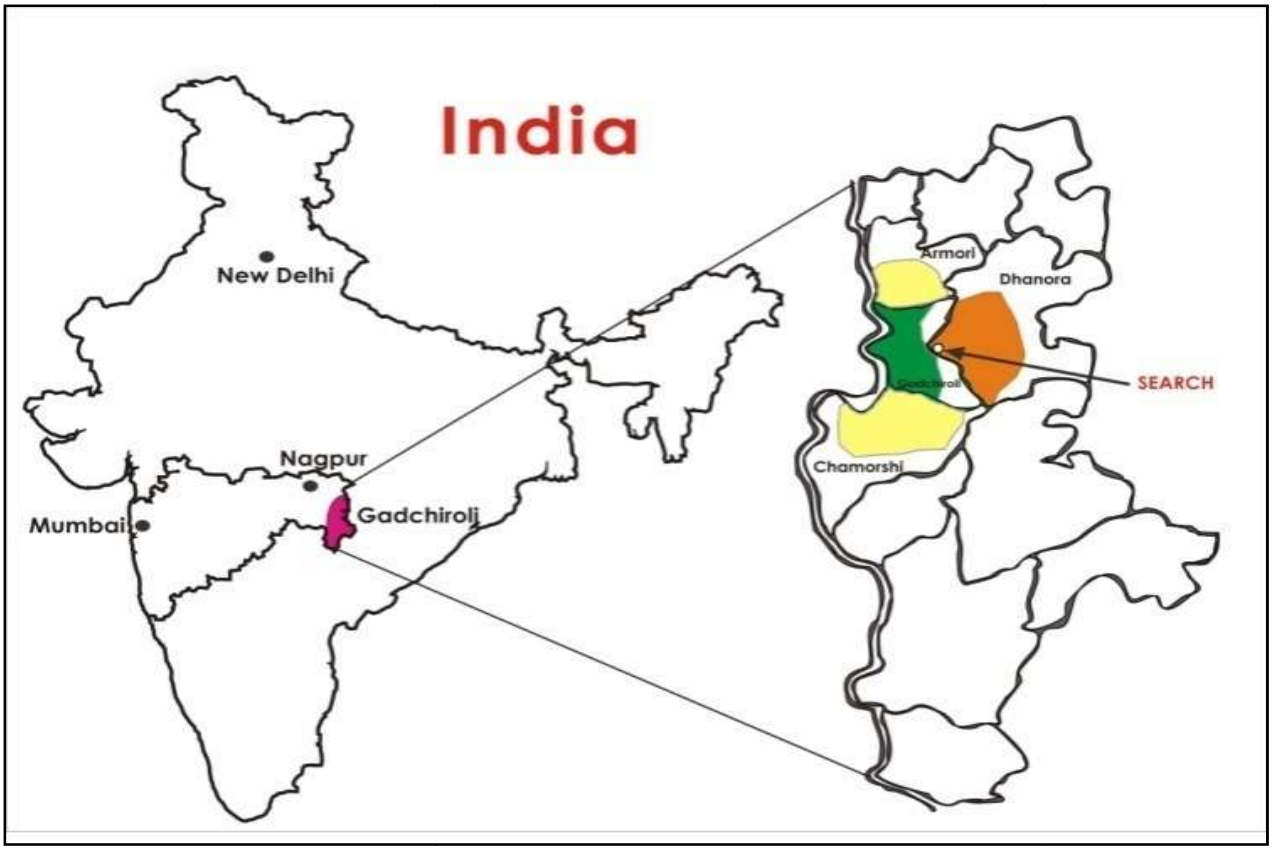
Cancer incidence and mortality in rural and tribal Gadchiroli during four years: 2015, 2016, 2017 and 2018

Population Based Cancer Registry, Gadchiroli, Maharashtra, India



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Executive summary

Goal

Population-based data on cancer in rural and tribal areas are scarce in India. Such data are crucial for designing strategies to prevent cancer as well as plan appropriate care. The Population Based Cancer Registry (PBCR), Gadchiroli is a collaborative effort between the Society for Education, Action and Research in Community Health (SEARCH), a non-governmental organization working in tribal and rural regions of Gadchiroli district of Maharashtra for the past 35 years and the Tata Memorial Centre (TMC), Mumbai, a leading cancer care provider and research organisation in India. The project was undertaken to understand the epidemiology of cancer in rural and tribal regions of Gadchiroli, one of the most under-developed regions of India.

Methods

The registry covered 134 villages with a total population of 105,157 in 2015 (SEARCH Census 2015). Cancer cases were enrolled in the registry from the following sources:

1. Annual house to house survey to screen for cancer cases
2. Hospital of SEARCH in Gadchiroli district
3. Mortality surveillance system of SEARCH in the 134 villages where all deaths are recorded andthe cause of death is ascertained using verbal autopsy

Results and discussion

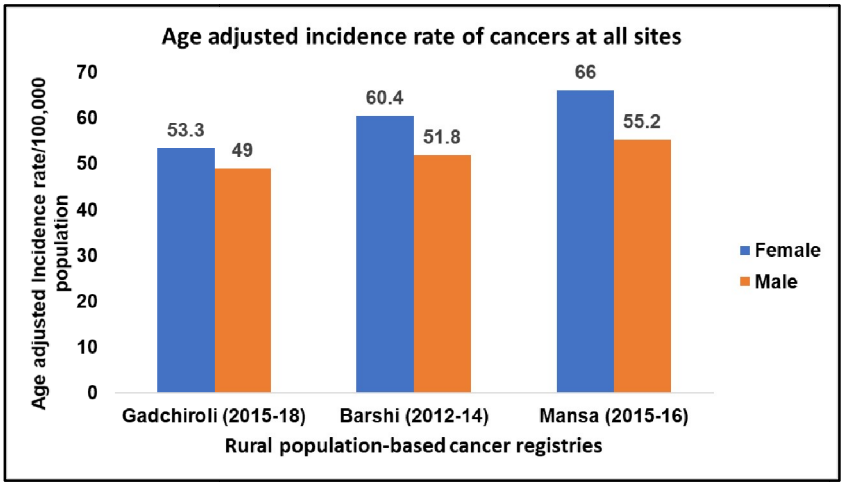
The Gadchiroli PBCR is one of the very few PBCRs in a rural and tribal region of India. The report draws attention to cancer epidemiology for a population where close to 50% of the individuals use tobacco (mostly chewed tobacco), a significant proportion is tribal, where healthcare services including facilities to diagnose cancer are not easily available and the nearest tertiary care for cancer is about 200 kilometers afar.

This report contains cancer data for the years 2015-18, the summary of which is as follows:

Number of cancer cases, crude and age adjusted incidence rate and age adjusted mortality rates for cancers for years 2015-18 in the Gadchiroli PBCR

	Female	Male	Overall
Total number of incident cancer cases registered	137	111	248
Person-years of follow up in the registry	212658	216413	429071
Crude incidence rate (CR) of cancer at all sitesin body (per 100,000 population)	64.4	51.3	57.8
Age-adjusted incidence rate (AAR) of cancer at all sites in body (per 100,000 population)	53.3	49	52.5
Age-adjusted mortality rate (AAR) of cancer at all sites in body (per 100,000 population)	38.4	42.9	40.4

The data from the Gadchiroli PBCR are compared with those from the rural PBCRs at Barshi[1] in Maharashtra and Mansa in Punjab[2]. The age-adjusted incidence rate (AAR) of cancer at all sites in the Gadchiroli, Barshi and Mansa rural PBCRswere comparable. The AARs were in the range of 50s to 60s as against AARs of about 100 and above reported fromthe urban cancer registries in India[1].



[1]Three Year Report of Population Based Cancer Registries 2012-2014: Report of 27 PBCRs in India [Internet]. [cited 2017 Sep 13];https://ncdirindia.org/ncrp/ALL_NCRP_REPORTS/PBCR_REPORT_2012_2014/index.htm

[2]Cancer Incidence and Mortality in Mansa District, Punjab State, India: 2015 – 2016. https://tmc.gov.in/tmh/pdf/Reports/Mansa%20Report%202015-2016.pdf

The age adjusted mortality rate (AAMR) of cancer in Gadchiroli was 38.4 among females and 42.9 among males. The AAMR of cancer was 38.2 and 40.5 among females and 35.9 and 42.5 among males in the rural PBCRs in Barshi and Mansa respectively [1,2].

Among females cervix and among males mouth was the leading cancer site. Mouth cancers accounted for 28% of all cancers in this registry. The Gadchiroli PBCR has the highest incidence of mouth cancers in men and women among various PBCRs in India[1].

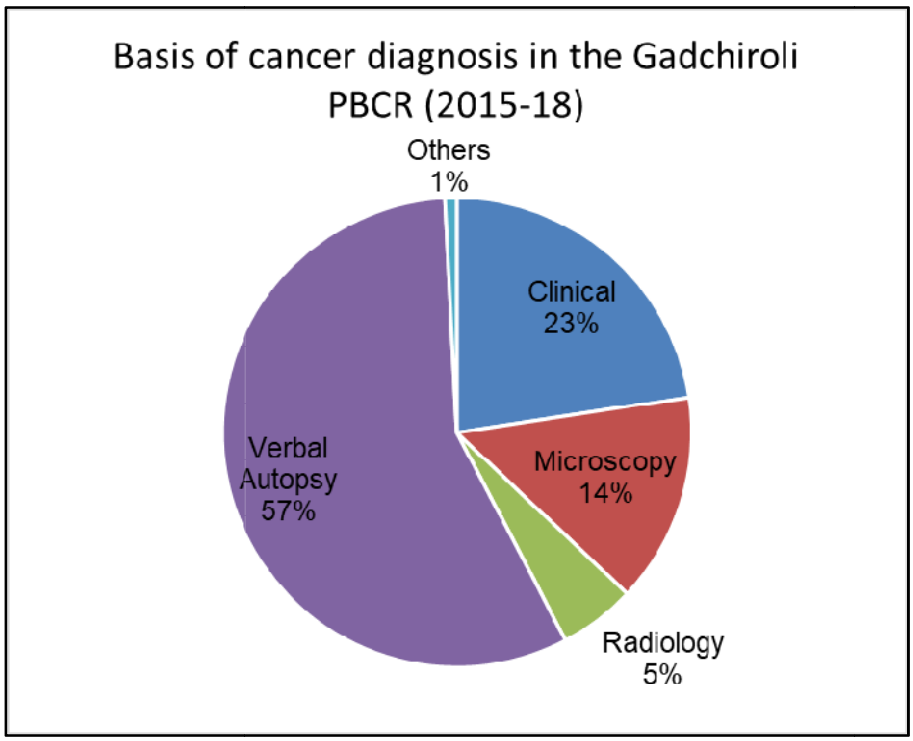
Leading cancer sites and proportion of tobacco related cancers in the Gadchiroli PBCR (2015-18)			
	Females	**Males**	**Overall**
Three leading sites of cancers (% out of all cancers)	1. Cervix uteri (21.2%) 2. Mouth (20.4%) 3. Breast (11.7%)	1. Mouth (37.8%) 2. Ill-defined sites (12.6%) 3. Leukemia (5.4%)	1. Mouth (28.2%) 2. Cervix uteri (11.7%) 3. Ill-defined sites (10.9%)
Proportion of tobacco related cancers (TRCs)	31.4%	53.2%	41.1%

A high proportion of tobacco related cancers in this registry confirms the perils of the heavy tobacco use in this district. Tobacco control thus clearly emerges as a priority for cancer control. To address the high prevalence of tobacco use, SEARCH along with the Tata Trusts and the Government of Maharashtra have already initiated a district wide tobacco and alcohol control programme- *Muktipath* (a path to liberation-from tobacco and alcohol) in 2016.

Among patients where information was available on cancer treatment (n=164), cancer directed treatment wastaken by32.3 % of the patients, treatment was incomplete among 1.8%, treatment was advised but not accepted by patients in 12.8% and 48.2% patients did not receive any treatment. In effect, above 60% of the cancer patients did not receive treatment for cancer.

A major challenge to setting up the cancer registry in Gadchiroli was lack of availability diagnostic information with the patients- either due to poor health care seeking, very few diagnostic facilities for cancer in the district or lack of proper storage of patient information. Onlyabout 15% of cancer patients had microscopic verification of cancer diagnosis. This was

expected given the under resourced set up of Gadchiroli. A majority of cancers werediagnosed using verbal autopsies (57%).



There could be some underreporting of cancer cases if the verbal autopsies miss cancer diagnosis due to inadequate information available with the family members of the deceased person. Also, cancer site could not be identified in 16.1% of cancers. These cases were registered through verbal autopsies. The challenge for the registry seems to be of medical under diagnosis of cancer rather than under recording. Use of house to house survey for cancer registration and availability of population-level information on deaths in this registry are likely to reduce the chances of under registration. Despite the limitations, the registry provides important data that can lead to public health action. For example, the emergence of mouth cancers as the leading cancers in the population in this district indicates a need for early diagnosis of mouth cancers and tobacco control. Similarly, higher AAR of cervical cancers indicates a need for generating awareness for early screening and treatment of cervical cancer.

Significance

1. The data obtained through the registry show the feasibility of conducting cancer registration in a rural-tribal population in a resource poor setting. The cancer incidence in this registry is fairly comparable with that from other rural population-based cancer registries such as those atBarshiand Mansa where more cancer diagnostic facilities are available. The Gadchiroli PBCR data add to the important and yet scarce information about cancer in a rural and tribalarea of an underdeveloped region of the country.
2. Given the high proportion of tobacco related cancers (41%), an emphasis on tobacco control strategiesis needed.
3. The data clearly point out the need to implement prevention programmes for cancers of mouth, cervix and breast.
4. There is lack of early diagnosis and treatment of cancers in Gadchiroli.
5. Future directions for improving cancer care in the district include-
    - increasing awareness about mouth, cervical and breast cancers using culturally appropriate material to promote early care seeking
    - strengthening cancer control infrastructure and the capacity of workforce in the district for screening and early diagnosis of these cancers
    - developing linkages with regional cancer centres to provide early navigation to these centres and streamlined treatment
    - reducing the out of pocket expenditure of cancer patients by channelizingcancer treatment through central or state government's health insurance schemes such as the Ayushman Bharator the Mahatma Phule Jan Arogya Yojana

1. Goals and objectives

Goals:

The goals of this registry were to-

1. Determine cancer rates, types and trends
2. Detect cancers early and prevent cancer deaths by promoting early care seeking through health education, providing curative (in selected cases) and referral services
3. Conduct research on selected issues dealing with cancer epidemiology, prevention and control in rural areas

in a population of about 100,000 individuals in the field practice area of SEARCH.

Objectives:

a) Collecting timely data on cancer incidence and mortality from the population in the registry

Data collection and management:

1. Identify all cancer cases and collect, code, store and analyze information on cancer cases
2. Conduct verbal autopsies on all deaths and identify and enumerate deaths due to cancers

Monitoring:

1. Monitor the incidence of cancers
2. Monitor cancer mortality

b) Early detection of cancers and prevention of cancer deaths by mobilizing community to seek early care through health education, providing curative (in selected cases) and referral services to individuals in the population registry

c) Research

1. Monitor cancer incidence and deaths of all cancers and cancers at specific sites
2. Study how the diagnosis, referrals and healthcare delivery for cancer can be improved in rural and tribal areas

2. Outline of the organization of the cancer registry

The registry was operationalizedin April 2015 and covers 134 villages in four tehsils (Armori, Chamorshi, Dhanora and Gadchiroli) of Gadchiroli. Cancer registration was conducted by SEARCH with technical and financial assistance from the Tata Memorial Centre (TMC), Mumbai.

The SEARCH team

Name	Role	Designation
Dr.Abhay Bang	Principal Investigator	Director, SEARCH
Dr.Rani Bang	Co-investigator	Director, MaaDanteshwari Hospital, SEARCH
Dr. Yogeshwar Kalkonde	Co-Principal investigator	Lead, Rural Chronic Non-Communicable Diseases Programme, SEARCH
Dr.Mrunal Kalkonde	Co-investigator	Pathologist, SEARCH
Mahesh Deshmukh	Statistician	Chief statistician, SEARCH
Dr. Sunil Jadhao	Collection and compilation of cancer registry data	Cancer registrar (2015-17)
Dr.Manveen Kaur	Collection and compilation of cancer registry data	Cancer registrar (2017-2018)
Dr. Shriyuta Bajpai	Compilation of cancer registry data	Research Fellow

The Tata Memorial Centre team

Dr. Rajendra Badwe	Director, TMC
Dr. Rajesh Dikshit	Professor of Epidemiology and Director, Centre for Cancer Epidemiology, Tata Memorial Centre, TMC
Dr.AtulBudukh	Professor of Epidemiology, TMC
Dr. Suyash Kulkarni	Professor, Department of Interventional Radiology, TMC

3. About Gadchiroli district

Gadchiroli district is situated on the eastern border of Maharashtra between 18.43` to 21.50' North latitude and 79.45' to 80.53' East longitude[1]. The district was carved out of Chandrapur district in 1982. On the East side Gadchiroli borders Chhattisgarh while on the South and South-West it borders Telangana. The district has an area of 14,412 km². About 75% of the district land is covered by forest and 95% of the population lives in 1688 villages.

Location of Gadchiroli district in Maharashtra state

Total population of the district is 1,072,942 with female and male population being 531,614 and 541,328 respectively (Census 2011). The tribal population constitutes 38.17 % of the population of the district. The literacy rate of the district is 66.03%.

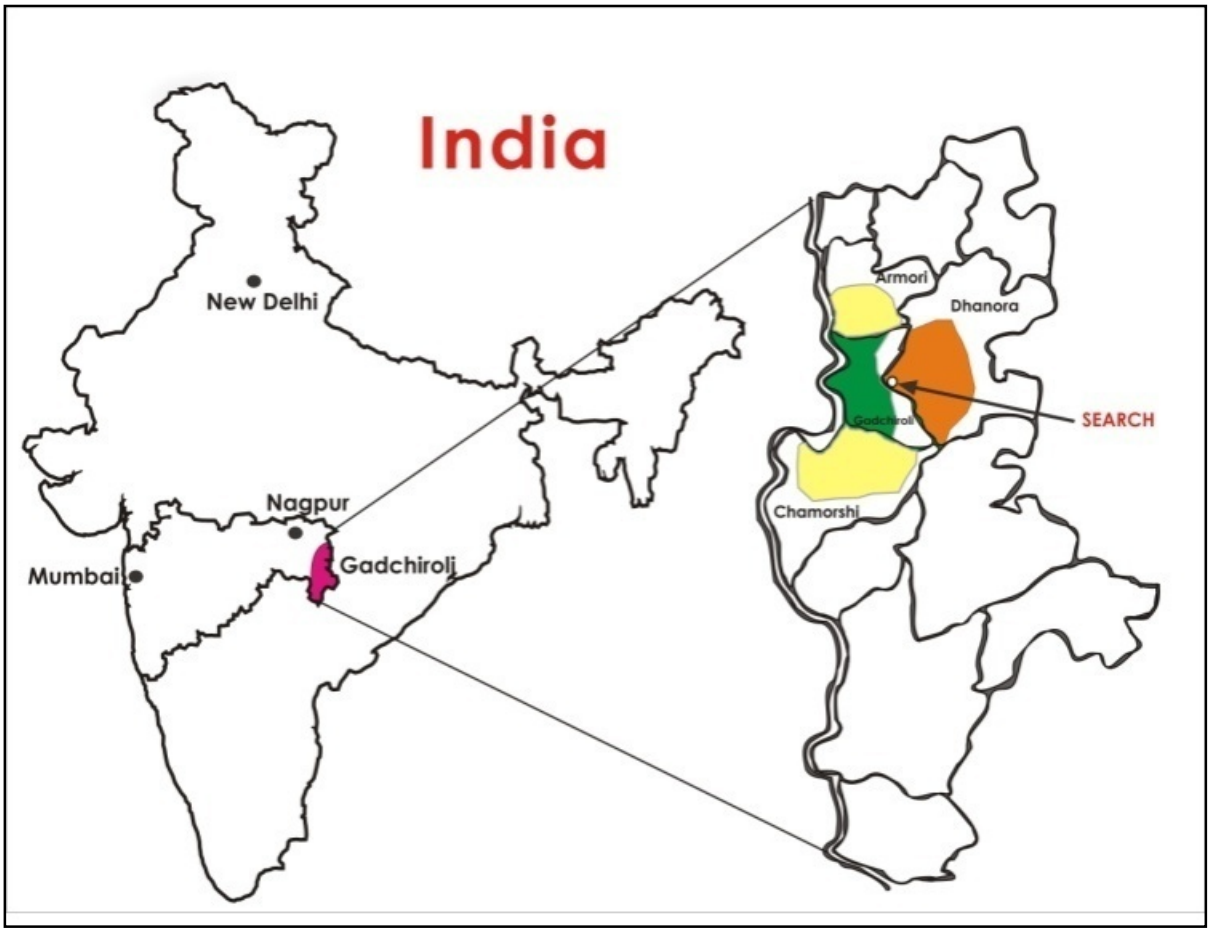
Gadchiroli is one of the most underdeveloped districts of Maharashtra and India. Moreover, the district is affected by left wing extremism or so called Naxalism. There are no large-scale industries in the district barring a few factories and subsistence farming and forest labor are the

main occupations in the district. There is only 18.48 kilometers of railway line in the entire district.

Healthcare in Gadchiroli district is provided by the government healthcare system through one district hospital, 3 Sub-Divisional Hospitals (SDHs), 9 community health centers (CHCs), 48 Primary Health Centers (PHCs) and 34 Public Health Units.However, these health centers continue to remain understaffed due to various reasons such as remote locations and threat of Naxalism etc. SEARCH provides healthcare services through its 60-bedded hospital and provides secondary and, for few ailments, tertiary level care. People also commonly seek care from unlicensed and unskilled village providers and herbal medication providers.

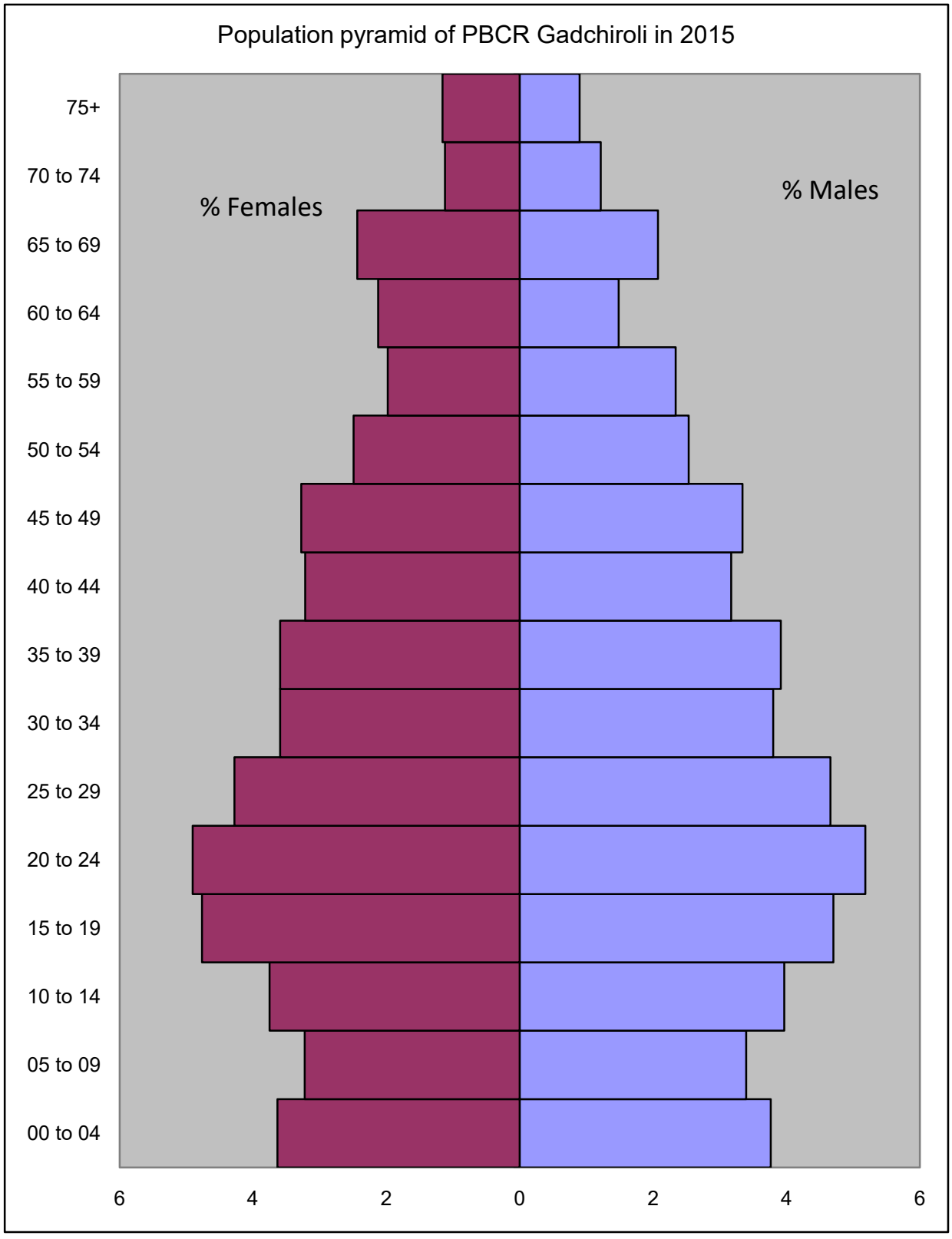
4. Population covered by the registry

The PBCR, Gadchiroli covered 134 villages in the field practice area of SEARCH. The villages are spread in four *tehsils* of the district (Armori, Chamorshi, Dhanora and Gadchiroli). SEARCH has a demographic surveillance system in these villages. SEARCH conducts a census in these villages every 10 years. As per the census conducted by SEARCH in 2015 the total population of these villages was 105,157. This population was used to calculate person-years of follow up and various cancer rates in the registry.



