

For instance, Colón, a region where most of the deaths (88.6 per cent) are medically certified, has one of the highest diarrhea mortality rates in the country; however, the morbidity rate is the lowest, which indicates substantial under-reporting of cases (Table 2).

Since diarrheal disease can be easily detected, even by persons with no specialized training, the total number of deaths from diarrhea, both with and without medical certification, may be regarded as the most homogeneous and exact parameter of the extent of the problem in Panama.

In 1978 the regions of Bocas del Toro, Colón, Chiriquí, and Veraguas had the highest mortality rates. Chiriquí and Bocas del Toro had the highest morbidity rate. The lowest mortality rates were reported in Azuero, the Metropolitan Region, Darien, and Coclé.

The evolution of all deaths from diarrheal diseases in each region of the country from 1970 to 1978 is shown in Figure 3. In 1978, the number of deaths declined in all regions of the country except the Metropolitan Area.

The rates shown in Table 3 indicate the age groups at greatest risk of contracting and dying from diarrheal

diseases. The <1 age group shows the highest morbidity and also mortality rates. The morbidity rate in this group is nine times and the mortality rate 18 times the corresponding rates for the total population.

Next in point of incidence is the 1-4 year group, but in this case the risk of contracting diarrheal disease is 2.5 times that faced by the total population, while the risk of dying is only twice that of the total population.

The 5-14 and 15-49 year age groups have relatively low morbidity and mortality rates, particularly the 15-49 year group (mortality rate 0.24 per 100,000 inhabitants).

The 50 and older group has the lowest morbidity rate but follows the 1-4 year group in terms of mortality. Even so, the risk of dying from diarrheal diseases is lower in this group than for the total population and the deaths are associated with other debilitating factors in this age group.

(Source: *Boletín Epidemiológico*, Vol. IV (4), 1979, Ministry of Health of Panama.

7970

Meningitis in Brazil, 1976-1978

The number of Brazilian states participating in the meningitis epidemiologic surveillance system has increased steadily since 1976. To the 14 states that were participating in the system that year, five were added in 1977 and two more in 1978, raising the total to 21.

The cases were classified into three major groups for study: meningococcal meningitis, meningitis from other known causes, and unspecified meningitis. The three groups taken together were designated as meningitis in general.

From 1976 to 1978, the number of cases of meningococcal meningitis declined by nearly 50 percentage points as a percentage of the number of cases of meningitis in general (Table 1); however, the proportion of meningitis due to other known causes more than doubled. These changes reflect a trend of the disease to regress to the endemic levels prevailing before the latest epidemic. They also indicate a progressive increase in the number of cases in the second group, which in turn suggests a better use of the laboratories for diagnosis.

The high proportion of cases of unspecified meningitis may be a consequence of the inclusion in the system of new reporting areas served by personnel having less ex-

perience with the problem, or of the inability to perform a laboratory test to determine the causative species.

The mortality rates in 1978 were lower than in 1977 but higher than in 1976 (Table 1).

Figure 1 shows the monthly meningitis mortality rates, in terms of number of cases per 100,000 inhabitants reported in Brazil each month during the period under study. Individual rates are shown for each etiologic group. It will be noted that the number of cases of meningococcal meningitis increased in the coldest months (from May to August), while the number of cases due to other known causes tended to increase in the warmest months (from September to January).

