



Pan American Health Organization (PAHO)
Division of Disease Prevention and Control

A TIMELINE FOR DENGUE IN THE AMERICAS TO DECEMBER 31, 2000 AND NOTED FIRST OCCURENCES

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1600s

1635 suspected dengue in Martinique and Guadeloupe

1700s

1780 dengue-like disease Philadelphia, PA

1800s

1818 outbreak in Peru

*50,000 cases

*1st reported epidemic

1824-28 PANDEMIC

1827-28 1st recorded pandemic of dengue in the Caribbean-Gulf-Atlantic region

*began in the Virgin Islands then moved west to Cuba, Jamaica, Venezuela, and the U.S. port cities of Pensacola, FL; Charleston, SC; Savannah, GA; and New Orleans, LA

*finally moved into Mexico (Veracruz) where it disappeared in 1828

*other affected countries include Curacao, the Lesser Antilles, northern Colombia, and Bermuda

*hemorrhages from the gums, bowel, and stomach reported

1828-1850 smaller outbreaks recorded throughout the Caribbean-Gulf-Atlantic region

1845-51 PANDEMIC

1845 cases reported in St. Louis, MO, USA and Rio de Janeiro, Brazil

1846-48 epidemic in Brazil

1850 epidemic in the southern U.S. cities of New Orleans, LA; Brownsville, TX; Charleston, SC; Augusta, GA; Woodville, MS; Mobile, AL; and Savannah, GA

*Havana, Cuba also affected

*hemorrhages from the gums, bowel, and stomach reported

1851 dengue reported in Lima, Peru

1851-53 epidemic in Brazil

1870-73 PANDEMIC

1873 cases reported in Alabama, Louisiana and as far north as Vicksburg, MS

*40,000 affected in New Orleans, LA

1879-80 epidemic in the Caribbean & southern U.S.

1882 1st outbreak in Bahamas

1885-86 epidemic in Austin and Texas gulf ports

*16,000 of 22,000 sick

*hemorrhagic symptoms reported

1897 epidemic in Texas

*almost every city and village across state affected

*hemorrhagic symptoms reported

1897-99 epidemic in the Caribbean & southern U.S.

1900s

1901-07 PANDEMIC

1904 cases reported in Florida, Texas, and Panama

1905-07 cases reported throughout the Caribbean from the Mississippi to Colombia and Cuba

1912-16 PANDEMIC

1912 cases reported in Panama

1914 cases reported in Iquique, Chile

1915 epidemic in Puerto Rico

1916 cases reported in northern Argentina

1916 epidemic in Brazil

1921-22 outbreak in the Bahamas

1922 epidemic in Texas

*50,000-600,000 persons affected (30,000 in Galveston alone)

*hemorrhagic symptoms reported

1922-24 cases reported in Louisiana

1922 7,561 persons affected

1923 1,376 persons affected

1924 1 person affected

1923 epidemic in Rio de Janeiro, Brazil

1926 last epidemic in Argentina for 72 years

1941-46 epidemic in the Caribbean, Mexico, Panama, Venezuela, and Texas Gulf cities

*cases reported in Puerto Rico, Bermuda, Cuba (1944), and the Bahamas (1946)

*DEN-2 was identified in Panama in 1941-42

-1st report of DEN-2 in Panama

-epidemiological evidence indicated DEN-1 may have occurred in previous years

*3 epidemics before this one also occurred in the Caribbean and southern U.S. during the 1900s

1942 Pan-American Sanitary Conference Resolution CSP11.R11

*1st mention of prevention and control of *Ae. aegypti* in Brazil

1944 outbreak in Cuba

1945 last continental dengue epidemic in the USA occurred in the Mississippi Delta region of Louisiana

- *lasted from September 1 to October 19
- *143 cases at original site with 100 more in nearby area
- *WWII veteran returning from Pacific theater carried dengue back to U.S. in August

1947 PAHO Directing Council Resolution CD1.R1

- *adopted hemisphere-wide *Ae. aegypti* eradication program to combat urban yellow fever

1949 PAHO Executive Committee Resolutions CE7.R15 and CE8.R13 and Directing Council Resolution CD3.R18

- *Recommended the elimination of Portugal's proof of vaccination against yellow fever requirement for visitors from South American countries.

1950 PAHO Executive Committee Resolution CE10.R16

- *Recommended the elimination of Portugal's proof of vaccination against yellow fever requirement for visitors from South American countries.

