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PERFIL EPIDEMIOLÓGICO DA MORTALIDADE  
MASCULINA: CONTRIBUIÇÕES PARA ENFERMAGEM\*

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## EPIDEMIOLOGICAL PROFILE OF MALE MORTALITY: CONTRIBUTIONS TO NURSING\*

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**ABSTRACT:** The objective in this study was to describe the mortality of the male population in the age range from 20 to 59 years in Cuiabá/Mato Grosso between 2002 and 2012, according to the sociodemographic conditions, group of causes, occurrence and assistance to death. Ecological study, consisting of 6,050 death records of men between 20 and 59 years of age, living in Cuiabá/Mato Grosso. Descriptive analysis with absolute and relative frequencies was applied and the standardized mortality coefficients were calculated. It was verified that the single, mulatto men between 20 and 49 years of age with less than 11 years of education die due to problems related to External Causes, Diseases of the Circulatory Apparatus and Malign Neoplasms. In view of the higher frequency of male deaths due to avoidable causes, the importance of investing in health promotion and disease prevention in primary health care is highlighted. The low quality of the records was evidenced, due to incompleteness of the available data.

**DESCRIPTORS:** Mortality; Men's health; Nursing; Epidemiology.

### PERFIL EPIDEMIOLÓGICO DA MORTALIDADE MASCULINA: CONTRIBUIÇÕES PARA ENFERMAGEM

**RESUMO:** Este estudo teve por objetivo descrever a mortalidade da população masculina na faixa etária de 20 a 59 anos em Cuiabá/Mato Grosso, no período de 2002 a 2012, segundo as condições sociodemográficas, grupo de causas, ocorrência e assistência ao óbito. Estudo ecológico, constituído por 6.050 registros de óbitos de homens com idade entre 20 a 59 anos, residentes em Cuiabá/Mato Grosso. Realizada análise descritiva com frequência absoluta e relativa e cálculo de coeficientes de mortalidade padronizados. Verificou-se que os homens solteiros, pardos, com idade entre 20 a 49 anos e com escolaridade inferior a 11 anos morrem devido a agravos relacionados a Causas Externas, Doenças do Aparelho Circulatório e Neoplasias Malignas. Considerando a maior frequência de mortes masculinas por causas evitáveis, destaca-se a importância de investimentos em promoção da saúde e prevenção de agravos na atenção primária. Evidenciou-se baixa qualidade nos registros por incompletude dos dados disponíveis.

**DESCRIPTORES:** Mortalidade; Saúde do homem; Enfermagem; Epidemiologia.

### PERFIL EPIDEMIOLÓGICO DE LA MORTALIDAD MASCULINA: CONTRIBUCIONES PARA ENFERMERÍA

**RESUMEN:** Estudio cuyo objetivo fue describir la mortalidad de la población masculina en la franja etaria de 20 a 59 años en Cuiabá/Mato Grosso, en el periodo de 2002 a 2012, de acuerdo a las condiciones sociodemográficas, grupo de causas, ocurrencia y asistencia a óbito. Fue un estudio ecológico, compuesto por 6.050 registros de óbitos de hombres con edad entre 20 y 59 años que viven en Cuiabá/Mato Grosso. Se realizó el análisis descriptivo con frecuencia absoluta y relativa, además de cálculo de coeficientes de mortalidad estandarizados. Se ha verificado que los hombres solteros, pardos, con edad entre 20 y 49 años y escolaridad inferior a 11 años mueren en razón de agravios referentes a Causas Externas, Enfermedades del Aparato Circulatorio y Neoplasias Malignas. Considerándose la mayor frecuencia de muertes masculinas por motivos evitables, se destaca la importancia de inversiones en promoción de salud así como en prevención de agravios en la atención primaria. Se constató poca calidad en los registros por escasez de datos disponibles.

**DESCRIPTORES:** Mortalidad; Salud del hombre; Enfermería; Epidemiología.

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## ● INTRODUCTION

Being a man is considered as the representation of a role loaded with senses and meanings, and the expression of its masculinity tends to correspond to the hegemonic masculinity model<sup>(1)</sup>, in which man is expected to be strong and invulnerable. These characteristics condition most men to take on a role of low self-care and distancing from health services, especially in primary care, negatively contributing to the health of this population, as verified by the high morbidity and mortality rates.

