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SUMMARY
2022 VIRTUAL PROGRAM REVIEW
HISPANIOLA INITIATIVE
THE DOMINICAN REPUBLIC AND HAITI
MARCH 14, 2023
THE CARTER CENTER
ATLANTA, GA

JULY 2023

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And to many others, our sincere gratitude.

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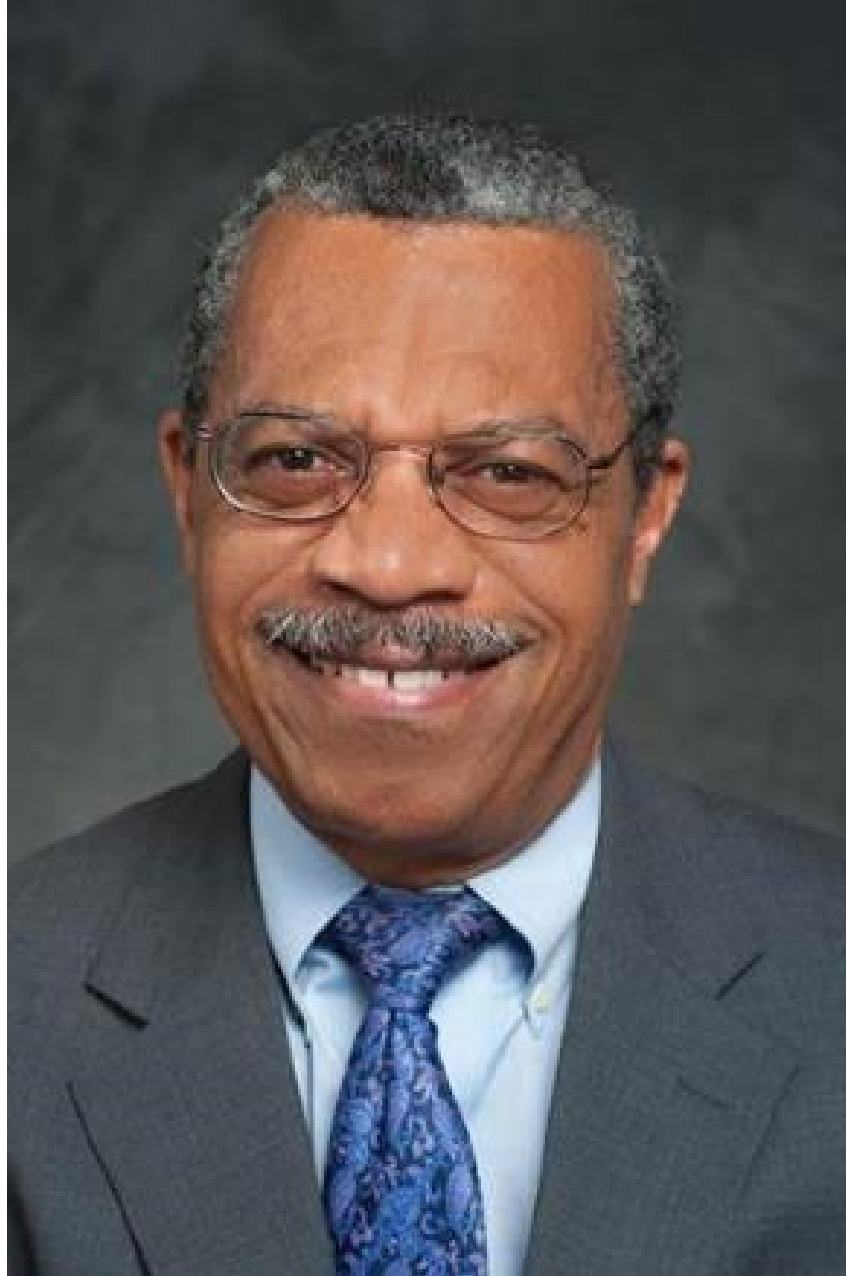
ACRONYMS

CCM	Community Case Management
CDC	U.S. Centers for Disease Control and Prevention
CDSMP	Chronic Disease Self-Management Program
CE	Community Engagement
CFA	Circulating Filarial Antigen
CHC	Community Health Council
COVID-19	2019 novel Coronavirus Disease
DAS	Health Area Directorates
DPS	Provincial Health Directorate
DTI-R	Diagnosis-Treatment-Investigation and Response
EU	Evaluation Unit
FFI	Freedom From Infection
FTS	Filariasis Test Strip
GLIDE	Global Institute for Disease Elimination
HLA	Human Leukocyte Antigen
HSC	Hôpital Sainte Croix
IDA	Ivermectin, Diethylcarbamazine, and Albendazole
IRS	Indoor Residual Spraying
ITFDE	International Task Force for Disease Eradication
IU	Implementation Unit
LF	Lymphatic Filariasis
MDA	Mass Drug Administration
MMDP	Morbidity Management and Disability Prevention
MSP	<i>Ministerio de Salud Pública</i> (Ministry of Public Health, Dominican Republic)
MSPP	<i>Ministère de la Santé Publique et de la Population</i> (Ministry of Public Health and Population, Haiti)
MZ	Malaria Zero
NPELF	National Program to Eliminate Lymphatic Filariasis (Haiti)
PAHO	Pan American Health Organization
PCR	Polymerase Chain Reaction
PELF	Program to Eliminate Lymphatic Filariasis (Dominican Republic)
PFree	Probability of Freedom
PNCM	National Malaria Control Program (Haiti)
PQ	Single low-dose primaquine
PTS	Post-Treatment Surveillance
RDT	Rapid Diagnostic Test
RPRG	Regional Program Review Group

SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SJS	Stevens-Johnson syndrome
SP	Sulfadoxine-Pyrimethamine
SSe	Sensitivity of Surveillance System Estimate
TAS	Transmission Assessment Survey
TCC	The Carter Center
TDA	Targeted Drug Administration
USF	University of South Florida
WHO	World Health Organization

In Memoriam

Dr. Stephen B. Blount (1953-2022)



EXECUTIVE SUMMARY

The ninth annual Carter Center (TCC) Hispaniola Initiative Program Review meeting convened virtually March 14, 2023. The purpose of the meeting was to review progress in elimination of malaria and lymphatic filariasis (LF) in Haiti and the Dominican Republic in 2022 and to make recommendations for activities in 2023.

Attending the meeting were representatives of the ministries of health of Haiti and the Dominican Republic, TCC staff, partners and donors, including representatives from Emory University, the Pan American Health Organization (PAHO), University of South Florida (USF), U.S. Centers for Disease Control and Prevention (CDC), CORUS International, Global Institute for Disease Elimination (GLIDE), Hôpital Sainte Croix (HSC), International Public Health Advisors, The Task Force for Global Health, University of Florida, and World Health Organization (WHO).

TCC's Hispaniola Initiative works with the ministries of health in Haiti and the Dominican Republic to eliminate malaria and LF from the countries' shared island, Hispaniola. It is the only island in the Caribbean that has not yet eliminated malaria. It also accounts for around 95% of the LF burden in the Western Hemisphere. In 2006, the International Task Force for Disease Eradication (ITFDE) concluded that elimination of malaria and LF from Hispaniola was "technically feasible, medically desirable, and would be economically beneficial" to both countries.¹ TCC launched an 18-month pilot project in 2008 to foster binational cooperation by establishing a cross-border initiative in the Ouanaminthe-Dajabón border region and facilitating the creation of binational plans and budgets for malaria and LF elimination by 2020. In the years that followed, TCC supported regular binational meetings to promote coordination between the Haitian and Dominican ministries of health. In 2014, TCC expanded its support for malaria and LF elimination in Hispaniola, including: i) continued support for binational cooperation, ii) technical assistance to re-orient the programs from control to elimination, and iii) updating the funding needs to achieve elimination goals and help the countries to secure the necessary financial support.

The meeting was chaired by Dr. Gregory Noland, Director of TCC's River Blindness, Lymphatic Filariasis, Schistosomiasis, and Malaria programs. The meeting opened with welcoming remarks from TCC's Vice President of Health Programs, Dr. Kashef Ijaz. The meeting also opened with a goodwill message from Dr. Tedros Adhanom Ghebreyesus, Director General of WHO. Dr. Noland provided an introductory presentation for the meeting and paid tribute to Dr. Steve Blount, former Director of the Hispaniola Initiative, who passed away April 30th, 2022.

¹ World Health Organization (2007). "Meeting of the International Task Force for Disease Eradication - 12 May 2006." *Weekly Epidemiological Record* **82**: 25-32.

