Original Article

Iraqi National Journal of Medicine. July 2025, Volume 7, Issue 2

Pattern of Cancer mortality in Basrah governorate from 2018–2022

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ABSTRACT

Background: Cancer is the second leading cause of death globally, with an estimated 9.6 million fatalities reported in 2018. Thus, understanding the impact of cancer rates and examining how cancer deaths are distributed by age and have changed over the years is crucial. **Aim:** This descriptive statistical study aimed to identify the most prevalent cancer types responsible for deaths in the Basra Governorate from 2018 to 2022, along with their distribution across various age groups and geographical areas. **Methods**: The study utilized a descriptive statistical approach based on death certificate data from Basra Governorate, encompassing all cancer-related deaths from 2018 through the end of 2022. The data were processed using Excel and Statistical Package for the Social Sciences (SPSS) software, and the outcomes were presented in tables and charts. **Results**: The findings revealed an increase in cancer-related fatalities from 2018 to 2022, although the proportion of cancer deaths relative to total deaths experienced a slight decline. The incidence of cancer deaths rose with age, with lung cancer accounting for the highest percentage, followed by breast cancer, brain cancer, and hematological malignancies, which were most prevalent among children. Among the younger demographic, cancers of the breast, brain, and digestive system were the most common. For individuals aged 40 to 60, breast, lung, and digestive system cancers were predominant, while lung, bladder, and breast cancers were most frequently observed in those aged 60 and older. The central region of the governorate recorded the highest percentage of cancer deaths, followed by Al-Zubair and Abi Al-Khaseeb districts, with no significant difference in cancer death rates between genders. **Conclusion**: Over the past five years, the cancer-specific mortality rate experienced a slight reduction, with lung, breast, and brain cancers presenting the highest frequencies and cancer death rates increasing with advancing age.

Keywords: cancer mortality, epidemiology of cancer, ICD-10

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Disclaimer: The authors have no conflict of interest.

DOI: https://doi.org/10.37319/iqnjm.7.2.4

Received: 26 OCT 2024 Accepted: 4 APR 2025 Published online: 15 JUL 2025

INTRODUCTION

Cancer encompasses a variety of diseases characterized by uncontrolled cellular growth and division, resulting in invasive and metastatic behavior. These malignant cells can invade adjacent tissues or spread to distant sites—a process known as metastasis. In contrast, benign tumors exhibit limited growth and do not invade or metastasize, although they can occasionally transfer into malignant forms. Genetic factors account for approximately five to 10% of cancer cases, inherited from one's parents.

Detection typically involves recognizing specific signs or symptoms, followed by medical imaging and biopsy confirmation.[1]

Globally, cancer is the second leading cause of death, contributing to roughly one in six fatalities, with an estimated 9.6 million deaths in 2018.[2]

Approximately 70% of cancer deaths occur in low- and middle-income nations. Behavioral and dietary risks, including high body mass index (BMI), inadequate fruit and vegetable consumption, physical inactivity, tobacco use, and alcohol consumption, are responsible for about one-third of cancer-related deaths. Tobacco use stands out as the primary risk factor, linked to approximately 22% of cancer fatalities.[3]

Infections such as hepatitis and human papillomavirus (HPV) contribute to 25% of cancer cases in lower-income countries, where issues like delayed diagnosis and treatment accessibility persist. As of 2017, merely 26% of low-income countries reported having pathology services available in the public sector, compared to over 90% in high-income countries. The economic burden of cancer is substantial, with the total annual cost estimated at US$ 1.16 trillion in 2010; unfortunately, only 20% of low- and middle-income countries possess the necessary data to inform cancer policy decisions.[4]

In the United States, lung cancer is the leading cause of cancer-related death among both males and females, followed by prostate cancer in men and breast cancer in women.[5]

Acute lymphoblastic leukemia is the most prevalent cancer among children aged one to 14, succeeded by central nervous system (CNS) cancer and neuroblastoma. Data from the National Cancer Institute indicates a 19% increase in childhood cancer cases from 1975 to 1990, primarily due to a rise in acute leukemia; however, incidence rates have since declined.[6]

The peak incidence of childhood cancer occurs within the first year of life, with an average annual rate of 233 per million infants from 1975 to 1995. Various estimates exist regarding cancer incidence in this demographic: neuroblastoma constitutes 28% of childhood cancers, leukemia accounts for 17%, and CNS malignancies represent 13%. Survival rates are favorable for neuroblastoma, Wilms tumor, and retinoblastoma, with leukemia achieving an 80% survival rate, while other cancers tend to have poorer outcomes.[7]

Accurately estimating annual mortality rates and identifying their causes are critical for evaluating the effectiveness of a country's healthcare system. These statistics assist health authorities in determining the appropriateness of health initiatives. Given the significance of cancer as a prominent cause of mortality, understanding its impact rates and the demographic distribution of these deaths is vital, along with recognizing shifts over previous years. This descriptive statistical study aims to identify the most common cancers leading to deaths in Basra Governorate from 2018 to 2022, alongside their distribution by age and geographic location.

