



Age- and Gender wise Socio-Economic Drivers of Cancer Burden in East Khasi Hills District, Meghalaya: A Geo-Health Analysis

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Abstract

Background: Cancer is a major global public health challenge, imposing severe health and economic burdens on healthcare systems and households. East Khasi Hills District in North-East India exhibits a unique cancer profile with elevated incidence rates of upper aerodigestive and gastrointestinal malignancies.

Objective: This study examines the epidemiological prevalence, age-wise distribution, and multidimensional socio-economic impacts of cancer in East Khasi Hills District, Meghalaya State.

Methods: Secondary epidemiological registry data covering major cancer types (N = 2,228 males; N = 1,240 females) were obtained from the Population-Based Cancer Registry (PBCR), East Khasi Hills, and standardized using Z-score analysis to identify age-specific vulnerability patterns. Primary survey data were collected from 50 cancer patients selected via stratified random sampling using structured questionnaires and personal interviews. Multivariate factor analysis was executed via Principal Component Analysis (PCA) with Varimax rotation on 35 socio-economic, clinical, and healthcare accessibility variables using IBM SPSS.

Result: Oesophageal cancer is the predominant malignancy among both male (43%, 973 cases) and female (32%, 467 cases) patients. Peak cancer vulnerability is concentrated in middle and older adulthood, specifically the 45–54 age group for males (Z = 1.80 for oesophageal cancer at 45–49 years) and 45–64 age group for females (Z = 1.66 at 55–59 years). PCA extracted 11 principal dimensions with eigenvalues > 1.0, explaining 78.52% of total cumulative variance.

Conclusion: The high concentration of cancer cases among middle-aged adults combined with catastrophic out-of-pocket costs underscores the critical need for targeted age-specific screening programs (ages 40–64) and institutional financial assistance mechanisms to protect vulnerable households from medical impoverishment.

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Keywords: Age-wise Distribution, Oesophageal Cancer, Principal Component Analysis (PCA), Socio-Economic Impact, Z-score Analysis

1. Introduction

Cancer has emerged as one of the most significant public health challenges of the twenty-first century, affecting millions of people across the globe and imposing an enormous burden on healthcare systems, economies, and societies.^[1-2] The increasing incidence of cancer, coupled with population ageing, urbanization, environmental changes, and unhealthy lifestyle practices, has

transformed the disease into one of the leading causes of morbidity and mortality worldwide. [3-4] According to the World Health Organization (WHO), cancer comprises a large group of diseases that can develop in almost any organ or tissue when abnormal cells grow uncontrollably, invade surrounding tissues, and spread to distant organs through metastasis. [5] described cancer as a complex disease resulting from the interaction between genetic predisposition and environmental influences, including tobacco consumption, alcohol use, dietary habits, chronic infections, occupational exposures, and lifestyle-related risk factors. [6]

Non-communicable diseases (NCDs) have become a major global health concern, significantly contributing to morbidity and mortality across all countries, regardless of their development status. [7-9]

These diseases are influenced by a combination of socio-economic conditions, lifestyle factors, environmental exposures, and access to healthcare [10-13]. Socio-economic factors play a crucial role in the prevalence and management of NCDs. [14-15] emphasizes that lower-income populations are particularly vulnerable due to limited healthcare access, poor dietary habits, and increased exposure to environmental hazards. [16-18] In India, socio-economic inequalities, especially in rural areas, intensify the burden of NCDs because of insufficient healthcare infrastructure and limited public health awareness [19-20]. Additionally, education, occupation, and income levels are key determinants of healthcare access. Lower education levels, in particular, are associated with poor health literacy, limiting the early detection and management of NCDs and India has seen a sharp rise in NCD prevalence in recent decades [21]. Environmental factors also significantly influence the onset of NCDs. Studies by [22] reveal that air and water pollution heighten the risk of respiratory and cardiovascular diseases, while inadequate sanitation contributes to gastrointestinal and ENT disorders. Research by [22] further stresses the need for improved environmental conditions to reduce NCD prevalence in both urban and rural settings.

Research by [23-24] identifies socio-economic determinants—such as occupation, income, and lifestyle factors like diet and physical activity—as major contributors to NCD incidence in India. Previous studies by [25-26] indicate that rural parts of Madurai experience a higher prevalence of NCDs due to limited healthcare infrastructure and poor socio-economic conditions.

Cancer prevalence has become a vital epidemiological indicator because it reflects the total number of individuals living with cancer within a population at a specific point in time, including both newly diagnosed patients and long-term survivors. Unlike incidence, which measures only new cases, prevalence provides a comprehensive picture of overall disease burden and the demand for healthcare services. [27-29] emphasized that prevalence data are essential for healthcare planning because they estimate the number of individuals requiring diagnostic workups, treatment, rehabilitation, and

long-term follow-up care. Likewise, [30-31] highlighted that advances in early diagnosis and improved treatment modalities have increased survival rates, making prevalence data increasingly important for planning healthcare resources, palliative care, and supportive services. India is experiencing a steady increase in cancer cases, with substantial regional variations across states [32]. The North-Eastern region of India, particularly Meghalaya, records some of the highest cancer incidence rates in the country. Studies have consistently reported a high prevalence of oesophageal, stomach, lung, oral, and cervical cancers in the region, largely associated with tobacco consumption, betel nut chewing (kwai), alcohol use, dietary practices (smoked and fermented foods), and environmental factors. Although existing studies provide valuable epidemiological information, most focus primarily on clinical incidence or risk factors in isolation rather than examining the broader socio-economic implications at the community level.