The global 2019 novel Coronavirus Disease (COVID-19) pandemic persisted in 2022. While social isolation practices waned globally, worsening insecurity, political instability, and fuel shortages in Haiti continued to restrict normal working and living conditions throughout 2022. Despite this, the Haitian Ministry of Public Health and Population (*Ministère de la Santé Publique et de la Population*, MSPP) and partners conducted mass drug administration (MDA) for LF in 7 of the 18 remaining LF-endemic districts in Haiti in 2022. In addition, three LF transmission assessment surveys (TAS) were conducted: TAS-2 in the two districts of Gonâve Island (Ouest department) and TAS-3 in Caracol district (Nord-Est department)—all of which passed TAS. The Regional Program Review Group (RPRG) met during 2022 and approved: 1) the halt of MDA in Leogane-Morne sub-district based on results from a Carter Center-assisted 2021 coverage and prevalence survey; and 2) to pass the formerly undecided TAS-3 in five districts comprising three evaluation units (EUs): Borgne (Nord department), Bas-Limbe, Port Margot, and Pilate districts (Nord department); and Ouanaminthe (Nord-Est department). In total, nine (6%) of the 140 districts in Haiti have completed the series of three TAS recommended by WHO. In the Dominican Republic, all three formerly endemic foci are under post-treatment surveillance (PTS). In 2022, TCC assisted the Dominican Ministry of Public Health (*Ministerio de Salud Pública*, MSP) to launch an integrated nationwide LF remapping survey. Preliminary results indicate that 19 (of 15,379) participants tested positive for LF circulating filarial antigen (CFA), 166 self-reported lymphedema, 19 self-reported hydrocele, and 1 individual tested positive for malaria by rapid diagnostic test (RDT). None (0) of the 18 CFA-positive individuals tested in follow-up were positive for circulating microfilaria in night blood testing.

In 2022, a total of 14,426 cases of malaria were reported in Hispaniola —14,090 (97.7%) in Haiti and 336 (2.3%) in the Dominican Republic. This represents a 31.7% increase in cases versus 2021 (10,951 cases) but an 83.3% decrease in cases since 2010, when 86,635 cases were reported island-wide following the major earthquake in January of that year. Five malaria deaths were reported in 2022 (all in Haiti), a 37.5% reduction compared to 8 deaths (7 in Haiti, 1 in Dominican Republic) in 2021.

RECOMMENDATIONS FOR 2023

Dominican Republic - LF

1. Complete the integrated LF remapping survey.
2. If final results of the remapping survey indicate foci of active LF transmission, develop an intervention strategy to eliminate transmission.
3. Strengthen morbidity management and disability prevention (MMDP) by integrating MMDP into primary care services and organizing workshops to train clinical staff at the primary care level.
4. Conduct LF TAS-3 in the East focus, and a PTS survey in the Southwest focus.
5. Prepare and submit a dossier to WHO/PAHO for LF elimination as a public health problem dossier, pending results of the East focus TAS-3.

Haiti - LF

6. Resume LF MDA with enhanced community sensitization in 9 (those outside of metro Port-au-Prince) of the 18 remaining endemic districts, as security situation permits.
7. Conduct LF TAS, including scheduled surveys and those delayed due to insecurity, as security situation permits.
8. Continue to scale up LF MMDP activities by organizing workshops to train clinical staff and establish a designated referral center for LF care in Artibonite department.
9. Publish results from the 2021 TCC-assisted integrated malaria-LF MDA coverage and prevalence surveys in Léogâne and Gressier.
10. Publish results of TCC-assisted integrated malaria-LF TAS survey.
11. Assist TCC Mental Health Program to publish results of the LF mental health chronic disease self-management program (CDSMP) pilot project in Haiti.

Dominican Republic - Malaria

12. Urge the Dominican MSP to finalize and release an updated national strategic plan for malaria.
13. Secure resources to establish a molecular surveillance laboratory at MSP.
14. Collaborate with CDC to train MSP laboratorians to conduct molecular lab assays, including polymerase chain reaction (PCR) diagnosis of malaria and multiplex serological assays.
15. In collaboration with USF, apply the Freedom From Infection (FFI) framework to evaluate the sensitivity of the existing malaria surveillance systems in the Dominican Republic.
16. Consider aggressive approaches (e.g., expanded community-based testing and treatment, indoor residual spraying [IRS], and possible targeted drug administration [TDA]) to halt the geographically shifting series of malaria outbreaks in the Dominican Republic.
17. Publish results of ethnographic research conducted in malaria outbreak-affected areas of Santo Domingo. Refine community engagement (CE) strategies for interrupting malaria transmission based on results.
18. Resume support for binational collaboration to interrupt malaria transmission in and around the Ouanaminthe, Haiti - Dajabón, Dominican Republic cross-border area.

Haiti - Malaria

19. Urge the Haitian MSPP to finalize and publish the Revised National Strategic Plan for Malaria Elimination 2020-2025.
20. Publish on the Haitian MSPP website the community health council (CHC) Implementation Manual and Monitoring and Evaluation Handbook developed to assist malaria elimination efforts in Haiti.
21. Collaborate with other programs at the Haitian MSPP to utilize CHCs for other health activities.

FIGURES AND TABLES

Figure 1. Lymphatic filariasis elimination status, by district, the Dominican Republic, December 2022

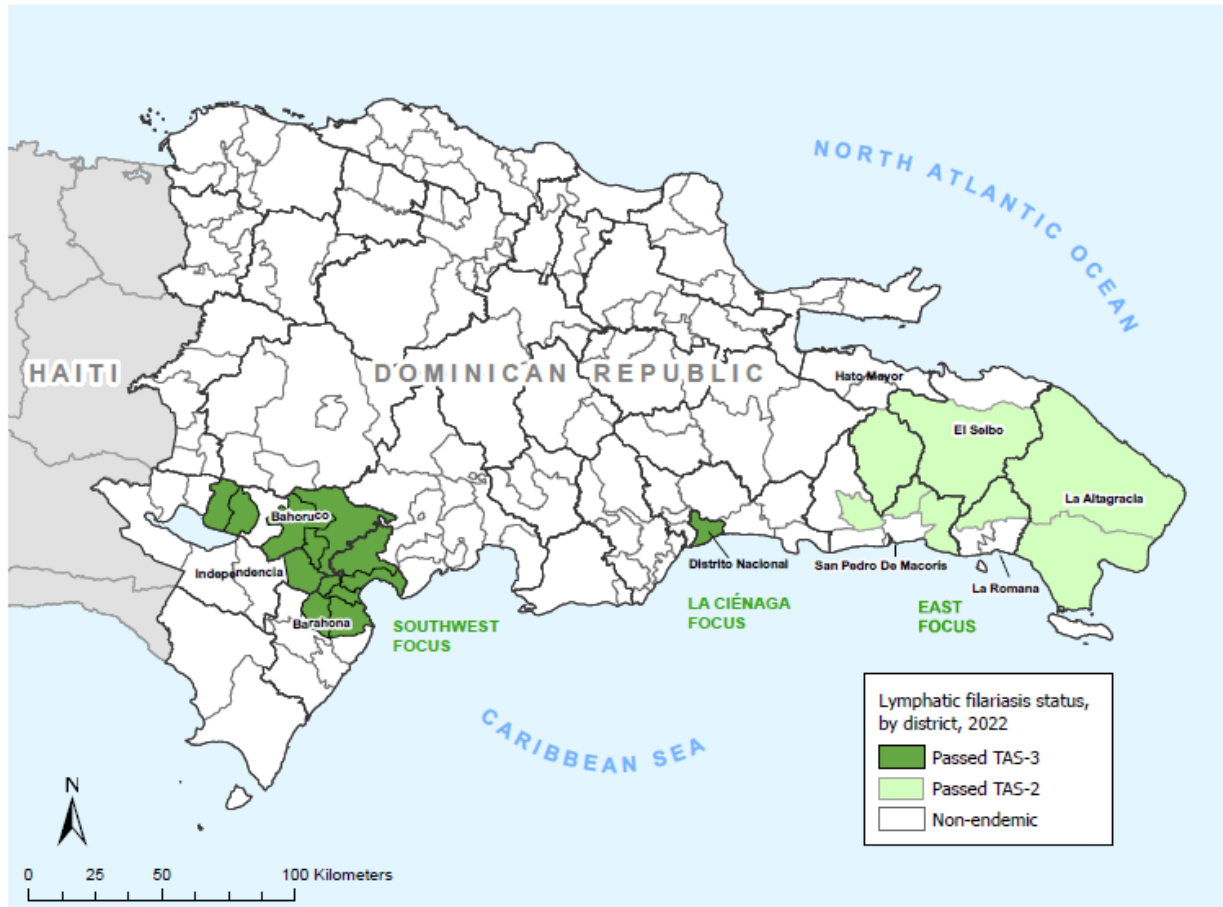


Figure 2. Lymphatic filariasis elimination program status over time, by district, the Dominican Republic

