Schistosomiasis: Celebrating Recent Achievements Supporting Elimination Goals

Executive Summary

The GSA convened a special one-day meeting on October 18, 2023 in Chicago following the COR NTD annual meeting, to reflect on and celebrate ongoing work and consider some of the exciting developments and work in progress that will help us reach the elimination targets set by the WHO NTD Roadmap 2021 to 2030. The aim of the meeting was to foster greater collaboration, coordination and communication across schistosomiasis implementation and research and development practitioners, and to recognise the progress being made.

Elimination of schistosomiasis as a public health problem by 2030 in all endemic countries, requires long-term investment, implementation of new strategies and strong country ownership and commitment. Encouraged by reports of falling prevalence in many countries, this one-day meeting explored how WHO policies and guidelines are providing the stimulus for countries to advance their control and elimination programmes. In the first session, on Global Perspectives of Recent Achievements, Dr Amadou Garba presented the current global situation of schistosomiasis, the new WHO policies and recommendations and highlighted work on a new SCH M&E framework and on the ESPEN Schistosomiasis Community Data Analysis Tool and workbooks for endemic countries in the African region. Dr Johannes Waltz gave an overview of the success of the Praziquantel Donation Programme, Merck's integrated schistosomiasis elimination approach and the challenges around the current estimated global praziquantel need.

In the second session, representatives from Ministries of Health presented perspectives on schistosomiasis elimination in their countries. Ms Florence Wakesho described Kenya's National Breaking Transmission Strategy, the use of granular mapping and a coordination framework to target intervention strategies at the county and sub-county level, and the importance of community engagement and integration with the primary health system, in particular to prevent and manage conditions such as female genital schistosomiasis (FGS). Dr Alain-Claver Kouamin presented on schistosomiasis in Côte D'Ivoire, learning from the schistosomiasis oversampling survey (SOS) and remapping activity using geostatistical analysis to guide interventions and targeting of treatment according to WHO recommendations, as well as Cote D'Ivoire's work on preventing FGS by integrating targeted treatment with sexual and reproductive health services. Dr Joseph Opare shared Ghana's experience of schistosomiasis control, presenting on the latest impact survey carried out in selected districts, showing a general decline in prevalence of schistosomiasis and soil-transmitted helminthiasis but with *S. haematobium* resurgence occurring in particular areas,

characterised by high infection intensities. Dr George Kabona gave an overview of Tanzania's schistosomiasis control programme and the changes in prevalences and intensities of infection as evidenced through national impact assessments, the latest impact assessments in 2022 included a switch of implementation from district level to sub-district level, and the adoption of new methodology developed from the schistosomiasis oversampling study.

The complexity of transmission of this water-borne disease means cross-cutting activities between different sectors such as water development, agriculture and health are an absolute must. The third session explored recent and ongoing projects on cross-cutting, cross-sector collaborations and initiatives. Dr Fiona Fleming (on behalf of Yael Velleman, Unlimit Health) presented a pilot project undertaken in Eastern Uganda using a participatory approach to develop local SCH-sensitive water and sanitation planning to interrupt transmission. The project highlighted the importance of community-specific SCH risk profiles and community action plans, co-developed with government and community, that bring together WASH and Health stakeholders. Prof Jason Rohr (University of Notre Dame) described a new approach to tackle the link between schistosomiasis and agriculture, clearing aquatic vegetation from water access points, thereby reducing aquatic snail populations, and converting this aquatic vegetation into compost for local crop production, livestock feed and/or into biofuel, thus developing an intervention with benefits to health, agricultural yields and water access. Ms Noelia Valderrama (KU Leuven) presented the award-winning ATRAP (Action Towards Reducing Aquatic snail-borne Parasitic diseases), project that leverages Citizen Science to collect snail specimens and data in local communities at low cost, empowering communities with knowledge and tools to lead snail monitoring and contribute to schistosomiasis research & control in their local area. Prof Giulio De Leo (Stanford University) described ongoing work by the GSA Engineering Working Group, under the leadership of Dr May Sule and Prof Giulio De Leo, to develop a blueprint to account for schistosomiasis transmission risk in Water Resource Development Programs, from integrating a SCH focused health impact assessment into existing Environmental Impact Assessments (EIA) and producing a menu of potential interventions to minimize and mitigate negative health and economic outcomes due to schistosomiasis.

After a lunch break, the meeting moved on to talks highlighting how research is providing new insights and tools with the potential to enhance schistosomiasis control. Firstly, research developments in behaviour change approaches, diagnostics and morbidity were showcased. Ms Michal Bruck (NALA Foundation) presented on experiences in Ethiopia using a community partnership approach to mobilize collective action for behaviour change, establishing multisectoral coordination tools and guides and moving beyond MDA for SCH elimination. Dr Sarah Hingel (FIND) gave an update on research and development on a rapid diagnostic test to detect circulating anodic antigen (CAA) to support MDA campaigns and reassessment mapping. Ms Omosefe Osinoiki (Sightsavers) presented how research and tools developed through the COUNTDOWN project on Female Genital Schistosomiasis were being further validated in Nigeria, and used to develop Standard Operating Procedures and clinical guides for healthcare professionals, with future plans to support further research in FGS diagnostics and holistic approaches to FGS prevention. Dr Goylette Chami (University of

Oxford) described the SchistoTrack Cohort study aiming to identify prospectively risk factors for liver morbidity development and progression in the context of repeated MDA, with striking results showing that current *S. mansoni* infection status cannot explain periportal fibrosis (PPF), that general infection proxies are not proxy indicators for PPF, that coinfections and comorbidities are associated with PPF and direct measurements of morbidity are important in the assessment of public health goals.

