MORBI-LETHALITY PROFILE AND ECONOMIC IMPACT BY PROSTATIC MALIGNANT NEOPLASIA

PERFIL DE MORBILETALIDADE E IMPACTO ECONÔMICO POR NEOPLASIA MALIGNA PROSTÁTICA PERFIL DE MORBILETALIDAD E IMPACTO ECONÓMICO POR NEOPLASIA MALIGNA PROSTATICA

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ABSTRACT

Objective: to describe the profile of morbidity and economic impact of malignant prostate cancer. **Method:** This is a quantitative, ecological and descriptive study, with data from the Hospital Information System regarding hospitalizations registered in the Northeast of Brazil from 2012 to 2017. The results were analyzed in Excel software with absolute and relative frequencies, presenting the in tables. **Results:** 33,426 hospitalizations and 2,702 deaths were registered, corresponding to a lethality of 8.1%. There was a higher prevalence of hospitalizations in people aged 65 to 69 years (21.6%), deaths aged 80 years or over (28.8%) and lethality between 35 to 39 years (31.3%). There is also an economic impact of over R \$ 126 million. **Conclusion:** it can be concluded that the morbidity profile refers to the higher prevalence of variables in men over 35 years of age, thus evidencing the fragility of this population. It is also highlighted that the disease implies greater burden on the public health system, besides being a factor of great impact on male personal identity. **Descriptors:** Epidemiology; Public Health; Men's Health; Medical Oncology; Health Care Costs; Information Systems.

RESUMO

Objetivo: descrever o perfil de morbiletalidade e impacto econômico por neoplasia maligna de próstata. **Método:** trata-se de estudo quantitativo, do tipo ecológico e descritivo, com dados do Sistema de Informações Hospitalares referentes às internações registradas no Nordeste brasileiro entre 2012 a 2017. Analisaram-se os resultados no *software Excel*, com frequências absoluta e relativa, apresentando-os em tabelas. **Resultados:** registraram-se 33.426 internações e 2.702 óbitos, correspondendo a uma letalidade de 8,1%. Destacou-se maior prevalência de internações em pessoas entre 65 a 69 anos (21,6%), óbitos na faixa etária igual ou superior a 80 anos (28,8%) e letalidade entre 35 a 39 anos (31,3%). Observa-se, ainda, um impacto econômico superior a R\$ 126 milhões. **Conclusão:** conclui-se que o perfil de morbiletalidade se refere à maior prevalência das variáveis em homens acima de 35 anos de idade, evidenciando, dessa forma, a fragilidade dessa população. Destaca-se, ainda, que a doença implica maior oneração ao sistema público de saúde, além de constituir um fator de grande impacto na identidade pessoal masculina. **Descritores:** Epidemiologia; Saúde Pública; Saúde do Homem; Oncologia; Custos de Cuidados de Saúde; Sistemas de Informação.

RESUMEN

Objetivo: describir el perfil de morbiletalidad y el impacto económico por neoplasia maligna de próstata. **Método:** se trata de un estudio cuantitativo, ecológico y descriptivo con datos del Sistema de Informaciones Hospitalarias que se refieren a las hospitalizaciones registradas en el noreste de Brasil entre 2012 y 2017. Los resultados se analizaron en un software Excel con frecuencias absolutas y relativas presentándose en tablas. **Resultados:** se registraron 33,426 hospitalizaciones y 2,702 muertes, lo que corresponde a una tasa de letalidad del 8.1%. Se observó una mayor prevalencia de hospitalizaciones en personas de 65 a 69 años (21.6%), muertes en el grupo de edad de 80 años o más (28.8%) y letalidad entre 35 y 39 años (31.3%). También se observa un impacto económico de más de R \$ 126 millones. **Conclusión:** se concluye que, el perfil de morbiletalidad se refiere a la mayor prevalencia de las variables en hombres mayores de 35 años, evidenciando, de esta manera, la fragilidad de esta población. También vale la pena señalar que la enfermedad implica una mayor carga para el sistema de salud pública, además de ser un factor de gran impacto en la identidad personal masculina. **Descriptores:** Epidemiología; Salud Pública; Salud del Hombre; Oncología Médica; Costos de la Atención en Salud; Sistemas de Información.