Cancer extends beyond being a medical condition and significantly affects the socio-economic well-being of patients and their families. Prolonged treatment cycles, repeated hospital visits, expensive chemotherapy, radiotherapy, and supportive medications demand high out-of-pocket spending. [28-29]. Many patients experience loss of employment, reduced household income, financial instability, psychological distress, and disruption of family life. [30, 32] These challenges are particularly severe in economically vulnerable households where access to financial protection is limited. Furthermore, existing studies in Meghalaya have rarely integrated epidemiological prevalence patterns with multivariate socio-economic impacts within a single geographical framework. These findings highlight the urgent need for targeted healthcare interventions that address the socio-economic and environmental challenges specific to the district.

1.1. Objectives

To examine the prevalence of cancer, focusing on age-wise distribution, gender differences, and major cancer types in East Khasi Hills District, Meghalaya.

To analyze the multidimensional socio-economic impact of cancer on patients and their households using Principal Component Analysis (PCA).

2. Study Area

East Khasi Hills District is situated in the central part of Meghalaya in North-Eastern India, extending between 25°07' N to 25°41' N latitude and 91°21' E to 92°09' E longitude, covering an area of approximately 2,748 km² [33]. It is bounded by Ri-Bhoi District to the north, West Jaintia Hills District to the east, Eastern West Khasi & South West Khasi Hills Districts to the west, and Bangladesh to the south. The district capital, Shillong, serves as the primary administrative, educational, commercial, and medical center of the state.

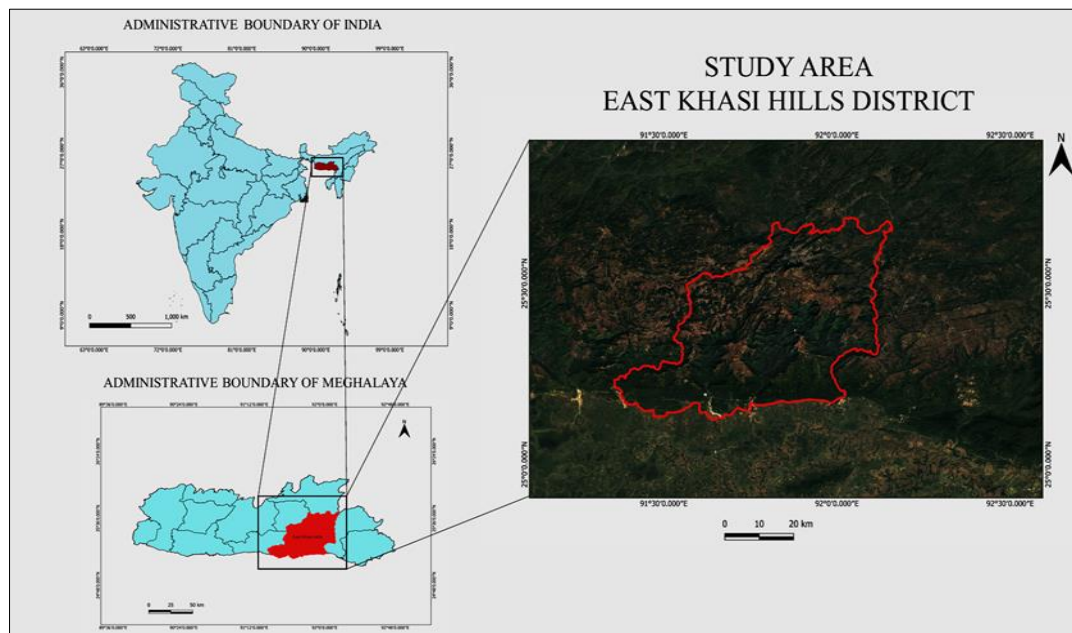


Fig 1: Location of study area

3. Methodology

This research utilizes a descriptive and analytical research design combining secondary epidemiological registry data with primary household field data (Figure 2).

3.1. Data Sources & Sampling Design

- Secondary Data:** Secondary incidence and prevalence statistics were sourced from the Population-Based Cancer Registry (PBCR), East Khasi Hills, alongside Census of India reports and public health publications.
- Primary Data:** Field survey data were collected from 50 cancer patients in East Khasi Hills using Stratified Random Sampling across diverse demographic strata. Structured questionnaires (comprising 35 socio-economic, clinical, economic, household, and healthcare accessibility variables) and personal interviews were administered to capture household impacts.

3.2. Statistical Analytical Techniques

Z-score Analysis: Standardizes age-group case distributions to evaluate age-specific vulnerability relative to the overall mean distribution:

$$= (X - X_{\text{mean}}) / S$$

where X represents the raw case count in a specific age category, X_{mean} is the mean across age categories, and S is the standard deviation. Positive Z-scores ($Z > 0$) denote above-average vulnerability.

Principal Component Analysis (PCA): Multivariate factor analysis was executed via IBM SPSS on 35 socio-economic variables using Varimax orthogonal rotation. Factors with eigenvalues > 1.0 were retained, and factor loadings $\geq \pm 0.30$ were interpreted as statistically significant.

