


Global Journal of Health Science (GJHS)

Assessment and Mitigation Strategies for the Burden of Cancer in the United Arab Emirates (UAE)

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Article History

Received 15th December 2025

Received in Revised Form 12th January 2026

Accepted 12th February 2026



How to cite in APA format:

Jasmi, A. (2026). Assessment and Mitigation Strategies for the Burden of Cancer in the United Arab Emirates (UAE). *Global Journal of Health Sciences*, 11(1), 11–23.
<https://doi.org/10.47604/gjhs.3635>

Abstract

Purpose: In the United Arab Emirates (UAE), cancer is becoming a significant public health concern due to its increasing incidence which is mainly driven by environmental, demographic and lifestyle factors. The most prevalent types are breast, colorectal and thyroid with obesity, poor diet, smoking and pollution acting as the main contributors. By combining information from multiple resources such as, international databases, national registries and peer-reviewed literature, this study aims to evaluate the cancer burden in the United Arab Emirates.

Methodology: A qualitative analysis highlighted the disproportionate impact of breast cancer on women, the growing prevalence of colorectal cancer in younger populations and the role of occupational and environmental exposures in shaping cancer risk.

Findings: The results underscore discrepancies between the Emirati and non-Emirati population as well as significant gaps in early identification and prevention. Health promotion campaigns, early detection and screening initiatives, health policy interventions and enhanced collaboration with healthcare providers were among the mitigation strategies discussed in this paper.

Unique Contribution to Theory, Practice and Policy: Strengthening these measures within the framework of the UAE's 2022-2026 national cancer control plan is essential for reducing the incidence and mortality of cancer. According to the study's findings, a multifaceted approach that includes enhanced screening, policy reinforcement and lifestyle changes can significantly reduce the incidence of cancer and improve long-term health outcomes in the UAE.

Keywords: *Cancer Burden, United Arab Emirates, Cancer Epidemiology, Lifestyle Risk Factors, Cancer Screening, Health Policy, Health Belief Model*

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INTRODUCTION

Cancer is a major cause of deaths globally, and in 2020, it has been estimated to have resulted in about 10 million deaths worldwide. It is considered as a multifaceted group of illnesses, characterized by the uncontrolled growth and dissemination of abnormal cells and has become a major concern to the population of the country. Significant attention towards cancer has been given in the past few decades because the relative cancer incidence is expected to increase by 60 percent in 2040 due to changes in lifestyle, age, and environmental exposures (World Health Organization [WHO], 2022; International Agency for Research on Cancer [IARC], 2022).

There has been a notable surge in the cancer incidence in the Gulf Cooperation Council (GCC) region, particularly in the United Arab Emirates (UAE). For example, breast, colorectal and lung cancers have appeared to be the leading types, with breast cancer compromising approximately 39% of cancer cases among women in the UAE (Al-Shamsi & Musallam, 2024) and overall, it is the cause of death in about 8.2% of women in the country. There is also an increasing prevalence of colorectal cancer which is of great concern as it affecting the younger population mainly (Alessy et al., 2024; Nazzal, 2023).

In the UAE, the burden of cancer is not merely linked to biological and genetic biases but also to environmental and societal factors such as urbanization and population growth. It is estimated that more than 40% of the UAE's adults are obese (WHO, 2022), and obesity has been presented to be one of the risk factors contributing to breast, colorectal and kidney cancers (Rafii & Al-Shamsi, 2024). The smoking of tobacco also remains as a significant risk factor for lung cancer, especially among young men. Additionally, environmental and occupational exposures such as air pollution and chemical hazards also contribute to increasing the risk of developing cancer (Ahmed et al., 2020).

