Original Article

The Top Ten Cancer Burdens at Hawassa University's Comprehensive Specialized Hospital from 2013 to 2019

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Abstract

Background: Cancer remains a leading cause of morbidity and mortality globally, posing significant public health challenges across various demographics. This study evaluates the epidemiology of the ten most prevalent cancers at Hawassa University's Comprehensive Specialized Hospital (HURCSH) from 2013 to 2019.

Methods: A retrospective cross-sectional study was conducted among all cancer patients treated at Hawassa University Comprehensive Specialized Hospital (HUCSH) between 2013 and 2019. A thorough review of medical records in both the oncology and pathology units was performed. Descriptive statistics and trend analyses were conducted using SPSS version 20, with results presented in tables and graphs.

Results: During the study period, a total of 4,658 new cancer cases were registered, with complete records available for 3,002 cases. The ten most common cancers accounted for 2,162 cases (72.1%). Breast cancer was the most prevalent, comprising 559 cases (25.9%), followed by cervical cancer with 385 cases (17.8%), gastric cancer with 257 cases (11.9%), esophageal cancer with 245 cases (11.3%), and colorectal cancer with 204 cases (9.4%). There was a notable predominance of cases among females, with a male-to-female ratio of 1:2.1. Many cancers peaked in individuals aged between 30 to 59 years. Alarmingly, there was a marked increase in cancer cases over the seven-year period, especially after 2016.

Conclusion: Burden of cancer is raising time to time, it is crucial to establish awareness, improve screening programs, and promote healthier lifestyle choices to mitigate the public health impact of cancer in Ethiopia. This study underscores the need for strengthened healthcare policies and resource allocation to effectively address the growing cancer burden.

Key words: Breast cancer, cervical cancer, Colorectal, Esophageal, Southern Ethiopia

Introduction

Cancer remains a serious threat to global health, contributing significantly to morbidity and mortality, particularly in low- and middle-income nations (LMICs). Cancer was the second most significant cause of death globally in 2022 with 9.7 million deaths attributable to the disease (1). It is anticipated that the number of cancer cases will increase, with regional differences in cancer kinds and prevalence but preventive actions could help to minimize or control over inflation of incidence (1-3).

However, cancer is huge burden on society in both more and less economically developed countries alike. Countries with the least resources are still facing the largest burden because of lack of screening programs (2). The occurrence of cancer is dependent on the growth and aging of the population, increasing prevalence of established risk factors, changing reproductive patterns associated with urbanization and economic development (4, 5). Based on the studies conducted on cancer incidence and mortality, about 14.1 to 18.7 million new cancer cases and 8.2 to 9.6 million deaths occurred worldwide from 2012 to 2018 (4, 6, 7). Sub Saharan Africa accounts 6% and 7.2% of world total new cases and death respectively (8).

Obstacles encompass insufficient screening, deficient treatment facilities, and little cognizance regarding cancer avoidance (9). Additionally, fear of being diagnosed with cancer; discomfort or pain from the screening procedure; lack of time, lack of knowledge about cancer screening; physical disability or underlying disease; and logistic barriers are considered as inhibiting factors for cancer screening (10). Low knowledge about cancer prevention, insufficient treatment infrastructure, and early detection services were also detected as top burden of cancer detection in Ethiopia (11).

However, there is limited evidence on the epidemiological trends and patterns of various cancer types in the country; Ethiopia has a rising cancer burden, accounting for 44,000 annual deaths and 60,000 new cases. The most prevalent types of cancer include colon, prostate, breast, and cervical (9, 12). However, the WHO study conducted in 2008 showed that in Ethiopia the epidemiology of cancer in general is scarce, the institutional recording and reporting of cancer related mortality and morbidity lacks completeness (13). In Ethiopia, Annual incidence and mortality of all cancer types were increased from 51700 to 64285, from 2008 to 2015 respectively (11, 14). Besides, cancer is responsible for 10% of deaths in the urban settings and 2% deaths in rural setting in Ethiopia (15).

Even though lifestyle and environmental factors determine the burden of cancer, age is one of predisposing factor for the burden of cancer and treatment outcome among young has good prognosis (6, 16, 17). Risk factors associated with the leading causes of cancer death are modifiable including tobacco use, overweight/obesity and physical inactivity, dietary patterns, and reproductive behaviors and infection (liver, stomach, and cervical cancer) (1, 18-20). An application of effective prevention measures, such as tobacco control, vaccination, and the use of early detection tests can prevent substantial portion of cancer cases and deaths broadly (21,22).

