

Infant mortality in children under five years old in a public hospital in Campo Grande/MS: a temporal description

RESUMO | Objetivos: identificar a causa de morte infantil hospitalar, correlacionando-a com as causas evitáveis de mortalidade e associando-a com a prevalência do município. Métodos: a pesquisa foi realizada utilizando como base de informações as certidões de óbitos e prontuários arquivados no Hospital Regional do Mato Grosso do Sul, dos quais foram selecionados os óbitos do período de 2012 a 2017 de crianças menores de 5 anos e foram analisados as variáveis sociodemográficas e causas das mortes. Resultados: ocorreram 364 mortes infantis no período, sendo que 75% dos óbitos registrados são classificados como causas evitáveis de óbitos infantis. Conclusão: são necessárias ações para a qualificação de recursos humanos e estruturas de saúde no âmbito hospitalar com enfoque nas causas evitáveis, sendo mandatório a atualização dos indicadores de mortalidade infantil, visto que representam a efetividade dos serviços de saúde e fazem parte da vigilância epidemiologia no âmbito da saúde coletiva.

Descritores: Mortalidade infantil; Vigilância epidemiológica; Saúde pública.

ABSTRACT | Objectives: to identify the cause of infant death in hospital, correlating it with preventable causes of mortality and associating it with the prevalence in the municipality. Methods: the research was conducted using death certificates and medical records filed at the Regional Hospital of Mato Grosso do Sul as a basis of information, from which deaths from 2012 to 2017 of children under 5 years were selected and the variables were analyzed sociodemographic factors and causes of death. Results: there were 364 infant deaths in the period, and 75% of registered deaths are classified as preventable causes of infant deaths. Conclusion: actions are needed for the qualification of human resources and health structures in the hospital environment with a focus on preventable causes, and it is mandatory to update the infant mortality indicators, as they represent the effectiveness of health services and are part of the epidemiology surveillance in the scope of collective health.

Keywords: Child mortality; Epidemiological surveillance; Public health.

RESUMEN | Objetivos: identificar la causa de muerte infantil en el hospital, correlacionarla con las causas prevenibles de mortalidad y asociarla con la prevalencia en el municipio. Métodos: la investigación se realizó utilizando como base de información los certificados de defunción y las historias clínicas archivadas en el Hospital Regional de Mato Grosso do Sul, a partir de la cual se seleccionaron las defunciones de 2012 a 2017 de niños menores de 5 años y se analizaron las variables factores sociodemográficos y causas de muerte. Resultados: hubo 364 defunciones infantiles en el período y el 75% de las defunciones registradas se clasifican como causas evitables de defunción infantil. Conclusión: se requieren acciones para la calificación de los recursos humanos y las estructuras de salud en el ámbito hospitalario con foco en las causas prevenibles, y es obligatorio actualizar los indicadores de mortalidad infantil, ya que representan la efectividad de los servicios de salud y son parte de la epidemiología vigilancia en el ámbito de la salud colectiva.

Palabras claves: Mortalidad infantil; Vigilancia epidemiológica; Salud pública.

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INTRODUCTION

One community children mortality levels study is a high value instrument, for knowing the health situation, but also identifying the population groups which are most vulnerable to illness and death ¹.

That way, in what concerns its significance, the child and fetal mortality monitoring is a strategic action present

at the National Agreement for Neonatal and Maternal Mortality Reduction, thereby being a priority at the Health Ministry and a compromise with the Federal Government².

Concerning its preventability, the child death is a sentry event for being an important health indicator of children and women 's health³. Accordingly to the List of Avoidable Death Causes by Intervention at the Ambit of the Brazilian Public Health System (SUS) for those with less than five years old, the causes are classified as avoidable when reducible through imuno prevention, proper diagnosis, treatment and health promotion actions and for the adequate attention to newborns, pregnant or at labour womens; bad defined and other causes when they're not clearly avoidable⁴.