Map of the field practice area of SEARCH, Gadchiroli, Maharashtra.

Population pyramid-PBCR Gadchiroli

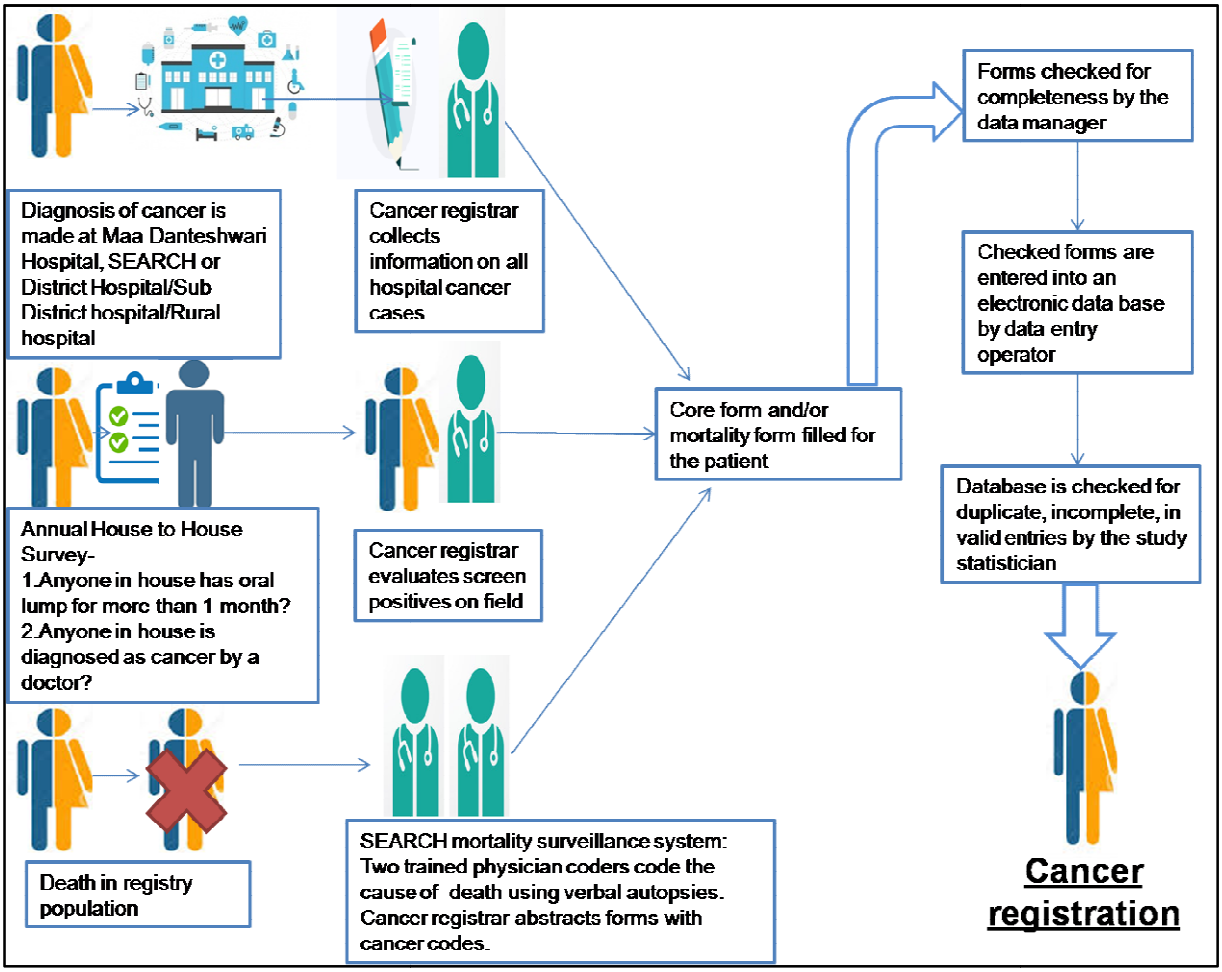


The age- and sex-wise distribution of population in 5-year age bands in the PBCR, Gadchiroli as per the population census conducted by SEARCH in 2015.

Age Group	Females		Males		Total	
	n	%	n	%	n	%
00 -04	3821	7.3	3957	7.5	7778	7.4
05-09	3392	6.5	3570	6.7	6962	6.6
10-14	3946	7.6	4172	7.9	8118	7.7
15-19	5010	9.6	4947	9.3	9957	9.5
20-24	5158	9.9	5451	10.3	10609	10.1
25-29	4501	8.6	4900	9.2	9401	8.9
30-34	3781	7.3	3997	7.5	7778	7.4
35-39	3778	7.2	4118	7.8	7896	7.5
40-44	3384	6.5	3335	6.3	6719	6.4
45-49	3448	6.6	3514	6.6	6962	6.6
50-54	2620	5.0	2665	5.0	5285	5.0
55-59	2082	4.0	2459	4.6	4541	4.3
60-64	2232	4.3	1558	2.9	3790	3.6
65-69	2564	4.9	2179	4.1	4743	4.5
70-74	1181	2.3	1276	2.4	2457	2.3
75+	1218	2.3	943	1.8	2161	2.1
Total	52116	100.0	53041	100.0	105157	100.0

5. Method of cancer registration :

Cancer patients were enrolled into the registry database from the following three sources:



Annual house to house cancer survey

SEARCH conducts an annual house to house survey to enumerate population in 134 villages and update the population register. A survey questionnaire was added to this activity to screen for cancer cases.

Annual, two-stage house to house cancer screening surveys were conducted between February and June in the villages in the registry. In the first stage, trained surveyors screened for cancer cases using a pre-tested, standardized survey questionnaire (Section 21, page 74). The trained surveyors visited every house in these villages and after obtaining an informed consent inquired

whether any member of the family is diagnosed by a doctor with cancer or anyone in the family has a lump in mouth that was present for more than one month. Individuals with affirmative answer to any one of the two questions were listed as screen-positive individuals.

In the second stage, screen-positive individuals were evaluated by the cancer registrar, a trained physician. During this evaluation visit, the registrar confirmed the diagnosis of cancer based on the documentation available with the patient, ruled out false positive cases and referred suspected cancer cases to MaaDanteshwari Hospital of SEARCH. The registrar filled the core form (incidence form) only for the patients whose cancer diagnosis was confirmed. Follow up visits of previously registered cancer cases were also undertaken to update diagnosis and treatment status.

Hospital visits

Information on the cancer cases from the registry area who were diagnosed at the MaaDanteshwari Hospital of SEARCH was obtained.The cancer registrar visited the MaaDanteshwari Hospital of SEARCHevery week. All cancer patients diagnosed during the week were screened according to the place of residence. The cancer registrar followed up those with suspected cancer from the registry area at their households to update their diagnosis and treatment status.

Verbal Autopsy

SEARCH has a mortality surveillance system in the 134 villages in the registry area where a verbal autopsy is conducted on every death. The community health workers (CHWs) of SEARCH informed the mortality surveillance team of SEARCH about each death. A trained field supervisor then visited the household where a death has occurred within 2-4 weeks after the death and filled in a verbal autopsy form. In order not to miss any death, an annual house-to-

house cross-survey was conducted to enumerate deaths in the past year. If there were any deaths which were missed, a verbal autopsy was conducted on these missing deaths. The verbal autopsies were coded by two trained physician coders independently and the underlying cause of death was assigned using a disease code using the tenth version of the International Classification of Disease (ICD-10). In case of disagreement, the coders were asked to reconcile their diagnosis. If the disagreement persisted, the cause of death was adjudicated by a third, senior physician. All verbal autopsies with code of diagnosis from C00-C97 were considered as cancer deaths.

6. Data collection, management and analyses

The cancer registrar filled in core forms for cancer cases from data obtained from various sources discussed above. The process was as follows-

Data from household surveys

- Data from screening household surveys were collected in a standardized survey form.
- If any members in the household reported being diagnosed with cancer or had a lump in oral cavity for more than a month, the person was considered as screen-positive for cancer. Her/his name was listed along with the details of the household and village.
- The cancer registrar visited such individuals, confirmed or refuted the diagnosis using available documentation, extracted information about the diagnosis and treatment of cancer and filled in a core form.
- A list of those with suspected cancer was made and such patients were followed up by the cancer registrar for an update of the diagnosis and treatment.

Data from hospitals

- The cancer registrar obtained a list of patients diagnosed with cancers from the hospital of SEARCH on a weekly basis. For those from the registry area the registrar filled in the core incidence form.
- Those who were suspected of having cancer were followed up by the cancer registrar to update the diagnosis and treatment details.

Data from verbal autopsies

- The cancer registrar was given the verbal autopsy forms with final ICD-10 codes belonging to 'C' category (alphabetical code for all cancer diagnoses) for deceased individuals from the registry area.
- The cancer registrar extracted data from these verbal autopsy forms and filled in a mortality core form.

Definitions of incident and prevalent cancer cases and cancer deaths

Incident cancer cases:

Cancer cases diagnosed for the first time between 1st January and 31st December of a given calendar year were listed as incident cancer cases for that year. Cancer patients who were registered for the first time after their death from the verbal autopsies in a given calendar year were also listed as incident cancer cases for that year.

Prevalent cancer cases:

Cancer patients who were diagnosed before 1st January 2015 and who were surviving during an annual household survey in a given calendar year were considered as prevalent cancer cases.

Cancer deaths:

Cancer patients who were enrolled in the cancer registry through verbal autopsies or incident/prevalent cases that were enrolled in the registry before their death but died during a given calendar year were considered as cancer deaths in the given calendar year.

Description of the coding procedures:

- An incidence and a mortality forms were developed on the lines of the standard reporting format for cancer registries with modifications to suit the data collection procedure for this registry.
- The incidence data form contained both the ICD O 3 (the third version of the International Classification of Diseases- Oncology codes) and the ICD 10 codes for cancer diagnosis.
- The mortality form (from verbal autopsy) contained only the ICD 10 codes used for cause of death diagnosis.
- If a registered cancer patient died and the information was available from both the incidence form filled when the patient was alive and the verbal autopsy form after the death then the most accurate information was used for data entry for that patient.
- If the site of cancer remained ill-defined from all sources during an evaluation by the cancer registrar and if at a later date more accurate information became available about the diagnosis (e.g. relative providing more information, additional information becomes available during diagnostic work up in the hospital) then the registry data were updated to include the most accurate diagnosis.

Data entry and analyses

- The data were entered in a standardized incidence or mortality form by the cancer registrar.
- The forms were checked for completeness by the data manager.
- The data in these forms were entered in a database by data entry operators.
- Data were analyzed using STATA statistical software(version 10)

7. Quality control

Due to lack of diagnostic facilities for cancer in the district, collecting data on cancer diagnosis was challenging. In order to ensure quality of the data collected through the registry, various quality control measures were put in place at every step of data collection and data management.

Cancer registrar training

- The cancer registrar underwent training in cancer registration for three days at the Tata Memorial Centre before the start of the registry.
- The cancer registrar also received on field training at the rural PBCR at Barshi.
- Cancer registrar underwent an 'Inter Country Training on Setting up Population Based Cancer Registries' organized by the World Health Organization in November 2016.

Training of field supervisors and surveyors

- Cancer registrar and a senior investigator (YK) trained field supervisors of SEARCH in screening for the cases of cancer.
- Surveyors of SEARCH were trained in one day workshop prior to house to house surveys to screen for cancer cases.
- Surveyors were evaluated at the end of the training and those scoring less than 80% marks underwent retraining at SEARCH and close supervision in the field.

Supervision and resurveys on a sample basis during household surveys

- The cancer registrar conducted supportive supervision during household surveys
- Field supervisors monitored the progress of data collection and re-surveyed about 2% of the households to ensure accuracy of the data.

Collecting evidence of cancer diagnosis and treatment from cancer cases identified from field surveys

- Photos of the diagnostic work up done on patients as well as discharge summaries were taken and their printouts were attached with the core forms to cross-verify the data collected by the cancer registrar.
- Clinical photographs were taken in cases where the cancer or its effects can be seen externally and kept for documentation.

Quality control in cancer death coding by verbal autopsies

- Standardized criteria specified by the Million Death Study(http://cghr.org:8080/cme2-training/reference/MDS_manual.pdf) were used to diagnose cancer deaths on verbal autopsies.
- To ensure that the verbal autopsy coder is not biased, each verbal autopsy was independently coded by two trained physicians.
- If the two coders continue to disagree, a third senior coder adjudicated the cause of death.

Core forms cross checking by senior investigator

- A senior investigator (YK) went through all the core forms to ensure correct coding of diagnoses.

Data entry, management and analyses

- The data manager went through the forms to ensure that the data were entered in the correct format.
- The statistician went through the database and before analyses checked the database for any invalid or missing data entries.
- The analyzed data were reviewed jointly by the cancer registrar, statistician and a senior investigator to check for any errors.

8. Data quality and indices of reliability

Some of the indicators used to assess the data quality in population-based cancer registries in India are-

- Percentage of cancer cases where the age was unknown -should be <10%
- Microscopic verification (MV)-should be >80%
- Cancer registration by death certificate only (DCO) –should be <10%
- Other and unspecified sites- should be <10%
- Stability of incidence rates over time

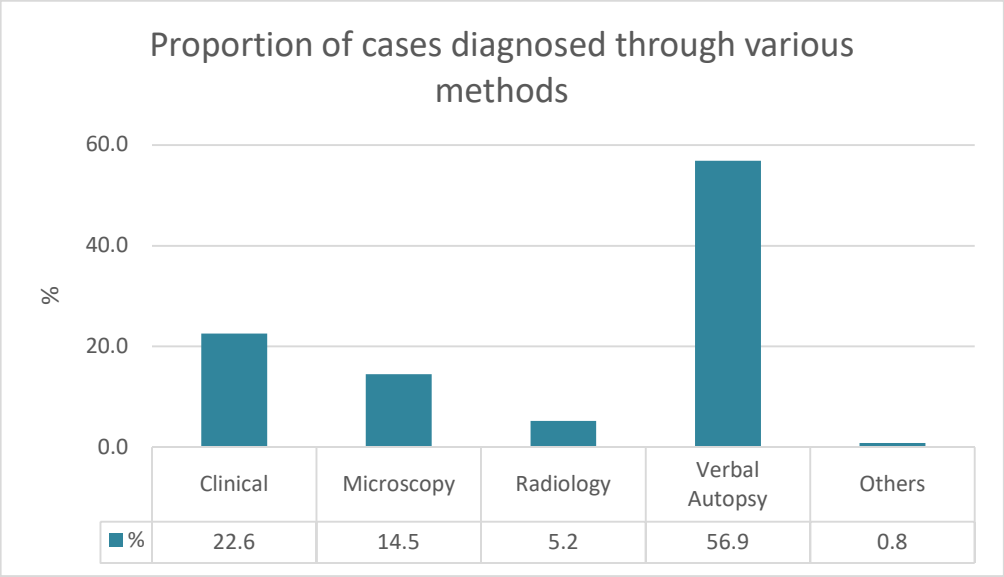
However, as discussed by Bray et al.[2], cancer registration in low- and middle- income countries may face hurdles in achieving these data quality indicators.

Percentage of cancer cases where age was unknown

Due to the availability of data from the census of SEARCH we did not have any cancer patient whose age was unknown.

Basis of diagnosis and microscopic verification

Gadchiroli district has mostly secondary level health care facilities. There was only one pathologist in the district until recently, now there are two. Due to poor availability of diagnostic and treatment facilities, lack of awareness, high costs of cancer diagnosis and fatalistic attitude towards cancer, few cancer patients had diagnosis confirmed by microscopy. Microscopic verification of diagnosis was available in 14.5% patients, 13.9% among females and 15.3% among males. A majority of patients were registered through verbal autopsies.



Comparison of basis of diagnosis of cancer in Gadchiroli PBCR with those of other rural registries

Registry-	**Gadchiroli (2015-2018)**		**Barshi (2012-2014)**		**Mansa (2015-16)**	
	Female	Male	Female	Male	Female	Male
Relative proportion of basis of diagnosis of all cancer sites	%	%	%	%	%	%
Clinical	29.2	14.4	4.2	4.0	4.8	5.8
Microscopy	13.9	15.3	85.1	85.0	86.3	80.8
Radiology	5.1	5.4	4.6	5.1	4.9	5.8
Verbal Autopsy	51.8	63	0	0	0	0
Others	0	1.8	4.8	5.1	0.5	0.6
Death Certificate Only (DCO)	0	0	1.3	0.9	3.5	6.9

(Note-The nearest organized cancer care is available at 200 kilometers for PBCR, Gadchiroli. The Barshi registry has the Nargis Dutt Memorial Cancer Hospital at Barshi while for Mansa registry, cancer care is available within 60 kilometers.)

Percentage of other and unspecified cancer sites

Overall the site for cancer remained undefined in 16.1% of cancer patients (ICD-10 codes for other and unspecified cancer sites are defined in section 21, pages 72-73). Among females, 20 out of 137 (14.5%) cancers and among males 20 out of 111 (18 %) of all cancers were ill defined. All the cancers of ill-defined sites were from patients who were enrolled in the registry through verbal autopsies.

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Registry	Total	Other and unspecified cancer sites	
	n	n	%
Gadchiroli (2015-2018)	248	40	16.1
Mansa (2015-16)	1026	63	6.1
Barshi rural (2012-2014)	929	82	8.8

Stability of incidence rates over time

The incidence rate was higher for the first year but then it hasdeclined and largely seems to be stabilizing (see Section 20, Table 6).

9. Cancer incidence

The data presented here are for the years 2015 and 2016.

Total number of incident cancer cases:

The year wise distribution of the cancer cases registered is as shown-

Year	Female	Male	Overall
2015	44	33	77
2016	32	22	54
2017	34	21	55
2018	27	35	62
Total	**137**	**111**	**248**

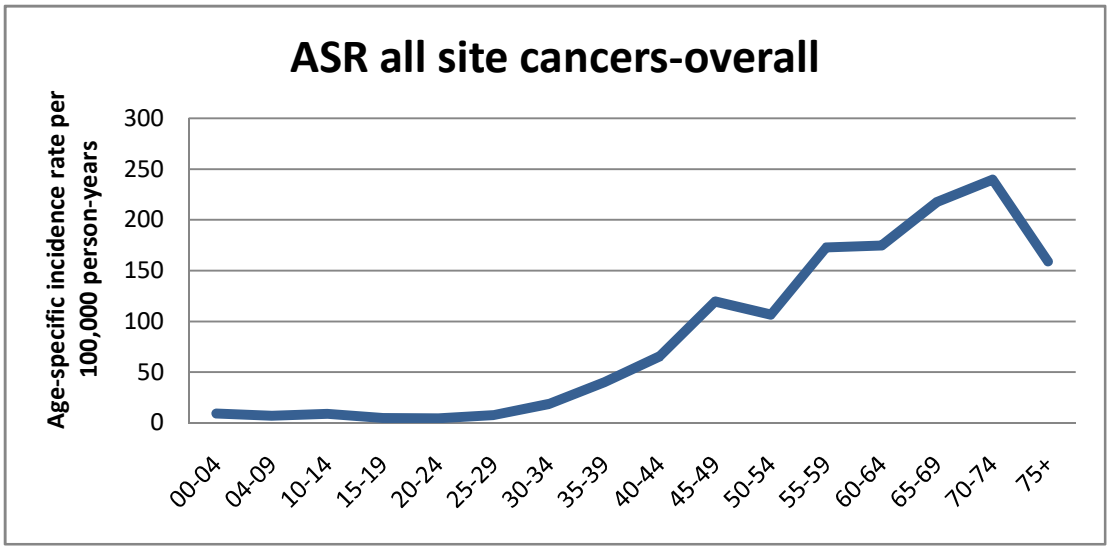
Cancer incidence: Crude incidence rates (CR), age-adjusted incidence rates (AAR) and truncated rates for ages 35-64 (TR) per 100,000 population for years 2015-18

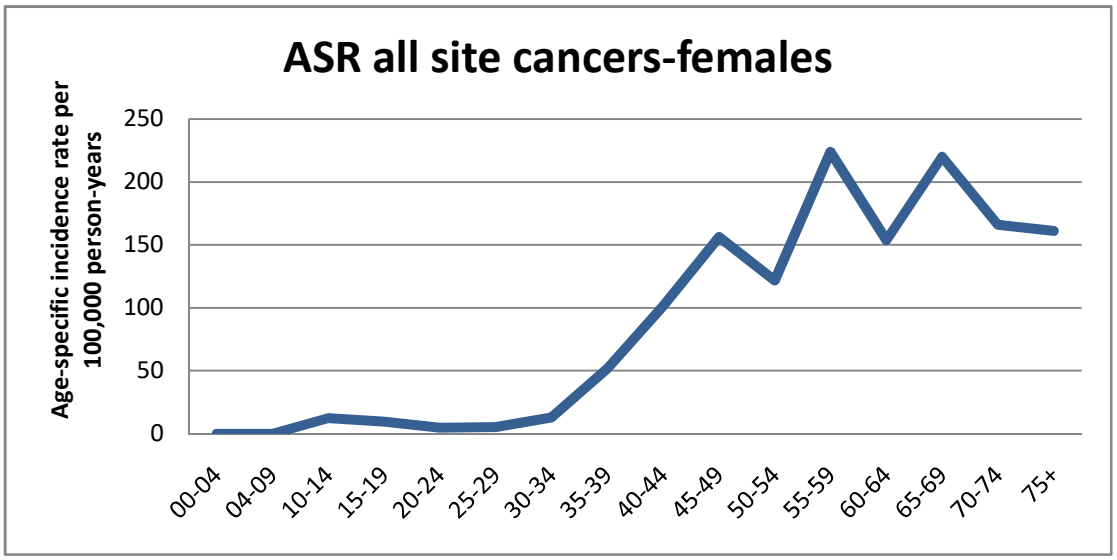
Female			Male			Overall		
CR	AAR	TR	CR	AAR	TR	CR	AAR	TR
64.4	53.3	128.3	51.3	49.0	85.6	57.8	52.5	105.8

