COR-NTD 2017 Meeting Outputs

Knowledge gaps and recommended next steps identified at the annual meeting of the Coalition for Operational Research on Neglected Tropical Diseases (COR-NTD) in Baltimore, MD, Nov. 3-4, 2017.

Contents

Click on a title to access content directly. Individual reports are available here.

NEGLECTED TROPICAL DISEASES SUPPORT CENTER

BILL & MELINDA GATES foundation

USAID FROM THE AMERICAN PEOPLE

UKaid Department for International Development

COR-NTD 2017 Meeting Outputs

COR-NTD 2017 Meeting Outputs

Glossary of Commonly Used Terms

Acronyms are defined and spelled out, wherever possible, throughout this document. They are defined again here for easy reference.

CDD	Community Drug Distributor
EQA	External Quality Assurance
EU	Evaluation Unit
HSS	Health Systems Strengthening
IDA	Combination Therapy (for Lymphatic Filariasis) with Ivermectin, Albendazole, and Diethylcarbamazine
IDM	Intensified Disease Management
iTAS	Integrated Transmission Assessment Survey (for Lymphatic Filariasis and Onchocerciasis)
IU	Implementation Unit
IVM	Ivermectin
LF	Lymphatic Filariasis
M&E	Monitoring and Evaluation
MDA	Mass Drug Adminitration
NTD	Neglected Tropical Disease
Oncho	Onchocerciasis
PCR	Polymerase Chain Reaction
PEP	Post-Exposure Prophylaxis (for Leprosy)
POC-CCA	Point-of-Care Rapid Diagnostic Test for the Circulating Cathodic Antigen for Schistosomiasis
PSAC	Pre-School-Age Children
PTT	Postoperative Trachomatous Trichiasis
PVS	Post-Validation Surveillance
RDT	Rapid Diagnostic Test
SAC	School-Age Children
SAE	Serious Adverse Event
SCH/Schisto	Schistosomiasis
STH	Soil-Transmitted Helminthiasis
TaNT	Test and Not Treat (Strategy for Onchocerciasis and Loasis Overlap)
TAS	Transmission Assessment Survey (for Lymphatic Filariasis)
TT	Trachomatous Trichiasis
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization
WRA	Women of Reproductive Age

COR-NTD 2017 Meeting Outputs

Lymphatic Filariasis

Challenges in Post-Validation Surveillance (PVS)

Knowledge Gaps

- What is the aim of PVS systems either on a global or country-specific scale?
- Which areas are at highest risk for recrudescence or misclassification that should be prioritized for PVS activities?
- Is there a population density below which transmission is not expected?
- Do all positive participants identified through PVS need to be followed?
- What are the cost implications of the various proposed PVS platforms?
- What are the strategies to maintaining political will for continuing surveillance when zero or low-level results are seen?
- Are adaptive sampling strategies practical and feasible to help continually refine sampling to best detect hotspots?
- How can modelling predict the true timeline for LF elimination?
- What strategies can be used to integrate PVS into other platforms?

Recommended Next Steps

- Define global and country-specific targets for PVS (e.g., measure transmission threshold or to detect an increase in markers over time)
- Identify how and in which quantities therapeutics and diagnostics will be available to countries in the post-treatment phase of their programs
- Improve diagnostics, including rapid diagnostic test for LF antibody

Disease Management in Filarial Lymphedema and Podoconiosis – possibilities for integration?

Knowledge Gaps

- What are the strategies for shifting from a disease-specific to a disease-agnostic approach to limb care?
- What are better strategies for estimating the number of cases of filarial and non-filarial lymphedema?
- How can we better engage the health-financing sector to allow for a more integrated approach to financing LF and podoconiosis programs?
- Is there a need to create a single staging scale to assess both filarial and non-filarial lymphedema?
- How can we create and disseminate integrated standard operating procedures for LF and podoconiosis?
- What are the strategies to train and supervise health care workers?
- What are the barriers to scaling-up of interventions for managing lymphedema?
- What are the roles for novel therapeutics (e.g., doxycycline) in managing lymphedema?

Recommended Next Steps

- Scale up approaches that are known to be efficacious for managing filarial and non-filarial lymphedema, in an integrated manner
- Investigate the barriers to provision of and access to lymphedema management care, addressing the whole patient (e.g., medical, psychosocial, and rehabilitative issues)

- Develop and test novel approaches to better address lymphedema secondary to LF and podoconiosis
- Investigate the pathogenesis of filarial lymphedema and podoconiosis to identify targets for novel interventions
- Confirm the results of randomized clinical trials demonstrating that doxycycline led to improvement/halt of progression of filarial lymphedema, applying the same to podoconiosis

Transmission Assessment Survey (TAS) Strengthening: Data Review and Analysis

Knowledge Gaps

- Should programs be advised to conduct focal MDA or IU/EU-wide MDA based on the finding of clustered cases?
- Are there hotspots missed by the TAS cluster-sampling methodology?
- Should we stratify coverage data by urban vs. non-urban and ensure that coverage is sufficient in both settings before proceeding to TAS?

