

Trachoma Surveillance: Are Countries Prepared to Sustain Elimination Gains?

Session Date & Time:	Tuesday, November 19; 1:00 PM to 4:00 PM
Session Location:	Aria
Session Description:	This session aims to lay out the urgency for furthering a collaboration between trachoma endemic countries and the global trachoma community to develop and execute operational research questions that will provide the evidence base need to build feasible and robust post-validation surveillance guidance.
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KEY DISCUSSION POINTS

- In the past decade, a large number of districts have completed recommended intervention for trachoma. Two countries in Africa have been validated for elimination of trachoma as a public health problem. There is now an urgent need to clarify guidelines for post-validation surveillance (PVS).
- Existing World Health Organization (WHO) trachoma guidelines have limited applicability for PVS.
 - The 2014 WHO trachoma guidance focuses on the administrative level at which surveillance should be undertaken and how/when pre-elimination surveillance should be conducted.
 - Surveillance should be conducted at a district/evaluation unit (EU) level (100,000-250,000 people).
 - The pre-validation surveillance survey should use repeat cluster random sampling surveys 2 years after passed the trachoma impact survey (TIS).
 - The guidance does not include methods for PVS.
 - The 2016 guidelines for trachoma dossiers included a requirement to submit “national plans (if any) for post-validation trachoma surveillance.”
 - There is currently no guidance for how to monitor for potential recrudescence.

- Current WHO guidelines rely solely on clinical indicators (trachomatous inflammation – follicular [TF] and trachomatous trichiasis [TT]). However, TF correlates poorly with ocular chlamydial infection in low prevalence settings. It is also challenging to train and certify graders in low prevalence settings in absence of TF cases.
- Operational research is needed to understand recrudescence and how to monitor it before new guidelines can be developed by WHO. Currently, one potential method utilizing serological surveillance is being evaluated.
- In 2018, Ghana was validated by WHO as having eliminated trachoma as a public health problem.
 - All 18 endemic districts passed impact assessments for TF between 2007 and 2009. TT was still above the elimination threshold. Post-treatment surveillance was conducted in collaboration with WHO from 2011-2014.
 - Active surveillance included examination of children 1-9 years old in 5 schools in 2 randomly-selected communities in each district.
 - Eight communities with TF prevalence above 5% were found. These communities were all treated for 3 years prior to pre-validation surveillance surveys. Examination of surrounding communities did not find any additional communities with prevalence above 5%.
 - Passive surveillance included training of:
 - Community volunteers to identify and report TT cases
 - Non-eye care health workers to suspect and report cases
 - Ophthalmic nurses (ONs) in district hospitals to validate reported cases, conduct TT surgery, and investigate TF cases through case search
 - A pre-validation surveillance plan was developed with support from WHO and was implemented from 2015-2016. All 18 districts still had TF below 5% and 17 were below the TT elimination threshold. Case-finding and surgery were implemented to bring the 18th district below the TT elimination threshold.
 - The PVS strategy is still under development
 - The plan is to use the DHIS2 platform to report cases.
 - Indicators for inclusion in the DHIS2 have been developed.
 - Operational research comparing Pgp3 antibody to Ct infection and TF is ongoing.
- Antibody testing is a promising tool for PVS.
 - To learn more about how antibodies behave in persons over time, longitudinal data were collected from 2,536 children from 50 villages in Kongwa, Tanzania.
 - At baseline, TF was 5.2% and antibody seroprevalence was 31.5%. Antibody seroprevalence varied widely among villages with low TF.