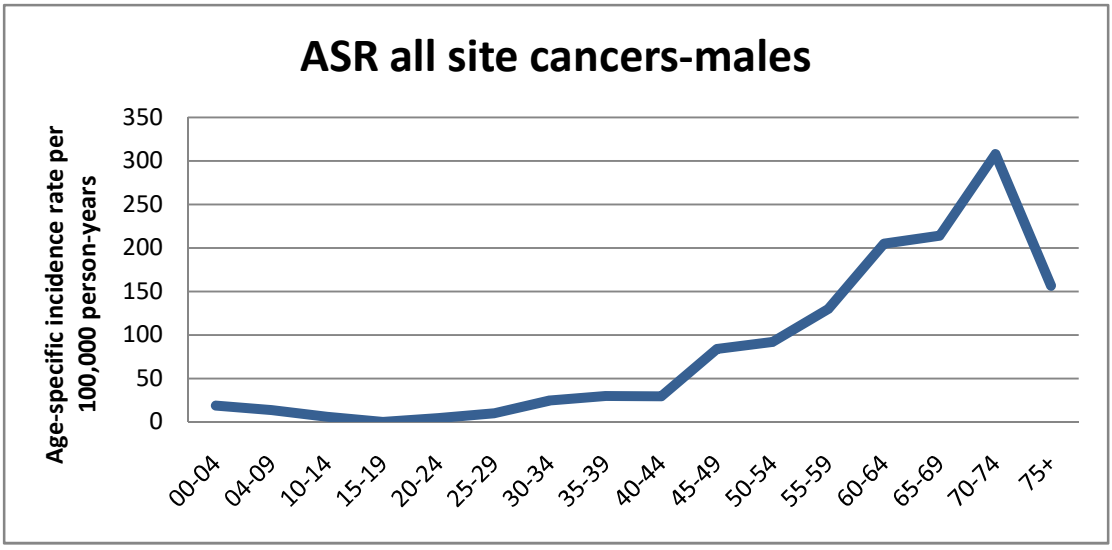
Cumulative rates, cumulative risk and the possibility of one in number of persons developing cancer at any site for years 2015-18:

Cumulative Rates (%)				Cumulative Risk (%)				Possibility of one in number of persons developing cancer			
0-64 years		0-74 years		0-64 years		0-74 years		0-64 years		0-74 years	
Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
4.3	3.2	6.2	5.8	4.2	3.2	6.0	6.2	24	31	17	18

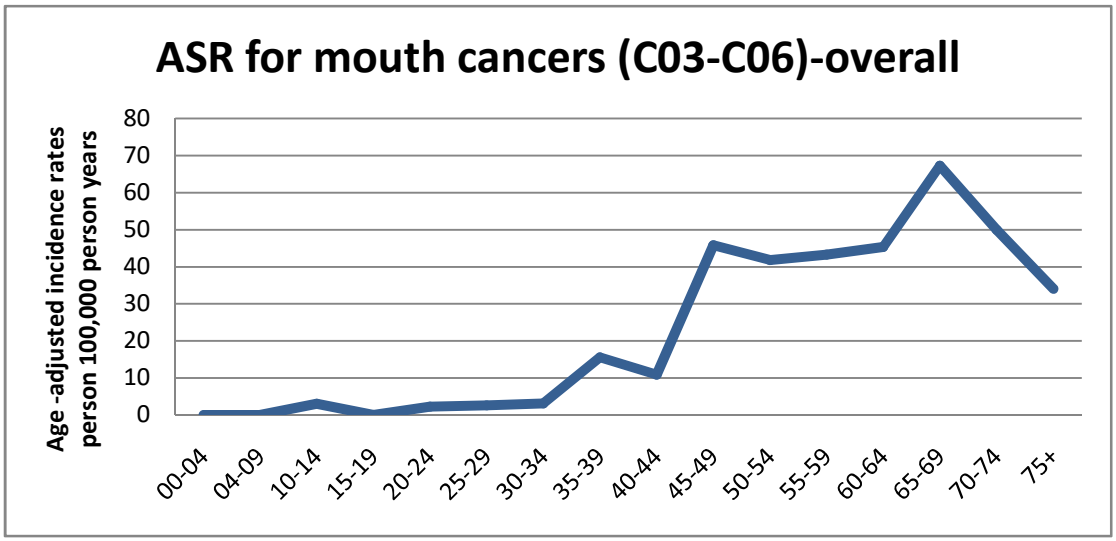
Age-specific incidence rates (ASR) for all site cancers (2015-18)

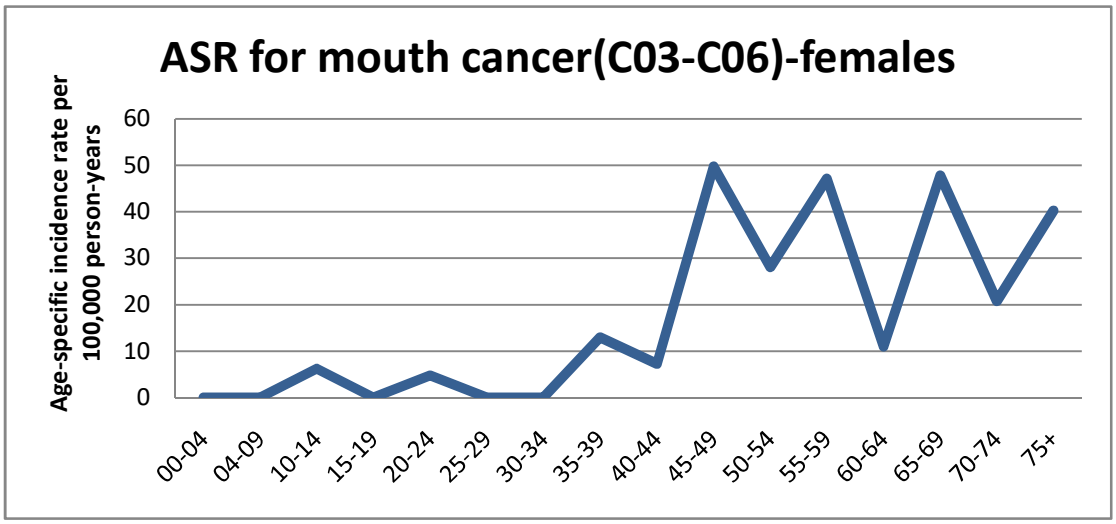


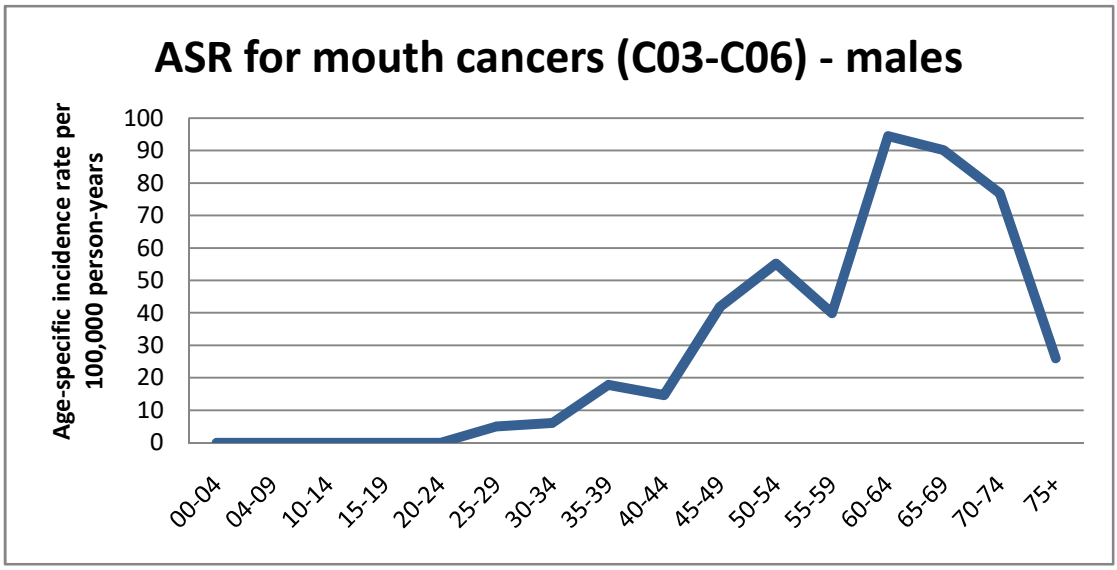


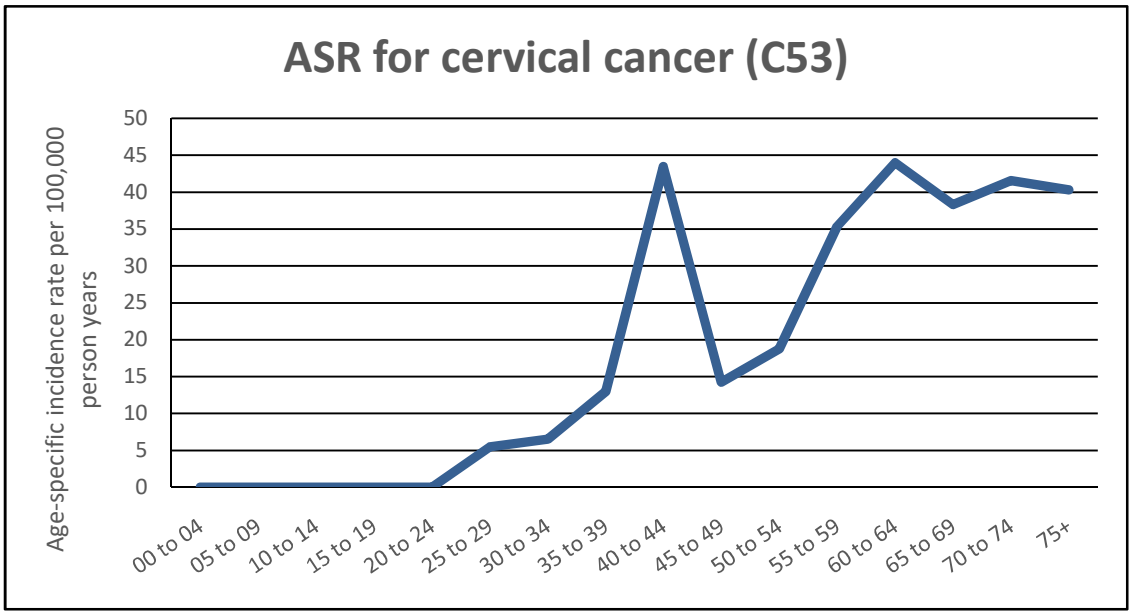


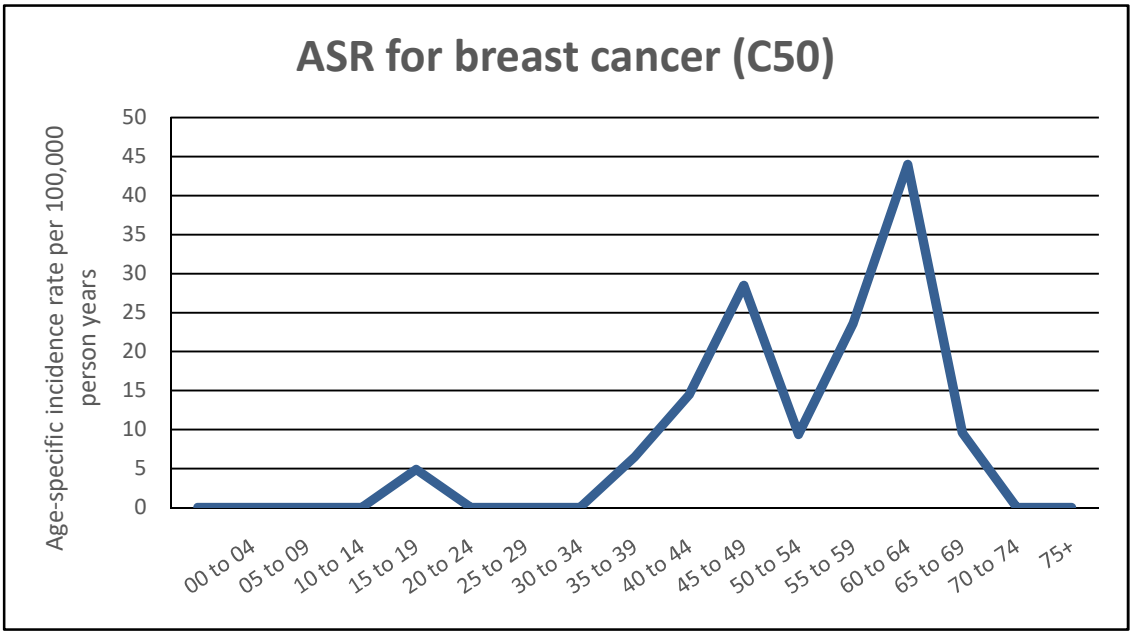
Age-specific incidence rates for selected cancers for years 2015-18





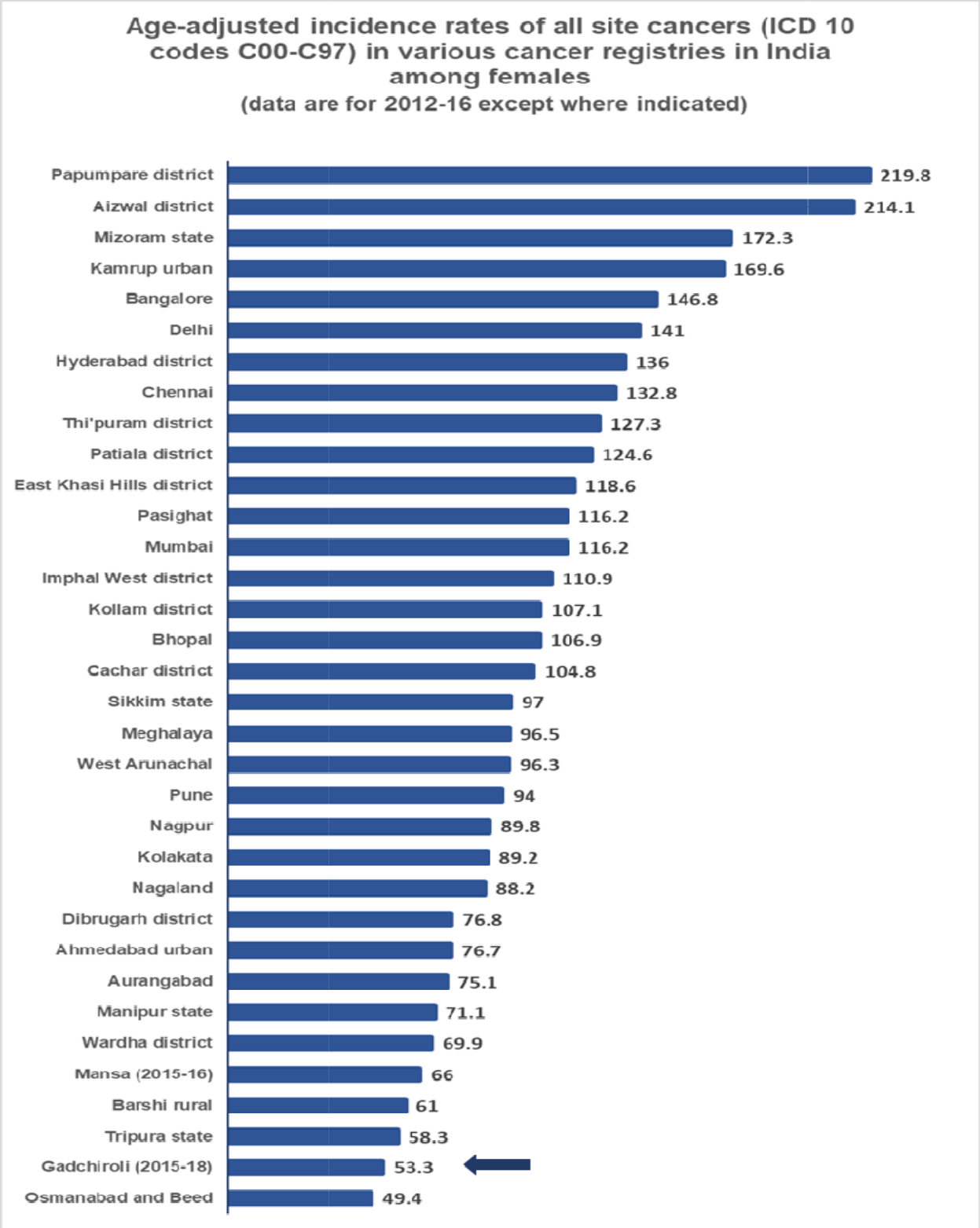


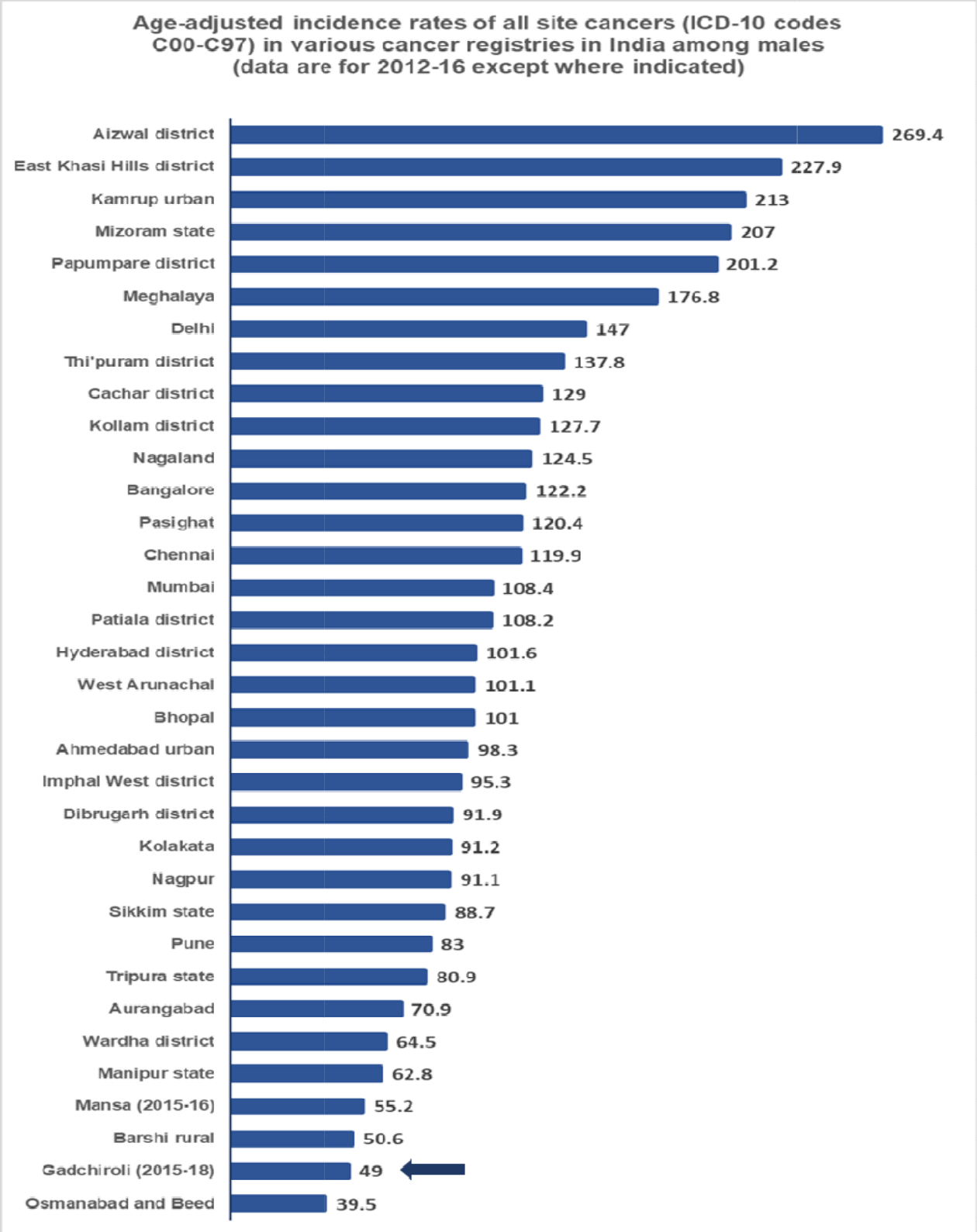

ASR for cervical cancer (C53)
Age-specific incidence rate per 100,000 person years
50
45
40
35
30
25
20
15
10
5
0
00 to 04
05 to 09
10 to 14
15 to 19
20 to 24
25 to 29
30 to 34
35 to 39
40 to 44
45 to 49
50 to 54
55 to 59
60 to 64
65 to 69
70 to 74
75+

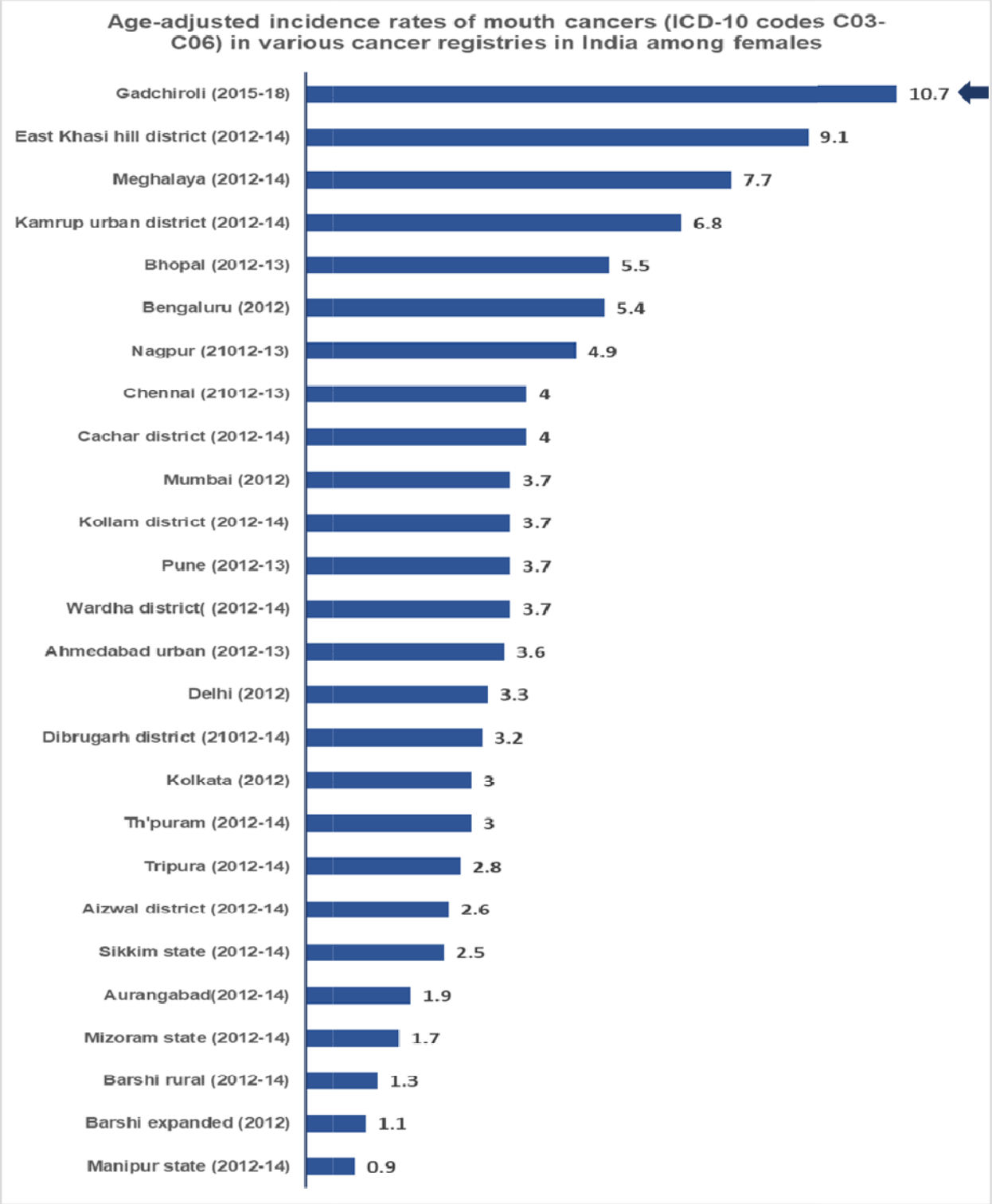

ASR for breast cancer (C50)
Age-specific incidence rate per 100,000 person years
50
45
40
35
30
25
20
15
10
5
0
00 to 04
05 to 09
10 to 14
15 to 19
20 to 24
25 to 29
30 to 34
35 to 39
40 to 44
45 to 49
50 to 54
55 to 59
60 to 64
65 to 69
70 to 74
75+