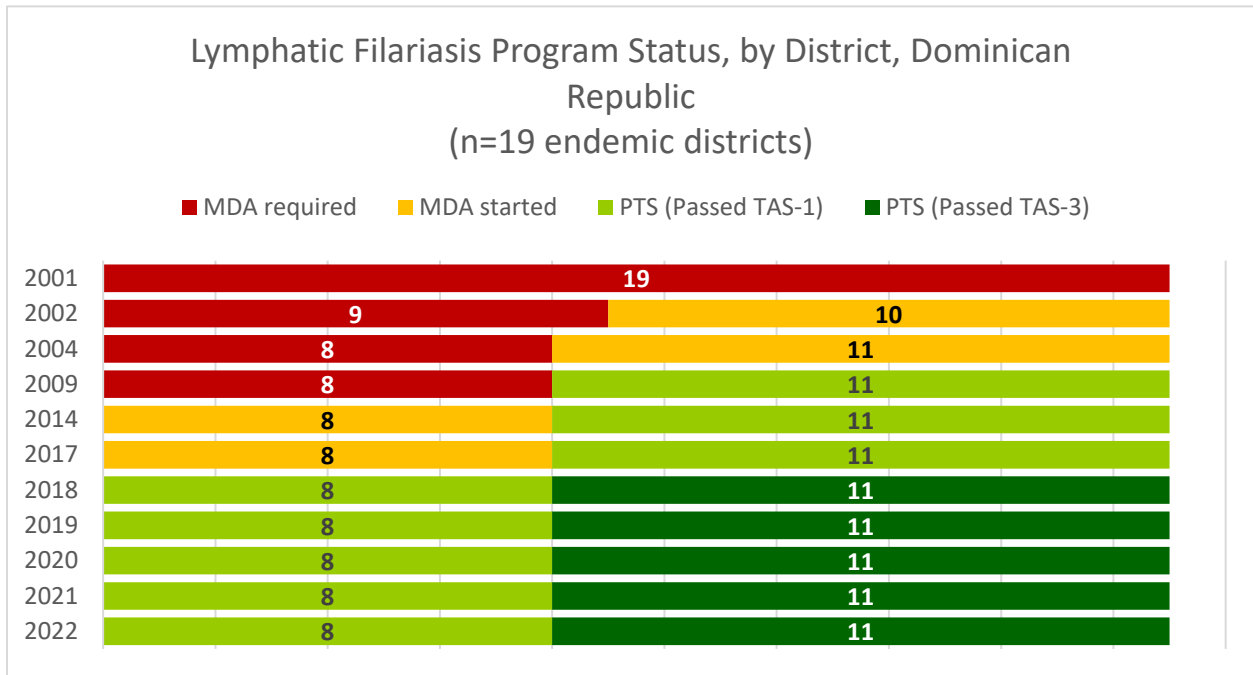


Figure 3. Preliminary LF Filariasis Test Strip (FTS) and malaria rapid diagnostic test (RDT) results, by household location, from the Dominican Republic integrated LF Remapping Survey

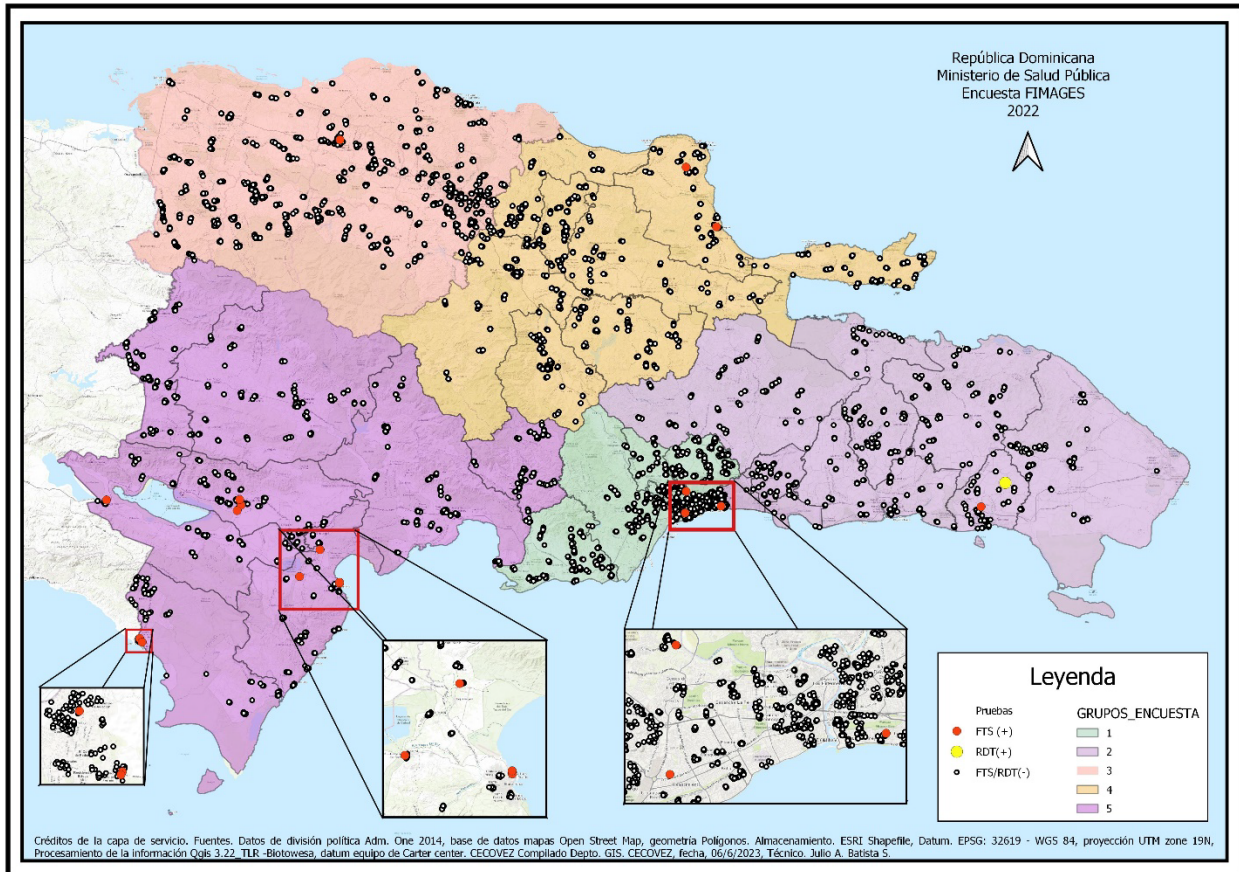


Figure 4. Preliminary LF morbidity results (self-reported hydrocele or lymphedema) from the Dominican Republic integrated LF Remapping Survey

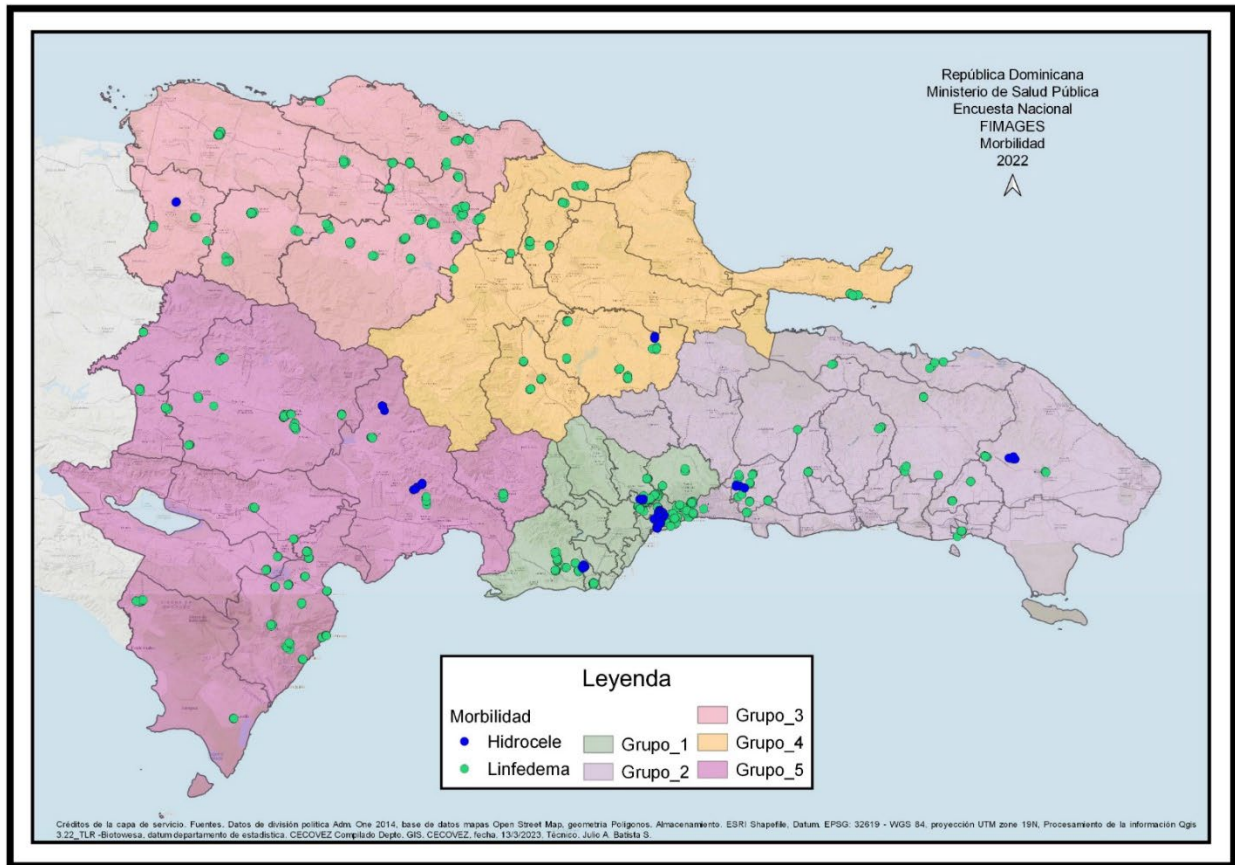


Table 1. Summary of LF transmission assessment survey (TAS) results in implementation units (IUs) conducted in 2022, Haiti