Several interventions have been suggested to enable reduction in the levels of cancer. The UAE government has started running cancer prevention and early detection initiatives, such as smoking and diet promotional campaigns (Rafii & Al-Shamsi, 2024). Besides, the UAE has been screening cancer in high-risk individuals. Breast cancer can be improved through mammography, and there is an improvement in mortality rates in colorectal cancer through colonoscopy (Wardle et al., 2015). Modifications on the risks of cancer could be achieved through taxes on tobacco products and reduced exposure to advertisements of unhealthy food (Bader et al., 2011; Fernandez & Raine, 2019). These complex strategies are aimed at early prevention and diagnosis with the aim to decrease the cancer burden in the UAE to improve its outcomes.

The purpose of the study is to determine the current burden of cancer in the UAE, main risk factors, and specific medical interventions that could be conducted to reduce the effects of cancer on people in the UAE. This paper will highlight the importance of cancer prevention and early detection measures in the UAE through the interpretation of statistics and risk factors of cancer and health policies. The research appraises and enhances healthcare models that can be used to decrease the occurrence of cancer and enhance survival. The key objectives are to evaluate the existing trends of incidence and mortality of cancer in the UAE, identify the key risk factors of environment and lifestyles that are of great influence on cancer and to suggest the evidence-based disease prevention and early diagnosis of cancer in the UAE.

Although the extent of research on cancer in the UAE is expanding, the existing studies highlight significant limitations that restrict their use for national cancer control strategies. Instead of providing an integrated population-wide assessment that connects epidemiological

burden with prevention and policy responses, much of the literature in the UAE focus on individual cancer types, specific subpopulations or single emirates (Al-Shamsi et al.,2022; Rashid et al., 2024). Furthermore, various studies use hospital-based or local cohorts only which underrepresent the expatriate population who make up 76.8% of all the cancer cases reported in the country (MOHAP,2023). According to Baynouna et al. (2025) and Mukherji et al. (2025), this restricts knowledge of lifestyle, environmental and occupational hazards that disproportionately impact the non-Emirati communities.

In addition, previous studies investigated age-specific trends and health system performance indicators inefficiently. Despite new evidence indicating an increase in the incidence of early-onset colorectal cancer in individuals under 50 years, most studies in the UAE report incidence rates without age stratification, which makes it difficult to adapt to policy changes in a timely manner (Al-Shamsi & Musallam, 2024; Alessy et al.,2024). The following epidemiological indicators further justify this gap: screening uptake still remains below optimal levels with mammography and cervical screening rates reported at 23% and 31% accordingly, age-standardized incidence rates remain high especially among females (157.8 per 100,000) and lastly breast and colorectal cancer contribute to disproportionately to mortality (IARC, 2022; Al-Awadhi et al.,2024; Abdalla et al.,2023). When taken as whole, these indicators highlight the need for informed research that integrates incidence, mortality, population inequalities and prevention performance in the UAE.

METHODOLOGY

Data Collection and Analysis

The study used a systematic data collection method, which is characterized by secondary data collection, to examine the incidence of cancer and its risk factors and intervention in the UAE. The process of data collection was divided into various sequential steps to keep things clear and pertinent. The steps included identifying keywords, selecting databases, applying filters and reviewing results for inclusion. Such a method allows us to make the analysis reliable and comprehensive.

Data Sources

Databases and sources searched included PubMed, Scopus, Web of Science, Google Scholar, the UAE national Cancer Registry, WHO Global Cancer Observatory and MOHAP health reports. General definitions, descriptions, and world cancer statistics were obtained from the site of the National Cancer Institute. In the case of the UAE, incidence rates, death rates, and distribution data were obtained by means of national health surveys, the UAE National Cancer Registry, and the Global Cancer Observatory. This literature disclosed UAE cancer patient statistics and deaths by type. The combination of peer-reviewed journal publications on cancer risk factors, epidemiology, and prevention and intervention measures on was searched for on the mentioned databases. They were refined with the help of filters such as cancer, UAE, risk factors, interventions, policies, and epidemiology.