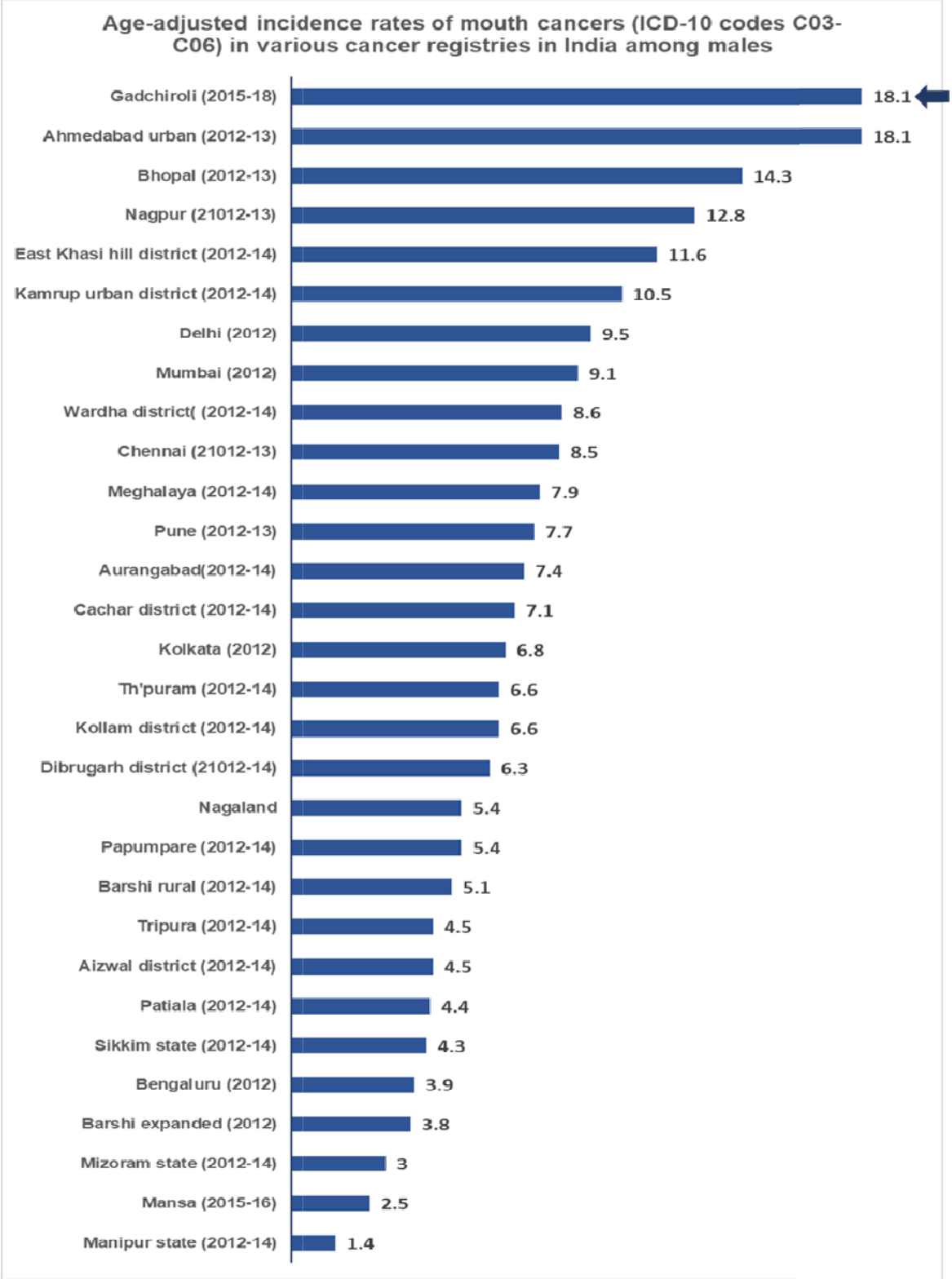
Comparison of age adjusted incidence rates for all cancer sites in PBCR Gadchiroli with other cancer registries

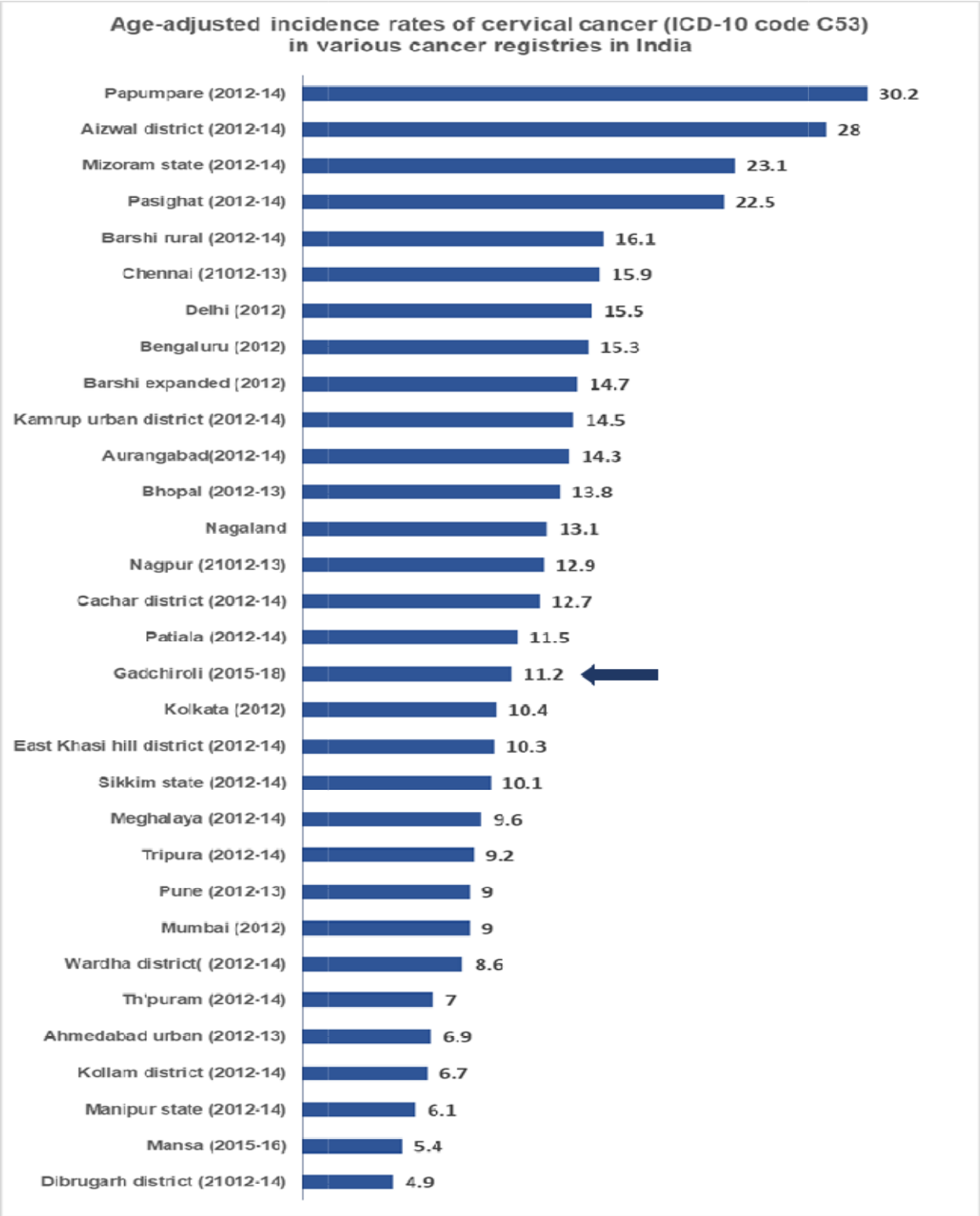
Data are presented for AAR of cancers at all sites as well as some leading cancer sites e.g. cervical, mouth and breast cancers in females and mouth cancers in males. Data on AARs for cancers at all sites (2012-2016) and for specific sites (2012-14) from the cancer registries in the National Cancer Registry Programme [3-4]. Data from Mansa population-based cancer registry was obtained from the published report of the registry for 2015-16[5].

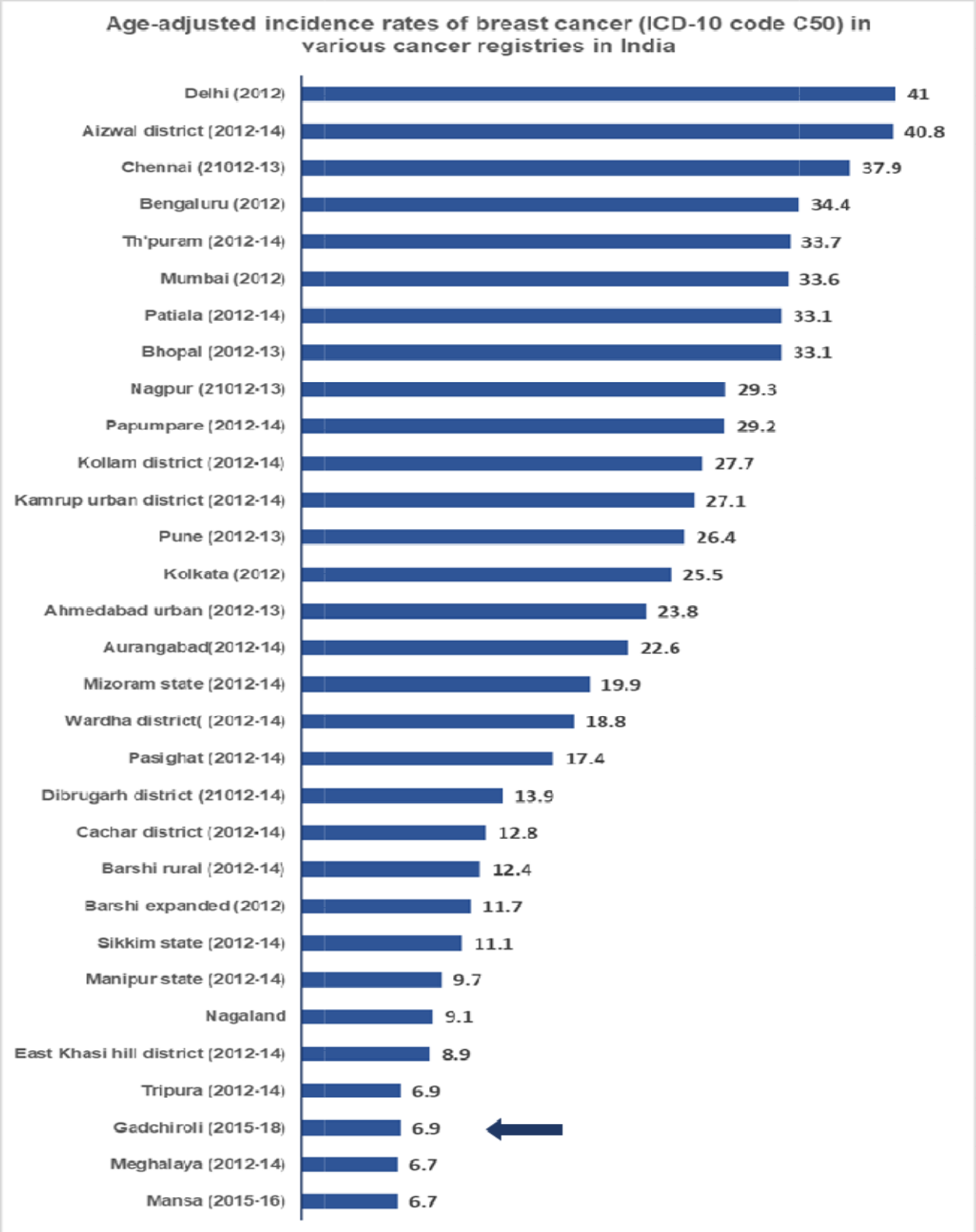

Age-adjusted incidence rates of all site cancers (ICD 10 codes C00-C97) in various cancer registries in India among females
(data are for 2012-16 except where indicated)
Papumpare district 219.8
Aizwal district 214.1
Mizoram state 172.3
Kamrup urban 169.6
Bangalore 146.8
Delhi 141
Hyderabad district 136
Chennai 132.8
Thi'puram district 127.3
Patiala district 124.6
East Khasi Hills district 118.6
Pasighat 116.2
Mumbai 116.2
Imphal West district 110.9
Kollam district 107.1
Bhopal 106.9
Cachar district 104.8
Sikkim state 97
Meghalaya 96.5
West Arunachal 96.3
Pune 94
Nagpur 89.8
Kolakata 89.2
Nagaland 88.2
Dibrugarh district 76.8
Ahmedabad urban 76.7
Aurangabad 75.1
Manipur state 71.1
Wardha district 69.9
Mansa (2015-16) 66
Barshi rural 61
Tripura state 58.3
Gadchiroli (2015-18) 53.3
Osmanabad and Beed 49.4


Age-adjusted incidence rates of all site cancers (ICD-10 codes C00-C97) in various cancer registries in India among males (data are for 2012-16 except where indicated)
Aizwal district 269.4
East Khasi Hills district 227.9
Kamrup urban 213
Mizoram state 207
Papumpare district 201.2
Meghalaya 176.8
Delhi 147
Thi'puram district 137.8
Cachar district 129
Kollam district 127.7
Nagaland 124.5
Bangalore 122.2
Pasighat 120.4
Chennai 119.9
Mumbai 108.4
Patiala district 108.2
Hyderabad district 101.6
West Arunachal 101.1
Bhopal 101
Ahmedabad urban 98.3
Imphal West district 95.3
Dibrugarh district 91.9
Kolakata 91.2
Nagpur 91.1
Sikkim state 88.7
Pune 83
Tripura state 80.9
Aurangabad 70.9
Wardha district 64.5
Manipur state 62.8
Mansa (2015-16) 55.2
Barshi rural 50.6
Gadchiroli (2015-18) 49
Osmanabad and Beed 39.5


Age-adjusted incidence rates of mouth cancers (ICD-10 codes C03-C06) in various cancer registries in India among females
Gadchiroli (2015-18) 10.7
East Khasi hill district (2012-14) 9.1
Meghalaya (2012-14) 7.7
Kamrup urban district (2012-14) 6.8
Bhopal (2012-13) 5.5
Bengaluru (2012) 5.4
Nagpur (21012-13) 4.9
Chennai (21012-13) 4
Cachar district (2012-14) 4
Mumbai (2012) 3.7
Kollam district (2012-14) 3.7
Pune (2012-13) 3.7
Wardha district((2012-14) 3.7
Ahmedabad urban (2012-13) 3.6
Delhi (2012) 3.3
Dibrugarh district (21012-14) 3.2
Kolkata (2012) 3
Th'puram (2012-14) 3
Tripura (2012-14) 2.8
Aizwal district (2012-14) 2.6
Sikkim state (2012-14) 2.5
Aurangabad(2012-14) 1.9
Mizoram state (2012-14) 1.7
Barshi rural (2012-14) 1.3
Barshi expanded (2012) 1.1
Manipur state (2012-14) 0.9


Age-adjusted incidence rates of mouth cancers (ICD-10 codes C03-C06) in various cancer registries in India among males
Gadchiroli (2015-18) 18.1
Ahmedabad urban (2012-13) 18.1
Bhopal (2012-13) 14.3
Nagpur (21012-13) 12.8
East Khasi hill district (2012-14) 11.6
Kamrup urban district (2012-14) 10.5
Delhi (2012) 9.5
Mumbai (2012) 9.1
Wardha district((2012-14) 8.6
Chennai (21012-13) 8.5
Meghalaya (2012-14) 7.9
Pune (2012-13) 7.7
Aurangabad(2012-14) 7.4
Cachar district (2012-14) 7.1
Kolkata (2012) 6.8
Th'puram (2012-14) 6.6
Kollam district (2012-14) 6.6
Dibrugarh district (21012-14) 6.3
Nagaland 5.4
Papumpare (2012-14) 5.4
Barshi rural (2012-14) 5.1
Tripura (2012-14) 4.5
Aizwal district (2012-14) 4.5
Patiala (2012-14) 4.4
Sikkim state (2012-14) 4.3
Bengaluru (2012) 3.9
Barshi expanded (2012) 3.8
Mizoram state (2012-14) 3
Mansa (2015-16) 2.5
Manipur state (2012-14) 1.4

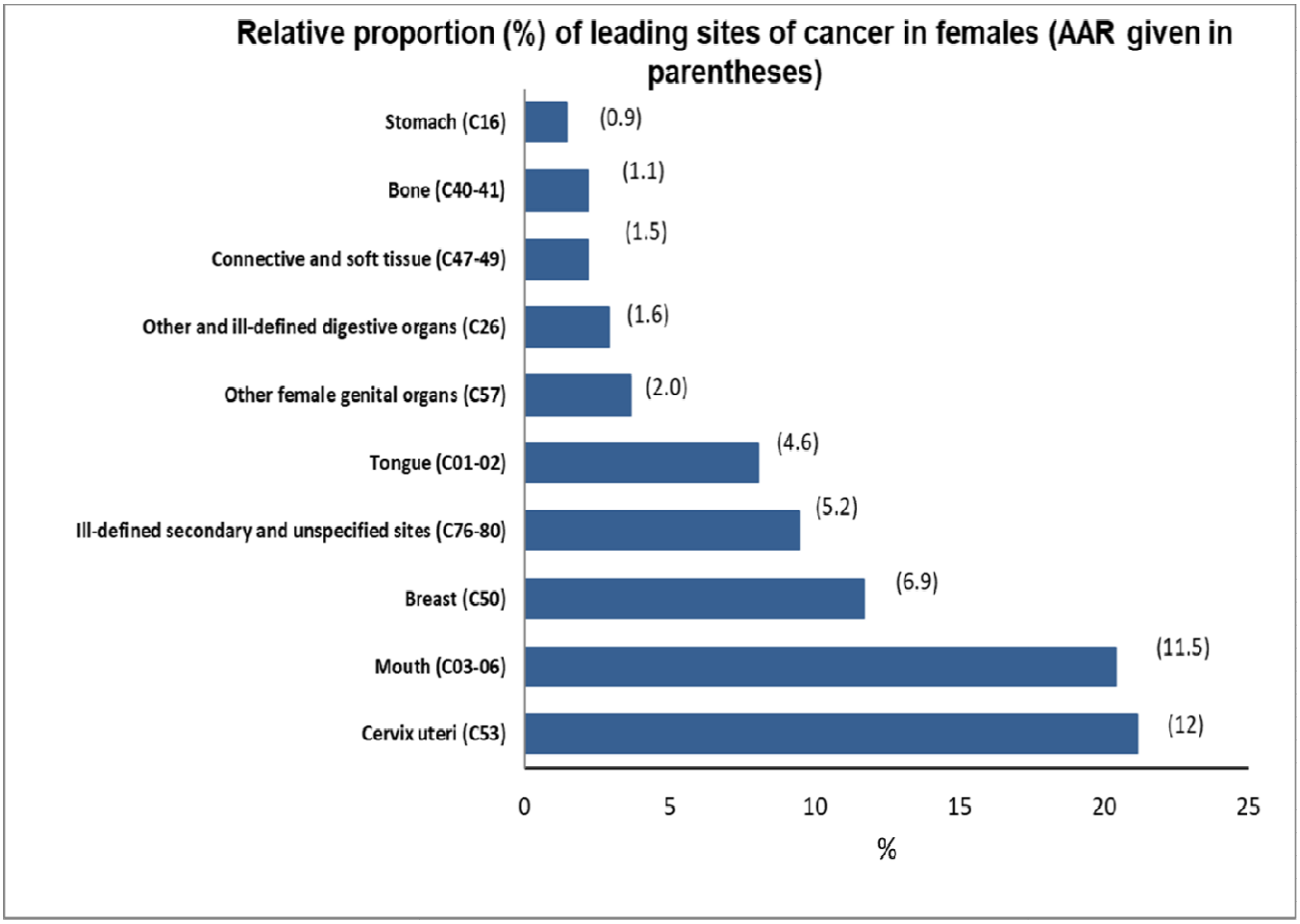

Age-adjusted incidence rates of cervical cancer (ICD-10 code C53) in various cancer registries in India
Papumpare (2012-14) 30.2
Aizwal district (2012-14) 28
Mizoram state (2012-14) 23.1
Pasighat (2012-14) 22.5
Barshi rural (2012-14) 16.1
Chennai (21012-13) 15.9
Delhi (2012) 15.5
Bengaluru (2012) 15.3
Barshi expanded (2012) 14.7
Kamrup urban district (2012-14) 14.5
Aurangabad(2012-14) 14.3
Bhopal (2012-13) 13.8
Nagaland 13.1
Nagpur (21012-13) 12.9
Cachar district (2012-14) 12.7
Patiala (2012-14) 11.5
Gadchiroli (2015-18) 11.2
Kolkata (2012) 10.4
East Khasi hill district (2012-14) 10.3
Sikkim state (2012-14) 10.1
Meghalaya (2012-14) 9.6
Tripura (2012-14) 9.2
Pune (2012-13) 9
Mumbai (2012) 9
Wardha district((2012-14) 8.6
Th'puram (2012-14) 7
Ahmedabad urban (2012-13) 6.9
Kollam district (2012-14) 6.7
Manipur state (2012-14) 6.1
Mansa (2015-16) 5.4
Dibrugarh district (21012-14) 4.9


Age-adjusted incidence rates of breast cancer (ICD-10 code C50) in various cancer registries in India
Delhi (2012) 41
Aizwal district (2012-14) 40.8
Chennai (21012-13) 37.9
Bengaluru (2012) 34.4
Th'puram (2012-14) 33.7
Mumbai (2012) 33.6
Patiala (2012-14) 33.1
Bhopal (2012-13) 33.1
Nagpur (21012-13) 29.3
Papumpare (2012-14) 29.2
Kollam district (2012-14) 27.7
Kamrup urban district (2012-14) 27.1
Pune (2012-13) 26.4
Kolkata (2012) 25.5
Ahmedabad urban (2012-13) 23.8
Aurangabad(2012-14) 22.6
Mizoram state (2012-14) 19.9
Wardha district((2012-14) 18.8
Pasighat (2012-14) 17.4
Dibrugarh district (21012-14) 13.9
Cachar district (2012-14) 12.8
Barshi rural (2012-14) 12.4
Barshi expanded (2012) 11.7
Sikkim state (2012-14) 11.1
Manipur state (2012-14) 9.7
Nagaland 9.1
East Khasi hill district (2012-14) 8.9
Tripura (2012-14) 6.9
Gadchiroli (2015-18) 6.9
Meghalaya (2012-14) 6.7
Mansa (2015-16) 6.7

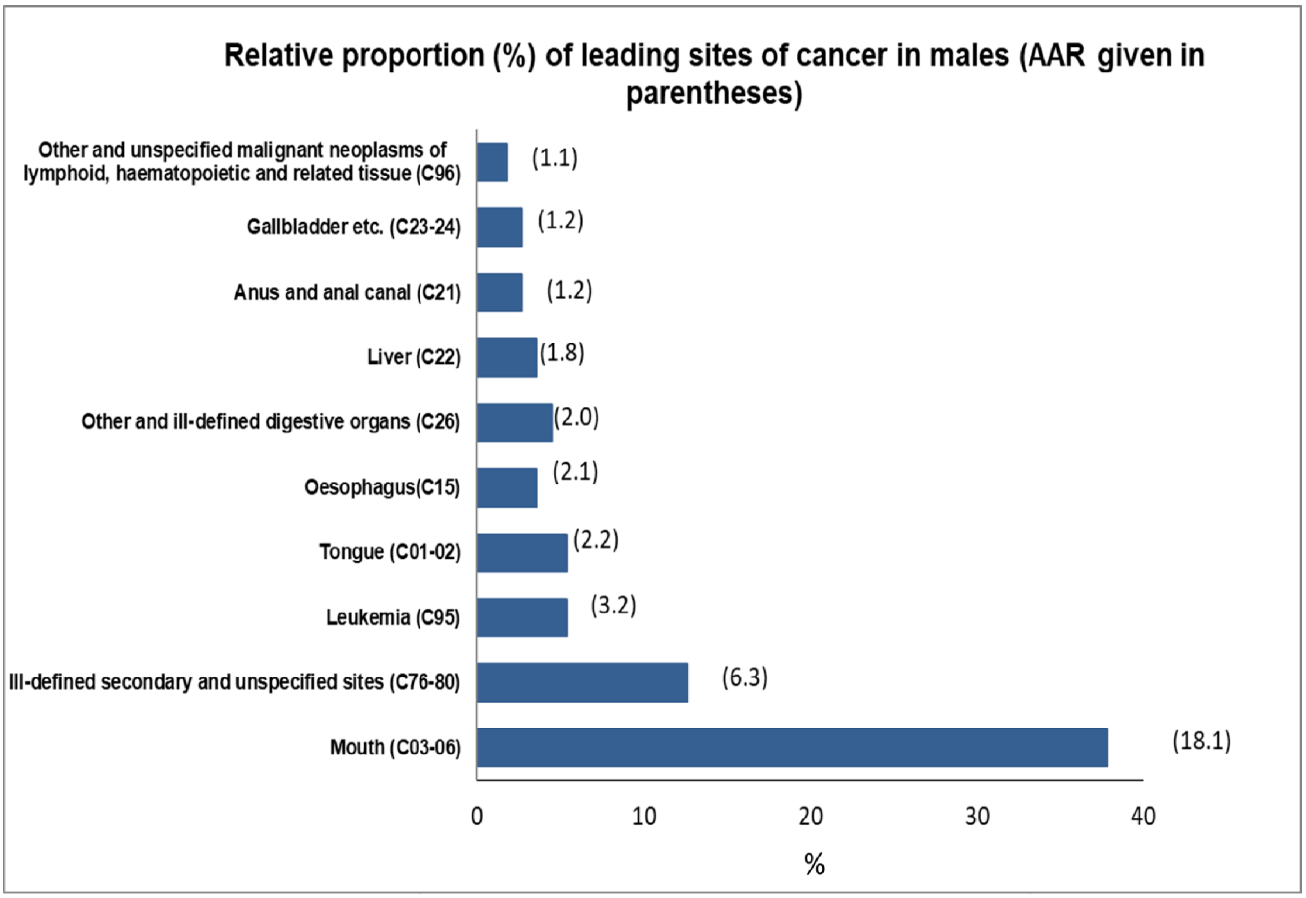
10. Leading cancer sites

The relative proportion of cancers at leading cancer sites and the age adjusted incidence rates are shown below.