Recommended Next Steps

- Complete data collection for TAS Strengthening and share it with the NTD Modelling Consortium to inform transmission models
- Develop a more sensitive Wb123 rapid diagnostic test
- Develop antibody thresholds for surveillance
- Remain open to changing TAS components

COR-NTD 2017 Meeting Outputs

Onchocerciasis

Addressing the Challenge of Oncho and Loa Co-endemicity

Knowledge Gaps

- What is the most reliable way to track people tested via Test and Not Treat (TaNT)?
- Is it economically feasible to implement community-based TaNT on a large scale?
- It is necessary to determine a compromise of time versus coverage for TaNT?
- What level of risk of Loa-related serious adverse events (SAEs) is acceptable in the context of oncho elimination?
- Can the community accept a threshold of 95% probability that less than 1% of the population has high intensity Loa infection, or should another be used?
- How does the Loa serologic test perform in low-prevalence settings?

Recommended Next Steps

- Field-test TaNT to assess its potential as a tool to reduce systematic non-compliance in meso- and hyper-endemic areas in which people are afraid of Loa-associated SAEs
- Conduct cost studies on large-scale TaNT
- Refine the model to incorporate spatial correlation, household-level clustering, familial correlation, and geographic features into models
- Prioritize hypo-endemic oncho mapping particularly in Loa coendemic areas: this will shrink the population in need of oncho treatment
- Evaluate the performance of the serologic test in areas with low or no Loa prevalence
- Pilot TaNT setting with on-going treatment and systematic non-compliance due to fear of SAEs
- Facilitate a decision-making process regarding the acceptable level of Loa including pharma, ethicists, public health physicians, and representatives from endemic countries

Operational Research Priorities for Onchocerciasis Elimination

Knowledge Gaps

- Is assessment of sentinel first line villages 30-50 km apart along a river adequate to ensure interruption of transmission?
- Does the number of flies necessary for programmatic decisions vary based on annual transmission potential and endemicity?
- Is there an alternative screening method to PCR pool screening?
- Is limited vector control a viable strategy to use at the end of MDA to accelerate elimination?
- What is the threshold of OV16 which constitutes a signal of transmission (at the community versus the district level)?
- How can entomology be used to calibrate what is considered a serological signal of transmission?
- How do we take into account people who live and work in different (sub)districts?
- In areas that require a random sample, how many villages need to be sampled (and at what size) to adequately assess for potential transmission?
- What is the false positive rate for our diagnostic tests, and how do we build that into our decision making?
- How do we standardize quality assurance and quality control (QA/QC) for the ELISA tests?

COR-NTD 2017 Meeting Outputs

- If a pre-stop-MDA survey is feasible and acceptable, what is should the threshold be for OV16 ELISA? For OV16 RDT?
- What is the design effect for oncho?
- Should the length of post-treatment surveillance vary based on prior status of transmission and endemicity?

Recommended Next Steps

- Assess relationship between OV16 positivity and MDA coverage in the non-first line villages
- Determine whether fewer flies could be collected by determining the number of infected flies (as opposed to infectious flies), and define a concerning level of infection
- Develop a tool to genetically identify the flies to determine transmission zone
- Assess coverage when testing in late school age (10-14 years) children instead of adults
- Add an exclusion criterion for people who lived elsewhere in the past 10 years to oncho surveys
- Develop an antigen test or a marker of the presence of adult female worms
- Determine a measurable threshold to allow safe MDA cessation
- Determine the most appropriate age group to assess transmission using an antibody test

COR-NTD 2017 Meeting Outputs

Lymphatic Filariasis & Onchocerciasis

Expanding the Benefit of Ivermectin (IVM) for Public Health Control of Tropical Diseases

Knowledge Gaps

- A better understanding of the regulatory landscape is needed in order to determine the barriers that could prevent extension of ivermectin (IVM) MDA to other diseases.
- Broader access to quality assured generic products is a critical component of expanding public health uses of IVM.
- Is there a risk that resistance will develop if use of IVM at community level is extended to other indications? How will we monitor this risk?
- How do we assess the public health benefits of IVM MDA for scabies or Strongyloides?
- What is the size of the population at risk that would benefit from the expanded indications of IVM, should they be incorporated into programs?
- What is the safety of IVM in currently excluded populations (pregnant women and children <15 kg? Pharmacokinetic and pharmacodynamic (PK/PD) data are needed to guide rational dosing, considering efficacy, safety, and logistics of administration.

