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A Study of Diversity of Cancer Incidents & Trends in the Hospital of Raipur, Chhattisgarh (India)

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Abstract:
Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body' Cancer has no single cause; it can result from genetic, environmental, or individual constitutional factors. Epidemiological studies link environmental exposures to increased cancer risks in certain populations. This is a record-based study and all data were collected from medical record department of Sanjeevani Cancer Care hospital (SCCH), Raipur Chhattisgarh. A total of 9,765 male and female patients were registered during 6-year period i.e. 2018 to 2023 are included in this study. It was found that mostly reported cancer among male are oral cancer and cancer of Buccal Mucosa. In female patients cervical cancer, uterus, and Breast cancer. It was also observed that number of incident cases are showing increasing trend i.e. from 1352 (2018) to 2896 (2023). During the Age wise distribution showed that, the minimum suffer age group is found 5-year-old and maximum age is 94.

Keywords: *Cancer, Chhattisgarh, Buccal Mucosa cancer, cervical cancer, Age effect.*

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I. Introduction:

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body. These cells may form tumours, which are lumps of tissue and often spreading into surrounding tissue [1]. These cancerous cells then impair normal organ functions. Cancer was first observed in 3000 BCE in Egypt [2].The term "carcinoses" for non-ulcer forming and "carcinoma" for ulcer forming tumors was first coined by the Greek physician Hippocrates (460 BCE–370 BCE), also known as the "Father of modern Medicine". In Greek *karcinos*, meaning "crab". Roman physician, Celcus (50 BCE–28 BCE), coined the term "Cancer." And Galen (130 BCE–200 CE) coined the term "oncos," which refers to swelling that describes tumours [3].

How Cancer occurs:
Cancer has no single cause; it can result from genetic, environmental, or individual constitutional factors. Epidemiological studies link environmental exposures to increased cancer risks in certain populations [4].

Cancer is a disease in which some of the body's cells grow uncontrollably and spread to other parts of the body [5]. These cells may form tumours, which are lumps of tissue and often spread into surrounding tissue. Tumours cancerous cells then impair normal organ functions [6].

Cancer was first observed in 3000 BCE in Egypt [7]. The term "carcinoses" for non-ulcer-forming and "carcinoma" for ulcer-forming tumours was first coined by the Greek physician Hippocrates (460 BCE–370 BCE), also known as the "Father of Modern Medicine." In Greek, "carcinoses" means "crab." Roman physician Celsus (50 BCE–28 BCE) coined the term "cancer." And Galen (130 BCE–200 CE) coined the term "oncos," which refers to swelling that describes tumours [8].

Macro Environmental Factors includes:

- Pollution: Exposure to environmental pollutants with carcinogens [9].
- Radiation: Ionizing radiation from sources like X-rays and UV rays [10].
- Occupational Exposures: Work-related exposure to carcinogens in certain industries [11].
- Climate and Geography: Environmental conditions and location influencing cancer rates [12].
- Infectious Agents: Infections caused by viruses, bacteria, and parasites [13].
- Genetic Factors: Inherited genetic mutations and spontaneous mutations during one's lifetime [14].
- Lifestyle related risk factors: Cancer can be caused by regular alcohol consumption and tobacco, e.g. smoking cigarettes, pipes or cigars. and chewing of tobacco (pan-masala [15]. Also noted that 3.6% of all cancer cases and 3.5% of cancer deaths worldwide are attributable to consumption of alcohol [16].

As this is going to be record based retrospective cohort study. We will analyse the data for understanding these factors affecting the pattern of cancer and help in undertaking further studies [17]. Such identification of additional associated factors plays important roles for developing appropriate strategies. While preparing for this research work, we observed that there is a lack of published literature, on regular updating basis, in this regard for the state of Chhattisgarh [18].

II. Materials & Methods

Data Collection: Sanjivani Cancer Care Hospital Raipur**:** It is a record based retrospective study conducted at Sanjivani Cancer Care Hospital, Raipur, Chhattisgarh. Patient's records were obtained from Medical Record department and relevant information was extracted from them for the present study. All registered cases of cancer patients at during the 6 years period of 1st January 2018 to 31st December 2024 were included in the study. The demographic details of the patient are recorded at the reception counter. The information is revised on every visit through computer-based hospital record software. During the study period, adequate measures were taken to recognize and avoid duplication of cases.

Statistical Analysis: The data were collected and compiled in Microsoft excel and analysed using descriptive statistical methodology.

Results & Discussion: The present hospital-based retrospective study recorded a total of **9,765 cancer patients** at Sanjeevni Cancer Care Hospital, Raipur, over a six-year period (2018–2023). A consistent increasing trend in cancer registration was observed, rising from **1,352 cases in 2018 to 2,896 cases in 2023**. This pattern is in agreement with national and regional cancer surveillance data reported by the **National Cancer Registry Programme (NCRP)**, which attributes rising cancer incidence in India to population growth, increased life expectancy, improved diagnostic coverage, and enhanced reporting systems (National Cancer Registry Programme [25] [23].