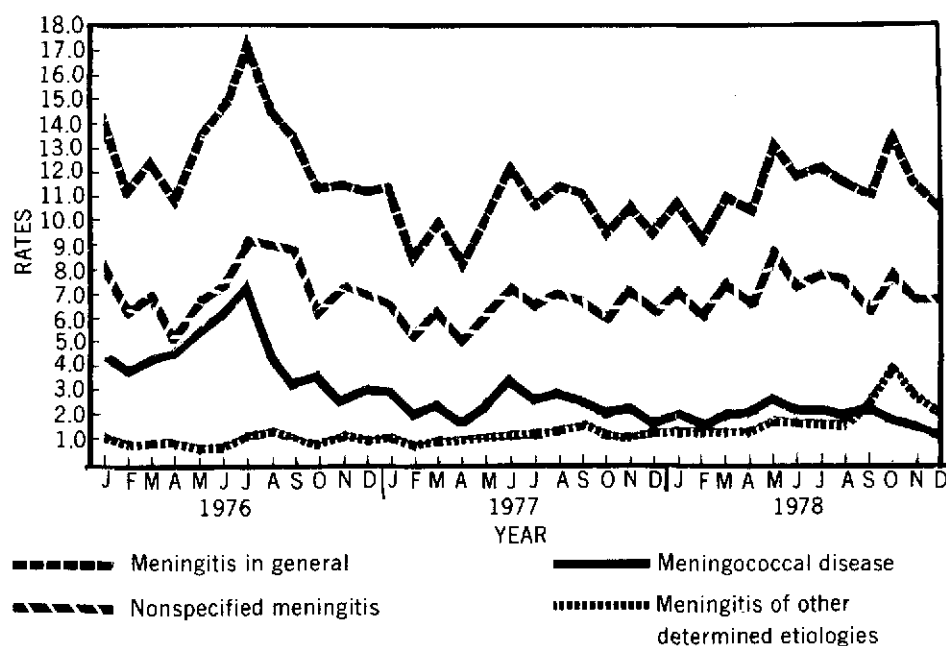
According to the data for 1977, of the total of 2,299 cases of meningococcal disease, 1,920 (83.5 per cent) were classified as meningococcal meningitis and 379 (16.5 per cent) as meningococcemia; 498 and 123, respectively, occurred in the municipalities including the state capital; and 1,422 and 256, respectively, in other municipalities of the state (Table 2). The fatality rates for meningococcal disease (18.5 per cent), meningococcal meningitis (15 per cent), and meningococcemia (36.1 per cent) were all higher than in 1976. The same holds

Table 1. Number of cases, deaths, and death rate, by type of meningitis, Brazil, 1976-1978.

Type of meningitis	1976					1977					1978 ^a				
	Cases		Deaths		Death rate %	Cases		Deaths		Death rate %	Cases		Deaths		Death rate %
	No.	%	No.	%		No.	%	No.	%		No.	%	No.	%	
Meningococcal disease	2,768	33.9	428	28.8	15.5	2,299	24.6	425	17.5	18.5	1,931	18.3	349	14.2	18.1
Meningitis due to other known causes	687	8.4	153	10.3	22.3	1,216	13.0	397	16.3	32.6	1,893	18.0	534	21.8	28.2
Nonspecified meningitis	4,716	57.7	907	60.9	19.2	5,824	62.4	1,608	66.2	27.6	6,719	63.7	1,568	64.0	23.3
Meningitis in general	8,171	100.0	1,488	100.0	18.2	9,339	100.0	2,430	100.0	26.1	10,543	100.0	2,451	100.0	23.2

^aProvisional data.

Figure 1. Cases per 100,000 population of meningococcal disease, meningitis of other determined etiologies, nonspecified meningitis, and meningitis in general by month, Brazil, 1976-1978.



true when the municipalities including the state capital and other municipalities in the states are considered separately.

The distribution of cases of meningococcal disease in 1977 by age group, broken down by incidence in the municipalities including the state capital and other municipalities, is shown in Table 3. Of all the cases, 71.9 per cent occurred in the <15 year group, which was higher than in 1976 (68.6 per cent). In the municipalities including the state capital this proportion was substantially the same in each of the two years (76.7 and 76.6 per cent, respectively).

In the <1 year age group the sharpest difference was observed between the proportion of cases registered in

1977 (18.4 per cent) and in 1976 (13.9 per cent), which probably indicates that the incidence of meningococcal disease was regressing to endemic levels after the epidemic that began in 1971. This difference becomes more apparent when the rates per 100,000 inhabitants, adjusted by age group (Figure 2), are analyzed. It will be seen that for all age groups except the <1 year group the rates in 1977 were lower than in 1976.

