Journal of Manmohan Memorial Institute of Health Sciences Vol 11 | Issue 1 | 2026

ORIGINAL ARTICLE

Demographic and Topographical Trends of Cancer in Nepal: A Five-Year Analysis (2016–2020)

Krishna Prasad Subedi[1,2]✉, Rishiram Poudel[1], Binay Thakur[2], Pramod Bhatta[3], Kishor Adhikari[4], Hari Bahadur Rana[4]

[1] *Nepal Sanskrit University, Beljhundi, Dang, Nepal*
[2] *B.P. Koirala Memorial Cancer Hospital, Bharatpur, Chitwan, Nepal*
[3] *Institutes of Medicine, Tribhuwan University, Kathmandu, Nepal*
[4] *Chitwan Medical College and Teaching Hospital, Bharatpur, Nepal*

✉ **Krishna Prasad Subedi,**
PHD, Scholar, Nepal Sanskrit University, Beljhundi, Dang, Nepal
Email: krishnasubedidr@gmail.com

Received: May 10, 2026
Accepted: May 27, 2026
Published: June 5, 2026
https://doi.org/10.3126/jmmihs.v11i1.94335

How to Cite

Subedi KP, Poudel R, Thakur B, Bhatta P, Adhikari K Rana H B Demographic and Topographical Trends of Cancer in Nepal: A Five-Year Analysis (2016–2020). J. Manmohan Memorial Inst. Health Sci. 2026;11(1):47-50. https://doi.org/10.3126/jmmihs.v11i1.94335

ABSTRACT

Introduction: Cancer is an escalating public health challenge in Nepal. This study analyzes the national cancer burden from 2016 to 2020 using data collected by B.P. Koirala Memorial Cancer Hospital (BPKMCH) under the National Cancer Registry Programme (NCRP).

Method: A retrospective descriptive study was conducted on 62,492 new cancer cases diagnosed across Nepal between 1 January 2016 and 31 December 2020. Key variables, including age, sex, address, and cancer site, were recorded and coded according to the International Classification of Diseases for Oncology (ICD-O-10, Third Edition). Data analysis was performed using SPSS version 29.0.

Result: Females accounted for 53.6% of cases, with the highest incidence observed in the 60–64-year age group. Urban districts, notably Kathmandu, Jhapa, and Morang, reported the highest case numbers, while remote districts showed lower reporting. Bronchus and lung cancer (12.55%) were the most prevalent overall, followed by breast (9.19%) and cervix uteri cancer (8.33%). Occupational and socio-demographic disparities were observed, with most female patients engaged in housework and males in agriculture.

Conclusion: The national cancer burden in Nepal is rising, with pronounced disparities across sex, age, geography, and occupation. Targeted prevention strategies, early detection programs, equitable healthcare access, lifestyle interventions, and HPV vaccination are essential to mitigate cancer incidence and improve public health outcomes.

Key words: **National cancer burden; National cancer epidemiology; Nepal; Topography; Demographic distribution**

INTRODUCTION

Cancer has become a major global public health challenge, with a rapidly increasing burden across both developed and developing countries. According to the International Agency for Research on Cancer, there were approximately 18.1 million new cancer cases and 9.6 million deaths worldwide in 2018[1]. This burden increased to 19.3 million new cases and 10.0 million deaths in 2020,[2] and further to nearly 20 million new cases and 9.7 million deaths in 2022[3]. Globally, about one in five individuals develops cancer during their lifetime, while approximately one in eight men and one in eleven women die from the disease.[2] Importantly, nearly 70% of cancer-related deaths occur in low- and middle-income countries, reflecting substantial global health inequities[4].

Regional variations in cancer incidence and mortality are significant. Asia accounts for nearly half of the global cancer burden, with an age-standardized incidence rate of 169.1 per 100,000 population and contributing 49.3% of global cases in 20202. The most common cancers in Asia include lung, breast, and colorectal cancers, while lung, liver, and stomach cancers are the leading causes of cancer mortality. In Africa, approximately 1.1 million new cases and over 700,000 deaths were reported in 2020, with increasing trends observed in 2022; breast, cervical, and prostate cancers are the most prevalent[2,3,5].

In high-income countries such as the United States, cancer remains the second leading cause of death after cardiovascular diseases, with an estimated 1.9 million new cases and 609,360 deaths in 20226. Similarly, in India, approximately 1.46 million new cancer cases were reported in 2022, with projections indicating a substantial increase in incidence in the coming decades[7, 8]. In China, nearly 4.8 million new cases and over 2.5 million deaths were recorded in 2022, with lung cancer being the leading cause of both incidence and mortality[9].

