Integrated Management Strategy for Dengue Prevention and Control on Aruba

IMS-Dengue Aruba

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Willemstad, Curaçao

Ministry of Health of Aruba

Department of Public Health Aruba (DESPA)

**Pan American Health Organization**

World Health Organization

Contents

Introduction

Dengue is the most important mosquito-borne viral disease in the world. Repeated epidemics of dengue and severe dengue affect millions of individuals each year in tropical and subtropical areas of the world, including Central and South America and the Caribbean.

Following the end of the *Aedes aegypti* eradication campaign in the 1960s for the control of Yellow Fever the efforts to control this vector were not maintained. As a result all areas that were formerly free of this vector were re-infested, which permitted the introduction and spread of Dengue when it was reintroduced into the region in the 1970's (PAHO 1997). Over the last 35 years dengue fever has spread throughout the Caribbean and Latin America with cyclical outbreaks (Figure 1). The last major outbreak occurred in 2010 with 1,662,296 cases reported and 1,193 deaths.

Figure 1. Evolution of Dengue in the Americas 1980-2011.
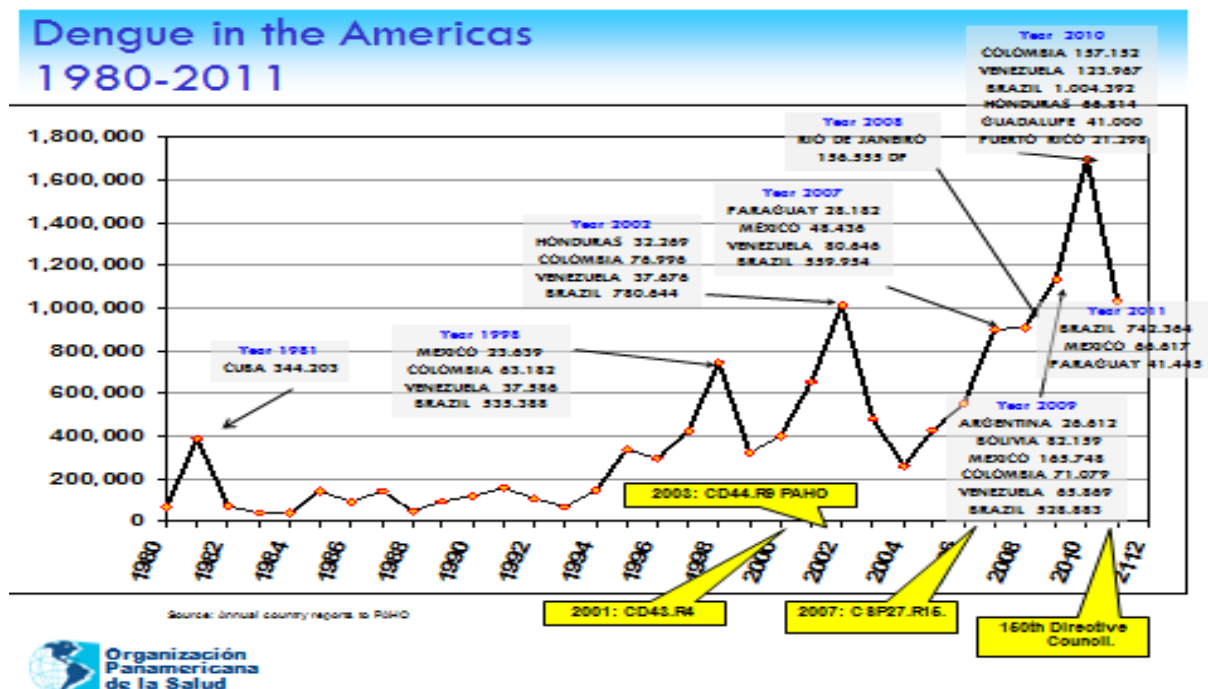
Current Regional Epidemiological Situation

From 2001 to 2012, more than 31 countries of the Americas have notified a total of 9,847,209 cases of dengue (PAHO 2012). The number of cases of severe dengue in the same period was 238,454. The total number of dengue deaths from 2001 to 2012 was 4,341, with a Case Fatality Rate (CFR) of 1.8%. Central America and the Caribbean sub-regions have countries that presented some of the highest incidence rates during this period, which means that there also exists a high epidemiological risk for the disease within these areas. The four serotypes of dengue circulate in the region (DENV-1, 2, 3, and 4); in Aruba, Barbados, Brazil, Colombia, El Salvador, Guatemala, French Guiana, Honduras, Mexico, Puerto Rico, Venezuela, Dominican Republic and Peru all four serotypes were simultaneously identified in one year of the same time period.

The year 2010 was an epidemic year with dengue outbreaks reported in Brazil, Colombia, Venezuela, Honduras, Ecuador, México and the French territories Guadeloupe and Martinique. A total of 1,727,339 dengue cases were reported in 2010, with 48,954 dengue severe cases and 1,194 deaths. A decreasing tendency was observed in 2011, with 1,327,385 dengue cases, 19,370 severe dengue and 742 deaths reported. In 2012, the tendency continuous descending, through epidemiological week No. 19, a total of 416,827 dengue cases have been reported with 3,763 severe dengue cases and 202 deaths. So far, dengue outbreaks had been reported in Colombia, Paraguay, Ecuador, Brazil and Guatemala.