Leading cancer sites in females



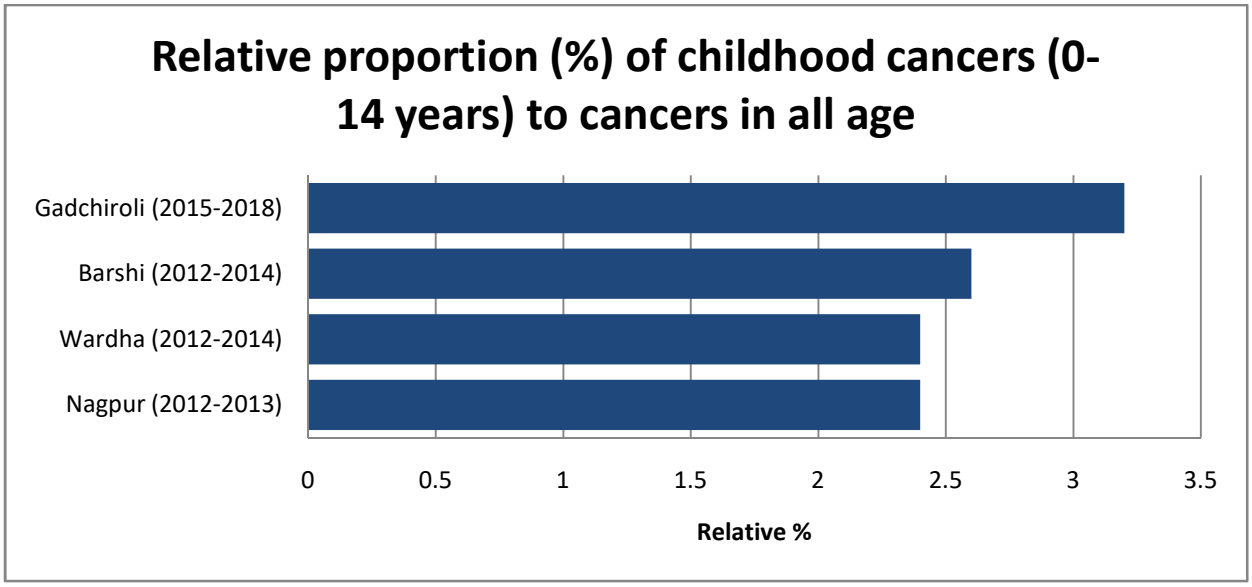
Leading cancer sites in males



Childhood cancers:

Childhood cancers accounted for 3.2 % of all cancers registered. There were two childhood cancers in females and six among males.

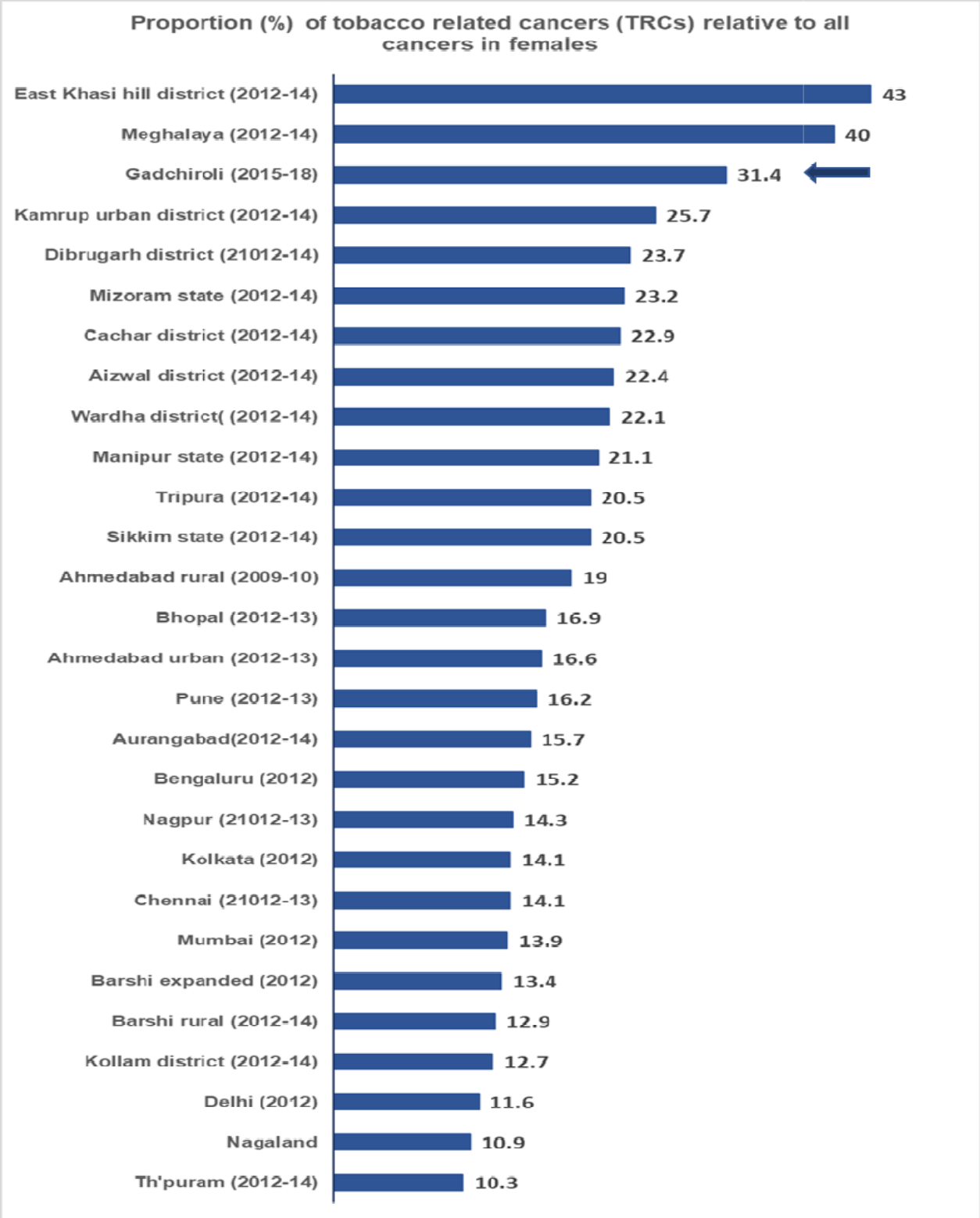
The following graph compares relative proportions of childhood cancers in selected PBCRs that are geographically close to Gadchiroli.

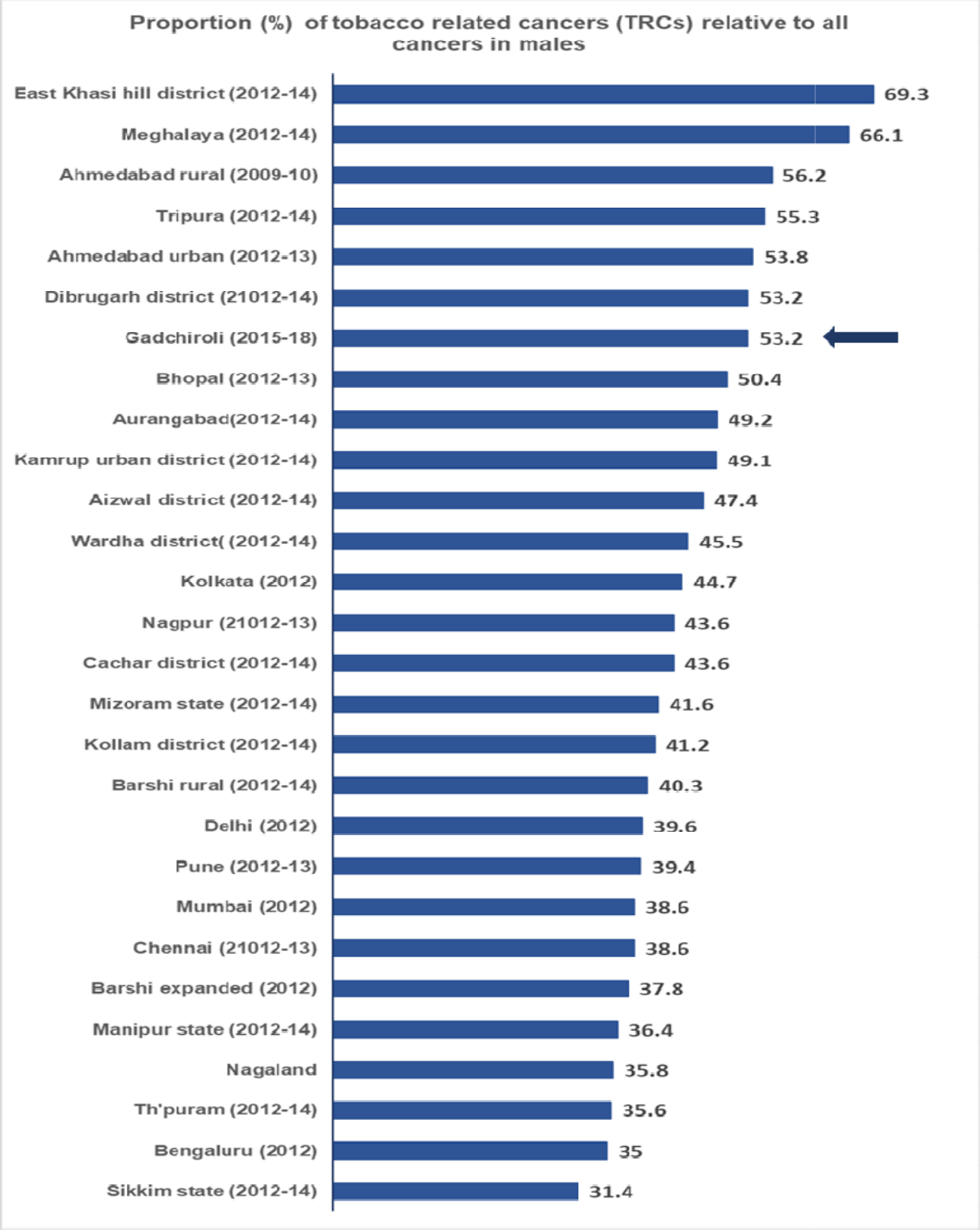


11. Tobacco related cancers (TRCs)in Gadchiroli

A pan shop selling tobacco products- one village has many such shops

Smokeless tobacco consumption is very common in Gadchiroli with close to 50% of the population using tobacco products[6]. Tobacco related cancers accounted for 41.1% of all cancers. Among females and males, the percentage of tobacco related cancers were among the highest reported from various cancer registries in India. Sex-wise distribution of TRCs in PBCR Gadchiroli and the other cancer registries is as shown-

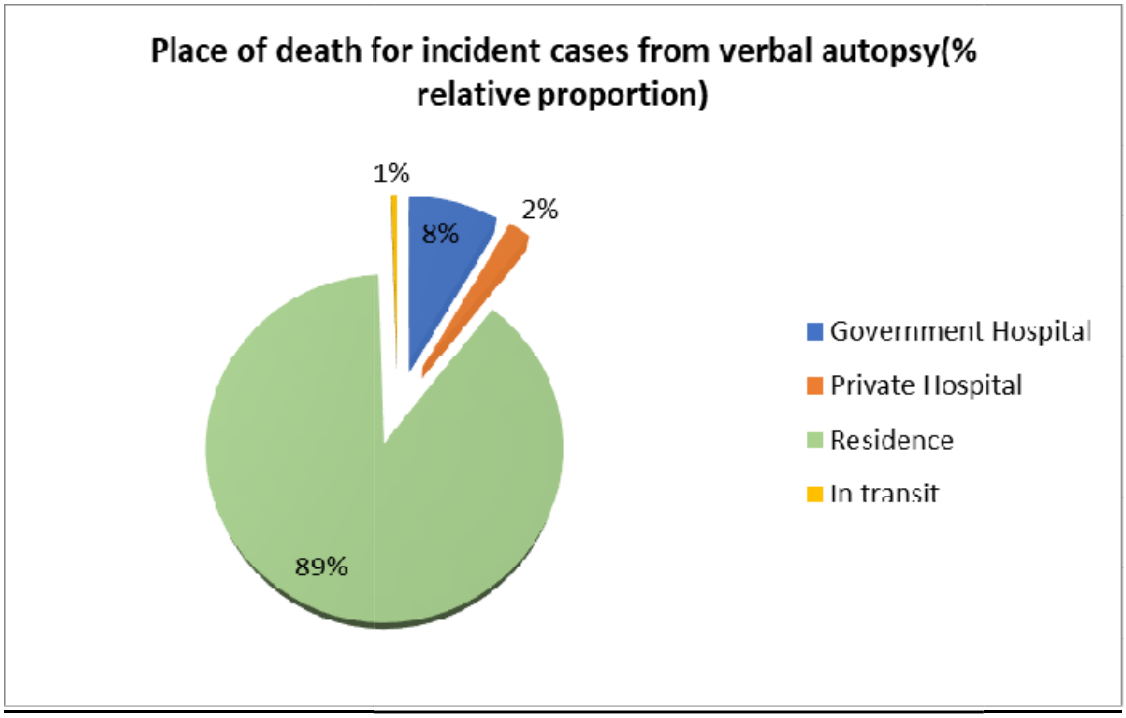

Proportion (%) of tobacco related cancers (TRCs) relative to all cancers in females
East Khasi hill district (2012-14) 43
Meghalaya (2012-14) 40
Gadchiroli (2015-18) 31.4
Kamrup urban district (2012-14) 25.7
Dibrugarh district (21012-14) 23.7
Mizoram state (2012-14) 23.2
Cachar district (2012-14) 22.9
Aizwal district (2012-14) 22.4
Wardha district((2012-14) 22.1
Manipur state (2012-14) 21.1
Tripura (2012-14) 20.5
Sikkim state (2012-14) 20.5
Ahmedabad rural (2009-10) 19
Bhopal (2012-13) 16.9
Ahmedabad urban (2012-13) 16.6
Pune (2012-13) 16.2
Aurangabad(2012-14) 15.7
Bengaluru (2012) 15.2
Nagpur (21012-13) 14.3
Kolkata (2012) 14.1
Chennai (21012-13) 14.1
Mumbai (2012) 13.9
Barshi expanded (2012) 13.4
Barshi rural (2012-14) 12.9
Kollam district (2012-14) 12.7
Delhi (2012) 11.6
Nagaland 10.9
Th'puram (2012-14) 10.3


Proportion (%) of tobacco related cancers (TRCs) relative to all cancers in males
East Khasi hill district (2012-14) 69.3
Meghalaya (2012-14) 66.1
Ahmedabad rural (2009-10) 56.2
Tripura (2012-14) 55.3
Ahmedabad urban (2012-13) 53.8
Dibrugarh district (21012-14) 53.2
Gadchiroli (2015-18) 53.2
Bhopal (2012-13) 50.4
Aurangabad(2012-14) 49.2
Kamrup urban district (2012-14) 49.1
Aizwal district (2012-14) 47.4
Wardha district((2012-14) 45.5
Kolkata (2012) 44.7
Nagpur (21012-13) 43.6
Cachar district (2012-14) 43.6
Mizoram state (2012-14) 41.6
Kollam district (2012-14) 41.2
Barshi rural (2012-14) 40.3
Delhi (2012) 39.6
Pune (2012-13) 39.4
Mumbai (2012) 38.6
Chennai (21012-13) 38.6
Barshi expanded (2012) 37.8
Manipur state (2012-14) 36.4
Nagaland 35.8
Th'puram (2012-14) 35.6
Bengaluru (2012) 35
Sikkim state (2012-14) 31.4

