

## Tropical Data trachoma survey protocol guide

Version 4, January 2020

Below is a suggested list of headings and content to include when developing your Tropical Data trachoma survey protocol.

### 1. Title page:

- Country
- Districts to be surveyed
- Type of survey (baseline, impact, surveillance, trachomatous trichiasis (TT)-only)
- Date and version of protocol
- Names and contact details of applicant(s) and key partners

### 2. Introduction/Background<sup>1</sup>:

- Trachoma is the leading infectious cause of blindness worldwide.
- The prevalence targets for elimination are: TF<5% in 1–9-year-olds, and TT unknown to the health system <0.2% in adults aged ≥15 years.
- Keep focus on the districts to be surveyed and their current and past situation.

### 3. Rationale/justification for trachoma survey in this/these district(s)

- Explain why this specific survey is appropriate to be conducted in this/these district(s) at this time.

### 4. Aim

For example:

- *Baseline surveys*: To determine the baseline prevalence of active trachoma in [name districts and country].
- *Impact surveys*: To measure the impact on trachoma prevalence brought about by the trachoma elimination interventions [name districts and country].
- *Surveillance surveys*: To determine if interventions against trachoma need to be re-introduced in [name districts and country] or whether prevalence of trachoma has been maintained below the elimination threshold.
- *TT-only surveys*: To determine the prevalence of trachomatous trichiasis (TT) in [name districts and country].

### 5. Specific objectives

For example:

- To measure the prevalence of TF among children aged 1–9-year-olds.
- To measure the prevalence of TT among adults aged ≥15 years.
- To determine household-level availability of improved water access and sanitation facilities.

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<sup>1</sup> Please remember that Tropical Data is not WHO-led. Instead, Tropical Data is a service that supports health ministries conduct trachoma prevalence surveys that conform to WHO recommendations.

## 6. Methods:

### • Survey population:

Include details on districts and Evaluation Units (EUs) to be surveyed, including population sizes<sup>2</sup>.

- If a district is split into two or more EUs due to large population size:
  - Please indicate how the district is being split (e.g. using a road as a natural demarcation), and the population of each EU.
  - It is also important to ensure that programmatic decisions can be implemented at the EU level.
- For multiple districts to be combined into one EU, they should be geographically contiguous, and it should make sense programmatically and geo-politically on the ground.

### • Sample size calculation:

The sample size calculation, according to the single population proportion for precision formula, is:  
 $n = DEFF \times (z^2 \times p(1-p)/c^2) \times e$

[where DEFF is the design effect; z is the standard deviation corresponding to 95% confidence intervals; p is the expected prevalence; c is the absolute precision; e is an inflation factor to account for non-response<sup>3</sup>].

Values to input into this formula for baseline, impact, surveillance and TT-only surveys are provided in Table 1 below. Baseline surveys may be powered to either detect a trichomatous inflammation—follicular (TF) prevalence of 10% ( $\pm 3\%$ ) or 4% ( $\pm 2\%$ ), depending on the expected TF prevalence (perhaps based on historical data, current prevalence in neighbouring districts, and/or geographical, socio-economic and political context).

Variable	Input		
	Baseline	Baseline, impact and surveillance	TT-only
Design Effect	3.69 <sup>4</sup>	2.63 <sup>4</sup>	1.47 <sup>4,5</sup>
Standard deviation for 95% confidence interval	1.96	1.96	1.96
Expected prevalence (%) <sup>6</sup>	10	4	0.2
Absolute precision (%)	3	2	0.2
Number to examine	1418	970	2818
Non-response rate inflation factor <sup>3</sup>	1.2	1.2	1.2
Targeted number to enumerate <sup>7</sup>	1701	1164	3382

<sup>2</sup> In general, an Evaluation Unit (EU) is a district, which for trachoma elimination purposes WHO defines as “the normal administrative unit for health care management, consisting of a population unit between 100,000–250,000 persons”

([https://apps.who.int/iris/bitstream/handle/10665/43405/9241546905\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/43405/9241546905_eng.pdf?sequence=1)).

<sup>3</sup> An arbitrary inflation factor of 1.2 is used, unless your previous work enables you to use an actual non-response rate for the population and setting.

