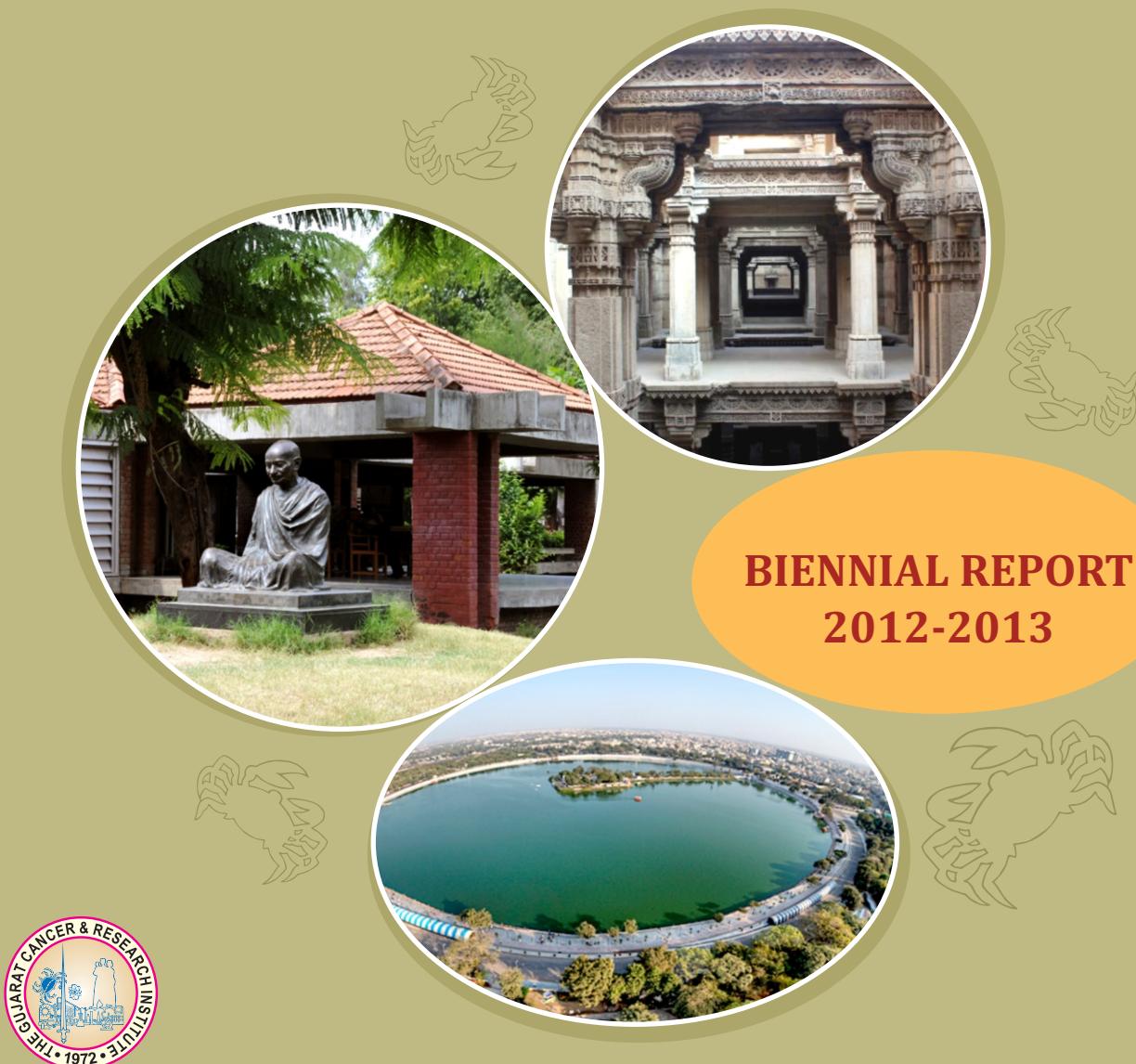


POPULATION BASED CANCER REGISTRY AHMEDABAD URBAN AGGLOMERATION AREA

NATIONAL CENTRE FOR DISEASE INFORMATICS & RESEARCH
NATIONAL CANCER REGISTRY PROGRAMME INDIAN COUNCIL OF MEDICAL RESEARCH



**BIENNIAL REPORT
2012-2013**



THE GUJARAT CANCER AND RESEARCH INSTITUTE

(M.P.ShahCancerHospital)

REGIONAL CANCER CENTRE

(Recognized by Ministry of Health & Family Welfare, Govt. of India)

New Civil Hospital Campus, Asarwa, Ahmedabad – 380 016, GUJARAT, INDIA

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October- 2016

PREFACE

This is the biennial report of the Population Based Cancer Registry of Ahmedabad Urban Agglomeration Area. The registry has now begun to see for itself a definite direction and a specific role.