1950s cases reported in Peru

1952 virtual eradication of *Ae. aegypti* from Colombia

- *early 1900s to 1952 dengue endemic in some regions of the Magdalena Valley and possibly other regions of Colombia
- based on serological evidence of DEN-2 infections

1950s and early 1960s dengue transmission suppressed by *Ae. aegypti* Eradication Program

1953 DEN-2 isolated for 1st time in the Caribbean

- *found in Trinidad
- 1st report of DEN-2 in Trinidad

1958 Pan-American Sanitary Conference Resolution CSP15.R35

- *Certified the eradication of *Ae. aegypti* from Belize, Bolivia, Brazil, Ecuador, French Guiana, Nicaragua, Panama, Paraguay, Peru, and Uruguay.
- *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities

1958-2000 *Ae. aegypti* eradication efforts

Belize

- 1958 certified eradication of *Ae. aegypti*
- 1967 re-infestation with *Ae. aegypti*
- 1974 re-eradication of *Ae. aegypti*
- 1975 re-infestation with *Ae. aegypti*
- 1978 1st report of dengue post eradication efforts
- 1998 1st report of DHF

Bolivia

- 1958 certified eradication of *Ae. aegypti*
- 1980 re-infestation with *Ae. aegypti*
- 1987 1st report of dengue post eradication efforts

Brazil

- 1958 certified eradication of *Ae. aegypti*

1967 re-infestation with *Ae. aegypti*
1973 re-eradication of *Ae. aegypti*
1976 re-infestation with *Ae. aegypti*
1982 1st report of dengue post eradication efforts
1986 1st report of DHF

Ecuador

1958 certified eradication of *Ae. aegypti*
1975 re-infestation with *Ae. aegypti*
1988 1st report of dengue post eradication efforts
2000 1st report of DHF

French Guiana

1958 certified eradication of *Ae. aegypti*
1964 re-infestation with *Ae. aegypti*
1970 1st report of dengue post eradication efforts
1991 1st report of DHF

Nicaragua

1958 certified eradication of *Ae. aegypti*
1967 re-infestation with *Ae. aegypti*
1984 1st report of dengue post eradication efforts
1985 1st report of DHF

Panama

1958 certified eradication of *Ae. aegypti*
1969 re-infestation with *Ae. aegypti*
1970 re-eradication of *Ae. aegypti*
1972 re-infestation with *Ae. aegypti*
1973 re-eradication of *Ae. aegypti*
1975 re-infestation with *Ae. aegypti*
1976 re-eradication of *Ae. aegypti*
1981 re-infestation with *Ae. aegypti*
1982 re-eradication of *Ae. aegypti*
1985 re-infestation with *Ae. aegypti*
1993 1st report of dengue post eradication efforts
1995 1st report of DHF

Paraguay

1958 certified eradication of *Ae. aegypti*
1981 re-infestation with *Ae. aegypti*
1988 1st report of dengue post eradication efforts

Peru

1958 certified eradication of *Ae. aegypti*
1984 re-infestation with *Ae. aegypti*
1990 1st report of dengue post eradication efforts
2001 1st report of DHF

Uruguay

1958 certified eradication of *Ae. aegypti*

1997 re-infestation with *Ae. aegypti*

Guatemala

1959 certified eradication of *Ae. aegypti*
1967 re-infestation with *Ae. aegypti*
1978 1st report of dengue post eradication efforts
1995 1st report of DHF

Honduras

1959 certified eradication of *Ae. aegypti*
1967 re-infestation with *Ae. aegypti*
1978 1st report of dengue post eradication efforts
1978 1st report of DHF

Guyana

1960 certified eradication of *Ae. aegypti*
1963 reported eradication of *Ae. aegypti*
1968 re-infestation with *Ae. aegypti*
1977 1st report of dengue post eradication efforts

El Salvador

1960 certified eradication of *Ae. aegypti*
1966 reported eradication of *Ae. aegypti*
1978 1st report of dengue post eradication efforts
1987 1st report of DHF

Costa Rica

1961 certified eradication of *Ae. aegypti*
1988 re-infestation with *Ae. aegypti*
1993 1st report of dengue post eradication efforts
1995 1st report of DHF

Chile

1961 certified eradication of *Ae. aegypti*

Mexico

1963 certified eradication of *Ae. aegypti*
1967 re-infestation with *Ae. aegypti*
1971 1st report of dengue post eradication efforts
1984 1st report of DHF

Argentina

1965 certified eradication of *Ae. aegypti*
1986 re-infestation with *Ae. aegypti*
1998 1st report of dengue post eradication efforts

1959 PAHO Directing Council Resolution CD11.R13

*Certified eradication of *Ae. aegypti* from Guatemala and Honduras.

*Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.

- 1960 PAHO Directing Council Resolution CD12.R4
 *Certified eradication of *Ae. aegypti* from El Salvador.
 *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
- 1960s Puerto Rico established a dengue surveillance system
- 1961 PAHO Directing Council Resolution CD13.R35
 *Certified eradication of *Ae. aegypti* from Chile and Costa Rica.
 *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
 *Requested the Director obtain the information needed to determine the feasibility of attaining hemisphere-wide eradication by 1966.
- 1962 Pan American Sanitary Conference Resolution CSP16.R31
 *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
 *Expressed satisfaction with the eradication campaigns underway in some countries.
 *Requested the Director strongly encourage campaigns to eradicate *Ae. aegypti* as soon as possible.
- 1963 PAHO Directing Council Resolution CD14.R13 and CD14.R14
 *CD14.R13 certified eradication of *Ae. aegypti* from Mexico.
 *CD14.R14 appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
- 1963-64 1st laboratory confirmed epidemic in the Americas
 *affected Jamaica, Puerto Rico, islands of the Lesser Antilles, and Venezuela
 *associated with DEN-3
 -1st documentation of DEN-3 in the Americas
 *1st report of DEN-3 in Antigua & Barbuda, Cuba, the Dominican Republic, Dominica, Jamaica, Puerto Rico, St. Kitts and Nevis, Anguilla, and Venezuela
 -1,500 cases in Jamaica; 27,000 in Puerto Rico; and at least 10,000 in Venezuela;
 sporadic cases in Cuba
- 1964 PAHO Directing Council Resolution CD15.R28
 *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
 *Instructed the Director to intensify studies to solve the resistance problem and to take appropriate measures to complete the eradication project as soon as possible.
- 1964 outbreak in Curacao
 *based only on clinical evidence
- 1965 PAHO Directing Council Resolution CD16.R28
 *Certified eradication of *Ae. aegypti* from Argentina.
 *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
 *Instructed the Director to intensify studies to solve the resistance problem and to take appropriate measures to complete the eradication project as soon as possible.

