

Mortality from Colon, Rectal, and Anal Cancer in Barranquilla Between 1985 and 2020

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Abstract

Introduction: Colorectal cancer is the third most common neoplasm worldwide, and Colombia is no exception. It is essential to study mortality from this condition in specific regions, as variations have been found even within the same country. The objective is to describe the mortality trends from colorectal cancer in the district of Barranquilla between 1985 and 2020. **Methodology:** A descriptive and retrospective study. Non-fatal death records with colorectal cancer as the underlying cause of death were analyzed from the National Administrative Department of Statistics (DANE) website for residents in Barranquilla between 1985 and 2020. Crude mortality rates were calculated for the years studied, along with the annual percentage changes in these rates. **Results:** A total of 3,201 deaths from colorectal cancer were recorded, with 59.6% in women and 21.7% in individuals aged 80 years or older. There was an increase in the age-adjusted mortality rate (per 100,000), from 5.1 to 12.7. Overall, there was an upward trend in the annual percentage changes in mortality rates. **Conclusion:** An increase in colorectal cancer mortality was observed in the district of Barranquilla. It is necessary to continue this line of research and investigate factors related to this trend.

Keywords

Mortality, Cancer, Colon, Rectum, Anus.

INTRODUCTION

Colon, rectal, and anal cancer (CRAC) is one of the most significant malignancies worldwide. According to the Global Cancer Observatory (GLOBOCAN), in 2020, there were 1,931,590 new cases, accounting for 10% of global cancer incidence, making it the third most common tumor after breast and lung cancer. Just over 50% of these incident cases occurred in men. Regarding mortality, this cancer accounts for 9.4% of all cancer-related deaths, second only to lung cancer, which accounts for 18%⁽¹⁾.

Early detection through screening and the removal of adenomatous polyps^(2,3), as well as advances in treatment and increased survival rates for CRAC^(4,5), may partly explain the declining mortality trends in high-income countries⁽⁶⁾. In contrast, most transitioning countries face significant challenges in achieving such trends due to limited resources, inadequate healthcare infrastructure, and consequently, a lack of effective screening⁽⁷⁾, along with difficulties in accessing oncology services and appropriate care⁽⁸⁾.

In Colombia, according to data from the High-Cost Account (CAC in Spanish), colon and rectal cancer ranks

as the third most common tumor nationally. In 2019, 3,420 new cases of this pathology were identified, with a distribution of 47.87% in men and 52.13% in women. That same year, 2,384 deaths from colorectal cancer were recorded across Colombia⁽⁹⁾. In 2012, guidelines for the Integrated Health Care Pathway for the Promotion and Maintenance of Health for the early detection of colon and rectal cancer were introduced in Resolution 4505, later amended by Resolution 3280 in 2018⁽¹⁰⁾.

In Barranquilla, some risk management indicators tracked by the CAC may be showing challenges in implementing the Integrated Health Care Pathway for the Promotion and Maintenance of Health. The proportion of patients with *in situ* CRAC is within a low compliance range (1.32%), lower than the national figure of 1.76%⁽¹¹⁾. This highlights the limited intervention in the primary care of the disease and the lack of preventive measures, such as identifying patients with risk factors for developing CRAC and those eligible for diagnostic tests aimed at detecting primary or suggestive lesions of first-degree cancer, such as *in situ* CRAC.

Given the above, and considering the need to understand mortality trends for CRAC over an extended period, as well as the absence of similar published studies concerning Barranquilla, a key city in the Colombian Caribbean, the aim of this study was to determine the mortality trends from colorectal cancer in the Barranquilla district between 1985 and 2020.

MATERIALS AND METHODS

This is a descriptive, retrospective study. The study population consisted of non-fetal deaths that occurred in Barranquilla between 1985 and 2020. The sample included all records in which the underlying cause of death was CRAC, from non-fetal deaths occurring in Barranquilla, using ICD-10 codes: C18-C20 and ICD-9 codes: 153.0-154.1. Incomplete records, or those lacking data on sex, age, or habitual residence, were excluded.

The sources of information for the research were secondary. Databases of anonymized non-fetal death records were downloaded from the website of the National Administrative Department of Statistics (DANE). The data were filtered for residents of Barranquilla to obtain the relevant sample. Population projections and retro-projections based on the 2018 DANE Census were also downloaded for the years covered in the study. Age-adjusted mortality rates were calculated using the direct method, with the SEGI population as the reference⁽¹²⁾. The relative variation of the age-adjusted mortality rate was calculated by year.

