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Malaria in the Americas

In 1995, the population of the Region of the Americas was estimated at 774 million, of which 248 million (32.0%) lived in areas where ecological conditions were propitious for the transmission of malaria.

In order to obtain a more accurate picture of the distribution of the disease, the countries of the Americas have redefined their malarious areas on the basis of different levels of risk of exposure to transmission (low, medium and high). Approximately 36 million people live in the medium risk areas and approximately 42 million in high risk areas. Exposure risk is the result of factors related to population movement, social stability, and adoption of individual attitudes and behaviors which facilitates contact between humans and vectors. These attitudes and behaviors are further influenced by limited access to appropriate diagnosis and treatment.

In 1995, 1,30 million cases of malaria were reported, an increase of 14,6% in relation to 1994 when 1,11 million cases occurred. (See Epidemiological Bulletin, Vol. 16, No. 3, September 1995). The increase in the number of cases could be partially due to the steady increase in infections caused by *P. falciparum*, especially in Bolivia, Colombia, and Perú.

The malaria morbidity rates increased on the basis of the total population of the Americas, from 145.9 per 100,000 in 1994 to 168.16 per 100,000 in 1995. Morbidity rates for the population inhabiting areas ecologically propitious for transmission increased from 481.6 to 523.26 per 100,000 in the same period.

Brazil reported the greatest absolute number of malaria cases in the region, 565,727 cases (44.2%), followed by the Andean Area with 461,121 cases (35.9%). However, the greatest risk of transmission is seen in the subregion which includes Guyana, French Guiana, and Suriname with an Annual Parasite Index (API) of 228.0/1,000, followed by Belize, API of 44.6/1,000 and Brazil with 29.8/1,000. The greatest increases of transmission intensity during 1995 were reported by Belize,

Bolivia, Colombia, Peru, and Nicaragua.

Table 1 presents the distribution of cases, the respective API, and the parasites found in 21 countries with active malaria control programs in the Region.

The coverage of epidemiological surveillance activities continues to increase in areas of high and medium risk, 14% and 8% respectively in relation to 1994. This comes together with a steady supply of blood smears in areas of low and no risk.

In recent years the epidemiological stratification of malaria in the Americas has been accompanied by the integration of case finding, diagnosis, and immediate treatment into the local health services. In 1995, 19 of 21 countries that had been reported cases, 8,3 million laboratory tests have been performed in persons with suspected cases of malaria. The diagnostic efficiency of the local health services was 16.9%, in 3,299,216 tests performed whereas active surveillance continues to show a low diagnostic efficiency and high operational cost, confirming only 2.42% of "recent fever" cases, in 1,974,625 examinations.

In recent years the epidemiological redefinition of areas of risk has led to the concentration of efforts in high priority areas and the improvement in the availability of treatment per diagnosed case. In the Americas until 1990 only 40 complete treatments were available for every 1,000 people exposed to the risk of contracting malaria. The introduction of epidemiological stratification in the national control programs as well as the further implementation of the "Global Malaria Control Strategy," which calls for an emphasis on clinical management of the disease have progressively improved the availability of treatment which is now 61,5 per 1,000 people.

Vector control activities continue to be applied by the countries as a means to prevent transmission. A clear shift away from the organochlorine and organophosphorus

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TABLE 1
Epidemiological status of 21 Countries with Malaria Programs, 1995

Countries by Geographic Subregion	Population Malarious Areas *	Blood Slides			Parasite Species		
		Examined	Positive	API	falciparum & mixed	vivax	malariae
Mexico	47,505	1,977,691	7,316	0.15	73	7,243	0
Belize	211	37,266	9,413	44.61	475	8,938	-
Costa Rica	1,103	143,407	4,515	4.09	16	4,499	-
El Salvador	5,400	169,267	3,362	0.62	6	3,362	-
Guatemala	4,202	135,095	24,178	5.75	671	23,490	17
Honduras	4,740	324,234	59,446	12.54	1,124	58,322	-
Nicaragua	4,147	493,399	69,444	16.75	4,103	65,322	-
Panama	2,165	222,498	730	0.34	18	712	-
Sub-total	21,968	1,525,166	171,088	7.79	6,413	164,645	17
Haiti**	5,500	54,973	23,140	4.21	23,140	-	-
Dominican Rep.	7,505	380,143	1,808	0.24	1,807	1	0
Sub-total	13,005	435,116	24,948	1.92	24,947	1	0
French Guiana	49	52,521	4,711	96.14	4,137	545	29
Guyana	132	296,370	59,311	449.33	29,652	29,335	-
Suriname	42	38,613	6,606	157.29	6,270	256	80
Sub-total	223	259,261	50,883	228.17	32,910	17,786	109
Brazil	19,010	2,582,017	565,727	29.76	203,402	361,560	765
Bolivia	3,122	152,748	46,911	15.03	3,374	43,537	-
Colombia	24,655	667,473	187,082	7.59	62,687	124,354	41
Ecuador	6,205	253,714	18,128	2.92	4,738	13,390	-
Peru	18,507	833,614	192,629	10.41	37,591	152,868	62
Venezuela	17,419	166,533	16,371	0.94	2,678	13,672	21
Sub-total	69,908	2,074,082	461,121	6.60	111,068	347,821	124
Argentina	5,610	12,986	1,065	0.19	-	1,065	-
Paraguay	1,382	86,664	898	0.65	35	862	1
Sub-total	6,992	99,650	1,963	0.28	35	1,927	1
T O T A L	178,611	9,076,226	1,302,791		385,997	913,333	1,016