Studies therefore, recommend that sub-Saharan Africa should strongly work cancer control program to reduce increasing incidence of cancer burden. Because, Cancer recordings can have an important role in the identification of cancer condition and restrict follow up (23). Besides, the generated data could support research and statistics for dissemination of information globally (24).

Despite of the truth, Ethiopia has not set national population-based cancer registration, thus, policy makers get difficulty to plan on cancer prevention and management (12). In addition, there is no reported cancer data from southern Ethiopia.

Hence, this study intended to disclose pattern of ten top cancer HUCSH that could provide primary information which allows other researchers to adopt, continue or modify their researching areas; contributing to the need for multi-sectorial involvement in the fight against cancer.

Methods and materials

Study Design and Study Area

A retrospective cross-sectional study was to investigate burden of ten top cancer patients treated at Hawassa University Comprehensive Specialized Hospital (HUCSH), located in Hawassa City, southern Ethiopia. This city is approximately 275 kilometres from Addis Ababa, the capital, 505 kilometres north of Moyale (which borders Ethiopia to the south), and 142 kilometres from Wolaita Sodo. HUCSH is the only facility providing comprehensive cancer treatment in the region, serving a large population of around 18 million people across southern Ethiopia and parts of the Oromia region.

Study population and Period

The study included all cancer patients treated at HUCSH between 2013 and 2019. Patient records with incomplete information were excluded from the analysis. Data were collected from the registration records of the pathology and oncology units from February to May 2020, utilizing a standardized checklist to ensure completeness and accuracy. Data entry was conducted using EpiData version 3.1, followed by analysis using SPSS version 20. Records with missing values were removed to maintain data integrity.

Data Analysis

Descriptive statistics and trend analysis were employed to identify patterns in the number of cancer cases over time. The findings were presented in detail through tables and graphs, offering a comprehensive overview of cancer care at HUCSH during the study period. Portions of this research have been published elsewhere. For more detailed methodology and results, please refer to the cited references (25-29).

Results

A total of 4658, new cases were registered in the main registration book of the oncology center of HURCSH. Of this, 3002 cards with complete records of new cases of cancer were taken for this study. Over a period of seven years, from 2013-2019, more than 80 cancer types were identified by body site. As presented in Figure 1 among all registered cancers, the top ten cancers account for 2162(72.1%). Breast cancer was the leading type 559(25.9%), followed by cervical cancer 385 (17.8%), Gastric cancer 257(11.9%), esophageal cancer 245 (11.3%), colorectal cancer 204(9.4%) and Non-Hodgkin Lymphoma (NHL) 155(7.2%).

Of all 1471(68%) were female and 691(32%) were male. M: F ratio is 1:2.1. The burden of cancers was found among females more than males as the result of breast and cervical ca. Gastric, colorectal, and bladder cancers were common among males with a ratio of 3.8:1 (Figure 2).

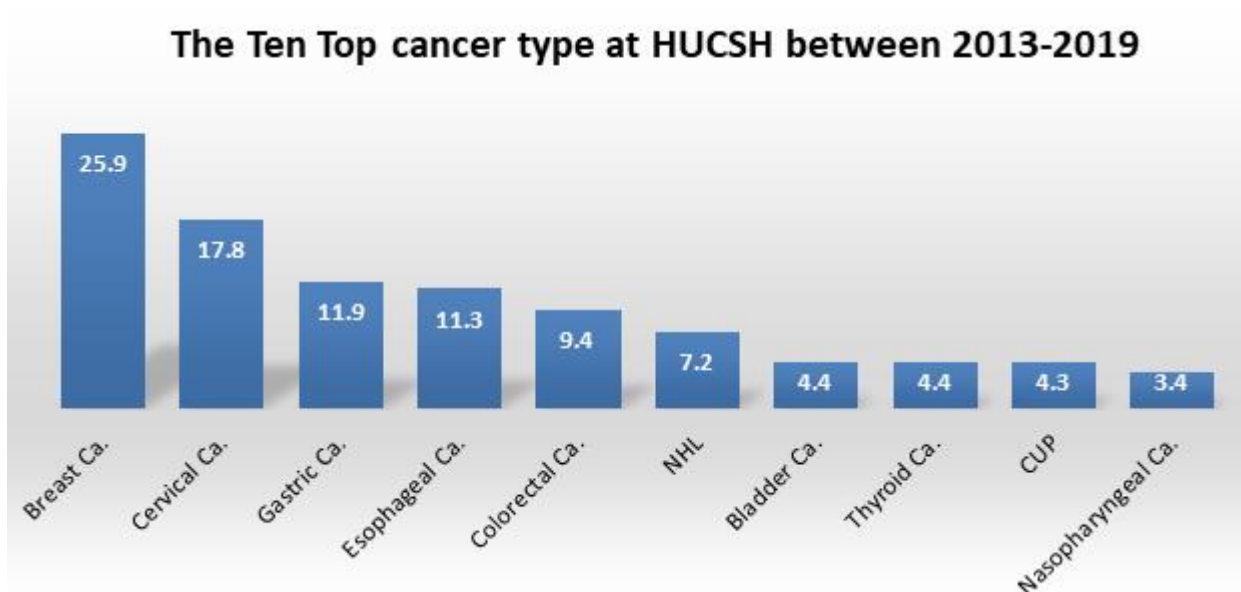## The Ten Top cancer type at HUCSH between 2013-2019