In that scenario, in 2009, the Ministry of Health established the National Comprehensive Care Policy for Men's Health (PNAISH), which was intended to qualify men's health care, guided by the comprehensive care principle, with a view to improving the health conditions<sup>(2)</sup>.

In the course of the implementation process of the policy, 26 cities were selected that presented the highest male mortality rates in Brazil. Among these, Cuiabá/Mato Grosso was one of the capitals selected. Although the mortality levels in this city were high, during the implementation process of the policy, no epidemiological studies were executed that verified the causes of male morbidity and mortality in the city<sup>(3)</sup>.

In a study that analyzed the implementation process of the PNAISH in the city, it was appointed that, differently from other governmental programs and policies, the professionals working in Primary Health Care in the city did not receive technical training for qualified care to men's health. In addition, although the policy acknowledges gender issues as the base for actions that target this public, the proposals were based on the biomedical model, mainly focused on aspects of prostate cancer prevention<sup>(3)</sup>.

Studies demonstrate that the male mortality rates continued to increase, even after the implementation of the PNAISH in the country, and that external causes represented the main cause of death among men between 20 and 59 years of age in the country in 2010<sup>(3-4)</sup>. This information demonstrates a contradiction between ministerial actions – focused on prostate cancer prevention – and epidemiological data, demonstrating a deficiency in the proposals the policy presents.

Studies have appointed the need to propose actions that take into account behavioral and gender issues to respond to the needs and particularities of the male population and reduce the morbidity and mortality rates, which are currently alarming when compared to the female rates, reflecting the gender inequalities<sup>(5-6)</sup>.

Therefore, the importance of getting to know the local male mortality profile and its particularities is highlighted, with a view to supporting the proposal of specific strategies for the PNAISH to be effective at the primary health care level, through the implementation of actions that permit the achievement of its targets.

In this context, the nurse is a core element, being one of the agents who promote health in primary care. Thus, it is important for this professional to know the sociodemographic and health conditions of the population, with a view to promoting prevention actions linked to the main causes of male mortality.

Based on this understanding, the objective in this study was to describe the mortality of the male population between 20 and 59 years in Cuiabá, between 2002 and 2012, according to the sociodemographic conditions, group of causes, occurrence and assistance to death.

## ● METHOD

Ecological research developed based on data about the deaths of men in Cuiabá that happened between 2002 and 2012. The inclusion criterion was: deaths with the code for the city of Cuiabá as the place of residence and place of death, between 20 and 59 years of age. The data on the deaths were collected in the Mortality Information System (MIS) of DATASUS in the first semester of 2015. The population data were obtained by the Brazilian Institute of Geography and Statistics (IBGE), available on the DATASUS website<sup>(7)</sup>.

The research variables were categorized as: sociodemographic (age range, marital status, race/color and education); Groups of causes: Infectious and parasitic diseases - IPD (A00 – B99), Neoplasms - NM (C00-D48), Diseases of the Circulatory System - DCS (I00-I99), Diseases of the Respiratory System – DRS (J00-J99) and External Causes - EC (V01-Y98), classified based on information related to the basic cause of death according to the International Classification of Diseases ICD – 10<sup>th</sup> version<sup>(8)</sup> and categorized according to the qualification forms of the Health Indicators organized by the Interagency Network of Health Information – RIPS<sup>(9)</sup>.

The variables related to the Occurrence of Death consisted of the following data: Place of Occurrence for all Groups of causes, and specifically for the External Causes, the records on the Circumstance of Death and the Information Source were retrieved. The variables related to Assistance to Death included the data as follows: Medical Care; Execution of Tests; Execution of Surgery; Execution of Necropsy.

To process, manage and analyze the data, the software Microsoft Office Excel, EpiInfo 3.5.2 and Statistical Package for the Social Sciences-SPSS 20 were used.

Descriptive statistics were applied, calculating the proportional distribution of the deaths according to the sociodemographic variables and the occurrence of the death. The variables related to the assistance to death were distributed proportionately to the groups of causes.