The Gujarat Cancer & Research Institute has established Population Based Cancer Registry (PBCR) of Ahmedabad Urban Agglomeration Area under National Cancer Registry Programme (NCRP), National Centre for Disease Informatics and Research (NCDIR) of Indian Council of Medical Research (ICMR) in the year 2007. While this development is bound to deliver advantage to the registries in terms of more opportunities, it will simultaneously necessitate extra efforts towards meeting the standards set for and by the NCRP-NCDIR.

The coming years will show to what measure we succeed in our efforts.

Dr. R.K.VYAS

In-charge Director and

Principal Investigator, PBCR Ahmedabad Urban

FOREWORD

I am very happy to write this foreword for the report of Population Based Cancer Registry (PBCR) Ahmedabad Urban Agglomeration Area. This report covers data accrued over two years period from 1st January 2012 to 31st December 2013 and is the outcome of the effort of PBCR Ahmedabad Urban under the network of NCRP-NCDIR.

This report is considered as standard work of reference for describing incidence rates and patterns of cancer in the Ahmedabad Urban Agglomeration Area. It serves as an important tool for target oriented approach for cancer control programmes. The information regarding magnitude and pattern of cancer can be the basis of population based epidemiological studies. I am sure that researchers, clinicians, health administration and epidemiologists would benefit with this report.

I do wish to congratulate Dr. Janmesh Shah, Co-Investigator and his able team for this useful and successful work.

Dr. Geeta Joshi

Dy. Director and Professor and Head of Palliative Medicine and
Co- Investigator, PBCR Ahmedabad Urban

ACKNOWLEDGEMENT

We express our sincere gratitude to Heads and staff members of all the government and private hospitals, Cancer Specialists, Private Practitioners and Diagnostic Laboratories for their valuable support for providing data on cancer morbidity and mortality to the registry staff. The data so collected will definitely be useful in knowing the burden and patterns of cancer in the registry area so as to serve as a base for studies in etiology and control of cancer.

We are also grateful to National Cancer Registry Programme (NCRP), National Centre for Disease Informatics and Research (NCDIR) of Indian Council of Medical Research (ICMR), Bengaluru for their technical and financial support.

I take this opportunity to thank The Gujarat Cancer & Research Institute for providing a platform for cancer registry. I also thank all the doctors and staff members of GCRI in anticipation of more support in future to flourish the registry.

We are thankful to the Government of Gujarat for showing their keen interest in cancer registry in recent times and we also appreciate Government of Gujarat's Resolution about providing all the cancer data to GCRI. This is considered as a step further for making cancer a notifiable disease in the state of Gujarat.

Finally, the registry staff needs to be admired who have performed their duties enthusiastically in collecting and processing the data on which this report is based. Without their hard work, this would have not been possible.

Dr. Janmesh Shah

Assistant Professor, Department of Community Oncology and Medical Records and Co- Investigator, PBCR Ahmedabad Urban

Government of Gujarat Resolution for reporting of any diagnosed or suspicious case of cancer to GCRI

Registration of diagnosed
or suspicious cases of
cancer in Gujarat State

GOVERNMENT OF GUJARAT
Health and Family Welfare Department
No -ICR-102016-521-S
Sachivalaya, Gandhinagar
Date 20 MAY 2016

Preamble

Incidence and mortality of cancer cases are increasing across the globe. While in Gujarat, incidence of oral cavity cancer is highest in India and other cancers are also on rise. All these cancer cases need to be recorded and reported.

The Gujarat Cancer and Research Institute, Ahmedabad being a State Institute for cancer control; Cancer registry is functioning at The Gujarat Cancer and Research Institute since 2004 under the guidance and supervision of National Cancer Registry Programme. This registry data are helpful in measuring comprehensive cancer load, incidence and trend of the disease. It also guides in planning as well as implementation of the cancer control programme.

Resolution:

The Government of Gujarat after due consideration of the matter has found it expedient that a diagnosis or suspicion of cancer cases should be reported to the institute.

Therefore, all hospitals (Government or Private), Nursing Homes, Pathological, Clinical and Radiological Labs, Vital statistics division and Institution imparting medical education and providing diagnosis, treatment and any other health care related facilities shall provide information of diagnosed or suspicious cases of cancer to The Gujarat Cancer and Research Institute, Ahmedabad in prescribed format either in soft copy or hard copy within a period not exceeding three weeks from the date of diagnosis or the date on which the suspicion arose.