- 1966 Pan American Sanitary Conference Resolution CSP17.R19
- *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
 - *Requested the Director strongly encourage campaigns to eradicate *Ae. aegypti* as soon as possible, coordinate a regional eradication efforts, and obtain funds to finance the campaign.
- 1966 Pan American Sanitary Conference Resolution CSP17.R20
- *Adopted the requirements for eradication established by the PASB.
 - *Confirmed these requirements must be met before a country can be certified as eradicated.
 - *Established countries must meet the PASB standards and
 - Eliminate all *Ae. aegypti* colonies from ecologically favorable conditions for vector
 - Eliminate all colonies in ecologically favorable conditions except those in scientific centers, and
 - Ensure that colonies in unfavorable conditions are maintained so as to prevent re-infestation of other areas.
 - *Recommended the Director organize a group of experts to determine standards for existing colonies so countries can still be certified as eradicated.
 - *Requested the Director submit the standards at the next meeting of the Directing Council.
- 1967 PAHO Executive Committee Resolution CE56.R14
- *Reaffirmed that governments of infested countries should overcome any administrative barriers and give the highest priority to achieving eradication.
 - *Recommended governments provide financial and material help to each other in their eradication campaigns and/or obtain loans for *Ae. aegypti* eradication.
 - *Recommended the Director provide assistance to the countries in obtaining funds and providing support to each other, strengthen the financial contribution going towards *Ae. aegypti* eradication, and look into establishing a special *Ae. aegypti* eradication campaign account.
- 1967 PAHO Directing Council Resolution CD17.R18
- *Appealed to infested countries to intensify their anti-*Ae. aegypti* activities and encouraged vector-eradicated countries to maintain strict vigilance to prevent re-infestation.
 - *Recommended governments provide financial and material help to each other in their eradication campaigns.
 - *Recommended international lending agencies provide funds to governments for *Ae. aegypti* eradication and instructed the Director to help governments use this aid.
 - *Authorized the Director to seek more funds for eradication.
 - *Determined the PASB may directly participate in eradication programs in special circumstances and at the request of the country.
 - *Requested the PASB establish, maintain, and periodically evaluate these services.
 - *Authorized the Director to limit certification of eradication to 3 years then request re-certification thereafter.
- 1967 Brazil and Guatemala re-infested with *Ae. aegypti*
- 1968 Guyana re-infested with *Ae. aegypti*
- 1968 1st report of DHF-like disease in Curacao and Venezuela
- 10/1968-1/69 DEN-2 outbreak in Curacao
- *confirmed by serological studies
 - *reached peak at end of November 1968

- *1st report of DEN-2 in Curacao

- 1968-69 dengue epidemic in the Caribbean and Venezuela
 - *in Jamaica DEN-3 responsible for 1968 outbreak but DEN-2 was primary serotype in 1969
 - *in Haiti both DEN-2 and DEN-3 recovered
 - 1st report of DEN-2 and DEN-3 in Haiti
 - *in Puerto Rico and the Lesser Antilles only DEN-2 was noted
 - 1st report of DEN-2 in Puerto Rico

- 1968-80 sporadic cases of DHF reported throughout the Region
 - *only 60 cases reported in 5 countries → Curacao, Honduras, Jamaica, Puerto Rico, Venezuela

- 1969 PAHO Executive Committee Resolution CE61.R9
 - *Requested the Director alert the governments that suspended their eradication programs of the seriousness of the situation.
 - *Recommended countries eradicate *Ae. aegypti* as soon as possible.
 - *Emphasized the need for *Ae. aegypti* free countries to maintain surveillance.

- 1969 PAHO Directing Council Resolution CD19.R12
 - *Re-iterated that countries must meet the PASB standards and
 - Eliminate all *Ae. aegypti* colonies except those in scientific centers from conditions ecologically favorable for the vector; and
 - Ensure that colonies in unfavorable conditions are maintained so as to prevent re-infestation of other areas.
 - *Adopted the standards scientific colonies in ecologically unfavorable areas must meet if those colonies are not to prevent a country from being declared eradicated.
 - *Recommended countries distribute the regulations as soon as possible.