The final session looked at innovations in drug resistance, One Health and vaccines. Dr Tim Anderson (Texas Biomedical Research Institute) presented research in progress leveraging putative praziquantel resistance alleles and PZQ resistance mapping projects to develop molecular surveillance tools for drug resistance in the field. Dr Martin Walker (Royal Veterinary College) described the importance of a One Health perspective when considering schistosomiasis elimination, how zoonotic transmission and animal schistosome reservoirs may hamper human-centric schistosomiasis interventions and how One Health calls for a holistic, multi-sector approach including snail control, WASH, livestock treatments, behaviour change and more. Dr Aravindan Kalyanasundaram (Texas Tech University Health Sciences Center) gave an update on the Sm-p80-based schistosomiasis vaccine candidate, SchistoShield, with its prophylactic (kills infectious larvae), therapeutic (kills existing worms), transmission-blocking (reduces egg-viability and expulsion) and anti-pathology (reduces eggs and granulomas in tissues) characteristics, and the ongoing Phase 1 and 1b clinical trials. Dr Meta Roestenberg (Leiden University) presented the development of a Controlled Human Schistosome Infection Model to gain insights into host-pathogen interactions and immunology and to accelerate progress for vaccine development, having developed and tested potential models in the Netherlands; these are now being established in Uganda with the Uganda Virus Research Institute.

Dr David Rollinson thanked all the speakers and chairs, and the participants both in-person and online, before closing the meeting.

Meeting Agenda

Time (CTD)	Topic	Speaker
8:30 - 9:00	Welcome Coffee and Teas	
9:00 - 9:05	GSA welcome	David Rollinson
Global Perspectives of Recent Achievements Chair: David Rollinson		
9:05 - 09:50	Updates on the global number of people requiring PC, 2022 treatments, M and E and need for impact surveys [20mins + 10mins Q&A]	Amadou Garba Pauline Mwinzi WHO

Time (CTD)	Topic	Speaker
	Praziquantel: How much is enough? [10mins + 5mins Q&A]	Johannes Waltz Merck Schistosomiasis Elimination Program
Targeted interventions, decentralized community programmes, integration with health systems, sustaining elimination Chair: Wellington Oyibo		
09:50 - 11:10	Decentralized community programs for sustained control interventions [10mins + 5mins Q&A]	Florence Wakesho Ministry of Health, Kenya
	Progrès réalisés dans la lutte vers l'élimination de la schistosomiase en Côte d'Ivoire et défis actuels [10mins + 5mins Q&A]	Alain Kouamin Ministry of Health, Public Hygiene and Universal Health Coverage, Côte D'Ivoire
	Schistosomiasis Treatment Impact Survey in Ghana 2022-2023 [10mins + 5mins Q&A]	Joseph Opare Ghana Health Service, Ministry of Health, Ghana
	Unravelling Success: Schistosomiasis Impact Assessment in Tanzania [10mins + 5mins Q&A]	George Kabona Ministry of Health Tanzania
	Discussion [10mins]	
11:10 - 11:20	Morning Coffee and Tea Break	
Cross-cutting, cross-sector collaborations and initiatives Chair: Louis-Albert Tchuem Tchuente		
11:20 - 12:30	WASH and schistosomiasis: Focal solutions for a focal disease. [10mins + 5mins Q&A]	Fiona Fleming Unlimit Health
	A planetary health innovation for disease, food and water challenges in Africa. [10mins + 5mins Q&A]	Jason Rohr University of Notre Dame
	sNailed it: Unlocking the potential of citizen science to control and prevent snail-borne diseases. [10mins + 5mins Q&A]	Noelia Valderrama KU Leuven / Royal Museum for Central Africa

Time (CTD)	Topic	Speaker
	A blueprint to account for schistosomiasis transmission risk in the Environmental Impact Assessment of water management infrastructure. [10mins + 5mins Q&A]	Giulio de Leo Stanford University
	Discussion 10 mins	
12:30 - 1:30	**Lunch**	
Research developments in behaviour change approaches, diagnostics and morbidity. Chair: Anne Straily		
1:30 - 2:30	NALA Foundation Community Approach. [10mins + 5mins Q&A]	Michal Bruck / Zvi Bentwich NALA Foundation
	Closing the diagnostic gap for Schistosomiasis. [10mins + 5mins Q&A]	Sarah Hingel FIND
	Female genital schistosomiasis; Sightsavers' perspective on efforts pushing ideas through to actions that tackle the challenges. [10mins + 5mins Q&A]	Omosefe Osinoiki Sightsavers
	The epidemiology of periportal fibrosis and the relevance of current *Schistosoma mansoni* infection. [10mins + 5mins Q&A]	Goylette Chami University of Oxford
2:30 -2:45	Afternoon Coffee and Tea	
Innovations in drug resistance, One Health and vaccines. Chair: Bonnie Webster		
2:45 - 3:45	Field surveillance for emerging Praziquantel Resistance in Schistosomes. [10mins + 5mins Q&A]	Tim Anderson Texas Biomedical Research Institute
	Leveraging One Health for the control and elimination of schistosomiasis. [10mins + 5mins Q&A]	Martin Walker Royal Veterinary College
	Recent updates on Sm-p80-based schistosomiasis vaccine	Aravindan Kalyanasundaram

Time (CTD)	Topic	Speaker
	[10mins + 5mins Q&A]	Texas Tech University Health Sciences Center
	The schistosome controlled human infection program, experiences from the Netherlands and Uganda. [10mins + 5mins Q&A]	Meta Roestenberg Leiden University
3:45 - 3:55	Discussion [10mins]	David Rollinson / Anouk Gouvras / Johannes Waltz
3:55 – 4:00	Wrap up and close of meeting	David Rollinson / Anouk Gouvras / Johannes Waltz