Background

The island of Aruba is located at 12° 30' North latitude and longitude 70° West and lies about 23 km (15 miles) from the northern coast of Venezuela. It is the smallest and most western island of a group of three Dutch Leeward Islands, the so-called ABC-islands (Aruba, Bonaire, Curaçao). Aruba is 33 kilometers (20 miles) long and 9 kilometers (5 miles) wide, and encompasses an area of 193 km². Aruba is geographically divided into 8 districts, which are Noord/Tanki Leendert, Oranjestad-

West, Oranjestad-East, Paradera, Santa Cruz, Savaneta, San Nicolas-North and San Nicolas-South. The capital is Oranjestad, named after the Dutch royal house of Orange.

Demography

The total population of Aruba as per the 4th quarter of 2009 was 107,138 of which 47.7% were males and 52.3% were females. The density of population has increased steadily from 501 inhabitants/km² in 1999 to 589 inhabitants/km² in 2008.

Weather

With an average rainfall of less than 20 inches a year, an average daytime temperature of 86° Fahrenheit (30° Celsius), and the constant cooling influence of the trade winds, Aruba is one of the most temperate islands in the Caribbean. The rainfall occurs mainly in short showers during November and December. Even though Aruba lies outside the hurricane belt, the island does feel effects from tropical waves, tropical storms, and hurricanes in the region. This can increase the rainfall considerably during the season.

Tourism

Since Aruba is a very small island and has a small domestic market and essentially no natural resources, the economic activity is limited. The main economic activity is the service sector, in which the tourism industry is the major one.

The Dengue situation on Aruba

According to the Epidemiology and Research Unit, Department of Public Health (Vector Ae. aegypti and Dengue Trend analysis Aruba 1999-2009) Aruba has experienced 6 outbreaks: in 1984-1985 with Dengue virus serotype I; 1995 with Dengue virus serotype II; 1999 & 2004 with Dengue virus serotype III; 2005 &2006 with Dengue virus serotype II, III; and 2008 & 2009 with Dengue serotype I.

Dengue Epidemics Aruba
1984 - 2009
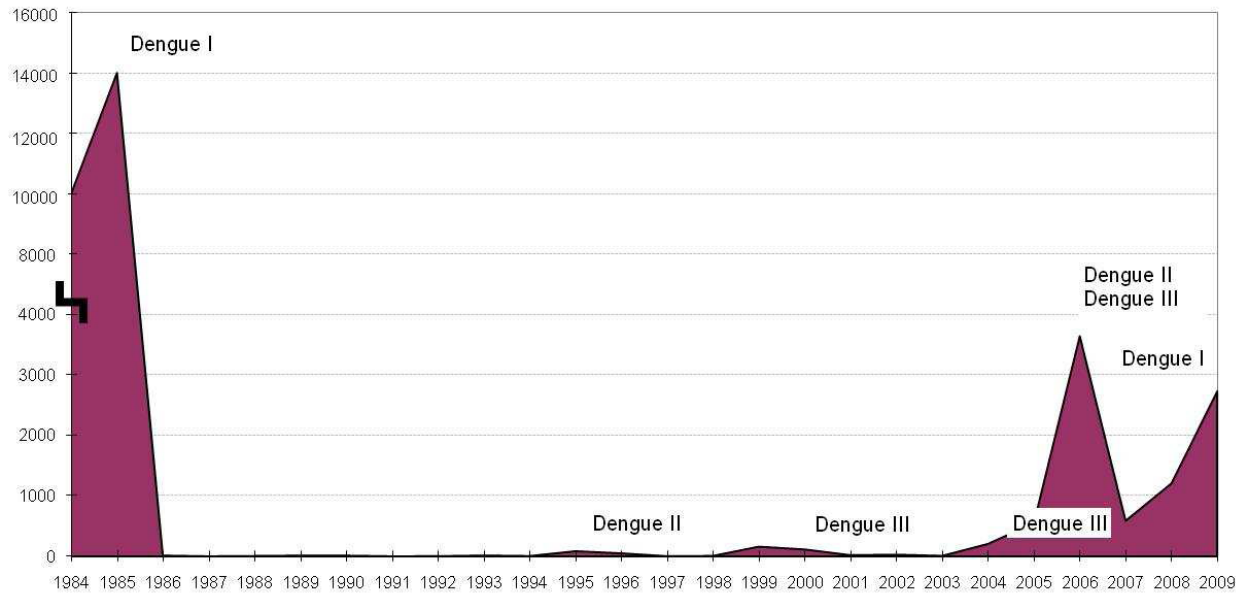
Notification Dengue cases,
Aruba 2012