The Specific Mortality Coefficients per Groups of causes and Age range were obtained through the formula:  $MC = [(No. \text{ of deaths by cause } X, \text{ in a certain age group, from area } A, \text{ period } t \div \text{ Male population from the same age group, from area } A, \text{ in the middle of period } t) \times 100,000]$ <sup>(10)</sup>. The Mortality Coefficients were standardized using the direct method<sup>(10)</sup>. To analyze the percentage variation ( $\Delta\%$ ), the proportions at the start (2002) and end (2012) of the period were used, with B corresponding to the final proportion and A to the initial proportion, as given by the following formula:  $\Delta\% = (B - A) / A \times 100$ <sup>(11)</sup>.

This research received approval from the Research Ethics Committee at *Hospital Universitário Júlio Muller* under CAAE number: 41468814.7.0000.5541, opinion 953.428.

## ● RESULTS

In Table 1, the data (n= 6050) are displayed on the deaths of men according to the sociodemographic variables, which took place between 2002 and 2012 in Cuiabá.

Table 1 – Frequencies (n=6050), proportions (%) and percentage variations ( $\Delta\%$ ) of male deaths according to sociodemographic variables. Cuiabá, MT, Brazil, 2002-2012 (continues)

Variables	Frequency (n)	Proportion (%)	$\Delta\%$ <sup>I</sup>
Age range			
20 to 29 years	1619	26.8	-10.3
30 to 39 years	1226	20.3	-5
40 to 49 years	1379	22.8	-15.8
50 to 59 years	1826	30.2	-34.4
Race/color <sup>II</sup>			
White	1523	25.2	-30.2
Black	555	9.2	39.4
Yellow	11	0.2	-50
Mulatto	3855	63.7	21.2
Indigenous	12	0.2	-
Marital status <sup>III</sup>			
Single	3441	56.9	11.9
Married	1797	29.7	-31.5
Widowed	85	1.4	111.1

Separated	345	5.7	94.8
Fixed partner	137	2.3	123
None	332	5.5	-30
Education <sup>IV</sup>			
1 to 3 years	1043	17.2	-25.9
4 to 7 years	2179	36	21.6
8 to 11 years	1581	26.1	42.7
12 and more	574	9.5	28.7

Obs.: I – Percentage variation between 2002 and 2012; II - 94 (1.6%) records were excluded due to uncompleted fields; III - 81 (1.3%) records were excluded due to uncompleted fields and 164 (2.7%) records were informed as unknown; IV- 116 (1.9%) records were excluded due to uncompleted fields and 225 (3.7%) records were informed as unknown.

The age range between 50 and 59 years presented a larger proportion of deaths 30.2% (n=1826). What the distribution of deaths according to race/color is concerned, a larger proportion of deaths was found among mulatto men 63.7% (n=3855). Single men were the most frequent victims 56.9% (n=3441), showing a percentage increase by 11.9%, from 49.5% (n=266) in 2002 to 55.4% (n=314) in 2012.

Concerning education, men with four to seven years of education were the most affected 36% (n=2179), with a percentage increase by 21.6% between 2002 and 2012.

A higher frequency of health problems was found related to EC 49.3% (n=2982), with a percentage variation ( $\Delta\%$ ) of -2.6% per year. The DCS were responsible for 22.1% (n=1339) and  $\Delta\%$  (-11.2) per year. In the third place in terms of frequency ranked the deaths due to causes related to NM 13.5% (n=814) and  $\Delta\%$  (88.1) per year.

Table 2 presents the Standardized Mortality Coefficients according to the age range and Groups of causes. As observed in Table 2, the age range between 20 and 29 years presented a higher risk of mortality due to EC. The DCS and NM represented a higher mortality risk for men between 50 and 59 years of age.

