. **They should assume the participant has:** • **RIGHT eye: TF** • **LEFT eye:** – **TT (upper eyelid only, 2 eyelashes touching the eyeball)** – **TS** • **No other eye conditions requiring treatment or referral** **(It may help to write the diagnoses on a flip chart for the trainee to refer to)** **The trainer will evaluate whether the trainee follows the correct sequence for examination, which is:**	Below expectation	Meets expectation
1. Put a follicle size guide on each thumbnail		
2. Put on loupes and ensure that you have good illumination (the ideal is placing chair in the shade on the edge of the sunlight, using sunlight for TF examination and a torch for trichiasis examination)		
3. Clean hands and torch handle with alcohol hand gel and let hands dry before touching the eyelid		
4. Ensure the grader and participant are properly positioned		
5. Ask the participant to look straight ahead		
6. Start with the **right upper eyelid**. The grader should examine the eyelid margin and eyelashes from different angles (below, temporal and nasal sides) using the torch		
7. The participant should be asked to look to the extremes of gaze on either side to see if the upper eyelid eyelashes move with the eyeball		
8. The grader should gently raise the upper eyelid using the thumb of the left hand to exert mild pressure on the participant's right upper eyelid, so that the eyelid lifts slightly, to determine if any eyelashes touch the eyeball or if there is evidence of removal of in-turned eyelashes from the upper eyelid		

9. The grader says the trichiasis diagnosis out loud (no right eye upper eyelid trichiasis), as though a recorder is recording the diagnosis in the field		
10. For the **right lower eyelid** the grader should examine the eyelid margin and eyelashes from different angles (above, temporal and nasal sides) using the torch		
11. The participant should be asked to look to the extremes of gaze on either side to see if the lower eyelid eyelashes move with the eyeball		
12. The grader should gently lower the lower eyelid using the thumb of the left hand to exert mild pressure on the participant's right lower eyelid, so that the eyelid lowers slightly, to determine if any eyelashes touch the eyeball or if there is evidence of removal of in-turned eyelashes from the lower eyelid		
13. The examiner says the trichiasis diagnosis out loud (no right eye lower eyelid trichiasis) as though a recorder is recording the diagnosis in the field		
14. The grader should slightly lift the chin of the participant. Place the fourth and fifth fingers of the left hand on the participant's right temple, stabilising the hand in relation to the participant's head. Ask the participant to look down without moving their head		
15. The grader should evert the right upper eyelid using the taught technique: • Use your 3rd finger to push the participant's right eyebrow slightly upwards, so that the eyelashes are lifted • Ask the participant to look down • Grasp the eyelashes between the index finger and thumb, and gently pull the eyelashes out and down so that a small space forms between the eyelid and the eyeball • Use the index finger of the other hand placed in the middle of the eyelid as a fulcrum over which to evert the participant's upper eyelid, then examine the conjunctiva		
16. The grader should look for evidence of TF and TI, and report findings to the recorder (TF present)		
17. The grader should ensure that the eyelid is returned to the normal position after examination		
18. Repeat with the left eye. • Start with the **left upper eyelid**. The grader should examine the eyelid margin and eyelashes from different angles (below, temporal and nasal sides) using the torch		

19. The participant should be asked to move their eyes to the extremes of gaze on either side to see if the upper eyelid eyelashes move with the eyeball.		
20. The grader should gently raise the upper eyelid using the thumb of the right hand to exert mild pressure on the participant's left upper eyelid, so that the eyelid lifts slightly, to determine if any eyelashes touch the eyeball or if there is evidence of removal of in-turned eyelashes from the upper eyelid		
21. The grader says the trichiasis diagnosis out loud (left eye TT in the upper eyelid only), as though a recorder were recording the diagnosis in the field		
22. The grader should count the number of eyelashes touching the eyeball and the number of eyelashes epilated (2 eyelashes touching the eyeball from the upper eyelid, 0 eyelashes epilated), and says these out loud for the recorder		
23. For the **left lower eyelid**, the grader should examine the eyelid margin and eyelashes from different angles (above, temporal and nasal sides) using the torch		
24. The participant should be asked to move their eyes to the extremes of gaze on either side to see if the lower eyelid eyelashes move with the eyeball		
25. The grader should gently lower the lower eyelid using the thumb of the right hand to exert mild pressure on the participant's left lower eyelid, so that the eyelid lowers slightly, to determine if any eyelashes touch the eyeball or if there is evidence of removal of in-turned eyelashes from the lower eyelid		
26. The grader should slightly lift the chin of the participant. Place the fourth and fifth fingers of the right hand on the participant's left temple, stabilising the hand in relation to the participant's head. Ask the participant to look down without moving their head		
27. The grader should evert the left upper eyelid using the taught technique as per point 15 (using the opposite hand)		
28. The grader should look for evidence of TF, TI, and TS and report findings to the recorder (TS present)		
29. The grader should also look for evidence of a surgical scar (they do not see a scar)		
30. The grader should ask the surgical management question, including using the local definition of a health worker. The participant answers that they have not been offered surgery		

31. The grader should ask the epilation management question, including using the local definition of a health worker. The participant answers that they have not been offered epilation		
32. The grader offers referral for surgery for TT		
33. The grader offers antibiotics for TF		
34. The grader confirms to the recorder that they have not identified other eye conditions that they feel need treatment or referral.		
Marking scheme • Below Expectation – does not demonstrate the appropriate technique without prompting: scores 0 • Meets Expectation – demonstrates the appropriate technique without prompting: scores 1		
DECISION: A candidate cannot have more than 3 “below expectation” marks to be certified as being able to examine the eyes.		
Further notes:		

Annex 10 Field-based OSCE mark sheet

Name of Candidate:

Date:

The grader trainee will examine 10 participants in the field: 5 preschool aged children, 3 school-aged children, 2 adults. The trainer will evaluate whether the trainee follows the <u>correct sequence for examination</u>:	**Tick if meets expectation for each of the 10 participants**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1. Making sure they are set up correctly (follicle size guides, loupe, good illumination, clean hands and torch, properly positioned).										
2. Examining right upper eyelid margin for signs of trichiasis, looking from different angles, asking participant to move eyes to extremes of gaze, and gently raising eyelid.										
3. Examining right lower eyelid margin for signs of trichiasis, looking from different angles, asking participant to move eyes to extremes of gaze, and gently lowering eyelid.										
4. Everting the right upper eyelid and examining for signs for TF, TI (and TS and surgical scar if the individual has trichiasis), and returns eyelid to normal position.										
5. Examining left upper eyelid margin for signs of trichiasis, looking from different angles, asking participant to move eyes to extremes of gaze, and gently raising eyelid.										
6. Examining left lower eyelid margin for signs of trichiasis, looking from different angles, asking participant to move eyes to extremes of gaze, and gently lowering eyelid.										
7. Everting the left upper eyelid and examining for signs for TF, TI (and TS and surgical scar if the individual has trichiasis), and returns eyelid to normal position.										
8. Disinfecting their hands and the handle of the torch (if used), before examining the next participant.										
9. **If the individual has trichiasis**, the trainee should: • Count the number of eyelashes touching the eyeball and the number recently epilated • Ask the trichiasis management questions, using the local health worker definition • Offer surgery referral										
10. **If the individual has TF**, the trainee should offer antibiotics.										
DECISION: A trainee must meet expectations for all steps for all participants in order to be certified as being able to examine the eyes.										
Further notes:										

(Shaded squares need not be completed if the individual does not have trichiasis or TF.)

