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The Inter-American Investigation on Mortality in Childhood

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The Inter-American Investigation on Mortality in Childhood

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The Inter-American Investigation on Mortality in Childhood*

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Mortality in children under 5 years of age is known to be excessive in Latin American countries[1]. *One of the goals established during the meeting of heads of governments of the countries of the Americas in 1961 and contained in the Charter of Punta del Este*[2] *was "to reduce the present mortality rate in children under 5 years of age by one-half". In order to approach this goal realistically, quantitative and qualitative data on causes of death and related factors must be provided to those persons responsible for health planning at local, national, and international levels. The Inter-American Investigation of Mortality in Childhood which is being carried out by the Pan American Health Organization was planned and designed to meet these needs.*

* This research project was made possible by a contract with the Agency for International Development of the United States of America to the Pan American Health Organization.

The field work for the eight projects included in this paper was directed by the following principal collaborators:
Dr. Dionisio Aceves S., Monterrey, México, Dr. Fernando Figueira, Recife, Brazil, Dr. Ruy Laurenti, Sao Paulo, Brazil, Dr. Adela Legarreta, Santiago, Chile, Dr. Valois Martinez C., San Juan, Argentina, Dr. Gregorio Mendizabal, La Paz, Bolivia, Dr. Kenneth Standard, Kingston, Jamaica, Dr. Eduardo Suarez M., San Salvador, El Salvador.

Nature of the Investigation

This Investigation is a continental, collaborative study whose overall objective is to develop accurate and comparable statistics related to causes of death in children under 5 years of age in 15 widely separated areas of the Americas.

Thirteen projects in Latin America, one in Canada and one in the United States of America have been included in the Investigation. They were selected on the basis of geographic representation as well as on the basis of resources to conduct the field studies. All the projects except one are being carried out in schools of medicine or public health with collaboration from those responsible for delivery of health services. The countries and areas included are described in previous papers (3 and 4).

Collection of data

In each project the principal collaborator directs a small team composed of physicians, public health nurses and/or social workers and secretarial staff. For each death to be investigated a home visit is made by the nurse or social worker to obtain information regarding housing conditions and neighborhood; composition of the household in which the dead child was a member; both parents, their age, occupation and education; additional data on the mother, her pregnancy history, medical attention and condition during pregnancy and delivery of this child and finally, facts about the child, his condition at birth, breast feeding and other foods, medical attention received and the illness leading to death.

The physician completes the medical portion of the questionnaire, utilizing data from hospitals, clinics, autopsy records, private physicians and, if necessary, from interviews with the family. The questionnaire also includes the transcription of diagnoses from the medical part of the death certificate, as well as a summary of causes considered by the local group to be responsible for the death. Great effort is being made to obtain as many autopsies as possible.

Information on approximately 35,000 deaths of children under 5 years of age which occur during a two-year period is being collected. In addition, a probability sample of households for each community, obtained during the same two-year period, will yield data for approximately 20,000 living children in this age group. Thus, the interrelationships between diseases and socio-cultural and environmental factors can

be established. Collection of data in the field started in mid-1968 and will be completed in late 1970 in the Latin American projects.

In order to obtain accurate data on infant and child mortality, each area has organized its own files of births, deaths and foetal deaths. In addition to official records, other possible sources have been used to learn of the occurrence of vital events, such as hospitals, midwives, health departments, church records, cemeteries, etc. The definitions of the World Health Organization of live birth and foetal death[5] are being used by all of the projects.

Procedures in the Central Office

Completed questionnaires have been sent periodically to the headquarters of the Pan American Health Organization. They are reviewed and the information coded for processing by computer. Multiple causes of death are being classified according to rules adopted for the Investigation. Through extensive study of these deaths in infancy and childhood, it is expected that the Investigation will contribute to the development of international rules for classification of multiple causes of death to be considered for inclusion in the 1975 Revision of the *International Classification of Diseases.*

Provisional Results

Preliminary analysis of data corresponding to the first 6–8 months in 8 projects is being used to evaluate the quality and completeness of the data; to develop concepts, mainly in the fields of multiple causes, nutritional deficiency and perinatal mortality; to point out needs for preventive programs; and for other uses in health planning.

Mortality in Childhood by Age Group

Provisional data on mortality in infancy and childhood are presented in Table 1 for 8 projects and, for comparison, for the United States of America. Infant death rates varied from 39 per 1,000 live births in the Kingston Area of Jamaica to 85 per 1,000 live births in San Juan Province of Argentina. As expected, the death rates for the other age periods are much lower than those in infancy. The purpose of this report is to analyze the causes and factors responsible for mortality in childhood, 1 through 4 years of age, as the basis for preventive programs.