Recommended Next Steps

- Establish the safety of ivermectin treatment in groups now excluded from oncho and LF MDA, namely young children and pregnant women
- Assess the impact of the addition of IVM to benzimidazole based regimens against STH in terms of efficacy, drug resistance and transmission interruption
- Conduct field trials of long-lasting IVM formulations to understand the potential impact of MDA on malaria transmission
- Enhanced monitoring of existing MDA programs to increase understanding of the collateral benefits of IVM MDA
- Map the population at risk for each of the new established and potential indications to determine population size and drug needs
- Evaluate the market outlook for generic IVM
- Strengthen interactions with WHO and regulatory agencies to understand and facilitate the process of expanding access to IVM

Integrated Stopping Decision for LF and Oncho: Experiences from the Field

Knowledge Gaps

- What threshold is appropriate for stopping?
- What are the cost-drivers of integration and how can we make the surveys more efficient?
- What is the cost difference between school-based and community-based surveys? Are the programmatic conclusions from school-based surveys equivalent to those from community-based surveys?
- When the integrated assessment is in an area not under treatment for oncho, should the stopping MDA serological threshold of <0.1% apply or should the mapping assessment criteria apply?
- What is the appropriate programmatic response when one EU passes the serological evaluation but the transmission focus is larger than the EU?

- When is an Ov16 RDT sufficient, as compared to an Ov16 ELISA, and in what scenarios is each diagnostic appropriate?

Recommended Next Steps

- Develop and provide guidance how countries can reconcile LF evaluation units with oncho transmission zones
- Determine the potential benefits of an integrated TAS (iTAS) in different oncho programmatic settings (e.g., stopping, mapping, mid-point assessment)

Translating Research Findings into Program Practice

Knowledge Gaps

- How can researchers produce evidence that meets WHO standards and can be used as the basis of guidelines and policy? What is necessary and sufficient?
- What happens when a guideline is changed or updated? How is this information communicated to programs?
- If there isn't sufficient evidence available to establish guidelines, how are interim recommendations put in place?
- How can researchers strengthen their evidence and make the case that certain interventions are effective and should be turned into guidelines?
- How can modelling be used to support the development and modification of guidelines?
- Now that IDA has been deemed safe and very effective, how can we translate this into millions of people receiving the therapy?
- How can we increase compliance with IDA in the future roll out?

Recommended Next Steps

- Roll out of IDA therapy is being planned in select countries. This roll out needs to be coupled with enhanced MDA to increase compliance.
- Researchers need to more diligently employ population, intervention, comparison, and outcome (PICO) questions and guidance to plan research. If this is the type of evidence needed to turn findings into guidelines, higher quality evidence must be obtained.
- Researchers must share ideas and be transparent with donors and WHO.
- Researchers should understand that evidence from multiple countries provides stronger evidence for policy change than data from a single country.

COR-NTD 2017 Meeting Outputs

Schistosomiasis

Schistosomiasis (SCH) in Africa: Defining the Program Targets

Knowledge Gaps

- How is morbidity control defined?
- Which age groups should we look at?
- What is the relationship between infection and morbidity?
- How can we demonstrate morbidity control, as currently used diagnostics are insensitive?
- POC-CCA is a better mapping tool than Kato-Katz for *S. mansoni*, but can prevalence data alone predict SCH-related morbidity?
- How do POC-CCA results correlate with Kato-Katz results?
- Are estimated background levels valid for determining an adequate baseline?
- What are the comparable rates of a given morbidity in non-endemic areas?
- Is morbidity nil when prevalence is <10%?
- Do observed relationships hold in pre-school-age children (PSAC)?
- There are data gaps for communities with <10% prevalence.
- How can SCH severe morbidity be treated and managed more in-line with IDM NTDs and into existing health outreach systems?
- In persistent areas of high infection, what combination of additional interventions are required to prevent morbidity and interrupt transmission?
- How do we quantify the added benefit from WASH interventions or molluscicide?
- What is the programmatic importance of egg-negative infection?

Recommended Next Steps

- Develop achievable evidence-based morbidity targets
- Develop robust monitoring and evaluation (M&E) framework & guidelines based on measurable targets
- Construct infection/morbidity curves relating *S. mansoni* infection level and morbidity for post treatment settings as well as treatment-naïve populations
- Use existing population-level data linking infection prevalence and morbidity prevalence for greater understanding of relationship
- Obtain accurate SCH-related morbidity levels in low and very low prevalence areas to re-address the threshold question
- Increase community-based sensitization and mobilization to reduce fear of side effects and increase compliance
- Apply comprehensive PHASE (preventive chemotherapy, health education, access to clean water, sanitation improvement, and environmental snail control and focal molluscicide) strategy
- Incorporate SCH morbidity management into health service delivery system
- Develop a feasible, affordable framework for schistosomiasis, with:
    a. Clear, measurable, evidence-based objectives
    b. Intervention strategies to address the objectives
    c. Efficient plan for M&E that results in program decisions
    d. Reasonable timeframe that can be budgeted and planned around
    e. Ability to transition to elimination once a proven strategy is developed