Annex 11 Survey form

(A) Cluster form

Date	Entered automatically by the Android
Recorder	[enter 4 digit code] ☐☐☐☐
Evaluation Unit	[enter 5 digit code] ☐☐☐☐☐
Cluster	[enter 3 digit code] ☐☐☐
What is the estimated total number of households in the cluster?	[Enter the estimated total number of households]
How are households in the cluster being selected?	1 = Compact segment sampling 2 = Simple random sampling 3 = Systematic random sampling 99 = Other
How many segments have you divided the cluster into? *(If selection method is 1 = Compact segment sampling)*	[Enter the number of segments]

Annex 11 Survey form

(B) Household questionnaire

Date

Recorder

Section 1: Identifying information		
1	Country	
2	Evaluation Unit [select 5 digit code]	
3	Cluster [select 3 digit code]	
4	Household ID [write household number followed by the head of household name]	
Section 2: Household GPS		
G1	Latitude (N)	•
G2	Longitude (E)	•
G3	Elevation (metres)	
G4	Accuracy (metres)	
Section 3: Water, sanitation and hygiene questions		
W1	In the dry season, what is the main source of drinking water for members of your household?	1 = Piped water into dwelling 2 = Piped water to compound/ yard/plot 12 = Piped water to neighbour 3 = Public tap/standpipe 4 = Tubewell/borehole 5 = Protected dug well 6 = Unprotected dug well 7 = Protected spring 8 = Unprotected spring 9 = Rainwater collection 10 = Delivered water (water vendor) 13 = Water kiosk 14 = Packaged water (bottled water, sachet water) 11 = Surface water (e.g. river, dam, lake, pond, stream, canal) 99 = Other (specify)
W2	How long does it take to go there, get drinking water, and come back?	Enter number of minutes required If water source is in the yard (or dwelling) enter "0" If response is unknown, enter "999"

W3	In the dry season, what is the main source of water used by your household for washing faces?	1 = Piped water into dwelling 2 = Piped water to compound, yard, or plot 12 = Piped water to neighbour 3 = Public tap/standpipe 4 = Tubewell/borehole 5 = Protected dug well 6 = Unprotected dug well 7 = Protected spring 8 = Unprotected spring 9 = Rainwater collection 10 = Delivered water (water vendor) 13 = Water kiosk 14 = Packaged water (bottled water, sachet water) 11 = Surface water (e.g. river, dam, lake, pond, stream, canal, irrigation channel) 99 = Other (specify)
W4	How long does it take to go there, get face-washing water, and come back?	Enter number of minutes required to collect face-washing water ☐☐☐ If water source is in the yard/plot enter "0" If all face washing is done at the water source, enter "888" If response is unknown, enter "999"
S3	If you have one or more children under 3 years of age residing in the household, the last time the youngest child passed faeces, what was done to dispose of the faeces?	1 = Child used latrine/toilet 2 = Put into latrine/toilet 3 = Put into drain or ditch 4 = Thrown into garbage 5 = Buried 6 = Left in the open 7 = Don't know 9 = Other 999 = There is no child under 3 years of age residing in the household
S1	Where do you and other adults in the household usually defecate?	1 = Shared or public latrine/toilet 2 = Private latrine/toilet 3 = No latrine/toilet, outside somewhere 9 = Other

S2	S2. What type of latrine/toilet do the adults in the household use? If private, observation: ask to see latrine/toilet; If shared, question: ask latrine/ toilet type.	1 = Flush/pour flush to piped sewer system 2 = Flush/pour flush to septic tank 3 = Flush/pour flush to pit latrine 4 = Flush/pour flush to open drains 5 = Flush/pour flush to unknown place 6 = Ventilated improved pit latrine (VIP) 7 = Pit latrine with slab 8 = Pit latrine without slab/open pit 9 = Composting toilet 10 = Bucket 13 = Container based sanitation 11 = Hanging toilet/hanging latrine 12 = No latrine/toilet (i.e. using bush or field or surface water) 14 = Not able to access (only select if unable to observe private latrine/toilet) 99 = Other (specify)
H1	*Observation:* Is there a handwashing facility in the yard/plot/premises?	0 = No 1 = Yes
H2	*Observation:* At the time of the visit, is water available at the handwashing facility? (If H1 is 1 = Yes)	0 = No 1 = Yes
H3	*Observation:* At the time of visit, is soap, detergent, or other cleaning agent available at the handwashing facility? (If H1 is 1 = Yes)	0 = No 1 = Yes: soap or detergent (in bar, liquid, or paste form) 2 = Yes: ash, mud or sand

Annex 11 Survey form

(C) Census and examination findings

Date	Entered automatically by the Android
EU	Select the 5-digit code from the list (generated from the cluster form)
Cluster	Select the 3-digit code from the list (generated from the cluster form)
Household ID	Select the Household ID from the list (generated from the household form)
Name *Name of resident being examined*	[Enter the name of the resident being examined]
Gender	1 = Male 2 = Female
Age (years)	[Enter the age of the resident being examined]
Examined? *(The survey only continues, if Examined is 1 = Yes (with consent). If Examined is not 1, survey will skip to additional notes)*	Examined? 1 = Yes (with consent) 2 = Absent 3 = Refused 4 = Other
E1 Trichiasis: Right eye (upper eyelid)	0 = Sign absent 1 = Sign present 2 = Not able to grade
Right eye (upper eyelid): How many eyelashes are touching the eyeball? (If E1 is 1 = Sign present)	0 1 2 3 4 5 6+
Right eye (upper eyelid): How many eyelashes have been recently epilated? (If E1 is 1 = Sign present)	0 1 2 3 4 5 6+

