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# PREVALENCE AND TRENDS OF COLORECTAL CANCER, IN NYAMBENE, MERU COUNTY, KENYA

**Brian Moindi Onduso[1*], Nicholas Jacob Mwenda[2] and Joram Lunjalu[3]**

[1]Department of Public Health, Human Nutrition and Dietetics, Kenya Methodist University, Nairobi Kenya.

[2]Department of Pure and Applied Sciences, Kenya Methodist University, Nairobi Kenya.

[3]Department of Public Health, Human Nutrition and Dietetics, Kenya Methodist University, Nairobi Kenya.

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***Corresponding Author**
**Brian Moindi Onduso**
Department of Public Health, Human Nutrition and Dietetics, Kenya Methodist University, Nairobi Kenya.

## ABSTRACT

**Aim:** Colorectal cancer is becoming a serious health problem in Kenya, particularly in the Kiegoi location of the Nyambene region. There is limited evidence on the prevalence and trends of colorectal cancer in Nyambene, which policy makers can use to guide intervention measures. This study, therefore, evaluated the trends and prevalence of colorectal cancer in Nyambene based on hospital records. **Method:** A cross-sectional retrospective review of 200 clinical records of colorectal cancer patients obtained from the cancer registry at Meru Teaching and Referral Hospital (MeTRH). Structured questionnaires were used in collecting patients' information. **Results:** 200 cases were identified during the study period. The median age was 51 years with a mean age of 51.27 years. 116 (58%) of the recorded cases were found to be male and 84 (42 %) were females. The commonest clinical symptoms presented were blood in stool in 105 patients (52.5%), abdominal pain in 57 patients (28.5 %) and rectal bleeding in 36 patients (18 %). According to the TNM staging of cancer, majority of the patients 90 (45%) were identified as having late stage cancer. The overall crude incidence was per 100,000 of the population. The age specific standardized rate was per 100,000 of the population. **Conclusion:** This study has showed a high prevalence of colorectal cancer in Nyambene with similar trends in clinical patterns as to that observed in most African countries.

**KEYWORDS**: Colorectal cancer, prevalence, TNM, significant.

## INTRODUCTION

Colorectal cancer (CRC) is a malignant growth that originates from the inner lining of the colon or rectal.[1] Certain risk factors, including excessive tobacco use, high alcohol intake, and a Western-style diet, are linked to the onset of this cancer.[2] Common clinical manifestations of CRC include changes in bowel habits, rectal bleeding, weight loss, abdominal discomfort, and signs of iron-deficiency anemia.[3] The presentation of colorectal cancer may vary depending on the tumor's location: Right-sided colon cancers typically present with abdominal pain, anemia and a palpable mass in the right iliac fossa often at advanced stages. In contrast left-sided colon cancers more commonly manifest as rectal bleeding changes in bowel habits and maybe detected earlier through a palpable mass in the left iliac fossa during a digital rectal exam.[4] Although early detection greatly enhance survival outcomes, CRC often presents with no specific signs in its early stages, limiting the early diagnosis.[5]

A range of factors has been implicated in the etiology of CRC including advanced age, genetic predisposition, personal or family history of colorectal polyps, inflammatory bowel disease and alcohol consumption.[6]

Globally (CRC) ranks as the third most common malignant cancer and is among the leading cause of cancer related mortality, posing a substantial threat to public health.[7]

Previous studies on colorectal cancer show that the prevalence varies widely in different regions and age groups.[8] According to data from the Global Cancer Observatory and the world health organization, CRC had an incidence rate of 6.1% and accounted for 9.2% of cancer related deaths in 2022.[9] An estimated 2 million cases were diagnosed that year with age-standardized rate of 22 per 100,000 among men, 15.2 per 100,000 among women and 18.4 per 100,000 in both genders.[9,10]

In Kenya, data from the Nairobi Cancer Registry indicates that CRC accounts for approximately 6% of all newly diagnosed cancers, with evidence of an increasing trend over the years.[11] In Nyambene, Meru Kenya, hospital records similarly show a rising number of CRC cases highlighting it as an emerging public health concern.[12] However, there is a lack of published data on the prevalence and trends of colorectal cancer in this region, which is

critical for informing evidence-based intervention. Therefore this study aimed to assess the prevalence and temporal trends of colorectal cancer in Nyambene, Meru County, Kenya. The findings are intended to provide data driven insights that can support public health policies, resource allocation and early intervention strategies to address the growing burden of CRC in this region.

