**Tailoring mass drug administration to context: Implementation research is critical in achieving equitable progress in the control and elimination of helminth neglected tropical diseases in sub-Saharan Africa**

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**Abstract**

The concept of a technological quick fix or ‘magic-bullet’ for control and elimination of Neglected Tropical Diseases (NTDs) is flawed. NTDs are embedded within complex biological and social systems that are shaped by ecological and political contexts. This commentary emphasises the need for implementation research to address implementation gaps in the control of NTDs. With a specific focus on sub-Saharan Africa and helminth diseases amenable to preventive chemotherapy through mass drug administration, we explore the important role of context, programme partnerships and community in achieving equitable and effective NTD control.

**Keywords:** Neglected Tropical Diseases, Implementation Research, Mass Drug Administration, Equity

**Introduction**

Control and elimination of Neglected Tropical Diseases (NTDs) pose significant challenges to the health system, especially in low- and middle-income countries (LMICs).1 During a recent meeting, “The disease elimination agenda: the role of science and advocacy” hosted by the Royal Society of Tropical Medicine and Hygiene, a session focused on ‘magic bullets’ and technological quick fixes that may change the landscape of NTDs. This commentary is based on a presentation given at that meeting which contests the idea that a single ‘magic bullet’ approach would necessarily impact the NTD landscape, arguing that implementation research to understand how to maximise impact from existing NTD interventions is required. We do this through the example of preventive chemotherapy (PC) strategies which offer expanded access to anthelminthics.

PC interventions, usually through mass drug administration (MDA), have become the primary public health intervention in meeting the NTD roadmap targets for control and elimination of helminth infections. The helminth diseases amenable to PC are; lymphatic filariasis (LF), onchocerciasis, soil-transmitted helminthiasis (STH) and schistosomiasis. Trachoma (caused by the Chlamydia infection) includes MDA as part of its broader SAFE strategy. Recent reports of drug treatment coverage show that national MDA campaigns have been successful, reaching a significant proportion of those in need.2, 3 However, segments of the population remain unreached and areas of persistent disease and parasite transmission remain.4 Furthermore, PC NTD landscapes are dynamic and complex as political, social, economic, demographic and ecological processes contribute to transmission as well as the responses at the household and community level. Implementation research to support the control and elimination of helminth infections is therefore needed to refine and adapt existing strategies, and to assess intervention scale-up and sustainability. This would address what has been described as a key ‘implementation gap’ in existing policy and programming for control and elimination of PC NTDs.1 We focus on three critical areas that need to be addressed to achieve equitable and context appropriate delivery of MDA and other NTD control strategies specific to helminth infections.3 Our case study examples focus on the COU**NTD**OWN consortium within sub-Saharan Africa and therefore arguments made are of specific relevance to this region.

**Context matters**

Context is critical in the design and implementation of NTD control programmes, particularly those reliant on community directed treatment strategies. In Ghana, coverage of the combined LF and onchocerciasis MDA programme in the Greater Accra region is only 71% compared to an average of 82% in surrounding regions.5 This programme relies on community directed treatment through MDA based on community structures present in rural areas. Greater Accra, in common with many urban settings, has a mixed population with varying social, cultural, and gender norms. Urbanisation presents less resilient and diverse community structures which bring challenges to the successful implementation of community directed treatment for MDA implementation in urban and peri-urban areas. Implementation research is therefore needed to explore how existing strategies, largely successful in rural settings, can be adapted to address these new, complex and changing community structures which emerge from migration into urban and peri-urban settings.6

**National Health Sector Partnerships are Paramount**

Health sector partnerships are crucial in achieving gains in helminth NTD control and elimination. Nigeria, like many sub-Saharan African countries, relies on donations of essential drugs for MDA from pharmaceutical companies, as well as implementation support and co-ordination from non-governmental organisations. Global public-private partnerships have been critically important in achieving progress toward the control and elimination of helminth NTDs through MDA.7 In addition, Nigeria has recently operationalised a strategic partnership between the LF and malaria programmes based on the benefit of long-lasting insecticidal nets (LLIN) to both programmes.8 However, all such partnerships take time and energy to develop: reflections from stakeholders in Nigeria highlight how perseverance, political commitment and trust are critical to establishing new collaborative approaches and sustaining them. For example, the success of research on LF transmission has persuaded the Ministry of Health to endorse policy change to ensure a synergistic approach of LLIN distribution and MDA (with ivermectin and albendazole) which is seen as the first step on a long pathway to achieve benefits in disease control and elimination (I. Anagbogu, personal communication). 8 Implementation research focusing on securing and maintaining partnership functionality between the public and private sector, as well as disease programmes within and outside the NTD sector, ensures more cost effective, equitable and sustainable elimination efforts through pooling resources, communication between partners and extending outreach.

**Community ownership critical to context embedded approaches**

The African Programme for Onchocerciasis Control (APOC) pioneered the key role of community engagement in NTD control strategies through the use of Community Directed Treatment with Ivermectin (CDTI).9 Community ownership becomes even more critical when we consider uptake of more complicated drug regimes. In the Littoral region in Cameroon, onchocerciasis is co-endemic with loiasis.10 Co-endemicity increases occurrence of severe adverse events during MDA with ivermectin and therefore alternative strategies such as short course administration of the anti-*Wolbachia* antibiotic, doxycycline, are needed. Acceptance of doxycycline was supported by early community engagement through awareness campaigns and active involvement of community health implementers within drug delivery processes. Community members felt that their engagement in the selection of community health implementers built trust and was a motivating factor in the high community uptake of treatment.10 We have to become accustomed to the idea that community ownership is an essential element of NTD control, but communities are dynamic with complex power structures that may need better understanding and research in real time. If interventions are designed and implemented with the community as active partners rather than passive bystanders, interventions are likely to be both more successful and equitable.9

**The way forward**

The way in which NTD interventions are implemented is key to their success. Context; strong approaches to community engagement; and inter-sectoral partnerships, are key to understanding and addressing the ‘implementation gap’ for PC interventions. Implementation research has the potential to provide us with an improved understanding of these areas and others; it should be prioritised to optimise and achieve more effective and equitable scale-up of interventions against NTDs.

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