MATERIALS AND METHODS

This study presents a descriptive statistical study based on data extracted from death certificates in Basra Governorate, documenting all cancer-related deaths from 2018 to the end of 2022. The data was meticulously entered into Excel and SPSS-22 programs for analysis, with results presented in the form of tables and charts.

1. Variables of causes of death: The study categorized cancer deaths, with cancer-specific proportions measured according to the International Classification of Diseases, 10th Revision. Cancer deaths were identified using underlying cause-of-death codes C00-C97 (malignant neoplasms).[8] The classification included the following:
    - C00–C14 Cancer of the lip, oral cavity and pharynx
    - C15–C26 Cancer of the digestive tract
    - C30–C39 Cancer of the respiratory system
    - C40–C41 Cancer of the bone and joints
    - C43–C44 Skin cancers
    - C45–C49 Cancer of soft tissue
    - C50 Breast cancer
    - C51–C58 Cancer of the female reproductive organs
    - C60–C63 Cancer of the male reproductive organs
    - C64–C68 Cancer of the urinary tract
    - C69–C72 Cancers of the eye and brain
    - C73–C75 Cancer of the endocrine glands
    - C76–C80 Secondary cancers
    - C81–C96 Cancer of the blood and lymphatic system
    - C97–Multiple cancers
2. Geographical distribution variables: Basra Governorate is administratively represented by 10 districts: Al-Faw, Abi Al-Khaseeb, Al-Zubair, the

governorate center, Shatt Al-Arab, Al-Deir, Al-Hartha, Al-Sadiq, Al-Qurna, and Al-Madinah.

3. Mortality rates: The mortality rates due to cancer were calculated based on the total deaths recorded each year from 2018 to 2022

Statistical Analysis

The data on cancer-related deaths in Basra Governorate for the period 2018–2022 were recorded and analyzed using Excel and SPSS, with significance tests conducted. A p-value of less than 0.05 was considered statistically significant.

The study computed mortality rates and percentages according to the defined variables, presenting the findings in tables and charts for clear visualization and interpretation.

RESULTS

An estimated total of 6581 cancer deaths occurred between 2018 and 2022, with a corresponding average cancer-specific mortality rate of 9.4%. The most common cancers were lung cancer in males and breast cancer in females. The mortality rate increased with increasing age intervals. The following tables and graphs will depict detailed study findings.

Table 1 shows that cancer deaths increased from 2018 to 2022, but the proportion of total deaths decreased in 2020 and 2021. This could be due to many cancer deaths being recoded as COVID-19 deaths during those years.

Table 2 indicates that the number of cancer deaths increases with increasing age interval. Table 3 reveals that lung cancer and breast cancer exhibit the highest percentages, followed by brain cancer.

The center of Basra has the highest percentage of cancer deaths, followed by Al Zubair. There is no statistically significant difference between sex and geographical distribution as the p-value is more than 0.05.

Table 1: Cancer distribution according to years.

Year	No. of cancer deaths	Total deaths	% of cancer deaths
2018	1278	11979	10.7
2019	1335	12339	10.8
2020	1312	15958	8.2
2021	1296	16383	7.9
2022	1360	13159	10.3
Total	6581	69818	9.4

Table 2: Cancer distribution according to years and age interval.

Age interval (years)	2018	2019	2020	2021	2022	Total years	%
Less than 1	2	7	3	16	6	33	0.5
1–4	35	36	30	23	28	152	2.3
5–9	30	38	40	35	27	170	2.6
10–14	29	34	27	22	25	137	2.1
15–19	25	25	21	20	26	117	1.8
20–24	22	19	19	30	24	114	1.7
25–29	21	24	20	27	21	113	1.7
30–34	24	45	21	18	26	134	2.0
35–39	40	49	39	49	43	220	3.3
40–44	61	69	73	55	52	311	4.7
45–49	87	86	81	81	84	419	6.4
50–54	119	115	110	104	123	571	8.7
55–59	82	108	118	129	150	587	8.9
60–64	155	133	122	117	115	642	9.8
65–69	172	189	203	188	186	938	14.3
70 & more	374	358	385	382	424	1923	29.2
Total	1278	1335	1312	1296	1360	6581	100

Table 3: Number and percentages of cancer deaths according to cancer type.

