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A century of onchocerciasis in Sierra Leone

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In 1926, Blacklock first described onchocerciasis (OV) transmission by black fly, *Simulium damnosum* in Sierra Leone. In the 1950-1960's, high OV prevalence was demonstrated along the rivers and the existence of black flies nationwide except around the capital and the coastal plain of Bonthe. In 1957, control efforts started with insecticides along the river breeding sites. In 1974, the Onchocerciasis Control Programme focusing on vector control was launched, extending to Sierra Leone in the 1980s. From 1995, the African Programme for Onchocerciasis Control commenced community-directed treatment with ivermectin (CDTI) in hyper-[microfilaridemia (mf) prevalence $\geq 40\%$] and meso- (nodule prevalence 20%-39%) sites. To be effective programme, coverage among the eligible population over five years of age needed be at least 80%.

In the mid-1990s, the rebel war stopped vector control and effective CDTI was not established until 2006. Baseline data using skin snips from 39 sentinel villages found the average OV mf prevalence was 53.1% (28.9 mf/snip). From October 2008, albendazole was added in phases to CDTI for all communities in all 14 districts for lymphatic filariasis (LF) elimination. In 2010, after five rounds of effective MDA, OV mf prevalence was 21.1% (8.29 mf/snip). Males had higher prevalence and density than females in both studies. Since then, OV control (acknowledging transmission continues) has transitioned to OV elimination assuming transmission can be interrupted once mf prevalence is less than 5%.

In 2017, a rapid assessment was integrated into LF-Transmission Assessment Survey and independently in 8 and 4 districts respectively, designed by the Survey Sample Builder. Children aged 5-9 years were randomly selected from 177 clusters and tested by OV-16 (Rapid Diagnostic Tests, SD BIOLINE) using finger-prick blood samples. Overall, 17 441 children participated and 347 (2.0%) were positive (M: 2.4% versus F: 1.6%) ($P < 0.001$). All districts recorded low prevalence (range Bonthe: 0.9%-Kailahun: 3.0%) although Bombali had 5 of 12 hotspots ($>10\%$). The LF- Transmission Assessment Survey sampling methodology does not take cognizance of black fly breeding sites, but did demonstrate ongoing transmission and another 4-5 rounds were advisable.

A technical advisory committee has been established with representation from international experts to help plan for accreditation of onchocerciasis elimination around 2025.

Keywords: Onchocerciasis; Sierra Leone; *Simulium damnosum*; Microfilaridemia

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