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INTRODUCTION

Prostate cancer (PC) is defined as a disordered multiplication of tumor cells present in this component of the male reproductive system.¹ The prostate is considered a small organ, located below the bladder neck, that circulates the urethral canal and is responsible for producing secretion that nourishes and meets the needs of sperm.²

It is considered a cancer with good prognosis if it is diagnosed and treated early.² The oncological stage usually begins without clinical manifestations. The tumor develops over time, evolving in its growth to the point of advancing in the bladder neck and obstructing the urinary tract, thus generating signs and symptoms such as dysuria, polyuria, urinary retention and reduced urinary force. The possibility of blood or semen in the urine and ejaculatory pain is also mentioned.¹

It is alerted that although there is growth and investment in public policies and health programs related to prevention and early diagnosis, cancer is still one of the main Chronic Noncommunicable Diseases (NCDs), becoming the main cause of deaths worldwide. It is expected that worldwide, by 2030, cancer is expected to reach an incidence of 27 million, of which 17 million will die and approximately 75 million people will be living with some type of cancer.³

It is noteworthy that PC occupies the fifth place among the most frequent malignant tumors in the world. It is reported that Brazil has a high incidence of PC and in 2014, 68,800 new cases were estimated in the country. Numerous determinants of the disease are evident that influence its origin, severity and / or aggressiveness, such as advanced age, high rate of diagnosis, lifestyle, endocrine and environmental conditions,⁴⁻⁸ as well as family history, which has the potential to increase the chances of developing cancer by up to ten times.⁴

It is recorded that, around 75% of PC diagnoses worldwide occur in economically developed countries. It is also reported that the number of new cases grew by about 25 times, with the highest incidence in Australia, New Zealand, Western Europe and North America.²

Therefore, the early diagnosis is of fundamental importance, since it significantly increases the chances of cure. Currently, it is recommended in Brazil, the screening of PC by digital rectal examination and annual dosage of prostate specific antigen, referring to the English term Prostatic Specific Antigen (PSA), in men aged 50 to 80 years. However, it is warned that men who have first-degree relatives diagnosed with cancer begin screening at age 45.⁴

It is noteworthy that the financial impact on health is influenced by demographic, cultural,

social and economic factors, which have the ability to attenuate or increase spending. It is also warned that the increase in NCDs reflects on demographic composition and is an indispensable feature for the analysis of health spending. In this perspective, it is reported that economic studies in the area have become a reason for concern among public managers, in order to promote efficiency in the allocation of financial resources.⁹⁻¹⁰

Allied to this, according to the Brazilian scientific literature, there is an even higher prevalence of studies focused on the health-disease process among women and children with cancer, thus demonstrating the indispensability of research that focuses on the attributes of men facing illness and cancer treatment.³ Therefore, the development of this study is justified in order to disseminate epidemiological information about such condition that most affects the male public and thus provide essential elements for the implementation of actions that break with the etiological-social chain responsible for contributing to the increased hospitalizations.

OBJECTIVE

- To describe the profile of morbidity and economic impact of malignant prostate cancer.

METHOD

This is a quantitative, ecological and descriptive study, whose collected data come from the electronic platform of the Hospital Information System (HIS). The HIS is a nationwide system that gathers a lot of information about Brazilian hospitalizations through the Unified Health System (UHS). Above all, the advantage is the speed of obtaining data easily and less costly, as well as the possibility of temporal monitoring by means of population and geographical variables.¹¹

The study scenario adopted was the Northeast region of Brazil organized into nine Federative Units (FU), according to table 1. It refers to a region marked by intense socioeconomic inequalities, in which its FU occupied the worst rankings in the Human Development Index (HDI) of the last census, which took place in 2010.¹²

Table 1. Federative Units of Northeast Brazil. Jequié (BA), Brazil, 2019.

Federative Units	HDI	Territory	Inhabitants	Demography
Maranhão	0.639	331,936,949 km ²	7,000,229	19.81 hab/km ²
Piauí	0.646	251,611,929 km ²	3,219,257	12.40 hab/km ²
Ceará	0.682	148,887.633 km ²	9,020,460	56.76 hab/km ²
Rio Grande do Norte	0.684	52,811.107 km ²	3,507,003	59.99 hab/km ²
Paraíba	0.658	56,468.435 km ²	4,025,558	66.70 hab/km ²
Pernambuco	0.673	98,076.021 km ²	9,473,266	89.62 hab/km ²
Alagoas	0.631	27,848,140 km ²	3,375,823	112.33 hab/km ²
Sergipe	0.665	21,918,443 km ²	2,288,116	94.36 hab/km ²
Bahia	0.660	564,732,450 km ²	15,344,447	24.82 hab/km ²

HDI: Human Development Index
Source: Brazilian Institute of Geography and Statistics (IBGE)¹³

It is reported that, on the electronic platform, in January 2019, all data related to malignant prostate neoplasia reported in the Northeast and its FU were collected. The following variables were selected: hospitalizations; deaths; lethality rate; age group (<1 and ≥ 80 years) and total value of hospital services expressed in real currency (R\$).

