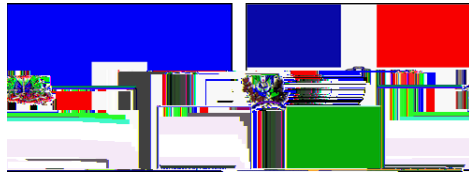


**ELIMINATING MALARIA FROM HISPANIOLA:
A BINATIONAL EFFORT**



1. Rationale:

Hispaniola is the only Caribbean island where malaria still persists. However, compelling evidence indicates that malaria can be eliminated from this island:

- The only prevailing malaria parasite is *Plasmodium falciparum*, which does not have persistent liver stages which can cause relapses.
- *Anopheles albimanus*, the principal vector, is relatively inefficient at transmitting malaria.
- The parasite remains clinically susceptible to chloroquine, an inexpensive and safe antimalarial drug.
- All other Caribbean islands have eliminated malaria, underlining the technical feasibility of this achievement in Hispaniola.

This technical feasibility is further enhanced by newly available tools. Electronic communications and geographic information systems, immuno-chromatographic (“rapid”) diagnostic tests, and molecular methods for monitoring drug resistance, can greatly increase the effectiveness of surveillance, prevention, and treatment of malaria.

In spite of these possibilities, recent developments are causes for concern:

- Outbreaks of introduced malaria, occurring since 2006 in neighboring Caribbean islands (The Bahamas and Jamaica), have been attributed to importation from Hispaniola and underline the risk of spreading the disease to neighboring malaria-free countries should malaria continue unchecked in Hispaniola.
- Genetic mutations associated with resistance to chloroquine have been detected in some malaria parasites isolated in 2006-2007 in Haiti, underlining the need to eliminate the disease before drug resistant parasites can emerge.

Thus, not only is it feasible to eliminate malaria from Hispaniola. It is also urgently needed, to prevent the problem from increasing in severity on the island and from expanding into neighboring malaria-free countries.

2. Malaria in Hispaniola:

In 2007 on the island of Hispaniola (total pop. 20 million), approximately 33,000 confirmed cases of malaria and 200 deaths attributed to the disease were reported. These statistics however are not reliable, because in Haiti the diagnosis of malaria often is not based on reliable microscopy results.

Haiti (pop. 9.7 million) bears the heaviest disease burden, accounting for about 90% of the confirmed cases in the island in 2007. However, an estimated 200,000 clinically suspected malaria episodes (without confirmation by microscopy) were estimated to have occurred in Haiti in 2007. Malaria risk is found in all locations of Haiti under 300 m altitude, including cities.

In the Dominican Republic (pop. 9.4 million) malaria occurs at high endemicity in only some of the country’s 133 *municipios* (14 and 7 *municipios* in 2007 and 2008, respectively). According to 2008 statistics, 25 % of cases in the DR reportedly occur in migrants from Haiti, or persons of Haitian origin, most of whom are migrant laborers in construction or agriculture.

Malaria elimination Hispaniola

diagnosis. This “control” approach, while less costly in the short term, failed in identifying many malaria infected patients and thus surrendered the long-term goal of eradicating the disease.

- Inadequate health infrastructures: Implementation of the control strategy was further hindered by fragmentation of the health system and lack

- Adoption of technical protocols that will be as uniform as permissible by national circumstances.
- Research activities that avoid duplication, are designed in a coordinated manner, and address issues of interest to both countries.
- Frequent exchanges of personnel (meetings, training, selected field activities by binational teams).
- Shared electronic surveillance system and geographic database.

7b. Chronology:

The activities will be conducted in 3 stages which will overlap to some extent, and whose duration may vary depending on developments:

Years 1-2 (Transition and build-up): The two countries decide how to coordinate their strategies and interventions; recruit and train new personnel and strengthen their organizational infrastructures; begin to implement a coordinated approach, making the necessary adjustments as they progress; and initiate research to identify the most cost effective interventions.