- 1969 PAHO Directing Council Resolution CD19.R23
 - *Requested the director sponsor a study of the strategy and methods of preventing the diseases transmitted by *Ae. aegypti* and
 - name a multidisciplinary group to review the existing strategy for *Ae. aegypti* borne diseases and to define a study that would examine all possible alternative systems including their public health and economic impacts;
 - engage an independent agency to carry out the study designed by the multidisciplinary group; and
 - seek voluntary contributions to finance the study.
 - *Recommended countries continue their eradication efforts and prevent re-infestation.

- 1969 Panama temporarily re-infested with *Ae. aegypti*

- 1970 PAHO Pan American Sanitary Conference Resolution CSP18.R43
 - *Recommended countries free of *Ae. aegypti* strengthen their surveillance measures.
 - *Requested re-infested countries adopt measures to re-eradicate *Ae. aegypti*.
 - *Urged infested countries to achieve eradication as soon as possible and to take action to prevent the spread of the vector into *Ae. aegypti* free countries.
 - *Authorized the Director to carry out the study recommended by the PAHO Study Group on the Prevention of Aedes aegypti-borne Diseases.
 - *Requested the Director submit a report on the cost-benefit study.

- 1970 1st report of DEN-2 in French Guiana

1970 Panama re-eradicated *Ae. aegypti*

1970-72 sporadic DEN-2 activity in Puerto Rico

1971 PAHO Executive Committee Resolution CE66.R5 and Directing Council Resolution CD20.R13

*Reaffirmed that any studies or investigations will not entail any reduction in existing eradication efforts or re-infestation prevention measures.

*Authorized the Director to contract the necessary services for carrying out cost-benefit studies.

*Requested infested countries attempt to eradicate *Ae. aegypti* as soon as possible and vector-free countries maintain surveillance to prevent re-infestation.

1971-72 DEN-2 epidemic in Colombia

*1st cases of dengue since 1952

*1st report of DEN-2 in Colombia

*estimates of >500,000 cases

1972 PAHO Directing Council CD21.R25

*Requested re-infested countries adopt measures to re-eradicate *Ae. aegypti*.

*Requested the Director convene a multidisciplinary group of experts with knowledge about *Ae. aegypti* and the diseases it transmits to make recommendations based on new knowledge and experience.

1972 Panama temporarily re-infested with *Ae. aegypti*

1972-73 DEN-2 epidemic in southern part of Puerto Rico

*> 7,000 cases

*DEN-2 cases continued to appear until 1975

1973 PAHO Executive Committee Resolution CE70.R17 and Directing Council Resolution CD22.R26

*Urged the governments to organize or intensify surveillance activities of diseases transmitted by *Ae. aegypti* without sacrificing vector eradication efforts.

*Encouraged the governments to continue research on other control mechanisms for diseases transmitted by *Ae. aegypti*.

1973 dengue prevention became driving force behind *Ae. Aegypti* eradication program

1973 serological survey done in Curacao

*no indication any serotype other than DEN-2 was circulating in Curacao at the time

1973 Brazil and Panama re-eradicated *Ae. aegypti*

1974 Belize re-eradicated *Ae. aegypti*

1975 PAHO Directing Council Resolution CD23.R23

*Requested the Director ask the Scientific Advisory Committee to study the existing *Ae. aegypti* situation and review existing PAHO policy in light of recent developments and scientific advancements.

*Asked the Director to prepare an updated policy statement on *Ae. aegypti*, yellow fever, and dengue based on the report.

1975 epidemic in Puerto Rico

- *3 patients with serologically confirmed dengue present hemorrhagic manifestations
- only 1 presentation typical of DHF
- 1st report of DHF-like disease in Puerto Rico
- 1st time DSS described in Western Hemisphere

1975 Ecuador and Panama re-infested with *Ae. aegypti*

1975-77 DEN-3 epidemic in upper Magdalena Valley of Colombia

- *reported from at least 50 towns
- *1st report of DEN-3 in Colombia

1976 PAHO adopts a more flexible policy urging vector control and vaccination instead of hemisphere-wide eradication

1976 Brazil re-infested with *Ae. aegypti*

1976 Panama re-eradicated *Ae. aegypti*

1977 PAHO Executive Committee Resolution CE78.R18 and Directing Council Resolution CD25.R16

- *Maintained existing policy of eradication and encouraged countries to overcome any obstacles preventing eradication or re-eradication.
- *Recommended vector-free countries strengthen surveillance to prevent re-infestation.
- *Requested countries support epidemiological surveillance and yellow fever vaccination.
- *Requested the Director ensure the availability of vaccine in the event of an emergency, ensure the availability of insecticides and equipment, help countries train personnel for epidemiological surveillance and eradication campaigns, and promote and support research on the biology and control of *Ae. aegypti* and yellow fever.