* Population by thousands

** No 1995 data available, 1994 data used

products, such as DDT, towards greater use of the synthetic pyrethroids such as malathion and fenitrothion has been observed.

Table 2 presents the geopolitical location and demographics of high risk areas, the causes of exposure, and the measures used for control. From the characterization of the

factors that lead to persistence of transmission, various control measures can be identified. There is still a need for intersectoral coordination in order to ensure the sustainability of these measures.

By and large, the control programs are undergoing a drastic reduction in budgetary funding and, therefore, each year are

TABLE 2
Malarious areas at high risk of transmission, and control priorities, 1995

Countries	Population	km2	Reported Cases	Control measures applied in different areas	Main Vectors
MEXICO					
Campeche	645,608	51,833	62	House, larvacide and aerial spraying; individual and mass radical treatments; entomological studies; and promotion of environmental management.	A. albimanus
Chiapas	3,288,845	72,002	2,351		A. vestitipennis
Guerrero	2,950,337	62,718	193		A. pseudopunct
Michoacan	2,799,278	57,309	567		
Oaxaca	3,043,770	87,922	1,137		
Quintana Roo	923,653	50,350	245		
Sinaloa	2,381,142	58,092	1,284		
Tabasco	1,709,246	24,661	130		
Sub-total	17,741,879	464,887	5,969		
BELIZE:					
Corozal	30,809	1,390	673	Spraying and drug therapy.	A. albimanus
Orange Walk	33,207	1,256	621		
Belize	61,733	701	503		
Cayo	40,800	3,585	3,742		
Stann Creek	19,575	1,289	1,701		
Toledo	18,877	2,190	2,174		
Sub-total	205,001	10,411	9,414		
COSTA RICA:					
Canton Los Chiles	20,794	1,358	401	Radical treatment, focal spraying and aerial spraying.	A. albimanus
Canton Limon	76,032	1,766	1160		
Canton Talamanca	27,047	2,810	424		
Canton Matina	23,324	773	795		
Sub-total	147,197	6,707	2,780		
EL SALVADOR:					
Costa Pacifico area hiperendem.	1,233,133	4,754	2,782	Spraying, drug therapy, larvicides, structural works, mosquito bednets.	A. albimanus
GUATEMALA:					
El Peten	310,008	351,854	7,708	Non-coordinated house spraying; low diagnositic and treatment coverage.	A. albimanus
Huehuetenango	816,376	...	1,923		
Alta Verapaz	379,318	5,992	3,612		
Escuintla	428,073	4,102	2,674		
Ixcán	36,958	...	4,682		
Izabul	370,859	7,491	710		
San Marcos	122,851	702	1,720		
Sub-total	2,464,443	370,141	23,029		

... Information not available

TABLE 2 (Cont.)
Malarious areas at high risk of transmission, and control priorities, 1995