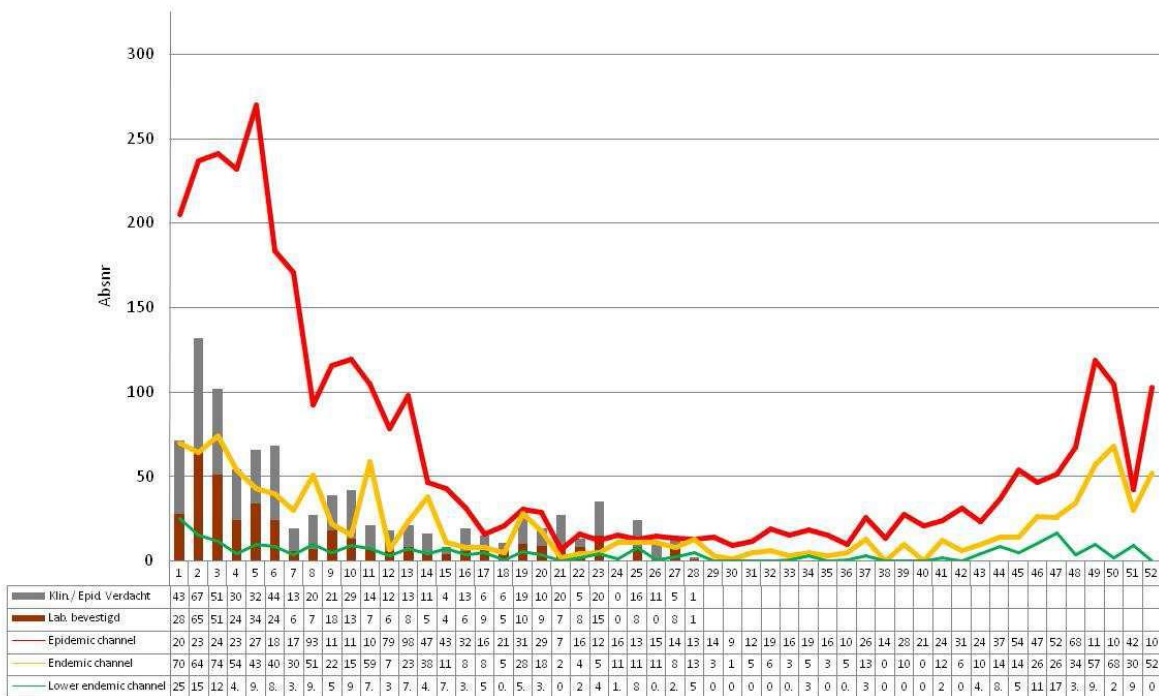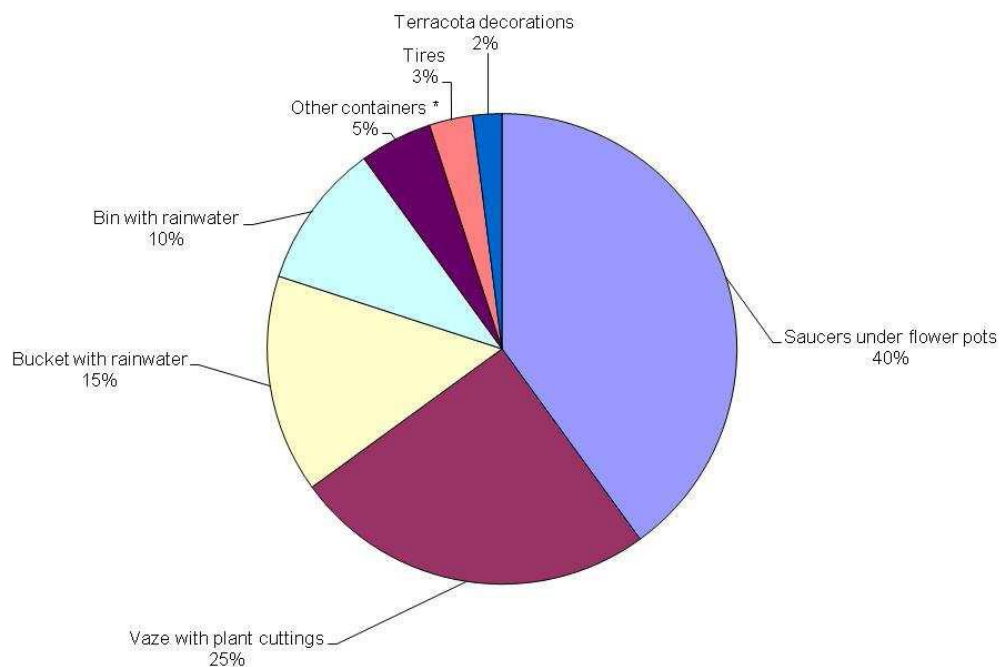|	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Klin./ Epid. Verdacht	43	67	51	30	32	44	13	20	21	29	14	12	13	11	4	13	6	6	19	10	20	5	20	0	16	11	5	1																								
Lab. bevestigd	28	65	51	24	34	24	6	7	18	13	7	6	8	5	4	6	9	5	10	9	7	8	15	0	8	0	8	1																								
Epidemic channel	20	23	24	23	27	18	17	93	11	11	10	79	98	47	43	32	16	21	31	29	7	16	12	16	13	15	14	13	14	9	12	19	16	19	16	10	26	14	28	21	24	31	24	37	54	47	52	68	11	10	42	10
Endemic channel	70	64	74	54	43	40	30	51	22	15	59	7	23	38	11	8	8	5	28	18	2	4	5	11	11	11	8	13	3	1	5	6	3	5	3	5	13	0	10	0	12	6	10	14	14	26	26	34	57	68	30	52
Lower endemic channel	25	15	12	4.	9.	8.	3.	9.	5	9	7.	3	7.	4.	7.	3.	5	0.	5.	3.	0	2	4	1.	8	0.	2.	5	0	0	0	0.	3	0	0.	3	0	0	0	2	0	4.	8.	5	11	17	3.	9.	2	9	0	

In 2008-2009 there were 3382 cases of Dengue of which 1354 confirmed and 2028 clinically suspected. During this outbreak 3 cases of Dengue Hemorrhagic Fever were reported from which 3 deaths. The intervals between the Dengue epidemics have become shorter during the past 5 years and it has been noted that Dengue is prevalent throughout the year making it endemic on the island. As soon as the rainy season starts the island experiences outbreaks of Dengue. Rainfall has a major influence on the breeding places whereby massive multiplication of the mosquito Ae. aegypti mosquito occurs.