COR-NTD 2017 Meeting Outputs

Schistosoma mansoni: Incorporating New Data into New Strategies and Goals

Knowledge Gaps

- How can persistent hotspots be identified and effectively addressed?
- Can the impact of high coverage, school-based MDA on 'non-target' populations be confirmed?
- How can morbidity due to schistosomiasis, especially in endemic areas of low-to-moderate prevalence, be defined and measured?
- What is the correlation between Kato-Katz and POC-CCA results, specifically in areas of very low, low and moderate prevalence?
- What test and treat strategies should be used, and when should they be implemented?

Recommended Next Steps

- Identify the characteristics of persistent hotspots, relative to responder villages in the same area
- Determine the best approach(es) for dealing with persistent hotspots (i.e., to bring down prevalence and intensity in areas that do not respond to multiple annual MDA)
- Define morbidity due to schistosomiasis at the beginning of an intervention study and after multiple years, with a focus on functional morbidities and how to measure them
- Compare Kato-Katz to POC-CCA results, specifically including data from areas with very low, low and moderate prevalence – before and after interventions
- Hold meetings to discuss possible test-and-treat strategies suitable for the focal nature and levels of schistosomiasis

COR-NTD 2017 Meeting Outputs

Soil-Transmitted Helminthiasis

Access for Women of Reproductive Age (WRA) to Deworming: Exploring Platforms

Knowledge Gaps

- What is the age distribution of anemia and STH-specific anemia?
- Are women anemic before they become pregnant for the first time or is anemia reflective of the fact they've had a child before?
- What is the effect of deworming on morbidity/mortality from postpartum hemorrhage?
- Would test and treat work in low prevalence areas?

Recommended Next Steps

- Determine the effectiveness of deworming programs on reducing morbidity in adolescent girls and adult WRA
- Estimate the impact (added value) of deworming programs targeting girls and WRA on the goal of eliminating STH disease burden and on other maternal and infant outcomes
- Update the global epidemiology of STH prevalence, intensity, morbidity and disease burden in girls and WRA
- Investigate practical and cost-effective ways in which first trimester pregnancies can be identified
- Explore ways in which social media and mobile technologies can contribute to optimizing program coverage

School vs Community Deworming for STH: Benefits, Cost-effectiveness, and Feasibility

Knowledge Gaps

- What are the up-front costs involved in community-wide treatment and the mapping necessary to execute it?
- How can programs increase compliance?
- How can programs ensure adequate coverage?
- How can models be adapted for different programmatic contexts?
- What tools can be leveraged to compensate for the low efficacy of albendazole against Trichuris?
- How can drug demand be balanced?
- How do we ensure that albendazole is not being given to women of reproductive age that may be pregnant?
- What happens when community-wide MDA for LF is stopped in certain areas?
- What is the measure of success?
- What is the role of WASH?
- Which factors may further reduce efficacy (e.g., ingesting food with the drug)?

Recommended Next Steps

- Develop a flexible community-wide MDA strategy
- Undertake work into the further improvement of surveillance activities, evaluation methods (M&E), diagnostics, and treatment efficacy (especially identifying more effective drugs against Trichuris infection)
- Borrow knowledge from other successful community-wide disease control programs
- Undertake research into and documentation of successful community sensitization practices

- Engage with the WHO to communicate evidence for changing policy guidelines as soon as possible
- Employ new tools such as molecular epidemiological methods to ascertain who infects whom to refine strategies for controlling infection in low prevalence communities after many rounds of MDA

Water, Sanitation, and Hygiene (WASH) Benefits and STH: Results and Program Implications

Knowledge Gaps

- What is the interaction between history of deworming and WASH interventions? Are elimination efforts through MDA more likely to succeed in settings with more improved WASH?
- What should we expect form each component of WASH on each STH? When is the best time to implement WASH interventions to impact STH?
- What is the prevalence of STH in drinking water and on hands?
- What is the relationship between geophagia and anemia and hookworm infection and prevalence of anemia?
- What is the effect of chlorine on hookworm?

