



UK Health  
Security  
Agency

# Cancer Hospital Admissions and Mortality Trends

10-year retrospective analysis,  
Montserrat

February 2023



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## Background

Montserrat, a small island in the Caribbean, faces a unique set of challenges when it comes to healthcare. With a population of just over 5,000 people, access to medical care is limited and often requires travel to other islands. In recent years, cancer has become a growing concern in the region. As such, this retrospective analysis of cancer hospital admissions and mortality at Glendon Hospital, Montserrat, is an important step in understanding the impact of cancer on the island and the healthcare system. By examining the demographic and clinical characteristics of cancer patients and identifying trends in hospital admissions and mortality rates, this work can inform public health initiatives and improve access to care for those affected by cancer on the island.

This is a 10-year analysis of the profile of acute medical admissions between years 2011 to 2021 at Glendon Hospital, Montserrat. Admitted patients are patients who undergo the admission process to receive treatment and/or care, which includes surgical, medical, intensive, rehabilitation, palliative care, and mental health. The objective of this study is to review the hospital records of patients to describe the demographic, clinical characteristics of patients admitted, as well as to ascertain a measure of impact upon the healthcare system. Information obtained included age, sex, address, ICD diagnosis, duration of stay, and clinical commentary upon admission. This analytical work aims to summarise the number of hospital admissions due to neoplasms (cancer), as well as the length of stay and mortality rate. A high burden of cancer may indicate a need for increased funding for public health initiatives and improved access to care.

## Executive Summary

Our findings showed that there were a total of 6,033 acute medical admissions at Glendon Hospital, Montserrat, between the years 2011 and 2021. Of these admissions, 233 patients were diagnosed with proximal neoplasms (cancer) according to the ICD-10 code (neoplasm-related hospital admission (NRHA)). This represents a prevalence of approximately 3.9% of all admissions over the study period. These results highlight the significant burden of cancer on the healthcare system in Montserrat and underscore the importance of further research and public health initiatives to address this issue.

## Methodology

In this report, we used hospital administrative data as our primary source of information on hospital admissions. The data was collected from a nationally representative database of hospital records and includes information on demographic characteristics, diagnoses, length of stay and readmissions. The data used in this report represents a 10-year period from 2011 to 2021 and all includes admissions from Glendon hospital across Montserrat.

## ICD-10 mapping and analysis

The ICD-10 code is a medical classification system used to identify diseases, disorders, and other health conditions. It is a standardised system of codes that is used internationally by healthcare providers to document diagnoses and treatment information in medical records. The codes are assigned based on the type and severity of the condition. Each record in the analytical dataset features an ICD-10 code with the proximal cause for admission. The R package 'icd' was used to map ICD-10 codes to disease groups and specific categories, to explain and summarise the groups of ICD codes in natural language (Wasey J, Lang M, R Core Team (2022). icd: Comorbidity Calculations and Tools for ICD-9 and ICD-10 Codes. R package version 4.0.9.9000).