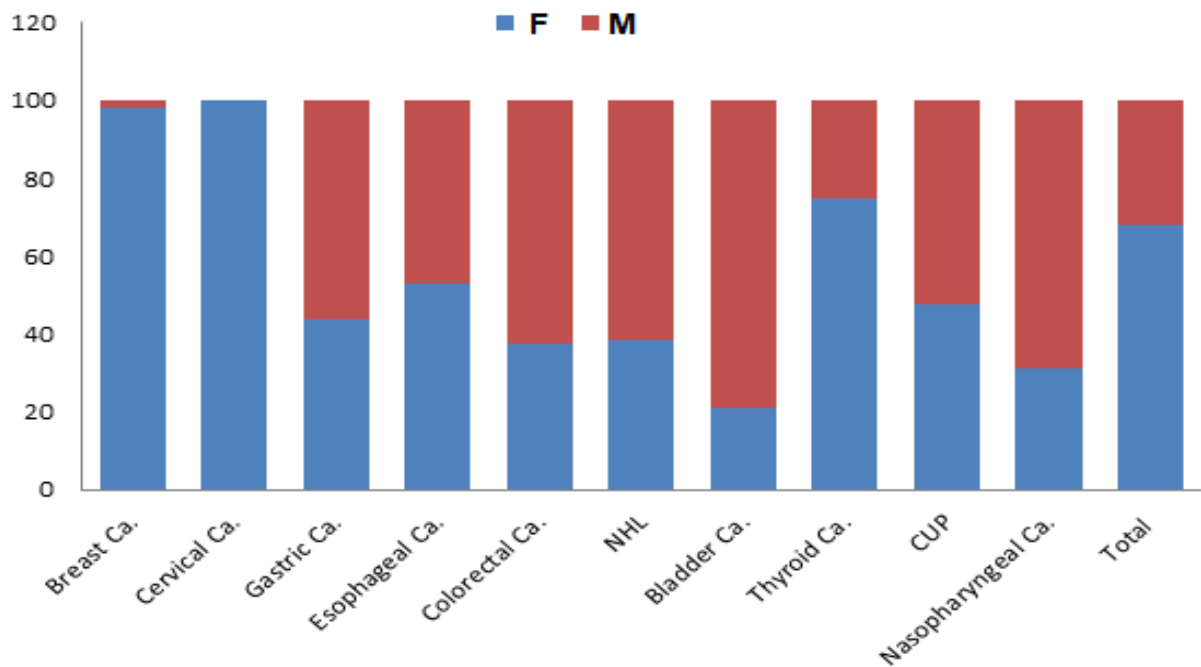Figure 1: Distributions of the ten tops of cancer from 2013-2019 at HUCSH

Figure 2: Distribution of the ten top cancer burdens by sex at HUCSH from 2013-2019.