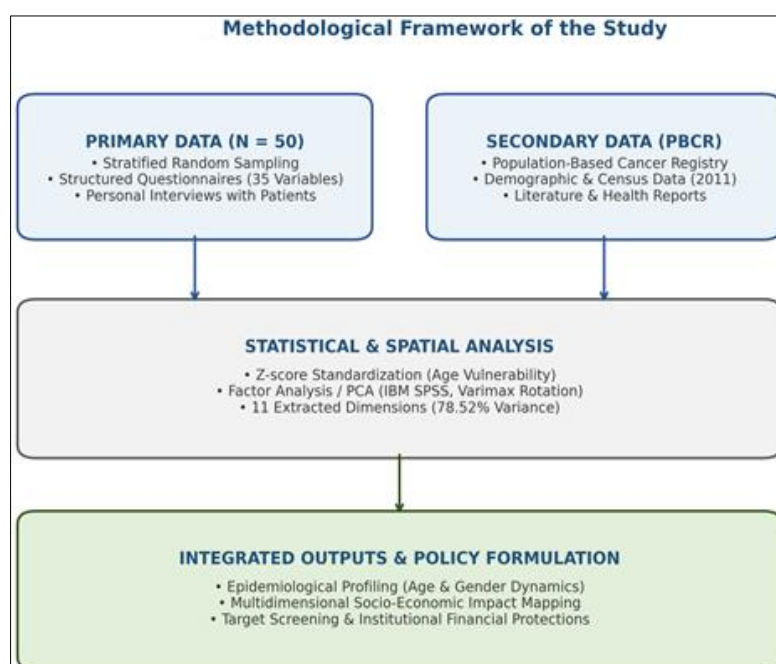


Figure 2 Methodological Framework

4. Result and discussion

4.1. Age-Wise Distribution and Types of Cancer in East Khasi Hills

Age is widely recognized as one of the most critical biological determinants of cancer incidence, as cumulative exposure to environmental carcinogens, lifestyle risk factors, and cellular senescence increases disease risk over time [34-36]. In East Khasi Hills District, Population-Based Cancer Registry (PBCR) statistics reveal distinct gender-specific epidemiological profiles.

4.2. Male Cancer Burden & Age Dynamics

A total of 2,228 male cancer cases across 10 major anatomical sites were evaluated. Oesophageal cancer emerged as the single largest contributor, representing 43% (973 cases), followed by Hypopharyngeal cancer (13%, 285 cases), Tongue cancer (8%, 174 cases), Laryngeal cancer (7%, 168 cases), Lung cancer (7%, 153 cases), Mouth cancer (7%, 152 cases), and Stomach cancer (7%, 152 cases). Tonsil (5%, 116 cases), Pharynx unspecified (2%, 54 cases), and Liver cancer (2%, 51 cases) accounted for the remaining share (Figure 3).

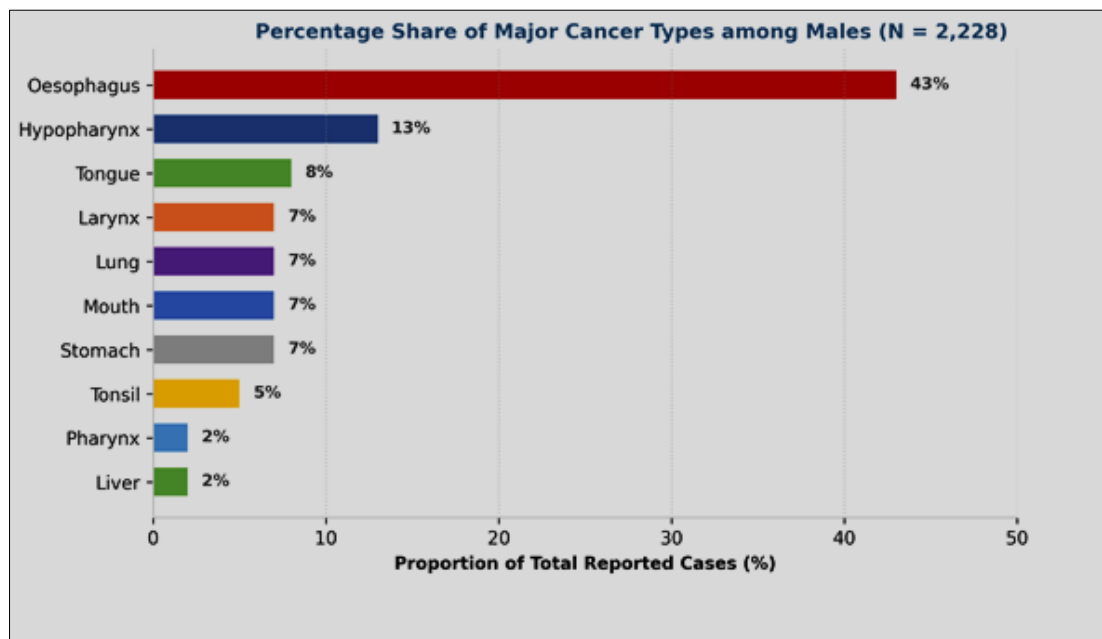


Fig 3: Percentage Distribution of Major Cancer Types among Male Patients (N = 2,228).