1977-80 DEN-1 epidemic in the Caribbean

- *began in Jamaica
- 1st report of DEN-1 in Jamaica
- 400,000 members of work force affected
- 1st report of DHF-like disease in Jamaica
- *spread to Cuba
- 1st report of DEN-1 in Cuba
- epidemic peaked here in Sept/Oct 1977
- 477,440 cases reported in 1977 and 75,692 in 1979
- estimates exceed five million cases
- was 1st dengue epidemic since 1945
- *moved to the Bahamas in late Oct 1977 then into Antigua & Barbuda, Aruba, Barbados, Curacao, Dominica, Grenada, Guadeloupe, Guyana, Haiti, Martinique, Montserrat, Puerto Rico, St. Kitts, St. Martin, St. Vincent and the Grenadines, Trinidad, Turks and Caicos, and the Virgin Islands (UK and US)
- 1st report of DEN-1 in the Antigua & Barbuda, Aruba, Bahamas, Barbados, Curacao, Dominica, Grenada, Guadeloupe, Guyana, Haiti, Martinique, Montserrat, Puerto Rico, St. Kitts, St. Martin, St. Vincent and the Grenadines, Trinidad, Turks and Caicos, and the Virgin Islands (UK and US)
- in Puerto Rico epidemic lasted from July to December 1977; approximately 355,000 cases; DEN-1 detected after end of DEN-2/ DEN-3 epidemic
- in Martinique 47,000 cases reported between October 1977 and June 1978

- DEN-3 isolated from a case in the Dominican Republic and one from Haiti
- *spread to South America in 1978
 - Colombia, Surinam, French Guiana and Venezuela affected
 - ~in Venezuela over 100,000 cases reported
 - ~1st report of DEN-1 in Colombia, Surinam, French Guiana, and Venezuela
- *spread to Central America in 1978
 - began in Honduras then spread to El Salvador, Guatemala, and Belize
 - ~in Honduras an estimated 134,000 cases occurred
 - ~1st report of DEN-1 in Honduras, El Salvador, Guatemala, and Belize
 - ~1st report of DHF-like disease in Honduras
- *reached southeastern Mexico in late 1978
 - by July 1979 reached Chiapas, Quintana Roo, and Oaxaca
 - in October and November 1979 outbreaks occurred near Tampico on the coast of the Gulf of Mexico and in Merida
 - by June 1980 six border towns had reported cases
 - 1st report of DEN-1 in Mexico
- *spread to Brownsville, TX in September 1980
 - 1st indigenous case in US since 1945
 - 1st report of DEN-1 in US
- *none of the cases in any of the outbreaks met WHO criteria for DHF or DSS

1978 Pan American Sanitary Conference Resolution CSP20.R22

- *Maintained the present policy of eradication and encourage countries to overcome any obstacles preventing eradication or re-eradication.
- *Requested the Director convene a Working Group to prepare a regional plan for the phased eradication of *Ae. aegypti*, develop a basic manual providing step-by-step guidelines for dealing with vector control emergencies, give all assistance necessary to national eradication programs, and ensure the availability of yellow fever vaccine in the event of an emergency
- *Recommended the strengthening of clinical, epidemiological, and laboratory surveillance of dengue and yellow fever and the designation of national collaborating centers for such surveillance.
- *Recommended PAHO specifically allocate funds for *Ae. aegypti* eradication programs and for the prevention and control of diseases transmitted by this vector.

1978 DEN-3 isolated in Puerto Rico

- *not seen again in the Americas for 16 years

1980 surveillance system established in south Texas

1980 1st report of DEN-4 in Mexico

1981 PAHO Directing Council Resolution CD28.R21

- *Requested the Director organize a technical group to study the problem and propose possible alternative courses of action for the eradication of *Ae. aegypti* and the control of dengue and yellow fever.

1981 1st major epidemic of dengue hemorrhagic fever (DHF) in the Americas

- *caused by DEN-2 in Cuba
 - 1st report of DEN-2 in Cuba
 - 344,203 cases of dengue, 10,312 cases of DHF and 158 deaths reported
 - 1st reported cases of DHF in Cuba

*over 77,000 DHF cases reported from 28 countries between 1981 and the end of 2000

1981 1st report of DEN-2 in Mexico

*DEN-1 outbreaks also occurred

1981 Surinam intensified its surveillance program because of reports of DEN-2 and DEN-4 in the Caribbean

1981 Panama temporarily re-infested with *Ae. aegypti*

1981-83 DEN-4 emerged in the Americas

*identified in Puerto Rico in September 1981

-1st report of DEN-4 in Puerto Rico

-DEN-1 also caused outbreaks in Puerto Rico in 1981

*caused outbreaks in the Caribbean, northern South America, Central America, and Mexico

-1st report of DEN-4 in Anguilla, Curacao, Dominica, Grenada, Jamaica, Puerto Rico, St. Kitts, St. Nevis, , St. Lucia, and the Virgin Islands (UK)

*in 1981 cases reported in the U.S.