Breast cancer was the first leading cancer among all cancer types identified in this study. The peak age of incidence of breast cancer in this study was 3rd and 4th decade (30-49 years) which accounts for 321(57.4%) of all cases. The peak age of cervical cancer incidence was 40-49 years of age. Colorectal cancer was very common at the age of 3rd and 4th decades. Esophageal and

Gastric cancer were very common at the age of 4th and 5th decades. In this study, most types of cancers were commonly appearing at the age of 3rd to 6th decade. NHL occurs at younger ages below 20 years. However, the peak age was between the 2nd and 4th decades of age. Bladder cancer was common in the age between 6th and 7th decades. Nasopharyngeal cancer was one of the common types of the ten top cancers and it is also common an early age less than 20 years up to the 5th decade (Table 1). The numbers of cancer cases were almost double in 2019 compared to 2013 in the majority of the cancer types. As the study showed since 2016 the burden of cancers case was increasing more than a fold (Figure 3).

Table 1: Distribution of types of cancer age of the patients at HUCSH from 2013-2019

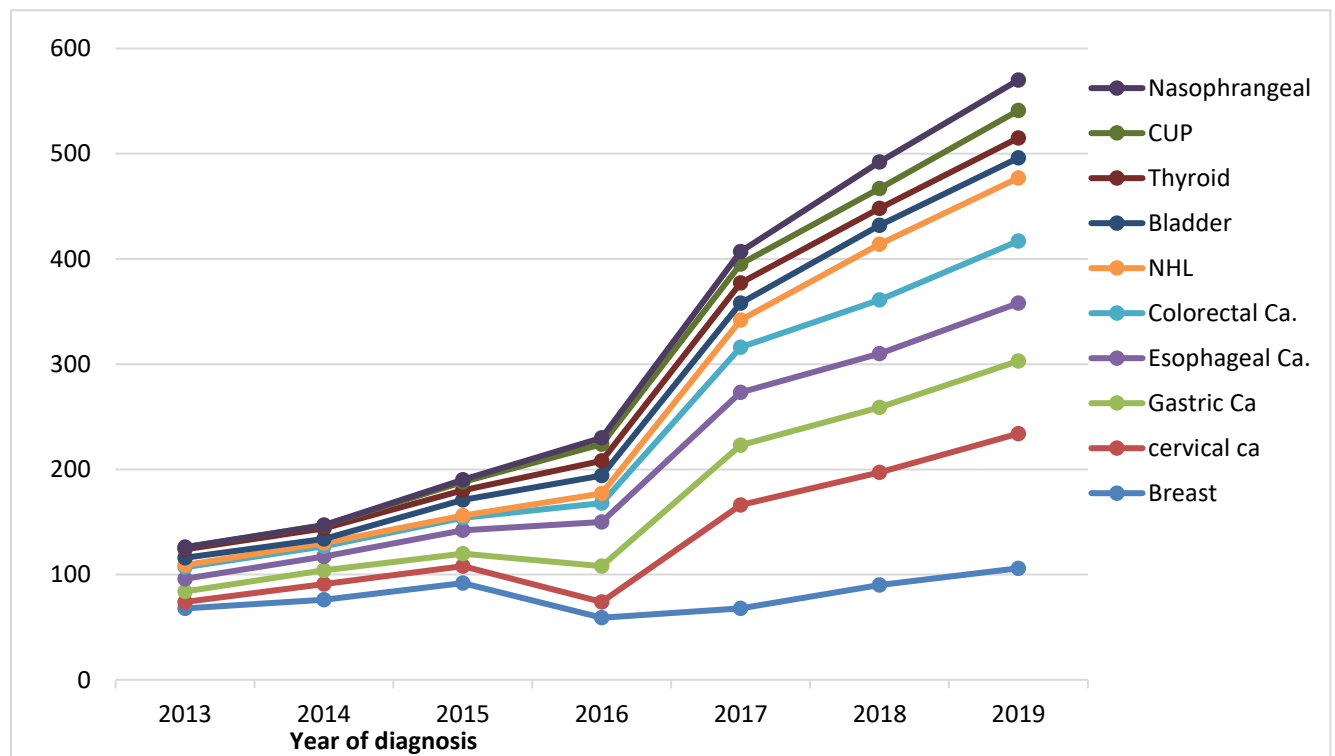| Age/ years	Breast	Cer-vical	Gastric	Esophageal	Colo-rectal	NHL	Bladder	Thyroid ca	CUP	N.pharyng eal ca
<20	2	0	3	0	5	11	0	1	3	14
20-29	100	27	10	10	18	24	5	9	14	18
30-39	194	99	38	34	40	23	12	24	17	14
40-49	127	124	64	66	44	30	14	20	23	9
50-59	77	72	70	57	40	24	12	24	20	13
60-69	41	48	41	42	32	21	24	7	10	3
>=70	18	15	31	36	25	22	29	10	5	3
Total	559	385	257	245	204	155	96	95	92	74