P.T.O.....

....2...

The authorized representative of the Gujarat Cancer & Research Institute shall visit the aforesaid hospitals (Government or Private), Nursing Homes, Pathological, Clinical and Radiological Labs, Vital statistics division and Institution imparting medical education and providing diagnosis, treatment and any other health care related facilities twice a month for collection of such information/reports and should be allowed to abstract the medical records of such patients if necessary. All concerned should maintain the strict confidentiality on the identity of the patients suffering from the disease.

By order and in the name of Governor of Gujarat.


(V. G. Vanzara)
Joint Secretary

Health and Family Welfare Department,
Government of Gujarat

To,

- Private Secretary to Hon Minister (Health) Swarnim Sankul-1, Gandhinagar.
- The Commissioner, Health, Dr. Jivaraj Mehta Bhavan, Gandhinagar
- The Additional Director (M.E.) Dr. Jivaraj Mehta Bhavan, Gandhinagar
- ✓ ➤ The Director, Gujarat Cancer and Research Institute, Ahmedabad.
- All hospitals (Government or Private), Nursing Homes, Pathological, Clinical and Radiological Labs, Vital statistics division and Institution imparting medical education and providing diagnosis, treatment and any other health care related facilities. (Through The Additional Director (M.E.) Dr. Jivaraj Mehta Bhavan, Gandhinagar)
- All District Health Officers
- Section Officer, (V, J, A and E Branches) Health and Family Welfare Deptt. Sachivalay, Gandhinagar.
- Select File
- Branch Collection

PBCR – AHMEDABAD URBAN AGGLOMERATION AREA*
BIENNIEL REPORT - 2012-13

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In-charge Director, GCRI, Ahmedabad

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Co – Investigator and
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Mr. Himanshu V Patel	:	In-charge Medical Record Officer
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Ms. Vishruti Pandya	:	Jr. Statistical Assistant
Ms. Neha Jadav	:	Jr. Statistical Assistant
Mr. Himanshu Patel	:	Junior Clerk
Mr. Rohit Cholavia	:	Social Worker

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Mr. Kiritkumar Vasaiya	:	Field Worker
Mr. Sebastian Farmer	:	Field Worker
Mr. Amit D. Rohit	:	Field Worker
Mr. Pratik S. Mahida	:	Field Worker

* Fully supported by the grant from National Cancer Registry Programme (NCRP),
NCDIR, Indian Council of Medical Research, Bengaluru.

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APPENDIX

We are thankful to the following sources of PBCR – Ahmedabad Urban Agglomeration Area who have contributed data and supported in the registry programme.

Sources

GOVERNMENT/MULTISPECIALITY/PRIVATE HOSPITALS

Aaesha Hospital	Laxmi Hosp / T R Memorial
Apollo Hospital	Life Line Diagnostic Center
Apollo Hospital City Centre	M J Institute Of Ophthalmology Hospital
Aradhana Histopathology & Cytology Clinic	N H L Municipal Medical College
B J Medical College	Narayana Multispeciality Hospital
C H Nagari Eye Hospital, Ahmedabad	Navjivan Hospital, Mehsana
Cancer Associates	Panchshil Hospital
CIMS Hospital	Parekhs Hospital
Columbia Asia Hospital	Parth Hospital
Devasya Kidney Hospital	Piramal Diag Centre
Dhruvi Hospital	Pokhraj Hospital
Diva Hospital	Pramukh Neuro
E S I S General Hospital, Bapunagar	Rajasthan Hospital
Eva Women Hospital	Rukshmani Hospital
Gcs Hospital	Sadhna Diagnostic Centre
General Hospital, Sola	Sanjivani Hospital
Government Dental College & Hospital	Satyamev Hospital
Green Cross Pathology	Savliya Hospital
Gujarat Blood Bank Pathology Lab	Savour Hospital
HCG Cancer Care	Shardaben General Hospital
Hem - Onco Associates	Shree Krishna Cancer Hospital
Institute Of Kidney Disease And Research Centre	Shrey Hospital
Jagmohan Hospital	Shubhdra Hospital
Jincy Hospital	Sidhdhi Vinayak Hospital
Jivaraj Mehta Hospital	Sindhu Hospital
Kaizen Hospital	Star Hospital
Kakadia Hospital	Sterling Hospital
Khushi Hospital	Sushrusha Hospital, Ahmedabad
Khushi Women's Hospital	Swayambhu Multispeciality Hospital
Krishna Surgical Hospital	V S General Hospital
L G Hospital, Ahmedabad	Vedant Hospital

