High incidence of preventable deaths during childhood in Porto Velho, Rondonia - Brazil

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Abstract

Background: We aimed to estimate and analyze epidemiological profile of deaths during childhood.

Method: We used the databases of deaths provided by Information System of mortality between 2006 and 2010. We selected only those records where the occurrence of deaths corresponded to Porto Velho city and those who were aged between 12 and 48 months old at the moment of death. We examined only deaths from preventable causes and poorly defined.

Results: The total number of deaths was estimated to be 103, 48.6% male. High frequencies of deaths occurred (39.8%) in children before reaching two years old. Vast majority of deaths (66.9%) was due to preventable causes, 18.4% by poorly defined causes and nearly one in three by external causes. Approximately one in four were due to traffic accidents, 41.9% by drowning and submersion. Also, there were significant frequencies of deaths associated with respiratory diseases (17.5%) and infectious and parasitic diseases (16.6%).

Conclusion: These findings reinforce the importance of studies of infant mortality, drawing attention to the debate on policy design to reduce childhood deaths, especially in acting on preventable causes.

Key words: Mortality; Child Health; Public Policy.

Background

One way to evaluate the policies and actions of health care is through studies regarding the distribution of deaths in a population, the identification of the most vulnerable issue to health problems and definition of the main problems. These aspects guide the allocation of resources and assist the planning, management and health evaluation. [1]

Wagstaff, [2] studying the magnitude and causes of socioeconomic inequalities in mortality of children under five years old from nine countries found that inequalities were higher than the corresponding mortality of infants, and were quite pronounced in Brazil and relatively high in Nicaragua and the Philippines. Inequalities in mortality in children under 5 years old were lower in Cote d'lvoire, Ghana, Pakistan and Vietnam. These results reflect intense inequalities in mortality between socioeconomic groups, with deaths concentrated among the most disadvantaged.

The biological determinants of death in childhood are subject to environmental, social and economic conditions and the availability of health services. [3] Rutstein et al. [4] indicate that the death is linked to the economic structure, social health of the country, and it is also associated with medical care. These authors proposed a method for evaluating the quality of medical care and created the concept of preventable death.

The preventable deaths in infancy occur for lack of adoption of individual and social actions, when compared to other observed populations, whose indexes are shown in low or reduction process. [5] Avoidable death is an excellent indicator of the quality of access to health services and indicates the perverse face of mortality manifestation, especially in children. [6]

The prevention of deaths is crucial to understanding the changes that occur in the structure of mor-

tality, as to distinguish the causes that are preventable by certain actions of health sector interventions for those preventable through public policies, as well as to evaluate access to health services and provide support for interventions priority problems observed. [7] Similarly, another study claims that the estimate and profile analysis of infant mortality may subsidize aims for good health planning. [8]

In view of the above considerations, this study aimed to estimate and analyze the epidemiological profile of deaths during childhood in Porto Velho, RO, Brazil.

Method

This is a descriptive study, we used the databases of deaths provided by the Information System of mortality between 2006 and 2010. The study was approved by the Ethical Committee in Research (Protocol CAAE No. 042/2010). We selected only those records where the deaths corresponded to the Porto Velho city and those who were aged 12 to 48 months old at the moment of death. We examined only deaths from preventable causes and poorly defined.

In this study we considered as the causes of avoidable deaths, only the following classifications: (I) – reduced through appropriate actions to diagnosis and treatment, and (II) reduced through appropriate actions to promote health, linked to appropriate actions to attention of health. To the

poorly defined causes of death we considered: (I) signs, symptoms and abnormal findings of clinical and laboratory not elsewhere classified. In others cases, the classification considered the list of preventable deaths of the Brazilian Health System proposed by Malta et al. [9]

The descriptive analysis of deaths was presented by frequency tables.

Results

The total number of deaths by cause was estimated to be 103, 51.4% female. There were high rates of deaths (39.8%) in children before reaching two years old. Vast majority of deaths (66.9%) was due to preventable causes, poorly defined causes comprised 18.4%. We observed that around one in four was due to traffic accidents, 41.9% by drowning and submersion. There were large discrepancies between the extremes of the years studied, i.e. the coefficient from 5.7 deaths in 2006 to 8.1 (per 10,000 inhabitants) in 2010, an increase of 70%. Table 1 shows the results of distribution of deaths of children.