Along these lines, Gastaud, Honer, Chunha⁵ have identified the 78 municípios of Mato Grosso do Sul' s epidemiologic profile, in which child death percentages are similar at the same group of causes and importance order, that similarity also occurs at the state' s capital data. Therefore, the Mortality and hospitalization indicators analysis, gathered with the child mortality rates and the post-natal component, are usually applied for a region' s health situation verifying ⁶.

Maia, Souza and Mendes⁷, have shown in its study that, between different brazilian capitals there is a consensus among what determines the child mortality, as well as multiparity, prenatal, type of pregnancy, maternal age, social vulnerability, and others. Yet, despite the biological factors demonstrating homogeneity between the risk values to child mortality, a big important aspect is evidenced: the maternal characteristics associated with newborn and mothers socioeconomic conditions at the North, Northeast and Southeast regions when compared to the South-central of Brazil.

Distinguishing the child mortality

rates of a population represents an important element to the health situation analysis which allows identifying morbidity and mortality health situation risk factors of a community. Based on that, the present study has as aim characterizing the child deaths in children younger than five years occurred at the Regional Hospital of Mato Grosso do Sul at Campo Grande - MS, with the purpose of contributing to an more accurate investigation of those deaths, as well as increase acknowledgement and understanding the processes of determination of child deaths at the concerning municípe.

METHOD

The present study is a retrospective, quantitative, descriptive, exploratory and inferential research, made at the Regional Hospital of Mato Grosso do Sul (HRMS) of Campo Grande's /MS municípe between 2012 to 2017. The time period was chosen for its data and physical medical charts access facility at the hospital during the research's previous years. All the data of less than five years childrens who died between 2012 to 2017 were evaluated through physical medical charts registered at the hospital services. This research counted on the institucional authorization, by the unit's management, from Regional Hospital from Mato Grosso do Sul and with the Research with Human Beings Ethical Committee System CEP/CONEP/UEMS CAAE n° 11180919.3.0000.8030, accordingly with all the ethical agreements at the n° 466/12 Resolution.

The databases were the death certificate and the charts archived at Regional Hospital of Mato Grosso do Sul, through which the sociodemographic variations and death causes of youngers than five years were analysed. The deaths occurred at other age-groups were excluded from the research. Beyond that, the Mortality Information System

(SIM) from the Estadual Health Secretary of Mato Grosso do Sul was used as data source and it is available by the Brazilian Health Ministry through the site DATASUS. The selected data were codified according to the basic death causes identified by the International Classification of Diseases, 10^a revision (CID-10).

The data processing was launched by the pronctuaries and death certificates revision and study varieties quantifying. The following step was calculate the respective percentages (with the help of the Epi Info software). Finally, the data was transcribed in charts, organized in a quantitative way and analysed using the descriptive statistics with percentage charts building.

RESULTS

The research sample has corresponded to the value of 364 child deaths. The total of deaths occurred at the hospital in this period is inconsistent with the data provided by the Informatic Department of the Brazilian Public Health System (DATASUS), since the hospital has registered 66 more deaths than the submitted at the Mortality Information System (SIM).

After the data analyss, it was verified that 52,5% (191) of the child's deaths has occur in childrens of the masculine sex and 41,2% (150) of the feminine sex and in 6,3% (23) there wasn't sex identificantion at the registers (table 1).

It was observed that from the total of deaths, the major number of child deaths (22%; 80/364) were caused by non-specified septicemia (A-41.9). The second pathology with higher preponderance was due to congenital malformations (15,6%;57/364), between them, distinguishing that in this group 19,2% correspond to congenital heart defects.

The pneumonia (11,5%; 42/364) has constituted the third pathologie

group that, followed by the neoplasm (8,8%; C00-D48), represented the higher death percentage. In a lower percentage, deaths by disorders related to short-time pregnancy and low weight at birth (7,2%;P07) have occurred.