The World Health Organization projects that the global cancer burden will increase by approximately 77% by 2050, driven by population growth, aging, urbanization, and increasing exposure to risk factors such as tobacco use, unhealthy diet, physical inactivity, and environmental pollution[10].

In the context of Nepal, cancer is an emerging and rapidly growing public health concern. According to the National Cancer Registry, the number of reported cancer cases increased from 3,251 in 2003 to 10,516 in 2017, demonstrating a steady upward trend[11,12]. More recent hospital-based registry data indicate that approximately 15,221 new cancer cases were diagnosed in 2020[13]. The most common cancers in Nepal include bronchus and lung cancer, followed by breast and cervical cancers. Among females, breast and cervical cancers are predominant, whereas lung and stomach cancers are more common among males[13].

Previous studies in Nepal consistently report lung cancer as the leading cancer type. For instance, Pun CB et al. identified bronchus and lung cancer as the most common cancer site, followed by cervical and breast cancers[14]. Similarly, Subedi et al. reported comparable findings using dual cancer registry data, emphasizing the increasing burden of tobacco-related malignancies in Nepal[15].

Cancer, often synonymous with malignant neoplasms, is characterized by uncontrolled cell proliferation with the ability to invade surrounding tissues and metastasize to

distant organs. Its increasing incidence, particularly in low-resource settings, reflects epidemiological transition, demographic shifts, and limited access to early detection, diagnosis, and treatment services[4].

Given the rising burden and evolving epidemiological patterns, there is a critical need for a comprehensive assessment of cancer incidence and distribution in Nepal. Therefore, this study aims to evaluate the national burden of cancer and its trends from 2016 to 2020, while also exploring its medical and astrological perspectives. This integrative approach is expected to contribute to a broader understanding of disease patterns and support evidence-based strategies for cancer prevention and control.

METHODS

This retrospective, descriptive cross-sectional study analyzed secondary data from the Hospital-Based National Cancer Registry Programme, with B.P. Koirala Memorial Cancer Hospital serving as the national authority for cancer data collection and coordination across 45 major hospitals in Nepal. All incident cancer cases diagnosed from January 1, 2016, to December 31, 2020, were included, while recurrent, duplicate, follow-up, and non-Nepalese cases were excluded. Key variables included age, sex, residential district, and primary cancer site, coded according to the International Classification of Diseases for Oncology, Third Edition (ICD-O-3)16 to ensure standardization and comparability.

Data quality was ensured through systematic validation, including completeness checks, consistency verification, and exclusion of incomplete or erroneous records. Statistical analysis was performed using SPSS version 29.0. Descriptive statistics were used to summarize cancer distribution, while temporal trends and age-, sex-, and geographic-specific patterns were assessed to evaluate variations in the cancer burden over time and across populations. Ethical approval was obtained from the relevant institutional authority, and all analyses were conducted on anonymized data, ensuring confidentiality and adherence to ethical research standards.

RESULTS

Between 2016 and 2020, a total of 62,492 new cancer cases were reported in Nepal, demonstrating a progressively increasing trend over the study period. The annual number of cases rose from 10,117 in 2016 (16.19%) to 15,221 in 2020 (24.36%), indicating a consistent upward trajectory in cancer incidence. Females consistently exhibited a slightly higher cancer burden than males across all years. Overall, males accounted for 28,994 cases (46.40%), whereas females accounted for 33,498 cases (53.60%).

Table 1: Distribution of cases based on diagnostic years and sex

Year	Male(%)	Female(%)	Total(%)
2016	4,697(16.20)	5,420 (16.18)	10,117 (16.19)
2017	4,939(17.03)	5,577 (16.65)	10,516 (16.83)
2018	6,010(20.73)	7,113 (21.23)	13,123 (21.00)
2019	6,261 (21.59)	7,254 (21.66)	13,515 (21.63)
2020	7,087(24.44)	8,134 (24.28)	15,221 (24.36)
Total	28,994(100.0)	33,498 (100.0)	62,492 (100.0)

The age-wise distribution demonstrated a progressive increase in incidence with advancing age, reaching a peak in the 60–64 years age group (12.67%), followed by 65–69 years (10.76%) and 70–74 years (9.50%). A relatively low burden was observed in pediatric and adolescent populations. Sex-specific analysis revealed distinct patterns: among females, the highest incidence was observed in the 50–54 years age group (12.28%), whereas among males, the peak occurred in the 60–64 years group (13.24%). Furthermore, females demonstrated a comparatively higher burden in younger and middle-aged groups (20–54 years), while males predominated in older age categories (≥55 years).