Recommended Next Steps

- Conduct social science research on how to sustain behavior change (i.e., tippy tap use for handwashing)
- Determine the effectiveness of WASH interventions longer than 2 years on addressing *Ascaris* ova in rural areas
- Compare the effects of household vs. community-level WASH conditions on MDA effectiveness
- Measure STH in stored drinking water and source water, and improve protocols for molecular detection of STH in environmental media
- Assess health effects of WASH in young children
- Conduct environmental monitoring
- Integrate STH (and protozoa) into studies of health and nutrition

COR-NTD 2017 Meeting Outputs

Trachoma

A Priority Research Agenda for GET2020

Knowledge Gaps

A detailed list of operational research gaps and priorities are available in the breakout report. In summary, identified gaps in trachoma research relate to:

- Trichiasis surgery, including:
  - understanding the causes of scarring and trichiasis, and disease progression
  - how to improve case-finding, increase uptake, and maximize post-surgical outcomes

- Rational use of antibiotics, including:
  - identifying poor coverage, understanding its impact, and determining how to improve it
  - safety of coadministering Zithromax® with other NTD treatments
  - alternative treatment strategies to improve effectiveness
  - understanding risks of reemergence and antimicrobial resistance

- Facial cleanliness & environmental improvements, including:
  - F&E approaches to produce sustained changes in behaviour, access, and reductions in the prevalence of trachoma
  - routes of transmission of ocular CT, their behavioural determinants, and approaches to interrupt them
  - optimal delivery strategies for F&E

- Elimination thresholds and surveillance, including:
  - how to reach vulnerable populations (IDPs, refugees)
  - reconsidering criteria, measurement, and thresholds for trachomatous trichiasis
  - understanding implications of Ct infection, persistent TF, and antibody measures and their roles in disease progression

Recommended Next Steps

- Evaluate strategies to improve access to and outcomes of TT surgery
- Design and conduct rigorous comparisons of alternative treatment strategies
- Develop studies to assess F&E intervention options and how these contribute to programmatic outcomes
- Define new strategies to increase the access of marginalized and vulnerable populations to trachoma interventions

COR-NTD 2017 Meeting Outputs

Post-trichiasis Surgery Follow-up: Experiences and Lessons Learned

Knowledge Gaps

- Is the WHO 2010 target (<10%) postoperative trachomatous trichiasis (PTT) at 1 year an achievable target for success? Could be it less; should it be more? Is 1 year the best time for this benchmark, as programs don't usually see patients at this timepoint?
- How do we assess outcomes in the most effective manner and who should conduct outcome assessments and audits? What new approaches can be introduced? Who should be prioritized for audit?
- Can immediate post-operative photos help predict who is most at risk of PTT?
- How will strategies for outcome assessment/surgical audit approaches evolve in increasingly lower burden districts?
- Are we following children properly after surgery?
- What management is needed for lid contour abnormalities?
- What is the intersection between what countries feel they can achieve vs. what international programs monitor?
- What are the challenges and opportunities for patient self-assessment vs programmatic assessment at 3-6 months?
- What can be done to ensure quality surgery with quality outcomes?
- What are the appropriate follow-up (e.g., house-to-house, central location, phone calls) approaches based on surgical volume/surgical type?
- What tools can be used to monitor and assess relevant outcomes?

Recommended Next Steps

- Conduct a literature review of level of follow up achieved after any surgery and what the outcomes are of those (also looking at patient comprehension of medical suggestions)
- Develop tools and guidelines to operationalize what is a good outcome
- Budget and plan for outcomes assessments and surgical audits in advance
- Counsel patients about follow up at all touch points, conducting follow-up at gathering places, and leveraging town criers
- Evaluate the potential of mobile apps to capture patient information and keep in touch
- Leverage and compare findings from outcome assessment and audit for programmatic decisions and improvements to individual surgical techniques
- Conduct studies to determine most appropriate time for TT surgery follow-up
- Provide refresher training to surgeons
- Disseminate preferred practices guidelines and a checklist of SOPs
- Design national TT surgery supervision framework

COR-NTD 2017 Meeting Outputs

Intensified Disease Management (IDM) Diseases

A Multi-Criteria Decision Analysis Approach to Scaling up Healthcare for Chagas Disease

Knowledge Gaps

- Enhancing the cost side of the model, connecting it to the cost of the selected strategies and actions
- Extending the model to scientific evidence/data from studies
- Reviewing some elements of the core model based on the inputs of the audience
    - Some interventions to control Chagas Disease are not purely additive (i.e., the outcomes of two interventions may not be simply added); this might require a modification of the core model
    - Assumption that actions in the health system only have to happen once
    - Difference between what interventions and actions are required by law versus what is actually implemented in the field.
- Studying the possibility to allow threshold level between outcomes and complexity (efficiency line) to be set by the user (rather than the median)

Recommended Next Steps

- Test the model and tool for other NTDs
- Leverage integrated approaches and explore possibilities for including several NTDs in the same exercise
- Include in the model and tool the cost-site analysis.
- Conduct research on cost-benefit of key Chagas interventions in affected countries
- Seek evidence on the effectiveness and impact of key interventions related to diagnosis and treatment of Chagas disease
- Perform implementation research on the impact of the use of the model and tools by policy makers in a series of municipalities
- Collaborate with other groups doing NTD modeling, especially on analysis related to how much a specific intervention impacts morbidity/mortality

Innovations in Interrupting Leprosy Transmission

Knowledge Gaps

- How does the global leprosy community overcome the widespread perception among politicians and the public that leprosy is no longer a problem?
- What is the most effective target population to interrupt transmission – post-exposure prophylaxis (PEP) or MDA?
- How might existing leprosy mapping efforts be linked? What might be learned from micro-mapping new cases? What can be learned from other NTD mapping exercises?
- How will the new molecular diagnostic perform when field tested?
- What is the role of animals as leprosy reservoirs?
- How can stigma be reduced among communities and healthcare workers? Why Does stigma vary from country to country?