Countries	Population	km2	Reported cases	Control measures applied in different areas	Main vectors
HONDURAS					
Health Region II	565,209	...	9,370	Integrated measures implemented; drug treatment; different spraying methods for physical and larval control; and community participation.	A. albimanus
Health Region III	1,504,379	...	9,330		A. darlingi
Health Region VI	604,354	...	15,290		
Health Region VII	356,810	...	14,065		
Health Region VIII	43,582	...	3,214		
Sub-total	3,074,334	...	51,269		
NICARAGUA					
Chinandega	348,971	4,926	8,000	...	A. albimanus
Leon	330,070	5,107	14,611		A. pseudopunct.
Jinotega	214,070	9,755	4,708		
Matagalpa	364,790	8,523	8,537		
Nueva Segovia	151,324	3,123	2,496		
R.A.A.N.	175,405	32,159	2,749		
Granada	153,183	929	2,159		
Managua	1,056,702	3,672	16,812		
Chontales	296,561	6,378	3,014		
Sub-total	3,091,076	74,572	63,086		
PANAMA					
Bocas del Toro	22,622	2,123	213	...	...
Changuinola	67,517	2,281	133		
Chiriqui Grande	14,400	2,628	69		
Chepigana	30,280	7,700	47		
Donoso	11,525	1,048	32		
Renacimiento	10,382	2,878	41		
San Blas	37,011	2,823	62		
Tole	30,021	3,203	32		
Sub-total	223,758	24,684	629		
HAITI					
...					
DOMINICAN REPUBLIC					
Pepillo Salcedo	8,735	...	116	Prophylactic treatment of immigrants, medicinal barriers, spraying in house and surrounding areas, cleanup of canals, fish farming, Bti treatment of breeding sites.	A. albimanus
Sub-total	8,735	...	116		
FRENCH GUIANA					
Camopi/T-Sauts	746	1,003	91	...	A. darlingi
Bas Oyapock	1,605	340	161	...	
Moroni	6,793	2,512	3,996		
Sub-total	9,144	3,855	4,248		

obtaining more of their financing through external loans and grants from outside the health sector budget. Table 3 indicates further reductions in the regular budgets as compared to 1994,

both in the total amount of money and in relation to the population exposed to medium and high risk. The complete *continued on page 11*

TABLE 2 (Cont.)
Malarious areas at high risk of transmission, and control priorities, 1995

Countries	Population	km2	Registered cases	Control measures applied in different areas	Main vectors
GUYANA	132	...	59,311	API= 449.3/1.000 AFI= 224.6/1.000	A. darlingi
BRAZIL					
Acre	484,400	...	35,732	API = 82.3/1,000	A. darlingi
Amapa	324,841	...	17,028	AFI = 29.6/1,000	
Amazonas	889,549	...	40,732		
Maranhao	863,580	...	26,320		
Mato Grosso	615,693	...	57,126		
Para	2,022,048	...	176,118		
Rondonia	874,870	...	132,236		
Roraima	262,201	...	39,574		
Tocantins	62,018	...	1,792		
Sub-total	6,399,200		526,658		
BOLIVIA					
Depart.:BENI	45,000	34,000	1,725	Supervised case finding and treatment, chemical control, physical control of breeding sites through petroleum applications. Health education on prevention and control.	A. darlingi
Riberalta	24,000	22,000	870		A. pseudopunct.
Guayaramerin					
Depart.:PANDO					
Provincias	4,400	18,000	1,421		
Puerto Rico/Conquista					
Depart.: Santa Cruz	300,000	86,000	6,300		
Andrez Ibanez					
Depart.: TARIJA					
Yaccuben, Benneijo	151,000	38,000	11,549		
Entre Rios, Villamen					
Dept.:CHUQUISACA	76,000	24,900	5,250		
Monteagudo/Huacoreta					
Sub-total	600,400	222,900	27,115		
COLOMBIA					
1. Bajo Cauca-Uraba	971,686	55,000	106,773	House spraying, physical control. Impregnated bednets, topical repellents. API = 59.5/1,000 AFI = 20.5/1,000	A. albimanus
2. Orinoquia	578,234	90,063	37,158		A.nuneztovari
3. Pacifico	959,419	80,000	22,001		A. darlingi
4. Amazonia	490,758	110,000	12,594		A. puntimacula
Sub-total	3,000,097	335,063	178,526		

TABLE 2 (Cont.)
Malarious areas at high risk of transmission, and control priorities, 1995

Countries	Population	km ²	Reported Cases	Control measures applied in different areas	Main Vectors
ECUADOR					
Esmeralda	394,485	14,597	6,079	House spraying.	A. albimanus
El Oro	425,503	302	1,099		
Los Rios	564,372	1,992	2,068	API = 3.0/1,000	
Manabi	1,093,830	4,015	2,536	AFI = 0.5/1,000	
Canar	37,047	349	793		
Cotopaxi	37,924	233	230		
Loja	195,281	610	368		
Sucumbios	81,275	2,049	739		
Pastaza	14,208	24,160	228		
Guayas	2,702,074	...	2,145		
Napo	112,860	542	512		