TAS	Department	No. of IUs	IU Name	TAS Implementing Partner	Survey Date	Target Sample Size	TAS Critical Cut-off	Num LF FTS tested	Num LF FTS+	TAS Result
TAS-2	Ouest	1	Anse à Galets	TCC	Aug-Sept 2022	1368	16	1436	1	Pass
TAS-2	Ouest	1	Pointe à Raquette	TCC	Aug-Sept 2022	780	9	854	1	Pass
TAS-3	Nord-Est	1	Caracol	TCC	May 2022	396	7	309*	1	Pass
	TOTAL	3				2,544		2,599	3	

*Target sample size not met

Table 2. Summary of 2022 Regional Program Review Group determinations for Haiti LF transmission assessment survey (TAS) conducted in 2021.

TAS	Department	No. of IUs	IU name (s)	Implementing Partner	Survey Date	Target Sample Size	Critical Cut-off	No. FTS tested	No. FTS positive	Result
TAS-1	Nord	1	Dondon	IMA/RTI/USAID	Feb. 2021	891	11	535*	3	Incomplete
TAS-2	Ouest	1	Kenscoff	IMA/RTI/USAID	Sept. 2021	1356	16	342*	0	Incomplete
TAS-3	Nord	1	Plaisance	IMA/RTI/USAID	Sept. 2021	1376	16	453*	5	Repeat
TAS-3	Nord	1	Borgne	IMA/RTI/USAID	Sept. 2021	1368	16	516*	0	Pass
TAS-3	Nord	3	Bas-Limbe, Port Margot, Pilate	IMA/RTI/USAID	Sept. 2021	1524	18	576*	1	Pass
TAS-3	Nord-Est	1	Ouanaminthe	IMA/RTI/USAID	Sept. 2021	1392	16	1184*	2	Pass
TAS-3	Nord-Est	3	Sainte Suzanne, Terrier Rouge, Trou Du Nord	IMA/RTI/USAID	Sept. 2021	1392	16	532*	1	Repeat
TAS-3	Nord-Ouest	1	Chansolme	IMA/RTI/USAID	Sept. 2021	530	6	531	5	Pass†
	TOTAL	12				9,829		4,669	17	

*Target sample size not met

†Focal mass drug administration (fMDA) recommended in areas with positive samples

Figure 5. Lymphatic filariasis elimination program status over time, by district, Haiti 2022

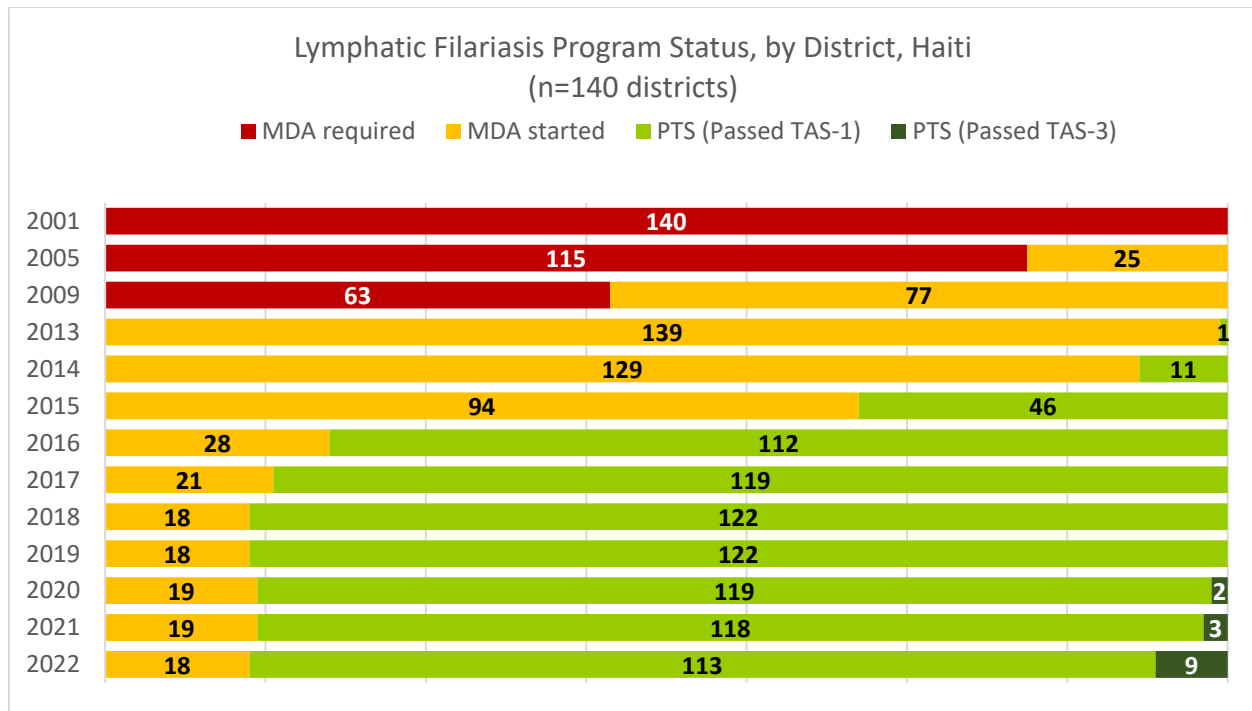


Figure 6. Lymphatic filariasis elimination program status, by district, Haiti, 2022

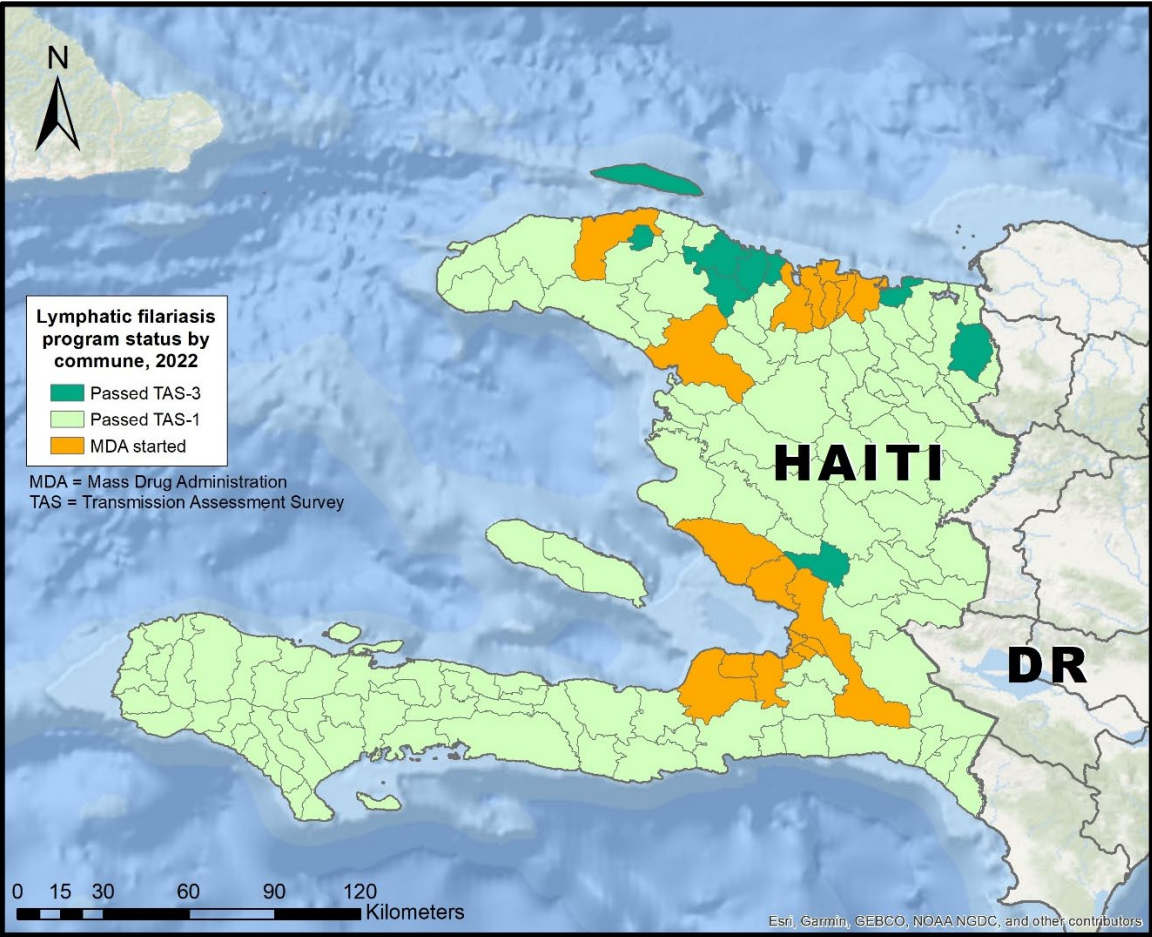


Figure 7. Number of Confirmed Malaria Cases in Haiti and the Dominican Republic, by year (2007–2022)