At this time data for the first 6–8 months of the Investigation are sufficient to divide into two age groups, 1 year and 2 through 4 years,

Table 1. Deaths under 5 years of age by age group with estimated annual rates[1] for 8 projects

(Provisional Data)

Project	Under 5 years		Under 1 year		1-4 years		1 year		2-4 years	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Kingston Area	620	9.8	517	39.2	103	2.0	55	4.4	48	1.3
La Paz	796	21.5	483	64.4	313	10.4	190	25.7	123	5.4
Monterrey	1,051	14.6	845	51.2	206	3.6	120	8.0	86	2.1
Recife	921	26.5	630	80.8	291	10.6	168	24.0	123	6.0
San Juan Province	575	22.7	477	85.2	98	4.9	68	13.3	30	2.0
San Salvador Area	826[2]	22.0	604	72.8	205	6.9	114	15.2	91	4.1
Santiago Area	542	11.3	466	48.5	76	2.0	48	5.2	28	0.9
São Paulo	1,188	16.3	1,028	65.5	160	2.8	77	5.3	83	1.9
United States of America, 1967		4.8		22.4		0.9		1.4		0.7

Estimated annual rates per 1,000 live births for infant deaths and 1,000 population for other age groups.
Includes 17 deaths with age not stated.

Table 2. Broad groups of underlying and associated

(Provisional

Cause Group	Underlying		Associated[1]	
	Number	Per cent	Number	Per 100 deaths
	Kingston Area			
All causes	103	100.0	177	171.8
Infective and parasitic diseases	27	26.2	25	24.3
Diarrhoea	18	17.5	15	14.6
Measles	—	—	—	—
Tuberculosis	2	1.9	2	1.9
Other	7	6.8	8	7.8
Malignant neoplasms	6	5.8	1	1.0
Nutritional deficiency	8	7.8	38	36.9
Diseases of nervous system and sense organs	10	9.7	5	4.9
Diseases of circulatory system	1	1.0	18	17.5
Diseases of respiratory system	19	18.4	42	40.8
Diseases of digestive system	4	3.9	2	1.9
Congenital anomalies	7	6.8	3	2.9
External causes	10	9.7	3	2.9
Other and unspecified causes	11	10.7	40	38.8
	San Juan Province			
All causes	98	100.0	200	204.1
Infective and parasitic diseases	57	58.2	29	29.6
Diarrhoea	9	9.2	22	22.4
Measles	38	38.8	4	4.1
Tuberculosis	3	3.1	1	1.0
Other	7	7.1	2	2.0
Malignant neoplasms	—	—	—	—
Nutritional deficiency	4	4.1	36	36.7
Diseases of nervous system and sense organs	5	5.1	13	13.3
Diseases of circulatory system	1	1.0	7	7.1
Diseases of respiratory system	14	14.3	55	56.1
Diseases of digestive system	2	2.0	7	7.1
Congenital anomalies	4	4.1	2	2.0
External causes	9	9.2	7	7.1
Other and unspecified causes	2	2.0	44	44.9

causes of death for children 1-4 years of age for 8 projects

Data)

Underlying		Associated[1]		Underlying		Associated[1]		Underlying		Associated[1]	
Number	Per cent	Number	Per 100 deaths	Number	Per cent	Number	Per 100 deaths	Number	Per cent	Number	Per 100 deaths
La Paz				Monterrey				Recife			
313	99.9	491	156.9	206	99.9	517	251.0	291	99.9	752	258.4
210	67.1	100	31.9	128	62.1	156	75.7	198	68.0	219	75.3
63	20.1	77	24.6	26	12.6	76	36.9	22	7.6	121	41.6
116	37.1	7	2.2	47	22.8	16	7.8	142	48.8	2	0.7
21	6.7	9	2.9	19	9.2	12	5.8	14	4.8	10	3.4
10	3.2	7	2.2	36	17.5	52	25.2	20	6.9	86	29.6
3	1.0	1	0.3	—	—	—	—	—	—	—	—
11	3.5	150	47.9	23	11.2	112	54.4	23	7.9	180	61.9
7	2.2	10	3.2	3	1.5	17	8.3	12	4.1	19	6.5
—	—	4	1.3	—	—	6	2.9	—	—	21	7.2
47	15.0	138	44.1	28	13.6	116	56.3	38	13.1	231	79.4
1	0.3	5	1.6	1	0.5	16	7.8	—	—	15	5.2
1	0.3	3	1.0	11	5.3	8	3.9	1	0.3	2	0.7
13	4.1	2	0.6	6	2.9	12	5.8	9	3.1	3	1.0
20	6.4	78	24.9	6	2.9	74	35.9	10	3.4	62	21.3
San Salvador Area				Santiago Area				Sao Paulo			
205	100.0	434	211.7	76	99.9	118	155.3	160	99.8	296	185.0
90	43.9	149	72.7	15	19.7	11	14.5	57	35.6	69	43.1
41	20.0	84	41.0	9	11.8	8	10.5	6	3.8	30	18.8
34	16.6	2	1.0	1	1.3	—	—	32	20.0	—	—
1	0.5	2	1.0	1	1.3	2	2.6	5	3.1	3	1.9
14	6.8	61	29.8	4	5.3	1	0.8	14	8.8	36	22.5
2	1.0	1	0.5	3	3.9	—	—	10	6.2	—	—
54	26.3	86	42.0	4	5.3	25	32.9	16	10.0	55	34.4
4	2.0	8	3.9	13	17.1	6	7.9	10	6.2	8	5.0
—	—	12	5.9	—	—	11	14.5	3	1.9	16	10.0
24	11.7	102	49.8	12	15.8	26	34.2	33	20.6	78	48.8
3	1.5	10	4.9	—	—	3	3.9	1	0.6	3	1.9
5	2.4	3	1.5	9	11.8	7	9.2	10	6.2	6	3.8
14	6.8	2	1.0	19	25.0	7	9.2	15	9.4	4	2.5
9	4.4	61	29.8	1	1.3	22	28.9	5	3.1	57	35.6

