

Prevention of Mortality from Diarrhoeal Diseases in Brazil *

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Introduction

Despite the large number of papers which have been published in Brazil stressing the gravity of the infantile mortality problem in that country, until recently there has been almost no mention of the diarrhoeal diseases in programmes of prevention. In studies carried out during the late 1940's and early 1950's the attention of investigators was concentrated almost exclusively on certain communicable diseases, such as measles, whooping-cough, diphtheria, malaria, tetanus, syphilis, tuberculosis, influenza and pneumonia. However, the diarrhoeal diseases were killing as many children as all the other communicable diseases together. In the Federal District, for example, during the period 1940-51 there were 27 372 deaths of infants from infectious and parasitic diseases, excluding the diarrhoeal diseases. These latter alone caused the death of 27 139 children under one year of age. Moreover, in the Federal District during the three-year period 1905-7, the number of deaths from diarrhoea and enteritis among infants under two years of age was greater than the total number of deaths of persons of all ages from plague, smallpox, yellow fever, influenza, malaria, typhoid fever, whooping-cough and d'p' th'ria.

What is the explanation of this passive attitude towards the problem raised by such a highly lethal group of diseases? A reply to this question would seem fundamental if we are to understand why so many infants still die from diarrhoeal diseases, even in areas with good medical facilities. Until recently, the accepted idea was that the majority of diarrhoeal diseases were caused by errors in diet, attributed in turn to the precarious economic and educational conditions of a large part of the Brazilian population. Thus, physicians deemed it impossible to avoid mortality from diarrhoeal diseases, since in the final analysis these were the result of unfavourable social and economic conditions over which they had no control.

The proof that infantile diarrhoea is almost always of an infectious nature is bringing about a

profound change in the attitude to the problem. As pointed out by the American Public Health Association, "All infantile diarrhoea should be regarded as bacillary dysentery until proved otherwise by bacteriologic examination of feces."^a In fact, we are faced with a group of communicable diseases, in which the prevention of mortality becomes a predominantly medical problem.

Although in Brazil the infectious etiology and modern treatment of diarrhoeal diseases are well understood in many quarters, nevertheless it is necessary to spread such knowledge widely among physicians, if programmes for the prevention of mortality are to have sufficient effect on a national scale.

Extent of the problem

The birth-rate in Brazil being 42 per 1000 inhabitants and the infant mortality rate 160 per 1000 live births, it can be estimated that in 1958 there were 421 000 infant deaths. If it is accepted that 35% of these deaths were caused by diarrhoeal diseases—a very reasonable assumption, since the available data indicate that the percentage should be much higher—these diseases were responsible for some 147 000 deaths among infants in that year. In three large Brazilian cities, which have ample medical facilities, infant deaths caused by diarrhoeal diseases amounted to 30% or more of all deaths, as can be seen from the table.

TOTAL DEATHS AND DEATHS FROM DIARRHOEAL DISEASES AMONG INFANTS UNDER ONE YEAR OF AGE

Area	Period	Total deaths	Deaths from diarrhoeal diseases	
			number	%
Federal District	1956-57	14 870	5 197	34.9
Municipality of São Paulo (State of São Paulo)	1956	8 288	3 208	38.7
Municipality of Recife (State of Pernambuco)	1957	5 895	1 766	30.0

* Note submitted to the WHO Study Group on Diarrhoeal Diseases, November 1958.

^a American Public Health Association (1955) *Control of communicable diseases in man*, 8th ed., New York, p. 59

The extent of the diarrhoeal disease problem in Brazil, of which these data give an idea, led us to recommend two principles which we consider fundamental to the greater success of prevention programmes: (a) simplification of methods and techniques, and (b) extension over a wider area. We shall return to these principles later on.

The prevention programme

In Brazil the programme for the prevention of mortality from diarrhoeal diseases has consisted of the following measures: (1) installation of rehydration centres; (2) home visits by nurses; (3) training of health personnel; (4) establishment of small blood-banks; (5) installation of lactaria; and (6) environmental sanitation.

Rehydration centres. Rehydration centres, the aim of which is to provide conditions for the rapid correction of disturbances in body fluids and electrolytes caused by diarrhoea and vomiting and to treat the disease by specific drugs, are being set up in many Brazilian communities. Those which are being established in health units call for special comment, in view of their particular features.

The extent of the problem in Brazil, the nature of its solution, the non-existence of hospitals in many regions and the low socio-cultural level were the factors which led us to recommend the setting up of rehydration centres to function as described below.