Table 2 – Standardized mortality coefficient (per 100,000 men) according to age range and group of causes. Cuiabá, MT, Brazil, 2002- 2012

Mortality Coefficient	Age Range			
	20 a 29	30 a 39	40 a 49	50 a 59
External Causes	2713.1	1823.2	1525.4	1556.9
Diseases of the Circulatory System	101.4	374.6	1271.2	3578.6
Neoplasms	82.3	193.3	674.8	2347.8
Infectious and Parasitic Diseases	151.2	403.3	549.2	771.0
Diseases of the Respiratory System	51.7	131.2	307.6	771.0

In Table 3, the data on the occurrence of death have been distinguished. As verified, the variable Place of Occurrence presents the distribution of the deaths in all Groups of Causes, while the variable Circumstance of the Death and Information Source describe the distribution of the deaths for the EC only. The data revealed that 61.5% (n=3721) of the deaths happened in hospitals. What the deaths by EC are concerned, in the large majority of cases, the main circumstance of death was homicide 26.9% (n=1630) and the occurrence reports stood out as the main source of information 34.5% (n=2087), which also presented an increase by 128% in the percentage variation between 2002 and 2012.

Table 3 - Frequencies (n=6050), proportions (%) and percentage variations ( $\Delta\%$ ) of male deaths according to occurrence. Cuiabá, MT, Brazil, 2002-2012

Occurrence of death	Frequency (n)	Proportion (%)	$\Delta\%$ <sup>I</sup>
Place of occurrence of the death			
Hospital	3721	61.5	-11.3
Public road	987	16.3	-1.8
Home	769	12.7	44.5
Others	478	7.9	32.6
Other health facility	89	1.5	1.150
Unknown	6	0.1	-100
Circumstance of death			
Homicide	1630	26.9	-3.9
Accident	1024	16.9	-13.4
Unknown	155	2.6	50
Suicide	146	2.4	31.5
Others	19	0.3	-
Information source			
Occurrence report	2087	34.5	128.0
Hospital	201	3.3	-13.5
Other	131	2.2	-
Unknown	128	2.1	-
Family	17	0.3	-100

Obs.: I-Percentage variation between 2002 and 2012

The data on the assistance provided until the time of death have been displayed in Table 4. A large proportion of unknown or unregistered cases is verified for the information “received Medical Assistance or not during disease/problem that caused death”. The same is verified for the variables Execution of Tests and Execution of Surgery. What the execution of a necropsy or not is concerned, this procedure was executed in a larger proportion of cases for deaths due to EC 87.9% (n=2621).

Table 4 - Frequencies (n= 6050) and proportions (%) of deaths per Groups of causes according to variables related to assistance to death. Cuiabá, MT, Brazil, 2002-2012 (continues)

Assistance to death	IPD n(%)	NM n(%)	DCS n(%)	DRS n(%)	EC n(%)
Medical Assistance					
With	296 (51.1)	449 (55.2)	585 (43.7)	142 (42.3)	435 (14.6)
Without	7 (1.2)	4 (0.5)	79 (5.9)	6 (1.8)	557 (18.7)
Unknown	37 (6.4)	75 (9.2)	142 (10.6)	25 (7.4)	548 (18.4)
No records	239 (41.4)	286 (35.1)	533 (39.8)	163 (48.5)	1442 (48.4)
Execution of Tests					
With	298 (51.5)	406 (49.9)	420 (31.4)	126 (37.5)	148 (5)
Without	65 (11.2)	64 (7.9)	326 (24.3)	64 (19)	1192 (40)
Unknown	72 (12.4)	96 (11.8)	182 (13.6)	40 (11.9)	507 (17)
No records	144 (24.9)	248 (30.5)	411 (30.7)	106 (31.5)	1135 (38.1)
Execution of Surgery					
With	21 (3.6)	153 (18.8)	78 (5.8)	4 (1.2)	149 (5)
Without	321 (55.4)	276 (33.9)	652 (48.7)	185 (6.8)	1291 (43.3)



Unknown	82 (14.2)	130 (16)	189 (14.1)	40 (11.9)	440 (14.8)
No records	155 (26.8)	255 (31.3)	420 (31.4)	107 (31.8)	1102 (37)
Execution of Necropsy					
With	20 (3.5)	15 (1.8)	204 (15.2)	54 (16.1)	2621 (87.9)
Without	494 (85.3)	728 (89.4)	1002 (39)	242 (72)	101 (3.4)
Unknown	1 (0.2)	4 (0.5)	0 (0)	0 (0)	3 (0.1)
No records	64 (11.1)	67 (8.2)	133 (9.9)	40 (11.9)	257 (8.6)

Legend: IPD – Infectious and parasitic diseases; NM – Neoplasms; DCS – Diseases of the Circulatory System; DRS – Diseases of the Respiratory System; EC – External Causes.