1 A death may be included more than once if multiple causes are diagnosed. For some causes, such as tuberculosis, malignant neoplasms and nutritional deficiency, multiple forms of the disease may be included as associated causes.

and the death rates for these two age groups are shown in Figure 1. Wide variations were noted in the death rate for children 1 year of age; the rate for La Paz, Bolivia, was nearly six times the rate in the Kingston Area of Jamaica and 18 times the rate in the United States of America. Although the death rates for children 2–4 years of age were much lower, of the order of one-third to one-sixth of the rates at 1 year of age, the variation was likewise great, from 1 to 6 per 1,000 population for the 8 projects. Thus, in all of these projects mortality in childhood could be reduced to much lower levels.

Patterns of Causes of Mortality

Study of mortality by clearcut age groups is relatively simple when the single or underlying cause approach is used. Unfortunately, statistics based on single causes fail to describe the complex pattern of pathological factors involved in most deaths. Also, statistics based on single causes may be responsible for adoption of isolated or independent actions and programs, not necessarily coordinated and not always according to real priorities.

The multiple cause approach, on the other hand, is more complex and difficult to apply but, at the same time, permits a better understanding of the factors involved in death. If chronologic relationships are established, important associations and interrelationships may be seen and hence sound, comprehensive, multisectorial and multidisciplinary actions can be recommended.

This Investigation was designed so that associated as well as underlying causes of death could be analyzed and thus the interrelationships of infectious diseases and nutritional deficiencies could be studied. Table 2 provides both underlying and associated causes of death in broad groups for children 1–4 years of age in 8 projects. These provisional tabulations are revealing marked differences in the patterns of mortality by causes in these areas. When data for the two complete years become available, study of the causes of death by smaller age group can be made.

Infective and parasitic diseases

The group of infective and parasitic diseases was responsible for high proportions of deaths for children 1–4 years of age, especially in areas with high death rates. In Recife, Brazil, and La Paz, Bolivia, over two-thirds of the deaths were due to infective and parasitic diseases (Figure 2). In these areas the percentages were high and at the same level for both age groups, 1 year and 2–4 years. In both areas epidemics of

measles occurred. Although deaths from measles have continued to occur, immunization programs were undertaken in the second year of the Investigation and thus changes are expected in the causes of death within this broad group during the two-year period of the Investigation. Diarrhea, also in the group of infective and parasitic diseases, was the second important cause in this group and the percentages for both measles and diarrhea are shown in the figure. The numbers of deaths due to other infectious diseases were smaller. In several projects, tuberculosis was the third most frequent infectious disease.

The two areas with the lowest death rates in the age period 1–4 years (the Santiago Area of Chile and the Kingston Area of Jamaica) had only 20 per cent and 26 per cent respectively of the deaths attributed to infective and parasitic diseases as the underlying cause. In the Santiago Area, external causes were responsible for slightly more deaths than infective and parasitic diseases. Diseases of the nervous system and sense organs were the third most frequent group responsible for deaths in the Santiago Area.

In addition to the underlying causes, the associated causes of death are given in Table 2. Infective and parasitic diseases were important associated causes as well as important underlying causes. With the exception of the Kingston and Santiago Areas, with relatively low death rates and small numbers of deaths, diarrhea was more frequently an associated cause than an underlying cause. For example, in Recife, diarrhea was an associated cause of 121 deaths and an underlying cause of only 22 deaths. In contrast, measles was the underlying cause of 142 deaths and an associated cause of 2 deaths.

Nutritional deficiency

Nutritional deficiency was classified frequently as an associated cause of death. This nutritional deficiency, most of the time pre-existent to the underlying cause, is the result of a past medical history in which repeated episodes of infectious diseases (mainly diarrhoeal disease), early weaning and environmental and social factors play an important role. In three projects, Recife, Brazil, the San Salvador Area of El Salvador, and Monterrey, Mexico, nutritional deficiency was an underlying or an associated cause in approximately two-thirds of the deaths of children 1–4 years of age (Figure 3). In other areas the percentages varied from 37 in the Santiago Area of Chile[1] to 51 in La Paz, Bolivia.