The Infectious Intestinal Diseases (A00-A09), diseases caused by protozoa (B50-B54), subnutrition and other nutritional deficiencies (E40- E64) , nutritional anemia (D50-D53) and congenital sifilis (A50) also was identified as causing agents of child deaths at HRMS, that added has totalized 8,5% (Table 2).

The research sample corresponded to the value of 364 child deaths and after data analysis, it was observed that 75% of the registered deaths at this period are classified as avoidable causes of children deaths (table 3), whereas between those it is worth to mention that 50% correspond to the appropriate diagnosis and treatment actions , with preponderance of deaths for unspecified Septicemia (A-41.9) and pneumonia (J12-J18).

The second cause of avoidable children mortality registered was 21,3% referent at the proper care during the pregnancy. It was also verified, in seemingly percentage, deaths reductable by appropriate health promotion actions, bounded to health care appropriate actions (11%; 30/272), other causes are not evidently avoidable (10,3%; 28/272) and ill-defined causes (7,4%; 20/272).

DISCUSSION

The Regional Hospital of Mato Grosso do Sul (HRMS) is a large-sized unit, whose demands goes beyond the boundaries of the municipe where it is localized, being reference to the state of Mato Grosso do Sul. That way, despite the information obtained at the present study being provenients from only one hospital, those are deeply relevant due to the hospital's importance for the

Table 1 – Less than five years child deaths distribution, at the Regional Hospital of Mato Grosso do Sul at Campo Grande-MS municipe, from 2012 to 2017.

Sex	N	%
Total of deaths	364	100
Sex		
Feminine	150	41.2%
Masculine	191	52.5%
Non-identified	23	6.3%

Subtittle: N = number of deaths, % = percentage of cases. Source: Cavalcante ER, et. al., 2020.

Table 2 – Major less than 5 years children 's death causes, Regional Hospital of Mato Grosso do Sul at Campo Grande's - MS Municipe, 2012 a 2017.

Causes	N	%
Total of deaths	364	100
Causes		
Septicemia	80	22%
Congenital defects	57	15.6%
Pneumonia	42	11.5%
Neoplasms	32	8.8%
Short-time pregnancy, low weight at birth	26	7.2%
Newborn's Respiratory Distress Syndrome	25	6.9%
Infectious Intestinal Diseases, Diseases caused by protozoa, Sub Nutrition, Nutritional anemia and Congenital Sifilis.	30	8.5%

Subtittle: N = number of deaths, % = percentage of cases. Source: Cavalcante ER, et. al., 2020.

Table 3. Less than 5 years children death classification according to avoidable criteria, at the Regional Hospital of Mato Grosso do Sul at the municipe of Campo Grande-MS, 2012 to 2017

Deaths	n	%
1.Reducible causes by:		
1.1. Imuno Prevention actions;	0	0
1.2.Appropriate attention at pregnancy and labour, as well as with the newborn.	58	21,3
2. Ill-defined causes.		
3. Other causes (not clearly avoidable).	28	10,3
Total 1.+ 2.+ 3.	272	100

Legenda: N = número de casos, % = porcentagem de casos. Fonte: Cavalcante ER, et. al., 2020.

state.

Beyond the characteristics exposed above, another advantage of the study to be made at the hospital unit owes to the fact that hardly there 's Death Certificates with ill-defined causes. In this regard, Vidal et al.⁸ emphasizes that the data trustworthiness taken from Death Certificates, since they pass through a systematic revision process, having the medical chart as "gold standard".

It is worth to salientate that this research faced challenges due to hospital bureaucracy for accessing the medical charts and death certificates, as well as information deficiency about the place and mother's socioeconomic conditions, turning those data analysis impossible. It is noteworthy that the present study is not unaware of the socioeconomic impacts at children's mortality, since it understands that the appropriate actions to be made by the health services could decrease it.