COR-NTD 2017 Meeting Outputs

Recommended Next Steps

- Leverage a global partnership for leprosy to:
    - Achieve global alignment on the priority needs and knowledge gaps
    - Present the priorities cogently for advocacy purposes
    - Coordinate resource mobilization
    - Translate evidence from research into policy and practice
    - Increase knowledge exchange with the broader NTD community
    - Learn from other NTDs
- Invest in research on effectiveness of different approaches to PEP, with or without vaccines
- Invest in real-time surveillance now and in diagnostics for early detection
- Leverage, embrace, and strengthen digital solutions for data collection and analysis
- Update WHO guidance as research and tools evolve (e.g., enhanced PEP)
- Continue basic research on transmission and disease markers

Integrated Approaches to NTDs Involving the Skin

Knowledge Gaps

- What can be learned about targeting interventions from high quality mapping data?
- How can case detection be improved?
- What rapid diagnostics and/or point-of-care tools can be validated for integrated mapping of skin NTDs?
- Can we integrate delivery of treatment of both skin-NTDs and/or common skin diseases?
- What are the optimal wound care strategies for use in low-resource settings?
- What is the role of the expert patient in integrated wound care?

Recommended Next Steps

- Validate new and existing simplified clinical diagnostic pathways
- Determine the potential role of the role of mobile-technology/dermatology in supporting fieldworkers in case-finding, management and training activities
- Compare case finding and contact tracing strategies, including household surveys, school-based surveys
- Determine the potential value of routine data (e.g., health care facility data) for mapping skin NTDs
- Leverage existing NTD morbidity strategies (e.g., those for LF, leprosy, and podoconiosis) to establish wound care and prevention service interventions

COR-NTD 2017 Meeting Outputs

Cross-Cutting

Achieving NTD Program Goals in Urban Settings

Knowledge Gaps

- How can we improve decision making on whether/when to start MDA in urban settings, and who should be targeted?
- What are cost-effective methods to ensure MDA coverage targets are met?
- What are strategies to monitor and evaluate MDA coverage to ensure that program goals are likely to be met?

Recommended Next Steps

Conduct operational research focused on the following:

- What are the best approaches to NTD prevalence mapping in urban settings?
- Can subpopulations or geographic units at risk for NTDs be identified and differentiated from other groups that are not at risk? If yes, how? How stable are these groups in time and space?
- How should the influence of other disease control efforts that can impact disease prevalence be included in the decision to start MDA (e.g., ITNs, IRS for LF), especially when mapping data is old?
- What is the role of xenomonitoring in deciding to start MDA?
- What is the comparative cost of having a more robust mapping strategy in urban setting compared to *x* number of rounds of MDA?
- What is the transmission potential of schistosomiasis in urban and peri-urban areas?
- Determine what approaches/platforms lead to achievement of coverage targets in different urban settings (e.g., fixed post, door to door, markets, malls, schools, private pharmacies, other private health care settings, entrances to large high rises, workplaces, prisons, etc.) and their relative cost.
- Develop a rapid assessment tool to identify best (effective, cost effective, feasible, replicable, etc.) service delivery package (planning, drug supply, motivation of health workers, training, supervision, monitoring, social mobilization, etc.) tailored to specific context.
    - Develop a rapid-assessment tool to identify behavioral drivers of MDA participation and propose social mobilization messages and strategies to improve MDA participation.
    - Generate and document examples of social mobilization strategies that effectively treat micro-populations present in urban areas (educated vs. illiterate; rich vs. poor; etc.) and methods and best practice for communication of health messages via radio, billboards, TV slots etc.
- What are good 'go to' protocols and tools for microplanning MDAs in urban settings?
- Develop methodologies for including community recommendations and different types of leadership systems in the design of MDA strategy.
- What are alternative methods to estimate denominators for urban MDA interventions in order to more accurately measure MDA coverage and account for populations that fluctuate according to the time of the day. In the morning the population moves into the city center and away in the evening.
- Develop monitoring strategies that help rapidly identify and remediate sub-optimal coverage of MDA delivery in urban settings in advance of full TAS
- Is there potential for using remote sensing to estimate population densities?