[1] Excluding more than one type of nutritional deficiency in a death.

In Recife, deaths from measles frequently occurred in children with nutritional deficiency. In fact in this age period in Recife, of the 142 deaths in which measles was the underlying cause, nutritional deficiency was an associated cause in 102, or 72 per cent. Table 3 and Figure 4 show that nutritional deficiency was an associated cause in higher proportions of deaths due to infective and parasitic diseases than of deaths due to all other causes combined. Thus, this interrelationship of infective and parasitic diseases and nutritional deficiency indicates the need for an integrated preventive program with the combination of immunization programs, food supplementation and health education. These observations are in accordance with research indicating the importance of the host as well as the infectious agent in the development of disease.

Table 3. Deaths 1–4 years of age from infective and parasitic diseases and from other underlying causes with number and percentage with nutritional deficiency as associated cause, for 8 projects

(Provisional data)

Project	Infective and parasitic disease			Other causes[1]		
	Total deaths	Nutritional deficiency associated cause		Total deaths	Nutritional deficiency associated cause	
		Deaths	Per cent		Deaths	Per cent
Kingston Area	27	13	48.1	68	23	33.8
La Paz	210	132	62.9	92	18	19.6
Monterrey	128	97[2]	75.8	55	14	25.5
Recife	198	144	72.7	70	36	51.4
San Juan Province	57	26	45.6	37	10	27.0
San Salvador Area	90	57	63.3	61	27	44.3
Santiago Area	15	8	53.3	57	16	28.1
Sao Paulo	57	26	45.6	87	27	31.0

[1] Excluding deaths with nutritional deficiency as underlying cause.
[2] Excludes one associated cause in a death with two types of nutritional deficiency.

Interrelationships of Factors

The death rates for the age period 1 though 4 years are shown in Figure 5 in rank order from the high rates of 10.6 and 10.4 per 1,000 population in Recife and La Paz to 2.0 in the Kingston and Santiago

Areas. Also, the death rates from nutritional deficiency as an underlying or associated cause, given in the second section of the figure, indicate that there is a close relationship between the size of the death rates from all causes and those from nutritional deficiency. In approximately 70 per cent of the deaths in which nutritional deficiency was found to be an associated cause, this deficiency state was classified as a contributory condition pre-existing to the underlying cause of death (Table 4). Major reductions in the death rates from all causes will require prevention of nutritional deficiency through improvement in the nutritional status of children in these areas.

Table 4. Deaths from nutritional deficiency as underlying or associated cause with rates per 1,000 population for age group 1–4 years for 8 projects

(Provisional data)

	Total[1]		Underlying cause		Associated cause[1]			
					Consequence		Contributory	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Kingston Area	44	0.9	8	0.2	11	0.2	25	0.5
La Paz	161	5.4	11	0.4	44	1.5	106	3.5
Monterrey	134	2.4	23	0.4	51	0.9	60	1.1
Recife	203	7.4	23	0.8	31	1.1	149	5.4
San Juan Province	40	2.0	4	0.2	8	0.4	28	1.4
San Salvador Area	138	4.6	54	1.8	32	1.1	52	1.7
Santiago Area	28	0.7	4	0.1	6	0.2	18	0.5
Sao Paulo	69	1.2	16	0.3	19	0.3	34	0.6

[1] Excludes two deaths in Kingston Area, two in San Salvador Area, two in Sao Paulo and one in Santiago Area with nutritional deficiency as an associated cause as well as an underlying cause and one death in Monterrey with two types of nutritional deficiency as a consequence of measles.

The types of nutritional deficiency responsible for these deaths have been considered. In only one death was the underlying cause attributed to a single vitamin deficiency, ascorbic acid deficiency; however, in this

death nutritional marasmus was an associated cause. For the other deaths, a multiple deficiency syndrome, protein malnutrition, nutritional marasmus or other and unspecified nutritional deficiency was stated. In the four areas with the highest death rates from nutritional deficiency the percentages of these deaths with protein malnutrition are given below:

	Nutritional deficiency	Protein malnutrition	
	(all types)	Number	Per cent
Recife	203	83	41
San Salvador Area	140	57	41
Monterrey	135	39	29
La Paz	161	23	14

In the San Salvador Area and Recife, the percentages of these deaths in which protein malnutrition (kwashiorkor) was known to be a factor were relatively high, 41 each. Gordon, *et al.*,[6] has commented on the two ways in which malnutrition contributes to high death rates "... first, through specific nutritional disorders such as kwashiorkor, marasmus, and others and second, with equal significance, through the extent to which it exaggerates the effects of infection."