All infants with diarrhoea arriving at a health unit are summarily put to bed in the rehydration centre, where they await medical examination. A check is then made to see whether the infant already has a record card in the files of the unit, and, if not, one is made out. In this way there is no need for the infant to be kept waiting in the queue, which generally forms when work commences, until the case can be dealt with by the clerk. If the gravity of the case warrants it, the infant can stay at the centre for the whole working day, which in many cases is eight hours (four in the morning and four in the afternoon, with a lunch interval).

The infants are placed in cots in the rehydration centre room and may thus be regarded as semi-hospitalized. In the lunch interval an attendant is put in charge of the children. Mothers or other responsible persons may accompany the children for the whole time they stop in the unit, if so desired. In general, however, they prefer to bring the infants in the morning and to return for them at the end of

the afternoon. In cases of diarrhoea which are not of a serious nature, the infants can be sent home after receiving treatment.

Role of nursing service. The nursing service of the health units plays a very important part, particularly by means of home visits, in educating families, urging them to take the babies to the health unit at the first sign of a gastro-intestinal upset, and following up in the home cases treated or being treated. As a result of the low socio-cultural level of very many Brazilian families medical advice is often sought only when the infant is already in the final stage of acute dehydration. This indicates the importance of the work of visiting nurses, who, being in direct contact with the population, can explain the necessity for and advantages of early treatment, while at the same time spreading knowledge on how to avoid enteric complaints in infants.

Training of health personnel. As already stressed, in order to prevent death from diarrhoeal diseases it is basically necessary to recognize the gravity of the problem and to know how to use methods and techniques of treatment. Because of this, it is essential to enlighten health personnel in general and physicians in particular. They must be clearly shown that it is now possible to prevent death in almost all cases of acute diarrhoea, provided the infants receive suitable medication immediately and in the appropriate doses, administered intravenously in grave cases.

Full use has been made of the Toxicosis Treatment Centre in the Federal District for the training of physicians, who, in turn, transmit the knowledge acquired to other practitioners. Among the advantages of a training period in the Toxicosis Treatment Centre, we may mention the teaching of the infraclavicular intravenous transfusion technique developed by Aubaniac,^b which represents a considerable simplification, making possible rehydration of the most serious cases outside hospitals by the intravenous route.

The creation of rehydration centres in health units leads to the systematization of treatment and to profound changes in the method of caring for the infants. We have also found that such centres help to change the attitude of physicians to the diarrhoeal diseases.

Blood-banks. Blood transfusion is an important therapeutic measure in serious cases of diarrhoea,

^b Aubaniac, R. (1952) *Presse méd.*, **60**, 1456

above all in areas where the harm done by the disease is combined with the effects of protein malnutrition. However, blood-banks have so far been established almost solely in the large urban centres, owing largely to the high cost of the equipment considered necessary. For this reason we have endeavoured to promote the creation of small blood-banks in all the health units. To achieve this, many technical difficulties had to be overcome. Among them, special mention may be made of the evacuation of blood-collecting bottles, cleaning of equipment, recovery of used bottles and rubber stoppers, washing of glassware and stoppers, separation of the plasma when haemolysis begins, etc. The solutions adopted have always had to take the economic aspect into consideration, making use of the equipment or material already available in the health units. A typical example is the solution found for evacuating collecting bottles. For this purpose, use was made of the compressor forming part of the dental equipment installed in many localities as part of the caries prophylaxis programme.

In many communities, hundreds of transfusions have already been made through small blood-banks, after the pilot project carried out in the Governador Valaderes Health Unit proved that the techniques and methods recommended were satisfactory.

Lactaria. Poverty and ignorance result in thousands of Brazilian infants being in a poor state of health owing to nutritional deficiencies. Among these deficiencies, relatively recent studies have underlined the importance of protein malnutrition, the appearance of which may be precipitated by infectious diarrhoea. The latter not only puts great difficulties in the way of absorption of food and increases the loss of organic proteins, but may also cause the mother to restrict the child's diet still further.^c Moreover, suitable nutrition plays a role of the highest importance in the recovery of the infant once the acute diarrhoeal stage has passed. Consequently, we are encouraging the establishment of lactaria on a large scale. In addition to the distribution of milk powder made in the country and of skimmed milk supplied by UNICEF, in October 1956 an experimental lactarium, using soya milk, was set up in the Pirapora Health Unit, State of Minas Gerais. Experience since that date has led to the conclusion that: (a) soya milk is readily accepted by infants and mothers; (b) periodic clinical examina-

tion shows that the majority of infants fed with soya milk gain weight satisfactorily; and (c) the running of a soya-milk lactarium is perfectly possible within the normal structure of a health unit.

At present, at least eight soya-milk lactaria have been installed in Brazil, and the Ministry of Health hopes to set up a further 25 in the near future. Thus soya-milk offers a new and favourable means of combating mortality from the diarrhoeal diseases.