Type of cancer	No. of cancer deaths	% from total cancer deaths
C34	851	12.93
C50	819	12.44
C71	568	8.63
C25	365	5.55
C91	352	5.35
C16	341	5.18
C67	322	4.89
C18	298	4.53
C22	255	3.87
C56	187	2.84
C61	186	2.83
C77	157	2.39
C64	120	1.82
C90	114	1.73
C32	99	1.50
C20	97	1.47
C41	91	1.38
C95	90	1.37
C55	78	1.19
C49	77	1.17
C92	77	1.17
C73	69	1.05
C15	63	0.96
C80	56	0.85
C96	52	0.79
Miscellaneous	797	12.11
Total	6581	100

Table 4: Distribution of cancer mortality according to sex and geographical distribution in Basra.

District	Female	Male	Total
Basra Center	1667	1629	3296
Zubair	519	536	1055
Abu-ALkasib	308	298	606
Qurna	237	256	493
Medaina	198	245	443
Shatt al Arab	188	204	392
Faw	80	72	152
Hartha	49	34	83
Deir	21	30	53
Sadiq	2	5	7
Total	3272	3309	6581
Chi square test = 15.8 P-value = 0.2			

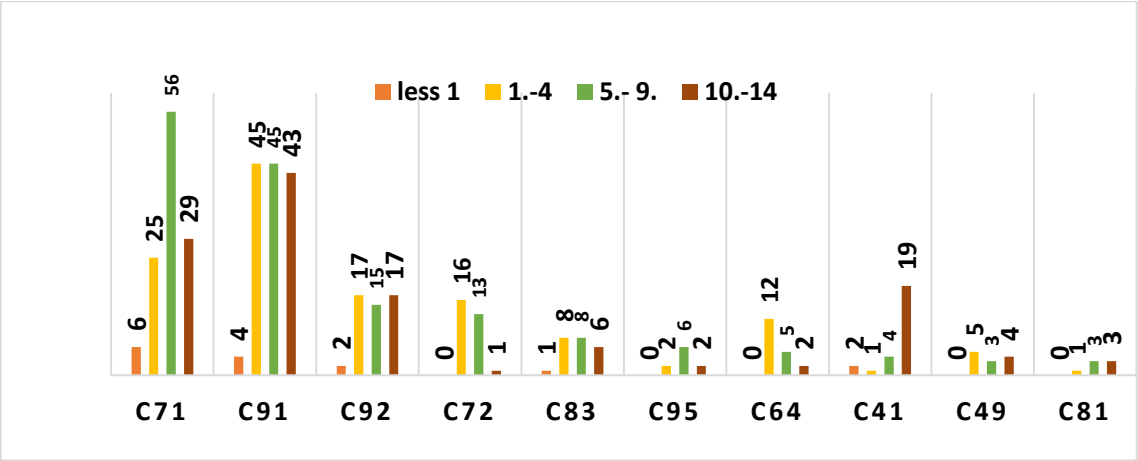

Figure 1: Brain and blood cancer are the highest percentage among pediatric age groups.

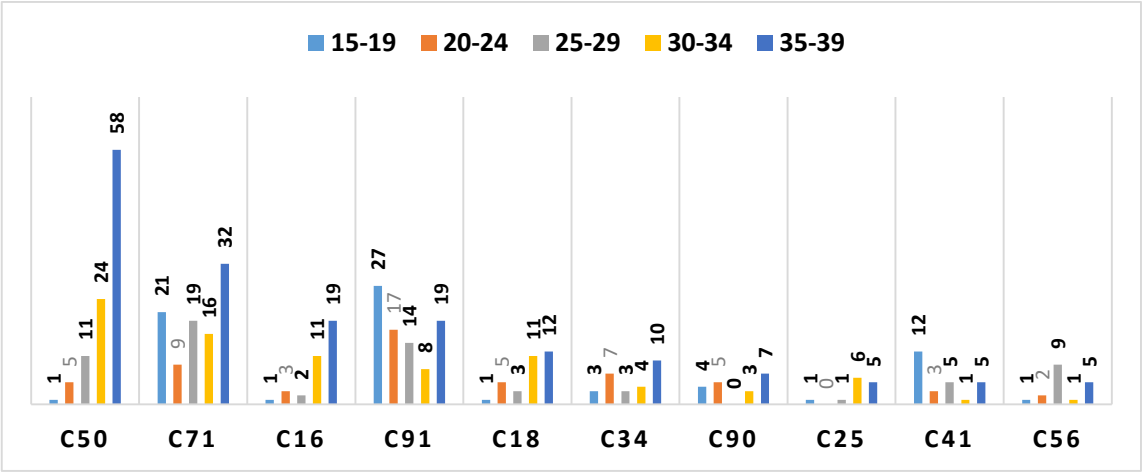

Figure 2: Breast cancer and brain cancer followed by digestive system ca are the highest among 15- to 40-year-olds.

