Program for Diarrheal Disease Control in Cali, Colombia

In 1975 an acute diarrheal disease control program was initiated at the Siloé Health Center of the Cali Regional Health Unit.[1] Its initial objective was to reduce diarrheal disease mortality to 50 per cent in children under five during the following five-year period. Since that time, the program has been progressively extended to all the health institutions in the Municipality of Cali.

In 1980 the population of Cali was estimated at 1,277,963, with a demographic structure in which 9.7 per cent of the population was under four years of age. As to water supply services, the city has three treatment plants and a 1,363,500-meter water supply network with approximately 96 per cent coverage inside the urban perimeter. Sewerage and sanitation services have a coverage of 90 per cent and 70 per cent, respectively.

Many of the neighborhoods located in the city's outlying areas are made up of squatter settlements, where the population is mostly composed of immigrants who usually have inadequate environmental sanitation. At present, the more recently settled areas have close to 30,000 families living on floodplains below the level of the Cauca River.

The city has two hospitals, four hospital centers, 19 urban health centers, 10 rural health centers, eight urban health posts, and 10 rural health posts. All these establishments provide, among other activities, maternal and child services, environmental sanitation, health education, and epidemiological surveillance, in accordance with their various degrees of complexity.

To ensure the provision of health services, the city has been divided into four program areas, which permits a sufficiently expeditious system for patient referral. Each area is made up of centers and health posts and a reference hospital center. The majority of the patients are served initially at the centers and ambulatory primary care posts. The patients who need more specialized services or hospitalization are sent by ambulance to the respective hospital center.

The program for diarrheal disease control was based on data that made it possible to make a diagnosis of the health situation and its relation to these diseases. These data provided information on the principal demographic and social aspects in the different program areas, the populations from 0 to 11 months and from 1 to 4 years, morbidity and mortality from diarrheal diseases, and the basic sanitary conditions in each area and, at the same time facilitated the identification and location of human, material, institutional, and community resources. The establishment of the goals of the program was supported by that information.

During the initial phase, personnel at different levels received training and a sufficient quantity of oral rehydration salts was provided by the Ministry of Health. During the development of the program there were additional resources from particular entities and active participation by the communities through the so-called Community Action Boards. Also, precise standards were established for the care of children with diarrheal diseases at the services and in the home, in accordance with the different levels of complexity of the institutions utilized. Finally, research was begun on different aspects of the program, placing special emphasis on better knowledge of the etiology of the infectious process and on the importance of socioeconomic factors in morbidity and mortality from enteritis. No statistical form was included, or any new clinical history, since the existing information system permits the epidemiological and operational evaluation of the program. All death certificates in the city of Cali have to be sent, immediately after each death, to the Epidemiology Unit, where they are tabulated and analyzed monthly. The evaluation is done every six months and covers operational and epidemiological aspects, and the possible impact the program may have on mortality.

Mortality from acute diarrheal diseases shows a steady decline in children under one year, and those from 1 to 4 and under 5 years, between 1970 and 1981 (Table 1). For purposes of analyzing mortality, the period was divided in the two stages before and after 1975, the year when oral rehydration therapy was initiated. The general trend of mortality from diarrhea was downward and becomes more drastic after the start of the program.

Mortality in the 1 to 4 age group continues in the same trend observed in children under one year, but with a much lower mortality rate (7 times lower in 1979).

[1]The oral rehydration formula recommended by the World Health Organization was used: sodium chloride (3.5 g), sodium bicarbonate (2.5 g), potassium chloride (1.5 g), and glucose (20.0 g).

Mortality from diarrhea in the four program areas presents a declining trend, although at different rates of speed. Comparing the years 1975 and 1981, it can be noted that the reduction was 56 per cent in area 1, 31 per cent in area 2, 44.7 per cent in area 3, and 30.7 per cent in area 4. Area 1 has the greatest concentration of urban population and, in addition, a larger number of new human settlements inhabited by families of limited economic resources. Many of these squatter settlements have been constructed on the hills of the northern area of the city, where the topographic situation makes it difficult for the Government to provide suitable water supply and sewerage services.

Table 1. Number of deaths from gastroenteritis in children under 1 and 1-4 years of age, with rates per 1,000 population, Cali, Colombia, 1970-1981.

Year	< 5 years					
	< 1 year		1-4 years		Total	
	No. of deaths	Rate	No. of deaths	Rate	No. of deaths	Rate
1970	445	14.9	209	2.4	654	5.6
1971	469	17.1	264	3.1	733	6.4
1972	541	22.3	272	3.1	813	7.3
1973	376	16.9	199	2.3	575	5.2
1974	362	16.4	175	1.9	537	4.8
1975	327	14.8	127	1.3	454	4.0
1976	366	15.2	167	1.7	533	4.6
1977	258	10.9	115	1.1	373	3.2
1978	247	10.3	88	0.8	335	2.8
1979	170	6.8	66	0.7	236	1.9
1980	235	9.0	72	0.8	307	2.6
1981	166	6.3	81	0.8	247	2.0

Table 2 shows the rapid decline in the importance of this group of diseases relative to mortality from all causes, in the under-five age group, especially in those under one year.