Inclusion and Exclusion Criteria

The inclusion criteria of the secondary data worked on the studies and reports that had been published within 5-10 years, which would mean the data was up-to-date and applicable. The UAE or GCC were the only regions to consider cancer incidences, mortality, and cancer risk factors. The documents and statistics were credible since they were outlined by governmental health institutions, international health institutions, and peer-reviewed journals. It was only the

widespread research and databases involving cancer trends, dangers to lifestyle, and exposures to the environment that were considered.

The exclusion criteria of the research included the omission of an article and a dataset not based in the territory of the UAE or the GCC state, as well as the projects that did not offer the detailed epidemiological data or were not within the scope of the research. Articles published in languages other than English were not included, and the articles with little information on cancer prevention measures and policy intervention were not included. That made the analysis concise about the sources that were relevant and complete.

Data Analysis Method

The analysis of the data was conducted in a qualitative way by emphasizing the thematic assessment of the cancer data obtained. The comparisons were made in a cross-sectional analysis of cancer types, risk variables, and demography. UAE cancer incidences, deaths, and types were determined in the form of graphs and tabulations. Thematic content analysis of the peer-reviewed articles determined lifestyle, environmental, and occupational causes of risk. The effectiveness of UAE cancer intervention options was also made known through this process. This work may be reproduced using cancer registries, public health surveys, and cancer databases at a global level. To ensure the inclusion of papers related to the UAE or GCC countries, a strict inclusion criteria based on the relevance of data, currency, and scope was used.

FINDINGS AND ANALYSIS

Epidemiology of Cancer in the UAE

The UAE's cancer profile shows a relatively high incidence of several types of cancers with an age-standardized rate of 86.4 and 157.8 per 100,000 in males and females accordingly (International Agency for Research on Cancer (IARC, WHO), 2022). When assessing the gender distribution, it is evident that cancer affects more females accounting for 55.6% of the reported cases as of 2023 when compared to males which made up only 44.4% of the cases within the same year. It was also revealed that a higher number of cases was reported in the non-Emirati population (76.8%) rather than the Emirati population (23.2%) and this highlights an important disparity between the two groups which makes these findings crucial for considering the can burden of cancer in the UAE (Table 2). The highest incidence identified among females is breast cancer (36.6%) and among males, colorectal cancer (11.5%) (MOHAP, 2023). Using the data from the national cancer registry of the UAE , it is evident that in 2023, breast cancer contributed to about 20.5% of all cancer incidences, while 11.2% of the cases contributed to thyroid cancer followed by colorectal (8.3%), skin (4.7%), prostate (4.6%) and non-Hodgkin lymphoma (4.6%) (Table 1). These patterns underscore the necessity for gender-directed interventions that prioritize breast cancer screening for women and colorectal cancer screening for both genders (AlKetbi et al., 2025). Among the elderly population, it is apparent that prostate cancer (12.1%) takes the lead as the cancer with the highest incidence rate followed by colorectal cancer (12%) (GLOBOCAN, 2022). However, the data indicates a rising surrender rate among young people for cancers related to lifestyle preferences, such as colorectal cancer (Al-Shamsi, 2024), therefore, early interventions and focusing public attention on modifiable risk factors are crucial.

Risk Factors

The increase in cancer incidence in the UAE is associated with increased risks from lifestyle preferences and environmental issues (Al-Shamsi, 2024). The high prevalence of obesity which

is associated with the excessive consumption of foods with low nutritional value such as red meat and processed foods, increases the risk of some forms of cancer like colon and rectum cancer (Nazzal et al., 2023). Lung cancer also results from high smoking instances, particularly among males, making the rates higher (Radwan et al., 2018). Environmental agents and the physical working environment also pose risks, including urban air pollution and occupational chemical hazards (Ahmed et al., 2020). Exposure to pollution and occupational carcinogens significantly increases cancer risks, necessitating the implementation of measures and tertiary jobs based on lifestyle modifications and systematic environmental controls (Baynouna et al., 2025). In addition, high risk viral infections such as HPV and HBV are also known to be risk factors in the UAE and that is why vaccination programs for these two viruses are highly emphasized in the country (Al-Shamsi, 2024).