Similar upward trends in hospital-based cancer registration have been documented in studies from Bilaspur (Chhattisgarh)**,** Allahabad (Uttar Pradesh)**, and** West Bengal**,** where improved access to oncology services and strengthened referral networks resulted in higher case detection rates. The decline in registrations observed during 2020 is comparable to reports from multiple Indian cancer centers, which identified reduced hospital visits and diagnostic delays during the COVID-19 pandemic as major contributing factors [20] [26].

The age-wise analysis revealed that cancer cases ranged from 5 to 94 years**,** with the highest burden observed in the 46–60 and 61–75 year age groups**. T**his trend aligns with findings from population-based cancer registries in Chandigarh, Mumbai, and Bhopal, which reported a significantly higher cancer incidence among middle-aged and elderly populations due to cumulative carcinogenic exposure, biological aging, and immune system decline [27] [28].

However, the present findings differ from the Chandigarh registry study, where the maximum proportion of patients belonged to the >60 years age group**,** whereas in Raipur, a substantial proportion was recorded in the **45–59 year group**. This variation may reflect regional differences in lifestyle practices, tobacco consumption patterns, occupational exposure, and healthcare-seeking behavior**,** which have been reported as influential factors in cancer onset across different Indian populations [19] [21].

Among female patients, the 30–44 year age group accounted for 28.53% of cases**,** indicating a growing burden of malignancies in younger women. Similar patterns have been reported in hospital-based studies from West Bengal and North India**,** where early marriage, multiparity, poor genital hygiene, and limited access to routine screening programs have been linked to higher incidence of cervical and breast cancers in younger age groups [20] [24].

The most commonly reported cancers among **female patients** in the present study were cervical and breast cancer**,** followed by cancers of the uterus, oral cavity, stomach, and colorectum**.** This distribution is consistent with findings from hospital-based studies conducted in **Allahabad and West Bengal**, where cervical cancer remains the dominant female malignancy due to inadequate screening coverage and low HPV vaccination uptake [21] [20].

In contrast, studies from Punjab and metropolitan regions such as Delhi and Mumbai have reported breast cancer as the most prevalent female cancer, reflecting an epidemiological shift influenced by urbanization, sedentary lifestyle, delayed childbirth, and changing reproductive behavior [22] NCRP, 2020). The persistence of cervical cancer as the leading malignancy in Raipur suggests a continued gap in preventive healthcare services and public awareness programs in central India.

Among male patients, **oral cancer** was the most frequently reported malignancy. This finding aligns with cancer registry data from Chhattisgarh, Odisha, and other eastern and central Indian states**,** where high prevalence of smokeless tobacco use, betel nut chewing, and smoking has been strongly associated with cancers of the buccal mucosa and oral cavity.

The majority of patients registered at the hospital were from the Raipur division**, likely due to the** geographical proximity and accessibility of the Regional Cancer Centre**.** Similar spatial clustering of cancer patients near tertiary care hospitals has been reported in hospital-based studies from **Bilaspur and Ranchi**, highlighting the role of healthcare infrastructure distribution in shaping cancer reporting patterns.

The increasing trend of cancer registration observed in the present study may reflect a combination of improved diagnostic facilities, increased public awareness, population aging, and the growing prevalence of cancer-promoting lifestyle factors, including tobacco use, dietary changes, physical inactivity, and environmental exposure. These factors have been widely recognized as major drivers of India's evolving cancer burden.

The contrasting trends of rising breast cancer and persistent cervical cancer burden among female patients emphasize the urgent need for region-specific cancer prevention **strategies**, particularly the expansion of HPV vaccination programs, community-based cervical and breast cancer screening, and strengthened public health education initiatives (Nair et al., 2014; [22].

Overall, the findings of this study are largely consistent with regional and national cancer epidemiology, particularly in central and eastern India. However, the observed variations in age distribution and site-specific prevalence compared to northern and metropolitan regions highlight the importance of localized cancer surveillance systems and targeted intervention programs to guide effective cancer control policies in Chhattisgarh.

Table No. 1: Total number of patients registered during (2018-2023)

S.No.	Year	Registered Patients
1	2018	1352
2	2019	2092
3	2020	1941
4	2021	2201
5	2022	2180
6	2023	2896