Sub-total	5,658,859	48,849	16,797		
PERU					
Piura	823,315	24,858	12,301	Diagnosis and treatment through general health services. Very limited residual spraying, aerial spray, environmental sanitation.	A. pseudopunct. A. benarrochi
L. Castillo	672,291	15,238	25,508		
Tumbes	164,730	4,657	1,899		
Loreto	701,513	368,851	37,871		
Jaen-Bagua	501,359	40,563	18,858		
Junin	1,176,478	44,409	38,941		
San Martin	574,450	51,253	15,514	API = 30.9/1,000	
Ucayali	321,819	102,410	5,331	AFI = 10.2/1,000 only for the population of Piura, L. Castillo, Tumbes, Jaen and San Martin.	
Madre de Dios	66,684	53,385	2,026		
Pasco	238,807	8,745	3,951		

Sub-total	5,241,446	714,369	162,200		
VENEZUELA					
Amazonas	64,512		1,941	Spraying and fogging, use of larvicides.	A. darlingi A. aquasalis A. nuneztovari
Bolivar	151,452		7,286		
Sucre	46,454		2,475		
Tachira	17,601		410	API = 41.2/1000	
Apure (S.C.)	17,988		918	AFI = 7.2/1000	
Delta Amacuro	32,311		591		

Sub-total	330,318		13,621		
ARGENTINA					
Fase De Ataque	24,741	11,275	858	Epidemiological surveillance and spraying.	A. pseudopunct.
PARAGUAY					
Caaguazu	418,136	11,474	592	Case detection and treatment, house spraying.	A. darlingi
Alto Parana	439,964	14,895	142		
Aambay	108,058	12,933	36		
Canindeyu	112,306	14,667	99		

Sub-total	1,078,464	53,969	869		

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report of the malaria situation in the Americas, 1995, is available in English and Spanish. Requests should be made to: Communicable Diseases Program, Division of Diseases

Prevention and Control; Pan American Health Organization, 525 23rd Street, N.W., Washington DC, 20037-2895, USA; Fax: (202)974-3688.

Source: Communicable Disease Program, Division of Disease Prevention and Control (HCP/HCT), PAHO/WHO.

TABLE 3
National Budget and Non-Budgetary Contribution to
Malaria Control Programs in the Americas 1992-1995
(in U.S. Dollars)

Countries	National Malaria Budget	Contributed Funds, Loans Other	National Malaria Budget	Contributed Funds, Loans Other	National Malaria Budget	Contributed Funds, Loans Other
	1993		1994		1995	
Argentina	1,826,000	-	3,000,000	-	510,900	-
Bolivia	187,066	-	619,430	20,000	871,749	...
Brazil	97,124,000	5,500,000	12,117,647	24,400,000	35,294,157	35,633,326
Colombia	13,542,381	-	14,614,045	-	2,518,694	-
Costa Rica	1,714,017	344,310	138,000	393,308	1,527,035	1,065,088
Cuba	...	...	...	...	...	...
Dominican Republic	599,334	517,815	667,171	...	758,525	113,717
Ecuador	4,963,244	-	5,253,888	-	6,057,590	-
El Salvador	1,220,930	1,023,255	1,314,286	682,571	1,321,838	402,299
Guatemala	2,434,719	166,985	...	288,703	...	41,000
Haiti	20,000	250,000	50,000	...	...	...
Honduras	2,016,013	283,072	1,611,927	576,382	956,146	40,000
Mexico	28,441,613	-	30,297,000	-	16,944,000	-
Nicaragua	...	301,647	...	386,004	...	250,000
Panama	3,719,976	71,000	3,633,545	124,224	3,742,203	145,683
Paraguay	6,405,522	-	1,030,831	-	1,362,444	-
Peru	...	-	3,062,696	-	2,865,431	-
Venezuela	6,976,914	4,600,000	24,233,445	25,319,792	...	...
Sub total	171,191,729	13,058,084	101,643,911	52,190,984	74,730,712	37,691,113
Guyana	538,535	-	295,483	-	...	...
Belize	477,919	100,000	617,462	79,407	-	760,819
Dominica	...	...	...	...	...	...
French Guiana	91,973	-	...	-	...	328,048
Granada	...	...	...	...	...	...
Guadeloupe Island	...	...	...	...	...	...
Jamaica	...	...	...	...	...	...
Panamá (C.Z.)	...	...	...	...	...	...
Saint Lucia	...	...	...	...	...	...
Suriname	...	...	5,494	...	49,000	758,525
Trinidad and Tobago	...	...	...	...	...	...
Sub total	1,108,427	100,000	918,439	1,847,392	49,000	1,847,392
Total	172,300,156	13,158,084	102,562,350	54,083,376	74,779,712	39,538,505
Grand Total	185,458,240		156,600,726		114,318,217	
Funds/person in malarious area	\$0.64		\$0.68		\$0.47	

Note: Funds/person only from reported data.