Discussion

According to Rashid et al. (2025), cancer burden is a highly concerning health problem in the UAE, particularly breast, colorectal, and prostate cancers, which are the most common in the world. Moreover, when it comes to comparing the results with global statistics, including the report prepared by the International Agency for Research on Cancer and the Global Cancer Observatory, it is possible to conclude that the UAE is currently facing epidemiological peculiarities (Rashid et al., 2024). The findings of this study indicate that the cancer burden in the UAE reflects a more complex epidemiological transition characterized by a high incidence of lifestyle related cancers, delayed detection and marked population disparities. The UAE has a comparatively high age-standardized rate for colorectal and breast cancers when compared to benchmark nations such as Australia and the UK especially among women and younger adults (IARC, 2022; Al-Shamsi & Musallam, 2024). Although screening services are available, mortality remains disproportionately high, indicating gaps in uptake rather than access alone. In the UK, continuous population-based screening programs have resulted in early diagnosis and declining mortality for these cancers (Smith & Canfell, 2017; Falcato et al., 2021; Al-Awadhi et al., 2024). Because of its distinct demographic makeup and emphasis on occupational and environmental risk exposures that are less common in more nationally homogenous populations, the UAE also has a greater percentage of cancer diagnosis among non-nationals than other Gulf Cooperation Council (GCC) countries (Alessy et al., 2024; Mukherji et al., 2025).

Another crucial finding is the occurrence of lifestyle-related cancers, such as colorectal cancer, which is already more prevalent among the younger population in the UAE. This is in line with other reports, which say that there is an increased trend of obesity within the area. According to Nazzal et al. (2023), some of the major factors that have caused this spike in the number of cases are the increased consumption of processed food, red meats, and practicing a sedentary lifestyle. This conforms to the current trends being experienced throughout the world in which colorectal cancer is being realized as one of the lifestyle diseases that is made worse by unhealthy diets, inactivity, and obesity, according to Eladl et al. (2024). This suggests that interventions related to healthy diet and exercise should be taken seriously in the UAE, in addition to sugar and tobacco taxation, which has been successful in other parts of the world (Fernandez et al., 2019; Bader et al., 2011).

The UAE's cancer profile is distinguished by several epidemiological peculiarities. First the disproportionately high cancer burden among women, which is mostly caused by breast and thyroid cancers is similar to global trends (IARC, 2022). Second, the increasing prevalence of early-onset colorectal cancer is consistent with rapid lifestyle changes and deviates from

conventional age-related cancer patterns (Al-Shamis & Musallam, 2024; Nazzal et al., 2023). Third, screening uptake is still below ideal levels with cervical and mammography screening coverage being much lower than in benchmark nations which contributes to delayed diagnosis and poorer health outcomes (Abdalla et al., 2023; Al-Awadhi et al., 2024). These variances show that societal structure and behavioral habits influence the cancer burden in the UAE.

From a socio-cultural perspective, these findings can be interpreted using the Health Belief Model which theorizes that perceived susceptibility, perceived severity, perceived benefits, perceived barriers and cues to action all influence health behaviors. The cultural stigma associated with cancer diagnoses, fear of procedures, misconceptions about the necessity of screening in the absence of symptoms and limited perceived susceptibility among asymptomatic individuals may all contribute to the low screening uptake in the UAE (Rabbani et al., 2019; Al-Amoudi et al., 2015). Despite the availability of screening devices, participation in such measures is decreased especially among women and the expatriate community due to insufficient cues to action and persistent perceived barriers. Therefore, incorporating provider-initiated screening reminders, culturally appropriate education and community engagement into national cancer control strategies may enhance early detection and align UAE outcomes closer to those observed in benchmark countries (Al-Shamsi et al., 2022; Rafii & Al-Shamsi, 2024).