Standardized Z-score analysis (Table 1& Figure 4) demonstrates a marked shift from negative Z-scores in young adulthood (ages 20–34) to elevated positive Z-scores during middle age (ages 40–64). Peak cancer concentration for male patients occurs between 45 and 54 years. Oesophageal cancer peaks sharply at 45–49 years ($Z = 1.80$, 206 cases), while

Hypopharyngeal ($Z = 1.70$ at 45–49 yrs), Tongue ($Z = 1.79$ at 50–54 yrs), Mouth ($Z = 2.09$ at 50–54 yrs), Stomach ($Z = 1.73$ at 50–54 yrs), and Pharyngeal ($Z = 2.22$ at 50–54 yrs) cancers exhibit intense clustering in middle adulthood. Lung cancer demonstrates a secondary peak in older adults aged 70–74 years ($Z = 1.73$).

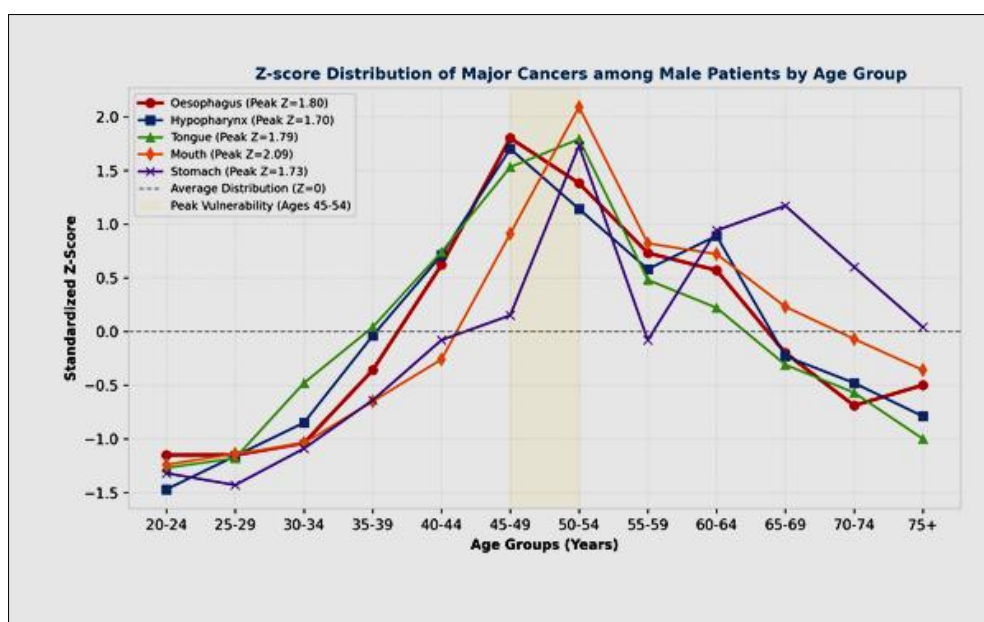


Fig 4: Z-score Trend of Major Cancer Types among Male Patients by Age Group.

Table 1: Z-Scores for Male Cancer Types and Age Group

Age Group	Oesoph	Hypoph	Tongue	Larynx	Lung	Mouth	Stomah	Tonsil	Phar Un	Liver
20–24	-1.15	-1.47	-1.27	-1.55	-1.28	-1.24	-1.32	-1.38	-1.18	-1.31
25–29	-1.15	-1.16	-1.18	-1.44	-1.28	-1.14	-1.43	-1.24	-1.18	-1.00
30–34	-1.04	-0.85	-0.48	-1.00	-1.28	-1.04	-1.09	-0.67	-0.91	-1.00
35–39	-0.36	-0.04	0.04	0.00	-0.98	-0.65	-0.64	0.19	-0.39	-0.69
40–44	0.62	0.71	0.74	0.11	-0.08	-0.26	-0.08	0.62	0.13	0.23
45–49	1.80	1.70	1.53	1.33	0.33	0.91	0.15	1.47	1.18	-0.69
50–54	1.38	1.14	1.79	1.33	1.03	2.09	1.73	1.33	2.22	1.15
55–59	0.73	0.58	0.48	1.11	0.73	0.82	-0.08	1.19	-0.13	1.15
60–64	0.57	0.89	0.22	0.77	0.53	0.72	0.94	0.33	0.65	1.46
65–69	-0.20	-0.23	-0.31	-0.11	0.33	0.23	1.17	-0.38	0.39	-0.08
70–74	-0.69	-0.48	-0.57	-0.22	1.73	-0.07	0.60	-0.67	-0.39	1.15
75+	-0.50	-0.79	-1.00	-0.33	0.23	-0.36	0.04	-0.81	-0.39	-0.38