## Limitations and assumptions of the analysis

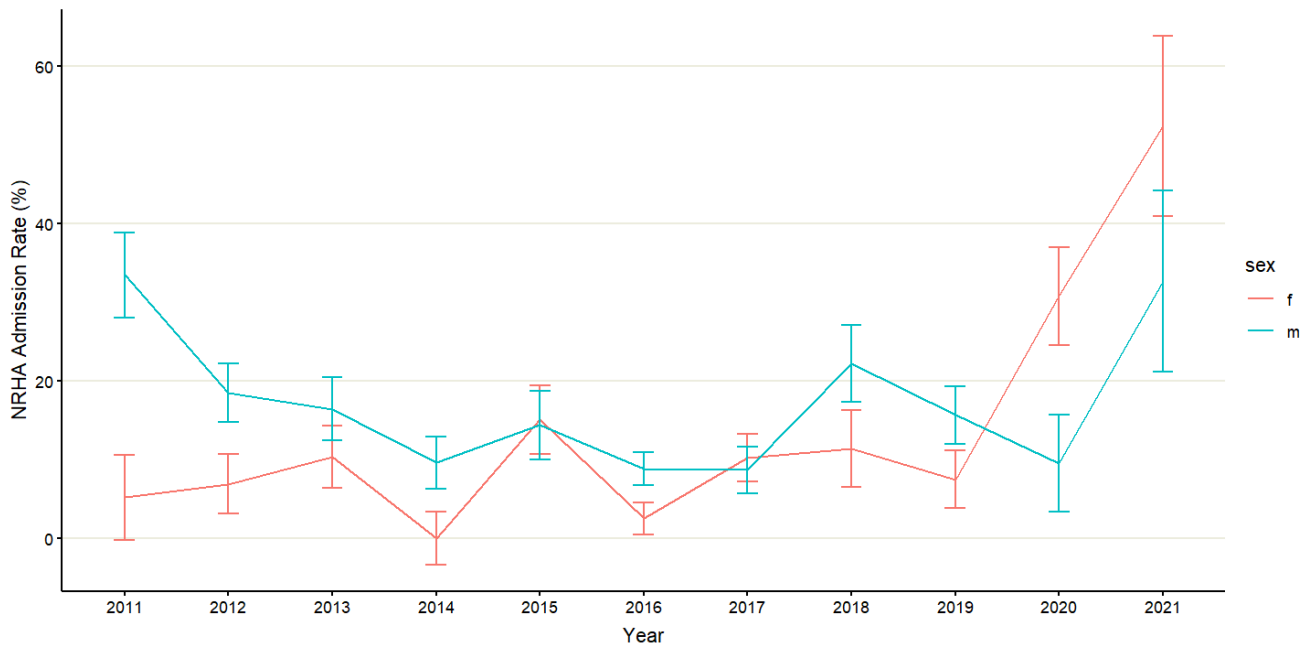
It is important to note that while this report is focused on neoplasm-related admissions, these admissions may not be fully representative of the prevalence or incidence of cancer in the population. This is because not all cancer cases require or result in hospital admission. Furthermore, the decision to admit a patient to the hospital for a neoplasm-related condition is dependent on a range of factors, such as the severity of the condition and the availability of appropriate care in other settings. As such, while neoplasm-related admissions provide an important insight into the burden of cancer-related health services, they may not fully reflect the true number of cancer diagnoses or the prevalence of the disease in the population.

The ICD-10 code captures only one diagnosis per admission. This means that it may not be possible to determine the co-morbidities or multiple factors impacting an individual's health, beyond the proximal cause for admission. Additionally, the ICD-10 code only captures the diagnosis assigned by the healthcare provider, and there may be some variability in the accuracy and completeness of these codes.

# Results

## NRHA Admission Rate Over Time by Sex

There is an overall increase in NRHA admissions due to neoplasms (cancer) for both males and females. Females accounted for 47.6% of the total patient population, but had a lower NRHA rate (0.033, 95% CI: 0.02 - 0.04) compared to males, who accounted for 52.3% of the total patient population and had a higher NRHA rate (0.04, 95% CI: 0.03 - 0.052). However, in 2020 and 2021, the NRHA admissions for females surpassed that of males, which suggests a potential shift in incidence or treatment outcomes between genders (or another factor).