In light of the related difficulties, the results shows relevant datas who suggests a low solvability of the health system, once 75% of the deaths occurs by avoidable causes. Such results become analogous with the study made by Gastaud; Honer; Cunha⁵, that despite the analysed population be provenient from 1 municipes of the state of Mato Grosso do Sul, and that come from one only hospital, it was verified that 73,1% was constituted by avoidable children deaths.

In this sense, the results at the hospital unit also are alike with the Born et al.⁹ research who shows that 76,4% of the deaths by reductable causes in one city of the northeastern region city, as well as the Kolling¹⁰ study refers to 83% of deaths for resectable causes in a Rio Grande do Sul's municipe. That way, it is understood that children 's death at the tertiary care level as well as at the different regions of Brazil are similar as much as its avoidability characteristics.

Avoidable death causes classifi-

cation turns it into an important instrument in what concerns the quality of health care given at the health system¹¹. Therefore, the present study has verified that how the study of Vidal et al.⁸, the founded values present major proportions to the deductible causes by appropriate diagnosis and treatment action. Among these data, there was a prevalence of deaths caused by septicemia ill-defined and pneumonia, being



Avoidable death causes classification turns it into an important instrument in what concerns the quality of health care given at the health system



consistent with the international scenario, evidentiated by the recent research with 1,2 millions of deaths in less than 5 years children at India that has reported significative death for septicemia and pneumonia values at neonatal and postnatal periods, respectively¹². Thereby, the hospital children death evaluation allows the health services efficiency evaluation at the different

levels of attention at the country and its equiparation with other nations, corroborating for public policies that aim reducing children mortality.

At this perspective, there were no deaths attributed to the group of reductible causes through imuno prevention actions. This result comes majorly from the vaccination instituted by the Immunization National Program that represents one of the principal mechanisms of the health public policy against infectious diseases, majorly at the first year of life.¹³ Moreover, the amplification of the Family's Health Strategy (ESF) are responsible for the children deaths reduction for imuno prevention, that way, demonstrating the impact of the primary attention at the rates of hospital mortality.

It is worth noticing that the epidemiologic profile of children mortality under the perspective of avoidability at MRMS, also identified that the second cause of reductible deaths, would have as major factor the appropriate care to the women at pregnancy and labour. A search made at the state of Mato Grosso do Sul has also observed that one third of the avoidable deaths were related to this causality, who evidenciate the woman's care ate the pregnancy-puerperal⁵ problematic. This way, pointing as major factors of avoidability, the amplification of the couverture of the prenatal and labour accompanying and the qualification of the health professionals.

In what concerns the option for the mentioned comparison of quantities of deaths ocurred at the HRMS and the Information Systems about Mortality – SIM¹⁴, ocurred that for it being an instituted instrument by the Ordinance nº 72/ GM from MS15 that established the obligatory of vigilance of the children and fetal death at the health services who integrate the Brazilian Public Health System (SUS). By consequence, through the analysis the prevalence of municipal children mortality data

could be compared with the results founded at the present study with the aim of identifying the determinant factor and allowing that measures adoption previews the reductable deaths to occur. Although, as is the Amaral¹⁶'s study, it identified problems related to the consistency of the system's data, pointing to the need for adjustments and better control and evaluation of the information provided.

CONCLUSION

The need of actions to qualifications of human resources and health structures at the hospital ambit with

focus on avoidable causes is evident. In addition to it, there is the need of increasing the Family Health Strategy coverage as a contributing factor for the reduction of inequalities in health and children mortality, since its orientation impacts the different levels of health care. Beyond that, the importance of actualization of the children's mortality indicators is verified, since they represent the effectiveness of health services and make part of the epidemiologic monitoring that is the way for the continuous development of the health and integral care that repercute at life. In what concerns the major fragility of the research, it points out the struggle

of accessing the charts available at the hospital. Hence, concerning the positive points, it is evidenced that the perception of delay at the diagnosis is essential for subsidize new public health proposals and calls attention through the health systems of the munícipe, since the children mortality is the indicator of health majorly sensitive and validated around the globe to evaluate a nation's life quality.