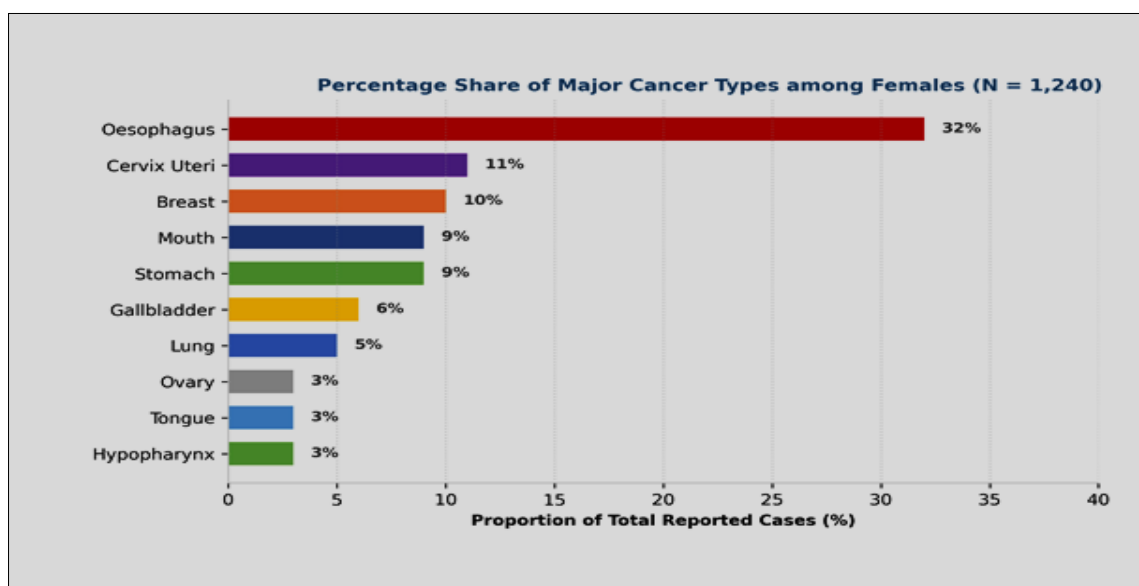
4.3. Female Cancer Burden & Age Dynamics

Registry data recorded 1,240 female cancer cases across 10 major sites. Oesophageal cancer is the leading malignancy among females, representing 32% (467 cases), followed by Cervix uteri cancer (11%, 150 cases), Breast cancer (10%, 124 cases),

Mouth cancer (9%, 131 cases), and Stomach cancer (9%, 121 cases). Gallbladder (6%, 85 cases), Lung (5%, 70 cases), Ovary (3%, 36 cases), Tongue (3%, 35 cases), and Hypopharyngeal cancer (3%, 33 cases) account for the remaining proportion (Table 2& Figure 5).

Table 2: Z-Scores for Female Cancer Types and Age Group

Age Group	Oesoph	Hypoph	Tongue	Larynx	Lung	Mouth	Stomach	Tonsil	Phar Un	Liver
20–24	-1.15	-1.47	-1.27	1.55	-1.28	-1.24	-1.32	-1.38	-1.18	-1.31
25–29	-1.15	-1.16	-1.18	-1.44	-1.28	-1.14	-1.43	-1.24	-1.18	-1.00
30–34	-1.04	-0.85	-0.48	-1.00	-1.28	-1.04	-1.09	-0.67	-0.91	-1.00
35–39	-0.36	-0.04	0.04	0.00	-0.98	-0.65	-0.64	0.19	-0.39	-0.69
40–44	0.62	0.71	0.74	0.11	-0.08	-0.26	-0.08	0.62	0.13	0.23
45–49	1.80	1.70	1.53	1.33	0.33	0.91	0.15	1.47	1.18	-0.69
50–54	1.38	1.14	1.79	1.33	1.03	2.09	1.73	1.33	2.22	1.15
55–59	0.73	0.58	0.48	1.11	0.73	0.82	-0.08	1.19	-0.13	1.15
60–64	0.57	0.89	0.22	0.77	0.53	0.72	0.94	0.33	0.65	1.46
65–69	-0.20	0.23	-0.31	-0.11	0.33	0.23	1.17	-0.38	0.39	-0.08
70–74	-0.69	-0.48	-0.57	-0.22	1.73	-0.07	0.60	-0.67	-0.39	1.15
75+	-0.50	-0.79	-1.00	-0.33	0.23	-0.36	0.04	-0.81	-0.39	-0.38

**Fig 5: Percentage Distribution of Major Cancer Types among Female Patients (N = 1,240).**

Female cancer vulnerability spans a broader middle-to-older adult window (45–64 years). Cervical cancer peaks at 45–49 years ($Z = 1.80$, 29 cases), Breast cancer peaks at 45–49 years ($Z = 1.52$, 24 cases), and Oesophageal cancer reaches its

absolute maximum at 55–59 years ($Z = 1.66$, 88 cases). Mouth ($Z = 1.51$ at 75+ yrs) and Stomach ($Z = 1.49$ at 75+ yrs) cancers exhibit late-life concentrations among elderly women (Figure 6).