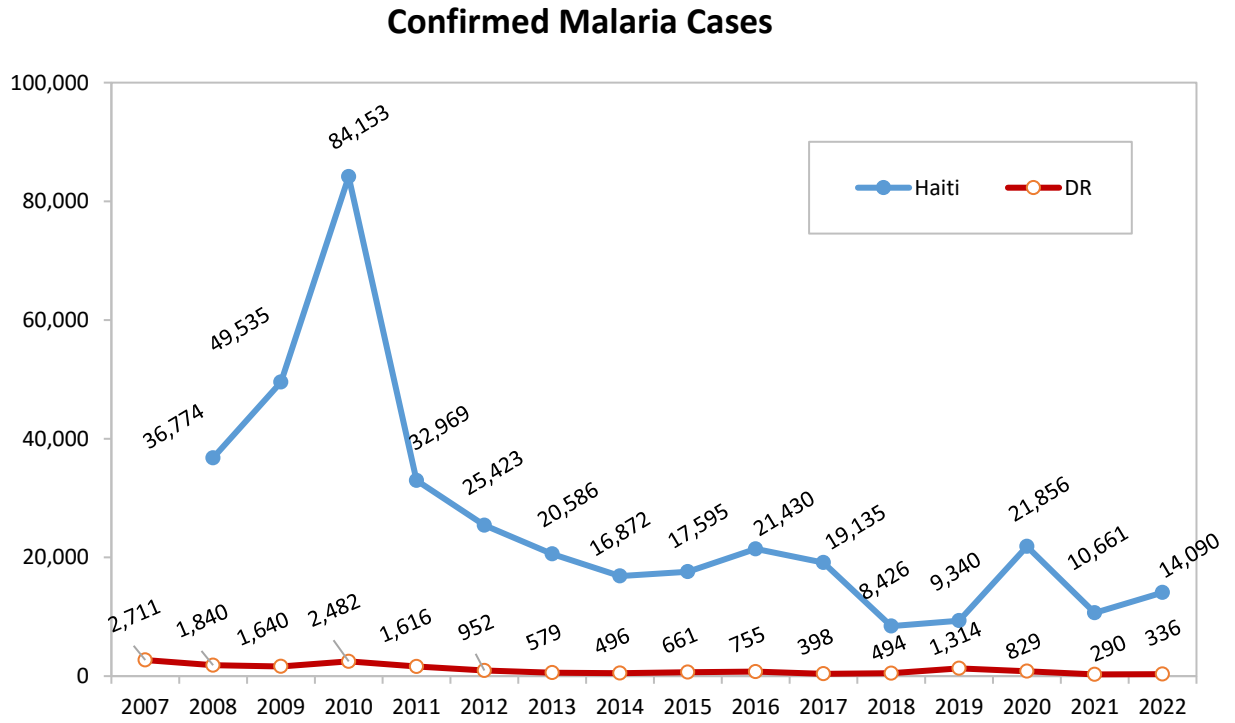


Figure 8. Annual malaria incidence (cases per 1000 persons), by district, the Dominican Republic, 2022

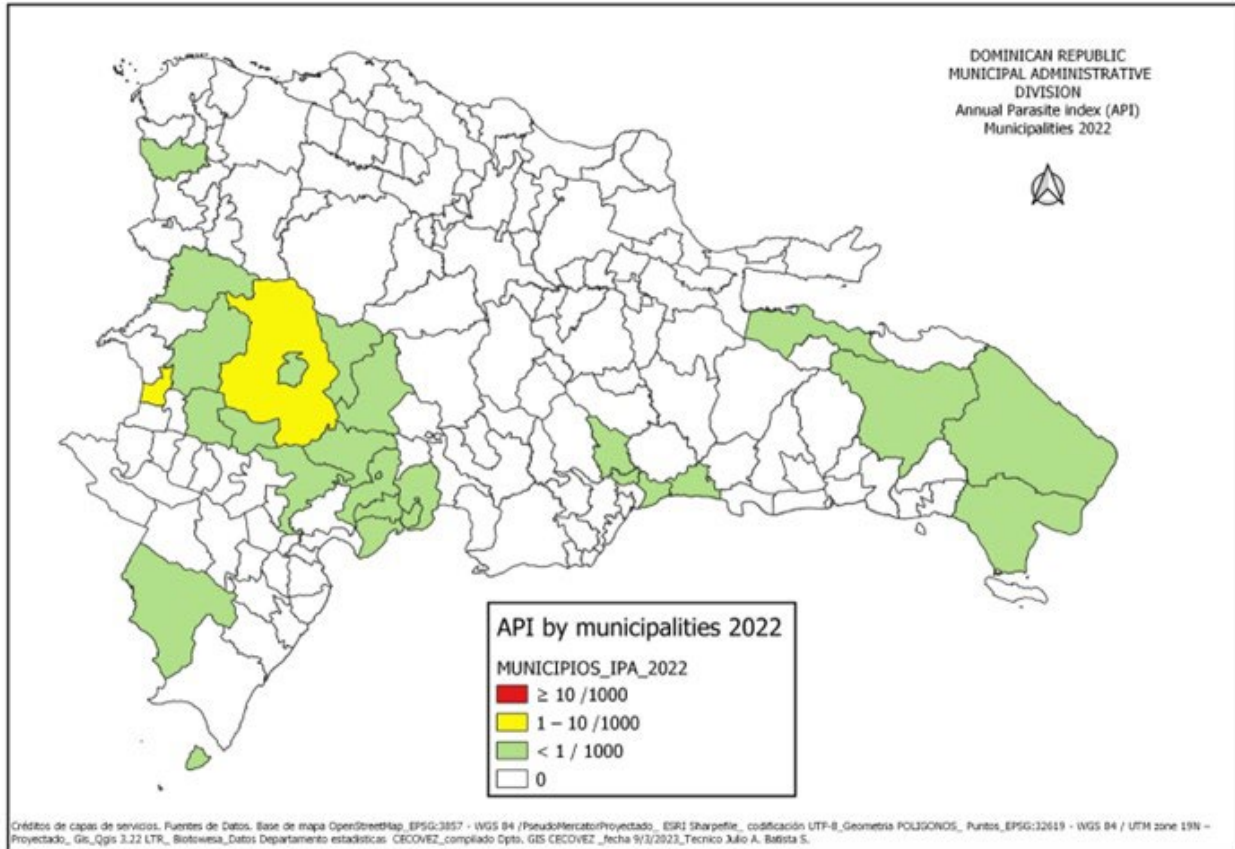
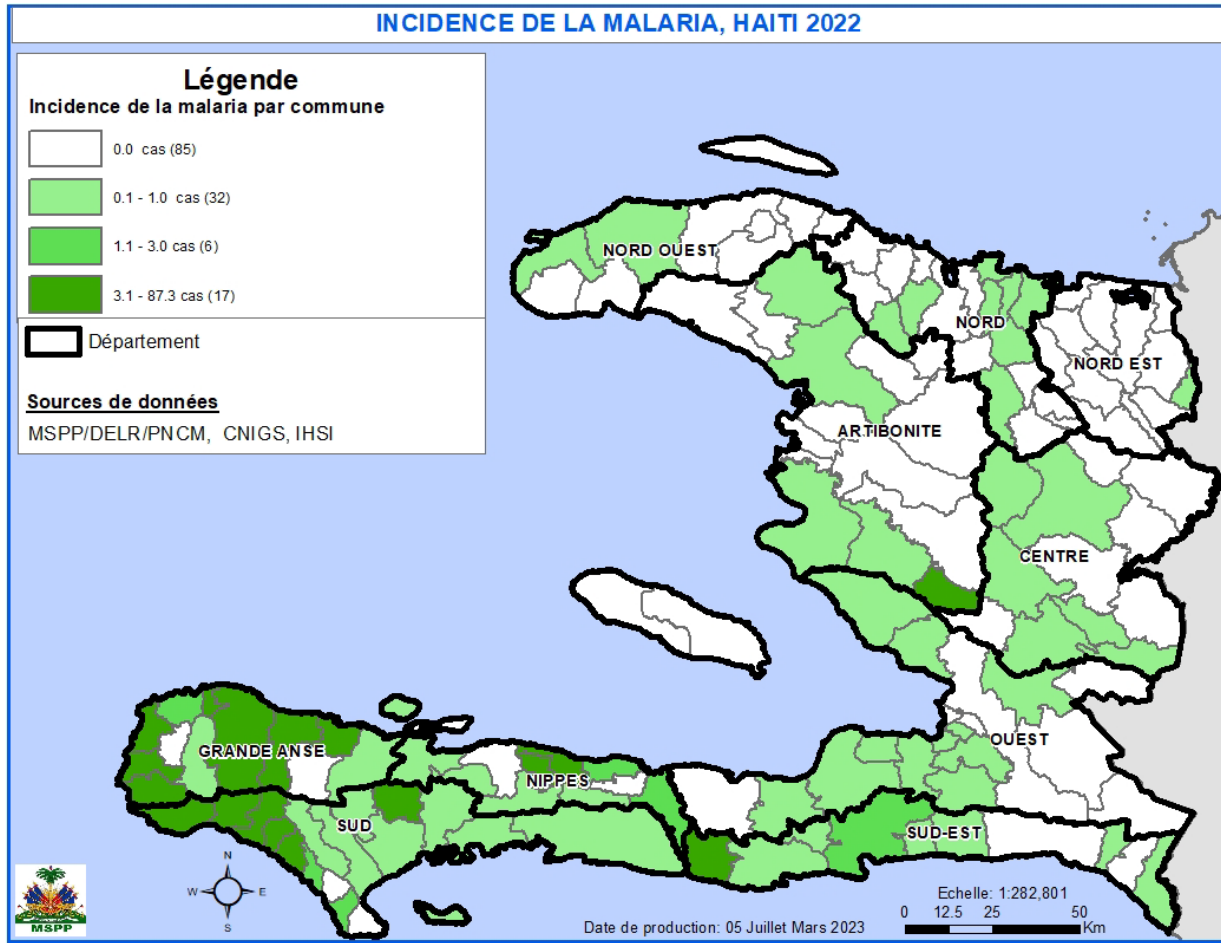