Figure 3: Trends of the ten top types of cancers at HUCSH from 2013-2019

Discussion

As result of this study, which was conducted at Hawassa University Referral and Comprehensive Specialized Hospital (HUCSH) oncology unit in southern Ethiopia, 3,002 new cancer cases were examined during a 7-year period from 2013 to 2019. The top 10 malignancies accounted for 72.1% of all cases. The most common cancer types were breast cancer (25.9%), cervical cancer (17.8%), gastric cancer (11.9%), esophageal cancer (11.3%), colorectal cancer (9.4%), and non-Hodgkin lymphoma (7.2%), The overall epidemiological patterns seen in Ethiopia and other sub-Saharan African nations are in line with this cancer pattern (12, 20, 30). The financial capacity, setting of infrastructures in health institutions, skill and competency of health professional, socio-demographic identities of most sub-Saharan communities and limitation of case registration are alike across African countries and most of such findings are in same page. (14, 16, 20, 31, 32) Despite of the finding of this study, in a global study conducted in 2022, the breast cancer was the second dominant cancer following the lung cancer(1). The width of study areas, covered, number of study participants and time of study period are perhaps assumed the reason for variation on findings. With a female to male ratio of 2.1:1, the high incidence of breast and cervical malignancies in women are a contributing factor to the observed female preponderance. On the other hand, the male to female ratio for cancers that are more common in men, like bladder, colorectal, and stomach cancers, was 3.8:1. The region's well-documented sex-based disparities in cancer patterns are probably caused by a confluence of biological, behavioural, and social variables (16, 33-35).

The majority of cancer types were most common in people between the ages of third to fifth decades, according to the examination of age distributions. The distribution of younger ages is consistent with the epidemiological profile of malignancies in low- and middle-income nations, where the incidence tends to be lower than in high-income environments (2, 36). These age patterns may be influenced by variables such genetic susceptibilities, variations in risk factor exposures, and availability of early identification and treatment services (2, 11, 37).

Among the observations that caught our attention was the comparatively high percentage of nasopharyngeal cancer, which seemed to afflict younger people (20 years of age or less). Given its known geographic and ethnic distribution, nasopharyngeal cancer is known to be more common in certain regions of Asia and Africa, possibly due to a combination of environmental and genetic factors (18, 38, 39). Almost twice as many cases of cancer were reported between 2013 and 2019 a worrying trend that the study clearly recognized. This is in line with the expanding cancer epidemic that is plaguing Ethiopia and other low- and middle-income nations due to aging populations, urbanization, and the shift in the epidemiological landscape (40, 41). It is imperative to address the rising cancer burden by strengthening cancer prevention, early detection, and treatment services (2, 7, 18, 42, 43, 15, 16).

Conclusion

The prevalence of gastrointestinal, breast, and cervical cancers was found to be highest, with peak ages varying depending on the type of cancer. This hospital-based study conducted in southern Ethiopia highlights the general distribution among younger populations and the significant increase in cancer incidence. It is recommended that targeted awareness campaigns and cancer prevention programs be designed, focusing on the prevalent cancer types identified in the region. Where appropriate, emphasis should be placed on immunization campaigns,

lifestyle modifications, and early detection techniques to reduce cancer incidence in the population.

Acknowledgement

Ethical considerations

Approval of this study was given by the research and the ethics committee of the School of Public Health and the Institutional Review Board of the College of Medical and Health Sciences at Hawassa University. Permission to undertake this study was also obtained from Hawassa university comprehensive specialized referral hospital administrative director then an official letter was sent to the medical record department from the chief clinical service officer of the hospital. Since all data was secondary data and obtained directly from medical records with no direct contact with patients. To ensure privacy and confidentiality of sensitive information, names were replaced with codes of each participant

Data availability statement

The data sets used/or analyzed during the current study is available from the corresponding author on reasonable request.