This research was approved by the Ethics Committee of Universidad Libre, Barranquilla branch. It is supported by the legal framework of Resolution 8430 of 1993, Article 5,

which primarily considers the criteria of respect, dignity, and protection of human rights. According to this classification, the present study is risk-free, as it only involves retrospective documentary research techniques and methods⁽¹³⁾.

RESULTS

A total of 3,201 deaths from colorectal cancer (CRC) occurred during the observation period. In both men and women, the number of deaths increased over the years. In 1985, 28 deaths were recorded, while in 2006, the numbers surpassed 100; in 2017, the figure reached 208, with a peak of 214 deaths occurring in 2020. Also, in most years, the percentage of cases was higher among women, reaching its peak in 2008 with 69.2% (**Figure 1**).

Regarding the distribution by age groups (**Figure 2**), a trend of increasing deaths was found as age increased, with a peak in those over 80 years old, representing 21.74% of the deaths. It is noteworthy that the age group 15 to 19 years had a percentage of 5.62%.

In terms of the age-adjusted mortality rate for CRC, 2017 recorded the highest rate, with 13.8 deaths per 100,000 inhabitants. This year also showed the highest mortality rate among women during the study period, with 13.26 deaths per 100,000 women. Among men, the highest rate was recorded in 2020, with 17.2 deaths per 100,000 (**Table 1**).

The mortality rate showed an increase of 147.4% between 1985 and 2020. Regarding the annual percentage changes in mortality (**Figure 3**), there was an increase, particularly between 1988 and 1989, with a 71.8% rise. On the other hand, the largest decrease occurred between 1986 and 1987, with a negative variation of 39.6%.

DISCUSSION

The analysis of CRAC incidence worldwide reveals a significant increase over the years, which has been linked to various factors such as dietary habits, obesity, tobacco and alcohol consumption, and lack of physical activity, among others⁽¹⁴⁾.

Despite this rise in incidence, it is interesting to note that it does not always directly translate into a higher mortality rate. According to Wong and colleagues⁽¹⁵⁾, mortality can be significantly influenced by access to early detection services and advanced therapies. This finding is supported by Breugom and collaborators⁽¹⁶⁾, who demonstrated that in Europe, the mortality rate has decreased thanks to improvements in staging, access to effective treatments, standardization of care, and the implementation of surgical audits.

In contrast to these results, a different scenario emerges in Barranquilla. Firstly, there is a notable trend of a steady increase in the number of deaths throughout the study period, which may be attributed to various determinants,