Years 3-5 (Coordinated attack): In close coordination, the two countries initiate intensive interventions in their most affected areas; the interventions will be tailored to local circumstances, but will include at minimum a combination of diagnosis and treatment, intensive surveillance, and focused indoor residual spraying (IRS); as the situation improves in these areas, using the acquired experience, the countries expand their efforts into less endemic areas, employing combined interventions tailored to local circumstances; the countries continuously document their efforts and outcomes and conduct research to guide their interventions.

Years 6-10 (Coordinated consolidation): In close coordination, the two countries continue the interventions, focusing on remaining foci; maintain intensive surveillance in all areas of the island, focusing on locales and population groups most at risk; detect outbreaks in a timely manner and conduct intensive interventions to control the outbreaks; conduct investigations to prevent reintroduction of infection into areas freed of malaria; and continuously document the malaria situation island-wide.

7c. Strategies and Interventions:

The elimination effort will be implemented by two national semi-vertical programs, which will be supported by adequate personnel, commodities, equipment and infrastructures. The two national programs will work in close coordination and follow technical protocols that will be as uniform as possible.

The two countries will adopt an evidence-based approach to deploy in a timely manner a comprehensive menu of interventions, including:

- *Epidemiologic surveillance:*
 - based on biologic confirmation (microscopy in the majority of cases; in selected circumstances, rapid diagnostic tests (RDTs) and molecular tests).
 - through both passive case detection and active case detection, and periodic parasite surveys in communities as required; serologic surveys will be conducted in areas recently freed of infections.
 - covering all localities of the island.

- with rapid communication of data (electronic network, portable telephones) into a surveillance database shared by the two countries.
- spatial analysis and constantly updated mapping of malaria distribution in the island.
- *Case management:*
 - accurate, timely diagnosis based on biologic confirmation (microscopy in the majority of cases).
 - uniform treatment protocol island-wide (using, for uncomplicated cases, chloroquine and primaquine; the latter compound aims to prevent transmission by killing the gametocyte stages infective to mosquitoes).
- *Prevention:*
 - vector control (indoor residual insecticide spraying, focused in time and space; outdoor/spatial spraying for outbreak controls; complemented by source reduction and larviciding; supported by entomological surveillance; as part of integrated vector management).
 - personal protection using long lasting insecticide-treated nets (LLINs) and/or curtains (years 1-2; continuation contingent on findings from research on protective effect).
- *Response to outbreaks:*
 - surveillance (early warning system).
 - active case detection, insecticide spraying, mass drug administration in severe situations.
- *Support strategies:*
 - training and supervision of personnel.
 - procurement of commodities.
 - information-education-communication.
 - community mobilization.
 - multisectorial collaboration.
 - advocacy (government, local businesses, international agencies).

7d. Research:

Research will aim at identifying the tools and methods that are most cost-effective to achieve elimination. The main topics include:

- assessment of the protective effect of LLINs.
- monitoring of parasite resistance to chloroquine, of *Anopheles* resistance to insecticides, and of adverse events due to primaquine.
- entomologic investigations to identify optimal combinations of vector control measures.
- epidemiologic investigations on patterns of transmission and re-introduction (e.g. migrant workers).
- identification of optimal methods for intersectorial collaboration (public/private sector intervention mix) and inter-country coordination.

7e. Documentation:

The progress of the elimination effort will be documented, including:

- monitoring and evaluation, to assess at defined time intervals the program outcomes and the health impacts of the elimination effort.

Malaria elimination Hispaniola

- cost of the various components of the elimination effort.

8. Potential added benefits:

In addition to the direct health and economic be

9. Budget:

*9a. Table:*¹

	Haiti ²	Dominican Republic ²	Binational collaboration ²	TOTAL
--	---------------------------	--------------------------------------------	--------------------------------------------------	--------------

Footnotes:

¹: The Table gives a budget estimate (in million USD) for each of the two countries, as well as for specific activities conducted under binational collaboration.

²