The most common breeding places are artificial and are created by residents such as flower pots, jars and vases. Most of the residents of Aruba have not shown interest during the years to eliminate these breeding places. Therefore the risk for the Dengue virus transmission through the A. aegypti mosquito remains very high.

Type breedingplaces A. aegypti 2004

Terracota decorations 2%
Tires 3%
Other containers * 5%
Bin with rainwater 10%
Bucket with rainwater 15%
Vaze with plant cuttings 25%
Saucers under flower pots 40%

Since the Aruban population has through the years more than once been exposed to the different types of the Dengue virus, the risk of contracting severe forms of Dengue (Hemorrhagic Dengue, Dengue Shock Syndrome) and even death is highly probable.

Integrated Management Strategy (IMS) for Dengue Prevention and Control on Aruba.

During the 43rd Directive Council Meeting held in September 2001, PAHO/WHO approved Resolution CD43.R4. This resolution presented the "New Generation of Programs for Dengue Prevention and Control". In September 2003, the 44th PAHO/WHO Directive Council approved the adoption of the Integrated Management Strategy for Dengue Prevention and Control (IMS-Dengue).

IMS-Dengue is a working strategy designed by member countries with the support of an international dengue expert team. The IMS-Dengue aims to promote the integration of six key components for dengue prevention and control at the national, sub-regional and regional levels. These include social communication (with emphasis on the application of the planning methodology *Communication for Behavioral Impact* - COMBI), epidemiological surveillance, laboratory diagnosis, environmental management, clinical case management, and integrated vector management (Figure 5).

Figure 5. Integrated Management Strategy for Dengue Prevention and Control (IMS-Dengue)
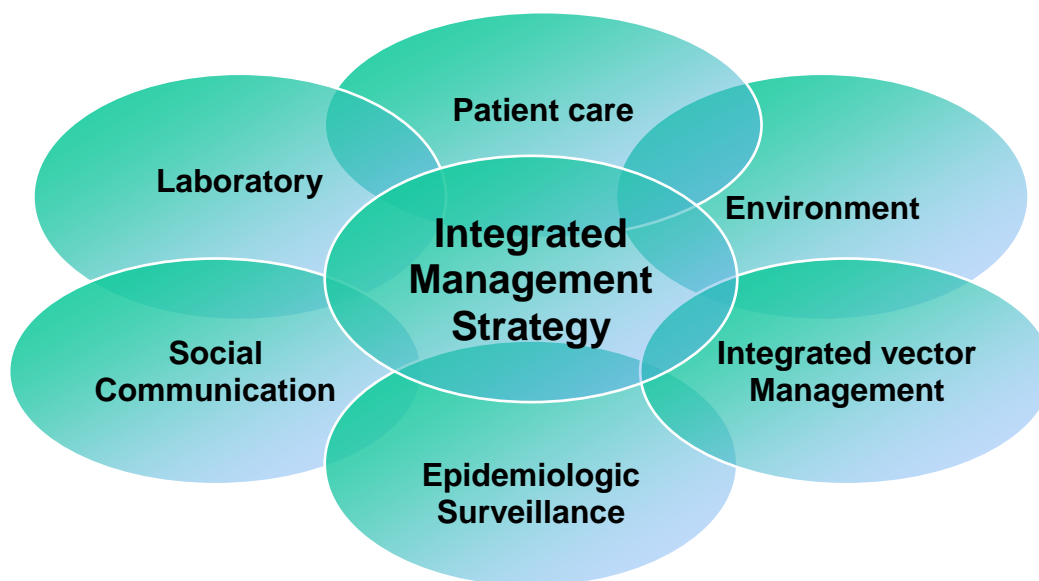
IMS-Dengue uses Integrated Vector Management, a comprehensive response to vector borne diseases as the guiding principal for vector control (Resolution CD48/13 approved at PAHO's 48th Directing Council, 2008). Integrated Vector Management (IVM) is defined as a rational decision-making process for the optimal use of resources for vector control in the 2008 WHO Position Statement. The cost effectiveness of vector control measures is central to IVM.

In 2007, the Pan-American Sanitary Conference approved Resolution CSP27.R15, in order to strengthen the preparation, implementation and systematic evaluation of the IMS-Dengue strategy across the region.

The IMS-Dengue strategy has been approved by different sub regional entities in Central and South America: Council of Ministries of Health in Central America (COMISCA), Health Sector Committee in Central America and Dominican Republic (RESSCAD), Central American Network for Emergent and Re-emergent Disease (RECACER), Mercado Común del Sur (MERCOSUR) and the Latin American Parliament (PARLATINO). To date, 22 countries and 4 sub-regions (Central

America, MERCOSUR, Andean and Caribbean sub-regions) are in the process of implementing the IMS-Dengue strategy.

The adoption of this strategy in the Caribbean countries will strengthen national dengue prevention and control programmes, the integration of the health sector with other sectors using a multidisciplinary and inter-programmatic approach, and the implementation of a Contingency Plan to prevent and control dengue outbreaks and epidemics.

Preparedness Plan for Dengue Outbreak Control and Response

Recent outbreaks in the Americas have shown that current response mechanisms are inefficient and health systems would be overwhelmed in large epidemics. Lack of clinical, vector control and laboratory supplies, shortages in trained clinical, paramedical and vector control personnel and inadequate communication strategies to reach the community in an effective way are some of the main issues to be targeted during dengue outbreaks.