## ● DISCUSSION

In the state of São Paulo, between 1980 and 2009, a drop in male deaths was observed in the younger age groups, with greater reductions in the group from 10 till 19 years old (32%) and from 20 till 39 years old (10%) while, in the age range from 40 till 59 years old, the number of deaths increased by 13%<sup>(12)</sup>.

As opposed to what was observed in Cuiabá, male mortality in Canada behaves differently. In 2011, the largest number of deaths was registered at 85 years for men and 89 years for women. Few deaths were observed for both sexes in the young population<sup>(13)</sup>, as opposed to the Brazilian reality, where more men of young age die. The concentration of Canadian actions to bring down violent deaths among young adults and investments in the treatment of cardiovascular diseases can partially explain these differences. In addition, cultural aspects stand out, such as similar behaviors between men and women, particularly in terms of risky habits, such as exposure to smoking and occupational stress<sup>(13)</sup>.

Information on race/color has started to be used to measure individuals' social situation, as well as their health-related risks<sup>(14)</sup>. Nevertheless, it is important to highlight that population surveys based on the IBGE classification system consider the self-declared race/color, which can compromise the study of this phenomenon.

In this study, the number of deaths was higher for mulatto men, which may be related to the population characteristics in the state of Mato Grosso, with a predominantly mulatto population, as verified by the IBGE data in the 2010 census, when 50.9 % of the population in Cuiabá self-declared to be mulatto<sup>(15)</sup>. In a study developed in Brazil in 2012 about mortality due to homicides, it was identified that, between 2002 and 2010, an upward selective mortality trend took place, with rising homicide rates (5.6%) for the black population and a steep drop (24.8%) in homicide rates in the white population<sup>(16)</sup>, suggesting the vulnerability of the black population in the Brazilian context.

What the marital status is concerned, in Cuiabá, the largest proportion of deaths was found among single men. In Denmark, in a study involving 6.5 million Danish individuals between 1982 and 2011, aiming to relate male mortality with the marital status, it was verified that the mortality risk among single men was higher in all age groups analyzed when compared to married, divorced and widowed men. The authors appointed the following possible justifications for those results: the financial benefit of living with a fixed partner; the healthier lifestyle among married people and the greater social inclusion among these individuals<sup>(17)</sup>.

Regarding education, this study showed a larger proportion of deaths among men with less than 11 years of schooling. In a study executed in 2010 to estimate the mortality differentials per education level in the Brazilian adult population, the probability of death among mean is smaller among men with higher education levels in all regions of the country. Partial explanations include the economic and social inequalities that result in differences in health access, lifestyle, eating habits and epidemiological profile in certain groups<sup>(4)</sup>.

The analysis of male mortality according to the groups of causes revealed that, in Cuiabá, among the causes of deaths in men, the EC ranked first, followed by the DCS and NM. The data on the profile of men's health situation in Brazil, published by the Ministry of Health, reveal that the Brazilian panorama

is similar to what was observed in this study: in Brazil, in 2010, the EC represented 35.2% of the deaths, the DCS 17.9% and the NM 11.8% in the male population between 20 and 59 years of age<sup>(18)</sup>.

The state capital of São Paulo presented a different panorama in 2011, when the DCS (25.52%) and EC (also 25.52%)<sup>(17)</sup> tied the ranking of the primary cause of male mortality.

Concerning the data on the Place of Occurrence of the deaths, in Cuiabá, most deaths happened in hospitals. This information was unknown in few records, which permitted identifying how care was provided to the individual at the time of death<sup>(19)</sup>. As the main causes of male mortality are severe, demanding hospitalization, it is coherent that most deaths happen there.