<sup>4</sup> WHO. Design parameters for population-based trachoma prevalence surveys. <http://apps.who.int/iris/bitstream/handle/10665/275523/WHO-HTM-NTD-PCT-2018.07-eng.pdf?ua=1>; 2018.

<sup>5</sup> WHO. Design and validation of a trichomatous trichiasis-only survey. [http://www.who.int/trachoma/resources/who\\_htm\\_ntd\\_pct\\_2017.08/en/](http://www.who.int/trachoma/resources/who_htm_ntd_pct_2017.08/en/); 2017.

- **Number of clusters and households to select<sup>8,9</sup>:**

For baseline, impact and surveillance surveys, the number of clusters,  $c$ , needed per EU is determined by dividing the total targeted number of children aged 1–9 years to be enumerated by ([number of households per cluster]x[mean number of 1–9-year-olds per household]). There should be a minimum of 20 clusters, so if  $c < 20$ , 20 clusters should be selected anyway. If  $c$ , determined by the above formula, is  $\geq 30$ , 30 clusters should be used<sup>4</sup>.

For TT-only surveys, the number of clusters,  $c$ , that would ideally be included is given by  $c = (3382)/(h \times a)$ , where  $h$  is the number of households that can be examined by 1 team in 1 day, and  $a$  is the expected mean number of adults resident in each household, as determined by the most recent census or recent population-based trachoma survey experience. There should be a minimum of 20 clusters, so if  $c < 20$ , 20 clusters should be selected anyway. If  $c$ , determined by the above formula, is  $\geq 30$ , 30 clusters should be used<sup>4</sup>.

<b>Variable</b>	<b>Input</b>
Sample size (target number of children aged 1–9 years to enumerate)	<ul style="list-style-type: none"> <li>• 1701 for TF 10% (<math>\pm 3\%</math>)</li> <li>• 1164 for TF 4% (<math>\pm 2\%</math>)</li> <li>• 3382 for TT-only surveys</li> </ul>
Number of households to survey per cluster	The number of households that can be examined by 1 team in 1 day
Mean number of individuals per household	<ul style="list-style-type: none"> <li>• 1–9-year-olds for baseline, impact and surveillance surveys</li> <li>• <math>\geq 15</math> year-olds for TT-only surveys</li> </ul>

- **Survey team composition and roles**

- **Training:**

Graders and recorders should have completed and be certified according to the Tropical Data training system<sup>10,11</sup>.

<sup>6</sup> For baseline, impact and surveillance surveys, this is the expected TF prevalence. For TT-only surveys, this is the expected TT prevalence.

<sup>7</sup> For baseline, impact and surveillance surveys, this is the number of children aged 1–9 years to enumerate. For TT-only surveys, this is the number of adults aged  $\geq 15$  years to enumerate.

<sup>8</sup> It is strongly recommended that a fixed number of households be recruited per cluster. Therefore, programmes should first set the number of households to be visited per cluster as the number of households that one team (one grader plus one recorder for prevalence surveys; one recorder/grader for TT-only surveys) can reliably see in a single day of fieldwork: this varies from one country to another based on how difficult it is to move from one household to another in rural communities, due to distance between households and the terrain.

<sup>9</sup> When doing the calculation, please do not round up or down the mean number of 1–9-year-olds per household, or the product of ([number of households per cluster]x[mean number of 1–9-year-olds per household]). However, when the cluster calculation has been completed, please round up to the next whole number, to help ensure the sample size is met. For example, if the calculation result is 23.4 clusters, round up to 24 clusters to survey.

<sup>10</sup> Courtright P, MacArthur C, Macleod CK, Dejene M, Gass K, Harding-Esch EM, Jimenez C, Lewallen S, Mpyet C, Pavluck AL, West SK, Willis R, Solomon AW (2019). Tropical Data: training system for trachoma prevalence surveys (version 3). International Coalition for Trachoma Control: London.  
<http://tropicaldata.knowledgeowl.com/help/training-system-for-trachoma-prevalence-surveys>.

<sup>11</sup> Courtright P, Flueckiger RM, Harding-Esch EM, Lewallen S, Solomon AW (2019). Tropical Data: training system for trachomatous trichiasis population-based prevalence surveys (version 2). International Coalition for

- **Sampling approach (cluster and household selection):**

Two-stage cluster random sampling. Sampling of clusters within the EU, and sampling of households within the cluster, should be undertaken to adhere to the principles of equal probability random sampling, or its best approximation given the circumstances.