The lethality rate was obtained by calculating the ratio between deaths and hospitalizations during the study period. Subsequently, the result was multiplied by 100, obtaining the percentage values. The results were then analyzed using the Excel software using simple descriptive statistics (absolute and relative frequencies) and presented as tables.

It is noteworthy that, referring to a study conducted with secondary data, access and public domain without the possibility of individual

identification, there was no need for consideration by the Research Ethics Committee. Such conduct is supported by the ethical aspects described in Resolution No. 466/2012 and 510/2016 of the National Health Council (NHC).

RESULTS

It is observed that, during the study period, 33,426 hospitalizations for malignant prostate cancer were reported, as shown in table 2. It is mentioned that among the hospitalizations, 2,702 died, corresponding to a lethality rate of 8.1%. It is also noteworthy that the state of Bahia recorded, respectively, the highest prevalence in the hospitalization and death variables, with 36.9%, 35.5%, and Alagoas stood out in the highest lethality, with 18.4%. It is noted, however, that hospitalizations and deaths showed increasing behavior over the years.

Table 2. Hospitalizations, deaths, and lethality rate for prostate malignancy in the Brazilian Northeast. Jequié (BA), Brazil, 2012-2017.

Variables	2012	2013	2014	2015	2016	2017	TOTAL	%
Hospitalizations								
Maranhão	15	403	501	636	695	692	2,942	8.8
Piauí	56	600	574	511	478	425	2,644	7.9
Ceará	68	668	839	950	970	951	4,446	13.3
Rio Grande do Norte	38	431	400	456	504	465	2,294	6.9
Paraíba	7	313	348	391	488	551	2,098	6.3
Pernambuco	57	871	907	942	1,072	1,237	5,086	15.2
Alagoas	6	96	167	198	191	233	891	2.7
Sergipe	6	156	130	155	129	100	676	2.0
Bahia	76	2,345	2,306	2,542	2,558	2,522	12,349	36.9
Total	329	5,883	6,172	6,781	7,085	7,176	33,426	100
Deaths								
Maranhão	1	29	43	53	61	75	262	9.7
Piauí	3	32	45	43	22	24	169	6.3
Ceará	8	42	56	44	36	38	224	8.3
Rio Grande do Norte	3	18	22	12	32	25	112	4.1
Paraíba	1	35	37	40	54	70	237	8.8
Pernambuco	6	70	77	96	113	126	488	18.1
Alagoas	1	15	25	38	29	37	145	5.4
Sergipe	1	14	17	27	25	22	106	3.8
Bahia	14	190	155	190	193	217	959	35.5
Total	38	445	477	543	565	634	2,702	100
Lethality								
Maranhão	6.7	7.2	8.6	8.3	8.8	10.8	8.9	8.9
Piauí	5.4	5.3	7.8	8.4	4.6	5.7	6.4	6.4
Ceará	11.8	6.3	6.7	4.6	3.7	4.0	5.0	5.0
Rio Grande do Norte	7.9	4.2	5.5	2.6	6.4	5.4	4.9	4.9
Paraíba	14.3	11.2	10.6	10.2	11.1	12.7	11.3	11.3

Pernambuco	10.5	8.0	8.5	10.2	10.5	10.2	9.6	9.6
Alagoas	16.7	15.6	15.0	19.2	15.2	15.9	16.3	16.3
Sergipe	16.7	9.0	13.1	17.4	19.4	22.0	15.7	15.7
Bahia	18.4	8.1	6.7	7.5	7.5	8.6	7.8	7.8
Total	11.6	7.6	7.7	8.0	8.0	8.8	8.1	8.1

Source: Ministry of Health - UHS Hospital Information System (HIS / UHS)

Table 3 shows, that men aged 65 to 69 stood out in hospitalizations, with 21.6%. It is also reported that, deaths were more prevalent in

individuals aged 80 years and over and there was a higher mortality rate in people aged 35 to 39 years, with 31.3%.