Dengue and Dengue Hemorrhagic Fever, 1996

Dengue and dengue hemorrhagic fever (DHF) activity in the Americas in 1996 has been considerably lower than in 1995, during which extensive epidemics were recorded in several countries of Central America, South America and the Caribbean. However, in 1996 outbreaks of dengue were reported in Brazil, Mexico and, Trinidad and Tobago. DHF continues to occur in Venezuela and for the second consecutive year Mexico has been reporting hundreds of DHF cases.

Up to 31 October 1996 a total of 190,527 cases of dengue and DHF were reported to PAHO, of which 69% were notified by Brazil (Table 1).

All four dengue serotypes continue to circulate in the Americas; dengue-3 which was reintroduced in the Americas in the second half of 1994 initially in Nicaragua and Panama, and subsequently spread to other countries in Central America and Mexico, has not been reported in any new country in the Americas in 1996. Table 2 shows the countries infested with *Aedes aegypti*. The following is a summary of the situation of dengue/DHF in the region:

Mexico. To week 48, a total of 18,053 cases were reported of which 252 were confirmed cases of DHF (an additional 354 cases are being investigated) with 13 deaths. Most DHF cases were reported by the states of Vera Cruz, Tolima and Taulmalipas. All four dengue serotypes have been detected in the country.

Central America. Countries of this subregion have reported 10,648 cases of which 72 were DHF cases, but no deaths (reports range from 30 weeks to 47 weeks). All four dengue virus serotypes continue to circulate in Central America.

Caribbean. A total of 4,720 cases were reported by English and Latin Caribbean countries of which 34 were DHF cases; the DHF cases were notified exclusively by the Dominican Republic and Puerto Rico, including two deaths. An outbreak of dengue fever associated with dengue-1 affected Trinidad in the second half of the year; up to week 36, 1,587 cases were reported in the island.

Venezuela. So far the 1996 outbreak has been much less severe than that observed in 1995: up to week 42 of 1996, 7,527 cases of which 1,333 (11 deaths) were DHF cases, whereas in 1995 there were 32,280 reports with 5,380 DHF cases and 43 fatalities. Only serotypes 2 and 4 have been detected in the country.

Colombia, Ecuador and Peru. Ecuador and Peru reported 3,933 (week 30) and 5,774 (week 36) cases of dengue (no DHF) respectively with circulation of serotypes 1, 2 and 4. To date Colombia has reported 7,787 cases of which 1,606 cases were of DHF.

Brazil. Up to week 38 this country reported 132,049 cases of dengue, only two of which were cases of DHF. Cases were reported by 23 of the 26 Brazilian states. The majority of reports, however, originated from the northeast region, mainly from the state of Bahia (48,260 cases). Only serotypes 1 and 2 were detected in the country.

Multiple causes are contributing for the spread and increased activity of dengue and DHF in the Americas. Among these are population growth and the increased urbanization and poor sanitation—insufficiency of adequate and reliable water supply and waste management; the exponential increase of number of plastic containers in modern societies, often discarded in the environment can become important breeding sites for *Aedes aegypti*. On the other hand the increase in frequency of travel facilitates the dissemination of the vector and the dengue viruses. Other important factors include the lack of adequate knowledge by the population of the importance of the dengue problem and of domestic sanitation to control breeding sites; sometimes the communities become aware of the problem but no change in behavior is observed. These factors combined with the lack of well structured programs to control *Aedes aegypti* in most countries explain the deterioration of the dengue/DHF problem in the Americas. Unfortunately in most countries there are insufficient well trained personnel, the funds are inadequate and there is a lack of political will to implement effective programs with adequate methodology.

PAHO activities in support of National programs in 1996

Seminar on integrated dengue control. A seminar was held in Nicaragua for all Central American countries, which focused in the situation of dengue/DHF in the subregion and in control measures, including community participation.

Support to the network of dengue laboratories. This support includes the following:

- Provision of kits for MAC-ELISA, prepared and distributed by the Pedro Kouri Institute (IPK) in Cuba funded by PAHO free of charge to countries.

- Proficiency testing of serology for national dengue laboratories, is being undertaken by the IPK and CDC, Puerto Rico.

- Training of two virologists at the San Juan Laboratory of the Centers for Disease Prevention and Control of the United States of America. In addition virologists from this laboratory visited Bolivia and Paraguay to conduct local training in a project funded by PAHO.

- Workshop on the use of PCR for detection of dengue viruses was organized by the CDC. This workshop was held at Oswaldo Cruz Foundation (FIOCRUZ), in Rio de Janeiro, Brazil. Each of the 11 participants from 7 countries received a PCR kit for testing more than 50 samples, paid for with PAHO funds. Participants received a panel of coded specimens for proficiency testing in their own laboratories.