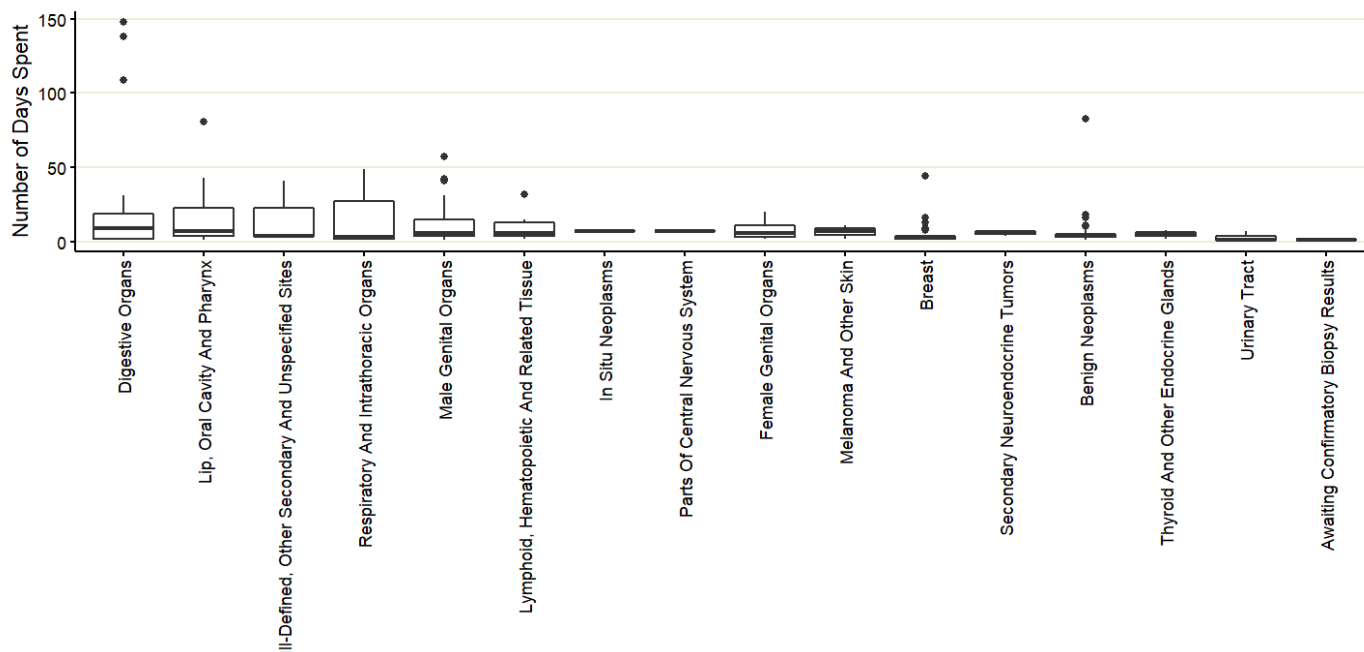


Sex	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>M</b>	28 (8.4%) / 335	14 (4.6%) / 303	12 (4.1%) / 292	5 (2.4%) / 208	9 (3.6%) / 250	6 (2.2%) / 272	6 (1.9%) / 276	14 (4.4%) / 252	9 (3.8%) / 230	3 (2.3%) / 126	16 (8.2%) / 196
<b>F</b>	4 (1.3%) / 309	6 (1.7%) / 347	8 (2.6%) / 309	- / 242	13 (3.8%) / 345	2 (0.6%) / 318	9 (2.8%) / 352	9 (2.8%) / 317	5 (1.9%) / 268	18 (7.7%) / 234	33 (13.1%) / 252

## Length of Stay for NRHA

The table below provides information on the age and length of stay (LOS) for cancer-related hospital admissions by sex. The data shows that, on average, males were older than females (66.34 vs. 54.47) and had longer LOS (12.61 days vs. 7.59 days). The median age for males was also higher than for females (67 vs. 50), indicating that the age distribution for males was more skewed towards older patients. The SEM for both age and LOS measures were small, indicating that the sample mean and median were relatively close to the true population values. Overall, the data suggests that cancer-related hospital admissions may be more common among older males compared to females, and that males may have longer hospital stays than females.

SEX	N	MEAN AGE	MEDIAN AGE	SEM AGE	MEAN LOS	MEDIAN LOS	SEM LOS
F	111	54	50	1.6	7.5	4	1.4
M	122	66	67	1.4	12.6	6	1.8



The table provides an overview of hospital admissions (n) and length of stay for various neoplasm groups. The Digestive Organs group had the highest mean number of days spent in the hospital (mean = 19.5), followed by Lip, Oral Cavity And Pharynx (mean = 16.6) and Ill-Defined, Other Secondary And Unspecified Sites (mean = 16.0). In contrast, Awaiting Confirmatory Biopsy Results had the lowest mean number of days spent in the hospital (mean = 1.0). The median number of days spent in the hospital varied from 1 day to 7 days across different neoplasm groups. The minimum and maximum number of days spent in the hospital also varied, with the Digestive Organs group having the widest range of 1-148 days.

