

## Evolution of the mortality rate for malignant neoplasm of the breast between 2011 and 2019 by health macro-regions in Goiás



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### ABSTRACT

**INTRODUCTION:** Malignant neoplasm of the breast in women is the second most frequent neoplasm, being, however, the leading cause of cancer deaths in women in Brazil, with a mortality rate of around 11.84 deaths/100,000 women in 2020. Thus, it is perceived that malignant neoplasm of the breast causes numerous deaths every year, indicating an aggressive disease with major sequelae for public health in Brazil.

**Keywords:** Malignant neoplasm of the breast, Mortality rate, Health macro-regions, Goias.

## 1 INTRODUCTION

Malignant neoplasm of the breast in women is the second most frequent neoplasm, being, however, the leading cause of cancer deaths in women in Brazil, with a mortality rate of around 11.84 deaths/100,000 women in 2020. Thus, it is perceived that malignant neoplasm of the breast causes numerous deaths every year, indicating an aggressive disease with major sequelae for public health in Brazil.

## 2 OBJECTIVES

To list, from the data analysis, the rates of deaths due to malignant neoplasms of the breast, by macro-region of health according to year of processing.

## 3 METHODOLOGY

This is an analytical, observational, longitudinal and retrospective study. The number of deaths due to malignant neoplasm of the breast (ICD-10 C50) was obtained through the Hospital Information System of the SUS (SIH/SUS) and the population data used by the Federal Court of Auditors (TCU) to determine the quotas of the Municipal Participation Fund (FPM). The number of deaths between 2011 and 2019 was included, stratified by health macro-region of Goiás. The mortality rate per 100,000



inhabitants was calculated. Subsequently, the trends of the MD in each region over time were determined by segmented linear regression, with the dependent variable being the natural logarithmic transformation of the TM and the regressor variable the year. Annual percentage variations (APCs) were obtained with 95% confidence intervals (95%CI).

#### 4 RESULTS

Between 2011 and 2019, Goiás showed an overall increase in the death rate from malignant neoplasm of the breast (APC= 6.30 ; CI95%= 3.8 ; 8.9). Similarly, there was an increase in rates in the Midwest health macro-regions (APC= 6.37 ; CI95%= 1.1 ; 11.9), North-Central (APC= 7.78 ; CI95%= 1.7 ; 14.2), and Central-Southeast (APC= 8.94 ; CI95%= -0.3 ; 19.1). Nevertheless, there was a reduction in rates in the Southeast macro-region (APC= -2.08 ; CI95%= -10.8 ; 7.5). Moreover, it is worth mentioning that, in the Northeast macro-region, it is possible to highlight two types of epidemiological profiles, with an increase between 2011 and 2017 (APC= 15.91 ; CI95%= -2.8 ; 38.2) and a reduction between 2017 and 2019 (APC= -34.36 ; CI95%= -75.5 ; 75.8).

#### 5 CONCLUSION

It is concluded that, in Goiás, although the increase in death rates due to breast cancer in the Midwest, Center-North and Center-Southeast macro-regions, there was a reduction in the Southeast. In addition, two epidemiological profiles were also observed in the Northeast macro-region, with an increase in rates between 2011 and 2017, followed by a reduction between 2017 and 2019.



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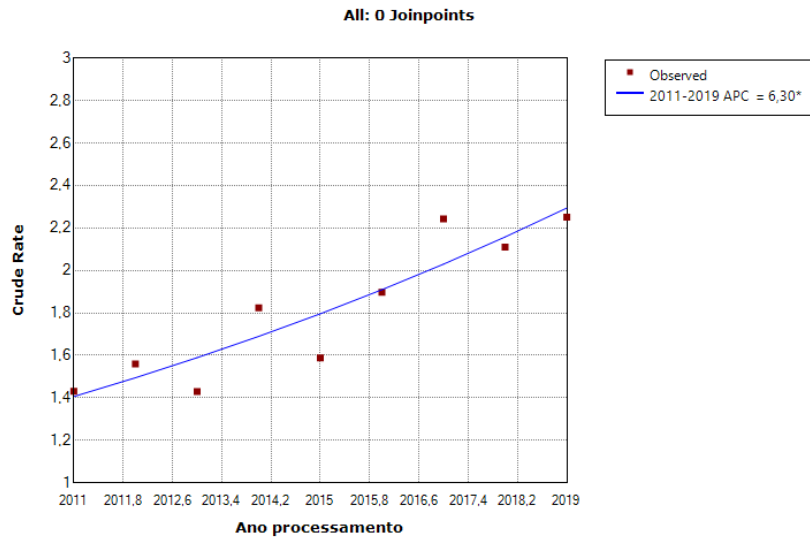
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<<https://www.cancer.gov>> Acesso em: 23 de setembro de 2022