The epidemiological profile of deaths remained during the first three consecutive years. On the other hand, it appeared generally decreased during 2010. Table 2 shows the results of distribution of deaths of children aged 1 to 4 years old, according to specific causes.

Table 1. Distribution of deaths of children aged 1 to 4 years old, according to the variables investigated

Socio-demographic variables	Year										Total	
	2006		2007		2008		2009		2010			
	n*	%	n*	%	n*	%	n*	%	n*	%	n*	%
Age (year)												
1	10	50.0	5	45.5	11	39.3	11	52.4	4	17.4	41	39.8
2	3	15.0	4	36.4	6	21.4	5	23.8	4	17.4	22	21.4
3	1	5.0	2	18.1	8	28.6	4	19.0	9	39.1	24	23.3
4	6	30.0	-	-	3	10.7	1	4.8	6	26.1	16	15.5
Gender												
Male	12	60.0	7	63.6	16	57.1	10	47.6	5	21.7	50	48.5
Female	8	40.0	4	36.4	12	42.9	11	52.4	18	78.3	53	51.5
Race												
White	8	42.1	4	44.4	11	47.8	4	22.2	10	45.5	37	40.7
Black	11	57.9	5	55.6	12	52.2	14	77.8	12	54.5	54	59.3

Source: SIM – Dept. Epidemiology/SEMUSA, 2012. We used the rate per 10,000 inhabitants.

Table 2. Distribution of deaths of children aged 1 to 4 years old, according to specific causes

Specific Cause	Year									
	2006		2007		2008		2009		2010	
	n*	%	n*	%	n*	%	n*	%	n*	%
Respiratory diseases	5	25.0	2	18.2	-	-	5	23.8	6	26.0
Infectious and parasitic diseases	3	15.0	3	27.3	2	7.1	6	28.6	3	13.1
Poorly defined causes	4	20.0	-	-	7	25.0	2	9.5	6	26.0
External Causes	6	30.0	4	36.3	15	53.6	3	14.3	3	13.1
Neoplasias	-	-	2	18.2	3	10.7	3	14.3	1	4.5
Others	2	10.0	-	-	1	3.6	2	9.5	4	17.3
Total	**10**	**100.0**	**11**	**100.0**	**28**	**100.0**	**21**	**100.0**	**23**	**100.0**

Source: SIM – Dept. of Epidemiology/SEMUSA, 2012. Underlying cause of death according to the International Statistical Classification of Diseases - Tenth Revision (ICD-10). We used the rate per 10,000 inhabitants.

Table 3. Distribution of deaths of children aged 1 to 4 years old, according to external causes

Specific Causes	Year										Total	
	2006		2007		2008		2009		2010			
	n*	%	n*	%	n*	%	n*	%	n*	%	n*	%
Transport accidents	2	28.6	1	25.0	4	26.7	-		1	33.3	8	25.8
Accidental drowning and submersion	3	42.9	1	25.0	6	40.0	2	66.7	1	33.3	13	41.9
Exposure to smoke, fire and flames	1	14.3	1	25.0		0.0	-		-	-	2	6.5
Others	1	14.3	1	25.0	5	33.3	1	33.3	1	33.3	8	25.8
Total	**7**	**100.0**	**4**	**100.0**	**15**	**100.0**	**3**	**100.0**	**3**	**100.0**	**31**	**100.0**

Source: SIM – Dept. of Epidemiology/SEMUSA, 2012. Underlying cause of death according to the International Statistical Classification of Diseases - Tenth Revision (ICD-10). We used the rate per 10,000 inhabitants.

Table 4. Distribution of proportional deaths in 1-4 years old children

Deaths	Year										Total	
	2006		2007		2008		2009		2010			
	n*	%	n*	%	n*	%	n*	%	n*	%	n*	%
Preventable	14	70.0	9	81.8	17	60.7	15	71.4	14	60.8	69	67.0
Poorly defined	4	20.0	-	-	7	25.0	2	9.6	6	26.0	19	18.4
Not preventable	2	10.0	2	18.2	4	14.3	4	19.0	3	13.2	15	14.6
Total	**7**	**100.0**	**4**	**100.0**	**15**	**100.0**	**3**	**100**	**3**	**100.0**	**31**	**100.0**

Source: SIM – Dept. of Epidemiology/SEMUSA, 2012. Brazilian List of Preventable Deaths. We used the rate per 10,000 inhabitants.