The pattern of breast feeding varied widely in the eight projects. In Recife, of the children who died from 1–4 years of age 60 per cent had been breast-fed for less than one month or had received no breast milk. At the other extreme, in La Paz, only 9 per cent had been breast fed for less than one month. In three areas, Monterrey, La Paz and San Salvador breast feeding was continued for 12 months or longer in 10 per cent or more of the children who died in this age period. In the other areas, prolonged breast feeding was not practised.

In Figure 5 and Table 5, the percentages of homes of deceased children with piped water supplies are also shown. The areas with high death rates in the age period 1–4 years are the ones with low percentages of homes with piped water supplies. In contrast, in the two areas with the lowest death rates, the Kingston and Santiago Areas, the percentages of homes with piped water supplies were over 80. The provision of water within the home has been demonstrated to have a direct relation to morbidity from diarrhoeal diseases[7] and thus to mortality.

Table 5. Number and percentage of homes of index cases 1–4 years of age with piped water, for 8 projects

(Provisional data)

Project	Total homes[1]	Piped water	
		Number	Per cent
Kingston Area	97	89	91.8
La Paz	192	92	47.9
Monterrey	167	120	71.9
Recife	265	32	12.1
San Juan Province	94	19	20.2
San Salvador Area	198	85	42.9
Santiago Area	59	52	88.1
Sao Paulo	126	67	53.2

[1] Excluding homes for which information was not available or was not specified.

Discussion

The constitutional characteristics which are determined by biological and medical history, the great socio-cultural and environmental dependence of children and their special requirements for growth and development are important factors influencing the health status of children.

These provisional data from the Inter-American Investigation of Mortality in Childhood indicate the complexity of the problem of prevention of diseases in childhood. The interrelationships between mortality from all causes and from specific causes and factors governing them are being clarified. It is evident that the data available from the study of deaths, using various sources of information, permit a better understanding of the diseases and conditions that participate directly or indirectly in mortality. The occurrence and importance of common associations can be revealed by the study of multiple causes. The infective and parasitic diseases and the nutritional deficiencies are closely related and are dependent on socio-cultural and environmental factors. Probably developing countries in many areas of the world experience patterns of mortality in childhood in which nutritional deficiency is contributing directly and indirectly to mortality. The solution of these problems requires coordinated, multidisciplinary approaches within the context of comprehensive health programs.

It is hoped that this Investigation, as it progresses, will contribute to better understanding of health problems of childhood in developing countries and hence, to important recommendations leading not only to decreased mortality but, mainly, to improved future well-being of survivors.

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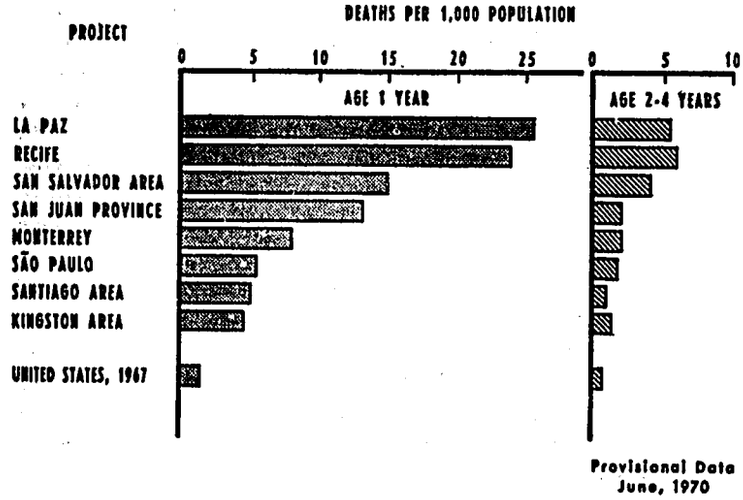
Figure 1

Death rates of children 1 year and 2-4 years of age, for 8 projects and United States



Provisional Data
June, 1970

Figure 2

Percentage of deaths 1-4 years of age due to infective and parasitic diseases, for 8 projects

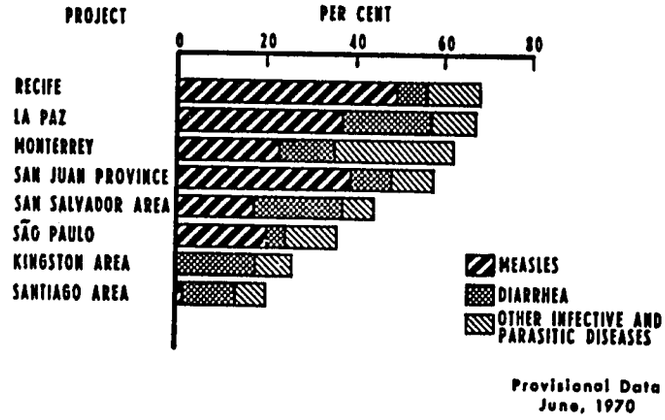


Figure 3

Percentage of deaths 1-4 years of age with nutritional deficiency, for 8 projects