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Dr. Bhavin Shah	Dr. Mehul V Sukhadia
Dr. Bipin Shah	Dr. Mukesh Bavishi
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Dr. D D Patel	Dr. Navinbhai K Shah
Dr. D G Yagnik	Dr. Nilesh Gandhi
Dr. Darshan Bhanshali	Dr. Niraj Kothari
Dr. Darshit Dalal	Dr. Niraj R Gupta
Dr. Devang Bhavsar	Dr. P B Patel
Dr. Dilip Shrinivasan	Dr. P B Shukla
Dr. Dinesh H Patel	Dr. P C Patel
Dr. Dipak D Patel	Dr. Pankaj M Shah
Dr. Dipak R Patel	Dr. Prabhakar Shukla
Dr. Dushyant Talasaniya	Dr. R A Tankshali
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Dr. Hema Talasaniya	Dr. Ragesh K Fadia
Dr. Hitesh V Shah	Dr. Ramanbhai M Patel
Dr. J D Patel	Dr. Ruchir Shah
Dr. J J Patel	Dr. Rupesh Modi
Dr. J P Pandit	Dr. S S Alulkar
Dr. J T Zala	Dr. S V Shah
Dr. Jayant H Patel	Dr. Sanjay Rajput
Dr. Jayesh Prajapati	Dr. Shailen Modi
Dr. Jayeshbhai & Natubhai	Dr. Shailesh S Patel
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Dr. Kalpana Kothari	

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Lab - Aashirvad Lab, Sanand	Mahalaxmi Surgical Patho Laboratory
Lab - Accuvview Lab	Maharshi - House Of Histopathology & Cytology
Lab - Bajaj Lab	Maitri Pathology Laboratory
Lab - Balar Lab	Nirman Pathology Laboratory
Lab - Cellcare Lab	Om Pathology Diagnostic Center
Lab - Green Cross Lab	Sanket Diagnostic Pvt Ltd
Lab - Gujarat Blood Lab	Supratech Pathology Laboratory, Ahmedabad
Lab - Gurukrupa Patho Lab	
Lab - Ilesh Safi Lab	
Lab - Jivraj Mehta	
Lab - Nalini Shah Patho Lab	
Lab - Parth Patho Lab	
Lab - Qualitech Lab	
Lab - Sarthi Lab	
Lab - Srl Diagnostic Center	
Lab - Supratech Lab	
Lab - Unipath Lab	
Lab - Vidhi Patho Lab	

MORTALITY SOURCES

Urban Health Centres (All wards)	Ahmedabad district panchayat
Birth and Death Department, Ahmedabad Municipal Corporation	

PBCR – AHMEDABAD URBAN

YEAR 2012-2013

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Introduction

The Population Based Cancer Registry (PBCR) – Ahmedabad Urban Agglomeration Area has been functioning since the year 2007 under the network of National Cancer Registry Programme (NCRP) which has evolved into a permanent centre of National Centre for Disease Informatics and Research (NCDIR), ICMR Complex at Bengaluru.

The main objective of PBCR Ahmedabad urban is

- (i) To assess the magnitude and type of various cancers in Ahmedabad urban Agglomeration Area and
- (ii) To provide a framework for controlling the impact of cancer on the community apart from carrying out research investigations on cancer aetiology through epidemiological studies.

Demographic Characteristics of Ahmedabad Urban Agglomeration Area:

Ahmedabad is the largest city and former capital of the Indian state of Gujarat. Ahmedabad is the most thriving city in west India after Mumbai. Ahmedabad is also known as Karnavati or Amdavad, located on the banks of the Sabarmati River, about 30 km south of Gandhinagar, the capital of Gujarat. The city of Ahmedabad has been under the rule of many dynasties from the Sultans to Mughals to Marathas and then to the British. There are many world class educational institutions, industries and a refreshing take on art and culture in the city. Ahmedabad city is also known as the Manchester of the East because of textile mills located in the city, it has become a popular tourist destination with many places of interest in and around the city. By 1960, Ahmedabad had become a metropolis, with classical and colonial European styled buildings lining the city's thoroughfares. It was chosen as the capital of Gujarat state after the bifurcation of the State of Bombay on 1 May 1960. During this period, a large number of educational and research institutions were founded in the city, making it a centre of higher education, science and technology.