Conflicts of interest

Authors declare that this study is original and free of plagiarism and also confirm that there is no conflict of interest

Funding statement

Authors' contributions

AG and DD, participated in planning the study, writing proposal, monitoring data collection process and analyzing the data, writing the result and the manuscript. All authors agreed to be accountable for all aspects of the work. All authors read and approved the final manuscript.
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References

1. 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: a cancer journal for clinicians. 2024;74(3):229-63.
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: a cancer journal for clinicians. 2021;71(3):209-49.
3. Liu Q. Understanding the Global Cancer Statistics 2018: implications for cancer control. Science China Life Sciences. 2019.
4. Fitzmaurice C, Allen C, Barber RM, Barregard L, Bhutta ZA, Brenner H, et al. Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 32 cancer groups, 1990 to 2015: a systematic analysis for the global burden of disease study. JAMA oncology. 2017;3(4):524-48.
5. Fitzmaurice C, Abate D, Abbasi N, Abbastabar H, Abd-Allah F, Abdel-Rahman

O, et al. Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 29 cancer groups, 1990 to 2017: a systematic analysis for the global burden of disease study. JAMA oncology. 2019;5(12):1749-68.

6. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. International journal of cancer. 2015;136(5):E359-E86.

7. Ferlay J, Colombet M, Soerjomataram I, Mathers C, Parkin D, Piñeros M, et al. Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. International journal of cancer. 2019;144(8):1941-53.

8. Hille J, Johnson NW. The burden of oral cancer in sub-Saharan Africa: An estimate as presented to the Global Oral Cancer Forum, March 2016. Translational Research in Oral Oncology. 2017;2:2057178X17721094.

9. Duncan K, Cira MK, Barango P, Trimble EL. Challenges and opportunities in the creation and implementation of cancer-control plans in Africa. ecancermedicalscience. 2019;13.

10. Lee YY, Jun JK, Suh M, Park B, Kim Y, Choi KS. Barriers to cancer screening among medical aid program recipients in the Republic of Korea: a qualitative study. Asian Pacific Journal of Cancer Prevention. 2014;15(2):589-94.

11. Memirie ST, Habtemariam MK, Asefa M, Deressa BT, Abayneh G, Tsegaye B, et al. Estimates of cancer incidence in Ethiopia in 2015 using population-based registry data. Journal of global oncology. 2018;4:1-11.

12. FMoH E. National Cancer Control Plan 2016–2020. In: DIRECTORATE DPAC, editor. Addis Ababa: FMoH; 2015.

13. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. International journal of cancer. 2010;127(12):2893-917.

14. Woldeamanuel YW, Girma B, Teklu AM. Cancer in Ethiopia. The Lancet Oncology. 2013;14(4):289-90.

15. Misganaw A, Mariam DH, Ali A, Araya T. Epidemiology of major non-communicable diseases in Ethiopia: a systematic review. Journal of health, population, and nutrition. 2014;32(1):1.

16. Fidler MM, Gupta S, Soerjomataram I, Ferlay J, Steliarova-Foucher E, Bray F. Cancer incidence and mortality among young adults aged 20–39 years worldwide in 2012: a population-based study. The Lancet Oncology. 2017;18(12):1579-89.

17. Henderson TO, Oeffinger KC. Reducing the global cancer burden among young adults. The Lancet Oncology. 2017;18(12):1554-5.

18. Jemal A, Center MM, DeSantis C, Ward EM. Global patterns of cancer incidence and mortality rates and trends. Cancer Epidemiology and Prevention Biomarkers. 2010;19(8):1893-907.

19. Kamangar F, Dores GM, Anderson WF. Patterns of cancer incidence, mortality, and prevalence across five continents: defining priorities to reduce cancer disparities in different geographic regions of the world. Journal of clinical oncology. 2006;24(14):2137-50.

20. IARC. Cancer in sub-saharan africa. France International Agency for Research on Cancer; 2018. 27-8 p.

21. WHO. Global action plan for the prevention and control of noncommunicable diseases 2013-2020: World Health Organization; 2013.

22. Jacques Ferlay IS, Rajesh Dikshit, Sultan Eser, Colin Mathers, Marise Rebelo, Donald Maxwell Parkin, David Forman and Freddie Bray. Cancer incidence and mortality worldwide, international agency for research on cancer. International Journal of Cancer. 2014;136:E359–E86.

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Ethiop. J. Med. Health Sci. 2024; 4(1):380-389.

23. Leal YA, Fernández-Garrote LM, Mohar-Betancourt A, Meneses-García A. The importance of registries in cancer control. salud pública de méxico. 2016;58:309-16.

24. Omonisi AE, Liu B, Parkin DM. Population-based cancer registration in sub-Saharan Africa: its role in research and cancer control. JCO Global Oncology. 2020;6.