Technical Meetings. Two technical meetings were organized in 1996, the first one being held in Paraguay for the countries of the Southern Cone to discuss effective measures to combat dengue. The second one took place in Rio de Janeiro and was a Task-Force meeting convened to study the feasibility,

TABLE 1
Number of Reported Cases of Dengue and Dengue Hemorrhagic Fever (DHF)*
in the Americas by Country (Provisional Figures for 1996)

Country or Subregion	Date of Report	Dengue & DHF (Serotipo)	DHF only	Deaths
Bolivia**	Week 37	52 (Den 2)	-	-
Brazil	Week 38	141,178 (Den 1,2)	2	-
Colombia	Week 47	7,787 (Den 1,2,4)	1,606	12
Ecuador	Week 30	5,189 (Den 1,2,4)	-	-
Peru	Week 36	6,395 (Den 1,2)	-	-
Venezuela	Week 42	7,527 (Den 2,4)	1,333	11
Mexico and Central America				
Mexico	Week 48	19,803 (Den 1,2,3,4)	884	13
Costa Rica	Week 30	1,222 (Den 1,3)	-	-
El Salvador	Week 46	790	1	-
Guatemala	Week 40	3,679 (Den 1,2,3,4)	19	-
Honduras	Week 39	5,047 (Den 3)	-	-
Nicaragua	Week 47	2,537	53	-
Panama	Week 47	742 (Den 1)	-	-
Paraguay	Week	-	-	-
Latin Caribbean				
Puerto Rico	Week 38	2,231 (Den 1,2,4)	23	1
Dominican Republic**	Week 36	89	17	2
English & French Caribbean				
Anguilla	Week 28	1	-	-
Antigua & Barbuda	Week 32	6 (Den 4)	-	-
Aruba	Week 4	10	-	-
Bahamas	Week 36	-	-	-
Barbados	Week 40	77 (Den 1)	-	-
Belize	Week 39	-	-	-
Bermuda	Week 36	-	-	-
British Virgin Islands	Week 36	-	-	-
Cayman Islands	Week 40	-	-	-
Curacao	Week	-	-	-
Dominica	Week 36	3	-	-
French Guiana	Week 40	364 (Den 1,2)	6	-
Grenada	Week 38	3 (Den 3)	-	-
Guadeloupe	Week	-	-	-
Guyana	Week 33	-	-	-
Jamaica	Week 38	41	-	-
Martinique	Week	-	-	-
Montserrat	Week 38	3 (Den 1)	-	-
Saint Kitts and Nevis	Week 37	5	-	-
Saint Lucia	Week 37	55	-	-
Saint Vincent & the Grenadines	Week 39	133 (Den 1)	-	-
Suriname	Week 24	369	-	-
Trinidad & Tobago	Week 36	1,587 (Den 1,2)	-	-
Turks & Caicos Islands	Week 28	2,289	-	-
Total		215,214	3,944	39

Source: Country reports to PAHO

* Confirmed or suspected cases

** Only laboratory confirmed cases

● Figures from the English Caribbean comprises suspected and confirmed cases (date from CAREC)

- No cases/deaths reported

TABLE 2
Aedes aegypti infestation in the Americas, 1995

Country	KM2		Population		Number of houses	
	Country	Infested* Area	Country	Infested* Area	Country	Infested* Area
<u>Central and North America</u>						
Canada		0		0		0
Costa Rica	50,900	40,720	3,392,075	996,700	678,415	28,156
El Salvador	21,041	782	5,405,013	1,767,565	1,236,188	333,503
Honduras	112,492	67,495	5,547,658	3,605,978	906,698	90,607
Mexico	1,967,183	320,560	91,852,474	19,988,371	18,297,306	3,188,856
Nicaragua	121,428	98	4,139,486		722,280	
Panama	75,517	33,084	2,400,000	1,992,673	597,058	452,880
U.S.A.	2,000,021		76,467,421			
<u>Caribbean</u>						
Bermuda	21		60,000		26,000	
Cuba	110,992	4,237	11,000,000	419,887	3,302,557	552,373
Dominica	771		71,994	64,795	20,000	3,600
Grenada	344	344	95,600		35,554	
Montserrat	104	69	10,639	10,639	6,300	6,300
Nevis	93		9,404		2,891	278
Puerto Rico	8,960	5,376	3,500,000	2,096,640	700,000	
Rep. Dominicana	48,000					
St. Kitts	176	3	34,000	12,605	5,600	181
St. Vincent & The G.	338	388	110,000		33,500	
Trinidad & Tobago	5,128		1,234,388		271,871	
<u>South America</u>						
Argentina	2,780,000	35,000	32,608,687	15,000,000	10,096,875	
Brazil	8,511,965	865,000	161,790,000	56,000,000	32,200,000	11,200,000
Bolivia	1,098,581	358,987	6,420,792	1,470,740	1,701,142	1,600
Chile						
Colombia	1,141,748	689,339	35,886,280	15,245,071		
Ecuador	272,045	18,150	10,990,000	6,205,691	715,802	
Paraguay	406,752	406,752	4,152,588	4,152,588	855,547	
Peru	1,285,216	273,081	23,029,603	1,726,270	4,605,920	345,254
Uruguay	176,215	0	3,076,800	0	988,525	0
Venezuela	912,050	911,930	21,644,121	1,515,905	4,328,824	303,181