E2 Trichiasis: Right eye (lower eyelid)	0 = Sign absent 1 = Sign present 2 = Not able to grade
Right eye (lower eyelid): How many eyelashes are touching the eyeball? (If E2 is 1 = Sign present)	0 1 2 3 4 5 6+
Right eye (lower eyelid): How many eyelashes have been recently epilated? (If E2 is 1 = Sign present)	0 1 2 3 4 5 6+
TS: Right eye (If E1 AND/OR E2 is 1 = Sign present)	0 = Sign absent 1 = Sign present 2 = Not able to grade
TF: Right eye	0 = Sign absent 1 = Sign present 2 = Not able to grade
TI: Right eye	0 = Sign absent 1 = Sign present 2 = Not able to grade
Have you ever been offered surgery by a health worker to correct the **[upper/lower]** eyelid trichiasis in the right eye? *Right eye (**[upper/lower]** eyelid)* Remember to use your locally agreed definition of a health worker	1 = Yes, a health worker informed me and offered me surgery, and I had surgery. 2 = Yes, a health worker informed me and offered me surgery and I accepted the offer, but I have not yet had surgery. 3 = Yes, a health worker informed me and offered me surgery, but I declined it. 0 = No health worker informed me and offered me surgery. 8 = Don't know

Have you ever been offered epilation by a health worker to correct the **[upper/lower]** eyelid trichiasis in the right eye? *Right eye (**[upper/lower]** eyelid)* Remember to use your locally agreed definition of a health worker	0 = No 1 = Yes 8 = Don't know
The examination procedure is then repeated for the left eye. Once completed the following questions remain:	
Additional notes?	[Enter any other trachoma related notes – for example, treatment offered or referrals provided]
Are there any other eye conditions graders wish to highlight for treatment or referral?	[Enter any other eye conditions]

Annex 12 Photos of water source categories

Tubewell/borehole

The Carter Center

The Carter Center

Protected dug well

Unprotected dug well

The Carter Center

Protected spring

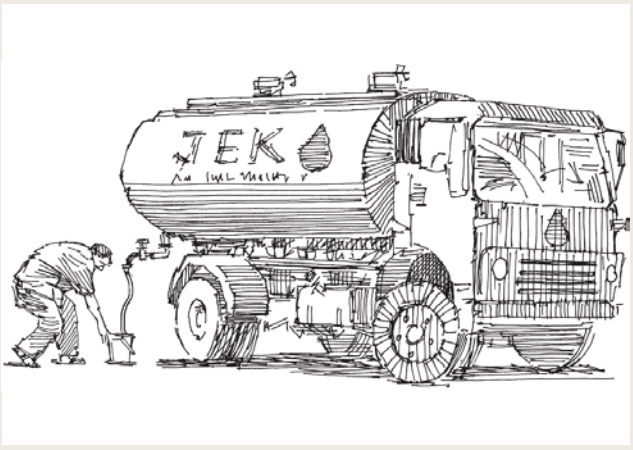
The Carter Center

Unprotected spring

Water for People

Water for People

Delivered water (water vendor)



Rainwater collection

Water kiosk

Surface water (e.g. river, dam, lake, canal)

Packaged water

Annex 13 Photos of sanitation facility categories

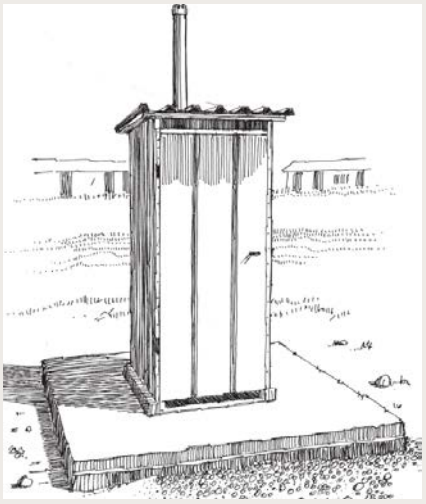
Flush toilet

Cement slab/ floor with seat; superstructure; toilet uses a cistern or holding tank for flushing urine/ faeces; and has a water seal (U-bend)

Pour flush toilet

Cement slab/floor with squatting slab, platform or seat; superstructure; water not directly connected to toilet, but added manually to flush; and has a water seal (U-bend)

Ventilated improved pit latrine (VIP)



Cement slab/floor; ventilation tube that accesses the pit and comes out of the superstructure; superstructure with roof and some type of door

Pit latrine with slab (improved pit latrine)

Cement slab/floor; superstructure with roof and some type of door

Pit latrine without slab/open pit (unimproved pit latrine)



Packed mud/dirt floor; mostly unlined pits; limited superstructure – no roof, no door, etc.

Composting toilet


Two toilets with separated areas for urine and faeces

Doors at back of toilet with faeces composts

Cement slab/floor with squatting slab, platform or seat; often elevated above ground; urine diversion (separate hole for faeces and urine); doors at the back or side used to access the compost superstructure, with roof and some type of door; ash and dirt generally present to help compost faeces; either one pit, or two alternating pits.

Container based sanitation


System where toilets collect excreta in sealable, removable containers (cartridges), which are regularly collected by commercial service providers for treatment and disposal.

Hanging toilet/hanging latrine

Annex 14A Practice Recorder Exercises

TROPICAL DATA

Today, you are going to collect data for **EU 00000, cluster 001** where there are an estimated 150 households. You will be using systematic random sampling for household selection. Please use the recorder ID assigned to you for the training. You will be enrolling at least 3 households that will be selected by the trainer. The trainer will project a PowerPoint with WASH elements that go with each household.

Trainees should show the trainer the summary of each completed form (Cluster, Household, Resident, and Absent Return) before submitting. If you forget, you may be asked to redo them. Ensure you have a paper absentee form ready to record any absentees.

Household 1: Samson Last

The main source of water for drinking and face washing for the household, both in the wet and dry seasons, is shown in slide 2, which is located some one hour round trip from the household. Adult household members defecate in the bush located to the rear of the household.

There is no hand washing facility in the compound of the household. There is one child under the age of three years and the mother said she disposes of his faeces in the ditch. The residents of this household are listed below:

Name	Age	Gender	Consent	Finding
1. Samson	36	Male	He consents	Samson has no signs of trachoma in either his right or left eyes. No other eye conditions are identified by the grader.
2. Lula	27	Female	She consents	Lula has trichiasis and TS in the right upper eyelid. The number of eyelashes touching the eyeball is six. None of her eyelashes have been epilated. No other trachoma related findings in either the right or left eyes, nor any other eye conditions. She was informed and offered surgery by a health worker about the trichiasis in her right upper eyelid, which she refused. She was not offered epilation by the health worker.
3.Salimata	10	Female	She is absent	Salimata is at school and will return at 5.00 pm.
4. Moses	2	Male	He consents	TF and TI present in the right and left eyes: no other trachoma findings. No other eye conditions identified by the grader.