Table 2: Distribution of cases by age group

Age Group	Male n (%)	Female n (%)	Total n (%)
0–4 yrs	502 (1.73)	323 (0.96)	825 (1.32)
5–9 yrs	504 (1.74)	267 (0.80)	771 (1.23)
10–14 yrs	514 (1.77)	367 (1.10)	881 (1.41)
15–19 yrs	649 (2.24)	564 (1.68)	1,213 (1.94)
20–24 yrs	705 (2.43)	795 (2.37)	1,500 (2.40)
25–29 yrs	741 (2.56)	1,062 (3.17)	1,803 (2.89)
30–34 yrs	957 (3.30)	1,500 (4.48)	2,457 (3.93)
35–39 yrs	1,216 (4.19)	2,201 (6.57)	3,417 (5.47)
40–44 yrs	1,380 (4.76)	2,888 (8.62)	4,268 (6.83)
45–49 yrs	1,888 (6.51)	3,644 (10.88)	5,532 (8.85)
50–54 yrs	2,528 (8.72)	4,115 (12.28)	6,643 (10.63)
55–59 yrs	3,052 (10.53)	3,750 (11.19)	6,802 (10.88)
60–64 yrs	3,839 (13.24)	4,078 (12.17)	7,917 (12.67)
65–69 yrs	3,656 (12.61)	3,068 (9.16)	6,724 (10.76)
70–74 yrs	3,292 (11.35)	2,645 (7.90)	5,937 (9.50)
75–79 yrs	2,096 (7.23)	1,263 (3.77)	3,359 (5.38)
80+ yrs	1,475 (5.09)	968 (2.89)	2,443 (3.91)
Total	28,994 (100)	33,498 (100)	62,492 (100)

The majority of patients were married (64.14%), with a slightly higher proportion among females than males. This likely reflects the age structure of the affected population.

Table 3: Distribution of cases by marital status

Marital Status	Male n (%)	Female n (%)	Total n (%)
Unmarried	791 (2.73)	921 (2.75)	1,712 (2.74)
Married	18,052 (62.26)	22,032 (65.77)	40,084 (64.14)
Widowed	698 (2.41)	820 (2.45)	1,518 (2.43)
Divorced/Separated	13 (0.04)	22 (0.07)	35 (0.06)
Not Applicable (<20 yrs)	2,169 (7.48)	1,521 (4.54)	3,690 (5.90)
Not Available	7,271 (25.08)	8,182 (24.43)	15,453 (24.73)
Total	28,994 (100)	33,498 (100)	62,492 (100)

The religious distribution broadly reflects the demographic composition of the Nepalese population, with the vast majority of patients identifying as Hindu (80.15%), followed by Buddhist (10.38%).

Table 4: Distribution of cases by religion

Religion	Male n (%)	Female n (%)	Total n (%)
Hindu	23,277 (80.28)	26,811 (80.04)	50,088 (80.15)
Buddhist	2,899 (10.00)	3,588 (10.71)	6,487 (10.38)
Islam	518 (1.79)	491 (1.47)	1,009 (1.61)
Christian	89 (0.31)	109 (0.33)	198 (0.32)
Others	1,299 (4.48)	1,585 (4.73)	2,884 (4.61)
Not Available	912 (3.15)	914 (2.73)	1,826 (2.92)
Total	28,994 (100)	33,498 (100)	62,492 (100)

The largest proportion of patients were illiterate (34.03%), with a higher representation among females (34.90%) than males (33.03%).

Table 5: Distribution of cases by educational status

Educational Status	Male n (%)	Female n (%)	Total n (%)
Literate	9,545 (32.92)	8,770 (26.18)	18,315 (29.31)
Illiterate	9,577 (33.03)	11,692 (34.90)	21,269 (34.03)
Not Applicable (<5 yrs)	504 (1.74)	324 (0.97)	828 (1.32)
Not Available	9,368 (32.31)	12,712 (37.95)	22,080 (35.33)
Total	28,994 (100)	33,498 (100)	62,492 (100)

Occupational distribution varied significantly by sex. Most male patients were engaged in agriculture (41.34%), while the majority of female patients were involved in housework (57.57%), reflecting socio-cultural and gender-based occupational patterns in Nepal.