## ATTACHMENTS

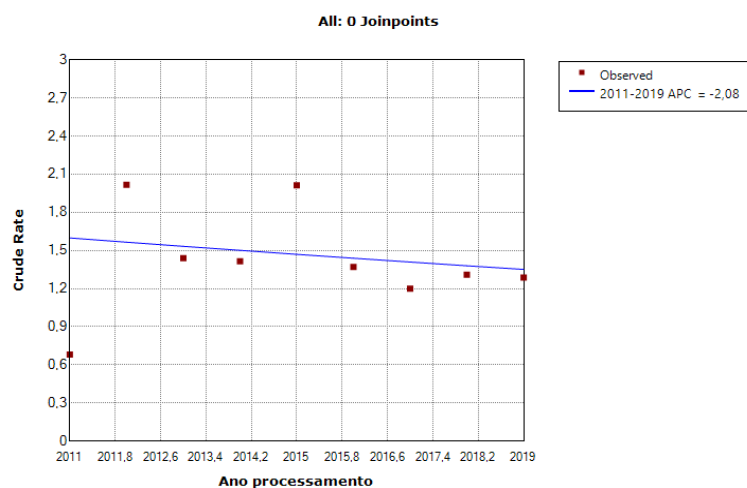
Goias:



\* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level  
Final Selected Model: 0 Joinpoints.

Annual Percent Change (APC)							
Segment	Lower Endpoint	Upper Endpoint	APC	Lower CI	Upper CI	Test Statistic (t)	Prob >  t
1	2011	2019	6,3*	3,8	8,9	6,0	0,001
* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level							
Average Annual Percent Change (AAPC)							
Range	Lower Endpoint	Upper Endpoint	AAPC	Lower CI	Upper CI	Test Statistic~	P-Value~
Full Range	2011	2019	6,3*	3,8	8,9	6,0	0,001
* Indicates that the AAPC is significantly different from zero at the alpha = 0.05 level. ~ If the AAPC is within one segment, the t-distribution is used. Otherwise, the normal (z) distribution is used. <a href="#">Learn More</a>							

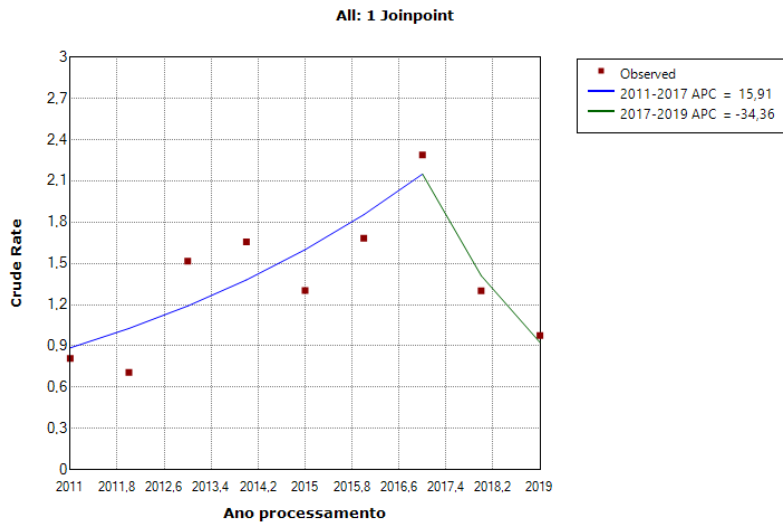
Southeast:



Annual Percent Change (APC)							
Segment	Lower Endpoint	Upper Endpoint	APC	Lower CI	Upper CI	Test Statistic (t)	Prob >  t
1	2011	2019	-2,1	-10,8	7,5	-0,5	0,612
* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level							
Average Annual Percent Change (AAPC)							
Range	Lower Endpoint	Upper Endpoint	AAPC	Lower CI	Upper CI	Test Statistic~	P-Value~
Full Range	2011	2019	-2,1	-10,8	7,5	-0,5	0,612
* Indicates that the AAPC is significantly different from zero at the alpha = 0.05 level. ~ If the AAPC is within one segment, the t-distribution is used. Otherwise, the normal (z) distribution is used. <a href="#">Learn More</a>							

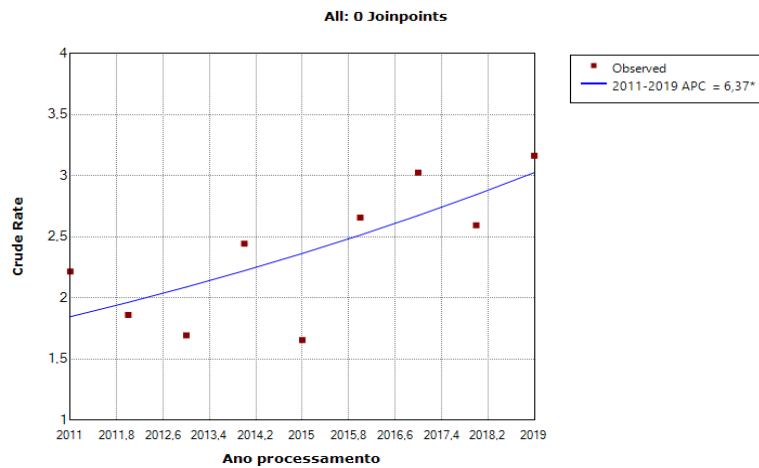


Northeast:



Estimated Joinpoints							
Joinpoint	Estimate	Lower CI	Upper CI				
1	2017	2013	2017				
Annual Percent Change (APC)							
Segment	Lower Endpoint	Upper Endpoint	APC	Lower CI	Upper CI	Test Statistic (t)	Prob >  t
1	2011	2017	15,9	-2,8	38,2	2,3	0,080
2	2017	2019	-34,4	-75,5	75,8	-1,2	0,301
* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level							
Average Annual Percent Change (AAPC)							
Range	Lower Endpoint	Upper Endpoint	AAPC	Lower CI	Upper CI	Test Statistic~	P-Value~
Full Range	2011	2019	0,5	-17,5	22,5	0,1	0,957
* Indicates that the AAPC is significantly different from zero at the alpha = 0.05 level.							
~ If the AAPC is within one segment, the t-distribution is used. Otherwise, the normal (z) distribution is used. <a href="#">Learn More</a>							

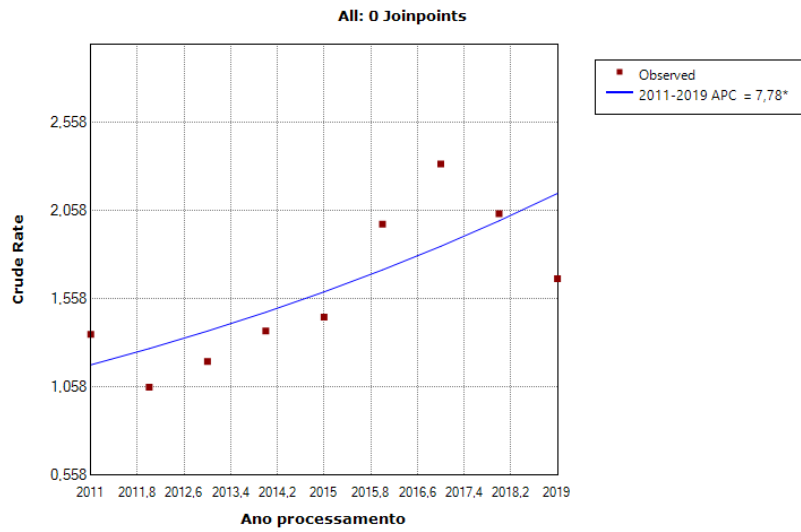
Midwest:



Annual Percent Change (APC)							
Segment	Lower Endpoint	Upper Endpoint	APC	Lower CI	Upper CI	Test Statistic (t)	Prob >  t
1	2011	2019	6,4*	1,1	11,9	2,9	0,023
* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level							
Average Annual Percent Change (AAPC)							
Range	Lower Endpoint	Upper Endpoint	AAPC	Lower CI	Upper CI	Test Statistic~	P-Value~
Full Range	2011	2019	6,4*	1,1	11,9	2,9	0,023
* Indicates that the AAPC is significantly different from zero at the alpha = 0.05 level.							
~ If the AAPC is within one segment, the t-distribution is used. Otherwise, the normal (z) distribution is used. <a href="#">Learn More</a>							

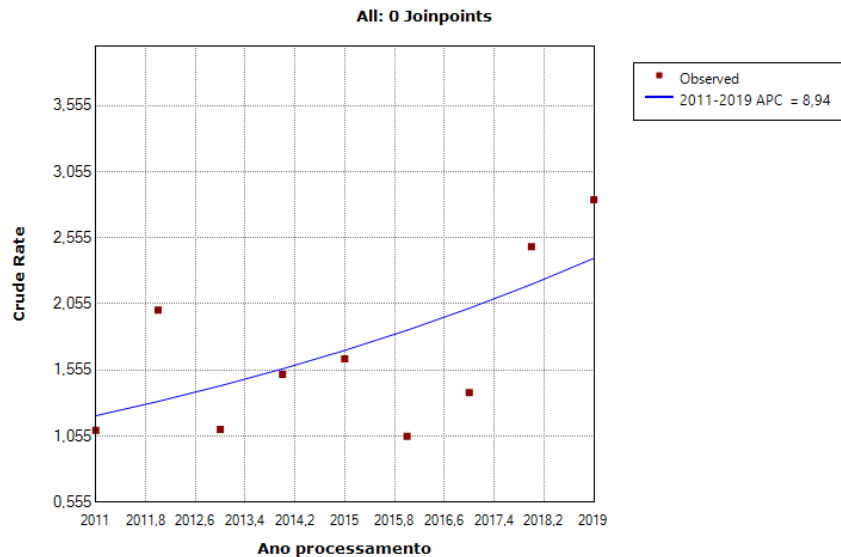


North Central:



Annual Percent Change (APC)							
Segment	Lower Endpoint	Upper Endpoint	APC	Lower CI	Upper CI	Test Statistic (t)	Prob >  t
1	2011	2019	7,8*	1,7	14,2	3,1	0,018
* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level							
Average Annual Percent Change (AAPC)							
Range	Lower Endpoint	Upper Endpoint	AAPC	Lower CI	Upper CI	Test Statistic~	P-Value~
Full Range	2011	2019	7,8*	1,7	14,2	3,1	0,018
* Indicates that the AAPC is significantly different from zero at the alpha = 0.05 level.							
~ If the AAPC is within one segment, the t-distribution is used. Otherwise, the normal (z) distribution is used. <a href="#">Learn More</a>							

Central-Southeast:



Annual Percent Change (APC)							
Segment	Lower Endpoint	Upper Endpoint	APC	Lower CI	Upper CI	Test Statistic (t)	Prob >  t
1	2011	2019	8,9	-0,3	19,1	2,3	0,057
* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level							
Average Annual Percent Change (AAPC)							
Range	Lower Endpoint	Upper Endpoint	AAPC	Lower CI	Upper CI	Test Statistic~	P-Value~
Full Range	2011	2019	8,9	-0,3	19,1	2,3	0,057
* Indicates that the AAPC is significantly different from zero at the alpha = 0.05 level.							
~ If the AAPC is within one segment, the t-distribution is used. Otherwise, the normal (z) distribution is used. <a href="#">Learn More</a>							