It's important to note that the counts of hospital admissions also vary across different neoplasm groups (N), which may reflect differences in disease prevalence and healthcare utilisation.

<b>GROUP</b>	<b>N</b>	<b>LOS</b>	<b>LOS MED</b>	<b>MIN</b>	<b>MAX</b>
Digestive Organs	37	19.5	9	1	148
Lip, Oral Cavity And Pharynx	15	16.6	7	1	81
Ill-Defined, Other Secondary And Unspecified Sites	3	16.0	4	3	41
Respiratory And Intrathoracic Organs	7	16.0	3	1	49
Male Genital Organs	43	11.2	6	1	57
Lymphoid, Hematopoietic And Related Tissue	9	9.7	6	2	32
In Situ Neoplasms	1	7.0	7	7	7
Parts Of Central Nervous System	1	7.0	7	7	7
Female Genital Organs	13	6.9	6	2	20
Melanoma And Other Skin	3	6.7	7	2	11
Breast	21	6.1	3	1	44
Secondary Neuroendocrine Tumors	2	6.0	6	4	8
Benign Neoplasms	71	5.5	4	1	83
Thyroid And Other Endocrine Glands	2	5.0	5	2	8
Urinary Tract	3	3.0	1	1	7
Awaiting Confirmatory Biopsy Results	2	1.0	1	1	1

## NHRA groups, by sex

The table below shows the major types of neoplasms (top ranking) for males and females separately, with the number of admissions and the percentage of total admissions for each neoplasm. The neoplasms are sorted in descending order of the number of admissions for each sex.

<b>FEMALES</b>				
Major Type of Neoplasm	N	Percent	Age	SEM
Malignant neoplasm of breast	18	6.7%	66	2.5
Malignant neoplasm of colon	6	2.2%	73	5.3
Malignant neoplasm of corpus uteri	6	2.2%	70	6.9
Malignant neoplasm of bronchus and lung	2	0.7%	57	7.0
Malignant neoplasm of liver and intrahepatic bile ducts	1	0.4%	59	-
Malignant neoplasm of oropharynx	1	0.4%	81	-
Benign lipomatous neoplasm	2	0.7%	39	7.0
Benign neoplasm of breast	1	0.4%	50	-
Benign neoplasm of mouth and pharynx	1	0.4%	20	-
Benign neoplasm of other and unspecified sites	1	0.4%	5	-
Carcinoma in situ of skin	1	0.4%	76	-
<b>MALES</b>				
Major Type of Neoplasm	N	Percent	Age	SEM
Malignant neoplasm of prostate	42	16.9%	76	1.7
Malignant neoplasm of colon	12	4.8%	61	4.5
Malignant neoplasm of bronchus and lung	5	2.0%	78	4.4
Malignant neoplasm of esophagus	6	2.4%	68	8.9
Malignant neoplasm of sites in the lip, oral cavity and pharynx	3	1.2%	54	0.3
Malignant neoplasm of liver and intrahepatic bile ducts	4	1.6%	73	0.5
Malignant neoplasm of stomach	4	1.6%	57	3.3
Malignant neoplasm of tonsil	4	1.6%	54	0.3
Malignant neoplasm of unspecified parts of tongue	3	1.2%	69	0.0
Malignant neoplasm without specification of site	3	1.2%	81	2.7

For females, the most common types of cancer were malignant neoplasms of the breast, accounting for 6.7% of all neoplasm-related hospital admissions, followed by colon and rectum (3.9%) and the cervix uteri (3.1%). Breast cancer is the most common cancer in women in the Caribbean, as it is globally, and the high number of admissions for malignant neoplasm of the breast in females in the table is consistent with this trend. This may be due to factors such as earlier onset of menstruation, longer duration of hormonal exposure, and lower breastfeeding rates. The percentage of admissions related to malignant neoplasms of the breast (6.7%) is significantly lower than that for malignant neoplasms of the prostate (16.9%) among males, which may be attributed to differences in cancer screening, awareness, and access to healthcare for different genders.