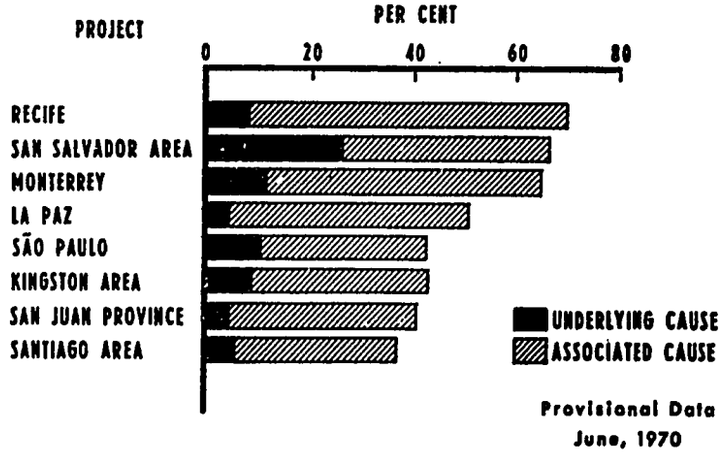


Figure 4
Percentage of deaths 1-4 years of age from infective and parasitic diseases and from other causes with nutritional deficiency as associated cause, for 8 projects

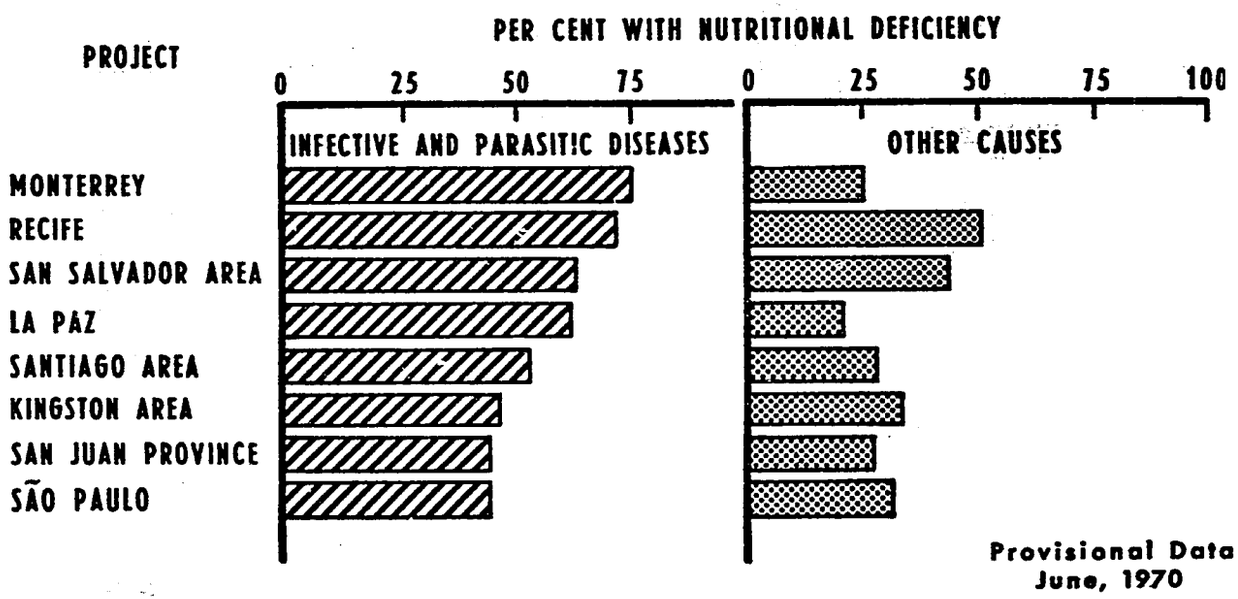


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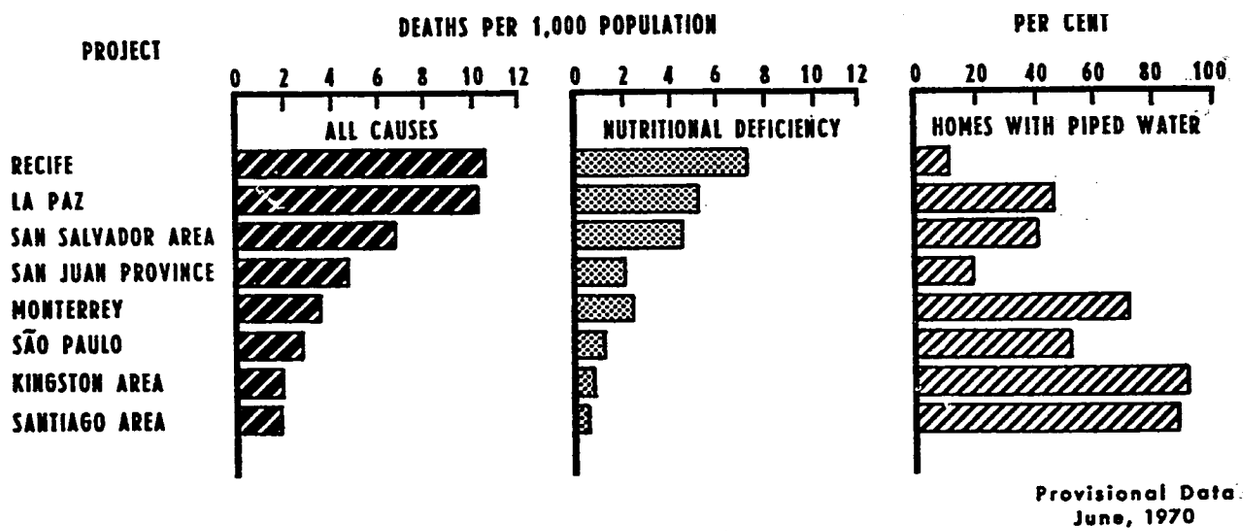
Figure 5

Death rate from all causes and from nutritional deficiency as underlying or associated cause and percentage of homes with piped water in age group 1-4 years, for 8 projects



Résumé

Enquête interaméricaine sur la mortalité du jeune enfant

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Dans les pays d'Amérique latine, le taux de mortalité est excessivement élevé chez les enfants de moins de cinq ans. Une enquête interaméricaine a été lancée sur quinze zones du continent américain. Son objectif était d'établir des statistiques comparables et précises, relatives aux causes de décès des enfants appartenant au groupe d'âge 1-5 ans, afin d'entreprendre des actions préventives. Des données provisoires, recueillies dans huit de ces quinze zones au cours des six-huit premiers mois de l'enquête, on peut tirer quelques constatations.

Deux groupes d'âge ont été considérés: les enfants de moins d'un an et les enfants entre 2 et 4 ans. Les taux de décès pour le deuxième groupe sont beaucoup plus bas que pour le premier groupe (enfants de moins d'un an). Ces taux varient dans un rapport de 1 à 6 suivant les zones étudiées.

L'étude des causes de mortalité montre que celles-ci sont très souvent multiples et associées. Un programme de prévention qui s'attaquerait à l'une de ces causes, sans prendre en considération les autres, serait assez peu efficace. Cette approche par causes multiples et associées rend l'étude statistique plus complexe certainement, mais elle permet une meilleure compréhension des facteurs qui provoquent les décès. D'ores et déjà, il est clair que des actions multidisciplinaires et multisectorielles doivent être recommandées.