- Can we estimate denominators from cell phone use patterns in different areas which might give a measure?
- How to sub-divide MDA units in areas for impact measures?
- For all of the above – explore how we can learn and adapt from other public health programs e.g immunization (including poilo), malaria, vitamin A, etc.

Changing, Sustaining, and Measuring WASH-related Behaviors in Integrated Programs

Knowledge Gaps

- How can WASH access be measured accurately and efficiently within NTD programs?
- What data are needed from the WASH community for parameterizing NTD modelling endeavors, and how can these be incorporated into national program M&E frameworks?
- How can national and sub-national data, as well as mapping data from the NTD community, be used to effectively advocate for better WASH targeting?
- What WASH interventions support control and elimination of NTDs?
- How can and should NTD-preventive WASH behaviors be included in WASH programming? What the appropriate messages and entry-points to targeting NTD-related WASH as scale in endemic areas?
- What are the prime drivers of NTD-related WASH behavioral change and maintenance? Why do some people adopt recommended behaviors early, and some very late?

Recommended Next Steps

- Agree on standardized protocols, materials and methods to use to collect WASH data across programs, countries and regions
- Determine if there are better, more standardized ways of measuring NTD-related WASH behaviors
- Determine the WASH parameters needed by modelers
- Undertake intensive basic research to identify behaviors needed to change transmission, and determine whether those are sufficient to eliminate NTDs
- Capture case studies for government stakeholders leading the integration of WASH and NTDs; provide guidance for country programs to better coordinate and collaborate between sectors
- Work with social scientists to identify what governs early versus late adoption of NTD-related behavior change
- Undertake health systems research on better integrating WASH and NTD programming at a large scale
- Undertake implementation research to identify the types of latrines, hygiene practices, and water supplies that help prevent NTDs

Connecting the Dots in the Implementation of PC-NTD Elimination

Knowledge Gaps

- There are many tools and strategies that other public health programs (polio, malaria, HIV) have developed to manage problems similar to those identified by NTD programs but these have not been systematically explored by the NTD community and adapted into the management of NTDs.
- Thus, there is both a knowledge-sharing gap as well as a practice gap at the country level.
- The biggest challenges in achieving the coverage targets in endemic countries are the most hard-to-reach areas, e.g., areas where security is problematic, and in urban areas where Community

Drug Distributors (CDDs) have different profiles than those of the 'typical' CDD in more rural communities.

- The complexity of multiple NTD interventions requires clear messages. CDDs often have to absorb new information given the dynamism of NTD strategies. CDDs who have been with the NTD program for a long time may find it difficult to integrate the new information with the messages that they have provided for many years.

Recommended Next Steps

- Complete the landscape of strategies successfully used by other public health programs, particularly those with elimination targets around the core issues that come up each year (e.g., supervision, supply chain, motivation of volunteers, reporting).
- Develop and test creative and sustainable supervision and feedback strategies. These two interrelated management activities have consistently been identified as performance challenges by the CDDs.
- Assess current NTD communication messaging to the community based on a specific set of criteria, e.g., are the messages understandable and timely.
- Shift from posters with multiple messages to an education strategy that is more targeted to specific populations where non-compliance has been identified and in communities where coverage has been consistently low.
- Health Systems Strengthening (HSS) is a buzz word. The NTD community must articulate specific HSS component(s) of critical importance to sustaining the gains of the NTD interventions and how the NTD programs contribute to strengthening the identified component(s).
- Develop a matrix of indicators for NTD programs that will measure the effect of NTD programs on HSS and the effect of non NTD HSS strategies on the NTD program.
- Disseminate the availability of the NTD Toolbox on the WHO website and encourage NTD programs to use it more effectively.
- Adapt lessons learned from the scale up of trachoma MDA activities to other NTD program needs, e.g., incorporation of NTD interventions into routine delivery systems.
- Provide timely implementation support when challenges arise during implementation.
- Training and refresher training must be interesting and relevant to the specific needs of CDDs and communities.
- How do the various financial incentive schemes of non-NTD programs complement or compete for CDD motivation and performance?
- Suggested CDD performance measures (from experience in Indonesia)

  Three metrics:
  - High-level knowledge of LF
  - High-level knowledge of MDA
  - Was informed about the number of people that take LF drugs (feedback)

Data Use for Decision Making: Barriers and Successes

Knowledge Gaps

- What denominators should be used to calculate coverage? This has long been identified as a problem, however, this is a shared issue with other community based programs. The NTD community should engage with other disease programs to understand their approach to both population and redistricting.

- Under what circumstances can real-time daily data reporting alone result in improved coverage? This would be an interesting area for research. Issues to assess include access, the demand for data, the opportunity cost for adding another activity, and other assessments of the benefits and challenges.
- How do large-scale electronic MDA data reporting systems, which presumably can give daily access to information during the MDA, impact data quality, coverage, and decision making?