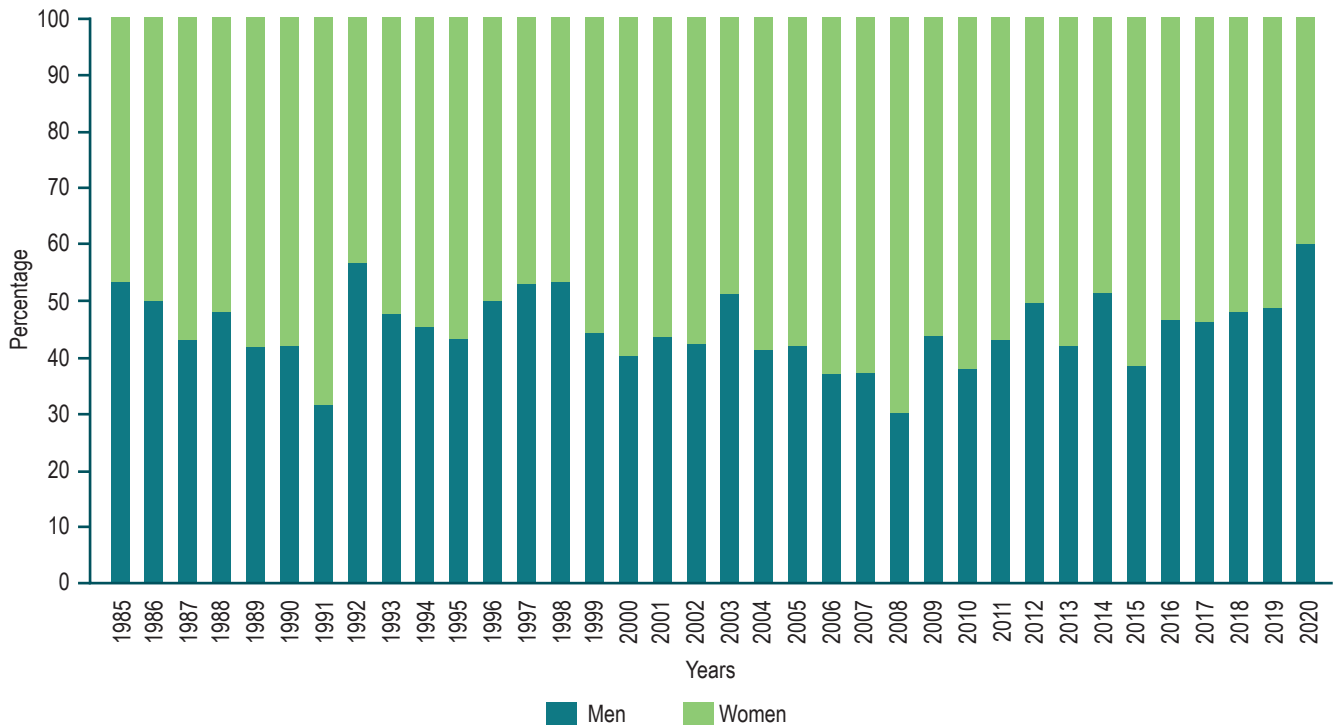


Figure 1. Percentage distribution of deaths from colon, rectal, and anal cancer in Barranquilla between 1985 and 2020, by sex. Prepared by the authors using DANE, Vital Statistics data.

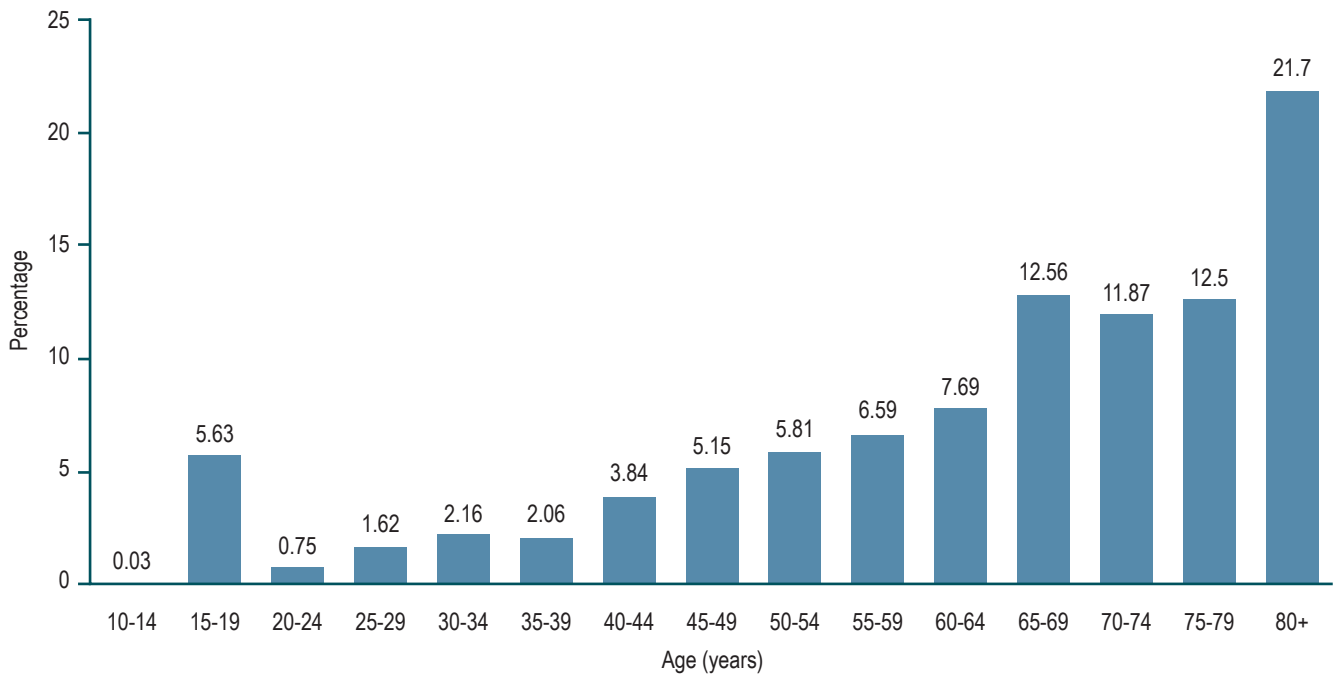


Figure 2. Percentage distribution of deaths from colon, rectal, and anal cancer in Barranquilla between 1985 and 2020, by age groups. Prepared by the authors using DANE, Vital Statistics data.