12. Cancer Mortality

Total deaths due to cancer for the years 2015-18 were -

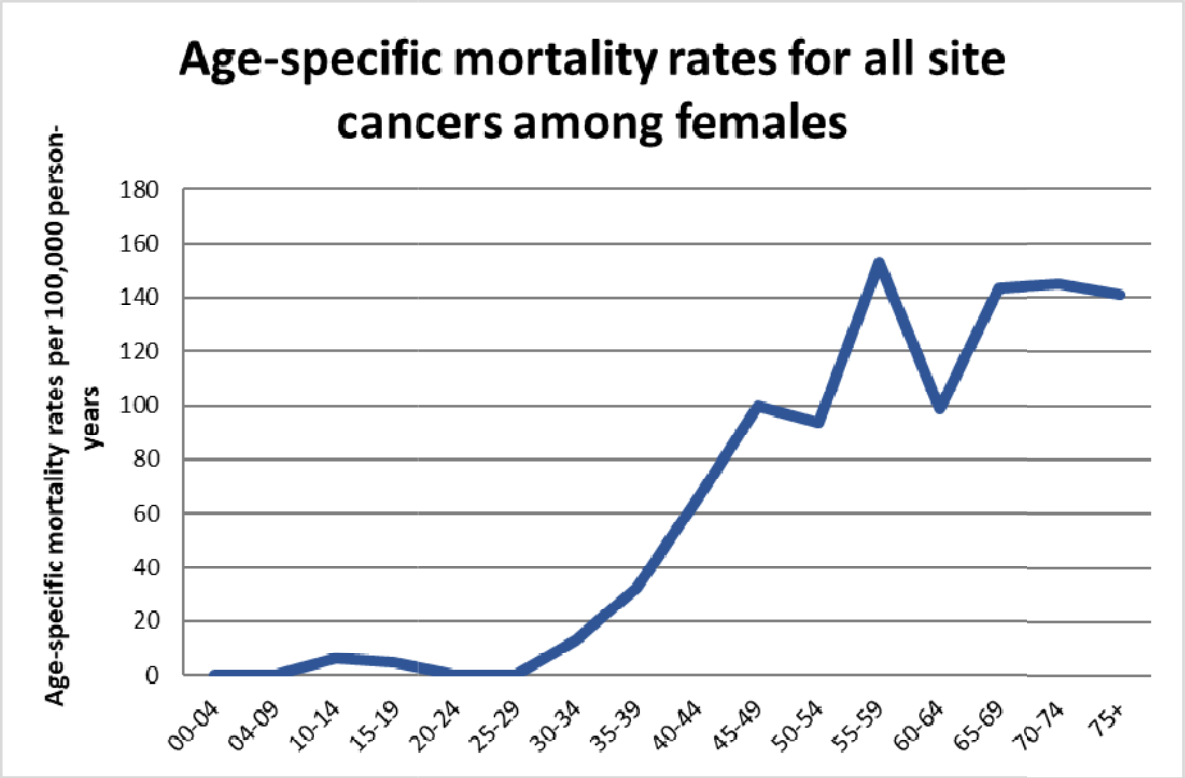
Female	Male	Overall
93	96	189

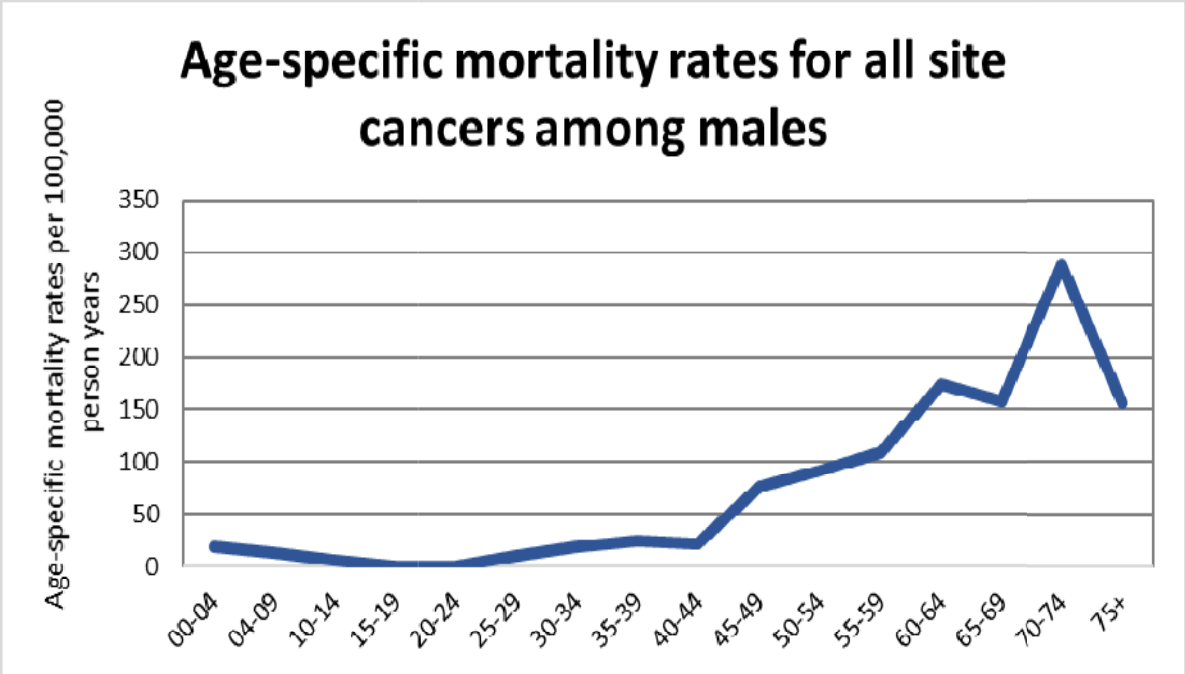


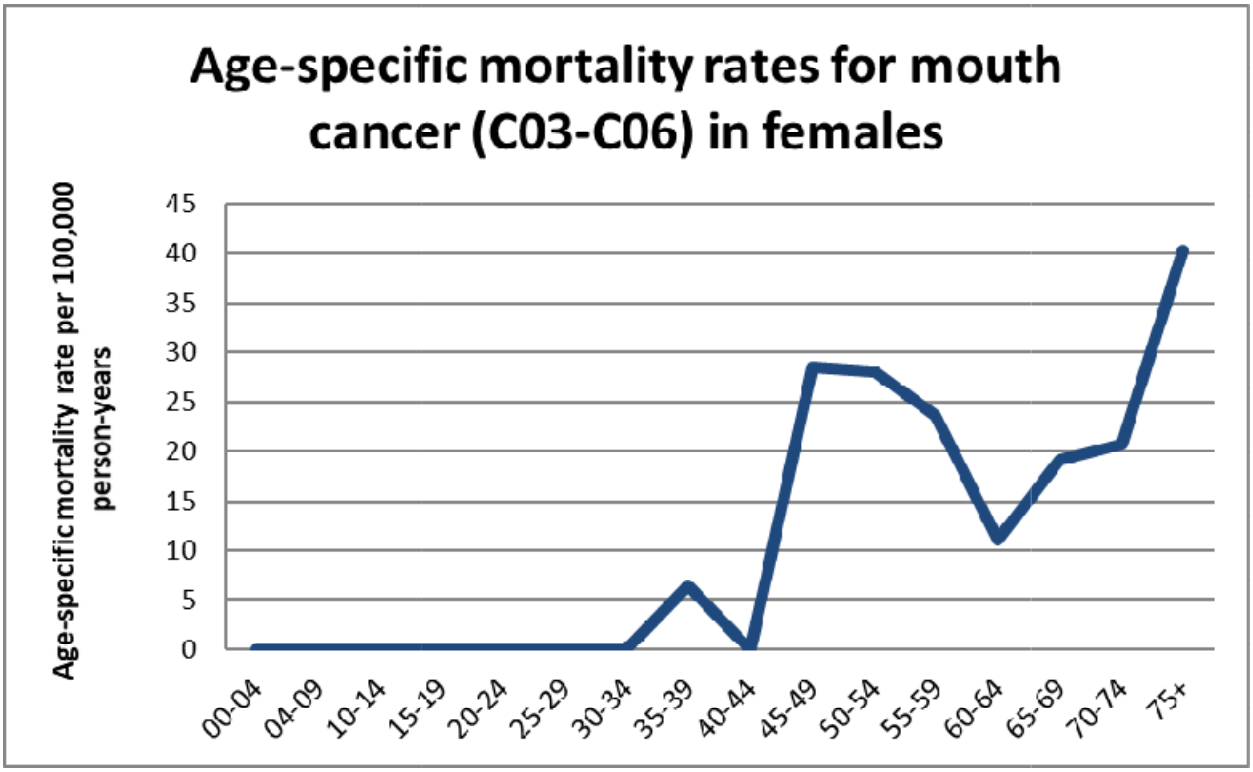
Following are the crude (CMR), age-adjusted (AAMR) and truncated (TMR) mortality rates (for age group 35-64) for cancer for the registry area for years 2015-18:

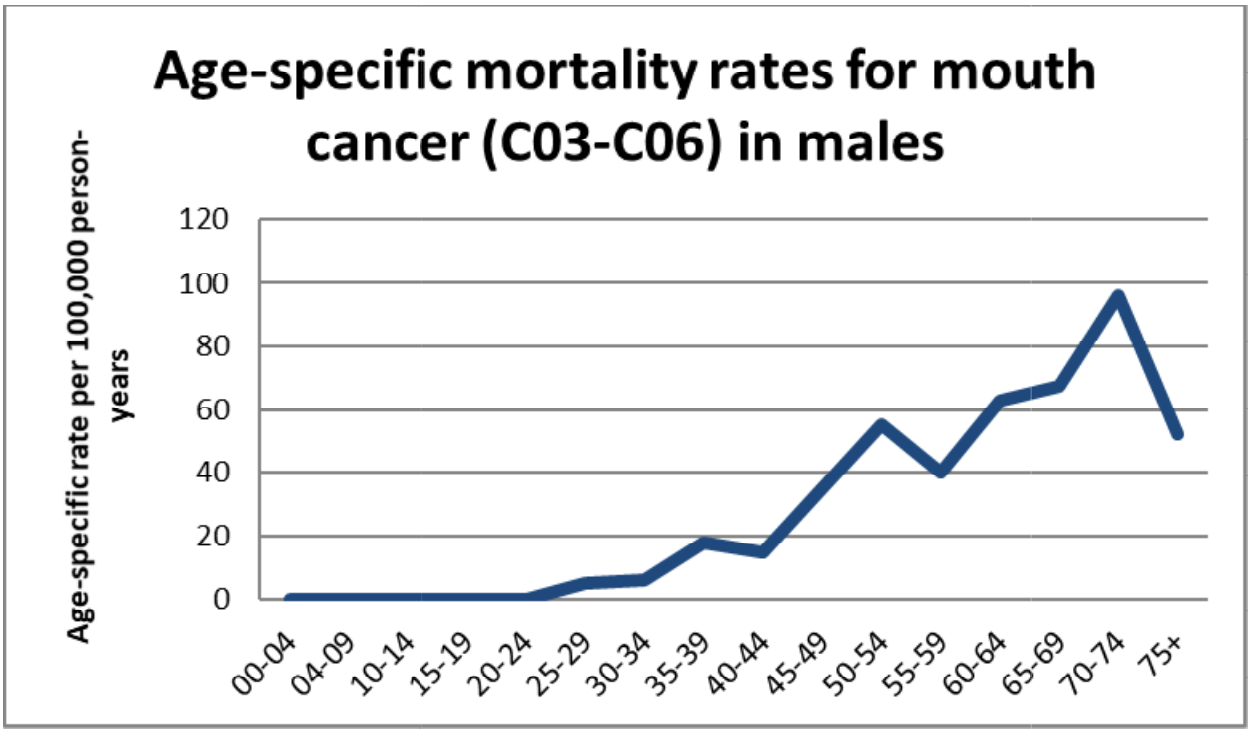
Female			Male			Overall		
CMR	AAMR	TMR (35-64)	CMR	AAMR	TMR (35-64)	CMR	AAMR	TMR (35-64)
43.7	38.4	85.8	44.4	42.9	75.1	44.0	40.4	79.3

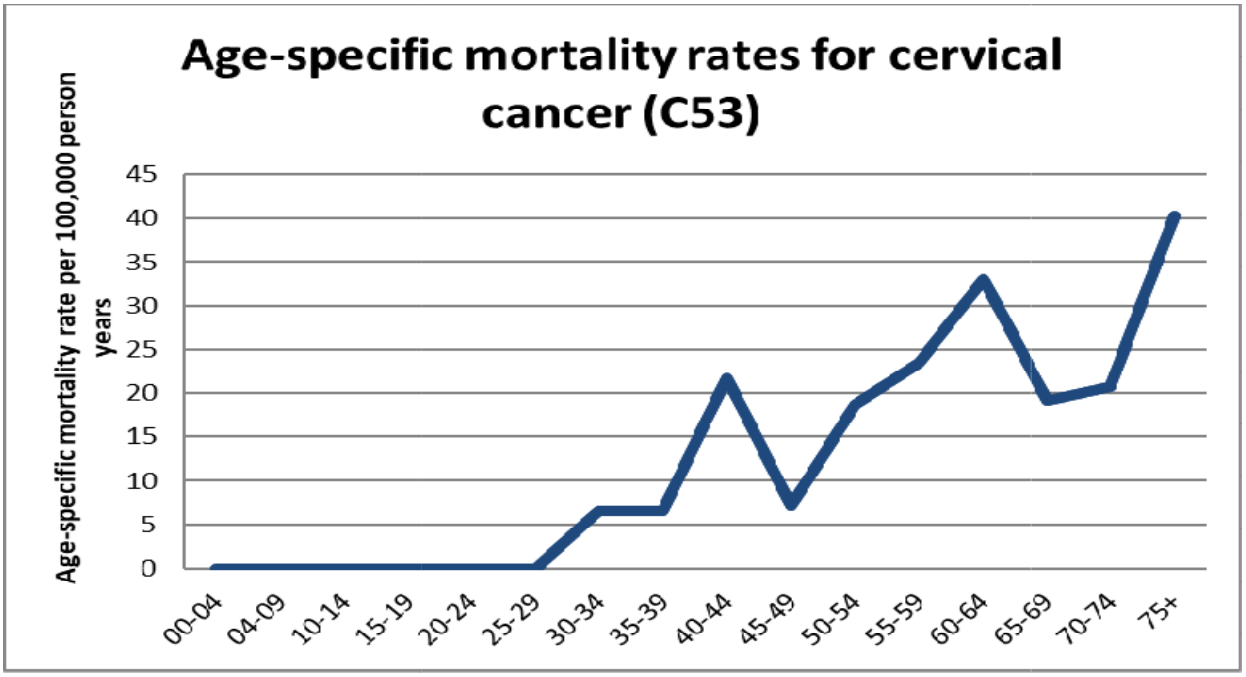
Age-specific mortality rates for all site cancers (2015-2018)

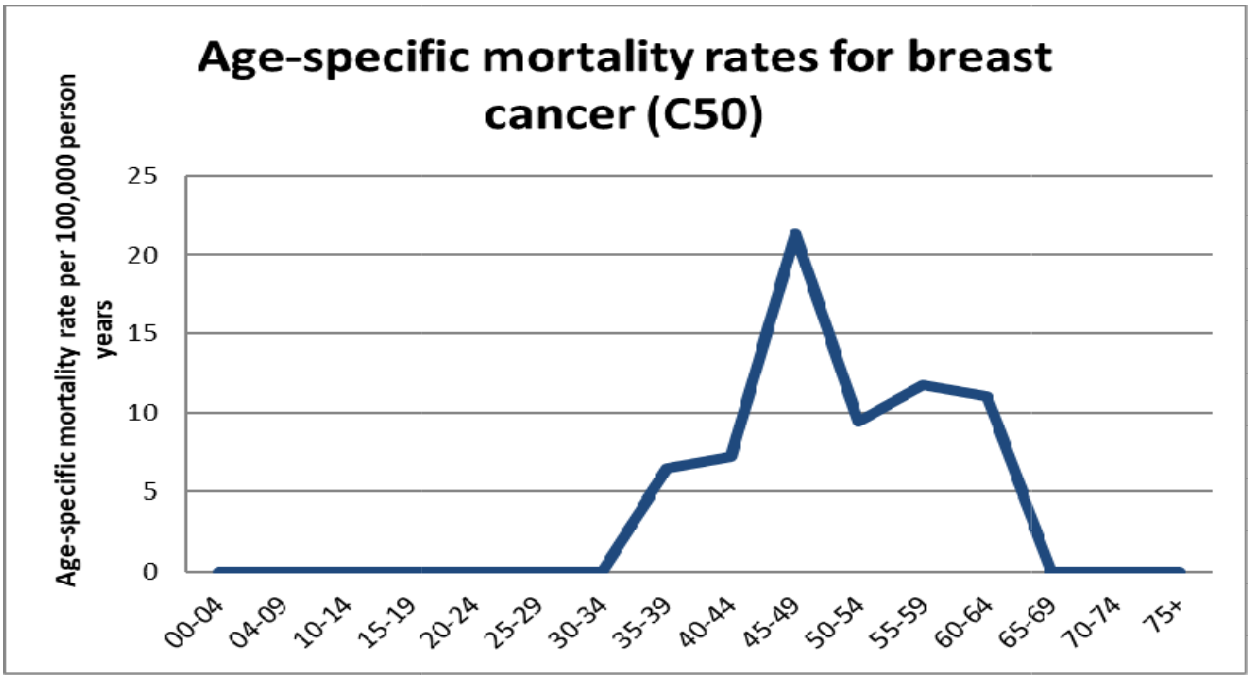




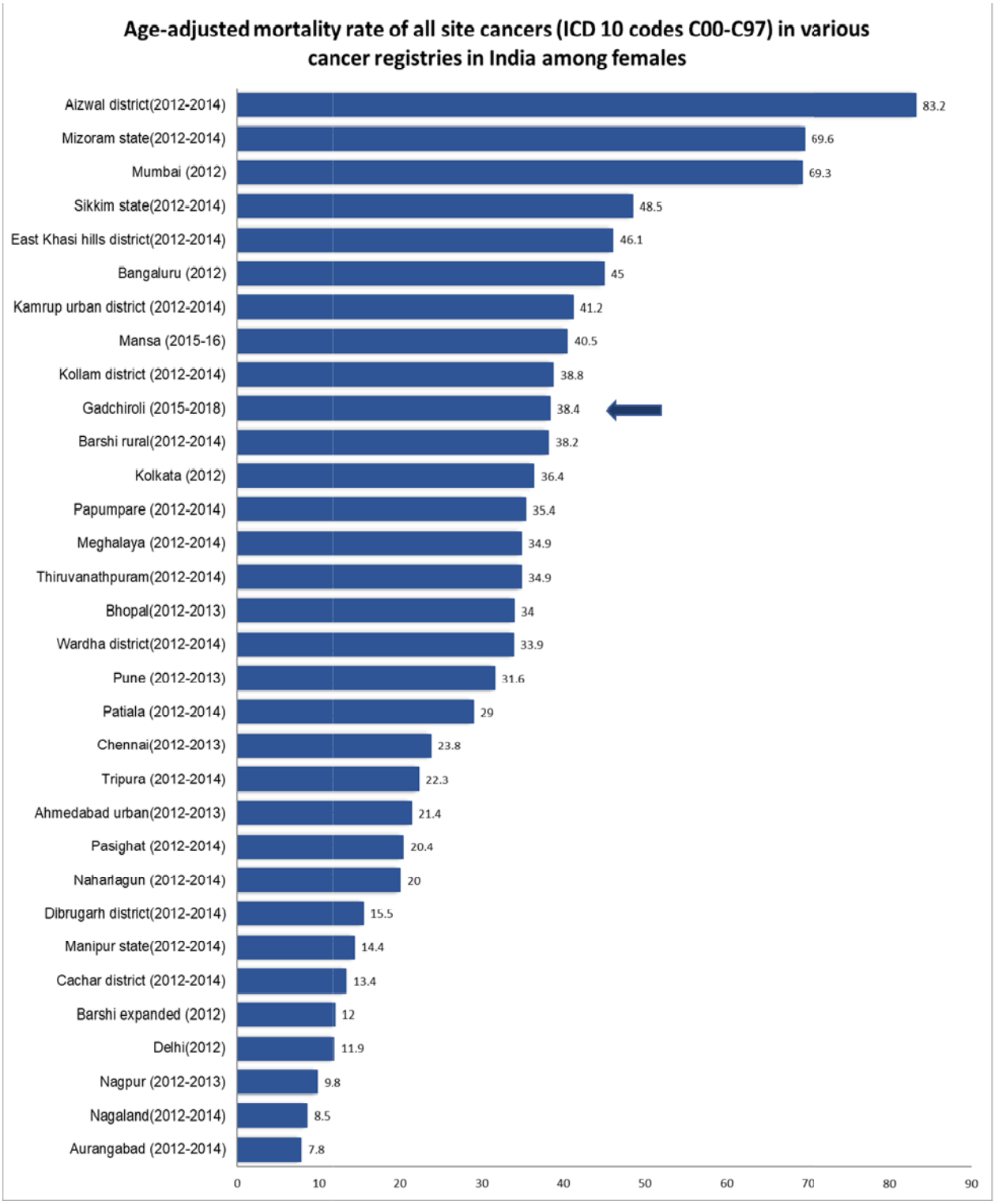

Age-specific mortality rates for mouth cancer (C03-C06) in females
Age-specific mortality rate per 100,000 person-years
45
40
35
30
25
20
15
10
5
0
00-04
04-09
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+

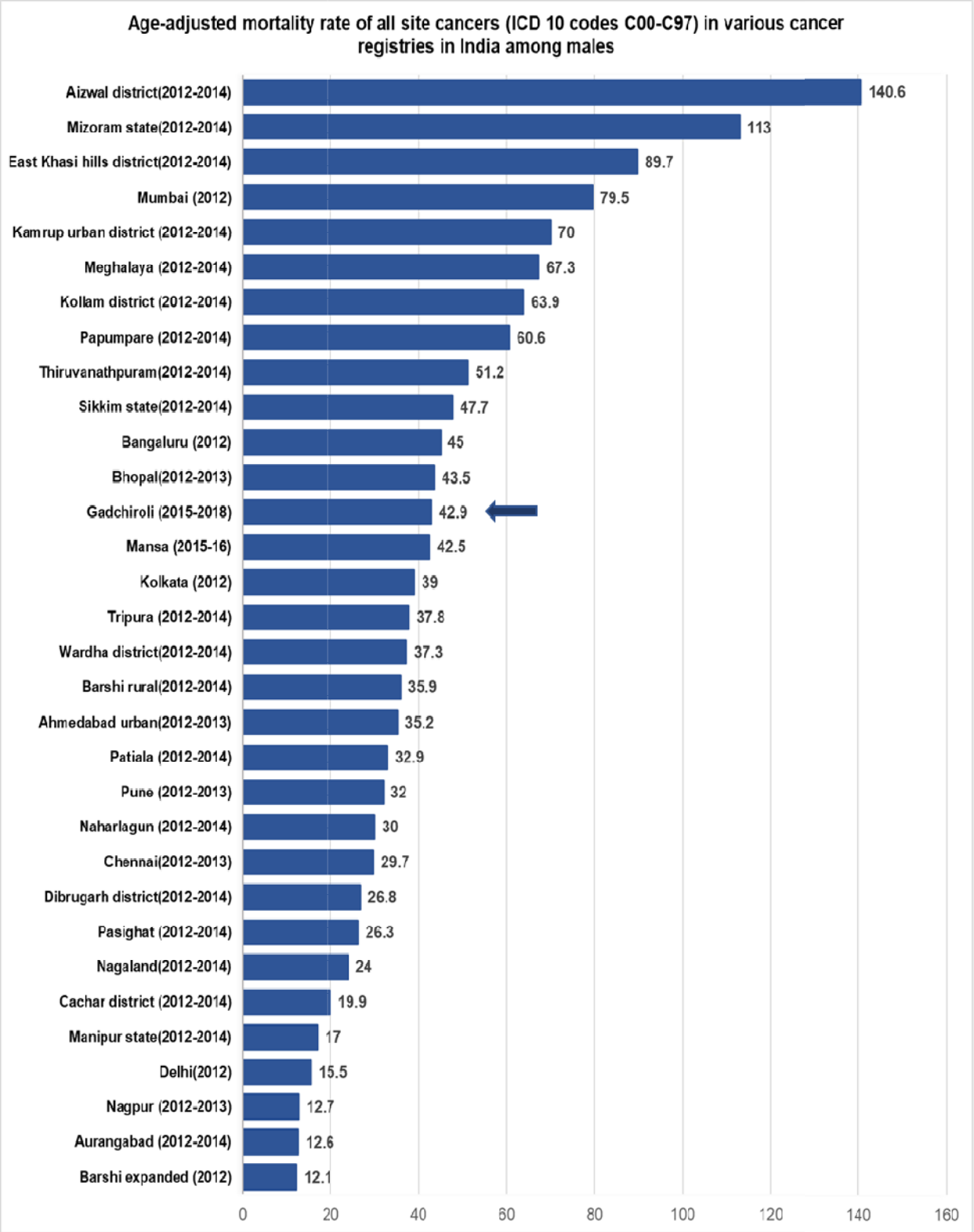

Age-specific mortality rates for mouth cancer (C03-C06) in males
Age-specific rate per 100,000 person-years
120
100
80
60
40
20
0
00-04
04-09
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+


Age-specific mortality rates for cervical cancer (C53)
Age-specific mortality rate per 100,000 person years
45
40
35
30
25
20
15
10
5
0
00-04
04-09
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+


Age-specific mortality rates for breast cancer (C50)
Age-specific mortality rate per 100,000 person years
25
20
15
10
5
0
00-04
04-09
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+

Comparisons of age adjusted cancer mortality rates (AAR) in different registries:



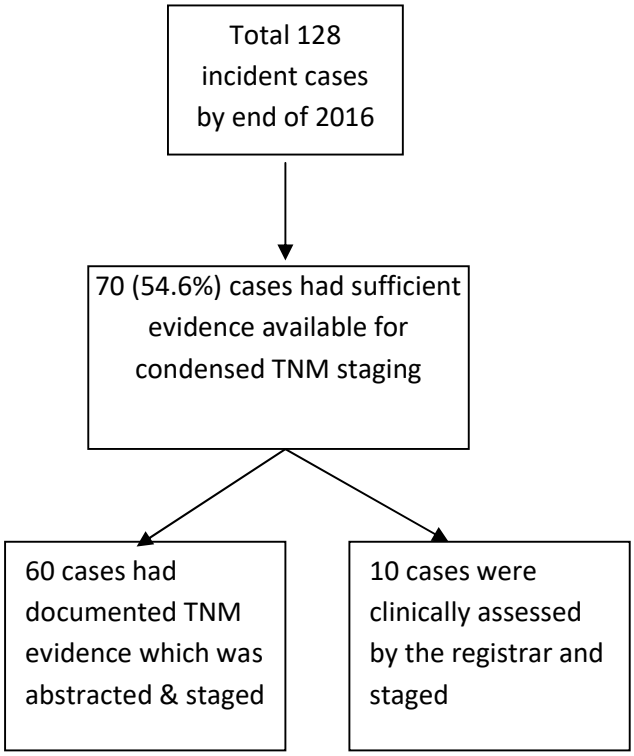

Age-adjusted mortality rate of all site cancers (ICD 10 codes C00-C97) in various cancer registries in India among males
Aizwal district(2012-2014) 140.6
Mizoram state(2012-2014) 113
East Khasi hills district(2012-2014) 89.7
Mumbai (2012) 79.5
Kamrup urban district (2012-2014) 70
Meghalaya (2012-2014) 67.3
Kollam district (2012-2014) 63.9
Papumpare (2012-2014) 60.6
Thiruvanathpuram(2012-2014) 51.2
Sikkim state(2012-2014) 47.7
Bangaluru (2012) 45
Bhopal(2012-2013) 43.5
Gadchiroli (2015-2018) 42.9
Mansa (2015-16) 42.5
Kolkata (2012) 39
Tripura (2012-2014) 37.8
Wardha district(2012-2014) 37.3
Barshi rural(2012-2014) 35.9
Ahmedabad urban(2012-2013) 35.2
Patiala (2012-2014) 32.9
Pune (2012-2013) 32
Naharlagun (2012-2014) 30
Chennai(2012-2013) 29.7
Dibrugarh district(2012-2014) 26.8
Pasighat (2012-2014) 26.3
Nagaland(2012-2014) 24
Cachar district (2012-2014) 19.9
Manipur state(2012-2014) 17
Delhi(2012) 15.5
Nagpur (2012-2013) 12.7
Aurangabad (2012-2014) 12.6
Barshi expanded (2012) 12.1
0 20 40 60 80 100 120 140 160

13. Clinical extent of cancer at registration

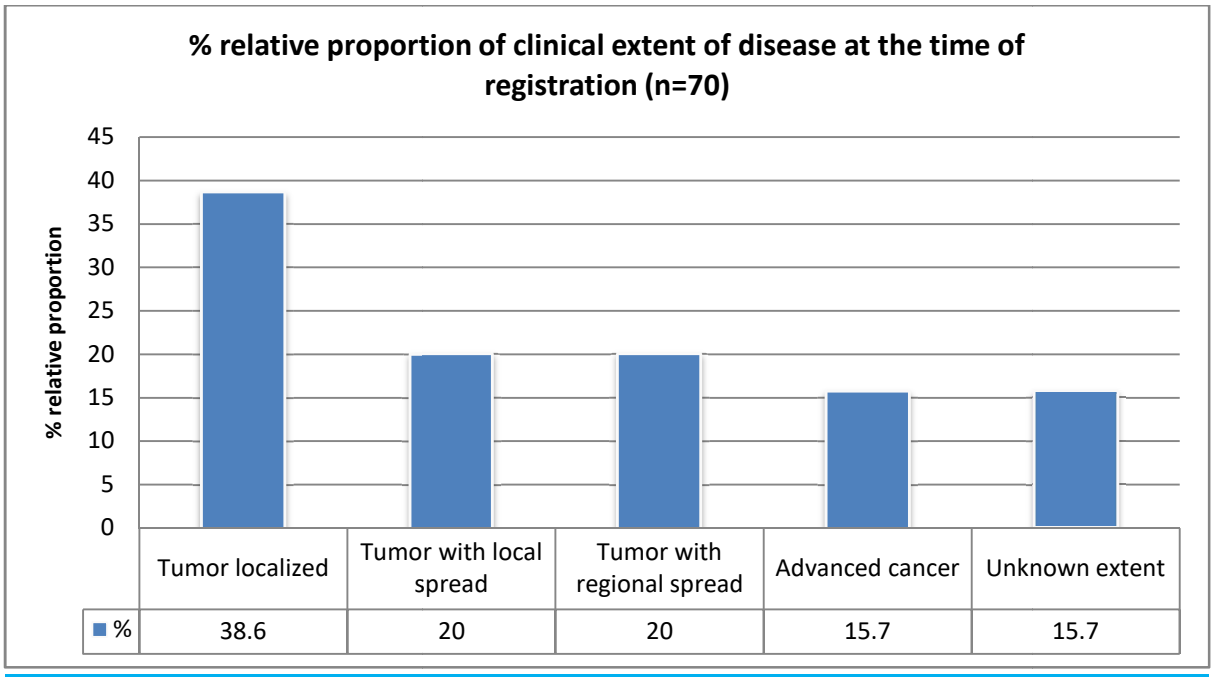
The clinical extent of disease was determinedusing condensed TNM staging (procedure described in detail in section 19)[7]

This exercise was conducted in the first two years of registration in 2015-16. Only cases where information in the form of documented evidence or personal interview and data abstraction by the cancer registrar was available were included in the analysis. For patients who were enrolled in the registry through verbal autopsies the clinical extent of the disease was not determined.