For males, the top three neoplasms in terms of both count and percentage of all NRHAs are prostate, colon, and bronchus and lung, accounting for 42 (16.9%), 12 (4.8%), and 5 (2.0%) admissions, respectively. Prostate cancer is the most common cancer in men in the Caribbean, as it is globally, and this may be due to factors such as genetic predisposition, lifestyle, and environmental exposures. The average age of patients in Montserrat with prostate cancer is 76 years old, which is consistent with the fact that prostate cancer is typically a slow-growing cancer that may not cause symptoms until later stages. This delayed onset of symptoms means that many cases of prostate cancer are not detected early, making treatment less effective. This highlights why screening for prostate cancer is important, particularly for men over the age of 50 or those with a family history of prostate cancer.

The high number of admissions for malignancies of the colon in both males and females is also noteworthy, as colon cancers are typically highly treatable when detected early. However, many cases are not detected until later stages when treatment is less effective. The number of admissions may reflect the prevalence of colorectal cancer in the population or differences in screening and diagnostic practices. Therefore, it is important to ensure that adequate screening and early detection measures are in place to reduce the burden of this cancer subgroup.

The table also reveals a number of admissions for malignant neoplasms of the liver and intrahepatic bile ducts in both males and females. This is a significant health concern and may be related to factors such as alcohol consumption, viral hepatitis, and aflatoxin exposure. The occurrence of these neoplasms may also be influenced by underdiagnosis and lack of screening programs.

In addition to the commonly occurring neoplasms, there were also a few rare types of cancer with only one or a few admissions such as carcinoma in situ of skin and Merkel cell carcinoma, which can still have a significant impact on individual patients and their families. This highlights the need for continued research and resources to support patients and families dealing with a wide range of cancer diagnoses.

## Summary

The data on neoplasm-related hospital admissions in Montserrat provides important insights into the most common types of cancer and associated healthcare burden.

This report provides an analysis of neoplasm-related hospital admissions on the island of Montserrat. The results reveal an overall increase in the number of hospital admissions, with the highest increase observed in 2020 and 2021. This increase is particularly pronounced in females, where the number of hospital admissions grew by 28.9% between 2016 and 2021. While the exact reasons for this increase are not fully understood, it is possible that the COVID-19 pandemic played a role. Lockdown measures and limited travel may have made it more difficult for people to seek treatment or diagnostic services for cancer off island, resulting in a domestic backlog of cases that eventually required hospitalisation. This report provides only a partial view of the situation on the island, and thus it's crucial to recognise that the full impact of the pandemic on cancer diagnosis and treatment will not be captured.

While this analysis provides insights into the most common types of cancer in Montserrat, counts of hospital admissions alone do not reflect the incidence, mortality, or outcomes of cancer in the population.

For example, breast cancer is a complex disease that can have varying outcomes depending on factors such as tumor size, stage at diagnosis, and molecular subtype. While the high number of admissions for malignant neoplasm of the breast in females may be an indicator of the prevalence of breast cancer in the population, it is also important to investigate the distribution of breast cancer subtypes and outcomes to guide targeted prevention and treatment efforts. Similarly, prostate cancer is a disease with varying outcomes, ranging from slow-growing tumors that may not require treatment to aggressive tumors that require immediate intervention. Therefore, while the high number of hospital admissions for malignant neoplasm of the prostate in males may indicate a high prevalence of the disease, it is also important to investigate the distribution of prostate cancer subtypes and outcomes to guide appropriate screening and treatment efforts.

In addition to breast and prostate cancers, the report identified other noteworthy trends related to malignant neoplasms of the colon. Highlighting the importance of adequate screening and early detection measures. The number of admissions may reflect differences in screening and diagnostic practices or the prevalence of colorectal cancer in the population. However, it is important to note that this analysis does not reflect incidence or mortality data, and outcomes such as survival rates and quality of life should be taken into consideration for a more comprehensive understanding of the impact of colorectal cancer in the Montserratian population.

Nevertheless, the report provides valuable insights into the burden of cancer upon Montserrat's health care system and highlights the need for continued research and resources to support patients and families dealing with a wide range of cancer diagnoses.

# About the UK Health Security Agency

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

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Prepared by: Abbie Harrison  
For queries relating to this document, please contact: [abbie.harrison@ukhsa.gov.uk](mailto:abbie.harrison@ukhsa.gov.uk)

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