Environmental risk factors, including urban air pollution and occupational hazards, are identified in the UAE as one of the major causes of cancer burden as well. According to Ahmed et al. (2020), much attention should be given to the rise in carcinogenic environmental factors due to urbanization and industrialization as they are one of the major risk factors contributing to high cancer rates. In comparison, other Gulf Cooperation Council (GCC) countries (Bahrain and Saudi Arabia) have also reported in their studies the same type of trends, with both air pollution and exposure to chemicals being the main contributors to the presence of lung and skin cancer (Alam et al., 2023). This necessitates the UAE to take the required steps to minimize the cancerous threats in the environment through the management of air pollution and implementing strict policies regarding occupational health and safety.

The other potential observation in the cancer profile in the UAE is the contribution of viral infections like HPV and HBV in enhancing cancer risks. Rafii and Al-Shamsi (2024) concluded that prospects of the national vaccination strategies against these viruses in the UAE are encouraging, although they should be enlarged to prevent cancer. Through screening and immunization programs, HPV-related malignancies in Australia and the UK have shown great reductions (Smith & Canfell, 2017), (Falcato et al., 2021). The UAE can benefit by adopting the practices of these countries in sustaining HPV awareness and incorporating menstrual screenings into medical examinations of women.

Additionally, the levels of cancer in the UAE are escalating, which highlights the need for the national cancer plan to be coordinated. The overview provided by Al-Shamsi et al. (2022) is consistent in its emphasis on an integrative preventive, early detection and treatment method. Recent WHO statistics suggest that countries whose cancer control policies concern the public health, and whose investments in health care systems are well-developed have a decreased number of cancer-related deaths. The 2022-2026 cancer control strategy developed by the UAE is the right step in the right direction, but it should be strongly monitored and evaluated (Al-Shamsi et al., 2022). Rabbani et al. (2019) also recommends introducing community-based education to inform the population about the risks of cancer and early identification.

Proposed Intervention Model

Health Promotion Campaigns

Steps like launching public awareness campaigns are crucial to raising awareness about the most prevalent types of cancer and their risk factors. Such measures must seek to inform the population about appropriate nutrition, exercise, and non-smoking practices. It has been evident by Rabbani et al. (2019) that education programs were significantly effective in improving the knowledge of women about breast cancer and its risk factors. Campaigns that are supported by the government can also be directed to schools, workplaces, and the public sector to ensure that all age groups are reached (Nazzal et al., 2023). In addition, the use of relevant cultural messaging also enhances understanding and consequently influences individual behavior.

Early Detection and Screening Programs

Early detection and screenings are key methods of reducing cancer mortality (Wardle et al., 2015). Annual mammography for asymptomatic females above the age of 40 is known to decrease breast cancer mortality, similarly, fecal occult blood tests and colonoscopy for adults older than 50 years of age are highly encouraged to lower the mortality rates of colon cancer (Rafii & Al-Shamsi, 2024). These measures are in line with the UAE National Cancer Control Plan (2022-2026) which recommends colorectal screening for individuals over the age of 50 and mammograms for women over 40 years old. It is important to make these screening programs accessible to the whole population, especially to the underprivileged by implementing free or low-cost screenings. This will increase the involvement and integration of primary health care professionals in such programs which guarantee referrals for early treatment and prognosis, hence higher success probabilities for recovery (Wardle et al., 2015). Such strategies are considered feasible due to the country's well-established infrastructure and existing national screening guidelines. The presence of sophisticated diagnostic facilities in both the public and private sectors suggests that better coordination is needed to scale screening programs.

Although workforce readiness is supported by a skilled multidisciplinary team, stronger engagement of primary care providers is required to improve referral pathways and increase screening participation. This can be achieved through training focusing on culturally appropriate risk communication and guideline-based screening (Al-Shamsi et al., 2024; Ketbi et al., 2025). Despite the rise in demand of diagnostic services that may accompany the increase in screening, early detection is expected to reduce long term health system burden by lowering late-stage cancer treatment costs and mortality which makes screening a cost effective and sustainable strategy within the UAE health system.