Le groupe des maladies infectieuses et des parasitoses est le principal responsable des décès des enfants de 1 à 4 ans. Dans ce groupe d'âge également, la déficience nutritionnelle apparaît comme étant en corrélation étroite avec les taux de mortalité, qu'elle soit cause première ou cause associée.

Toutes les observations montrent l'importance d'une lutte contre la pollution de l'eau pour réduire le développement des diarrhées.

Dans approximativement 60% des décès, les déficiences nutritionnelles apparaissent comme une cause associée. Dans la plupart des cas de décès, il s'agit d'un syndrome de déficience nutritionnelle multiple dont la malnutrition protéinique est le principal aspect.

Les maladies infectieuses et parasitaires, les déficiences nutritionnelles sont étroitement associées et dépendent de l'environnement socio-culturel.

Les données qui proviennent de cette étude de la mortalité utilisant diverses sources d'information devraient permettre une meilleure compréhension des causes et des conditions qui influent directement sur la mortalité. Les programmes sanitaires doivent être conçus dans une optique d'ensemble et non en vue de s'attaquer à des causes particulières de décès.

Resumen

Encuesta interamericana sobre la mortalidad del niño

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En los países de América Latina, la tasa de mortalidad en los niños menores de cinco años, es excesivamente elevada. Una encuesta interamericana fue lanzada en quince zonas del continente americano. Su objetivo era establecer estadísticas comparables y precisas, relativas a las causas de deceso de los niños pertenecientes al grupo de edad 1-5 años, con el fin de emprender acciones preventivas. De los datos provisorios recogidos en ocho de las quince zonas, en el curso de los seis-ocho primeros meses de la encuesta, se pueden sacar algunas conclusiones.

Fueron considerados dos grupos de edad: los niños de menos de un año y los niños entre 2 y 4 años. El porcentage de decesos en el segundo grupo es mucho mas bajo que en el primero (niños menores de un año). Estos porcentajes varían en una relación de 1 a 6 según las zonas estudiadas.