Table 1. Age-adjusted mortality rates (AAMR) for colon, rectal, and anal cancer in Barranquilla between 1985 and 2020

Year	Age-Adjusted Rate per 100,000			Year	Age-Adjusted Rate per 100,000		
	Men	Women	Total		Men	Women	Total
1985	5.74	4.60	5.11	2003	9.39	7.05	8.10
1986	6.56	5.54	6.01	2004	7.33	8.34	7.91
1987	3.91	3.36	3.63	2005	5.79	5.37	5.59
1988	4.16	3.66	3.86	2006	7.48	10.38	8.98
1989	5.92	7.11	6.62	2007	6.87	7.83	7.45
1990	4.32	5.12	4.74	2008	6.44	10.87	9.00
1991	3.80	7.18	5.66	2009	9.29	9.44	9.38
1992	5.58	3.48	4.41	2010	7.54	9.63	8.71
1993	6.90	5.97	6.39	2011	7.14	6.79	6.92
1994	6.94	7.55	7.24	2012	11.15	8.48	9.66
1995	5.96	6.85	6.47	2013	8.16	8.17	8.18
1996	7.40	5.52	6.41	2014	12.63	8.74	10.42
1997	8.93	6.61	7.60	2015	9.15	11.38	10.41
1998	9.22	5.92	7.39	2016	12.62	10.31	11.32
1999	7.84	8.14	8.10	2017	14.74	13.26	13.88
2000	7.05	8.38	7.89	2018	14.60	11.98	13.16
2001	6.20	6.25	6.22	2019	12.70	10.89	11.60
2002	6.64	6.97	6.90	2020	17.21	9.39	12.68

Prepared by the authors using DANE, Vital Statistics data.

ranging from changes in detection and diagnostic patterns to possible risk factors within the population.

Another notable finding is the higher predisposition of women to die from CRC. In 2008, the highest number of deaths among females was recorded. However, it is important to note that this predisposition does not remain consistent over time. By age group, there is a trend of increasing risk of death as age advances, similar to global patterns⁽¹⁵⁾, which underscores the importance of early detection and medical care in older adult populations. Surprisingly, the age group of 15 to 19 years also shows a significant percentage. This unusual finding warrants further investigation to better understand its underlying causes.

Despite efforts and strategies implemented by the Colombian government through the Ministry of Health to improve the situation, mortality has continued to rise

in this city. This raises questions about the effectiveness of the measures taken. Risk management indicators show a low percentage of patients with CRAC classified as *in situ* (1.32%), and only 75.76% of patients are stratified according to the TNM staging system. These, along with other indicators, highlight the difficulties in implementing the Integrated Health Care Pathway for the Promotion and Maintenance of Health. This suggests that medical care in Barranquilla may not be meeting the desired standards.

However, determining the reasons for the increase in mortality in the city is beyond the scope of this study. Particularly, with a steady rise in the number of deaths throughout the study period, a variety of factors could be involved, ranging from changes in detection and diagnostic patterns to potential risk factors in the population. Therefore, it is considered appropriate to link mortality