To complement the IMS-Dengue strategy there is a strong need to develop a National Contingency Plan to respond to dengue outbreaks and epidemics. This plan should strengthen dengue surveillance and inter-sectoral linkages and information exchange. Thus, the National Contingency Plan will assist in the timely control of dengue outbreaks in the country.

Following is the work plan for the implementation of IMS-Dengue Strategy on Aruba and a framework for development of a National Contingency Plan and an agenda that will assist in the evaluation and monitoring of implementation of the strategy.

INTEGRATED MANAGEMENT STRATEGY FOR DENGUE PREVENTION AND CONTROL (IMS-Dengue) OF ARUBA

GOAL: to reduce the social, economic and health impact caused by dengue in Aruba

Purpose	Indicators	Verification Sources	Assumptions / risks
1. Reduce dengue related morbidity by 25%, and case fatality rates by 50% by effective implementation of the IMS dengue, within the context, of IHR, in the next 5 years (2012-2017)	Incidence rates of dengue, and severe dengue	Weekly epidemiological reports	Dengue Outbreak Team will be formed and functional and general designed
	Case fatality rate	Outbreak reports	Funding allotted by the Ministry of Health
	Number of days of absent from work	Ministry of Health Annual report	Introduction of serotype IV
	Number of governmental institutions that participate and have implemented the components of the IMS dengue (health department, educational department, tourism department, KvK)	Minutes of meeting	

I. MANAGEMENT

Results	Indicators	Verification Sources	Assumptions / risks
R1. IMS implemented at all levels and functions	1. Dengue Outbreak Team (DOT), established 2. National IMS implementation plan developed and tasks completed according to time frame.	1. Minutes and reports of DOT 2. National IMS Plan 3. Monthly, quarterly and annual progress report of IMS 4. Implementation reports 5. Surveillance records 6. Epidemiological reports 7. Outbreak investigation 8. Entomological reports	Political commitment Surveillance systems established and operating Functional communication system Climatic conditions
Results	**Activities**		
R1. IMS implemented at all levels and functions	R1A1. Strengthen the Dengue Outbreak Team (DOT) R1A2. Implementation of IMS at all levels R1A3. Establish mechanism for collaboration between intersectional stakeholders		

Activities	Task	Execution period*			Responsible	Cost** US$	Comments
		S	M	L			
R1A1. Strengthen Dengue Outbreak Team (DOT)	1. Provide training on management strategy and the specific aspects of each component	x	x	x	CMO, DOT		
R1A2. Assessment of capacities and needs for the implementation of IMS	1. Review systems and baselines for each component	X			DOT		
	2. Develop an assessment tool.	x			DOT		
	3. Identify the needs and gaps	x			DOT		
	4. Prepare summary report	X			DOT		
R1A3. Establish mechanisms for collaboration between inter-sectoral stakeholders.	1. Identify key stakeholders	X			DOT		
	2. Advocate for collaboration on IMS Dengue				DOT		

	3. Establish MOU between key stakeholders	X	X	X	DOT		
	4. Implement periodic inter-sectoral meetings	X	X	X	DOT		

II.   VECTOR CONTROL

Results	Indicators	Verification Sources	Assumptions / risks
R1. Integrated Vector Management (physical, biological, chemical, inter-sectoral collaboration and community participation) for dengue prevention implemented to reduce vector populations in Aruba	1. Number of training courses in IVM completed 2. Number of districts that have implemented IVM approach 3. Aedes entomological indices (Breteau index, House index, Container index and (pupal index) as a point in time index where applicable) 4. Priority areas for intervention identified and mapped 5.Number of organizations supporting/ involved in community participation activities for vector control 6.MOU of co-operation between key stakeholders on vector control intervention 7. Efficacy test conducted annually for all parishes.	1. Document of number of persons trained and certified 2. Monthly Entomological Surveys/reports 3. Standard Operating Procedures for Vector Surveillance 4. Maps of priority areas by district 5. Meeting Reports 6. Completed MOU document 7. Efficacy Test Reports 8. Monitoring and Evaluation Reports	Intra and inter-sectoral commitment for developing actions to reduce breeding sites Community participation Availability of personnel, inputs and equipment in quantity and quality. Effective and evaluated interventions

	8. Routine monitoring, evaluation and verification of activities		

Results	Activities
R1. Integrated Vector Management (physical, biological, chemical, inter-sectoral collaboration and community participation) for dengue prevention implemented to reduce vector populations in Aruba	R1A1.Training and certification of public health staff and other persons on IVM R1A2. Strengthen routine entomological surveillance, interventions, verification, monitoring and evaluation R1A3. Strengthen inter-sectoral collaboration amongst key stakeholders to address environmental problems and social concerns relating to vector-borne disease R1A4. Forge alliance with civic groups (including school, churches, etc..) to address vector control issues at the community level R1A5. Lobby for increase resources to Vector control