*Jan 82 cases reported in Surinam

-1st report of DEN-4 in Surinam

-1st report of DHF-like disease in Surinam

-1st report of DEN-2 in Surinam

*early 1982 cases reported in Barbados, Belize, Dominican Republic, El Salvador, French Guiana, Guadeloupe, Haiti, Martinique Puerto Rico, St. Vincent and the Grenadines, Trinidad and Tobago

-1st report of DEN-4 in Barbados, Belize, Dominican Republic, El Salvador, French Guiana, Guadeloupe, Haiti, Martinique St. Martin, and St. Vincent and the Grenadines

*March-May 1982 in Boa Vista, Brazil

-1st report of DEN-4 in Brazil

-DEN-1 also caused epidemics

~1st report of DEN-1 in Brazil

-an estimated 7,000 cases occurred

1981 DEN-1, DEN-2, and DEN-4 outbreaks in Trinidad and Tobago

*1st report of DEN-4 in Trinidad and Tobago

1981 DEN-2 and DEN-4 outbreaks in Jamaica

*1st report of DEN-2 in Jamaica

*1st report of DEN-4 in Jamaica

1982 Pan American Sanitary Conference Resolution CSP21.R28

*Maintained the present policy of eradication and encourage countries to overcome any obstacles preventing eradication or re-eradication.

*Recommended vector-free countries increase surveillance efforts to prevent re-infestation while countries still infested prevent the export of the vector to other countries.

*Recommended countries create emergency plans to inventory resources available in other countries and a plan for implementation in the event of an epidemic.

*Recommended countries assist each other in eradication of the vector.

*Requested the Director coordinate and promote all activities needed to eradicate *Ae. aegypti*.

*Requested the Director coordinate and promote all activities needed to respond in the event of an epidemic of dengue hemorrhagic fever.

- 1982 DEN-2 and DEN-4 transmission detected in Tamaulipas and Oaxaca, Mexico
- 1982 1st report of DEN-2 in U.S.
- 1982 1st report of DHF in Surinam
- 1982 Panama re-eradicated *Ae. aegypti*
- 1983 DEN-1 outbreaks throughout Mexico
 *began in Puebla
 *later ranged from Chiapas (south) to Jalisco (north)
 *cases also seen in Veracruz and Yucatan on the east coast
- 1983 1st report of DEN-3 in U.S.
- 1983 1st report of DEN-4 in Colombia
- 1983 No reported cases of DHF in the Region
 *only year from 1981 to 2000
- 1984 DEN-4 associated DHF epidemic in Mexico
 *occurred in Merida and the rural areas of Yucatan
 *1st report of DHF-like disease in Mexico
- 1984 DEN-1 outbreak in Belize
- 1984 1st report of DEN-1 in the Dominican Republic and Nicaragua
- 1984 DEN-1 and DEN-2 isolated in Venezuela
 *1st report of DEN-2 in Venezuela
- 1984 1st report of DEN-2 in Honduras
- 1984 Peru re-infested with *Ae. aegypti* (detected in Iquitos)
- 11/84-3/85 DEN-1 outbreak in Aruba
 *24,000 cases reported
- 1985 PAHO Directing Council Resolution CD31.R26
 *Urged the countries to overcome any barriers to the eradication of *Ae. aegypti* and to prevent the exportation of the vector to other countries.
 *Recommended countries maintain their surveillance efforts to prevent re-infestation.
 *Requested the Director support the mobilization of resources; promote intersectoral mechanisms which may facilitate eradication and control; and to stimulate new prevention, surveillance, and control approaches.
- 1985 DEN-1, DEN-2 and DEN-4 isolated in Maracaibo and Caracas, Venezuela
 *1st report of DEN-4 in Venezuela
- 1985 dengue epidemic in Nicaragua

- *2 outbreaks occurred
 - *17,482 total cases reported
 - *both DEN-1 and DEN-2 were isolated
 - 1st report of DEN-2 in Nicaragua
- 1985 1st report of DHF-like disease in Aruba, Colombia, and Nicaragua
- 1985 1st report of DEN-2 in the Dominican Republic and St. Martin
- 1985 1st report of DEN-4 in Honduras
- 1985 Panama re-infested with *Ae. aegypti*
- 1986 Pan American Sanitary Conference Resolution CSP22.R25
 - *Requested member countries recognize the seriousness of the *Ae. aegypti* and *Ae. albopictus* problem and support PAHO activities towards its solution.
 - *Recommended countries begin or continue effective surveillance of *Ae. albopictus* and measures to control it or eradicate it if possible.
 - *Urged the Director of the PASB to prepare a plan to combat *Ae. albopictus*, to support country surveillance and control measures of *Ae. albopictus*, and to promote research to improve control.
- 1986 Argentina re-infested with *Ae. aegypti*
- 1986 (March) DEN-1 outbreaks in Rio de Janeiro, Brazil
 - *1st isolation of DEN-1 in Rio de Janeiro
 - *1st confirmed cases of dengue in Rio de Janeiro since 1923
 - *estimated to have caused over 2,000,000 clinical cases
 - *1st report of DHF-like disease in Brazil
- 1986 autochthonous transmission of DEN-1 in Texas
 - *Laredo, Corpus Christi, and Brownsville affected
- 1986 DEN-4 associated DHF epidemic in Puerto Rico
- 1986 (October) 1st documented case of DHF in St. Lucia of the Lesser Antilles
- 1986 *Ae. albopictus* found in seventeen continental U.S. states and three Brazilian states
- 1986-87 DEN-1 associated DHF deaths in Brazil
 - *1st report of DHF in Brazil
- 1987 PAHO Executive Committee Resolution CE99.R6
 - *Urged countries to prepare and integrate an *Ae. albopictus* control activities into existing *Ae. aegypti* control strategies.
 - *Asked the Director to support these national plans with all existing resources.
- 1987 DEN-1 epidemic in Bolivia
 - *1st appearance of dengue in Bolivia
 - *1st report of DEN-1 in Bolivia
- 1987 DEN-1 outbreak in Guatemala