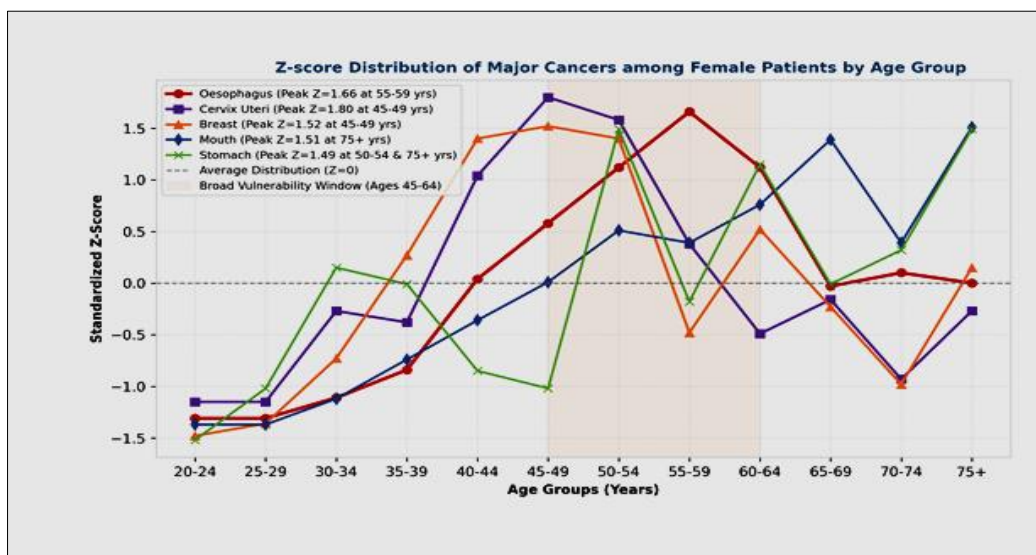
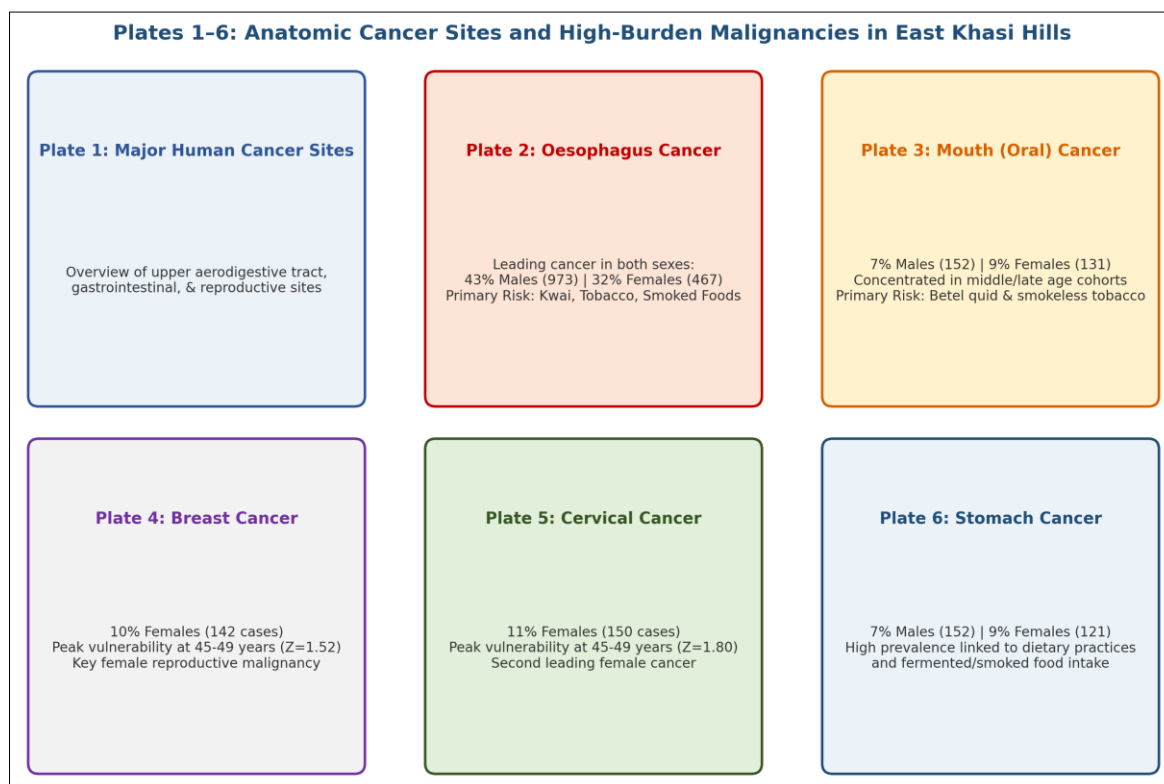


Fig 6: Z-score Trend of Major Cancer Types among Female Patients by Age Group.

Table 2: Case Counts and Z-Scores for Female Cancer Types by Age Group

Age Group	Oesoph	Cervix	Breast	Mouth	Stomach	Gallbl	Lung	Ovary	Tongue	Hypoph
20-24	-1.31	-1.15	-1.48	-1.37	-1.52	-1.16	-1.08)	-1.91	-1.06	-0.99
25-29	-1.31	-1.15	-1.36	-1.37	-1.02	-1.16	-1.08)	0.00	-0.70	-0.99
30-34	-1.11	-0.27	-0.73	-1.12	0.15	-1.00	-1.08)	-0.96	-1.06	-0.99
35-39	-0.84	-0.38	0.27	-0.74	-0.01	-1.16	-0.34)	0.96	-0.70	-0.63
40-44	0.04	1.04	1.40	-0.36	-0.85	-0.01	-0.89)	0.96	0.03	1.17
45-49	0.58	1.80	1.52	0.01	-1.02	1.30	0.03	0.96	-0.70	-0.27
50-54	1.12	1.58	1.40	0.51	1.49	1.47	-0.52	0.96	1.49	1.90
55-59	1.66	0.38	-0.48	0.39	-0.18	-0.51	0.22	-0.96	0.03	0.45
60-64	1.12	-0.49	0.52	0.76	1.15	0.97	1.70	0.96	1.49	1.17
65-69	-0.03	-0.16	-0.23	1.39	-0.01	0.81	1.33	0.00	0.39	-0.99
70-74	0.10	-0.93	-0.98	0.39	0.32	-0.01	0.59	0.00	-0.70	0.09
75+	0.00	-0.27	0.15	1.51	1.49	0.48	1.14	-0.96	1.49	0.09



Plates 1-6: Major Anatomical Cancer Sites and High-Burden Malignancies in East Khasi Hills.