Policy Interventions

Policy measures are important determinants of healthcare practices and population behavior. Introducing policies targeted at controlling the associated risk factors of cancer can be beneficial in reducing the incidence of cancer in the UAE. The implementation of excise tax on tobacco products is highly effective in reducing smoking habits among the youth and young adults (Bader et al., 2011). Similarly, sugar sweetened beverages taxation has also shown to alter the consumption patterns of such beverages, and several studies have suggested that sugar sweetened taxation in combination with other interventions is a feasible and effective policy to address obesity which is one of the major risk factors of cancer (Fernandez & Raine, 2019). Also, limiting the freedom of food advertisements will perhaps greatly diminish unhealthy

eating habits, especially concerning children. Furthermore, the implementation of policies that encourage members of society to engage in physical activity will also help in reducing the population's risk of cancer.

Collaboration with Healthcare Providers

Collaboration with healthcare providers can be enhanced through a Health Belief Model (HBM) approach that addresses the key determinants of preventive behavior. By integrating cancer risk assessments, workplace exposure screening and employer facilitated referrals into routine health evaluations, occupational health services can enhance perceived susceptibility and severity, serving as useful cues to action for working age and expats (Mukherji et al., 2025; Baynouna et al., 2025). Through individualized risk counselling, culturally sensitive communication and adherence to national screening policy guidelines, primary care providers play an essential role in reducing perceived barriers and increasing perceived benefits. Community health organizations also complement these efforts by addressing stigma, dispelling misconceptions and strengthening self-efficacy through community-based education and outreach programs particularly among women and vulnerable groups (Rabbani et al., 2019). By focusing on behavioral and sociocultural elements that affect screening participation and early detection in the UAE, provider collaboration that is in line with HBM constructs improves the effectiveness of interventions.

Challenges to implementing Proposed Solutions

Despite the UAE's efforts and progress in reducing the cancer burden, several challenges limit cancer prevention in the country. The cultural stigma around screening makes women reluctant to participate which can delay early diagnosis causing complications of the disease. For instance, a study conducted in Al Ain revealed that mammography and pap smear screening uptake only 23% and 31.3% respectively among women, with many identifying these procedures as painful and unnecessary (Al-Awadhi et al., 2024; Abdalla et al., 2023). Also, non-Emiratis who form a major part of the population often have limited access to healthcare making screening programs non-equitable (Rabbani et al., 2019; Nazzal et al., 2023). Additionally, research efforts are limited due to moderate funding and small patient cohorts which restrict the implementation of longitudinal studies which are very helpful in identifying causal relationships and tracking changes over a long period of time (Mukherji et al., 2025; Al-Shamsi et al., 2022)

Limitations

One of the limitations of the study is the reliance on secondary data sources which may be affected by reporting biases and incomplete registries. Also, the insufficient availability of longitudinal studies based in the UAE restrict trend analyses of cancer in the country. Additionally, the qualitative synthesis may not fully capture the intricacy of interactions between the various risk factors. Future studies should focus on incorporating primary data collection, patient-outcome levels and cohort studies to strengthen the evidence.

Conclusion

The problem of increasing cancer incidence in the UAE requires multidimensional interventional measures, changes in health policies, and successful health care partnerships. Health promotion needs to be put in place to avoid dangerous cancer risks such as poor nutrition, the absence of physical activity, and smoking. Screening and follow-ups aid in the identification of malignancies at an early stage which also aid in reducing mortality rates. The UAE is also focusing on the research of cancer and collecting data to estimate future trends

and analyze current interventions. Engagement of communities, engagement of healthcare practitioners, and networking with and getting involved in national cancer organizations are the key elements of cancer prevention and control in the UAE. In addition to the current efforts being made, actionable targets are still required. For instance, mammography coverage for women over the age of 40 should increase by 30% within the next five years. Furthermore, strengthening the surveillance system, by sharing data through regional collaboration with GCC states could help track and evaluate the impact of interventions in addition to monitoring the epidemiology of cancer in the region. These measurable goals could be of great benefit to policy makers and healthcare professionals in reducing cancer burden effectively.