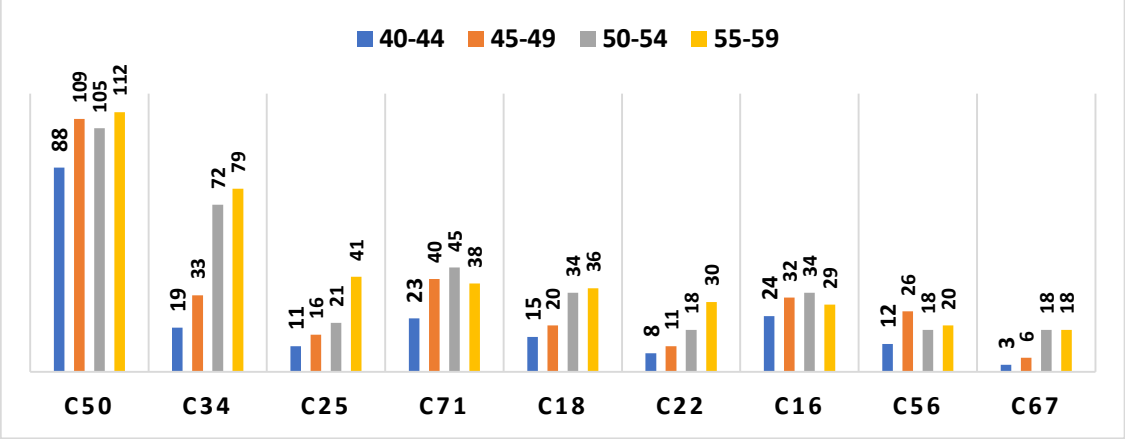

Figure 3: Breast, lung, and digestive system cancer are highest from 40 to 60 years old.

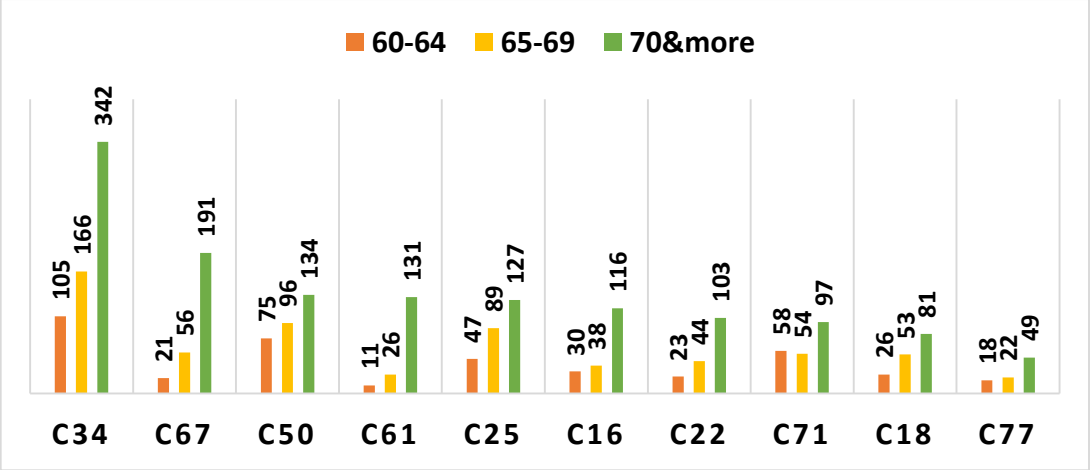

Figure 4: Lung, bladder, and breast cancer are the highest from 60 years and above.