Table 3. Hospitalizations, deaths, and lethality rate for prostate malignancy in the Brazilian Northeast according to age group. Jequié (BA), Brazil, 2012-2017.

Age group (years)	Hospitalizations	%	Deaths	%	lethality (%)
<1	7	0.0	1	0.0	14.3
1 to 4	14	0.0	-	-	-
5 to 9	17	0.1	1	0.0	5.9
10 to 14	1	0.0	-	-	-
15 to 19	12	0.0	-	-	-
20 to 24	11	0.0	2	0.1	18.2
25 to 29	14	0.0	-	-	-
30 to 34	11	0.0	-	-	-
35 to 39	16	0.0	5	0.2	31.3
40 to 44	87	0.3	4	0.1	4.6
45 to 49	397	1.2	12	0.4	3.0
50 to 54	1,308	4	80	3.0	6.1
55 to 59	3,070	9.2	157	5.9	5.1
60 to 64	5,462	16.3	252	9.3	4.6
65 to 69	7,210	21.6	413	15.3	5.7
70 to 74	6,664	19.9	476	17.7	7.1
75 to 79	4,645	14	520	19.2	11.2
≥ 80	4,480	13.4	779	28.8	17.4
Total	33,426	100	2,702	100	8.1

Data not in system
Source: Ministry of Health - UHS Hospital Information System (HIS / UHS)

In the study period, hospital costs exceeding R \$ 126 million to the public coffers were recorded, and Bahia accounted for 45.5% of the total, as

shown in table 4. It is also warned that, the values are behaving growing over the years.

Table 4. Total value of hospital care costs spent on malignant prostate cancer in the Brazilian Northeast. Jequié (BA), Brazil, 2012-2017.

Total value	2012 - 2013	2014 - 2015	2016-2017	TOTAL	%
Maranhão	1,164,353.17	3,748,615.87	4,948,824.18	9,861,793.22	7.8
Piauí	1,700,217.97	3,136,522.94	3,482,924.86	8,319,665.77	6.6
Ceará	2,138,088.98	7,027,168.39	9,181,671.70	18,346,929.07	14.5
Rio Grande do Norte	1,517,533.56	4,752,167.72	4,951,259.20	11,220,960.48	8.9
Paraíba	940,006.52	2,928,358.66	3,712,037.52	7,580,402.70	6.0
Pernambuco	1,751,218.93	3,915,858.38	5,160,272.41	10,827,349.72	8.5
Alagoas	153,610.34	481,934.76	865,009.48	1,500,554.58	1.2
Sergipe	282,881.45	582,884.09	482,807.85	1,348,573.39	1.0
Bahia	9,299,748.11	23,346,669.71	24,994,890.51	57,641,308.33	45.5
Total	18,947,659.03	49,920,180.52	57,779,697.71	126,647,537.26	100

Source: Ministry of Health - UHS Hospital Information System (HIS / UHS)

DISCUSSION

It is revealed that, in recent years, PC has become an important object of study among researchers considered references in the theme.⁸ It is characterized by being a multifaceted and ascending issue that requires, therefore, expressive dedication of health professionals, especially nurses, to act in prevention, direct assistance and participation in planning and evaluation of men's health care, thus contemplating, the completeness of care.⁴

It was evidenced in this study that the State of Bahia obtained the highest prevalence of hospitalizations (36.9%) and deaths (35.5%) and

Alagoas stood out in lethality (18.4%), according to table 2. Factors of poor survival and higher risk of death are late diagnosis, non-curative treatment and clinical worsening.¹⁴ From this perspective, it is mentioned that other studies have already shown late diagnosis in Bahia for various diseases such as leprosy,¹⁵ congenital syphilis,¹⁶ cervical cancer,¹⁷ and even cancer in general,¹⁸ associated with a larger number of inhabitants, contributes to a higher prevalence of hospitalizations and deaths among states.