25. Epidemiological Trends of Breast Cancer in Southern Ethiopia: A Seven-Year Retrospective Review Achamyelesh Gebretsadik, Netsanet Bogale, and Dereje. G Negera.Cancer Control Volume 28: 1–7,2021.

26. Achamyelesh Gebretsadik, Netsanet Bogale, Dubale Dulla. Descriptive epidemiology of gynecological cancers in southern Ethiopia: a retrospective cross-sectional review BMJ Open 2022;12:e062633. doi:10.1136/ bmjopen-2022-06263

27. Gebretsadik, A., Bogale, N. ., & Dulla, D. . (2024). Trends of gastro-intestinal tract cancer between 2013 and 2019 in Southern Ethiopia: A retrospective record review. Ethiopian Journal of Medical and Health Sciences, 3(1), 169-179.

28. Gebretsadik A., Bogale, N. ., & Dulla, D. (2024). Pattern of genitourinary tract cancers in southern Ethiopia: A retrospective document review. Ethiopian Journal of Medical and Health Sciences, 3(2), 252-263

29. Gebretsadik Achamyelesh, Bogale Netsanet, Geleta Dereje, Melaku Nebiyu, Dulla Dubale (2024) Nasopharyngeal, tongue and laryngeal cancer in Southern Ethiopia: a seven-year retrospective cross-sectional review *ecancer* 18 1784

30. Rebbeck TR. Cancer in sub-saharan africa. Science. 2020;367(6473):27-8.

31. Okobia M. Cancer care in Sub-Saharan Africa–urgent need for population–based cancer registries. Ethiopian Journal of Health Development. 2003;17(2):89-98.

32. Varughese J, Richman S. Cancer care inequity for women in resource-poor countries. Reviews in Obstetrics and Gynecology. 2010;3(3):122.

33. DeSantis CE, Miller KD, Goding Sauer A, Jemal A, Siegel RL. Cancer statistics for african americans, 2019. CA: a cancer journal for clinicians. 2019;69(3):211-33.

34. Ferlay J, Colombet M, Soerjomataram I, Parkin DM, Piñeros M, Znaor A, et al. Cancer statistics for the year 2020: An overview. International Journal of Cancer. 2021.

35. Begoihn M, Mathewos A, Aynalem A, Wondemagegnehu T, Moelle U, Gizaw M, et al. Cervical cancer in Ethiopia–predictors of advanced stage and prolonged time to diagnosis. Infectious agents and cancer. 2019;14(1):1-7.

36. Varadhachary GR, Raber MN. Cancer of unknown primary site. New England Journal of Medicine. 2014;371(8):757-65.

37. Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, et al. Global cancer Observatory: cancer today. Lyon, France: international agency for research on cancer. 2018.

38. Ng M, Freeman MK, Fleming TD, Robinson M, Dwyer-Lindgren L, Thomson B, et al. Smoking prevalence and cigarette consumption in 187 countries, 1980-2012. Jama. 2014;311(2):183-92.

39. Ullrich A, Ciardiello F, Bricalli G, Cherny NI, Eniu A. ESMO and WHO: 14 years of working in partnership on cancer control. ESMO open. 2016;1(3).

40. Joko-Fru WY, Miranda-Filho A, Soerjomataram I, Egue M, Akele-Akpo MT, N'da G, et al. Breast cancer survival in sub-Saharan Africa by age, stage at diagnosis and human development index: A population-based registry study. International journal of cancer. 2020;146(5):1208-18.

41. Allemani C, Weir HK, Carreira H, Harewood R, Spika D, Wang X-S, et al. Global surveillance of cancer survival 1995–2009:

analysis of individual data for 25 676 887 patients from 279 population-based registries in 67 countries (CONCORD-2). The lancet. 2015;385(9972):977-1010.

42. Prager GW, Braga S, Bystricky B, Qvortrup C, Criscitiello C, Esin E, et al. Global cancer control: responding to the growing burden, rising costs and inequalities in access. ESMO open. 2018;3(2):e000285.

43. Torre LA, Siegel RL, Ward EM, Jemal A. Global cancer incidence and mortality rates and trends—an update. Cancer Epidemiology and Prevention Biomarkers. 2016;25(1):16-27.

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Ethiop. J. Med. Health Sci. 2024; 4(1):380-389.