Household 2: Mauricio Cardona

The main source of water for drinking is water that the family purchases from a water vendor in slide 3, the vendor visits their village, and it takes them 10 minutes to go and collect it. The family washes their faces with water from a local river 20 minutes away; they wash their faces at the river, shown in slide 3.

The household has its own latrine, which is not shared with any other households (slide 4); they do not know where it flushes to. The family's handwashing station is also shown in slide 4, which is just outside the latrine. There is water and soap. Marcela's faeces are put into the latrine.

Name	Age	Gender	Consent	Finding
1. Mauricio	31	Male	He consents	Upper eyelid trichiasis and TS are present in the left eye with three eyelashes touching the eyeball, none have been epilated. He does not have trichiasis in the right eye, nor lower eyelid trichiasis in either eye. Mauricio has been offered surgery by a health worker for the trichiasis in the left upper eyelid, but not epilation; he has not yet had the surgery due to family commitments. TF and TI are absent in both eyes. The grader identified cataract in both the right and left eyes.
2. Clara	26	Female	She consents	Trichiasis, TF, TI are absent in both eyes. No other eye conditions identified by the grader
3. Martha	7	Female	She is absent	She is at school, and will be home after 4pm today.
4. Edwin	3	Male	He consents	He has TF and TI in the right eye and only TF in the left eye. All other trachoma signs are absent. No other eye conditions identified by the grader.
5. Marcela	1	Female	She consents	She has TF in both eyes, but no TI and no trichiasis. No other eye conditions identified by the grader

Household 3: Fernando Bolívar

The source of water for both drinking and washing faces, in the wet and dry seasons, is the structure shown in slide 5, which is found by the side of the house. Adults in the household defecate in a facility that is only used by members of the household, also shown in slide 5.

Their handwashing station is shown in slide 6, in their yard. No water or soap are available. The residents of this household are listed below.

Name	Age	Gender	Consent	Finding
1. Fernando	57	Male	He consents	There is trichiasis in both eyelids of his right eye, as well as TS. He has two eyelashes touching his eyeball from the upper eyelid and three touching his eyeball from the lower eyelid. None of the eyelashes have been epilated. He has no trichiasis in the left upper or lower eyelids. Fernando has not been offered surgery, but a health worker offered him epilation, which he refused. TF and TI are absent in both eyes. The grader identified cataract in his left eye.
2. Claudia	40	Female	She consents	There is no trichiasis, TF, or TI in either eye. No other eye conditions identified by the grader.
3. Gloria	9	Female	She is absent	She is at the river and will return home this afternoon after 4 pm.
4. Felipe	5	Male	He consents	Right eye: TF present; there is no TI or trichiasis. Left eye: there is TF and TI, but no trichiasis. No other eye conditions identified by the grader.
5. Lina	4	Female	She consents	She has TF in both eyes but all other signs of trachoma are absent. No other eye conditions identified by the grader.
6. Hugo	95	Male	He consents	There is bilateral upper eyelid trichiasis with four eyelashes touching the eyeball in both the right and left eyes. There is no lower eyelid trichiasis, nor any signs of epilation. The grader is not able to evert either eyelid. Hugo has never seen a health worker about his eyes. The grader identified no other eye conditions.

Their handwashing station is shown in slide 6, in their yard. No water or soap are available. The residents of this household are listed below.

Annex 14B Trainer scripts for the recorder practice exercises

Notes: The following are the scripts for practice households 4 and 5 that should be read aloud clearly by the trainer, whilst trainees complete the relevant forms. Notes in italics are directions for the trainer and do not need to be read out. Trainees may ask you to repeat certain information if needed, as they might in the field. The scripts will need to be accompanied by the relevant slides in PowerPoint L2.

At least one of these households should be completed by trainees prior to their test, as well as at least two of the 'written' households in Annex 14A. Trainees should show you each form they complete prior to saving and sending so that any errors can be highlighted and corrected. For these scripted households, this means that it will take longer to go through them as everyone is completing them at the same pace and will need their forms checked at the same time.

Trainer script:

You are still working in EU 00000 and cluster 001.

Household 4:

Mr Pedro Garcia is the head of the fourth household that you visit. After being briefed on the objectives of the survey, Pedro consents for his household to be enrolled. After taking the GPS for the household, the recorder asks Pedro questions about the WASH situation of the household. Accordingly, in the dry season the family gets water for drinking and washing faces from this structure (show slide 7 in PowerPoint L2). This water source is located in their yard. Pedro tells you there are no children under 3 in the household. He says that the adult members of the household defecate in a ditch outside their compound as they have no latrine. There is a station with water and soap to wash hands outside their house (continue showing slide 7).

(Stop for trainees to show you their household form. You will then need to stop after each resident form is completed for these to also be checked.)

You confirm there are five people living in the household and the age of the family members ranges between 5 and 54 years. Three of the family members are currently at home, to of whom consent for examination, however one refuses. The eye examinations are conducted as follows.

1. Pedro is a 54 year old male. He refuses to be examined.
2. Paula is a 52 year old female. She consents to being examined. The grader reports that: there is right eye upper lid trichiasis with two eyelashes touching the eyeball, there are also four recently epilated eyelashes; there is no trichiasis in the right eye lower eyelid. After everting the right eyelid the grader confirms Paula has TS, but no TF or TI. The grader asks the health management questions and confirms that Paula has never seen a health worker for the trichiasis in her right eye.

The grader moves to the left eye and finds trichiasis present in the upper eyelid with eight eyelashes touching the eyeball. There are no signs of recent epilation. She does not have trichiasis in the lower eyelid. When everting the left upper eyelid the grader identifies TS but

no TF or TI. After asking the health management questions Paula confirms she has not seen a health worker about her left eye either.

The grader reports no other eye conditions in either eye.

3. Jose is male and 19 years old. Paula confirms he is at school at the moment and will be home after 3 pm today.
4. Paula tells you about their second child Maria who is 12. She is visiting her Grandmother and will not come back until tomorrow afternoon.
5. Their youngest Juan, he is 5 years old. The grader reports trichiasis upper eyelid zero and trichiasis lower eyelid zero. After everting the eyelid the graders confirms TF equals zero and TI equals zero. He finds the same in the left eye. He does not have any other eye conditions.

As you are about to leave Jose arrives home early. He agrees to be examined. The grader does not find triachiasis in either lid of his right eye. After everting the eyelid he identifies TF present and TI absent. Looking at the left eye, he finds no trichiasis in either eyelid, no TF and no TI. He does not identify any other eye conditions.

Household 5:

You arrive at your 5th household of the day where you greet Alex Ball. After explaining why you are there Alex consents for his household to be enrolled in the survey. You record the GPS for the household and continue asking the WASH-related questions. This includes the source of water for drinking in the dry season, which is shown in this slide (show slide 8). This is located in the center of the village and it takes one hour to go to the water source, collect water and come back. They collect water from the same source for washing their faces.