Figure 9. Annual malaria incidence (cases per 1000 persons), by district, Haiti, 2022



LYMPHATIC FILARIASIS

LF Elimination Progress in the Dominican Republic - Dr. Keyla Ureña, on behalf of Dr. Manuel Gonzales (MSP)

In 1998, the Dominican MSP created the Program to Eliminate Lymphatic Filariasis (*Programa de Eliminación de la Filariasis Linfática* [PELF]) with the goal of eliminating LF as a public health problem by 2020. Baseline mapping conducted from 1999–2003 and finished in 2007 (after a pause due to global test kit shortages and performance issues) revealed that transmission was limited to 19 (12%) of 155 municipalities, classified as LF-endemic and in need of MDA, clustered into three geographic foci (Figure 1): Southwest (comprising 10 districts), East (8 districts)—two vast agricultural regions—and La Ciénaga (1), a small urban focus in the national district of Santo Domingo (distinct from La Ciénaga of Santo Domingo West, a recent malaria transmission focus). After a series of MDA campaigns, by 2018, LF antigen prevalence was less than 2% in all foci and MDA had stopped (Figure 2). Post-treatment surveillance (PTS) surveys conducted in the Southwest (2009, 2012, 2018 and 2020) and in La Ciénaga (2011, 2014, 2018, and 2021), and East (2018 and 2021) indicate that transmission is below hypothesized sustainable levels and that MDA remains unnecessary. PELF's revised goal is to eliminate LF as a public health problem no later than 2025. TAS-3 in the East focus is scheduled for 2023, after which, if LF antigenemia remains less than 2%, MSP will be eligible to submit its dossier to WHO for validation of having eliminated LF as a public health problem.

Recognizing the time that has elapsed since the baseline mapping surveys, population mobility within the country, and results of a 2016 integrated LF-malaria survey that found LF antigen-positive individuals outside of the 3 historic transmission foci (Keys *et al.*, 2019), a nationwide integrated re-mapping survey started in 2022 to estimate the prevalence and spatial distribution of LF, LF-associated morbidity, and malaria. Within each of the 40 MSP Provincial Health Directorate/Health Area Directorates (DPS/DAS), 30 *barrios* (neighborhoods) were randomly sampled, plus six *barrios* in which LF-antigen-positive individuals were detected in the 2016 survey. Within each *barrio*, 16 households were selected, and within each household, one present household member aged 6 years or older was randomly selected to participate. Blood samples were also requested from any household members who reported current fever or LF morbidity. Preliminary results indicate 19 participants (of 15,379) across 10 DPS/DAS tested positive for LF CFA by Filariasis Test Strip (FTS), 166 self-reported lymphedema, 19 self-reported hydrocele, and 1 individual tested positive for malaria by RDT (Figures 3 and 4). Among the 19 individuals who tested positive for CFA, ages 21–68 years, none (0) of the 18 tested in follow-up were positive for microfilariae by microscopic examination of night blood samples. The FTS expired before data collection was completed, which is now anticipated for 2023.

LF Elimination Progress in Haiti – Dr. Marc-Aurèle Telfort (MSPP)

The Haitian National Program to Eliminate Lymphatic Filariasis (NPELF) coordinates LF elimination activities for MSPP. In 2022, work in Haiti continued to be hindered by political instability, security concerns due to an increase in gang violence and kidnappings, the COVID-19 pandemic, as well as a resurgence of cholera starting in October 2022. In 2022, MDA microplanning was conducted in Arcahaie, Cabaret, Gressier, and Léogâne districts in the Ouest department; Acul du Nord, Limonade, Milot, Plaine du Nord, and Quartier-Morin in the Nord department; and Port-de-Paix in the Nord-Ouest department. Among these, MSPP conducted MDA in seven districts with reported epidemiological coverage of 65% in Cabaret, 70% in Arcahaie, 77% in Port-de-Paix, 78% in Milot, 115% in Quartier-Morin, 122% in Plaine-du-Nord, and 140% in Acul du Nord. Coverage surveys were conducted in three of these districts, with coverage estimates lower in each versus reported coverage: Milot (70% vs. 78%), Acul du Nord (71% vs. 140%), and Port-de-Paix (56% vs. 77%).

The RPRG met several times in 2022 to review results of 2021 surveys in Haiti. In January, the RPRG approved the halt of MDA in Leogane-Morne sub-district based on results from TCC-assisted 2021 coverage and prevalence survey. In June, the group reviewed the results of inconclusive TAS conducted in 2021 (Table 2). They recommended to pass TAS-3 in five districts comprising three EUs: Borgne (one EU in Nord department); Bas-Limbe, Port Margot, and Pilate districts (one EU in Nord department); and Ouanaminthe (one EU in the Nord-Est department). In Chansolme (Nord-Ouest department), which passed TAS-3 with adequate sample size in 2021, the RPRG recommended two rounds of focal MDA with ivermectin, diethylcarbamazine, and albendazole (IDA) due to a high number of CFA-positive children detected in TAS-3 (five versus the cut-off of six). The RPRG recommended to redo the community-based TAS-3 as a school-based TAS-3 in Plaisance (one EU in Nord department) and Sainte Suzanne, Terrier Rouge, and Trou du Nord (one EU in Nord-Est department). The RPRG did not make a determination on the TAS-2 results in Kenscoff (Ouest department) and instead recommended to proceed with plans for TAS-3 as scheduled in 2023. The RPRG also did not consider inconclusive TAS-1 results in Dondon (Nord department); however, MSPP elected to discontinue MDA in the district based on the partial data.

In 2022, community-based TAS-2 were completed in two EUs, Anse à Galets and Pointe à Raquette, on La Gonâve island (Ouest department). Each EU passed with one participant testing positive for CFA by FTS (Table 1). Caracol (Nord-Est department) also passed a school-based TAS-3 with only one CFA-positive participant. Twelve TAS (five TAS-2 and seven TAS-3) remain pending due to security concerns. By the end of 2022, MDA has started in 18 districts, 113 districts passed TAS-1, and 9 districts passed TAS-3 (Figures 5 and 6).

Scale-up of MMDP to 4 additional sites was planned for 2022, but not realized due to ongoing instability. HSC in Léogâne was the only clinic supporting LF morbidity management in 2022. HSC reported 799 LF care visits and 4,184 LF patient contacts in psychosocial activities during 2022.

LF MDA in Léogâne and Gressier, Haiti: Research & Planning Activities 2022-2023 – Lee Wilkers (Emory University)

This presentation discussed research and planning activities related to improving LF MDA campaigns in Léogâne and Gressier, Haiti that complement other microplanning efforts. The focus was on the transition from a primarily fixed-post to a door-to-door distribution strategy and related efforts to improve campaign planning, management, and evaluation. The approach included a literature review to identify “promising practices” for door-to-door drug distribution in MDA campaigns, and the development of a supply planning tool to support strategic microplanning. Findings from this work are currently being integrated into an “LF MDA blueprint” to support campaign planning, management, and evaluation.