Table 6: Distribution of cases by occupational status

Occupational Status	Male n (%)	Female n (%)	Total n (%)
Agriculture	11,986 (41.34)	2,161 (6.45)	14,147 (22.64)
Business	1,494 (5.15)	961 (2.87)	2,455 (3.93)
Housework	1,459 (5.03)	19,286 (57.57)	20,745 (33.20)
Office work	1,126 (3.88)	841 (2.51)	1,967 (3.15)
Others	1,026 (3.54)	685 (2.04)	1,711 (2.74)
Not Applicable (<15 yrs)	1,520 (5.24)	957 (2.86)	2,477 (3.96)
Not Available	10,383 (35.81)	8,607 (25.69)	18,990 (30.39)
Total	28,994 (100)	33,498 (100)	62,492 (100)

Bronchus and lung cancer constituted the most prevalent malignancy in Nepal during the study period, accounting for 12.55% of all reported cases, followed by breast cancer (9.19%) and cervix uteri cancer (8.33%).

Table 7: Distribution of Cancer Cases by Topography

ICD-10	Topography	Male n (%)	Female n (%)	Total n (%)
C34	Bronchus & Lung	4,414 (15.22)	3,430 (10.24)	7,844 (12.55)
C50	Breast	175 (0.60)	5,571 (16.63)	5,746 (9.19)
C53	Cervix uteri	0 (0.00)	5,208 (15.55)	5,208 (8.33)
C16	Stomach	1,902 (6.56)	1,306 (3.90)	3,208 (5.13)
C67	Bladder	1,405 (4.85)	439 (1.31)	1,844 (2.95)
C32	Larynx	1,137 (3.92)	402 (1.20)	1,539 (2.46)
C22	Liver & Bile duct	1,026 (3.54)	743 (2.22)	1,769 (2.83)
C18	Colon	889 (3.07)	743 (2.22)	1,632 (2.61)
C20	Rectum	966 (3.33)	760 (2.27)	1,726 (2.76)
C23	Gallbladder	902 (3.11)	1,613 (4.82)	2,515 (4.02)
Total	All Sites	28,994 (100)	33,498 (100)	62,492 (100)

These findings highlight the substantial contribution of respiratory and female-specific cancers to the overall cancer burden. Notably, bronchus and lung cancer demonstrated a higher predominance among males (15.22%) compared to females (10.24%), whereas breast and cervical cancers were overwhelmingly concentrated among females, reflecting clear sex-specific disease patterns. Gastrointestinal malignancies also contributed significantly to the total burden.

DISCUSSION

This study provides a comprehensive assessment of the national cancer burden in Nepal from 2016 to 2020, revealing a consistent increase in cancer incidence over the five-year period. This upward trend aligns with global patterns, where rising cancer burden has been attributed to population aging, epidemiological transition, lifestyle modifications, and improvements in diagnostic and reporting systems[1,2,3].

Sex-specific analysis demonstrated a slightly higher prevalence of cancer among females (53.6%) compared to males (46.4%). This disparity is primarily driven by the high incidence of breast and cervix uteri cancers among women, consistent with regional evidence from South Asia[7,17]. In contrast, bronchus and lung cancer predominated among males, reflecting well-established risk factors such as tobacco consumption, occupational exposures, and environmental pollution[6]. Collectively, the predominance of lung, breast, and cervical cancers underscores a dual burden of respiratory and female-specific malignancies in Nepal, mirroring patterns observed in other low- and middle-income countries[18].

The age-wise distribution indicated a peak in cancer incidence among older age groups, particularly 60–64 years, highlighting the strong association between aging and cancer risk. This finding is consistent with global epidemiological evidence demonstrating increased cancer susceptibility with advancing age[1]. It further emphasizes the necessity for age-targeted screening, early detection, and geriatric oncology services to mitigate disease burden and improve survival outcomes.

Geographical analysis revealed higher reported cancer cases in urban districts such as Kathmandu, Jhapa, and Morang. This pattern likely reflects higher population density, improved healthcare access, and more efficient diagnostic and reporting mechanisms. Conversely, lower reported incidence in rural and remote regions may indicate underdiagnosis, underreporting, and limited access to healthcare infrastructure[4]. These disparities highlight significant inequities in cancer detection and care, necessitating the expansion of diagnostic facilities and equitable healthcare delivery across underserved regions.

Socio-demographic patterns suggested that a large proportion of female patients were engaged in household activities, while males were predominantly involved in agriculture. These occupational distributions may indirectly reflect exposure to risk factors such as indoor air pollution, pesticide exposure, and lifestyle behaviors, although causal relationships cannot be established within the scope of this study. Additionally, the predominance of married and Hindu individuals among cases likely reflects the underlying

population structure rather than disease-specific risk[13].