There are no residents under 4 years old. Alex confirms that the adult members of the household defecate in a shared facility and so you ask what type. Their response is shown in slide 9. The hand washing station used by family members is also shown in slide 9 and is located in the household's yard. You observe water and soap are available.

There are five people living in the household and all of them consent to be examined.

(Stop for trainees to show you their household form. You will then need to stop after each resident form is completed for these to also be checked.)

1. **Alex** is a 55 year old male.

The examination done by the grader on the right eye shows that there is no trichiasis in the upper or lower eyelids. However, after everting the right eyelid the grader identifies TF and TI. He has nothing else wrong with this eye.

On examining the left eye the grader identifies trichiasis in the upper eyelid and counts three eyelashes touching the eyeball. The grader does not see any epilated eyelashes. The lower eyelid is absent for trichiasis. After asking Alex the health management questions he confirms that he was informed about the trichiasis in his left eye and offered surgery, but he has refused due to fear. He was not offered epilation by a health worker for it. The grader everts the eyelid and confirms TS, TF and TI are all present. The grader does not identify any other eye conditions in this eye.

2. **Hula** is a 38 year old female. The grader examines her right eye and confirms she does not have trichiasis in the upper or lower eyelids. After everting the eye, the grader identifies TF and TI and no other eye conditions.

After examining the left eye, the confirms trichiasis as zero for both the upper and lower eyelids. After everting the eyelid he confirms she also has TF and TI in this eye, but no other conditions to note.

3. **Hanna** is 16 years old. The grader examines her right eye and confirms there is no trichiasis in the upper or lower eyelids. After everting the lid he confirms she has TF and TI in this eye. The grader does not see any other conditions that need noting.

Looking at her left eye, the grader confirms trichiasis is also absent in both these eyelids. He everts the eyelid and reports there is no TF or TI in this eye, nor does she have any other issues to report.

4. **Maria** is the grandmother who lives with the family, she is 75.

The grader first examines her right eye upper eyelid and finds that she has trichiasis. He confirms there Maria has two eyelashes touching the eyeball from the upper eyelid and there are no signs of epilation. He does not find trichiasis in the lower eyelid. After asking Maria the health management questions she reports that she has never seen a health worker about the eyelashes in this eye. The grader everts her right eyelid and identifies TS, but no TF or TI, nor does she has any other eye conditions to note.

The examination of the left eye finds Maria also has trichiais in the upper eyelid of this eye, with four eyelashes touching her eyeball. There is no trichais in the lower eyelid. The grader asks the health management questions and Maria confirms she has not seen a health worker about this eye either, but her neighbour did suggest epilation to her, but she did not like the idea of it. Upon everting the left eyelid the grader reports TS, TF and TI as present, but no other issues.

5. **James** is a seven year old boy. The grader confirms no trichiasis in his right eye, either eyelids. After everting the eyelid he confirms TF as present, TI absent and no other issues.

Examining the left eye the grader confirms no trichiasis in either eyelid, no TF or TI. No other eye condition was identified by the grader in the left eye.

Questions for discussion on the practice households:

These can be read out once the exercises are complete to review and check understanding, as well as discussing any other areas that trainees may have found difficult

1. Can candidates identify the various water sources accurately?
2. How would you answer questions H1, H2 and H3 for each household?
3. If you return to Household 2 to examine Martha (who was absent at the time of the first visit) and she is still absent, would you use the ABSENT RETURN survey?
4. What would you do if you finished examining the listed individuals in Household 3 and then discovered that another person lives in the household just as you were about to leave?
5. For household 3, would you return to collect information on Gloria if she had not returned early?
6. For household 3, how did candidates record the examination results for Hugo? What is particular about his TS, TF and TI diagnoses?
7. For Household 4, would you return to collect information on María?
8. How will you keep track of the absent individuals?
9. For household 5 with a shared latrine facility, do you make an observation to determine the type of the latrine facility?

Answers

1. Go around the room and ensure the trainees are confident in identifying the different kinds of water sources by showing pictures.
2. Discuss the correct responses for each household and ensure trainees are confident in their selection.
3. No, you would only enroll someone in the absent return survey if they are present AND consent to examination when you return to the household.
4. You would open a new RESIDENT survey form and add the new person to the correct household.
5. Yes, if you have time
6. Bilateral upper eyelid trichiasis means he has trichiasis in both the right and left upper eyelids. For the surgery and epilation questions, for both eyes, you would record that he has not been informed of either by a health worker. For the question about trachomatous scarring (TS), you would record "not able to grade" as his eyelids could not be everted. You would do the same for TF and TI. Lower eyelid trichiasis is not present in either eye. .
7. As she will not be home until tomorrow, it is unlikely the team will still be in the cluster to return and examine her. If they were, she would not be a priority as the teams should prioritise any 1–9-year-olds before other ages.
8. Write the names of the heads of households to which you need to return (as well as the names and ages of the missing residents) on paper (a template is provided in Annex 9c).
9. You do not need to make observations of a shared latrine facility. Instead, you ask the respondent to give you the description of the type of the latrine facility.

Annex 15A Recorder Reliability Test

Today, you are going to collect data for EU 12345, cluster 678. Use the recorder code assigned to you for the training. You will be enrolling at least 3 households that will be selected by the trainer. The trainer will project a PowerPoint with WASH elements that correspond to each household.

Trainees should show the trainer the summary of each completed form (Cluster, Household, Resident, and Absent Return) for marking before submitting. If you forget, you will be asked to redo them. Ensure you have a paper absentee form ready to record any absentees.

Household 1: Samuel West

The main source of water for drinking is shown in slide 2, it takes 10 minutes to go there, get water and come back. They use a different water source for cooking and washing faces that is in the yard. When you ask to see the latrine, they point to the wooded area behind their house.

They show you a hand washing station right outside of their home with water and soap.

Name	Age	Gender	Consent	Finding
1. Samuel	31	Male	Consented	Negative for all trachoma signs, in both right and left eyes. The grader identified no other eye conditions.
2. Zuwena	28	Female	She is absent	Zuwena went to the market and will return in the evening.
3. Fatima	55	Female	Consented	No upper or lower eyelid trichiasis in the right eye. Positive for TI in the right eye. Positive for upper eyelid trichiasis and TS in the left eye. One eyelash touches the eyeball from the left upper eyelid, there are no epilated eyelashes. She has been offered surgery for the trichiasis by a health worker, but has not yet gone to have the surgery due to childcare responbilities. There are no other signs of trachoma in either eye. She was told about epilation by a neighbour, but not by a health worker. The grader identified no other eye conditions
4. Rashid	9	Male	Consented	Positive for TF in the right eye, positive for TF and TI in the left eye. No other trachoma related findings in either eye. The grader identified no other eye conditions
5. Glory	5	Female	Consented	Positive for TI in the left eye. No other trachoma related findings in either eye. The grader identified no other eye conditions

Household 2: Eddie Robert

The main source of water for drinking and face washing in the dry season is shown in slide 3, which is located in the compound of the household. Eddie reported that adult members of his family use a private latrine constructed from local materials and is located behind the house (slide 4). The family washes their hands using water from the containers located on the floor of the latrine (slide 4). There is no water, soap or other cleaning materials for hand washing adjacent to the containers used.