Recommended Next Steps

- Assessment of the data and technology capacity and demand for data at the sub-national level. Is there a desire for data at sub-national level?
- Can partners support data collection, storage, and use by leveraging existing national systems vs building new centralized platforms? Available systems, cost, sustainability, ownership, capacity are all elements to explore
- Collaboration with other disease programs to address shared challenges
- Can hybrid systems (paper to phone call or SMS to a human operator) provide additional benefits over a mobile/cloud-based system or a fully paper system?

Identifying a Research Agenda for NTD-related Stigma and Mental Health Care

Knowledge Gaps

- How can we better understand the links between mental health, stigma, and NTDs?
- What are the impacts of stigma and mental health issues on the lives of people affected, communities in which they live, and on efforts to control NTDs?
- How can the NTD community craft a response to the issues of stigma and mental health?

Recommended Next Steps

- Generate baseline data related to prevalence of mental disorders among people affected by different NTDs
- Delineate putative mechanisms for associations between individual NTDs, mental health outcomes, and stigma
- Quantify and explore social and economic impact on people affected, caregivers' wellbeing, and family finances
- Model the above to inform burden estimates and generate economic burden figures
- Understand the impact of mental ill health on key NTD goals
- Synthesize, develop and validate appropriate instruments to measure mental health, wellbeing and stigma
- Quantify impact of good physical treatment for NTDs on mental health outcomes
- Quantify the impact of good psychosocial support and access to mental health care on use of NTD services, access to MDA and NTD physical outcomes
- Develop and evaluate models of integration of mental health care into NTD programs
- Policy work on effective integration of mental health into basic care packages for NTDs, ultimately to ensure formal recognition as standard component.

Innovative Strategies to Increase Compliance

Knowledge Gaps

- Is there a method (ex. composite index) to help us identify marginalized households or households that are more likely to be systematic non-compliers?

- Are there ways to integrate with other programs (MCH, malaria, etc.) that would improve compliance?
- What is the message that needs to be sent out, and when? By what channels should those messages be sent? How should those messages change over the course of an MDA program?
- What training and support do distributors need to make them experts and increase professionalism?
- How can we achieve the greatest impact with minimal cost?

Recommended Next Steps

- Develop and test process tools to help programs conduct situation analysis and understand why their MDA programs are not achieving high coverage and what they should do about it.
- Develop the business case for additional resources required to improve compliance so that programs can advocate for these resources. Improved compliance costs more in the short run but it should decrease the number of years required to reach elimination goals and decrease overall program costs.

Modelling and Programs: A Love-Hate Relationship

Knowledge Gaps

- What data is useful (from the field)?
- What questions are important to ask (for the modelling)?
- How can accessibility of user-friendly versions of models (e.g., web apps, spreadsheets, etc.) be increased?
- How can access to modelling outputs by non-modelers be improved?

Recommended Next Steps

- Relate model outputs back to identifiable measures with simpler and more recognizable terms
- Maintain consistency in type between modelling output and observations
- Visualize model assumptions
- Evaluate previous predictions – update models when needed
- Encourage co-authorship between modelers and non-modelers on modelling papers (crediting everyone for the information they've contributed)
- Demonstrate the value of data availability
- Train local modelers and policymakers
- Investigate the possibility of a modelling fellowship

Quality Assurance for NTD Diagnostics and Laboratories

Knowledge Gaps

- What communications improvements can be made to improve the uptake, use, and financial support of external quality assurance (EQA) programs?
- Can EQA be made more feasible and cost-efficient for labs?
- How can efforts be synergized at thee country level to address the neglect of EQA?
- How can labs pay for EQA panels?
- What can be done to address the lack of stewardship for EQA programs or their governing administrations?

COR-NTD 2017 Meeting Outputs

Recommended Next Steps

- Create a nucleus working group for EQA
- Conduct training and EQA sensitization
- Identify needed materials, procedures, and stewardship for EQA
- Set up a centralized EQA system with a lead laboratory
- Generate mechanisms to recognize the achievement of labs doing well

Use of Multiplex Technology to Innovate Public Health Surveillance in the Americas

Knowledge Gaps

- Standardized protocols needed to ensure consistent approaches to:
    - Assay performance and data interpretation
    - Quality control
    - Validation of new antigens on the platform
- Inclusion of new antigens in the multiplex panel (e.g., arboviruses, Chagas and leprosy)
- Epidemiologic support is needed to determine how to optimize survey design and frequency

Recommended Next Steps

- Urgent attention is required to validate arborvirus antigens for inclusion in multiplex panels
- Information exchange across countries should be promoted, to encourage exchange of technology and surveillance findings
- Additional countries should consider whether planned public health surveys provide an opportunity to include multiplex testing