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Tables

Table 1: Cancer Incidence and Mortality by Type: UAE 2023 (MOHAP, 2023)

Cancer Type	% of Cases	Mortality Contribution
Breast	20.5%	High (leading in women)
Thyroid	11.2%	Moderate
Colorectal	8.3%	High
Skin	4.7%	Low
Prostate	4.6%	Moderate (men >65)
Non-Hodgkin Lymphoma	4.6%	Moderate

Table 2: Cancer Incidence Distribution by Gender and Population Group: UAE, 2023 (MOHAP,2023)

Category	Proportion of Cases (%)
Females	56.1
Males	43.9
Emirati Population	23.2
Non-Emirati Population	76.8

Figures

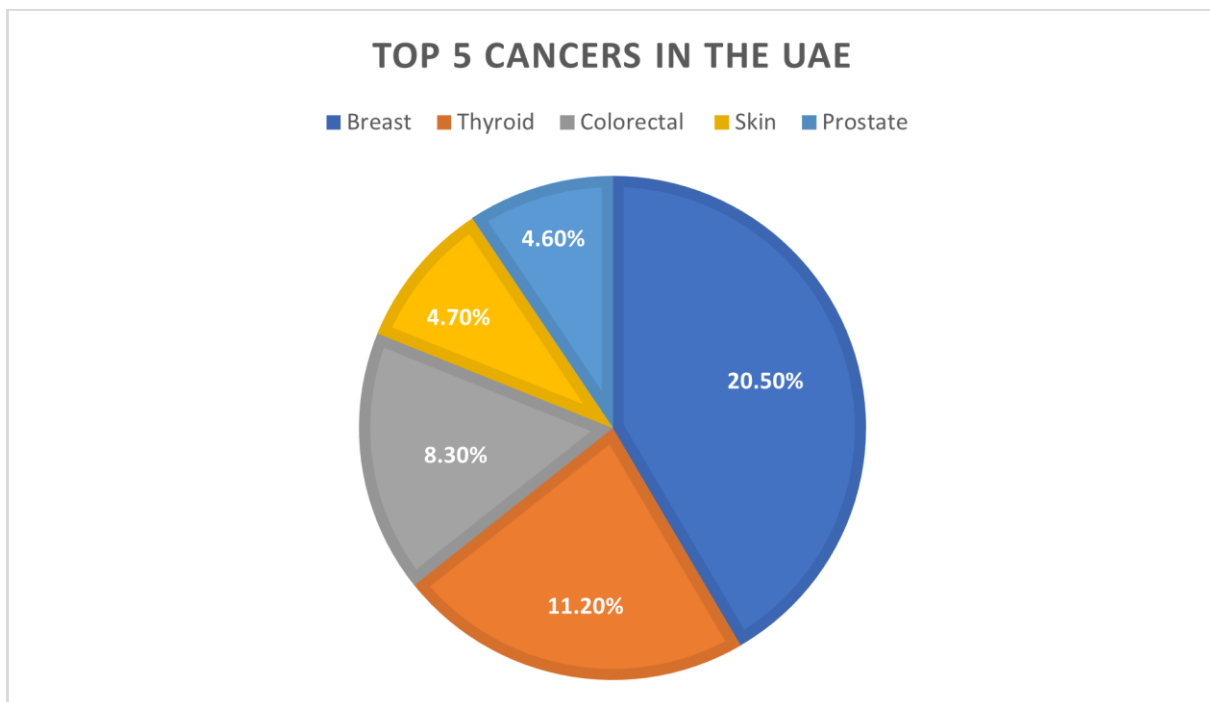


Figure 1: Data Compiled from MOHAP, 2023