Name	Age	Gender	Consent	Finding
1. Eddie	65	Male	He consented	Lower eyelid trichiasis and TS present in the right eye. Two eyelashes touch the eyeball from the right lower eyelid. No other trachoma related findings in either the right or left eyes. Eddie was offered surgery for the right lower eyelid trichiasis, he accepted the offer and is waiting for the date of the surgery appointment. He was not informed about epilation by a health worker. The grader identified no other eye conditions.
2. Tania	55	Female	She consented	Tania has TF and TI in both right and left eyes. No other trachoma related findings in either eye. The grader identified no other eye conditions.
3. Liza	15	Female	Consented	No trachoma related findings in either the right or left eyes. The grader identified no other eye conditions
4.Mulu	9	Female	Consented	Mulu is positive for TF and TI in the right and left eyes. No other trachoma related findings in either eye. The grader identified no other eye conditions

Household 3: Jemal Alye

The main source of water for drinking and washing faces, both in the dry and wet seasons is a water body shown on slide 5. Jemal said that it takes his wife two hours to fetch water from the water source. Adult members of the family defecate in an open space to the rear of the household. No hand washing facility was observed in the compound of the household.

Name	Age	Gender	Consent	Finding
1. Jemal	76	Male	He consented	Upper eyelid trichiasis and TS present in both the right and left eyes. The number of eyelashes touching the eyeball from the right upper eyelid was three and one eyelash touches the eyeball from the left upper eyelid. No eyelashes have been epilated in either of these eyelids. He also has TF in the right eye, but no other trachoma related findings in either eye. Jemal was offered surgery by a health worker for the right and left upper eyelid trichiasis, but he refused the surgery. He was not informed by the health worker about epilation. The grader identified no other eye conditions
2. Zahara	58	Female	She consented	Zahara has trichiasis in the left lower eyelid with two eyelashes touching the eyeball. 1 eyelash has been recently epilated. No other trachoma related findings in either the right or left eyes. Zahara was not informed and offered surgery by a health worker for the left lower eyelid trichiasis. But she was offered epilation by an elderly traditional practitioner in the village. The grader identified no other eye conditions
3. Sofia	18	Female	Absent	She has gone to school and will not be back until 5.00 pm today
4. Murad	16	Male	Consented	He is positive for TF in the right eye. No other trachoma related findings in either eye. Murad reported poor eyesight from his right eye due to the trauma that he sustained while he was a small child. The grader wishes to have this referred for further examination.

Annex 15B Trainer notes and scripts for the recorder reliability test

For the purposes of the recorder reliability test, trainees should complete at least 3 test households. Two households should be selected from the above Annex 15A. Give trainees a print out of these and ask them to work through the information to enter the data, using PPT L3 in parallel.

The third household should be read aloud by the trainer, choosing from one of the two scripted households below (accompanied by PowerPoint L3). This is to provide a simulation closer to what trainees might experience in the field, being told the necessary information by members of the household or the grader.

The scripts should be read aloud clearly by the trainer, whilst trainees complete the relevant forms. Notes in italics are directions for the trainer and do not need to be read out. Trainees may ask you to repeat certain information if needed, as they might in the field. The trainees must show you the summary of each completed form (Cluster, Household, Resident, and Absent Return) before submitting, as well as their completed paper- based absent return forms where applicable. If they forget to show you the form before submitting, they will need to re-do it. For the 'scripted' households it will take a bit longer to go through them as everyone is completing these at the same pace and will need their forms checked at the same time.

The excel based recorder test mark sheet should be used by the trainer to track and calculate the trainees' scores. The scores can be entered as soon as the trainer reviews a form and full instructions for using the sheet are contained within it. If required, a 'correct responses' sheet (document L3) is also available to support the trainer with marking.

Trainer script for delivering the recorder reliability test exercises:

You are still working in EU 12345, cluster 678.

Household 4:

Your arrive at Household 4 and introduce the team. Mohammed consents for his household to be enrolled in the survey and so you take GPS to start. Mohammed reports that in the dry season his family gets water for drinking and face washing from the water source shown on slide 6. It takes the family 45 minutes to fetch the water. The youngest child in the house is 2 years old and the mother says that she throws the child's faeces into the latrine. The family has their own latrine that they do not share with any other families (slide 6). You observe a hand washing facility located outside their house. They have water and liquid soap available (slide 7).

There are five family members in the household and four of them are present at the time of the visit and consented for eye examination. Sultana, the seven year old female, is reported to be at school and her mother said that she will return at 4.00 pm today.

(Stop for trainees to show you their household form. You will then need to stop after each resident form is completed for these to also be checked.)

The grader starts the individual eye examinations.

1. **Mohmmed Ali** confirms that he is 55 years old. The grader starts by examining his right eye and confirms he has no trichiasis in either the upper or lower eyelids. The eyelid is everted and the grader confirms TI and TI are also absent.

In his left upper eyelid the grader confirms trichiasis as present with 8 eyelashes touching the eyeball. There are also 2 recently epilated eyelashes. He does not have trichiasis in the left lower eyelid. The grader everts the eyelid and identifies TS, TF and TI in the left eye. AFter asking the health management questions, Mohammed confirms that he was informed about the upper eyelid trichiasis in the left eye and referred to the hospital, but he refused the surgery due to fear. He was not informed by the health worker about epilation, but a relative did suggest it. The grader identifies no other eye conditions in either eye.

2. **Seida** is a 36 years old and she consents for examination.

Starting with her right eye the grader finds trichiaiss in her upper eyelid with 2 eyelashes touching the eyeball, none have been epilated. She does not have lower lid trichiasis in this eye. After asking the health management questions Seida says she was informed by a health worker about the trichiasis in her right eye and had surgery, however there has been a recurrence. She was never informed about epilation by a health worker. The grader everts the right upper eyelid and identifies that there is TS, but not TF or TI in the right eye

The examination made on the left eye reveals no trichiasis in either eyelid. The grader everts the eyelid amd finds TF and TI in the left eye. The grader identifies no other eye conditions in either eye-

3. **Faisal** confirms his age as 13. The grader examines his right eye and report trichiais upper eyelid absent and lower lid absent. He everts the list and confirms TF zero, TI zero.