5. Multivariate Analysis of Socio-Economic Impact (PCA)

Principal Component Analysis (PCA) with Varimax rotation was executed on 35 socio-economic, clinical, and

accessibility variables collected from primary field survey respondents (N = 50). Eleven dimensions with eigenvalues > 1.0 were extracted, explaining 78.52% of total cumulative variance (Table 3&Figure 7).

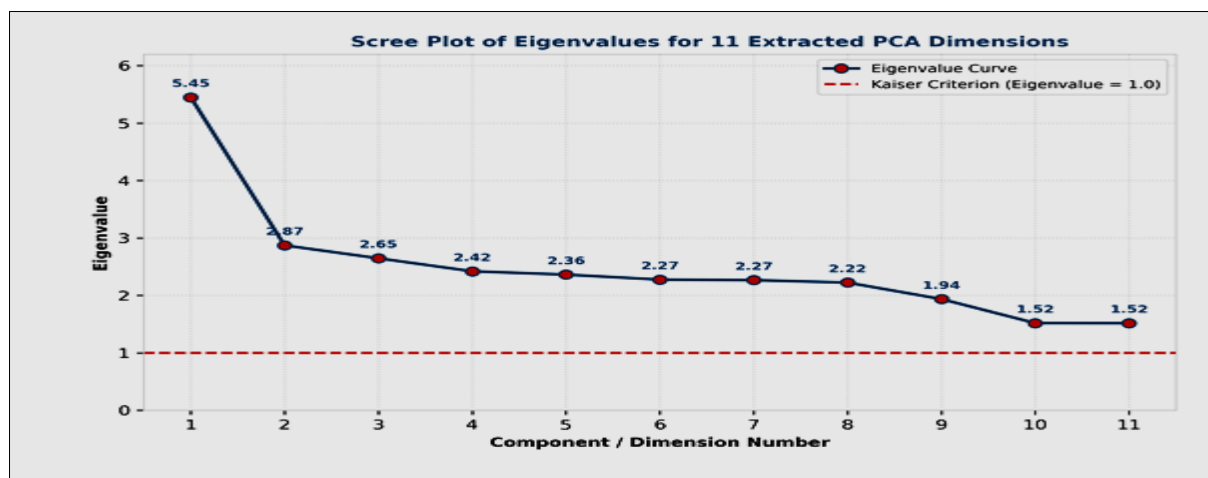


Fig 7: Scree Plot showing Eigenvalue Distribution across the 11 Extracted PCA Dimensions.

Table 3: Eigenvalues and Cumulative Variance Explained by PCA Dimensions

Dimension No.	Dimension Name	Eigenvalue	% Variance (Cum %)
I	Economic Burden and Household Consequences	5.450	15.57% (15.57%)
II	Clinical Status and Treatment Management	2.871	8.20% (23.78%)
III	Social Relationships and Financial Coping	2.646	7.56% (31.34%)
IV	Socio-economic Characteristics & Household Welfare	2.420	6.92% (38.25%)
V	Cancer Diagnosis and Early Detection	2.362	6.75% (45.00%)
VI	Financial Accessibility to Cancer Care	2.275	6.50% (51.50%)
VII	Mental Well-being and Healthcare Support	2.266	6.47% (57.97%)
VIII	Demographic and Cancer Risk Profile	2.223	6.35% (64.32%)
IX	Community Support and Recovery	1.936	5.53% (69.86%)
X	Demographic Characteristics of Cancer Patients	1.518	4.34% (74.19%)
XI	Family Background and Lifestyle Changes	1.516	4.33% (78.52%)

5.1. Dimension I: Economic Burden and Household Consequences

Dimension I represents the primary socio-economic impact factor (Table 4). Loss of household income recorded the highest positive loading (0.918), indicating that the incapacitation of primary wage earners severely undermines family financial stability. Routine household functioning

(0.674) and children's education (0.629) are significantly disrupted. High negative loadings on caregiver work cessation (-0.790), financial burden (-0.778), medicine availability constraints (-0.774), and out-of-pocket treatment costs (-0.680) underscore the severe economic strain on families

Table 4: Dimension I: Economic Burden and Household Consequences

Var No.	Variable Description	Factor Loading
16	Income Reduced	0.918
22	Household Activities Disrupted	0.674
24	Children's Education Affected	0.629
28	Lifestyle Adaptation	0.485
30	Support Type Received	0.477
33	Hospital Visit Frequency	0.471
20	Assets Sold for Care	0.411
35	Govt. Scheme Assistance	0.351
17	Treatment Cost Burden	-0.680
13	Medicine Availability Constraints	-0.774
21	Financial Burden Severity	-0.778
23	Caregiver Work Stopped	-0.790

5.2. Dimension II: Clinical Status and Treatment Management

Dimension II captures clinical disease severity and medical management (Table 5). Cancer stage (0.815) and treatment modality (0.796) carry high positive loadings, showing that

advanced disease stages demand aggressive multimodal therapies (surgery, chemotherapy, radiation), which directly affect main earners (0.444) and alter hospital visit frequency (-0.498).