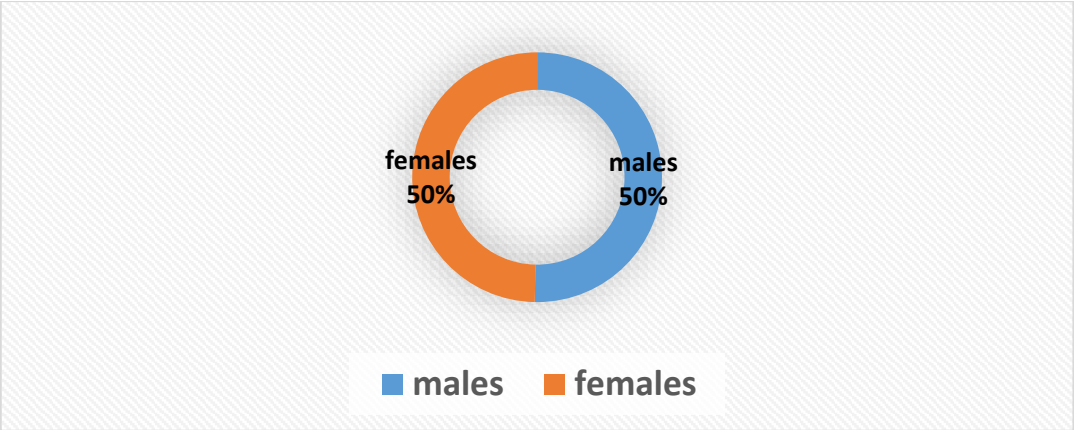

Figure 5: Cancer mortality deaths in males and females.

DISCUSSION

Globally, cancer ranks as the second most prevalent cause of death. From 2009 to 2016, age-adjusted cancer mortality rates per 100,000 population fell from 173.5 to 155.8, followed by a more rapid decline to 146.2 in 2019. In that year, cancer accounted for the deaths of 599,601 individuals.[9]

Research conducted in Southern Iraq [10–12] indicates an increasing risk of cancer over the past two decades. Consequently, the growing cancer-proportional mortality ratio may signify a genuine increase in cancer-related mortality in the region.

Our study analysis revealed that while cancer deaths rose from 2018 to 2022, their share of overall mortality decreased in 2020 and 2021. This trend may be attributed to many cancer fatalities being recorded as COVID-19 deaths.

Cancer mortality rates vary depending on the cancer type, sex, race, ethnicity, and whether individuals reside in urban or rural areas. The potential influence of a patient's place of residence on cancer survival has garnered the attention of numerous researchers.[13] However, our study did not find any statistically significant difference between residence and sex among cancer deaths, with the majority of cancer deaths occurring in the center of Basra Governorate.

In the US, cancer ranked as the second leading cause of death, following heart disease, in 2020.[14]

Our study observed that cancer mortality rises with increasing age, supporting findings by Jia et al., who noted that a younger biological age correlates with a lower risk of malignant diseases.[15]

Another study revealed that cancer risk increases with advancing age, with individuals aged 65 years and older accounting for 58% of newly diagnosed cancers in developed countries and 40% in developing countries.[16]

The investigation identified lung cancer and breast cancer as the leading causes of cancer deaths, followed by brain cancer. According to the National Cancer Institute, lung and bronchial cancers account for the highest mortality rates in the US, nearly tripling the

deaths attributed to colorectal cancer, which is the second most common cause of cancer mortality. Moreover, Pancreatic cancer is now recognized as the third deadliest cancer.[17]

Furthermore, a study highlighted that the rising incidence of breast cancer is attributed in part to a decreasing fertility rate and increasing obesity.[18]

The high mortality rate from lung cancer reflects both its high rate of diagnosis (incidence rate) and low survival rate. It is also worth noting that lung cancer incidence and mortality rates increase dramatically with age.[19]

CONCLUSIONS

Rising Cancer Mortality Rates: The total number of cancer-specific mortalities increased from 2018 to 2022, in a total of 6581 deaths, despite a slight decrease in the proportion of cancer deaths relative to total mortality during certain years, particularly 2020 and 2021.

Age-Related Mortality Trends

Cancer deaths exhibited a clear correlation with age, with the highest rates observed in individuals aged 70 and older. Specific types of cancers were more prevalent in different age groups, such as leukemia in children and breast cancer in younger adults.

Prevalent Types of Cancer

Lung cancer and breast cancer were the most prevalent causes of cancer-related deaths, followed by brain cancer. The study also revealed variations in the types of cancer affecting different demographics and age groups.

Geographical Distribution

The central area of Basra reported the highest cancer mortality rates, followed by Al-Zubair and Abi Al-Khaseeb, with no significant differences in mortality rates between males and females.

Recommendations

The study findings emphasize the necessity for improved cancer awareness, early detection, and treatment options in Basra to effectively address the rising trends in cancer mortality.

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