Examination of the left eye shows no trichiasis in either eyelid. On everting this lid the grader says TF one, TI zero. The grader identifies no other eye conditions in either eye

4. **Sultana** is a seven years old. She is at school and her mother says she will return after 4.00 pm today.

5. **Nuria** is two years old. Her mother consent sfor her to be examined and helps to hold her. The grader confirms that she does not have trichiais in either the upper or lower eyelid of her right eye. AFter everting her eyelid the grader identifies TF and TI.

Looking at her left eye the grader reports no trichiasis in this eye, upper or lower. He everts the eyelid and again finds TF and TI. He gives the mother TEO and shows her how to apply it. He does not identify any other eye conditions.

Sultana: Before your team leaves the village Sultana returns from school and consents for examination. The examinationof her right eye shows that she does not have trichiasis in either eyelid. The grader everts her eyelid and does not find TF or TI.

Looking at her left eye the grader confirms she does not have trichiasis in either eyelid. However when the grader everts this eyelid he identifies TF and TI. No other eye conditions are identified by the grader in either eye

Household 5

The team arrive at the 5th household of the day and greet the family. Thomas, the head of the household, consents for the survey and so you take a GPS reading. You continue onto the WASH questions. You find that the main source of water for drinking and washing faces for members of the household both during the dry and wet seasons is the structure shown on slide 8. It was

noted that the water source was dug using a drilling machine. It takes the family 15 minutes to collect water from the water source. There is no one under 3 in their household. They have a latrine in their yard (shown in slide 8) which they share with two of their neighbouring households. There is a hand washing station a few meters away from the latrine with water, but you do not see soap or any other cleansing materials by it.

(Stop for trainees to show you their household form. You will then need to stop after each resident form is completed for these to also be checked.)

There are six people living in the household and four of them were present at the time of the visit. Three of the household members consent for eye examination and one refuses.

1. **Thamas Bah** is a 40 year old male. He consents for examination. The grader finds no upper eyelid trichiais in the right eye, but lower lid trichiasis is present. He has 3 eyelashes touching the eyeball, none have been epilated in the lower lid. The grader then everts the eyelid and confirms Thomas does not have TS, TFI or TI. After asking the health management questions Thomas reports that he was not offered surgery, but he was offered epilation by a healthworker.

After examining the left eye the grader identifies no trichiasis in either eyelid, nor TF or TI. He does not identify any other eye conditions.

2. Maria is a 34 year old female and she refuses to be examined.
3. Moses is a 75 year old male and he consents for the eye examination. The examination of his right eye confirms he does not have trichiasis in his upper or lower eyelids. The grader is unable to evert his right eyelid.

Examining his left eyelid the grader confirms he does not have trichiaiss in this eye, and similarly, he cannot this eyelid. The grader does not identify any other eye issues to be noted.

4. Yuri is 12 years old. He consents to be examined. AFter examingn his right eye, the grader confirms he does not have trichiais in either eyelid. The grader everts the right eyelid and identifies TF as present, but TI absent.

Looking at his left eye the grader confirms there is no trichiasis in either eyelid. Upon everting the left upper eyelid the grader confirms Yuri does not have TF in this eye, but does have TI. He does not have any other eye related conditions.

5. Beauty is an 11 year old female. Thomas reports that she went tot he market and will return in 2 hours.
6. Solomon is 7 years old. He is at school now and will return in 3 hours.

Questions for discussion on the test exercises (can be read out once the exercises are complete to review and check understanding)

1. What responses were given for water sources, latrine and handwashing facilities for each household?
2. For all households, how did you respond to the child latrine usage question?
3. For Household 1, the wife/mother is absent. Do you need to return to this household after departing?
4. For Household 1, what is your response to the health management questions following the examination of the Grandmother, Fatima?
5. For Household 5, you have 2 absent residents: an 11-year-old returning in 2 hours and a 7-year-old returning in 3 hours. Do you need to return to this household? If yes, when should you return?
6. For Household 5, what would your responses be for TF and TI following the examination of the Grandfather, Moses?
7. For a household with no latrine facility do you need to look if there is a hand washing facility around the compound and record the findings?

Answers

1. Discuss the responses given, any errors and ensure trainees are confident in identifying the different WASH elements.
2. For Household 4, Nuria's faeces are put into the latrine. The other households do not have children under 3 and so trainees should select "There is no child under 3 years of age resident in the household."
3. A return visit is not necessary because the mother is outside the 1–9-year-old age range that should be prioritized. However, if you have time you could return and examine her.
4. You would select "Yes, a health worker informed me and offered me surgery and I accepted the offer, but I have not yet had surgery." For epilation, she has never been informed about it by a health worker, only her neighbour.
5. Yes, you should return in 3 hours. If the 11-year-old has returned, you can examine her as well, but the 7-year-old son is the priority for follow-up.
6. As his eyelids cannot be everted you would have to select "Not able to grade" for TF and TI.
7. Irrespective of presence of a latrine facility in a household you need to look if there is a hand washing facility within the compound, with water, soap and or other cleansing materials.

Tropical Data – Absent Return Form

Country: _____

Name of the recorder: _____ Recorder's ID: _____ Evaluation Unit Code: _____

Cluster Code: _____ Name of the Locality/village: _____ Date: _____

Household ID	Name of the person reported absent	Age of absentee	Gender of absentee	Reason for not being available	Time the person is expected to return

Signature of the recorder: _____

Annex 16 Absent Return Form

TROPICAL DATA

Annex 17 Cluster Sampling and Household Selection – Aide-mémoire

Sampling is typically done in 2 stages:

First stage:

- Select the clusters (communities/villages) from a complete list of clusters in the EU.
- Cluster sampling is done by the survey coordinator and/or epidemiologist and communicated to the teams in advance of the survey to aid planning.
- Following WHO recommendations, 20-30 clusters are selected per EU, with the exact number defined by the programme, in consultation with the epidemiologist.