CONFLICTS OF INTEREST

Nothing to report.

References

1. Monteiro RA, Schmitz BAS. Principais causas básicas da mortalidade infantil no Distrito Federal, Brasil: 1990 a 2000. *Revista Brasileira de Saúde Materno Infantil*. 2004; 4(4):413-421.
2. Brasil. Ministério da Saúde. Pacto Nacional pela Redução da Mortalidade Materna e Neonatal. Brasília: Ministério da Saúde. 2004.
3. Oliveira CM et al. Mortalidade infantil: tendência temporal e contribuição da vigilância do óbito. *Acta Paul Enfermagem*. 2016;29(3):282-90.
4. Gaiva MAM, Fujimori E, Sato APS. Mortalidade neonatal: análise das causas vitáveis. *Revista de enfermagem UERJ*. 2015; 23(2): 247-53.
5. Gastaud ALGS, Honer MR, Cunha RV. Mortalidade infantil e evitabilidade em Mato Grosso do Sul, Brasil, 2000 a 2002. *Caderno de Saúde Pública*. 2008; 24(7):1631-1640.
6. Oliveira TCR, Larorre MRDO. Tendências da internação e da Mortalidade infantil por diarreia: Brasil, 1995 a 2005. *Revista Saúde Pública*. 2010; 44(1):102-11.
7. Maia LTS, Souza WV, Mendes ADCG. Determinantes individuais e contextuais associados à mortalidade infantil nas capitais brasileiras: uma abordagem multinível [Individual and contextual determinants of infant mortality in Brazilian state capitals: a multilevel approach]. *Cad Saude Publica*. 2020 Mar 6;36(2):e00057519. Portuguese. doi: 10.1590/0102-311X00057519. PMID: 32159610.
8. Vidal SA et al. Óbitos infantis evitáveis em um hospital de referência estadual do Nordeste brasileiro. *Revista brasileira de saúde materno infantil*. 2003; 3(3):281-289.
9. Nascimento SG et al. Mortalidade infantil por causas evitáveis em uma cidade do Nordeste do Brasil. *Revista brasileira de enfermagem*. 2014; 67(2).
10. Kolling AF. Perfil epidemiológico da mortalidade infantil no município de Sapiranga, RS, entre 2006 e 2009. *Dissertação (Mestrado) – Faculdade de Medicina, Universidade Federal do Rio Grande do Sul*. 2011.
11. Malta DC et al. Mortes evitáveis em menores de um ano, Brasil, 1997 a 2006: contribuições para a avaliação de desempenho do Sistema Único de Saúde. *Cad. Saúde Pública*. 2010; 26(3).
12. Shally Awasthi AA. Do regional differences in under-5 mortality in India reflect the burden of Streptococcus pneumoniae and Haemophilus influenzae type b disease?. *The Lancet*. 2019; 7.
13. Brasil. Ministério da Saúde. Programa Nacional de Imunizações – 30 anos. Brasília: Ministério da Saúde, 2003.
14. Departamento de informática do Sistema Único de Saúde (base de dados online). Sistema de Informação sobre Mortalidade. Disponível em: < <http://svs.aids.gov.br/dantps/centrais-de-conteudos/paineis-de-monitoramento/mortalidade/infantil-e-fetal/>>. Acesso: 18 de fevereiro de 2019.
15. Brasil. Ministério da Saúde. Portaria GM Nº 72, de 11 de Janeiro de 2010. Estabelece que a vigilância do óbito infantil e fetal é obrigatória nos serviços de saúde (públicos e privados) que integram o Sistema Único de Saúde (SUS). Brasília, 2010.
16. Amaral TCL. Mortalidade Hospitalar na Rede SUS: Espelho dos Óbitos Ocorridos na População Brasileira? *Dissertação (Mestrado) – Universidade do Estado do Rio de Janeiro, Instituto de Medicina Social*. 2002.