Activities	Task	Execution period*			Responsible	Cost** US$	Comments
R1A1.Training and certification of public health staff and other persons on IVM	1. Adapt existing IVM manual to develop training curriculum specific to local needs	X			Medical Entomologist PAHO		Contingent on the availability of funds
	2. Establish agreements with local centers of higher education to incorporate the vector control training and pesticide application certification as part of their programme	X			Medical Entomologist PAHO Dengue out break team		
	3. Schedule and support training courses in all aspects of vector control: entomological surveillance, GIS/GPS applied to entomology, equipment calibration, pesticide safety, etc.	X	X	X	Medical Entomologist PAHO		Public Health Officers Vector Control Workers
R1A2. Strengthen entomological surveillance, intervention,	1.Develop and implement surveillance framework for Aedes aegypti and other vector-borne diseases	X			Medical Entomologist District Staff		

verification, monitoring and evaluation	2. Strengthen the uses of mapping and data base system to determine priority areas of activities using vector surveillance data	X	X	X	Medical Entomologist G.K.M.B PAHO		
	3. Develop and implement a routine monitoring and evaluation programme of vector control activities	X	X	X	Medical Entomologist		
	4.Conduct annual insecticide resistance testing across the parishes	X	X	X	Medical Entomologist		

	5.Determine capacity gaps and needs in vector control and lobby for these to be addressed
	
	    a. Staff
	    b. Transportation
	    c. Equipment etc..
		X			Medical Entomologist		PAHO to assist

	6. Implement control intervention based on entomological surveillance data	X	X	X	Medical Entomologist		PAHO to assist
	7. Design specific intervention for major breeding sites	X	X	X	Medical Entomologist		PAHO to assist

	8. Collaborate with Surveillance Unit to use entomological data to determine risk	X	X	X	Medical Entomologist		PAHO to assist
R1A3. Strengthen inter-sectoral collaboration amongst key stakeholders to address environmental problems and social concerns relating to vector-borne	1.Identify environmental problems and social concerns linked with vector occurrence	X			Dengue out break team Medical entomologist district Staff Health Education		
	2.Identify relevant stakeholders	X			Medical Entomologist		
	3. Establish MOU and coordination mechanism between key stakeholders on addressing environmental problems and social concerns linked with vector occurrence	X			Dengue out break team Medical Entomologist		
	4. Identify civic groups that support vector control	X	X	X	Dengue out break team Medical Entomologist		

	5.Establish quarterly inter-sectoral meeting at the parish level to discuss and address environmental health matters including vector control	X	X	X	Chief Public Health Inspector Regional Environmental Health Officer Medical Officer (Health)		
R1A4.Forge alliance with civic groups (including school, churches, etc..) to address vector control issues at the community level	1.Identify civic groups that can support vector control	X			Health Educators Medical Entomologist district Staff		
	2.Establish communication mechanism between groups	X	X		Health Educators Medical Entomologist district Staff		
	3. Conduct training of selected community based personnel within the civil groups	X	X	X	Health Educators Medical Entomologist		

III.LABORATORY

Results	Indicators	Verification Sources	Assumptions / risks
R1. Laboratory capacity is strengthened to support surveillance and outbreak investigation for a timely response to clinicians and public health officials.	1. Number of laboratories referring samples to CAREC for serotyping. 2. Number of laboratories participating in quality control programs (internal and external)	1. Guidelines for laboratory diagnosis and annual reports. 2. Ministry of Health quarterly epidemiology bulletin 3. Quality control reports (internal and external)	Human resources, equipment, infrastructure and financial resources available Reporting results in real time

Results	Activities
R1. Laboratory capacity is strengthened to support surveillance and outbreak investigation for a timely response to clinicians and public health officials.	R1A1. Periodic sampling of dengue specimens for serotyping R1A2. Support the establishment of the quality control program in the lab

Activities	Task	Execution period*			Responsible	Cost ** US$	Comments
		S	M	L			
R1A1. Periodic sampling of dengue specimens for serotyping to CAREC .	1. Establish an agreement with CAREC for samples shipment						
	2. Prepare an algorithm for the selection of the samples that will be sent to CAREC	X	X	X	PAHO, Ministry of Health		
R1A2. Support the establishment of the quality control program in the lab	1. Participate in an external proficiency program with an international laboratory for dengue diagnostic (ELISA)		x		CAREC Holland Lab		
	2. Maintain the internal quality control program for dengue diagnostic	X	X	X	Aruba lab		

IV. EPIDEMIOLOGICAL SURVEILLANCE

Results	Indicators	Verification Sources	Assumptions / risks
R1. Dengue epidemiological surveillance system for timely alert and opportune response to outbreaks implemented in Aruba	1. 100% of GPs reports suspected cases of dengue to the contagious disease department on the same day of the patient's visit 2. 100% of hospital and laboratories reporting weekly to the contagious disease department on the same day that the results are received 3. At least 50% of GPs and the hospital Emergency Department will implement syndromic surveillance 4. All dengue outbreaks detected and reported to the national and international level according to the IHR.	1. Surveillance records 2. Epidemiological reports 3. Weekly syndromic surveillance reports 4. Outbreak investigation reports 5. Outbreak management reports 6. Laboratory reports	Political commitment Surveillance system established and operating Functional communication system Human and financial resources Supportive legislation Climatic conditions Insufficient resources

Results	Activities					
R1. Dengue epidemiological surveillance system for timely alert and opportune response to outbreaks implemented in Aruba	R1A1. Strengthen the capacity of the existing surveillance system R1A2. Continue to produce Epi-Info reports of dengue activity in Aruba R1A3. Initiate syndromic surveillance at GP offices and Hospital Emergency Department					

Activities	Task	Execution period*			Responsible	Cost** US$	Comments
		S	M	L			
R1A1. Strengthen the capacity of the existing surveillance system	1. Update the national surveillance guidelines to reflect the new case definitions for dengue and severe dengue	X			DOT		
	2. Examine electronic systems for dengue surveillance and update as needed	X			DOT		