It was revealed in a study¹⁹ that between 1980 and 2010, there was a tendency of increasing mortality by PC in all regions of Brazil, and the Northeast recorded greater variation. Similarly,

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another study²⁰ which showed an increase in mortality rates in 2015, especially in the states of the Northeast region such as Bahia, Tocantins, Sergipe and Roraima. In addition to these data, it is estimated that by 2025, there will be a significant increase in mortality from PC in the North and Northeast, followed by a decrease in other regions of the country.²¹ Such information is explained due to the influence of the region-specific social, economic and geographic aspects that interfere with access to specialized services and the temporal widening between diagnosis and treatment.²²

It is mentioned that the chances of progressing to a lethal outcome are higher when patients are hospitalized. This fact is elucidated, mainly because the higher incidence of PC is in the elderly, as they usually have other comorbidities, besides the clinical complications.¹⁴ This information corroborates the results of this study, which showed a higher prevalence of hospitalizations and deaths in individuals aged 65 years and over, as shown in Table 3. Similar studies are mentioned, which showed an average of age over 70.^{5,14,23}

With the increase in life expectancy worldwide, the incidence of PC is expected to increase by up to 60%,²³ therefore requiring more efforts to ensure male adherence to preventive examinations. Rectal touch is a simple, effective and inexpensive screening method. It is reported, however, that the procedure afflicts the male imagination, in such a way that many men ignore such prevention, preventing the chances of a possible diagnosis and early treatment.^{4,24}

Thus, it is noteworthy that in order to achieve male adherence to preventive health care actions, it is essential to adjust the services to men's needs, not only focusing on the problem presented, but in its entirety aiming at the expanded clinic.⁴ Thus, in Brazil, the National Policy for Integral Men's Health Care (NPIMHC) was instituted in 2009 in order to reduce morbidity and mortality and build strategies for the promotion of male health. It is also reported that NPIMHC encourages the adoption of a new look on men, aiming at understanding the symbolic, organizational, social and cultural factors that permeate the male universe and influence the way they take care of health.³

From this, it is mentioned that the greater the adherence to preventive methods, the lower the hospitalization rates and, consequently, there will be a reduction in the financial impacts on the public health system. It is noteworthy that the economic cost imposed by neoplasms is significant, mainly challenging universal health systems, such as the UHS. It is also informed that although the care provided to individuals with cancer generates substantial impacts on public

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coffers, the disease must be faced in a scenario that highlights the constant need for effective investments and strategy.²⁵

Note that the PC generated a financial impact of over R\$ 126.6 million in the Northeast, according to table 4, significantly surpassing the kidney transplants performed in the region between 2013 and 2017.²⁶ It is reported, however, that the hospital costs for PC in Bahia observed in this study were higher than the hospitalization costs for Diabetes Mellitus (2013-2017)²⁷ and pulmonary tuberculosis (2012-2016)²⁸ recorded in the State.

It is noteworthy that health costs cannot be used as the main focus nor in isolation in discussions about the theme, since expressive values do not necessarily mean quality care or good use of resources. However, its use is emphasized as an evaluative parameter of public health policies and of stimulating price negotiations.²⁵

However, it is reported that individuals with PC experience limitations imposed by neoplasia and social and family transformations, as well as conflicts that occur with oneself. It is also pointed out that the therapeutic dynamics and their implications have significant impacts on their lives and, as such, require that when entering the service, it is essential that they find care in a humanized way.²³

CONCLUSION

In conclusion, the morbidity profile refers to the higher prevalence of variables in men over 35 years of age, thus showing the fragility of this population. It is also emphasized that the disease implies greater burden on the public health system, besides being a factor of great impact on male personal identity. From this perspective, this study provides essential elements to implement actions that break the etiological and social chain.

REFERENCES

1. Gomes CRG, Izidoro, LCR, Mata LRF. Risk factors for prostate cancer, and motivational and hindering aspects in conducting preventive practices. *Invest Educ Enferm*. 2015 Sept-Dec;33(3):415-23. DOI: <https://doi.org/10.17533/udea.iee.v33n3a04>
2. Maia LFS. Câncer de próstata:preconceitos, masculinidade e a qualidade de vida. *Rev Recien*. 2012 Dec;2(6):16-20. DOI: <http://dx.doi.org/10.24276/rrecien2177-157X.2012.2.6.16-20>
3. Modena CM, Martins AM, Gazzinelli AP, Almeida SSL, Schall VT. Câncer e Masculinidades:Sentidos Atribuídos ao Adoecimento e ao Tratamento Oncológico. *Temas Psicol*. 2014 Apr;22(1):67-78. DOI: <https://doi.org/10.9788/TP2014.1-06>