The literature review identified key categories of “promising practices” for potential consideration, including distributor recruitment and selection, training, interactions with prospective participants, distribution practices and procedures, morale and motivation of drug distribution teams, and social mobilization and demand generation. The supply planning tool, currently in prototype stage, was designed for resource forecasting, supply calculation, stock allocation, and human resource deployment. The “LF MDA blueprint,” still in development, will function as a comprehensive adaptive management and organizational learning plan, covering stages, procedures, decisions, and management tasks associated with MDA implementation. The insights gained from this research hold the potential to not only enhance program strategies and decision-making for LF MDA campaigns in Léogâne and Gressier, Haiti, but also to inform and improve similar campaigns in different contexts.

MALARIA

Malaria Elimination in the Americas: Regional Update – Dr. Roberto Montoya (PAHO)

Paralleling the global trend, progress on the achievement of regional targets for reductions in malaria burden has stalled since 2015. Between 2015 and 2020, malaria cases in the Americas increased by 32%, while malaria deaths decreased by 31%. Between 2020 and 2022, endemic regions reported a significant reduction in the number of cases, especially a marked reduction in malaria morbidity in Venezuela. In 2021, the Americas reported a total of 524,000 cases of malaria, an 8% increase compared to 2015. This presentation analyzes the malaria situation in the Americas, drawing attention to the favorable situation for elimination in Central American countries and the challenges for elimination in South America related to gold mining and other determinants in indigenous and dispersed populations in the Amazon region.

Despite the challenges in Haiti, the situation in Haiti's and the Dominican Republic's shared island of Hispaniola is one of the most favorable in the region to eliminate malaria. Factors in favor of elimination include the exclusive transmission by *Plasmodium falciparum*, the susceptibility of this parasite to chloroquine, the low levels of transmission associated with the main vector *Anopheles albimanus*, and the island's condition. In 2021, the Dominican Republic reported the lowest number of cases (290) since 1975.

The presentation emphasizes the main interventions and strategies promoted by PAHO for the elimination of malaria, highlighting the need to expand access to malaria diagnosis and treatment, which would solve any possible barrier and maximize the use of RDTs. This intervention should be based on a local exercise of microepidemiology, sectorization, and focalization of the territory to organize the malaria operation at the local level.

The presentation also stresses the need to develop National Strategic Plans for the elimination of malaria, which would provide the regulatory and operational framework for inclusion of malaria in health services and the development of an intra- and intersectoral mechanism. These plans would also include measures to achieve elimination and introduce sustainable actions to prevent the re-establishment of transmission.

Malaria Elimination in the Dominican Republic – Dr. Keyla Ureña (MSP)

The Dominican MSP reported a total of 336 cases of malaria with zero deaths in 2022. This represents a 15.9% increase from the 290 cases reported in 2021 (Figure 7). Half of all cases (168) were detected by passive surveillance and the other half by active surveillance conducted by community health workers. There were 331 autochthonous cases detected, all *P. falciparum*, and 17 imported cases (12 *P. falciparum* and 5 *P. vivax*). The number of imported cases increased from 7 (2.4% of the national total) in 2021 to 17 (5.1% of the national total) in 2022. Areas of origin include: Haiti (6), Guyana (5), unspecified African regions (5), and India (1). Geographically, 89% of cases occurred

in four foci: San Juan (67%), Azua (11%), Bavaro-La Altagracia (7%), and Elias Piña (4%). Cases were reported in 24 (15.5%) of 155 municipalities (districts), down from 40 (25.8%) municipalities reporting cases in 2021. Incidence was <1 case per 1000 persons in all but the district of San Juan, which had an incidence of 1.1/1000 persons in 2022 (Figure 8). The 2022 incidence in San Juan was similar to 2021 incidence indicating sustained local transmission. In response, MSP distributed bed nets in the San Juan focus in 2022. In addition, the DPS trained health personnel on the DTI-R (diagnosis, treatment, investigation, and response) strategy, and the community surveillance network (*colaboradores comunitarios* [COLCOM]) was expanded. The results of these efforts are captured in the reported number of persons tested for malaria, which increased 2.8% from 60,519 in 2021 to 77,693 in 2022. Over two-thirds (53,471, 68.8%) of tests were conducted by community health workers, highlighting the importance of their work to elimination efforts.

Freedom From Infection Project in the Dominican Republic – Dr. Gillian Stresman (USF)

Providing the absence of a disease is not practical using conventional statistical tools. However, it is possible to measure the probability that infections would be detected if they exist, given the current surveillance system in place. We have adapted the FFI framework, developed for the context of veterinary epidemiology, with the aim to determine if and how these tools can be suitably adapted to the context of human health, using malaria as a case study. This presentation started with giving an overview of the FFI activities that were conducted in the Dominican Republic, including collecting routine malaria data and conducting interviews with clinical staff to measure the sensitivity of the surveillance system estimate (SSe) and the corresponding probability of freedom (PFree) in 48 health facilities, including 9 where community case management (CCM) was being implemented. Overall, the consistency of reporting routine malaria data improved over time with only 6 of 32 facilities having sufficient data available in 2018 to run the analysis, improving to 32 by 2022. Examples of factors associated with a high SSe included having antimalarial treatment and testing supplies in stock, and where the average travel time from home to health facility was less. Stockouts of key commodities reduced SSe. Where there were sufficient data to inform estimates, facilities were able to achieve a high PFree and sustain it over time. When data from CCM were available, this tended to improve estimates. Overall, the FFI framework was successfully applied to the context in the Dominican Republic and if validated, the FFI model outputs could provide information to support programmatic decision-making for malaria elimination.

Malaria Elimination Progress in Haiti – Dr. Marc-Aurèle Telfort (MSPP)

The Haitian National Malaria Control Program (*Program National de la Contrôle de la Malaria* [PNCM]) coordinates malaria elimination activities for MSPP. The goal of the Revised National Strategic Plan for the Elimination of Malaria in Haiti (2020 – 2025) is the elimination of malaria by 2025, measured by zero cases of autochthonous malaria transmission and zero malaria deaths by 2025. In 2022, 14,090 cases of malaria (Figure 7) and 5 malaria deaths were reported in Haiti. This represents a 32.2% increase in cases, compared to 10,661 cases reported in 2021 and a 28.6% decrease in reported malaria deaths versus 2021 (7 deaths). The increase in cases occurred despite a 2.3% decrease in the number tested, from 234,324 in 2021 to 228,872 in 2022. Nonetheless, 2022 represents a nearly 6-fold decrease in malaria cases since 2010, when 84,153 cases were reported following the major earthquake in January of that year. Over 95% of 2022 malaria cases were reported from four departments: Grand’Anse (55.3%), Sud (22.5%), Sud-Est (9.6%), and Nippes (7.9%) (Figure 9). Overall, the country continues to move towards elimination: in 2022, more districts reported zero cases in the past three years with good surveillance (29 as compared to 23 in 2021), and fewer districts had more than 50 cases in the past three years (42 as compared to 49 in 2021). In Sud department, MSPP established 16 new CHCs and provided training to 12 existing CHCs.

Considerations for MDA with Sulfadoxine-Pyrimethamine for Malaria in Haiti – Dr. Michelle Chang (CDC)

In 2018, MSPP with Malaria Zero (MZ) piloted an MDA campaign in areas of Grand’Anse as part of a package of interventions to accelerate malaria elimination. The goals of the pilot were to assess the safety, acceptability, feasibility, and programmatic effectiveness of the campaign. The MDA campaign administered sulfadoxine-pyrimethamine (SP) and a single low dose of primaquine (PQ) to residents in study areas with high malaria transmission during October to early November 2018. Each person willing to take the MDA medications was screened for medical contraindications to SP and PQ. Passive pharmacovigilance was implemented along with the campaign to identify any adverse events related to the MDA. No severe adverse events related to the 2018 MDA were detected after treating 36,338 people. In 2020, due to the upsurge in malaria cases, MSPP and MZ implemented another MDA campaign in the same department using the same medications and procedures as in the 2018 campaign. The 2020 MDA campaign began in September and after five weeks, four cases of Stevens-Johnson syndrome (SJS) were identified after treating 42,249 people. The 2020 campaign was halted, and an investigation of the risk factors was conducted. After completion of personal interviews and testing the case individuals and their family members for potential causes of SJS, we concluded that the increased risk of SJS among the MDA participants was likely related to having a certain human leukocyte antigen (HLA) and possibly being infected with Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) at the time they took SP.

Based on these findings, we discourage the use of SP for MDA in Haiti in the presence of circulating SARS-CoV-2 until additional evidence is available on the potential interaction with the novel virus, especially among individuals with certain HLA genotypes.

ANNEX 1. Milestones: Hispaniola Initiative

2022: TCC and the Dominican MSP commence an integrated LF Remapping Survey. Despite ongoing security challenges, TCC and Haitian MSPP conduct LF TAS in three districts in Haiti. TCC establishes 19 more CHCs in Sud department, Haiti.