Table 5: Dimension II: Clinical Status and Treatment Management

Var No.	Variable Description	Factor Loading
7	Cancer Stage at Diagnosis	0.815
10	Treatment Modality	0.796
6	Duration Since Diagnosis	0.649
14	Main Earner Affected	0.444
33	Hospital Visit Frequency	-0.498

5.3. Dimension III: Social Relationships and Financial Coping

Dimension III underscores the psychosocial toll and debt coping mechanisms. Altered social relationships (0.899) and

social stigma (0.804) dominate this dimension, demonstrating that cancer patients face emotional isolation alongside the need to borrow money (0.431) for treatment expenses (Table 6).

Table 6: Dimension III: Social Relationships and Financial Coping

Var No.	Variable Description	Factor Loading
25	Social Relationships Altered	0.899
26	Social Stigma Experienced	0.804
14	Main Earner Status	0.431
18	Borrowed Money for Care	0.431
8	Family History of Cancer	0.411
17	Treatment Cost	0.375

5.4. Dimension IV: Socio-Economic Characteristics & Household Welfare

This dimension reflects the role of institutional support and baseline socioeconomic status (Table 7). Government

scheme assistance (0.755) and monthly family income (0.730) strongly determine household welfare, mitigating employment impacts (0.626) and educational disruptions (0.446).

Table 7: Dimension IV: Socio-Economic Characteristics & Household Welfare

Var No.	Variable Description	Factor Loading
35	Govt. Scheme Assistance	0.755
5	Monthly Family Income	0.730
15	Employment Affected	0.626
24	Children's Education	0.446
22	Household Activities	0.416
4	Educational Qualification	0.305

5.5. Dimension V: Cancer Diagnosis and Early Detection

Dimension V isolates the diagnostic pathway. Diagnostic delay (0.919) versus early diagnosis (-0.912) demonstrates

that delayed presentation leads to advanced disease stages, complex therapies, and multiplied financial strain (Table 8).

Table 8: Dimension V: Cancer Diagnosis and Early Detection

Var No.	Variable Description	Factor Loading
12	Diagnosis Delay Experienced	0.919
11	Early Stage Diagnosis	-0.912

5.6. Dimensions VI to XI: Financial Access, Mental Well-being, & Demographic Profiles

The table 9 shows remaining dimensions capture specific access barriers and coping mechanisms: Dim VI (Financial Access: Debt increase 0.635, Treatment access -0.696); Dim VII (Mental Well-being: Patient mental health 0.644, Facility

sufficiency -0.779); Dim VIII (Risk Profile: Risk factors 0.787, Age -0.820); Dim IX (Community Support: Network support 0.827); Dim X (Demographics: Gender 0.867, Marital status 0.543); and Dim XI (Family Background: Lifestyle changes 0.600, Family history -0.701).

Table 9: Dimensions VI to XI: Financial Access, Mental Well-being, & Demographic Profiles

Var No.	Variable Description	Factor Loading
19	Debt Accumulation Increase (Dim VI)	0.635
31	Treatment Accessibility Barriers (Dim VI)	-0.696
27	Patient Mental Well-being (Dim VII)	0.644
34	Healthcare Facility Sufficiency (Dim VII)	-0.779
9	Risk Factor Exposure (Dim VIII)	0.787
29	Community Network Support (Dim IX)	0.827
2	Gender Profile Impact (Dim X)	0.867
28	Lifestyle Adaptation (Dim XI)	0.600

6. Discussion

The empirical findings establish that East Khasi Hills District faces an extraordinarily heavy burden of upper aerodigestive tract cancers most notably oesophageal, hypopharyngeal, tongue, and stomach malignancies. The concentration of gastrointestinal cancers in Meghalaya aligns with regional literature citing widespread consumption of raw or cooked betel nut (kwai), tobacco (smoking and chewing), alcohol, and traditional smoked meat products as primary risk drivers^[37-39].

The Z-score standardization confirms that peak cancer risk affects individuals during their most economically active years (45–64 years). When cancer strikes adults in this age cohort, the economic impact is compounded because the patient is frequently the primary wage earner. PCA Dimension I confirms that wage loss (0.918), caregiver employment cessation (-0.790), asset liquidations (0.411), and medical debt (0.635 in Dim VI) deplete household capital and force families to compromise on children's education (0.629). Targeted Community Screening Programs: Establish age-specific screening initiatives targeting adults aged 40–64 for early detection of oesophageal, oral, cervical, and breast cancers at primary healthcare centers (PHCs). Culturally Tailored Behavioral Campaigns: Launch intensive public health campaigns addressing key local dietary and lifestyle risk factors, specifically raw betel nut (kwai), smokeless tobacco, and smoked food consumption[]. Integrated Psychosocial & Caregiver Support: Incorporate psychological counselling, social stigma reduction programs, and caregiver financial relief mechanisms into district tertiary hospital oncology units.

7. Conclusion

This study provides integrated epidemiological and socio-economic evidence on cancer in East Khasi Hills District, Meghalaya. Oesophageal cancer is the predominant malignancy across both sexes, with peak vulnerability concentrated among middle-aged and older adults aged 45 to 64 years. The economic impact on households is severe, driven by primary earner income loss, high out-of-pocket medical expenditures, caregiver job loss, asset liquidations, and mounting debt.

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Conflicts of Interest

There is no conflict of interest among the authors.

Ethical Approval

Ethical approval not required

Human or Animal Rights

This article does not contain any studies with human participants or animals performed by any of the authors.

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