Environmental sanitation. Surveys carried out in the country confirm the great influence which the amount of water available for families has on the incidence of diarrhoeal diseases. The problem of water supply for the population is very complex, and even the installation of a water-supply system in a community—a measure of a primarily economic nature—does not always solve the difficulty. The rapid growth of centres of population in Brazil, the low purchasing power of the people and their precarious cultural level are factors which, even in the presence of a good water-supply system, prevent a considerable part of the population from benefiting thereby.

In an attempt to improve this situation, we have tried to exert a direct influence in the home and to obtain results by means of domestic improvements. With this aim in view, we carried out another pilot project at Governador Valaderes, State of Minas Gerais, the results of which have had profound repercussions on the sanitation policy being applied over large areas of the country.

Two decisive contributions were made as a result of this experiment. The first concerns the working methods of health auxiliaries. Up till then, these workers, following the traditions of their profession, limited their activities to giving the usual advice on health education and providing technical information. In the project, however, they made a direct contribution towards the carrying out of practical improvements, after receiving special training as carpenters, masons and tin-smiths. This direct contribution included a limited amount of help in respect of material and the loan of tools, which became a normal part of the equipment of the health unit. The second contribution concerns the improvisation of new sanitary equipment using locally available materials. In this way, cement basins, rudimentary showers and faucets, etc., were installed; special mention should be made of a type of water reservoir holding 200 litres and a tank constructed with French tiles.

^c Scrimshaw, N. S., Béhar, M., Arroyave, G., Tejada, C. & Viteri, F. (1958) *Bol. Ofic. sanit. panamer.*, **44**, 513

The people were encouraged to participate in these measures, since they saw that, although originally of a health nature, such improvements also contribute to domestic comfort. This new approach to environmental sanitation problems also

brought about an improvement in methods of excreta disposal. In general, it offers great prospects for raising the health level of the Brazilian population, despite unfavourable economic and cultural conditions.

Organization of the Control of Gastro-intestinal Diseases in Young Children in the Soviet Union *

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In 1913 infant mortality was extremely high in Russia, amounting to 273 per thousand births. This high rate was caused by the backwardness of the population in matters of health and hygiene, unfavourable living conditions and the almost complete absence of medical care for mothers and children. It suffices to say that only 5.2% of pregnant women received medical care during childbirth and more than 30 000 women in the prime of life died in child-bed every year.

Of the total number of children who died in the first year of life approximately one-third died from gastro-intestinal diseases, for which the morbidity rate was also very high. According to figures for 1913 the gastro-intestinal morbidity rate in Moscow itself was 312 per thousand and in Moscow Province over 600 per thousand.

By gastro-intestinal diseases of young children are meant primarily diarrhoeal diseases of infectious or nutritional origin (i.e., simple dyspepsia and toxicosis, gastro-enteritis, enterocolitis, colitis and dysentery) and chronic nutritional disturbances in the form of dystrophy of varying degrees of severity.

In the Soviet Union today the problem of gastro-intestinal diseases has gradually begun to lose its urgency and undoubted successes have been achieved in their control. During the last few years there has been a considerable reduction in gastro-intestinal diseases among children of all ages and particularly young children, and mortality from these diseases is decreasing from year to year, so that they no longer occupy first place among the causes of death in children. Whereas in 1913 40%-50% died of toxicoses, this figure has been reduced almost tenfold today; in

many children's hospitals and in certain whole cities (Moscow, Leningrad, Kiev and others) it does not exceed 1.5%-2.0%, and mortality from dysentery does not exceed 0.5%-1.5%. Mortality figures for Leningrad over a recent six-year period are shown in Table 1.

It has been possible to achieve this reduction in morbidity and mortality only by carrying out large-scale measures of many different kinds and, primarily, by considerably improving the material welfare of the whole population and greatly raising its cultural level.

As a result of this main factor a considerable decrease in general and child mortality has been achieved in the USSR, simultaneously with the maintenance of the birth-rate at the relatively high level of 25 per thousand. (According to figures for 1956, total mortality was equivalent to 7.5 per thousand persons and child mortality was reduced to 45 per thousand births—a more than sixfold

TABLE 1
PERCENTAGE MORTALITY FROM GASTRO-INTESTINAL DISEASES AMONG CHILDREN IN LENINGRAD, 1951-56

Year	Toxicoses	Dysentery	Enterocolitis and gastritis
1951	9.0%	3.6%	3.4%
1952	6.0%	2.1%	2.2%
1953	5.6%	2.5%	0.35%
1954	2.7%	1.5%	1.34%
1955	2.1%	1.5%	1.26%
1956	1.8%	1.2%	1.0%

* Note submitted to the WHO Study Group on Diarrhoeal Diseases, November 1958.