Table 4 shows that most of the cases of meningococcal disease (82.3 per cent) were confirmed in the laboratory in 1977, 4 percentage points more than in 1976 (78.3 per cent), despite the fact that in the municipalities including the state capitals the proportion of cases diagnosed in the laboratory was identical (85.6 per cent) in the two

Table 2. Meningococcal disease cases and deaths in municipalities including the state capital and in other municipalities in 1977, and fatality rates in 1977 and 1976, by clinical form, Brazil.^a

Clinical form	Capitals				Other municipalities				Total			
	Cases No. and (%)	Deaths No. and (%)	Death rate (%)		Cases No. and (%)	Deaths No. and (%)	Death rate (%)		Cases No. and (%)	Deaths No. and (%)	Death rate (%)	
			1977	1976			1977	1976			1977	1976
Meningococcal meningitis	498 (80.2)	70 (62.0)	14.1	12.8	1,422 (84.7)	218 (69.9)	15.3	12.9	1,920 (83.5)	288 (67.8)	15.0	12.9
Meningococemia	123 (19.8)	43 (38.0)	34.9	31.4	256 (15.3)	94 (30.1)	36.7	30.9	379 (16.5)	137 (32.2)	36.1	31.1
Total	621	113	18.2	17.9	1,678	312	18.6	14.7	2,299	425	18.5	15.5
(Meningococcal disease)	(100.0)	(100.0)			(100.0)	(100.0)			(100.0)	(100.0)		

^a1976 data for 14 states; 1977 data for 19 states.

Table 3. Incidence of meningococcal disease, by age group, in municipalities including the state capital, in other municipalities, and total for 19 states, Brazil, 1977.

Age group (years)	Capitals ^a				Other municipalities				Total			
	No. of cases	%		Rate per 100,000	No. of cases	%		Rate per 100,000	No. of cases	%		Rate per 100,000
		Partial	Cumulative			Partial	Cumulative			Partial	Cumulative	
< 1	140	21.0	21.0	27.8	282	17.3	17.3	13.3	422	18.4	18.4	16.1
1- 4	181	27.2	48.2	9.1	305	18.7	36.0	3.6	486	21.1	39.5	4.7
5- 9	120	18.0	66.2	4.9	326	20.0	56.0	3.2	446	19.4	58.9	3.5
10-14	70	10.5	76.7	3.3	230	14.1	70.1	2.5	300	13.0	71.9	2.7
15-19	47	7.1	83.8	2.5	160	9.8	79.9	2.1	207	9.0	80.9	2.2
20-39	78	11.7	95.5	1.8	206	12.6	92.5	1.1	284	12.4	93.3	1.2
40 +	29	4.4	99.9	0.9	90	5.5	98.0	0.7	119	5.2	98.5	0.7
Unknown	1	0.1	100.0	—	34	2.0	100.0	—	35	1.5	100.0	—
Total	666	100.0	—	4.3	1,633	100.0	—	2.3	2,299	100.0	—	2.7

^aExcept Curitiba, the data for which refer to the entire metropolitan area (+45 cases).

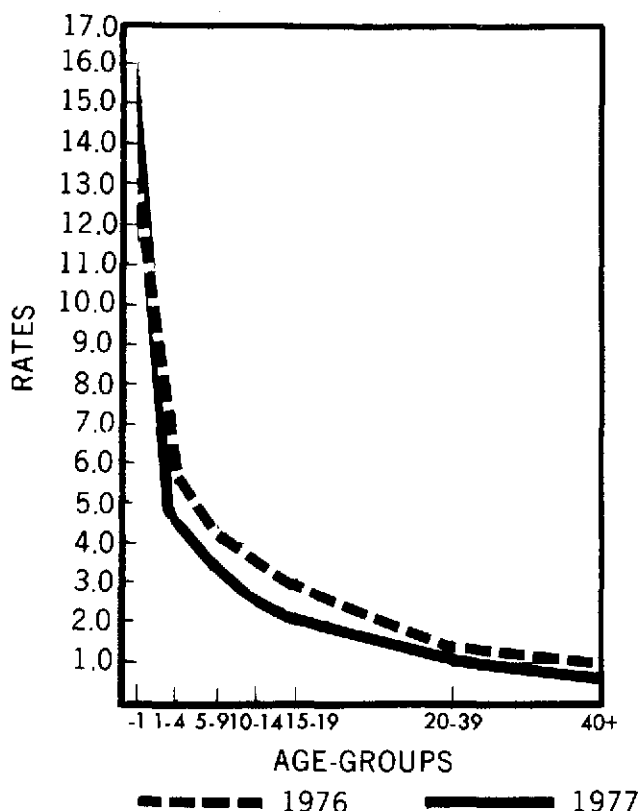
Table 4. Number and percentage of cases of meningococcal diseases in the municipalities including the state capital and in other municipalities, classified according to diagnosis confirmation criterion, Brazil, 1977 and 1976.^a