## METHODS

### Study design

This was a retrospective cross-sectional study to obtain data on the prevalence and trends of colorectal cancer in Nyambene using structured questionnaires. The target population was adult colorectal cancer patients in Nyambene diagnosed between 2018-2024.

### Study population and selection

The patient files of all colorectal cancer patients from Nyambene treated at Meru Teaching and Referral Hospital from January 2018 to December 2024 were retrieved. A total of 200 cases were identified. The records were analyzed for information on TNM staging, clinical presentation and demographics.

### Inclusion criteria

Clinically confirmed cases of colorectal cancer recorded in the hospitals' databases for adult patients from Nyambene from January 2018 to December 2024.

### Exclusion criteria

CRC patients who were not from Nyambene and had other underlying colorectal conditions.

### Data collection

Structured questionnaires were used in collecting data on adult colorectal cancer (CRC) patients in Nyambene from the Meru Teaching and Referral Hospital oncology unit database.

### Data processing and analysis

Daily checking of data entries was done to ensure conformity. After data collection, thorough data cleaning was performed to identify out-of-range values and missing entries**.** The collected data was cleaned and organized using Microsoft Excel. IBM-SPSS v29 was employed to analyze the data. Descriptive statistics, the mean and median, and were employed when performing data analysis. Age standardized rates were calculated from the

determined crude prevalence rates. Tables and bar graphs were used to display the findings.

### Ethical consideration

Ethical clearances were sought from the KeMU ethics committee and NACOSTI before data collection to ensure the research was conducted according to the required ethical guidelines.

## RESULTS

**Table 1: Population demographics.**

| Variable | Frequency |
|---|---|
| **Age (Mean, Median)** | **51.27, 51** |
| 30-39 years | 9 (4.5%) |
| 40-49 years | 62 (31%) |
| 50-59 years | 109 (54.5%) |
| 60-69 years | 20 (10%) |
| | |
| **Gender** | 116 (58%) |
| Male | 84 (42%) |
| Female | |

**Table 2: Crude prevalence of CRC.**

| Age group | CRC cases | Estimated population | Crude Prevalence per 100,000 |
|---|---|---|---|
| 30-39 | 9 | 4128.5 | 218 |
| 40-49 | 62 | 4128.5 | 1502 |
| 50-59 | 109 | 4128.5 | 2640 |
| 60-69 | 20 | 4128.5 | 484 |
| **Overall** | **200** | **16514** | **1211** |

### ASR

**Table 3: Age standardized rates of CRC.**

| Age group | Rate per 100,000 | WHO weight | Weighted rates |
|---|---|---|---|
| 30-39 | 218 | 0.15 | 33 |
| 40-49 | 1502 | 0.14 | 210 |
| 50-59 | 2640 | 0.12 | 317 |
| 60-69 | 484 | 0.08 | 39 |
| **ASR per 100,000** | | | **599** |

From this study a total of 200 colorectal cancer cases were identified. The mean age of the study participants was 51.27 years and ranged from 35-65 years. The majority of the study participants were males with 116 cases (58%), while female cases identified were 84 (42%), translating into a male-to-female ratio of approximately 1.38:1. The analysis of Age at diagnosis reveals that the majority of colorectal cancer cases fall within the older age brackets. Specifically, the highest number of cases (109), are observed in the 50-59 years age

group representing the peak incidence. This is followed by 62 cases in the 40-49 years age group, and 20 cases in the 60-69 years group. A smaller number of cases, 9, is found in the 30-39 years group, with no cases with no cases reported below 30 years.

The overall crude prevalence of CRC in this population was 1211 per 100,000 populations. The highest prevalence (2640 per 100,000) was recorded in those aged 50-59 years. This was followed by 40-49 years with 1502 per 100,000, then 60-69 years with 484 per 100,000 and finally 30-39 years with 218 per 100,000. The age specific standardized rate using WHO world populations was 599 per 100,000.