- Over time, seroconversion rate dropped with increasing rounds of mass drug administration (MDA) but not to zero. This occurred in all ages but only in villages with a baseline TF>0.
 - Seroreversion rate increased for older children while under MDA.
- Single measures of cross-sectional prevalence may only be useful for monitoring of age groups born after cessation of MDA and where STDs are not prevalent and where seropositivity in 1 to 9-year-old children is very low.
- Seroprevalence over time has the potential to be a more useful indicator for trachoma surveillance.
- Seroreversion should eventually outweigh seroconversion and prevalence should decrease during surveillance if there is low or no transmission. There is a need to maintain reduction of trachoma as a public health problem and protect existing investments by making plans for post-treatment surveillance systems that can be implemented directly by ministries of health and have the potential to detect recrudescence of trachoma.
 - Currently, validation does not occur in a country until all districts have passed trachoma surveillance surveys (TSS). In countries where some but not all districts have passed TSS, years can pass between TSS and PVS. These districts are generally never visited during this time.
 - Countries are currently expected to develop their own PVS strategies, but may not have the resources (technical, human, or financial) to do so. In order to develop guidance, more data will be needed. There may opportunities within existing national programs where surveillance surveys have been conducted and TF remained <5% among children ages 1-9 years.
 - The cost of a functioning surveillance system should be acceptable, adaptable, actionable, and affordable for country programs. Over the same period, a surveillance system should not cost any more than conducting TSS in the same area.

KNOWLEDGE GAPS IDENTIFIED AND RECOMMENDED NEXT STEPS

- The 2018 WHO serology meeting concluded that there is a need for further study before serology is used for post-validation surveillance.
 - Collection of data in the following settings should be prioritized:
 - Moderate to high TF prevalence pre-intervention
 - Settings where individuals and populations can be followed longitudinally
 - Settings with unexpected discrepancies between TF, infection, and serology (excluding Melanesia)
 - Populations with high likelihood of recrudescence should be sampled first.

- Studies should be conducted on the potential contribution from urogenital chlamydia and how to interpret serology in such areas.
- Further research is needed to inform recommendations for PVS systems.
 - Is it necessary to conduct PVS in all districts?
 - Should districts be targeted based on empirical evidence (e.g. previous TIS or TSS with TF $\geq 5\%$, low uptake of facial cleanliness [F] and environmental improvements [E]) and/or modeling?
 - We can compare alternate sampling methods with repeat TSS surveys conducted after validations. Alternate surveillance methods should be at least as sensitive as TSS and no more resource intensive.
 - Is it appropriate to conduct surveillance on the EU level or are there other options? Is it useful to consider surveillance on a sub-district level?
- There is a need for operational research on recrudescence.
 - How do we define recrudescence? How can we detect a real signal versus noise?
 - What is an acceptable interval of uncertainty for measuring recrudescence?
 - What should the threshold be for restarting MDA after validation of elimination?
 - How long must PVS/monitoring for recrudescence continue?
 - Which metrics should be used to determine whether recrudescence has occurred?
 - Can F and E metrics predict recrudescence?
 - Whenever possible, multiple indicators (serology, TF, infection) should be included in OR studies.
 - How should non-endemic areas surrounding endemic districts be considered in assessment of recrudescence?
 - It is important to consider nomadic populations or other special populations when monitoring for recrudescence.
- Further work on the 5% TF threshold is needed.
 - Does TF $\geq 5\%$ indicate recrudescence in a post-MDA setting?
 - Operational research studies can monitor villages with small increases in TF prevalence to determine whether this indicates recrudescence.
 - Does TF $< 5\%$ mean that transmission has been interrupted?
 - A systemic review of existing data could suggest whether this is an appropriate threshold.
 - Does interpretation of TF prevalence vary by how well F and E have been implemented in the area in question?
 - Should there be a minimum threshold for F and E implementation? If so, how should we monitor behavior change?
- Further modeling work is needed for serology data.

- There is a need to enhance the existing model for predicting serologic outcomes.
 - This can be done initially with existing data. Will this model be able to predict recrudescence?
 - Data to add to the model:
 - Data from different program stages
 - Longitudinal data in kids
 - Community-level prevalence indicators over time
- How can modeling help us target opportunities to measure recrudescence/understand the length of time that monitoring needs to continue?
- More evidence is needed before serology can be implemented programmatically.