Topographical distribution further confirmed that cancers of the respiratory and female reproductive systems are the leading contributors to the national burden. The high prevalence of lung cancer among males corresponds with widespread tobacco use and environmental exposures, while the predominance of breast and cervical cancers among females underscores the critical need for targeted interventions, including early screening, HPV vaccination, and awareness programs[4, 19].

Overall, the findings reveal significant disparities in cancer burden across sex, age, and geographic regions in Nepal. Addressing these challenges requires a multifaceted public health approach, including strengthening national cancer control programs, expanding screening and early detection services, promoting preventive strategies such as tobacco control and vaccination, and ensuring equitable access to treatment facilities. Furthermore, continued enhancement of cancer registry systems and data quality is essential for accurate surveillance, informed policy-making, and effective resource allocation.

CONCLUSION

The five-year retrospective analysis from 2016 to 2020 underscores a progressively rising national cancer burden in Nepal, characterized by distinct demographic, geographic, and topographical disparities. The data reveal a dual burden of disease: a high prevalence of bronchus and lung cancers predominantly affecting males, juxtaposed with a significant incidence of breast and cervical cancers driving a marginally higher overall cancer burden in females. Consequently, mitigating this public health challenge requires the immediate implementation of targeted, sex-specific screening programs and the decentralization of oncological care to underserved districts.

REFERENCES

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68(6):394-424.
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2021;71(3):209-249.
3. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2024;74(3):229-263.
4. World Health Organization. Cancer fact sheet [Internet]. Geneva: WHO; 2022. Available from: https://www.who.int/news-room/fact-sheets/detail/cancer
5. Cowling N. Number of new cancer cases in Africa 2020–2022, by type. 2024.
6. Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. CA Cancer J Clin. 2022;72(1):7-33.
7. Sathishkumar K, Chaturvedi M, Das P, Stephen S, Mathur P. Cancer incidence estimates for 2022 & projection for 2025: Results from National Cancer Registry Programme, India. Indian J Med Res. 2022.
8. World Health Organization. Cancer country profile: India. Geneva: WHO; 2020. Available from: https://www.who.int/cancer/country-profiles/IND_2020.pdf
9. Han B, Zheng R, Zeng H, Wang S, Sun K, Chen R, et al. Cancer incidence and mortality in China, 2022. J Natl Cancer Cent. 2024;4(1):47-53.
10. World Health Organization. Cancer projected burden. Geneva: WHO; 2023.
11. B.P. Koirala Memorial Cancer Hospital. Cancer handbook: Cancer prevention, control and research department. Bharatpur: BPKMCH; 2009.
12. National Cancer Registry Programme. Report of hospital-based cancer registry (HBCR) 2017. Bharatpur: B.P. Koirala Memorial Cancer Hospital; 2021.
13. National Cancer Registry Programme. Report of hospital-based cancer registry (HBCR) 2020. Bharatpur: B.P. Koirala Memorial Cancer Hospital; 2024.
14. Pradhananga KK, Siwakoti B, Subedi K, Moore MA. Malignant neoplasm burden in Nepal: Data from major cancer service hospitals for 2012. Asian Pac J Cancer Prev. 2015;16(18):8659-8663
15. Subedi K, et al. Comparative analysis of cancer incidence by dual cancer registry in Nepal 2013–2015. Int J Sci Res. 2019.
16. World Health Organization, International Agency for Research on Cancer. International classification of diseases for oncology. 3rd ed. Geneva: WHO; 2000
17. Christopher E, Dee C, Eala MA, Laversanne M, Ginsburg O, Gomez SL, et al. Cancer in Southeast Asia: A comparative analysis of 2022 incidence and mortality data. J Clin Oncol. 2024;42(16_suppl):10564.
18. Huang J, Ngai CH, Deng Y, Tin MS, Lok V, Zhang L, et al. Cancer incidence and mortality in Asian countries: A trend analysis. Cancer Control. 2022;29:10732748221095955
19. International Agency for Research on Cancer. Cancer tomorrow: Estimated future cancer incidence. Lyon: IARC; 2018. Available from: https://gco.iarc.fr/tomorrow

ACKNOWLEDGEMENT

The author gratefully acknowledges the invaluable guidance, support, and encouragement provided by Soma Kanta Baral, Kishor Kumar Pradhananga, Bhola Siwakoti, Sunil Parajuli, Salim Ansari, Laxmi KC, and Mina Dawadi throughout the course of this research. Their insightful feedback, expertise, and continuous assistance have significantly contributed to the successful completion of this study.

CONFLICT OF INTEREST

The authors declare no competing interests

FUNDING

None