El estudio de las causas de la mortalidad muestra que, a menudo, ellas son múltiples y asociadas. Un programa de prevención que atacaria a una de estas causas, sin tomar en consideración las otras, sería bastante poco eficaz. Esta aproximación por causas múltiples y asociadas, aumenta, ciertamente, la complejidad del estudio estadístico, pero permite una mejor comprensión de los factores que provocan los decesos. Desde ahora, es evidente que unas acciones multidisciplinarias y multi-sectoriales deben ser recomendadas.

El grupo de enfermedades infecciosas y de las parasitosis es el principal responsable de los decesos de los niños de 1 a 4 años.

En este grupo de edad, la deficiencia nutricional igualmente aparece en estrecha correlación con la tasa de mortalidad, que sea como causa primera o causa asociada.

Todas las observaciones muestran la importancia de una lucha contra la polución del agua para reducir el desarrollo de las diarreas.

En aproximadamente el 60% de los decesos, las deficiencias nutricionales aparecen como una causa asociada. En la mayoria de los casos de deceso, se trata de un síndrome de deficiencia nutricional múltiple, en el cual la malnutrición proteica contituye el aspecto principal.

Las enfermedades infecciosas y parasitarias, las deficiencias nutricionales, están estrechamente asociadas y dependen del ambiante socio-cultural.

Los datos que provienen de este estudio de la mortalidad utilizando diversas fuentes de información, deberían permitir una mejor comprensión de las causas y condiciones que influyen directamente sobre la mortalidad. Los programas sanitarios deben ser concebidos con un enfoque de conjunto y no con la perspectiva de atacar a unas causas particulares de la mortalidad.

Zusammenfassung

Interamerikanische Untersuchung über die Kleinkindersterblichkeit

Ruth R. Puffer
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Ann Dillon

In den lateinamerikanischen Ländern ist die Sterblichkeitsrate der weniger als fünf Jahre alten Kinder übermässig hoch. Es wurde eine Ermittlung in 15 Zonen des amerikanischen Kontinents angestellt. Sie hatte zum Ziel, vergleichbare und genaue Statistiken über die Todesursachen bei Kindern in der Altersgruppe von 1-5 Jahren zu erstellen, um vorbeugende Massnahmen zu treffen. Die vorläufigen Daten, die in acht dieser fünfzehn Zonen im Laufe der ersten sechs bis acht Untersuchungsmonate gewonnen wurden, lassen einige Feststellungen zu.

Zwei Altersgruppen wurden in Betracht gezogen: Kinder von weniger als einem Jahr und Kinder zwischen 2 und 4 Jahren. Die Sterblichkeitsrate bei der zweiten Gruppe liegt viel niedriger als bei der ersten Gruppe (Kinder von unter einem Jahr). Diese Raten schwanken im Verhältnis von 1 zu 6 je nach den Ermittlungszonen.

Die Untersuchung zeigt, dass die Sterblichkeit sehr oft vielfältige und miteinander verbundene Ursachen hat. Ein Vorbeugungsprogramm, das gegen eine dieser Ursachen anginge, ohne die anderen zu berücksichtigen, hätte eine ziemlich geringe Wirkung. Dieses Vorgehen über multiple und miteinander verbundene Ursachen macht die statistische Untersuchung zwar komplexer, gestattet aber ein besseres Verständnis der Faktoren, die die Todesfälle hervorrufen. Von nun an ist es klar, dass Massnahmen empfohlen werden müssen, die sich gleichzeitig auf viele Disziplinen und Sektoren beziehen.

Die Gruppe der durch Infektionen und Schmarotzer verursachten Krankheiten ist hauptverantwortlich für die Sterbefälle von Kindern von 1-4 Jahren. Es scheint auch, dass in dieser Gruppe die Unterernährung oder einseitige Ernährung in enger Wechselbeziehung zu den Sterblichkeitsraten steht, entweder als primäre Ursache oder ursächlich mit ihr im Zusammenhang stehend.

Alle Beobachtungen zeigen die Wichtigkeit des Kampfes gegen die Wasserverunreinigung, um das Auftreten von Diarrhöen zu verringern.

In ungefähr 60% der Sterbefälle tauchen Ernährungsmängel als mitverantwortliche Ursache auf. In den meisten dieser Sterbefälle handelt es sich um ein Syndrom von multiplem Ernährungsmangel, bei dem unzureichende Versorgung mit Eiweiss der Hauptfaktor ist.

Die durch Infektionen und Schmarotzer hervorgerufenen Krankheiten und die Ernährungsmängel sind eng miteinander verbunden und hängen von der sozial-kulturellen Umgebung ab.

Die Daten, die diese Untersuchung, die sich auf verschiedene Informationsquellen stützt, ergeben haben, müssten ein besseres Verständnis der Ursachen und der Bedingungen ermöglichen, die die Sterblichkeit direkt beeinflussen. Gesundheitsprogramme sollten mit dem Blick auf das Ganze konzipiert werden und nicht unter dem Gesichtpunkt, einzelne Todesursachen zu bekämpfen.

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