

## Post-MDA Transmission Assessment Survey for Elimination of Lymphatic Filariasis in La Ciénaga, Dominican Republic

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**Abstract.** The Dominican Republic is one of four remaining countries in the Americas with lymphatic filariasis (LF). Annual mass drug administration (MDA) with albendazole and diethylcarbamazine was conducted in La Ciénaga, an impoverished urban *barrio* in Santo Domingo, from 2004 to 2006. Eight years after the last MDA, a transmission assessment survey (TAS) was conducted in November–December 2014 to determine if LF transmission remains absent. Of 815 first and second grade primary school students (mean age: 6.51 years; range 5–9) tested by immunochromatographic test (ICT), zero (0.0%) were positive. This is below the TAS critical cutoff of nine, indicating that the area “passed” TAS and that transmission remains interrupted in La Ciénaga. Importantly, this also provides evidence that three rounds of effective (> 65% coverage) MDA, likely aided by environmental improvements and periodic school-based albendazole monotherapy MDA, achieved interruption of LF transmission from a relatively low-transmission setting.

The Dominican Republic (DR, population 9.5 million) is one of four remaining countries in the Americas region with lymphatic filariasis (LF)—a mosquito-transmitted parasitic disease that currently affects an estimated 67.88 million people in 73 countries.<sup>1</sup> The island of Hispaniola, which the DR shares with Haiti, accounts for approximately 90% of cases in the Americas.<sup>2</sup> LF in Hispaniola is caused by *Wuchereria bancrofti* with *Culex tritaeniorhynchus* the principal vector.<sup>3</sup> Infection is not fatal, but 30–40% of individuals develop lymphedema, elephantiasis, and/or genital swelling (hydrocele in men) due to blockage of the lymphatic vessels by adult worms.<sup>4</sup> Affected individuals often suffer impairment of daily activities and social isolation in addition to the pain and discomfort of severe disease.<sup>5</sup> The Dominican Ministry of

held at the local primary schools before the survey to inform parents and teachers about the survey. Written informed consent was obtained from all parents who agreed to their child's participation, and all participating children provided assent prior to sample collection. The survey protocol was reviewed by Emory University Institutional Review Board. Antigen testing from 100  $\mu$ L of finger-stick blood collected in EDTA-coated microtainer tubes was performed using BinaxNOW ICT card tests (Alere, Inc., Scarborough, ME) at the Centro Nacional de Control de Enfermedades Tropicales (CENCET) laboratory in Santo Domingo on the day of sample collection.

A total of 815 primary grade 1 and 2 students from all seven area schools were tested by ICT. This represents 66.3% of the total enrolled children in these grades. The sample was 49.3% male, with mean age 6.51 years (standard deviation: 0.69; range: 5–9). Of those tested, none (0.0%) were antigen positive (Table 1). The critical cutoff value for this larger sample population is nine positives, meaning that the EU “passed” the TAS and that antigen prevalence was significantly less than 2%. This corroborates data from the first post-MDA survey conducted 3 years previously in La Ciénaga (0.2% antigen prevalence), and indicates that LF transmission remains interrupted 8 years after the from internal stercleoeed, preve d Ciénagathat P443j51(that49n)4ion9(chan)-33-gobtor44

MDA in school children was insufficient to interrupt LF transmission community wide. Recent data show that 1 year of semi-annual treatment with albendazole alone reduced antigen prevalence, mf prevalence, and mf density among microfilaremic individuals.<sup>14</sup> Therefore the resumption of annual school-based albendazole MDA for STH in 2005 may have acted synergistically with concurrent community-wide albendazole–DEC to interrupt LF transmission by 2006 by providing two doses of albendazole and one dose of DEC per year to school children in 2005 and 2006. However, any direct synergy would be limited to the school age population. This raises the question of whether the school-age population