* Estimated

timeliness and appropriateness of eradicating *Aedes aegypti* from the Americas.

Collection and dissemination of information. Beginning in the second semester of 1995, special efforts are being made to obtain and disseminate current information on dengue in the Americas. In this context, a table with the reported number of cases of dengue/DHF and deaths, and virus serotypes, is continually updated and regularly circulated among Member countries. This approach has been rewarding as most countries

are improving their reporting systems and updating the information on dengue/DHF.

Consultantships to national programs. Technical cooperation was provided on matters related to dengue/DHF prevention and control to Bolivia, Brazil and Venezuela.

Source: Division of Disease Prevention and Control, Communicable Diseases Program, HCP/HCT, PAHO.

Summer Courses in Epidemiology in 1997

The Johns Hopkins University School of Hygiene and Public Health is sponsoring the Fifteenth Annual Graduate Summer Program in Epidemiology, to be conducted from 16 June to 4 July 1997. The program includes: principles of epidemiology; introduction to biostatistics; methods in epidemiology; intermediate biostatistics; applications of the case-control method; epidemiologic methods for planning and evaluating health services; epidemiologic basis for tuberculosis control; design and conduct of clinical trials; cohort studies; methods of health risk assessment; infectious disease epidemiology; nutritional epidemiology; outcomes and effectiveness research; epidemiology of AIDS; molecular biology: a primer for epidemiologists; epidemiology of emerging infections; use of microcomputers in epidemiology; advanced topics in SAS programming; meta-analysis; epidemiology and public policy; statistical methods for longitudinal data; new paradigms/new approaches to management of epidemiological studies. Proficiency in the English language is required.

Further information is available from: Helen Walters, Program Coordinator, Graduate Summer Program in Epidemiology, The Johns Hopkins University, School of Hygiene and Public Health, 615 North Wolfe Street, Baltimore, Maryland 21205. Tel. (410) 955-7158; Fax (410) 955-0863; E-mail: HWALTERS@PHNET.SPH.JHU.EDU

The University of Michigan School of Public Health announces the Thirtieth-two International Graduate Summer Session in Epidemiology to be conducted from 6 to 25 July, 1997. Three, two and one-week courses will be offered. Three-week courses include: applied epidemiology for health practitioners; fundamentals of epidemiology; and fundamentals of biostatistics. Two-week courses include: basic computer applications in epidemiology; genetic epidemiology; and Methods in Medical Quality Assessment.

One-week courses include: basic concepts of clinical epidemiology; clinical trials, design and conducts; clinical trials-analytic methods; introduction to the logistic model; analysis of survival, and follow-up data; introduction to cancer epidemiology; advanced concepts and methods in cancer epidemiology; cancer prevention; occupational epidemiology; environmental epidemiology and risk assesment; epidemiology of injuries; epidemiologic methods and injury control; epidemiology of mental disorders; update in infectious diseases; emerging infections; sexually transmitted diseases and HIV; nutritional epidemiology; epidemiologic issues in women's health: controversies and challenges; pharmacoepidemiology; scientific writing; advanced

computer applications in epidemiology; behavioral modification; ethics, epidemiology and public health research; introduction to genetics in Public Health; epidemiology and the law; cardiovascular epidemiology; and Meta-Analysis: A synthesis of Medical Literature. Proficiency in the English Language is needed.

For further information contact: Dr. David Schottenfeld or Jody Gray, Administrative Coordinator, Graduate Summer Session in Epidemiology, The University of Michigan, School of Public Health, 109 S. Observatory Street, Ann Arbor, Michigan 48109-2029. Tel. (313) 764-5454; Fax (313) 764-3192; E-mail: umichgss@sph.umich.edu

The Department of Epidemiology and Biostatistics, McGill University will hold its Twelveth Annual Summer Program in Epidemiology and Biostatistics from 5 May to 27 June, 1997. General topics will include: principles and methods of epidemiology; statistical inference; clinical epidemiology; multivariate analysis; practical issues in protocol development.