2021: The Dominican Republic reported the lowest number of malaria cases in the country (290) since 1975 (when there were 159). PTS surveys for LF are completed in the East and La Ciénaga foci of the Dominican Republic that indicate LF transmission remains interrupted in both foci. The country launches the first ever support group for LF patients. TCC and MSPP conduct surveys to measure post-LF MDA coverage and LF and malaria prevalence in Leogane and Gressier districts, Haiti. Haitian president Jovenel Moïse was assassinated on July 7th exacerbating instability in the country. Progress reports on efforts to eliminate malaria and lymphatic filariasis from Hispaniola were presented to ITFDE.

2020: The COVID-19 pandemic disrupts public programs globally. TCC supports two rounds of MDA for LF in Léogâne and Gressier, Haiti—one in February–March (delayed from 2019) and one in December. TCC establishes an additional 12 CHCs in Haiti and supports CE for a second MZ MDA campaign. PTS surveys for LF are completed in the Southwest focus of the Dominican Republic; results indicate LF transmission remains interrupted.

2019: TCC establishes 36 more CHCs in Grand’Anse, Haiti.

2018: The East focus passes TAS-1, meaning all formerly LF-endemic areas of the Dominican Republic qualify to stop MDA. In partnership with MZ, TCC establishes 23 CHCs in Haiti and supports CE for a pilot IRS-MDA campaign in select areas of Grand’Anse, Haiti.

2017: The Dominican Republic and Haiti won a Malaria Champions of the Americas Award recognizing their outstanding work in interrupting malaria transmission and developing local systems to access malaria diagnosis and treatment.

2016: TCC conducted a survey for malaria and LF in agricultural areas across the Dominican Republic to investigate the burden of these diseases in isolated communities historically suspected of being reservoirs for disease transmission.

2015: TCC, the ministries of health in Haiti and the Dominican Republic, and other partners formed a consortium, known as the MZ alliance, with funding from the Bill & Melinda Gates Foundation, to accelerate malaria elimination on Hispaniola. TCC led CE to promote and deliver community-based interventions for malaria elimination.

As part of MZ activities, TCC staff helped develop curriculum and served as instructors for malaria elimination training for MSPP staff, and drafted plans for MZ implementation.

2014: The Hispaniola Initiative expanded institutional support for malaria and LF elimination in Hispaniola. In Haiti, TCC participated in meetings to update Haiti's National Strategic Plan for malaria. In the Dominican Republic, TCC provided financial support for LF MDA launching in the East and technical assistance for an LF TAS in the La Ciénaga area of Santo Domingo.

TCC also commissioned an economic study to provide an updated cost of eliminating malaria and LF in Hispaniola.

Progress reports on efforts to eliminate malaria and LF in Hispaniola were presented to ITFDE.

2013: TCC sponsored additional meetings to continue binational coordination of malaria and LF elimination activities.

2012: TCC sponsored four binational meetings to update malaria and LF elimination plans. In November, ITFDE reviewed progress on malaria and LF elimination in Hispaniola.

2011: President Carter participated in the first launching of MDA for LF in metropolitan Port-au-Prince, Haiti.

2009: Haiti and the Dominican Republic produced a binational plan to eliminate malaria in Hispaniola by 2020. Haiti also produced a national plan to eliminate LF by 2020. In October, President Carter met with heads of state of both countries to mobilize support for these plans.

2008: TCC helped the ministries of health establish a cross-border pilot project to target malaria in Ouanaminthe, Haiti (pop. 92,000), and Dajabón, Dominican Republic (pop. 27,000). The project included purchase and distribution of insecticide-treated bed nets; provision of laboratory supplies, motorbikes, and other equipment; training for health staff; and protocol standardization for malaria diagnosis and treatment.

2006: ITFDE concluded that implementation of an integrated comprehensive program to eliminate both malaria and LF on the island of Hispaniola is technically feasible and medically desirable and would be economically beneficial to both the Dominican Republic and Haiti. <https://www.cartercenter.org/documents/ITFDEsum0506.rev.pdf>

ANNEX 2. Carter Center-Authored Hispaniola Publications

2022 publications shown in bold.

Keys, H. Following Misdirection and Multiple Malaras in Santo Domingo, Dominican Republic. *Science & Technology Studies*. 2022 May 15; 35(2): 52-71.

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Gonzales M, Noland GS, Mariano EF, Blount S. Lymphatic filariasis elimination in the Dominican Republic: History, progress, and remaining steps. *PLoS Negl Trop Dis*. 2021 Aug 10;15(8):e0009590

Beau De Rochars Madsen VE, Keys H, Samuels SK, Jo A, Noland GS, Gonzales M, Blount S, Mainous AG. Prevalence of Diabetes, Prediabetes, and Associated Risk Factors Among Agricultural Village Residents in the Dominican Republic. *Am J Trop Med Hyg*. 2021 Jun 2;104(6):2241-2250.

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Valdez D, Keys H, Ureña K, Cabral D, Camilo F, Ogando EC, Mercedes L, Noland GS, Blount SB, Lavery JV, Desir L, Puello J. Malaria outbreak response in urban Santo Domingo, Dominican Republic: lessons learned for community engagement. *Rev Panam Salud Publica*. 2020;44:e92 <https://doi.org/10.26633/RPSP.2020.92>

Wodnik BK, Louis DH, Joseph M, Wilkers LT, Landskroener SD, Desir L, Lemoine JF, Lavery JV. The roles of stakeholder experience and organizational learning in declining mass drug administration coverage for lymphatic filariasis in Port-au-Prince, Haiti: A case study. *PLoS Negl Trop Dis*. 2020 May 29;14(5):e0008318. doi: 10.1371/journal.pntd.0008318. eCollection.

Oviedo A, Knipes A, Worrell C, Fox LM, Desir L, Fayette C, Javel A, Monestime F, Mace K, Chang MA, Udhayakumar V, Lemoine JF, Won K, Lammie PJ, Rogier E. Combination of Serological, Antigen Detection, and DNA Data for Plasmodium falciparum Provides Robust Geospatial Estimates for Malaria Transmission in Haiti. *Sci Rep*. 2020 May 21;10(1):8443. doi: 10.1038/s41598-020-65419-w.

Keys HM, Noland GS, De Rochars MB, Taylor TH, Blount S, Gonzales M. Perceived discrimination in bateyes of the Dominican Republic: results from the Everyday Discrimination Scale and implications for public health programs. *BMC Public Health*. 2019 Nov 12;19(1):1513. doi: 10.1186/s12889-019-7773-2.

Keys HM, Noland GS, De Rochars MB, Blount S, Gonzales M. Prevalence of malaria and lymphatic filariasis in bateyes of the Dominican Republic. *Infect Dis Poverty*. 2019 May 27;8(1):39. doi: 10.1186/s40249-019-0547-3.

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ANNEX 3. List of Program Review Participants

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ANNEX 4. 2022 Hispaniola Initiative Program Review Agenda

Hispaniola Initiative Program Review Agenda			
Tuesday, March 14, 2023			
Start	End	Title	Speaker
9:00 AM	9:10 AM	Welcome and Introductions	Dr. Gregory Noland
9:10 AM	9:13 AM	Welcoming Remarks	Dr. Kashef Ijaz
9:13 AM	9:15 AM	Goodwill Message	Dr. Tedros Ghebreyesus
9:15 AM	9:30 AM	Hispaniola Initiative Overview & Tribute to Dr. Stephen Blount	Dr. Gregory Noland
<i>Lymphatic Filariasis</i>			
9:30 AM	10:00 AM	LF Elimination Progress in the Dominican Republic	Dr. Manuel Gonzales & Dr. Keyla Ureña
10:00 AM	10:15 AM	Discussion	
10:15 AM	10:45 AM	LF Elimination Progress in Haiti	Dr. Marc-Aurèle Telfort
10:45 AM	11:00 AM	Discussion	
11:00 AM	11:15 AM	Coffee Break	
11:15 AM	11:30 AM	Human Engagement Learning Platform (HELP) Research Updates - Haiti LF	Lee Wilkers
11:30 AM	11:40 AM	Discussion	
<i>Malaria</i>			
11:40 AM	11:55 AM	Malaria Elimination in the Americas - Regional Update	Dr. Roberto Montoya
11:55 AM	12:05 PM	Discussion	
12:05 PM	12:35 PM	Malaria Elimination Progress in the Dominican Republic	Dr. Jose Luis Cruz Raposo
12:35 PM	12:50 PM	Discussion	
12:50 PM	1:20 PM	Lunch	
1:20 PM	1:35 PM	Freedom From Infection Project in the Dominican Republic	Dr. Gillian Stresman
1:35 PM	1:45 PM	Discussion	
1:45 PM	2:15 PM	Malaria Elimination Progress in Haiti	Dr. Marc-Aurèle Telfort
2:15 PM	2:30 PM	Discussion	
2:30 PM	2:45 PM	Clinical Update on Haiti Malaria MDA Campaign	Dr. Michelle Chang
2:45 PM	2:55 PM	Discussion	
2:55 PM	3:00 PM	Summary and Closure	Dr. Gregory Noland