**Table 4: Clinical parameters.**

| Variable | Frequency |
|---|---|
| **Year of diagnosis** | |
| 2018 | 50 (25%) |
| 2019 | 45 (22.5%) |
| 2020 | 16 (8%) |
| 2021 | 25 (12.5%) |
| 2022 | 34 (17%) |
| 2023 | 18 (9%) |
| 2024 | 12 (6%) |
| **Clinical presentation** | **Frequency** |
| Blood in stool and abdominal pain | 105 (52.5%) |
| Anemia and tiredness | 57 (28.5) |
| Rectal bleeding | 36 (18%) |
| Other clinical presentations | 2(1%) |
| **TNM staging** | |
| Stage 1 | 25 (12.5%) |
| Stage 2 | 40 (20%) |
| Stage 3 | 90 (45%) |
| Stage 4 | 45 (22.5%) |
| | |

All of the subjects presented with more than one symptom. The common symptoms were blood in stool in 105 patients (52.5%), abdominal pain in 57 patients (28.5 %) and rectal bleeding in 36 patients (18 %). Intestinal obstruction and weight loss were less common symptoms as shown in Table 3. TNM staging revealed stage 3 has the highest number of cases at 45%, followed by Stage 4 with 22.5 %, then stage 2 with 20 % and stage 1 with 12.5 %.

## DISCUSSION

The patterns of colorectal cancer have been shown to differ across various geographical

areas. Findings from this study indicate that colorectal cancer was more prevalent in men compared women, aligning with general epidemiological trends often reported for colorectal cancer. This male predominance echoes numerous regional and global reports of higher CRC incidence and mortality in men.[12] Possible biologic explanations include: sex-specific differences in hormonal milieu most prominently the hypothetical protective-effect of estrogens on colonic epithelium and in visceral-fat distribution and gut-microbiome composition. Behavioral risk factors such as higher rates of red-meat intake, smoking and alcohol consumption among men can also augment the gap.

The age group analysis indicates that most cases of colorectal cancer in this population are between 40-60 years. This distribution is broadly consistent with previous studies.[13] Nevertheless, the proportion of patients under the age of 50 years (47.0 %) is high and exceeds western countries, where colorectal cancer typically affects older individuals, with the majority of diagnoses occurring in those over the age of 50 years.[14] African populations however often see cases presenting at a younger age with more advanced and aggressive disease, resulting in a poorer prognosis.[15] Plausible explanations include: Environmental influence, limited access to diagnostic/specialized cancer care services and genetic predisposition.

The staging results showed that the majority of the patients were diagnosed at advanced stages. Late presentation in this population is likely to be influenced lack of awareness about the disease, limited access to healthcare facilities, and the absence of screening programs in this area. There is a need for heightened awareness regarding the symptoms of colorectal cancer among the general public, along with the establishment of screening initiatives in Nyambene.

In this study, rectal bleeding/blood in stool was identified as the most prevalent symptom of colorectal cancer, aligning with findings from other research conducted.[4] Rectal bleeding is a frequent issue that prompts individuals to seek medical assistance. However, based solely on the presence of bleeding, it remains a diagnostic challenge to differentiate between a benign anal condition and a serious underlying colorectal issue. Bleeding is the primary symptom in the initial stage of colorectal cancer and requires prompt and thorough investigation.

There is a significant difference in the prevalence of colorectal cancer globally, with Western nations exhibiting higher rates than those in Africa. Nevertheless, an increasing rate of colorectal cancer has been observed in several regions of Africa.[14] Results from this research indicate that the overall crude prevalence of colorectal cancer in Nyambene is 1211 per 100,000 populations. The age standardized prevalence rate (ASR), based on the WHO world population was 599. These results are relatively greater than the outcomes reported in most African countries.[16] According to a study by Yeboah et.al 2017 in Nigeria, using hospital-based records the total crude annual incidence of colorectal cancer was 4.62 per 100000 populations. The age-adjusted standardized incidence rate, using the WHO world population as a reference, was 7.93 per 100,000 populations. Compared to our current estimates, prevalence of colorectal cancer in Nyambene is high and even exceeds that reported in developed countries such as Denmark, which has an ASR of 48.1 per 100,000.

## CONCLUSION

Findings from this study indicate that Nyambene has a high prevalence of colorectal cancer and that men are more affected. Individuals aged 40-60 years are the most affected with cases being diagnosed at advanced stages. The study emphasizes the need for implementing age- and sex-targeted screening programs and enhancing public awareness of colorectal cancer symptoms to improve early diagnosis, treatment outcomes, and overall colorectal cancer control.

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