As to the results about the Circumstance of Death, specifically for deaths due to EC, it was observed that the most prevalent causes were homicides, followed by accidents, using the occurrence report as the information source. These results support a study executed in Fortaleza-CE in 2010, which also identified homicides 410 (19.4%) as the most prevalent circumstance, followed by accidents 181 (8.5%), adopting the occurrence report as the main information source (27.2%)<sup>(20)</sup>.

Hence, the most observed circumstances of death are expected to be related to murders and traffic accidents, considering that these are the main mortality causes in the EC groups<sup>(21)</sup>. In addition, it is understandable that most records use the occurrence reports as the information source. Concerning the percentage variation observed in the variable occurrence report, a considerable increase was to be expected as, in case of deaths by homicides and traffic accidents, the occurrence needs to be registered and forwarded to the Medico-Legal Institute (IML).

In Cuiabá, a representative percentage of deaths without medical assistance took place during the research period, particularly deaths due to EC 557 (18.7%). When considering the unknown records and records without information, the scenario becomes even more concerning, showing a significant increase of deaths without medical attendance or without this information when compared to deaths in which the obtainment of medical assistance was declared.

In a study that analyzed the quality of information about deaths due to EC in Fortaleza-CE, in 64.96% of the death records, the fields on the receiving of medical assistance<sup>(22)</sup> were not completed, making it difficult to distinguish whether the deaths were due to sudden or instantaneous death, without time for medical care, or there were other reasons for the absence of assistance<sup>(21)</sup>.

The occurrence of a relatively large number of deaths without assistance makes it impossible to identify the basic cause of death, which can be considered a critical factor for the quality of mortality statistics in Brazil<sup>(23)</sup>.

As regards the execution of necropsy, it was observed that, in Cuiabá, most cases of necropsy were due to deaths by EC. This result can be expected as deaths by violent causes have to be forwarded to the IML for this procedure<sup>(24)</sup>.

Because the execution of the necropsy permits obtaining more precise diagnoses and the qualitative assessment of the assistance, executing this procedure is fundamental, not only for the deaths due to EC, but also for deaths by other causes, as the access to reliable data supports the planning of health policies and epidemiological surveillance actions. Nevertheless, it should be highlighted that the high costs of necropsies limits its widespread practice.

In this research, a large proportion of uncompleted and unknown data was found, mainly related to assistance to death. The underreporting of the Death Certificate records underlines the influence of inequalities in socioeconomic conditions and health service access, keeping in mind that not knowing the characteristics of the deceased (sex, age, marital status and others), of the appropriate provision of medical assistance and the basic cause of death make it difficult to construct indicators that contribute to the recognition of the mortality profile<sup>(25)</sup>. This information allows the managers and health professionals to analyze the health situation and propose intervention actions to reduce the mortality in specific populations.

## ● FINAL CONSIDERATIONS



The male mortality profile in Cuiabá evidenced that single, mulatto men between 20 and 59 years of age with low education level died due to conditions related to EC, DCS and NM.

It is highlighted that the incomplete filling of the data on the medical assistance provided at the time of death leaves doubts as to whether the care was provided or simply left unregistered. In that sense, the health surveillance entities in Cuiabá, health professionals, including physicians and nurses, teaching institutions and health services need to acknowledge the need to improve the information quality in the death records through continuing training of all stakeholders in the production of this information, in the active search for incomplete information and for unreported deaths.

In view of the higher frequency of male deaths due to chronic, degenerative and violent conditions, investments are needed in health promotion and prevention, professional training, sensitization of the male population about risk behaviors, health education in schools, among others, which can contribute to change the current panorama.

In that context, the importance of the health professionals is highlighted, especially the nurse, as a reference in primary health care. With this information at hand, nurses can act to prevent deaths and establish promotion and prevention actions. In addition, men's awareness raising to access the health services is emphasized, permitting an early diagnosis and contributing to the reduction of deaths in this population. Therefore, investments in human and material resources are needed, better work conditions for the professionals involved in care for this population and the partnership with support networks.

Among the limitations of this research, the low quality of the records and the dichotomous classification of the death certificates and Mortality Information System (MIS) are highlighted, based on the biological sex (female and male), without considering gender diversities, leading to the underreporting of information about the mortality rates in those groups. In that sense, discussions on the need to include these vulnerable populations are proposed.

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