Souza Júnior EV de, Santos M dos, Nunes CA, *et al.*

4. Belinelo RGS, Almeida SM, Oliveira PP, Onofre PSC, Viegas SMF, Rodrigues AB. Exames de rastreamento para o câncer de próstata: vivência de homens. *Esc Anna Nery*. 2014 Oct-Dec;18(4):697-704. DOI:

<https://doi.org/10.5935/1414-8145.20140099>

5. Martín Sánchez V, García-Sanz M, García-Martínez L, Canto CM, Campanario-Pérez F, González SP *et al.* Incidencia hospitalaria, tendencia y distribución municipal del cáncer de próstata en el área de salud de León (1996-2010). *Rev Esp Salud Publica*. 2015 Dec;89(6):575-83. DOI:

<http://dx.doi.org/10.4321/S1135-57272015000600005>

6. Discacciati A, Wolk A. Lifestyle and dietary factors in prostate cancer prevention. *Recent Results Cancer Res*. 2014 Feb;202:27-37. DOI:

http://dx.doi.org/10.1007/978-3-642-45195-9_3

7. López-Abente G, Aragonés N, Pérez-Gómez B, Pollán M, García-Pérez J, Ramis R *et al.* Time trends in municipal distribution patterns of cancer mortality in Spain. *BMC Cancer*. 2014 July;14:535. DOI:

<https://doi.org/10.1186/1471-2407-14-535>

8. Czorny RCN, Pinto MH, Pompeo DA, Bereta D, Cardoso LV, Silva DM. Fatores de risco para o câncer de próstata: população de uma unidade básica de saúde. *Cogitare Enferm*. 2017 Oct;(22)4:e51823. DOI:

<http://dx.doi.org/10.5380/ce.v22i4.51823>

9. Roy A, Roe MT, Neely ML, Cyr DD, Zamoryakhin D, Fox KA, *et al.* Impact of human development index on the profile and outcomes of patients with acute coronary syndrome. *Heart*. 2015 Feb;101(4):279-86. DOI:

<http://dx.doi.org/10.1136/heartjnl-2014-306389>

10. Kernkamp CL, Costa CKF, Massuda EM, Silva ES, Yamaguchi MU, Bernuci MP. Perfil de morbidade e gastos hospitalares com idosos no Paraná, Brasil, entre 2008 e 2012. *Cad Saúde Pública*. 2016 July;32(7):e00044115. DOI:

<http://dx.doi.org/10.1590/0102-311X00044115>

11. Machado JP, Martins M, Leite IC. Qualidade das bases de dados hospitalares no Brasil: alguns elementos. *Rev bras epidemiol*. 2016 Sept;19(3):567-81. DOI:

<http://dx.doi.org/10.1590/1980-5497201600030008>

12. Silva JS, Pinheiro LIF. Políticas públicas e desenvolvimento do nordeste brasileiro na visão do estruturalismo cepalino. *Contrib cienc soc* [internet]. 2017 Jan-Mar [cited 2018 Dec 5]. Available

from: <http://www.eumed.net/rev/cccss/2017/01/pobreza.html>

13. Brasil. Instituto Brasileiro de Geografia e Estatística. Por cidade e estado [internet]. [cited 2018 Dec 5]. Available from: <https://www.ibge.gov.br/estatisticas->

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[novoportal/por-cidade-estado-estatisticas.html?t=destaques&c=Brasil](https://novoportal.por-cidade-estado-estatisticas.html?t=destaques&c=Brasil)

14. Braga SFM, Souza MC, Oliveira RR, Andrade EIG, Acurcio FF, Cherchiglia ML. Sobrevida e risco de óbito de pacientes após tratamento de câncer de próstata no SUS. *Rev Saude Publica*. 2017 May;51:46. DOI:

<https://doi.org/10.1590/S1518-8787.2017051006766>

15. Souza EA, Ferreira AF, Boigny RN, Alencar CH, Heukelbach J, Martins-Melo FR *et al.* Hanseníase e gênero no Brasil: tendências em área endêmica da região Nordeste, 2001-2014. *Rev Saúde Pública*. 2018;52:20. DOI:

<http://dx.doi.org/10.11606/s1518-8787.20180520003>

16. Cavalcante PAM, Pereira RBL, Castro JGD. Sífilis gestacional e congênita em Palmas, Tocantins, 2007-2014. *Epidemiol Serv Saúde*. 2017 June;26(2):255-64. DOI:

<http://dx.doi.org/10.5123/s1679-49742017000200003>

17. Freire AP, Brito FC, Campo RTF. Prevalência do câncer de colo de útero na Bahia, no período de 2008-2013. *Rev Eletrôn Atualiza Saúde* [internet]. 2016 Jan-Feb [cited 2018 Dec 5];3(3):24-33. Available

from: <http://atualizarevista.com.br/wp-content/uploads/2016/01/Preval%C3%Aancia-do-c%C3%A2ncer-de-colo-de-%C3%BAtero-na-Bahia-no-per%C3%ADodo-de-2008-2013-v-3-n-3.pdf>

18. Souza CMC. Conhecer e educar para controlar o câncer na Bahia. *Educ Rev*. 2014 Oct-Dec;(54):55-70. DOI:

<https://dx.doi.org/10.1590/0104-4060.38203>

19. Conceição MBM, Boing AF, Peres KG. Time trends in prostate cancer mortality according to major geographic regions of Brazil: an analysis of three decades. *Cad Saúde Pública*. 2014 Mar;30(3):559-66. DOI:

<http://dx.doi.org/10.1590/0102-311X00005813>

20. Guerra MR, Bustamante-Teixeira MT, Corrêa CSL, Abreu DMX, Curado MP, Mooney M *et al.* Magnitude e variação da carga da mortalidade por câncer no Brasil e Unidades da Federação, 1990 e 2015. *Rev bras epidemiol*. 2017 May;20(Suppl 1):102-15. DOI:

<http://dx.doi.org/10.1590/1980-5497201700050009>

21. Jerez-Roig J, Souza DLB, Medeiros PFM, Barbosa IR, Curado MP, Costa ICC, *et al.* Future burden of prostate cancer mortality in Brazil: a population-based study. *Cad Saúde Pública*. 2014 Nov;30(11):2451-58. DOI:

<http://dx.doi.org/10.1590/0102-311X00007314>

22. Silva JFS, Mattos IE, Aydos RD. Tendência de mortalidade por câncer de próstata nos Estados da Região Centro-Oeste do Brasil, 1980 - 2011. *Rev bras epidemiol*. 2014 June;17(2):395-406. DOI:

<http://dx.doi.org/10.1590/1809-4503201400020009ENG>

23. Quijada PDS, Fernandes PA, Oliveira DS, Santos BMO. Câncer de próstata: retrato de uma realidade de pacientes em tratamento. *Rev enferm UFPE on line*. 2017 June;11(Supl. 6):2490-9. DOI: <http://dx.doi.org/10.5205/reuol.9799-86079-1-RV.1106sup201702>
24. Carroll PR, Vickers AJ. Point/Counterpoint: Early Detection of Prostate Cancer: Do the Benefits Outweigh the Consequences?. *J Natl Compr Canc Netw* [internet]. 2014 May [cited 2018 Mar 3];12(Suppl. 5):768-71. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/24853213>
25. Knust RE, Portela MC, Pereira CCA, Fortes GB. Estimativa dos custos da assistência do câncer de pulmão avançado em hospital público de referência. *Rev Saúde Pública*. 2017 Aug;51:53. DOI: <http://dx.doi.org/10.1590/s1518-8787.2017051006665>
26. Souza Júnior EV, Cruz DP, Caricchio GMN, Moreira SLF, Boery RNSO, Boery EN. Transplante renal: epidemiologia e gastos públicos hospitalares. *Rev enferm UFPE on line*. 2019 Apr;13(4):1046-51. DOI: <https://doi.org/10.5205/1981-8963-v13i4a237758p1046-1051-2019>
27. Souza Júnior EV, Cruz DP, Caricchio GMN, Nunes GA, Fróes AS, Silva Filho BFS *et al.* Morbidade hospitalar e impactos financeiros por diabetes mellitus. *Rev enferm UFPE on line*. 2019 Apr;13(4):981-988. DOI: <https://doi.org/10.5205/1981-8963-v13i4a237751p981-988-2019>
28. Souza Júnior EV, Nunes GA, Cruz DP, Boery EN, Boery RNSO. Internações hospitalares e impacto financeiro por tuberculose pulmonar na Bahia, Brasil. *Enferm Actual de Costa*. 2018 Dec;(35):38-51. DOI: <http://dx.doi.org/10.15517/revenf.v0i35.31868>

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