- *2,318 cases reported
- 1987 autochthonous transmission of DEN-1 in Texas
- 1987 1st report of DEN-2 in Barbados and El Salvador
- 1987 outbreak in Caracas, Venezuela
 - *primarily DEN-2 isolated but some DEN-4 present
- 1987 DEN-4 associated DHF epidemic in El Salvador
 - *1st report of DHF in El Salvador
 - *1987-88 suspected DHF epidemic
 - *few cases laboratory confirmed
- 1987 DEN-4 outbreak in Choluteca in southern Honduras
 - *8,300 estimated cases
- 1988 PAHO Executive Committee Resolution CE101.R19 and Directing Council Resolution CD33.R19
 - *Urged *Ae. aegypti* and *Ae. albopictus* infested countries to implement surveillance and control measures.
 - *Requested countries report periodically to the Director on *Ae. albopictus* infestations.
 - *Urged countries to implement regulations regarding importation and exportation of used tire casings and to prepare national plans of action for *Ae. albopictus* similar to those for *Ae. aegypti*.
 - *Requested the Director support countries in *Ae. albopictus* surveillance and control measures.
- 1988 Panama established dengue active surveillance program
- 1988 DEN-1 epidemics in Ecuador and Paraguay
 - *1st appearance of dengue in Paraguay in 50 years and in Ecuador in at least 32 years
 - *1st report of DEN-1 in Ecuador
 - *1st report of DEN-1 in Paraguay
- 1988 (summer) DEN-1 outbreak in Taxco, Guerrero State, Mexico
 - *highest altitude at which dengue transmission has been documented (1700 meters)
- 1988 1st report of DEN-2 in Guatemala
- 1988 1st report of DEN-4 in Aruba and Guatemala
- 1988 1st report of DHF-like disease in the Dominican Republic
- 1988 Costa Rica re-infested with *Ae. aegypti*
- 1989 1st report of DEN-2 in Dominica, Guadeloupe, Guyana, Martinique, and the Virgin Islands (U.S.)
- 1989 small outbreak in the Bahamas from September 19 to October 15
 - *laboratory confirmed
 - *probably DEN-2
 - 1st report of DEN-2 in the Bahamas
- 1989 DEN-2 outbreak in Grenada

*1st report of DEN-2 in Grenada

1989-90 2nd major outbreak of DHF in the Americas
*occurred in Venezuela
*DEN-2 was predominant serotype but DEN-1 and DEN-4 also present

1990 DEN-1 epidemic in Iquitos in the Department of Loreto in the Amazon Region and in Tarapoto in the Department of San Martin, Peru
*1st report of DEN-1 in Peru
*DEN-4 also isolated
-1st report of DEN-4 in Peru

1990 DEN-1 outbreak in Ecuador

1990 DEN-1 reported in Trinidad for the 1st time since 1985

1990 DEN-2 outbreak in Nicaragua
*DEN-1 and DEN-3 also isolated

1990 1st report of DEN-2 in Brazil
*isolated in Rio de Janeiro

1990 1st report of DEN-2 in Bolivia, Ecuador and Martinique

1990 DEN-3 reported in the U.S.

1990 1st report of DEN-4 in Virgin Islands (U.S.)

1990-91 DHF outbreak in Rio de Janeiro, Brazil

1990-91 1st dengue outbreak in the state of Sao Paulo, Brazil
*DEN-1 isolated

1991 1st report of DEN-3 in El Salvador

1991 DEN-3 reported in the U.S.

1991-92 DEN-1 and DEN-2 outbreaks in Venezuela
*>12,000 cases

1991-92 1st dengue/DHF epidemic in French Guiana
*associated with DEN-2

1992 1st report of DHF in Grenada and Trinidad & Tobago

1992 1st report of DEN-4 in Nicaragua

1992-95 DEN-1, DEN-2 and DEN-4 outbreaks in Colombia
*over 100,000 cases reported