The system for the certification and analysis of diarrhea cases is incorporated in the city's general system for epidemiological surveillance of communicable diseases, which only includes the official services already described. It is possible that the progressively rising trend of cases in all ages (Table 3) is the result of improved coverage in case-finding and in the care of diarrhea cases or of the presence of epidemic outbreaks,

Table 2. Ratio of deaths from diarrheal diseases in children under 1 and 1-4 years of age over total deaths in each age group, Cali, Colombia, 1970-1981.

Year	< 5 years		
	< 1 year (%)	1-4 years (%)	Total (%)
1970	32.8	38.1	34.3
1971	30.7	37.4	32.8
1972	35.8	40.5	37.2
1973	29.9	40.7	33.0
1974	28.4	34.4	30.1
1975	26.6	32.8	27.3
1976	26.7	31.5	28.1
1977	22.3	28.8	23.9
1978	25.6	28.9	26.4
1979	22.5	22.0	19.5
1980	26.8	25.7	26.3
1981	21.3	32.7	23.8

Table 3. Number of diarrheal disease cases in children under 1 and 1-4 years of age, with rates per 1,000 population, Cali, Colombia, 1975-1981.

Year	< 5 years					
	< 1 year		1-4 years		Total	
	No. of cases	Rate	No. of cases	Rate	No. of cases	Rate
1975	1,491	67.41	4,965	55.21	6,456	57.61
1976	4,522	188.23	3,719	40.91	8,241	71.71
1977	4,853	205.01	4,324	47.07	9,177	79.43
1978	7,058	293.30	4,180	45.02	11,238	96.12
1979	9,098	366.75	11,443	121.94	20,541	173.12
1980	5,452	209.19	4,809	50.70	16,511[a]	136.56
1981	6,851	258.59	7,087	73.93	13,938	113.92

[a] Includes 6,250 cases in children under 5 years of age, not classified by age group or health area.

as seems to have occurred in 1979. It is interesting to note that, of all the cases reported annually in children under five, except for 1975 and 1978, practically half the cases were registered in those under one year.

The highest morbidity rates reported by each area between 1975 and 1981 are observed in areas 1 and 3. It is

in these areas, precisely, where mortality from diarrhea has declined most dramatically. The elevated number of cases of diarrhea registered in them appears, then, to be due, in part, to improved case-finding and health care coverage of sick patients. Some of the neighborhoods that are in these two areas are populated by families from rural zones which at present lack appropriate water supply and excreta disposal services. In any case, these two areas of the city are the ones of greatest demographic density and the ones which at the same time have greater accessibility to the health services. Early weaning may be a factor contributing toward an increased risk of acute episodes of diarrhea in the earlier ages. Also, it is probable that many of the cases that have been reported are diarrheal episodes noted in the same child in a short space of time and would be part of a single attack of acute diarrhea or, on the contrary, children with successive attacks of acute diarrheal disease that are reported a single time as continuous cases.

The data presented illustrate the need to perfom an initial diagnosis of the situation and to formulate and carry out diarrheal diseases control programs that are integrated with the rest of the health programs, especially the maternal and child area. In addition, it is necessary to have a simple and effective surveillance system incorporated into the rest of the information services, which will make it possible to evaluate and measure the effect caused by the programs for oral rehydration in the reduction of mortality from diarrhea.

(*Source*: Dr. Melba de Borrero, Director, National Diarrheal Disease Control Program, Ministry of Health, Colombia and Epidemiology Unit, Health Programs Development, PAHO.)

Diseases Subject to the International Health Regulations

Cholera, yellow fever, and plague cases and deaths reported in the Region of the Americas up to 30 June 1983.

Country and administrative subdivision	Cholera cases	Yellow fever		Plague Cases
		Cases	Deaths	
BOLIVIA	—	*11*	*10*	*20*
Beni	—	1	1	—
Cochabamba	—	8	7	—
La Paz	—	2	2	20
BRAZIL	—	*3*	*3*	—
Rondônia	—	2	2	—
Pará	—	1	1	—
COLOMBIA	—	*1*	*1*	—
Santander	—	1[a]	1[a]	—
ECUADOR	—	*3*	—	*64*
Chimborazo	—	—	—	64
Pastaza	—	3	—	—
PERU	—	*18*	*17*	—
Huanuco	—	1	1	—
Junín	—	3	3	—
Madre de Dios	—	4	4	—
San Martín	—	10	9	—
UNITED STATES	—	—	—	*16*
Arizona	—	—	—	7
New Mexico	—	—	—	7
Oregon	—	—	—	1
Utah	—	—	—	1

[a]Imported.