	3. Sensitize and train all staff at all levels about the new dengue case definitions	X	X		DOT		
R1A3. Continue to produce and disseminate Epi-Info reports of dengue activity in Aruba	1. Prepare Epi-Info reports at least once per quarter	x			Epidemiologist		
	2. Disseminate all Epi Info reports to all GPs	x			Epidemiologist		
R1A3. Implement syndromic surveillance in order to rapidly identify possible outbreaks	1. Train physicians in syndromic coding	x			Epidemiologist CAREC		
	2. Monitor trends in data submitted	x	x		Epidemiologist CAREC		

*Execution period: S = short (1 year), M= medium (2-3 years), L = long-term (4-5 years)

** Some costs for activities and tasks to be developed by component are being reviewed by the responsible entity.

V. CLINICAL CASE MANAGEMENT

Expected Results	Indicators	Verification Sources	Assumptions / risks
R5.1. Reduce dengue related morbidity by 25%, and case fatality rates by 50% 2. All health workers are able to work with dengue patients, no further complications of the patients and less mortality	1. Case fatality rate 2. Number and % of patients admitted for severe dengue 3. Number and % of patients admitted for dengue with warning signs 4. Number and % of patients admitted to ICU for severe dengue 5. Length of stay in hospital	1. DOT database 2. Hospital records 3. Mortality records 4. Case investigation reports 5. Disease notifications 6. Laboratory reports 7. GP records	Political support Availability of human, material and financial resources Surveillance system functional Insufficient resources and funds Insufficient infrastructure resource, technology Natural disaster

	6. Length of ICU stay		
	7. Number and % of patients seen by GP with suspicion of dengue		
	8. Number and % of patients referred by GP to the hospital for dengue with warning signs		
	9. Number and % of patients referred by GP to the hospital for severe dengue		

Results	Activities
R5. 1. Reduce dengue related morbidity by 25%, and case fatality rates by 50% 2. All health workers are able to work with dengue patients, no further complications of the patients and less mortality	R5A1.Strengthen the Group of Clinical Experts in Dengue R5A2. Revise Guidelines for Clinical Case Management of Dengue based on WHO/PAHO current guidelines. R5A3. Training of health care workers in clinical case management. R5A4. Develop and Implement a Contingency Plan for clinical management at all levels.

Activities	Task	Execution period*			Responsible	Cost** US$	Comments
		S	M	L			
R5A1 Strengthen the Group of Clinical Experts in Dengue	1. Identify leading experts and interested physicians in dengue in the country.	x	x	x	DOT		
	2. Convene periodical meetings of the Clinical Experts in Dengue.	x	x	x	DOT		

	3. Update the Clinical Experts in Dengue according to WHO/PAHO current guidelines	x	x	x	DOT		
R5A2. Revise Guidelines for Clinical Case Management of Dengue based on WHO/PAHO current guidelines.	1. Review meeting of the WHO /PAHO Guidelines for Clinical Management of Dengue.	x			DOT Clinical experts		
	2. Update national algorithm for clinical dengue case management	x	x	x	DOT Clinical experts		
R5A3. Training of health care workers in clinical case management.	1. Create a national training plan on clinical case management for all health care workers.	x			DOT Clinical experts		
	2. Conduct a training of trainers for physicians in Dengue Diagnosis and Treatment.	x	x		DOT Clinical experts		
	3. Sensitize>90% of healthcare workers at different levels of • Doctors in public and private care practice(specialists and general practitioner) • Nurses • Paramedics • Community health	x	x		DOT Clinical experts		

	workers						
	4. Train doctors and nurses in the health system.	x	x	x	DOT Clinical experts		
	5. Advocate and include dengue as a topic in Continuous Medical Education.	x	x		DOT Clinical experts		
R5A4. Develop and Implement a Contingency Plan for clinical management at all levels.	1. Assessment of human resources, technology, material, financial funds	x	x		DOT		
	2. Contingency Plan	x	x	x	DOT		

VI. SOCIAL COMMUNICATION

RESULTS	INDICATORS	VERIFICATION SOURCE	ASSUMPTION/RISKS
R1. Strengthened National Communication Program including area and districts for dengue prevention and control.	1. National Communication Plan revised and updated 2. Number of training seminars for COMBI approach 3. Number of district plans creating according to priority implemented using COMBI approach associated with dengue prevention	1. National Communication Plan 2. List of participants 3. Training reports 4. District plans 5. Educational material	Participation and continuous dialogue amongst various stakeholders Political commitment Adequate resources (materials, finance, human) available Competing priorities Differences in risk perceptions Social and cultural barriers

Results	Activities
R1. Strengthened National Communication Program including all districts for dengue prevention and control.	R1.A1. Establish Communication Working Group R1.A2. Build capacity on COMBI Approach R1.A3. Develop and Implement National Communication Plan including all levels

Activities	Tasks	Time			Person Responsible	Costs	Comments
		S	M	L			
R1.A1. Establish Communication Working Group	1.Establish Terms of Reference (TOR) for Communication Working Group (CWG)	X	X		Health Communication MOH		Including MOH
	2. Identify and train the members of CWG on different types of communications	X	X		Health Communication MOH		The PAHO Office will facilitate training seminars.
	3. Manage and maintain activities of working group	x	x	x	Health Communication MOH		
R1.A2. Build capacity on COMBI Approach	1.Conduct training workshop on COMBI for all health educators and other relevant staff (especially vector control)	X	X	X	Health Communication MOH - PAHO, CWG.		The PAHO Office will facilitate training seminars
	2.Develop training kits	X			Health Communication MOH - PAHO CWG		
R1.A3. Develop and Implement National	1.Analyze information from each component of IMS Dengue to identify	X	X	X	Health Communication		