Flow diagram for data availability on the clinical extent of disease

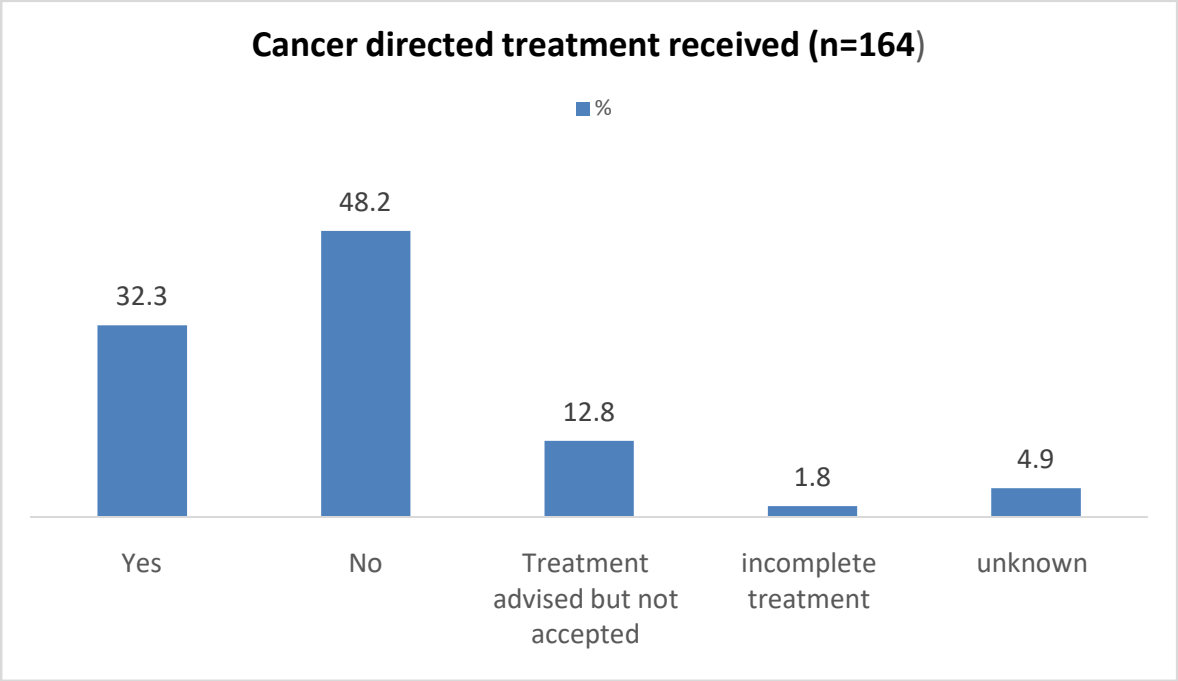


The clinical extent of disease at the time of registration was as follows



14. Cancer directed treatment

The information on cancerdirected treatment,where available, was obtained from the documentary evidence available with the patients by the cancer registrar.



15. Under-diagnosis and under-registration

There may be under-diagnosis and under-registration of cancer cases due to the following reasons-

1. There are very few medical centers with availability of diagnostic facilities for cancer in the registry area.
2. Verbal autopsy is an important source of cancer registration in PBCR Gadchiroli.The information obtained from verbal autopsy largely depends on the relatives' knowledge of cancer diagnosis in the deceased. Also,if a patient has a cancer of internal organs but did not undergo any diagnostic procedures due to lack of financial resources or cultural factors then such patients may not be diagnosed with cancer by verbal autopsies leading to under-diagnosis.
3. If the family is not aware of the specific site of cancer despite diagnostic work up, e.g. the family might report in verbal autopsy that the patient had 'cancer in abdomen' which could be from any of the abdominal organs, then site of the cancer remains undefined.
4. Many people do not keep medical records in safe places therefore diagnostic data regarding specific site or specific type are often lost and not available for evaluation by the cancer registrar.
5. Cancer patients migrate to places with facilities for cancer management such as Nagpur for treatment, sometimes the whole family migrates. In such patients details of the diagnosis are notavailable.
6. Sometimes, the documents are kept with relatives residing at the place of tertiary care treatment, so documentary evidence is unavailable
7. Under-registration in PBCR Gadchiroli is less likely as the data are gathered through house to house surveys as well as population-based mortality surveillance system where information on all deaths in the registry population is recorded. The cases that are missed in the annual house to house survey are likely to be captured in the next year's

annual survey if the patient remains alive or captured through the mortality surveillance system if the patient dies due to cancer.

Thus,under-diagnosis remains the main challenge in this registry rather than under-registration.Our data indicates a need for better diagnostic facilities for cancer in Gadchiroli.

16. Challenges to cancer care in rural Gadchiroli

Cancer care: A patient's perspective

As she sits up on her bed, it is the cough in her throat and the pain in her pelvis that is troubling her. "I was doing *maatikaam*(heavy manual labour involving digging and carrying dirt)last year this time. Now, I cannot complete a sentence without coughing." Geeta, a lady in her late 30s was diagnosed with cervical cancer one and a half year back. "The doctor gave away cancer diagnosis blatantly. It is wrong. I was all but dead. At least inform the relative first" she reflected on how the diagnosis was first conveyed to her.

There is a note of despair in her voice as she pauses to cough again. Geeta had difficulty in passing urine, which wasn't too distressing when she was diagnosed with cancer. After diagnosis, she visited multiple hospitals in and around Gadchiroli- from private to government, allopathic to ayurvedic. "There is no alternative to light (radiotherapy), they said. Then I'll need blood after treatment with light. From where do I arrange for blood in Nagpur? If family is around, one can manage. Where am I supposed to house my children in Nagpur?"

Geeta's mother has just prepared lunch and appears from the kitchen. She was preparing for an elective surgery for a cataract in her eyes. Geeta's sudden deterioration of health forced her to cancel the same and come and look after her daughter and her family.

"Two months back, I could suddenly pass no urine. There was an unbearable pain here (pointing towards the lower abdomen). My husband rushed me to the Government Hospital Gadchiroli. The doctors could not pass the urine tube inside. Finally, they put in a tube meant for little children." Going to Nagpur for treatment of cancer, trying herbal remedies, spending time with her family at home were her options. "Cancer requires a lot of money. Even if I visit Nagpur for investigations, I'll have to spend anywhere between three and twenty thousand rupees. We are farmers, where are we supposed to bring the money from?"

"*Gaavthi* (herbal) medicines have kept me alive and well till now", she says. Spending 100-200 rupees for herbal medicines for each treatment is somewhat affordable to her."Had the doctors guaranteed cure after operation, we would have taken efforts and arranged for money. I've heard operation for cervical cancer is successful."

She shows a passport size photograph of her from the last year."Nobody could say I had cancer. For the last 2 months I am unable to eat. If I keep eating, I'll be healthy. But the sight of food gives me nausea. *Aambil*(rice porridge) is all I have been drinking."

She has seen two cancer patients closely."I never visited Shobha," she refers to Shobha, a cervical cancer patient who died 6 months back. "She had money; she went to Nagpur, got operated, underwent 'light' treatment (radiotherapy) and became so weak and frail. Light killed her."

"My sister had bone cancer", says Geeta's husband. "My brother-in-law is rich. They spent a lot of money for treatment in Nagpur. But she died within six months of diagnosis."

"That is why I said no to light. I'll stay at my home, be with my children, see them at least for a few days and then die."

"I had some problem when my first child was born11 years back. The pain in abdomen was similar to the one I have now. Could this cancer be growing for 11 years? The village women say it is the reason for my cancer. But these uneducated village women mutter anything. How could have I been alive till now? Cancer patients die within 6 months. The disease (cancer) is growing (in community)."

Geeta's 5 yearold niece brings in a sweet for her. She teases her, takes the sweet and keeps it aside. "Never should anybody suffer from cancer. Either live or die, but never go through this constant pain and struggle".

17. Interpretation and the significance of the findings of the registry

- It is feasible to conduct cancer registration in an under-resourced rural-tribal setting using the method of cancer registration developed by us.
- Verbal autopsy emerged as a leading source of cancer diagnosis and registration due to lack of cancer diagnosis facilities in the district.
- The age adjusted incidence rate of all site cancers in Gadchiroli PBCR is comparable to that from the other rural PBCRs at Barshi and Mansa.
- The method for cancer registration developed by us can be used in other under-resourced rural setting in India and abroad.
- Mouth cancer emerged as a leading cancer among men and surprisingly, as a second leading cancer among women. In fact, Gadchiroli has the highest incidence of mouth cancer among various PBCRs in the country.
- Tobacco use is very common in Gadchiroli. This is reflected in a high proportion of mouth (28.2%) and other tobacco related cancers in the district (41%). Tobacco control emerges as a key strategy to reduce cancers in this district. SEARCH is already working on a districtwide campaign to reduce tobacco and alcohol use in the district.
- Mortality rates due to cancer and mortality to incidence ratio were higher in Gadchiroli compared to many PBCRs, likely to be due to difficulties in care seeking for cancer in the district. More than 60% patients did not take cancer directed treatment.
- Heavy use of tobacco, lack of awareness about cancer symptoms, lack of availability of cancer care in Gadchiroli, lack of financial resources for cancer care and fatalistic attitude based on observations that people die despite receiving treatment for cancers are some of the challenges to improving cancer care and control in the district.

- Mouth, cervix and breast emerged as three important cancer sites in the district. Cancer prevention and treatment programme need to focus on these three cancers.

- Future directions to improve cancer care in the district include-

    - increasing awareness about mouth, cervical and breast cancers using culturally appropriate material to promote early care seeking

    - strengthening cancer control infrastructure and the capacity of workforce in the district for screening and early diagnosis of these cancers

    - developing linkages with regional cancer centres to provide early navigation to these centres and streamlined treatment of cancers,and

    - reducing the out of pocket expenditure of cancer patients by channelizing cancer treatment through central or state government's health insurance schemes such as the Ayushman Bharat or the Mahatma Phule Jan Arogya Yojana

18. Acknowledgement

We would like to thank the team members from various teams of SEARCH who were involved in data collection, entry and analysis.

Field data collection team-

We would like to thank our community health workers who undertook house to house surveys for their efforts for timely data collection from 134 villages. We would like to thank field supervisors Mr.AanandraoDudhbale, Mr.CharandasSahare, Mr.SubhashBodhankar, Mr. Mahadeo Satpute, Mr. HaridasSakhare for training and supervision of community health workers during data collection for the cancer registry as well as for conducting verbal autopsies.

Hospital team

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Office and administration

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Non-communicable Diseases(NCD) Team

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20. Standard registry tables

Table-1: No. of incident cancers by 5-year age groups and sites among females in Gadchiroli (2015-2018)

ICD10 codes	Sites	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 40	41 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75+
C00	Lip	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C01-C02	Tongue	0	0	0	0	0	0	0	1	1	1	3	2	0	2	0	1
C03-C06	Mouth	0	0	1	0	1	0	0	2	1	7	3	4	1	5	1	2
C07-C08	Salivary Gland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C09	Tonsil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C10	Oth.Oropharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C11	Nasopharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C12-C13	Hypopharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C14	Pharynx Unspecified	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
C15	Oesophagus	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
C16	Stomach	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
C17	Small Intestine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C18	Colon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C19-C20	Rectum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C21	Anus & Anal Canal	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
C22	Liver	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
C23-C24	Gallbladder etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C25	Pancreas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C26	Other & ill defined digestive organs	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
C27	Ill defined digestive organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-C31	Nose,Sinuses etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C32	Larynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C33-C34	Lung etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C37-C39	Other Thoracic Organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C40-C41	Bone	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0
C43	Melanoma of Skin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C44	Other Skin	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
C45	Mesothelioma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C46	Kaposi Sarcoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C47-C49	Conn. & Soft Tissue,peritoneum	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0
C50	Breast	0	0	0	1	0	0	0	1	2	4	1	2	4	1	0	0
C51	Vulva	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C52	Vagina	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
C53	Cervix uteri	0	0	0	0	0	1	1	2	6	2	2	3	4	4	2	2
C54	Corpus uteri	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
C55	Uterus Unspecified	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
C56	Ovary etc.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
C57	Other Female Genital	0	0	0	0	0	0	0	0	1	0	0	2	0	2	0	0
C58	Placenta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C60	Penis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C61	Prostate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C62	Testis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C63	Other Male Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C64	Kidney etc.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
C65	Renal Pelvis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C66	Ureter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C67	Urinary Bladder	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
C68	Uns.Urinary Organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C69	Eye	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C70-C72	Brain,Nervous System	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
C73	Thyroid	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
C74	Adrenal Gland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C75	Other endocrine glands & related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C76-80	Ill defined secondary and	0	0	0	0	0	0	0	1	2	0	1	2	2	3	1	1
C81	Hodgkins Disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C82-C85	Non-hodgkin's lymphoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C88	Malig Imn.Prol.D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C90	Multiple Myeloma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C91	Lymphoid Leukemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C92-C94	Myeloid Leukemia	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
C95	Leukemia Uns	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
C96	CMD,O & U LMH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
C97	Malignant neoplasm of primary multiple sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	0	0	2	2	1	1	2	8	14	22	13	19	14	23	8	8

Table-2: No. of incident cancers by 5-year age groups and sites among males in Gadchiroli (2015-2018)

ICD10 c	Sites	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 40	41 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75+
C00	Lip	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0
C01-C02	Tongue	0	0	0	0	0	0	1	1	1	0	0	0	0	2	1	0
C03-C06	Mouth	0	0	0	0	0	1	1	3	2	6	6	4	6	8	4	1
C07-C08	Salivary Gland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C09	Tonsil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C10	Oth.Oropharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C11	Nasopharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
C12-C13	Hypopharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C14	Pharynx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
C15	Oesophagus	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
C16	Stomach	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
C17	Small Intestine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C18	Colon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C19-C20	Rectum	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
C21	Anus & Anal Canal	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
C22	Liver	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1
C23-C24	Gallbladder etc.	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
C25	Pancreas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C26	Other & ill defined digestive organs	0	0	0	0	0	0	0	0	0	1	0	3	0	1	0	0
C27	Ill defined digestive organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-C31	Nose,Sinuses etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C32	Larynx	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
C33-C34	Lung etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C37-C39	Other Thoracic Organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C40-C41	Bone	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
C43	Melanoma of Skin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C44	Other Skin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C45	Mesothelioma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C46	Kaposi Sarcoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C47-C49	Conn. & Soft Tissue,peritoneum & retroperitoneum	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
C50	Breast	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
C51	Vulva	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C52	Vagina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C53	Cervix uteri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C54	Corpus uteri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C55	Uterus Unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C56	Ovary etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C57	Other Female Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C58	Placenta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C60	Penis	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
C61	Prostate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C62	Testis	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
C63	Other Male Genital	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C64	Kidney etc.	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C65	Renal Pelvis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C66	Ureter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C67	Urinary Bladder	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
C68	Uns.Urinary Organs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C69	Eye	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C70-C72	Brain,Nervous System	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C73	Thyroid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C74	Adrenal Gland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C75	Other endocrine glands & related	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C76-80	Ill defined secondary and	0	0	0	0	0	1	1	0	0	0	1	1	3	1	5	1
C81	Hodgkins Disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C82-C85	Non-hodgkin's lymphoma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C88	Malig Imn.Prol.D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C90	Multiple Myeloma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C91	Lymphoid Leukemia	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
C92-C94	Myeloid Leukemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C95	Leukemia Uns	2	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0
C96	CMD,O & U LMH	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
C97	Malignant neoplasm of	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	3	2	1	0	1	2	4	5	4	12	10	13	13	19	16	6

Table 3 – Average annual age-specific, Crude (CR), Age Adjusted (AAR) and Truncated (35- 64 yrs) (TR) Incidence Rates per 100,000 population among females in Gadchiroli (2015-2018)

ICD10 codes	Sites	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 40	41 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75+	CR	AAR	TR
C00	Lip	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C01-C02	Tongue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	7.2	7.1	28.1	23.6	0.0	19.1	0.0	20.1	5.2	4.2	11.6
C03-C06	Mouth	0.0	0.0	6.2	0.0	4.7	0.0	0.0	13.0	7.2	49.8	28.1	47.1	11.0	47.9	20.8	40.3	13.2	10.7	25.6
C07-C08	Salivary Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C09	Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C10	Oth.Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C11	Nasopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C12-C13	Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C14	Pharynx Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	11.0	0.0	0.0	0.0	0.9	0.9	2.8
C15	Oesophagus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	0.5	0.5	1.5
C16	Stomach	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	20.8	0.0	0.9	0.9	1.5
C17	Small Intestine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C18	Colon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C19-C20	Rectum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C21	Anus & Anal Canal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.5	0.4	1.4
C22	Liver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.7	0.0	0.0	1.4	0.9	0.0
C23-C24	Gallbladder etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C25	Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C26	Other & ill defined digestive organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	9.6	20.8	20.1	1.9	1.2	1.5
C27	Ill defined digestive organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-C31	Nose,Sinuses etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C32	Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C33-C34	Lung etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C37-C39	Other Thoracic Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C40-C41	Bone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	11.8	0.0	9.6	0.0	0.0	1.4	1.1	2.8
C43	Melanoma of Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C44	Other Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	1.4
C45	Mesothelioma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C46	Kaposi Sarcoma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C47-C49	Conn. & Soft Tissue,peritoneum & retroperitoneum	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	7.1	9.4	0.0	0.0	0.0	0.0	0.0	1.4	1.5	2.9
C50	Breast	0.0	0.0	0.0	4.9	0.0	0.0	0.0	6.5	14.5	28.4	9.4	23.6	44.0	9.6	0.0	0.0	7.5	6.9	19.8
C51	Vulva	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C52	Vagina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	0.5	0.5	1.5
C53	Cervix uteri	0.0	0.0	0.0	0.0	0.0	5.4	6.5	13.0	43.5	14.2	18.7	35.4	44.0	38.3	41.5	40.3	13.6	11.2	26.9
C54	Corpus uteri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	1.4
C55	Uterus Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.9	0.7	0.0
C56	Ovary etc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	1.4
C57	Other Female Genital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	0.0	23.6	0.0	19.1	0.0	0.0	2.4	2.0	4.4
C58	Placenta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C60	Penis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C61	Prostate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C62	Testis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C63	Other Male Genital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C64	Kidney etc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	1.4
C65	Renal Pelvis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C66	Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C67	Urinary Bladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	0.0	0.5	0.4	0.0
C68	Uns.Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C69	Eye	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C70-C72	Brain,Nervous System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	1.4
C73	Thyroid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	20.1	0.9	0.5	1.5
C74	Adrenal Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C75	Other endocrine glands & related structures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C76-80	Ill defined secondary and unspecified sites	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	14.5	0.0	9.4	23.6	22.0	28.7	20.8	20.1	6.1	4.8	11.4
C81	Hodgkins Disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C82-C85	NHL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C88	Malig Imn.Prol.D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C90	Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C91	Lymphoid Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C92-C94	Myeloid Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	2.8
C95	Leukemia Uns	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.9	0.9	1.4
C96	CMD,O & U LMH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	0.0	0.5	0.4	0.0
C97	Malignant neoplasm of primary multiple sites	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	12.4	9.8	4.7	5.4	13.0	51.9	101.4	156.4	121.7	223.9	153.9	220.2	166.1	161.2	64.4	53.3	128.3

Table 4 – Average annual age-specific, Crude (CR), Age Adjusted (AAR) and Truncated (35- 64 yrs) (TR)incidence rate per 100,000 population among males in Gadchiroli (2015-2018)