For first-stage cluster sampling, where cluster-level population estimates are known in advance, probability of cluster selection should be proportional to population size<sup>12</sup>.

Household selection within clusters will vary from country to country, with the most common methods being simple random sampling and systematic sampling when there is a complete list of households at the cluster level, and compact segment sampling when there is not<sup>13</sup>. During fieldwork, it is the number of households per cluster that should be targeted, not the number of individuals-to-be-examined or enumerated that was indicated by the sample size calculation. If the required number of households are not present in any given selected cluster, the remaining households can be selected, using the same household selection method, from the closest adjacent cluster. If compact segment sampling is used, teams should survey all households in the segment, regardless of whether this is more or fewer than the target number of households.

- **Data collection, management and ownership:**

Data will be entered into the Tropical Data app, on an Android smartphone.

Include details on the trachoma grading (including examination methods) and questionnaire data collection, data management, and data ownership.

For baseline, impact and surveillance surveys, at each household, teams should examine both eyes of each person aged one year and above for the clinical signs trichiasis (upper and lower lid), TF and TI. Follicle size guides, routinely provided by Tropical Data, should be used for the diagnosis of TF. Where trichiasis is recorded as being present in an eye (upper or lower lid), the presence or absence of TS (in the upper tarsal conjunctiva of the same eye) should also be recorded, and the subject should be asked if they have ever been offered management for their trichiasis. GPS and WASH (water, sanitation and hygiene) data<sup>14</sup> are collected at the household level.

For TT-only surveys, generally a single individual functions as both grader and recorder, and no WASH data are collected. At each household, teams should examine each person aged  $\geq 15$  years for the clinical signs of trichiasis (upper and lower lid). Where trichiasis is recorded as being present in an eye (upper or lower lid), the presence or absence of TS (in the upper tarsal conjunctiva of the same eye) should also be recorded, and the subject should be asked if they have ever been offered management for their trichiasis.

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Trachoma Control: London. <http://tropical-data-fr.knowledgeowl.com/help/training-for-mapping-of-trachomatous-trichiasis>.

<sup>12</sup> [https://apps.who.int/iris/bitstream/handle/10665/43405/9241546905\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/43405/9241546905_eng.pdf?sequence=1)

<sup>13</sup> <https://www.futurelearn.com/courses/eliminating-trachoma/3/steps/236969>, [https://apps.who.int/iris/bitstream/handle/10665/43405/9241546905\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/43405/9241546905_eng.pdf?sequence=1) and Turner *et al.* <https://doi.org/10.1093/ije/25.1.198>

<sup>14</sup> WASH variables are in-line with the WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) core questions for households (<https://washdata.org/sites/default/files/documents/reports/2019-03/JMP-2018-core-questions-for-household-surveys.pdf>) and enable JMP sanitation and hygiene ladder classification.

Teams should return to the household once at the end of the day to try to examine household members from the target age-group (1–9-year-olds for baseline, impact and surveillance surveys; ≥15 year-olds for TT-only surveys) who were absent at the initial time of examination.

All data collected using Tropical Data tools are owned by the respective health ministries<sup>15</sup>.

#### **7. Ethical considerations:**

Include details on any ethics committee approvals, methods for obtaining consent, and provisions in place to treat individuals with active trachoma and manage trichiasis cases. Verbal consent for examination is routinely recorded in the Android phones, so unless required by national ethical committees, it should not be necessary to have paper-based forms. Name and ages of individuals are recorded, as these facilitate identification of individuals for clinical examination.

#### **8. Dissemination:**

We would like to encourage international dissemination of the data, including at conferences and in peer-reviewed publications.

#### **9. Materials required**

Tropical Data will routinely provide:

- Loupes
- Follicle size guides
- Android phones

#### **10. Timeline**

#### **11. Budget**

#### **12. References**

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<sup>15</sup> Further details regarding the Tropical Data data collection and management processes can be found in “Tropical Data News, December 2017”: <http://tropicaldata.knowledgeowl.com/help/december-2017>