1993 DHF outbreak in state of Ceara, Brazil

- 1993 (October) autochthonous transmission of dengue fever in Costa Rica
 *1st appearance of dengue in 40 years
 *1st report of DEN-1 in Costa Rica
- 1993 (November) autochthonous transmission of dengue fever in Panama
 *1st appearance in 50 years
 *associated with DEN-2
- 1993 1st report of DEN-2 in St. Vincent and Grenadines
- 1993 1st report of DEN-4 in Ecuador
- 1994 DEN-1 epidemic in Nicaragua
 *20,469 cases reported
 *cases also reported in Panama
 -1st report of DEN-1 in Panama
- 1994 DEN-3 detected in Nicaragua and Panama
 *1st report of DEN-3 in Nicaragua and Panama
 -belonged to Sri Lanka/India genotype that caused major epidemics in those countries in 1989-92
- 1994 1st report of DEN-2, DEN-3, and DEN-4 in Costa Rica
- 1994 DEN-3 reported in U.S.
- 1994 1st report of DEN-4 in Montserrat and Panama
- 1994 1st report of DHF in St. Kitts and Nevis and Anguilla
- 1994 PAHO published *Dengue and Dengue Hemorrhagic Fever in the Americas: Guidelines for Prevention and Control* (Scientific Publication Number 548)
- 1995 1st report of DEN-2 in Peru
- 1995 DEN-3 outbreaks throughout Central America and Mexico
 *1st report of DEN-3 in Guatemala, Honduras, and Mexico
 *also reported in Costa Rica, El Salvador, Nicaragua, and Panama
- 1995 1st report of DHF in Barbados, Costa Rica, Dominica, Guadaloupe, Guatemala, Martinique, and Panama
- 1995 dengue/DHF epidemic in Mexico
 *DEN-2 (predominantly) and DEN-1 associated with DHF
- 1995-96 DHF epidemic in Colombia
- 1996 PAHO Executive Committee Resolution CE118.R13 and Directing Council Resolution CD39.R11
 *Urged governments:

- To collaborate in developing a hemisphere plan that supports from a public health and an environmental perspective the combating of *Ae. aegypti* as a public health problem.
- To use mass communication to inform the population and strengthen community participation.
- To promote epidemiological, entomological, and environmental surveillance and strengthen national laboratories.

*Requested the Director:

- Review current national programs to determine effectiveness.
- Support the improvement of surveillance and to facilitate the implementation of integrated combat measures.
- Cooperate in the preparation of national plans to combat *Ae. aegypti*.
- Build consensus and co-operation among countries about dengue and yellow fever.

1996 1st report of DEN-2 in Aruba

1996 DEN-3 reported in Costa Rica, Guatemala, Honduras, and Mexico

1996 1st report of DEN-4 in Antigua/Barbuda

1997 PAHO Executive Committee Resolution CE120.R19 and Directing Council Resolution CD40.R15

*Urged governments:

- To adopt the hemisphere plan entitled *Dengue and Dengue Hemorrhagic Fever in the Americas: Guidelines for Prevention and Control*.
- Identify human and financial resources needed for the implementation of the plan.
- Include yellow fever vaccine in national immunization programs.

*Requested the Director:

- Collaborate with the countries in the implementation of the plan.
- Promote communication between the countries to optimize plan implementation.
- Cooperate with the countries in seeking external funds for implementing the plan.

1997 Uruguay re-infested with *Ae. aegypti* after 30 years

1997 1st report of DEN-3 in Belize

*DEN-3 also reported in Costa Rica, Guatemala, Honduras, and Mexico

1998 PANDEMIC

*epidemics in Colombia, the Dominican Republic, El Salvador, Honduras, Jamaica, Nicaragua, Puerto Rico, St. Vincent and the Grenadines, and Trinidad & Tobago

*epidemic in Argentina

-1st report of DEN-2 in Argentina

-1st dengue epidemic in Argentina in over 70 years

*epidemic in Brazil

-over 500,000 cases of dengue and DHF reported

1998 1st report of DEN-1 in St. Lucia

1998 1st report of DEN-3 in Aruba, Barbados and Guyana

*also reported in Belize, Costa Rica, El Salvador, Honduras, Jamaica, Mexico, Nicaragua, Puerto Rico, and St. Christopher/Nevis

1998 1st report of DEN-4 in the Bahamas

1998 1st report of DHF in Belize

1999 1st report of DEN-3 in French Guiana and Martinique

*DEN-3 also reported in Barbados, Guatemala, Honduras, Nicaragua, Panama, Puerto Rico, and St. Christopher/Nevis

1999 DEN-3 reported in Venezuela

1999 PAHO produced *A Blueprint for Action for the Next Generation: Dengue Prevention and Control* (PAHO/HCP/HCT/136/99)

*promoted intersectorial activities

*emphasized the incorporation of social communication into control programs

1999 PAHO held sub-regional dengue meeting in Port of Spain, Trinidad (PAHO/HCP/HCT/171.00)

*analyzed the dengue situation in the sub-region

*presented blueprint to countries

2000s

2000 DEN-1 outbreak in Paraguay

2000 1st report of DEN-3 in Ecuador and Peru

*1st appearance of DHF in Ecuador

*all 4 serotypes now circulating in Ecuador and Peru

*DEN-3 also reported in Barbados, Brazil, Costa Rica, Cuba, Curacao, Dominica, the Dominican Republic, Ecuador, French Guiana, Guadeloupe, Martinique, Mexico, Panama, Puerto Rico, Venezuela, and the Virgin Islands (UK)

2000 PAHO held sub-regional dengue meetings in Lima, Peru (OPS/HCP/HCT/172.00); and Asuncion, Paraguay (OPS/HCP/HCT/173.00); & Managua, Nicaragua (PAHO/HCP/HCT/174.00).

*analyzed the dengue situation in the sub-region

*presented blueprint to countries

2001 1st confirmed cases of DHF in Peru

2001 1st report of DEN-2 in Paraguay

2001 1st report of DEN-3 in Brazil and Surinam

2001 PAHO presented blueprint to the PAHO Governing Bodies

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