ICD10 codes	Sites	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 40	41 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75+	CR	AAR	TR
C00	Lip	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	15.7	0.0	0.0	0.0	0.9	1.0	3.4
C01-C02	Tongue	0.0	0.0	0.0	0.0	0.0	0.0	6.1	6.0	7.3	0.0	0.0	0.0	0.0	22.5	19.2	0.0	2.8	2.2	2.6
C03-C06	Mouth	0.0	0.0	0.0	0.0	0.0	5.0	6.1	17.9	14.7	41.9	55.2	39.9	94.4	90.1	76.9	26.0	19.4	18.1	40.6
C07-C08	Salivary Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C09	Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C10	Oth.Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C11	Nasopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	0.0	0.0	0.5	0.3	0.0
C12-C13	Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C14	Pharynx Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	26.0	0.5	0.5	0.0
C15	Oesophagus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	0.0	15.7	0.0	0.0	52.0	1.8	2.1	3.5
C16	Stomach	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7	11.3	0.0	0.0	0.9	1.0	2.0
C17	Small Intestine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C18	Colon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C19-C20	Rectum	0.0	0.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7	0.0	0.0	0.0	0.9	1.0	2.0
C21	Anus & Anal Canal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0	38.5	0.0	1.4	1.2	1.5
C22	Liver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.9	0.0	0.0	0.0	0.0	0.0	26.0	1.8	1.8	4.1
C23-C24	Gallbladder etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	38.5	0.0	1.4	1.2	1.4
C25	Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C26	Other & ill defined digestive organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	29.9	0.0	11.3	0.0	0.0	2.3	2.0	5.2
C27	Ill defined digestive organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-C31	Nose,Sinuses etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C32	Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.5	0.0	0.0	0.9	0.7	0.0
C33-C34	Lung etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C37-C39	Other Thoracic Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C40-C41	Bone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	0.0	0.0	11.3	0.0	0.0	0.9	0.8	1.5
C43	Melanoma of Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C44	Other Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C45	Mesothelioma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C46	Kaposi Sarcoma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C47-C49	Conn. & Soft Tissue,peritoneum & retroperitoneum	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.0
C50	Breast	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.3	0.0	0.0	0.5	0.3	0.0
C51	Vulva	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C52	Vagina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C53	Cervix uteri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C54	Corpus uteri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C55	Uterus Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C56	Ovary etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C57	Genital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C58	Placenta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C60	Penis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.9	0.8	2.4
C61	Prostate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C62	Testis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.5	0.4	1.3
C63	Other Male Genital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C64	Kidney etc.	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.0
C65	Renal Pelvis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C66	Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C67	Urinary Bladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	19.2	0.0	0.9	0.8	1.3
C68	Uns.Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C69	Eye	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.0
C70-C72	Brain,Nervous System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C73	Thyroid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C74	Adrenal Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C75	Other endocrine glands & related structures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C76-80	Ill defined secondary and unspecified sites	0.0	0.0	0.0	0.0	0.0	5.0	6.1	0.0	0.0	0.0	9.2	10.0	47.2	11.3	96.1	26.0	6.5	6.3	8.9
C81	Hodgkins Disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C82-C85	Non-hodgkins Lymphoma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C88	Malig Imn.Prol.D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C90	Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C91	Lymphoid Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.5	0.4	1.3
C92-C94	Myeloid Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C95	Leukemia Uns	12.4	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	0.0	0.0	11.3	19.2	0.0	2.8	3.2	1.5
C96	CMD,O & U LMH	0.0	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.9	1.1	1.3
C97	Malignant neoplasm of primary multiple sites	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C97	Malignant neoplasm of primary multiple sites	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	18.6	13.7	5.9	0.0	4.5	10.0	24.5	29.8	29.4	83.7	92.0	129.7	204.6	214.1	307.6	156.1	51.3	49.0	85.6

Table-5: Average overall annual age-specific, Crude (CR), Age Adjusted (AAR) and Truncated (35- 64 yrs) (TR) incidence rates per 100,000 population in Gadchiroli (2015-2018)

ICD10 codes	Sites	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 40	41 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75+	CR	AAR	TR
C00	Lip	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	6.5	0.0	0.0	0.0	0.5	0.5	1.5
C01-C02	Tongue	0.0	0.0	0.0	0.0	0.0	0.0	3.2	6.2	7.3	3.5	13.9	10.8	0.0	20.7	10.0	11.4	4.0	3.4	6.9
C03-C06	Mouth	0.0	0.0	3.0	0.0	2.3	2.6	3.2	15.5	10.9	45.8	41.8	43.2	45.3	67.3	49.9	34.1	16.3	14.5	32.1
C07-C08	Salivary Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C09	Tonsil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C10	Oth.Oropharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C11	Nasopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.2	0.2	0.0
C12-C13	Hypopharynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C14	Pharynx Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	6.5	0.0	0.0	11.4	0.7	0.7	1.5
C15	Oesophagus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	5.4	6.5	0.0	0.0	22.7	1.2	1.1	2.2
C16	Stomach	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	6.5	5.2	10.0	0.0	0.9	0.8	1.6
C17	Small Intestine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C18	Colon	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C19-C20	Rectum	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.5	0.4	0.8
C21	Anus & Anal Canal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	6.5	0.0	20.0	0.0	0.9	0.9	1.6
C22	Liver	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	15.5	0.0	11.4	1.6	1.3	2.0
C23-C24	Gallbladder etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	20.0	0.0	0.7	0.6	0.7
C25	Pancreas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C26	Other & ill defined digestive organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	21.6	0.0	10.4	10.0	11.4	2.1	1.8	3.5
C27	Ill defined digestive organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-C31	Nose,Sinuses etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C32	Larynx	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	0.0	0.0	0.5	0.3	0.0
C33-C34	Lung etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C37-C39	Other Thoracic Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C40-C41	Bone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	4.6	5.4	0.0	10.4	0.0	0.0	1.2	0.9	2.0
C43	Melanoma of Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C44	Other Skin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.7
C45	Mesothelioma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C46	Kaposi Sarcoma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C47-C49	Conn. & Soft Tissue,peritoneum & retroperitoneum	0.0	0.0	3.0	0.0	0.0	0.0	3.2	0.0	0.0	3.5	4.6	0.0	0.0	0.0	0.0	0.0	0.9	0.9	1.4
C50	Breast	0.0	0.0	0.0	2.5	0.0	0.0	0.0	3.1	7.3	14.1	4.6	10.8	25.9	10.4	0.0	0.0	4.0	3.7	10.2
C51	Vulva	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C52	Vagina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.2	0.2	0.7
C53	Cervix uteri	0.0	0.0	0.0	0.0	0.0	2.6	3.2	6.2	21.9	7.0	9.3	16.2	25.9	20.7	20.0	22.7	6.8	6.1	13.7
C54	Corpus uteri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.7
C55	Uterus Unspecified	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.5	0.3	0.0
C56	Ovary etc.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.7
C57	Genital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	10.8	0.0	10.4	0.0	0.0	1.2	1.0	2.1
C58	Placenta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C60	Penis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.5	0.4	1.3
C61	Prostate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C62	Testis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.2	0.2	0.7
C63	Other Male Genital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C64	Kidney etc.	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.7
C65	Renal Pelvis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C66	Ureter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C67	Urinary Bladder	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	20.0	0.0	0.7	0.6	0.7
C68	Uns.Urinary Organs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C69	Eye	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	0.0
C70-C72	System	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.7
C73	Thyroid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	11.4	0.5	0.5	0.7
C74	Adrenal Gland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C75	Other endocrine glands & related structures	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C76-80	Ill defined secondary and unspecified sites	0.0	0.0	0.0	0.0	0.0	2.6	3.2	3.1	7.3	0.0	9.3	16.2	32.4	20.7	59.9	22.7	6.3	5.7	9.8
C81	Hodgkins Disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C82-C85	NHL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C88	Malig Imn.Prol.D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C90	Multiple Myeloma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C91	Lymphoid Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.2	0.2	0.7
C92-C94	Myeloid Leukemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	1.4
C95	Leukemia Uns	6.3	0.0	3.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	6.5	5.2	10.0	0.0	1.9	2.1	1.6
C96	CMD,O & U LMH	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	0.0	0.0	10.0	0.0	0.7	0.8	0.7
C97	Malignant neoplasm of primary multiple sites	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	9.5	7.0	9.0	4.9	4.6	7.8	18.9	40.4	65.7	119.7	106.7	172.9	174.7	217.4	239.6	158.9	57.8	52.5	105.8

Table 6- Year and sex-wise age adjusted cancer incidence rates

Year	AAR	
	Females	Males
2015	73.1	58.1
2016	51.4	37.5
2017	57	37.3
2018	44.6	63.1
2015-18	53.3	49

Table 7-Crude mortality rate (CMR), age adjusted mortality rate (AAR) and truncated mortality rate (TMR) per 100000 population for different registries

Registry	Female			Male		
	CMR	AAR	TMR	CMR	AAR	TMR
Bengaluru (2012)	36.2	45	75.8	34.2	45	61.2
Barshirural(2012-2014)	43.8	38.2	63.9	39.2	35.9	49.7
Barshi expanded (2012)	12.7	12	24.2	12	12.1	20.3
Bhopal(2012-2013)	28.1	34	69.8	34.3	43.5	80.2
Chennai(2012-2013)	24.8	23.8	39.2	29.6	29.7	44.5
Delhi(2012)	9.8	11.9	22.1	11.4	15.5	22.6
Mumbai (2012)	67.8	69.3	107.3	68.2	79.5	106.4
Cachar district (2012-2014)	10.3	13.4	26.5	14.9	19.9	32.3
Dibrugarh district(2012-2014)	12.5	15.5	33.4	20.9	26.8	44.4
Kamrup urban district (2012-2014)	27	41.2	71.5	47.2	70	101.8
Manipur state(2012-2014)	10.9	14.4	21.9	12.2	17	21.3
Imphal west district (2012-2014)	18	19.1	28.3	20.2	22.9	24.8
Mizoram state(2012-2014)	48.4	69.6	106.7	77.3	113	176.2
Aizwaldistrict(2012-2014)	64.3	83.2	127	103.8	140.6	235.1
Sikkim state(2012-2014)	35	48.5	80.9	36.7	47.7	64
Ahmadabadurban(2012-2013)	20.2	21.4	43.5	30.9	35.2	65.1
Aurangabad (2012-2014)	6.3	7.8	10.1	8.8	12.6	15
Kolkata (2012)	42.6	36.4	65.1	46.1	39	51.4

Kollam district (2012-2014)	51.3	38.8	68.2	79.8	63.9	96.9
Nagpur (2012-2013)	9.9	9.8	17.5	11.9	12.7	22.1
Pune (2012-2013)	27.3	31.6	55.7	25.2	32	42.7
Thiruvanathpuram(2012-2014)	45.7	34.9	61.6	62.9	51.2	78.9
Meghalaya (2012-2014)	19.9	34.9	76.3	34.6	67.3	148.7
East Khasi hills district(2012-2014)	29.5	46.1	95.7	51.1	89.7	202.2
Tripura (2012-2014)	19.4	22.3	45.9	30.7	37.8	63.5
Nagaland(2012-2014)	5.3	8.5	15.9	14	24	41.2
Wardha district(2012-2014)	37.5	33.9	69.9	40.2	37.3	65.6
Papumpare (2012-2014)	17.3	35.4	89.9	26	60.6	95.5
Pasighat (2012-2014)	13.8	20.4	28	18.5	26.3	29.9
Patiala (2012-2014)	29.1	29	56.7	30.7	32.9	54.8
Gadchiroli (2015-2018)	**43.7**	**38.4**	**85.8**	**44.4**	**42.9**	**75.1**

Table 8-Cancer mortality to cancer incidence (M/I) percentage for different registries

Registry	Female			Male		
	Incidence	Mortality	M/I%	Incidence	Mortality	M/I%
Bengaluru (2012)	4547	1572	34.6	3284	1578	48.1
Barshirural(2012-2014)	475	315	66.3	454	313	68.9
Barshi expanded (2012)	1131	264	23.3	901	272	30.2
Bhopal(2012-2013)	1746	543	31.1	1718	717	41.7
Chennai(2012-2013)	6212	1164	18.7	5447	1398	25.7
Delhi(2012)	9598	769	8.0	10148	1027	10.1
Mumbai (2012)	6759	3915	57.9	6598	4591	69.6
Cachar district (2012-2014)	2100	275	13.1	2666	412	15.5
Dibrugarh district(2012-2014)	1345	252	18.7	1498	433	28.9
Kamrup urban district (2012-2014)	2392	523	21.9	3071	1011	32.9
Manipur state(2012-2014)	2542	495	19.5	2081	560	26.9
Imphal west district (2012-2014)	823	148	18.0	640	160	25.0
Manipur state excluding Imphal west district(2012-2014)	1719	347	20.2	1441	400	27.8
Mizoram state(2012-2014)	2089	830	39.7	2567	1346	52.4
Aizwaldistrict(2012-2014)	1066	410	38.5	1275	647	50.7
Sikkim state(2012-2014)	678	311	45.9	707	365	51.6
Ahmedabad urban(2012-2013)	4117	1141	27.7	5477	1937	35.4
Aurangabad (2012-2014)	1118	117	10.5	1123	175	15.6
Kolkata (2012)	2596	916	35.3	2777	1077	38.8
Kollam district (2012-2014)	5478	2158	39.4	5534	2985	53.9
Nagpur (2012-2013)	2417	251	10.4	2236	313	14.0
Pune (2012-2013)	3686	1353	36.7	3417	1379	40.4
Thiruvanathpuram(2012-2014)	8002	2378	29.7	7638	2989	39.1
Meghalaya (2012-2014)	1616	591	36.6	2632	1027	39.0

East Khasi hills district(2012-2014)	988	389	39.4	1624	661	40.7
Tripura (2012-2014)	2702	1082	40.0	3628	1778	49.0
Nagaland(2012-2014)	546	55	10.1	815	153	18.8
Wardha (2012-2014)	1424	720	50.6	1306	815	62.4
Naharlagun (2012-2014)	704	127	18.0	735	212	28.8
Papumpare (2012-2014)	333	50	15.0	299	75	25.1
Pasighat (2012-2014)	159	28	17.6	175	39	22.3
Patiala (2012-2014)	3158	815	25.8	2853	962	33.7
Gadchiroli (2015-2018)	137	93	67.9	111	96	86.5

Table 9- Source of registration for cancer cases by year

Source of data	2015		2016		2017		2018	
n(%)	Female	Male	Female	Male	Female	Male	Female	Male
House-to-house Survey	13 (29.55)	13 (39.39)	5 (15.63)	5 (22.73)	6 (17.65)	6 (28.57)	1 (3.7)	6 (17.14)
SEARCH rural hospital	9 (20.45)	2 (6.06)	1 (3.13)	3 (13.64)	15 (44.12)	2 (9.52)	14 (51.85)	4 (11.43)
Verbal autopsy	22 (50)	18 (54.55)	26 (81.25)	14 (63.64)	13 (38.24)	13 (61.9)	12 (44.44)	25 (71.43)
Total	44 (100)	33 (100)	32 (100)	22 (100)	34 (100)	21 (100)	27 (100)	35 (100)

Table 10-Place of death among cancer patients who died during 2015-18

Place of Death	**Female**		**Male**		**Overall**	
	n	**%**	**n**	**%**	**n**	**%**
Government Hospital	9	9.68	7	7.29	16	8.47
Private Hospital	2	2.15	2	2.08	4	2.12
Residence	81	87.10	87	90.63	168	88.89
In transit	1	1.08	0	0	1	0.53
Total Deaths-	93	100	96	100	189	100

21. Description of statistical terms and operational definitions

A) Statistical terms

1. Incidence rate

Incidence expresses the number of new cases of cancer which occur in a definedpopulation of disease-free individuals, and the incidence rate is the number of suchevents in a specified period of time.

$$Incidence\ rate = \frac{Number\ of\ new\ cases\ of\ disease}{Population\ at\ risk}\ in\ a\ period\ of\ time$$

Incidence rates are usually expressed as per 100,000 population or person years of observation.

2. Crude cancer incidence rate

The crude, all-ages cancer incidence rate per *100 000 person-years of observation*is calculated by dividing the total

number of cases *(R)* by the total number of person-years of observation *(N)* andmultiplying the result by *100 000*

$$Crude\ rate = \frac{Total\ number\ of\ cancer\ cases}{Total\ numbr\ of\ person\ years\ of\ observation} \times 100000$$

3. Age-specific rate

The age-specific rate for age class i, is calculated as a rate per *100 000* by dividing the number of cases in the age-class ***(r,)*** bythe corresponding person-years of observation *(n,)* and multiplying the result by

100 000

$$Age\ specific\ rate = \frac{Number\ of\ cases\ in\ the\ age\ class}{corresponding\ person\ years\ of\ observation} \times 100000$$

4. Age-standardized or age adjusted rate

An age-standardized rate is the theoretical rate which would have occurred if theobserved age-specific rates applied to a reference population: the population referred to being the Segi world standard population.

By denoting $w_i$as the population present in the ith age class of the world standard population, where, as above, ***i***= 1, 2, ..and letting a_i represent the agespecific rate in the ith age class, the age-standardized rate (ASR) is calculated using the following equation

$$ASR = \frac{\sum_{i=1}^{A} a_i w_i}{w_i}$$

5. Truncated rate

A truncated rate is a rate calculated over the truncated age range 35 to 64 years of age, mainly because of doubts about the accuracy of age-specific rates in the elderlywhen diagnosis and recording of cancer may be much less certain

6. Cumulative rate

The cumulative rate is the sum over each year of age of the age-specific incidence rates. It can be interpreted either as a directly age-standardized rate with the same population size in each age group, or as an approximation to the cumulative risk.

$$Cumulative\ rate = \sum_{i=1}^{A} a_i t_i$$

Where

a_i is the agespecific rate for the t age group.

7. Cumulative risk

The cumulative risk is the risk which an individual would have of developing thecancer in question during a certain age span if no other causes of death were inoperation. It is essential

to specify the age period over which the risk is accumulated:usually this is 0-74, representing the whole life span. For childhood cancers, 0-14 canbe used.

Cum. risk = 100 x [I - exp (-cum. rate/100)]

B) Operational Definitions

1. Childhood cancer

Cancer cases diagnosed in the 0 to 15 age group are childhood cancers

2. Tobacco Related cancer

Cancer of lip, tongue, mouth, oropharynx, hypopharynx, pharynx, oesophagus, larynx, lung or urinary bladder are tobacco related cancers

3. Clinically suspected oral cancer

Clinically suspected oral cancer is a lump in the oral cavity which is progressively increasing in size AND which does not respond to treatment for infection or inflammation with antibiotic, anti-inflammatory agents or surgical drainage after 3 months of treatment

4. Clinically diagnosed oral cancer

Diagnosis of oral cancer by a dentist, a surgeon, an internist or an oncologist based on clinical examination alone

5. Operational definitions to diagnose cancer deaths (From the Registrar General of India and Center for Global Health and Research Million Death Study, Cause of Death Training Manual Version 13, March 2011)

C00 Lip cancer

C01-02 Tongue cancer

C01-C06 Oral cancer (mouth)

Lump or mass or swelling on tongue/ cheek/ mouth cavity/ gum/ palate, usually progressive

AND Any one of the following:

• Non healing sore or ulcer

• Bleeding on touch

• Restriction/difficulty in opening mouth

• Weight loss

OR

Diagnosed as mouth cancer

C10-C14 Pharynx or larynx (i.e. throat cancer)

Growth in throat / neck or hoarseness of voice AND Any

one of the following:

• Pain/difficulty in swallowing

• Loss of weight

OR Diagnosed as throat cancer

C15 Oesophageal cancer

Progressive difficulty in taking foods. AND weight loss over several months OR Diagnosed as oesophageal cancer

C16 Stomach cancer

Vomiting/ Vomiting of blood. Difficulty in swallowing AND Mass in upper abdomen AND Any of the following:

• Pain in abdomen

• Weight loss

• Enlarged liver

• Black stools

OR Diagnosed as stomach cancer

Possibly with History of repeated course of anti-ulcer

drugs

C17-C21 Intestine, colon or rectal cancer

Bleeding from anal opening AND any of the following:

• Constipation alternating with loose stools or constipation alone

• Weight loss

• Painful abdominal distension

• Lump in lower part of abdomen

OR

Diagnosed as colorectal cancer

C22 Liver cancer

Enlargement of liver AND abdominal distension (ascites) within weeks AND weight loss

AND H/o hepatitis or jaundice ANDno regular fever

OR diagnosed as liver cancer

C33-C34,C39 Trachea, bronchus and lung cancer(airways)

Chronic cough and blood streaked sputum eventually leading to haemoptysis, and not responding to antibiotics and antitubercular drugs AND Any of the following:

• Breathlessness

• Chest pain

• Hoarseness of voice

• Recurrent history of Pneumonia

• Rapid loss of weight towards end

AND No h/o Tuberculosis (no fever)

OR

Diagnosed as lung cancer

C43 Melanoma

Rapidly expanding mole AND Any of the following signs or symptoms:

• Patch/lesion with irregular margins may or may not bleed

• Varied discoloration of the lesion (brownish or red)

• Progressively expanding lesion

OR Diagnosed as melanoma

Possibly with Massive liver enlargement

C50 Breast cancer

Painless lump in one or both breasts AND Any of the following:

• Discharge from nipple

• Skin ulceration over breast

• Enlarged glands in the neck/maxilla

OR

Diagnosed as breast cancer

C53 Cervical cancer

Non-menstrual bleeding often after menopause OR Intermenstrual bleeding OR post coital bleeding OR Blood stained discharge OR foul smelling vaginal discharge with blood AND

Weight loss OR diagnosed as carcinoma cervix

OR Diagnosed as cervical cancer

Note: Try to rule out uterine cancer (C54-55)

C57 Malignant neoplasm of other and unspecified female genital organs

Where the underlying cause of death is suspected to be cancer of the female genital system but it is unclear from the verbal autopsy narrative as to which part of the female genital system the cancer originated from

C71 Brain cancer

Persistent headache OR vomiting AND Any of the
following:

- Headache
- Convulsions
- Involuntary eye movements (side to side or up/down)
- Unsteady gait
- Fainting spells
- Dementia/inappropriate behavior

OR

Diagnosed as brain cancer

C76 Malignant neoplasm of other and ill-defined sites

When the underlying cause of death is suspected to be cancer but it is unclear from the narration in the verbal autopsy as to which body organ the cancer originated from

C81-C85 Lymphoma Hodgkins (C81) & Non-Hodgkins (C83)

Painless enlargement of multiple lymph nodes, in neck
not responding to antibiotics or antitubercular treatment
AND Any of the following:

- Low grade fever
- Hoarse cough

• Night sweats

• Abdominal distension

• Weight loss

• Abdominal pain

OR

Diagnosed as lymphoma

C91-C95 Leukaemias

Acute onset fever or bleeding or bruising or anaemia

AND Any of the following:

• Night sweats

• Weakness

• Bruising

• Weight loss

• Persistent sore throat not responding to antibiotics

• Abdominal pain

OR

Diagnosed as leukaemia

Other and unspecified cancer sites

The other and unspecified cancer sites are-

C26 – Other and ill defined digestive organ

C39- Other and ill defined sites within respiratory systems and inter thoracic organ

C48- Retro peritoneum and peritoneum

C75- Other endocrine glands and related structures

C76 -Other and ill-defined, secondary and unspecified sites

C77 – Secondary and unspecified malignant neoplasm of lymph node

C78 – secondary malignant neoplasm of respiratory and digestive organs

C79 – Secondary malignant neoplasm of other and unspecified sites

C80 – Malignant neoplasm without specification of site and

C97 – Malignant neoplasm of independent(primary) multiple

6. Clinical extent of disease

Taking into account the modes of availability of data and the need for standardization of staging method to maintain data quality, it was decided to use the condensed TNM staging guide proposed by European Union of Cancer Registries in 2002[7].

The details of the same are given below

Tabulation of the clinical extent of disease

Serial No.	Clinical extent of disease	Condensed TNM stage
1.	Tumor localized	TL/N0/M0
2.	Tumor with local spread	TA/N0/M0
3.	Tumor with regional spread	any T/N+/M0
4.	Advanced cancer	any T/any N/ M+
5.	Unknown extent	Tx/Nx/ Mx

Where,

T-Tumor

TL- Tumor Localized

TA- Tumor Advanced

Tx-Tumor unknown extent

Guidelines followed for condensed TNM staging are as in Reference 7.

7. Annual house to house cancer survey form

सर्च गडचिरोली

रजिस्टर पे.नंबर	कुटुंब क्रमांक	माहिती कोणाला विचारली - नांव	पेशंटचे नांव	आजचे वय	तुमच्या घरात कोणालाही कॅन्सरची बिमारी झाली आहे. **असे डॉक्टरने सांगितले का?**	तुमच्या घरात कोणालाही **एक महिन्यापेक्षा जास्त दिवस तोंडात गाठ आहे का?**
					हो / नाही	हो / नाही
					हो / नाही	हो / नाही
					हो / नाही	हो / नाही
					हो / नाही	हो / नाही
					हो / नाही	हो / नाही

22. Photo documentation of registry activities:

Training of community health workers of SEARCH for house to house survey

A community health worker of SEARCH conducting house to house survey to inquire about cases of cancer

Cancer registrar evaluating a screen-positive individual detected in the house to house survey in a tribal village

A patient with oral cancer

Publication of the first Gadchiroli PBCR report for years 2015-16 at the Tata Memorial Centre, Mumbai by Dr Abhay Bang, Director, SEARCH and Dr Rajendra Badwe, Director TMC