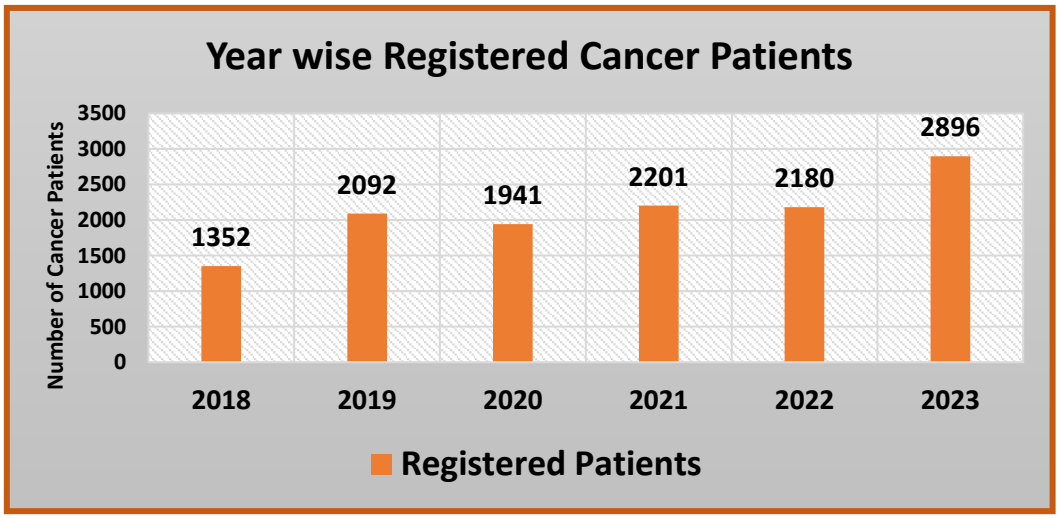

Figure No. 01: Year wise registered cancer patients.

Table-2- Distribution of cancer patients according to age group during year 2018-2023 at Sanjeevni Cancer Care Hospital, Raipur.

	2018	2019	2020	2021	2022	2023
1to 15	46	70	56	63	49	92
16 to 30	130	204	160	203	205	255
31 to 45	227	385	362	421	450	632
46 to 60	**450**	**673**	**695**	**802**	**818**	**1113**
61 to 75	420	631	567	614	582	695
76 to 100	78	129	101	98	76	109
Total	**1351**	**2092**	**1941**	**2201**	**2180**	**2896**

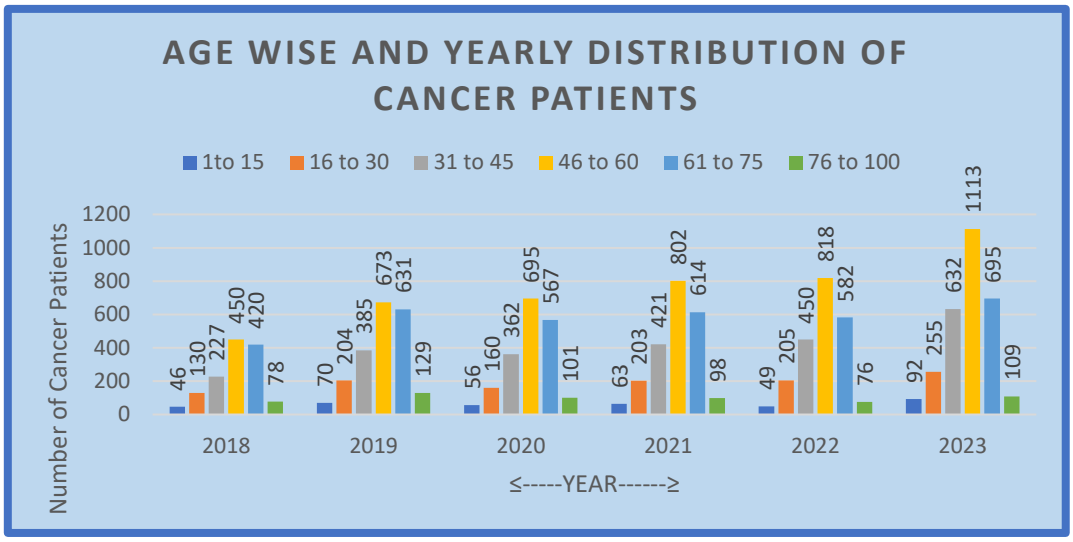

Figure No. 02: Age wised yearly distribution of cancer patients.

III. Conclusion:

This hospital-based retrospective analysis of cancer cases registered at Sanjeevni Cancer Care Hospital, Raipur, over a six-year period (2018–2023) provides important insights into the evolving epidemiological profile of cancer in central India. The steady increase in the number of registered patients reflects not only a growing disease burden but also improvements in diagnostic capacity, public awareness, and healthcare accessibility within the region.

The age-wise distribution highlights that the highest cancer burden is concentrated in middle-aged and older adults, particularly within the 46–75 year age groups, underscoring the cumulative impact of environmental exposure, lifestyle-related risk factors, and biological aging on cancer development. At the same time, the notable proportion of female patients in the 30–44 year age group signals an emerging shift toward earlier onset of certain malignancies, emphasizing the need for timely screening and preventive interventions among younger populations.

The predominance of cervical and breast cancers among female patients, along with the high incidence of oral cancer among male patients, reflects persistent regional risk patterns shaped by limited screening coverage, low uptake of preventive measures, and widespread use of tobacco and related products. These findings reinforce the importance of strengthening community-based cancer awareness programs, expanding HPV vaccination initiatives, and promoting early detection strategies tailored to the local sociocultural and healthcare context.

Overall, the study demonstrates that while the cancer profile of Raipur shares similarities with broader national trends, distinct regional variations in age distribution and site-specific prevalence remain evident. Continuous monitoring through hospital-based and population-based cancer registries, coupled with targeted public health policies and equitable access to oncology services, will be essential for developing effective cancer control strategies and reducing the long-term burden of cancer in Chhattisgarh.

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