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

Session Date: Saturday, November 4

Session Time: 1:00pm – 4:00pm

Session Location: Loch Raven II

Session Description: The goal of this breakout session is to discuss the potential benefit, cost-effectiveness, and any barriers to implementation of the strategy of community-wide mass drug administration (MDA) in the treatment of soil-transmitted helminthiases (STH) in different contexts. This strategy could have particular importance in areas where the primary goal of MDA is to interrupt transmission of infection rather than treating morbidity alone.

Session Chairs: Sir Roy Anderson, Imperial College London
Susana Vaz Nery, Australian National University

Session Rapporteur: Alison Bettis, Imperial College London

KEY DISCUSSION POINTS

Roy Anderson, Professor at Imperial College London, presented results from modelling work over a number of different projects (e.g. DeWorm3, NTD Modelling Consortium in collaboration with Erasmus University), and using numerous data sources (Pullan et al 2010, Schad & Anderson et 1985, Sarkar et al 2017, etc.). This work involves fitting project data to deterministic and stochastic models in order to predict outcomes, including estimating transmission breakpoints, bounce-back rates, and cost-effectiveness. These models also aim to identify optimum treatment strategies given the data available. His presentation was titled "Overview of the potential benefits and cost-effectiveness of community deworming."

Susana Vaz Nery, Research Fellow at Australian National University, presented results from the S(WASH)-D for WORMS pilot study, which took place in Timor-Leste. This study investigates the impact of integrated STH control programmes (deworming and WASH) at the school and community level. Her presentation was titled "Investigating school- and community-based integrated control programmes for soil-transmitted helminths in Timor-Leste: The S(WASH)-D for WORMS pilot study." The results of the pilot support the hypothesis that children will benefit more (in terms of prevalence reduction) if the entire community is dewormed.

Rachel Pullan, Associate Professor at the London School of Hygiene and Tropical Medicine, presented the aims, methods, and preliminary results of the recently completed TUMIKIA project. The TUMIKA project is a large-scale cluster randomised trial which took place in Kwale county, Kenya, and evaluated three different STH treatment strategies: 1) annual school-based deworming, 2) increased coverage (community-wide treatment), and 3) increased coverage and frequency (biannual community-wide treatment). Her presentation was titled "The TUMIKIA study: a cluster randomised trial evaluating alternative treatment strategies and delivery strategies for STH in Kenya."

Judd Walson, Associate Professor at the University of Washington, presented aims and methods for the DeWorm3 study, a large-scale project which recently started data collection. The DeWorm3 study will test the feasibility of interrupting transmission of STH using community-wide treatment. His presentation was titled "Examining the feasibility of interrupting transmission on a global scale: The DeWorm3 Project."

Following these presentations, a group discussion was held in which the following questions were addressed:

a. Challenges to the implementation of large-scale community-based deworming for STH
b. Policy change: Economic arguments and feasibility
c. Challenges to elimination: Resistance, diagnostics, and compliance

CHALLENGES/KNOWLEDGE GAPS IDENTIFIED

Challenges to implementation:

1. **Cost**: While community-wide treatment appears to be cost-effective over time (if transmission breakpoint is reached), there are significant up-front costs for implementation. In addition to costs for distribution and logistics, the cost of drugs must be accounted for (which are often presumed to be free given donations by industry). There is also a significant cost involved in doing epidemiological work prior to even starting a community-wide MDA programme (e.g. mapping).
2. **Compliance:** Issues with compliance are ever present. A lack of trust between community and health system/drug distributors is an ongoing problem in some contexts, and different areas will have different cultural factors/community attitudes affecting compliance to MDA. Community sensitization is key to success of any programme.
3. **Coverage**: Community-wide coverage is logistically complicated, and it will still be difficult (and expensive) to reach isolated and high-risk populations. Additionally, long-term and large-scale MDA programmes are likely to see fatigue amongst community health-workers or drug distributors (especially those that are volunteering their time) which may lead to decreasing coverage over time.
4. **One size does NOT fit all when it comes to MDA programmes**: Any model would have to be largely adaptable in different contexts.
5. **Suboptimal tools for control**: ALB efficacy against Trichuris is comparatively low.
6. **Drug demand**: If community-wide treatment were to be taken up globally, it could put a strain on drug production (donations from industry). We also need to account for the fact the governments may choose to purchase drugs domestically, with potential consequences of suboptimal efficacy and adverse events.
7. **Expanding coverage in adult populations**: How do we ensure that ALB 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? Will countries be willing to employ a new strategy or prefer to continue with an already set targeted deworming strategy?

Feasibility of policy change:

1. **Timeline:** In order to change policy guidelines, the WHO will need compelling evidence (coming from excellent data and many studies). While we are currently building the evidence base (examples of which are presented in this session), it will still take a long time for a WHO committee to *decide* to revise guidelines and even longer for these guidelines to be developed and pushed out (up to 5 years). A lot could change in this amount of time (e.g.

many agreements for drug donation from industry are set to be renegotiated in 2020), and we can't afford to wait that long.

2. **What is the measure of success?** How can we best measure the success of community-wide MDA (e.g. coverage, changes in prevalence, etc.)? M&E activities to measure success (however it is defined) will be very costly, and this will have to be taken into account as part of any policy recommendations.
3. **WASH:** Difficulties in quantifying WASH means that its impact is difficult to account for (problematic for making policy recommendations). Some results suggest that WASH may be most important in preventing rebound of infections once prevalence and intensity has been brought down by sustained MDA.
4. **Need for better evaluation:** Improvements in accurate evaluation would be a great help in fully understanding the transmission/epidemiology of STH in specific contexts and help decision makers to make recommendations.

Challenges to elimination:

1. **Resistance:** Which factors may further reduce efficacy (e.g. ingesting food with the drug)? We need ongoing surveillance in place in order to track efficacy and identify resistance before it becomes a bigger problem.
2. **Compliance and coverage:** As mentioned earlier, coverage and compliance can be a problem especially in long-term MDA campaigns. Suboptimal coverage and compliance in community-wide MDA could mean drastically reduced impact compared to the increased investment.
3. **Accurate surveillance:** Accurate surveillance is crucial to the success of these programmes at all stages. Current coverage data and surveillance activities are likely suboptimal in many contexts, in part due to suboptimal diagnostics (e.g. Kato-Katz method).

RECOMMENDED NEXT STEPS

1. Continue to discuss the issues above in order to develop a flexible community-wide MDA strategy that meets all stated criteria.
2. 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).
3. Borrow knowledge from other successful community-wide disease control programmes (LF, malaria, polio, etc) for lessons learned.
4. Undertake research into and documentation of successful community sensitization practices, which will be crucial to sustaining high coverage and compliance of community-wide MDA programmes.
5. Engage with the WHO now, in order to communicate evidence for changing policy guidelines as soon as possible.
6. 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