Communication Plan	areas to be addressed in the communication plan				MOH - CWG		
	2.Define behavior change objectives for educational programme	X	X	X	Health Communication MOH - CWG		
	3.Identify stakeholders to support the development and implementation of communication plan	X	X	X	Health Communication MOH - CWG		Media, Ministry of Education,
	4. Prepare and implement the National Communication Plan	X	X	X	Health Communication, MOH - CWG		
	5. Monitoring and evaluation of National Communication Plan	X	X	X	Health Communication MOH - CWG		Internal and external evaluation

Framework for Contingency Plan to Respond to Dengue Outbreaks on Aruba

Activities	Task	Responsible	Cost ** US$ comments
1. Revise and strengthen the National Emergency Contingency Plan (created in 2010) to respond to dengue outbreaks.	1. Review and standardize the existing contingency plans and protocols for Aruba	DOT, PAHO, CAREC	
	2. Review the criteria to confirm and declare the start of a dengue outbreak.		
	3. Disseminate the revised protocol at all levels.		
2. Confirmation / Declaration of an outbreak	1. Confirm the occurrence of a dengue outbreak based on the DOT's definition of dengue outbreak	DOT, Epi	
	2. Declare the occurrence of a dengue outbreak and notify the national and international levels (PAHO, CAREC and IHR notification when appropriate) and all relevant local stakeholders	DOT, Ministry of Health, Health Department	
	3. Implement national emergency contingency plan	DOT, Department of Health	
	4. Activate the disaster team if needed	DOT	
3. Monitor and assess the epidemic situation	1.The Dengue Outbreak Team will intensify activities during an outbreak	DOT	

	2. Update all relevant sectors, national and international organizations about the outbreak	DOT, Department of Health/ Communications	
	3. Analyze and interpret data and develop outbreak reports	Epi, Department of Health	
	4. Utilize DOT protocol to determine the phase of the outbreak and guide intervention based on the outbreak phase.	DOT, Department of Health	
4. Direct and coordinate the response, mobilize resources and facilitate national and international collaboration.	1. Determine the needs for additional resources and international collaboration	DOT, Health Department	
	2. Ensure necessary resources are provided for all components of dengue IMS.	DOT, Ministry of Health, Health Department	
	3. Establish technical and logistical support and collaboration for all components of IMS dengue Aruba	DOT, Ministry of Health, Health Department	
5. Utilize and enhance the epidemiological surveillance system for monitoring and decision making.	1. Intensify dengue surveillance activities at all levels	DOT, GKMB	
	2.Sensitize and train multidisciplinary teams	DOT	
	3.Analyze data and prepare and submit reports as established.	Epi	
	4. Disseminate data and reports to all levels	Epi, Department of Health	
6. Optimize the use of laboratory resources	1. Implement the sampling criteria for confirmation of suspected cases of dengue to monitor the epidemic according to CAREC PAHO/WHO guideline/	DOT, laboratories	

	DOT guideline		
	2. Timely reporting of laboratory results to all levels of health care (results available to physicians within 2 days sample collection).	DOT, laboratories	
7. Organize patient care services	1. Implement patient care protocol using WHO/PAHO Guidelines (2009 Updated Guidelines with color coded sections)	Department of Health, Hospital, HAVA, VMSA (national organization for GP/ medical specialist)	
	2. Conduct triage to reduce dengue morbidity and mortality and to optimize resources.	Department of Health, Hospital, HAVA, VMSA (national organization for GP/ medical specialist)	
	3. Ensure adequate surge capacity	Department of Health, Hospital, HAVA, VMSA (national organization for GP/ medical specialist)	
	4. Ensure a functional referral system	Department of Health, Hospital, HAVA, VMSA (national organization for GP/ medical specialist)	
8. Implement the risk communication plan	1. Activate the risk communication team	Department of Health, Health promotion united, DOT	

	2.Conduct training in risk communication, unless already recently conducted in Aruba	Department of Health, Health promotion united, PAHO	
	3. Coordinate with partners (media, community leaders, private and public sector, NGOs, stakeholders) and establish communication channels.	Department of Health, Health promotion united, DOT	
	4. Implement the Communication Policy for public announcements and ongoing release of information	Department of Health, Health promotion united, DOT, Epi	
	5. Establish and maintain a mechanism to monitor communication messages and channels	Department of Health, Health promotion united	
	6.Implement and monitor risk communication plan according to outbreak phase	DOT, Department of Health, Health promotion united	
9. Intensify vector control measures	1. Implement emergency vector control procedure according to PAHO/WHO recommendations and national contingency plan	DOT, GKMB,	
10. Monitor and evaluate the contingency plan (after the outbreak has concluded)	1. Monitor the implementation of the contingency plan for all components of dengue IMS.	DOT, Department of Health, GKMB	
	2.Evaluate the efficacy of the contingency plan and update the plan as needed	DOT, Department of Health, GKMB	
	3. Prepare and disseminate the comprehensive final report for the outbreak	DOT, Department of Health, GKMB	