The data in Table 3 suggest that the vast majority of deaths from external causes occurred in children between one and two years old, with decreasing trend in the period of the study.

Table 4 presents the results of proportional distribution of preventable, poorly defended and not preventable deaths in children between 1 and 4 years old.

Discussion

Considering that there are few studies that explore death data provided by the Information System of mortality in Brazil, mainly in Rondônia, this investigation was undertaken to evaluated epidemiological profile of deaths during childhood in Rondônia. In the city of Porto Velho, in the period studied, more black children died from one to

four years old compared to white. This finding is in agreement with the socially expected in many countries of the world, particularly in Brazil [10] and the U.S. [11] In these countries there are a significant number of black people whose families have low income and poor health care services and medication, which may be part of explaining mortality in black children.

Moreover, the present study found that more female children died when compared to male, which is against with what is biologically expected, i.e. there are more deaths in male gender compared to females, in all age groups. In this perspective, research asserts that the male gender is a risk factor for mortality in all stages of human life. [12-14]

Besides this differential mortality between the genders of children in the study, the low number of deaths in 2007 compared to other years is typical of underreporting cases of information, suggesting the need for a commitment to provide complete and trustful data by professionals qualified to perform such function. Also, according to Duarte (1992), [15] mortality statistics are affected by the low coverage of the information system and / or the under-reporting of information or poor quality of death certificates, specifically regarding the causes of death. The death declarations when not properly filled preclude analyzes of mortality that serve to delineate the health profile of the population in a particular region.

In this study, we found that the one of the main causes of deaths were caused by external causes (30%) and by infectious and / or parasitic (16.6%) in children of Porto Velho. These findings corroborate the data in others Brazilian states [16-17] and in Porto Velho city. [9]

Almost half of the deaths due to external causes in this study were by drowning and / or submersion. Accidents affect children because they are more exposed to factors risk such as, for example, swimming pools and rivers baths. The high incidence of deaths from this accident in particular the deaths of children in swimming pools and rivers baths, can be understood as a public health issue, and can be avoided when protective and monitoring measures are taken with the child by responsible and / or caregiver. [18]

In this direction, another research performed in one year old regarding drowning indicates that it is a result of lack of skill in the aquatic environment

added with parents and guardians carelessness. [19] High percentage of deaths (67.0%) are estimated as preventable, in this study, if health promotion actions were adopted and / or if they had adequate actions of diagnosis and treatment, and according to a previous study, these high percentages of deaths suggest problems of access to health services, coverage and / or quality of care. [20]

It was also high (18.4%) the incidence of deaths due to poorly defined causes in this study. This incidence of deaths is considered as an indicator of quality of information about death causes and their occurrence, pointing to the need for investments in diagnostic and therapeutic resources, as well as the training of professionals for the correct completion of death certificates. [21] Moreover, in some developed countries the incidence of deaths due to poorly defined causes is less than 1%. Brazil is considered by the World Health Organization as having mid-level quality of mortality information system. [22]

There was a very important increase (70%) in mortality rate between 2006 and 2010 despite the improvement in living conditions in Porto Velho, from 2004, with improvements in urbanization, sanitation, nutrition and education, as well as improvements in the performance of health services with the expansion of the Family Health Strategy, the increased number of hospital beds and the quality of care.

Therefore, one may consider that Porto Velho city showed no improvements on economic health required for satisfaction of its population in the researched period. However, there was a reduction in infant mortality in Brazil, although there are regional disparities, which persist in the high rates of mortality in children under five years old in some regions of the country, such as Porto Velho city, Rondônia. [23, 24]

Although our study presents limitations because it was based on secondary data, our findings seem to reflect the present situation in other cities with characteristics of health services similar to Porto Velho, Rondônia, reiterating the need to evaluate the effectiveness of care provided, especially if it is considered that deaths could be avoided by health care measures. The absence of a network of verification services structured deaths makes the basic causes still poorly defined persistent in the city.

Conclusion

This study offers further evidence that reinforce the importance of studies of mortality infant, drawing attention to the debate on policy design to reduce deaths in childhood, working in particular on preventable causes.

Author's contribution

All authors participated in the revision of the manuscript. All authors determined the design, interpreted the text and drafted the manuscript. All authors read and gave final approval for the version submitted for publication.

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