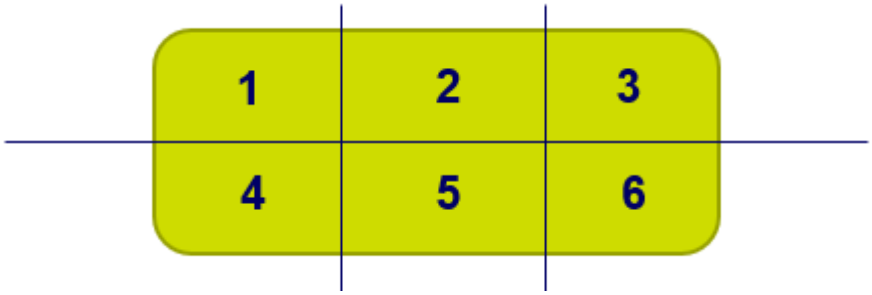
Second stage:

- Select households within the clusters. Remember to check the definition of a household outlined in the protocol.
- The number of households to select (generally 25-30) will be determined by the programme.
- The selection of households is done by the teams. There are different methods, with the choice influenced by the existence or absence of a list of households in the selected cluster.
- The 3 main methods are: compact segment sampling, simple random sampling, and systematic random sampling.

Household selection:

Compact Segment Sampling:

- Teams (or those sent to conduct sensitisation ahead of the team's arrival) request a village leader to make a rough map of the village and to estimate the number of households (e.g. 180).
- The total number of households should be divided by the number of households to be examined per cluster (e.g. 180/30 = 6).
- The village should then be split into equal-size segments based on the previous calculation (6). One of those segments is then randomly selected and all eligible households in the segment are surveyed.



Simple random sampling:

- Used where there is a list available of households in the village, with sampling most likely done before going to the field.
- Each household on the list of village households should be given a number (e.g. 1-180).
- The required number of households (as set out in the protocol) should be randomly selected from that list (e.g. using Excel), visited and enrolled for the survey.

Systematic random sampling:

- Used where there is a list available of households in the village, with sampling possible when in the field.
- Each household on the list should be given a number (e.g. 1-180).
- Calculate the sampling interval by dividing the total number of households by the number of households to be selected (e.g., 180/30 = 6).
- Select one random number from the sampling interval (e.g., one random number between 1 and 6).
- This will be the first household in the sample. E.g., If you select HH4, this will be the first household to select from your list.
- Add the sampling interval to the previously selected household to determine the next household to visit on the list, e.g. 4+6 = HH10.
- Keep adding the sampling interval to the previously selected household until you have completed the total number of households required. (10+6=16, 16+6=22, etc.).

HH Number	Name	HH Number	Name	HH Number	Name
1	James	31	Martin	61	Bilbil
2	Michael	32	Mamadou	62	Aminou
3	Robert	33	Conde	63	Mahamat
4	Christian	34	Badiane	64	Mayang
5	Matthew	35	Bella	65	Marie
6	Ben	36	Emilienne	66	Koizan
7	Alan	37	Sarjo	67	Aly
8	David	38	Serge	68	Roger
9	John	39	Joseph	69	Serena
10	Gilbert	40	Stephanie	70	Madaleine
11	Patrick	41	Michaela	71	Suleman
12	Ange	42	Clare	72	Abdali
13	Amadou	43	Bert	73	Adam
14	Nassirou	44	Mohammed	74	Brahima
15	Yilikal	45	Rafikula	75	Jaques
16	Wondu	46	Abdul	76	Ngoi
17	Miheret	47	Ali	77	Nicaise
18	Niao	48	Coulibaly	78	Dieu Merci
19	Barka	49	Alvin	79	Pierre
20	Boubacar	50	Donna	80	Francisca
21	Sarr	51	Lizzy	81	Solomon
22	Kabona	52	Lucy	82	Annette
23	Georges	53	Robyn	83	Anthony
24	Jeremiah	54	Tessa	84	Assefa
25	Caleb	55	Shea	85	Berhanu
26	Sol	56	Andreas	86	Fentahun
27	Amir	57	Gracia	87	Nigussie
28	Emma	58	Wilfred	88	Mesfin
29	Cristina	59	Timothy	89	Habtamu
30	Clara	60	Samuel	90	Melaku

NOTE: If you are aware of or encounter any potential issues with cluster accessibility, such as insecurity or flooding, please alert the Tropical Data team as early as possible so we can create a plan to mitigate issues.

Annex 18 Supervisor checklist

TROPICAL DATA

- To be completed before departing from the team.
- Observations should be completed and notes made for each section, also detailing any feedback given to the teams. The specified bullet points in each section are for guidance only, feel free to include any other relevant points or not to address these specifically as you may not have time to observe all these aspects during a visit.

Date & time :		Supervisor ID:	
Recorder ID of observed team:		EU code:	
Community name (or GPS reading):		Cluster code:	

Consent, Communication & Sensitisation:

- Are teams treating communities/households with respect, making appropriate introductions and ensuring to gain consent? Have there been any issues around sensitisation?
- Are teams communicating regularly with the supervisor and escalating issues?

Recording:

- Are WASH questions being asked correctly? Are form responses being entered accurately and questions answered in the right order? Is GPS being recorded?
- Is a paper record of absentees being kept and were efforts made to return to households if time allowed at the end of the day?
- Are data being sent daily or as per the agreed schedule?

Grading:

- Are you satisfied with the quality of the grading and the process of examination?
- Were those in need of treatment appropriately managed?

Protocol:

- Are the right number of households and clusters being visited? Have there been any challenges?
- Are all households members being examined and selected as per the protocol?

Logistics:

- Do teams have all the materials they require? If not, what is the solution?
- Have there been, or do they foresee, any challenges? (e.g. weather, security, financial, etc.)

Personnel:

- Are graders and recorders working well together? Are they motivated? Are they coping physically and emotionally? Have any steps been taken to address any issues?

General:

- Any other comments, feedback or observations not already given? What is going well?
- Do any issues need escalating to the survey coordinator or data team?

Annex 19 Team training final quiz

1. What are some of the common factors associated with an area or person having trachoma? Suggest at least three.

2. What do the four letters in the "SAFE" strategy stand for ?

S:	A:
F:	E:

3. Why is it important to have good quality data from trachoma surveys?

4. Trachoma surveys take place in: (circle all that apply)
   a. schools
   b. households
   c. all the villages/clusters in an Evaluation Unit
   d. in selected villages/clusters of an Evaluation Unit

5. (A) How many recommended methods of household sampling are there and (B) which one will you be using?

A:	B:

6. In a household selected for survey, who gives consent for children to be examined, and what age do they have to be?

7. Who is eligible for eye examination in a household?

8. What do you do if you find someone who has trichiasis?

9. What is the local definition of a health worker?

10. Name 3 potential issues that teams may encounter for which they should consult with, or report to, their supervisor?

11. What would you do if you cannot get to the assigned cluster due to a landslide making the road impassable?

12. If you are using simple random sampling and the list of households was preselected for you prior to your arrival in the cluster, if you find one of the households is absent (the neighbour says they have gone to visit relatives), what would you do?

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Right
A woman has her eye checked for signs of trachoma, Ethiopia.

Dominic Nahr/Magnum/Sightsavers

For further details about Tropical Data or this manual,
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