Diagnostic criterion	Capitals ^b				Other municipalities				Total			
	1977		1976		1977		1976		1977		1976	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Clinical diagnosis only	96	14.4	96	14.4	311	19.0	361	25.5	407	17.7	490	21.7
Laboratory diagnosis	570	85.6	572	85.6	1,322	81.0	1,056	74.5	1,892	82.3	1,772	78.3
a) culture	311	46.7	289	43.2	363	22.2	242	17.1	674	29.3	571	25.2
b) counter-immuno-electrophoresis	8	1.2	8	1.2	15	0.9	11	0.8	23	1.0	24	1.1
c) serology	1	0.1	—	—	1	0.1	—	—	2	0.1	—	—
d) bacterioscopy	225	33.8	233	34.9	860	52.7	681	48.0	1,085	47.2	1,012	44.7
e) cytochemistry	25	3.8	42	6.3	83	5.1	122	8.6	108	4.7	165	7.3
Total	666	100.0	668	100.0	1,633	100.0	1,417	100.0	2,299	100.0	2,262	100.0

^a1976: 14 states; 1977: 19 states.

^bExcept Curitiba, the data for which refer to the entire metropolitan area (+45 cases).

Figure 2. Incidence of meningococcal disease (rates per 100,000) by age-groups, Brazil, 1976 and 1977.



years. In addition, there was an increase in the utilization of culture tests both in the capitals and in other municipalities, as well as in the use of spinal fluid bacterioscopy in municipalities other than those including the state capital. This test continued to be the most commonly used laboratory test for the confirmation of cases in 1977.

In 1977 the samples for 447 cases from 10 of the 19 states that supplied information were submitted for a determination of *Neisseria meningitidis* serogroups. (In 1976, 11 of the 14 states supplied this type of data.) In 322 (72 per cent) of the total number of cases the serogroups were identified, in 120 cases (26.8 per cent) a classification was not possible, and in 5 (1.2 per cent)

Table 5. Cases of meningitis of known etiology, excluding those of meningococcal origin, and agents identified, Brazil, 1977.^a

Etiologic agent	Cases	
	No.	%
Pneumococci	160	35.6
Tuberculosis bacillus	130	29.0
<i>H. influenzae</i>	56	12.4
Enterobacteria	23	5.1
<i>Staphylococcus</i> sp.	19	4.2
<i>Streptococcus</i> sp.	14	3.1
Epidemic parotitis virus	13	3.0
Gram-positive cocci	11	2.4
<i>Salmonella</i> sp.	5	1.1
Gram-positive diplococci	5	1.1
<i>Pseudomonas</i> sp.	4	0.9
<i>Escherichia coli</i>	3	0.7
Gram-negative bacilli	2	0.4
<i>Klebsiella</i> sp.	1	0.2
<i>Brucella</i> sp.	1	0.2
<i>Proteus</i> sp.	1	0.2
Gram-negative bacilli	1	0.2
<i>Cryptococcus neoformans</i>	1	0.2
Total	450	100.0

^aSupplementary information supplied by the departments of health of 14 states.

other serogroups were determined to be the causative agent but were not specifically reported.

Some 65.2 per cent of the cases corresponded to serogroup A, 30.1 per cent to serogroup C, and 4.7 per cent to serogroup B. There was an increase in the proportion of serogroup A cases compared to that in 1976, a year in which the percentages registered for the three groups were 58.9, 37.3, and 3.8, respectively.

Of the 1,216 cases of known etiology, excluding meningococcal origin, supplementary information was obtained in 1977 on the etiologic agent identified in 450 cases from 14 states (Table 5): 64.6 per cent of the cases corresponded to meningitis due to pneumococci and to tuberculosis bacillus (35.6 and 29 per cent, respectively).

(Source: *Boletim Epidemiológico*, Vol. XI (18 and 20), 1979. Ministry of Health of Brazil.)