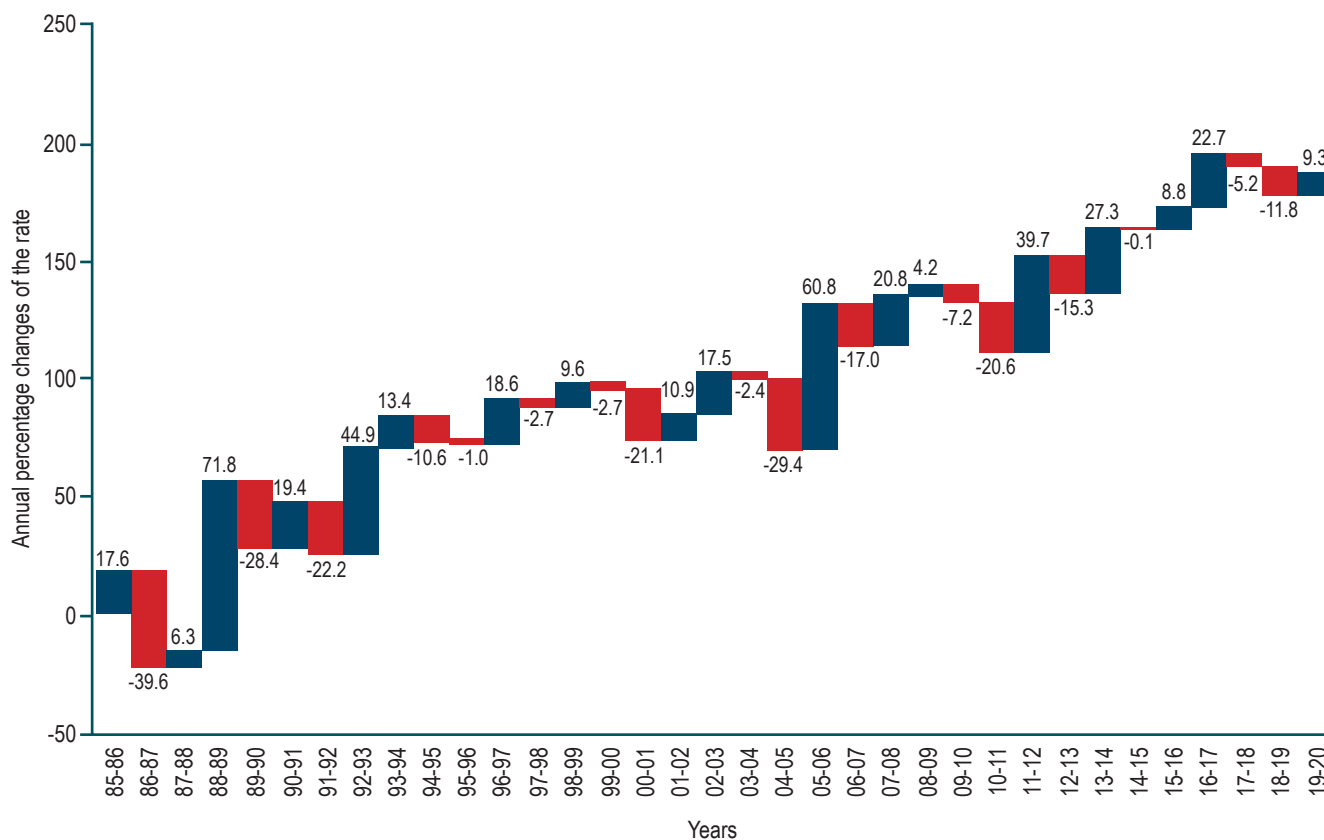


Figure 3. Annual percentage changes (APC) (%) in mortality from colon, rectal, and anal cancer in Barranquilla between 1985 and 2020. Prepared by the authors using DANE, Vital Statistics data.

with rates of premalignant lesions, the number of units equipped to provide early detection and diagnostic services, the percentages of colonoscopies ordered and performed, the timeliness of care, and the level of knowledge among healthcare professionals on the subject.

Additionally, the type of treatment received should be reviewed, as mortality increases when surgery is the only option available without complementary therapy⁽¹⁷⁻¹⁹⁾. Delays in diagnosis, referral, and treatment, along with cultural beliefs and financial limitations, can also account for most of the mortality⁽²⁰⁾.

As a limitation, it is important to mention that there may have been underreporting of mortality, especially in the early years studied, when a death certificate was not required to access funeral services. Additionally, it should be noted that population-based indicators require knowledge of the number of individuals in the area. Population censuses are a mechanism to determine the number of inhabitants; however, due to the costs involved, the country conducts them every ten years. Projections are made based on this data to estimate population sizes until a new census

is conducted, and these projections are adjusted with retro-projections based on past censuses. These changes affect the behavior of the indicators, as the risk estimates, such as mortality from CRAC, could be under- or overestimated prior to census adjustments.

CONCLUSIONS

The global increase in the incidence of CRAC and its relationship with various risk factors highlights the importance of early detection strategies and advanced treatments. However, despite governmental efforts, mortality from CRAC in Barranquilla has increased, potentially indicating deficiencies in healthcare and in the implementation of disease prevention and control programs.

Overall, these results provide a comprehensive picture of the evolution of CRC mortality in Barranquilla over the decades. These findings could be critical for formulating public health strategies focused on early detection and education about the disease across all age groups and sexes.

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