For more information contact: Summer Program Coordinator, Joint Departments of Epidemiology, Biostatistics and Occupational Health, McGill University, 1020 Pine Avenue West, Room 38B, Montreal, Quebec, Canada, H3A 1A2. Tel. (514) 398-3973; Fax (514) 398-4503; E-mail: summer@epid.lan.mcgill.ca

The Fifteenth International Course in Applied Epidemiology, conferring diploma status recognized by the National Autonomos University of Mexico, will take place from 30 June to 25 July, 1997 in Mexico, D.F., under the coordination of the Department of Epidemiology of the Ministry of Health of Mexico.

Main courses include basic and intermediate epidemiology; basic and intermediate biostatistics; design of research protocols; introduction to Epi-Info 6.0 for epidemiologic analysis; multivariate analysis in epidemiology; health services administration; mortality measurement; epidemiology and nutrition and epidemiology of injuries. Other courses offered are environmental and occupational emergencies; sociology and anthropology in epidemiological studies; research methods in gastrointestinal diseases; clinical epidemiology; epidemiological methods and chronic diseases and epidemiology of infectious diseases.

For further information, contact: Dirección General de Epidemiología; Francisco de P. Miranda núm. 177; Col. Unidad Lomas de Plateros; Tel: 593-36-61. México, D.F.

Chagas disease in the Americas

A progress report of the activities by the countries of the South Cone

Tripanosoma cruzi infection has been estimated to affect 16-18 million people in the Americas. At least 20% of these will develop the clinical symptoms that characterise Chagas disease. Approximately 43,000 deaths have been attributed annually to this disease. Although human infection extends from Mexico in the North to Argentina and Chile in the South, organized programs for the control of the vector of *T. cruzi* are being carried out mainly in the Southern Cone countries where the most important vector is the *Triatoma infestans*.

Vector control is done by a combination of spraying with residual insecticides, health education and, occasionally, modification or replacement of housing.

Situation in the Southern Cone countries is as follows:

- Argentina reduced house infestation by 75% in 13 of the 15 endemic provinces between 1982 and 1994. During the same period the serological prevalence rate among men joining the military services decreased from 5.8% to 1.2%. More than 114,000 houses were sprayed in 1995. Interruption of transmission is foreseen for the year 2000.

- Bolivia is progressing more slowly. In spite of the above 26,800 houses were sprayed in 1995 (More than 400,000 houses still require spraying).

- Brazil reported that of the 711 municipalities infested with *T. infestans* in 1992, only 83 still remained positive in 1993.

Intradomiciliary capture of infected insects for the whole country decreased from 84,000 bugs (1983) to 2500 (1993). In the States of Rio Grande do Sul and Bahia almost 200,000 houses were sprayed in 1995. Interruption of transmission is expected by the year 2000.

- Chile experienced a 90% reduction in house infestation rates from 1982 to 1993. In the endemic Region IV, seroprevalence rates among children less than 15 years old decreased from 20.3% in 1986 to 4.2% in 1992. However a portion of these cases are likely to represent congenital rather than vectorial infections. Interruption of transmission is expected by 1998.

- In Paraguay has just begun a coordinated effort to combat the vector: 32,502 houses were sprayed in 1995.

- Uruguay had a 90% reduction in house infestation rates. The rate of positive serology in children under 12 years old decreased from 5.2% in 1985 to 0.67% in 1994 in the departments of highest infestation such as Rivera, Paysandu, Tacuarembó, Cerro Largo, and Salto. Interruption of transmission is expected in 1997.

Source: Division of Disease Prevention and Control, Communicable Diseases Program, HCP/HCT, PAHO.

Seventh Summer Session in Intermediate Epidemiology

The Seventh Summer Session in Intermediate Epidemiology sponsored by the Health Situation Analysis Program, of the Pan American Health Organization, will be conducted from 7 to 25 July, 1997 at the College of Public Health, University of Southern Florida, Tampa, Florida. The courses being offered are: intermediate methods in epidemiology; statistics applied to epidemiology and the use of software packages, and the use of epidemiology in the programming and evaluation of health services. Students are required to have approved basic training in epidemiology. Courses will be conducted in Spanish, but participants must be able to read English.

For more information and application: Carlos Castillo-Salgado, HDP/HDA, Pan American Health Organization, 525 Twenty-third Street, NW, Washington, DC 20037. Tel. (202) 974-3327; Fax (202) 974-3674.

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