The city of Ahmedabad was founded in 1411 as a walled city on the eastern bank of the river Sabarmati, now the seventh largest metropolis in India and the largest in the state. The urban agglomeration (UA) population has increased from 3.31 Million in 1991 to 6.3 million in 2011. The city is devoid of any major physical features except for the river Sabarmati, which is cutting the city into two parts: eastern walled city and western Ahmedabad on either side of its banks. Ahmedabad has a tropical monsoon climate, which is hot and dry, except in the rainy season. The Ahmedabad Urban Agglomeration (AUA) housed 23.25 % of the State's urban population in 1991, which has gone up to about 40.38% in 2011. Compared to other metropolises in India Ahmedabad has a lesser degree of primacy and urban population is spread evenly across other metropolitan and class I cities in the State. Ahmedabad City lies between 20°00' and 23°04' North Latitude and 71°06' and 72°09' East Longitude. It has an area of 299.71 per km². As per the census 2001, total population of registry area was 42,20,048 with 14,080 per km² population density. The Male/Female (sex) ratio was 1000:885. Male/Female ratio was 1000:825 in 0-6 years age group. Literacy rate as per the census 2001, in males and females was 89.76 and 77.27 respectively.

The registry area covered under AHMEDABAD URBAN is shown in the map given below.

Map of Ahmedabad Urban Agglomeration Area



SUMMARY

In 2012-13, in Ahmedabad Urban, 9594(5477 males, 4117 females) new cancer cases were registered. The Crude Cancer Incidence Rate (CIR) per lac population per year in male was 87.4 and in females 73.0. The corresponding Age Adjusted Rates (AAR) was 98.5 and 76.5. The truncated incidence rate (TR) among males and females were 181.0 and 155.7 per 1,00,000 persons respectively. Male/Female ratio was 1.33:1.

Mouth Cancer (1113 cases, 20.32%) was the leading site among males followed by cancer of Tongue (627 cases, 11.45%), Lung (458 cases, 8.36%), Oesophagus (307 cases, 5.61%) and Prostate (205 cases, 3.74%). Among females Breast (1298 cases, 31.53%) was the leading site followed by cancer of Cervix (382 cases, 9.28%), Ovary (220 cases, 5.34%), Mouth (197 cases, 4.79%) and Tongue (188 cases, 4.57%).

Pediatric cancers (age 0-14 years) constituted 171 cases (1.78%) of total cancer load in both sexes with higher percentage of cases among boys (2.04%) than girls (1.43%).

Over half (3086 cases, 56.34%) of all cancers in males and (818 cases, 19.87%) of all cancers in females were Tobacco Related Cancers.

Diagnosis by microscopic verification was available in 92.23% of males and 90.72% of females.

Mortality to Incidence (M/I) Percentage was 32.08% and the cases registered with Death Certificate Only sources (DCOs) accounted for 0.37%.

The Number of Incident cases, percent increase in number of cases (compared to base year-2007) and the comparative study of rates for the year 2007 to 2013 are shown in Table I and Table II.

Table: I
Incidence Cases by Gender: 2007-2013

Year	Incident cases			Percent increased
	Male	Female	Total	
2007	1847	1535	3382	-
2008	2139	1711	3850	13.8
2009	2263	1743	4006	18.5
2010	2270	1723	3993	18.1
2011	2519	1871	4390	29.8
2012	2913	2248	5161	52.6
2013	2564	1869	4433	31.1

Table : II
Comparative study for year 2007 to 2013

	2007		2008		2009		2010	
	Male	Female	Male	Female	Male	Female	Male	Female
Number of Cancer Cases and Percentage	1847 (54.61%)	1535 (45.39%)	2139 (55.56%)	1711 (44.44%)	2263 (56.49%)	1743 (43.51%)	2270 (56.85%)	1723 (43.15%)
Crude Incidence Rate	74.4	70.2	84.8	77.0	88.2	77.2	87.0	75.1
Age Adjusted Incidence Rate	98.6	81.2	115.5	89.8	119.2	89.2	116.1	85.4
Truncated Incidence Rate	187.6	168.1	199	183.4	205.8	184.8	212.9	184.8
Crude Mortality Rate	24.2	17.8	23.4	17.1	17.5	12.4	27.3	19.1
Age Adjusted Mortality Rate	31.2	20.2	32.4	20.1	22.7	13.9	37.7	22.4
Truncated Incidence Rate	63.4	45.8	57.2	42	44.1	29.6	64.6	48.5
Death Certificate Only	50 (2.71%)	19 (1.24%)	131 (6.12%)	89 (5.20%)	47 (2.08%)	43 (2.47%)	20 (0.88%)	26 (1.51%)
Microscopically Confirmed	1670 (90.42%)	1390 (90.55%)	1963 (91.77%)	1586 (92.69%)	2191 (96.82%)	1685 (96.67%)	2218 (97.71%)	1664 (96.58%)

	2011		2012		2013	
	Male	Female	Male	Female	Male	Female
Number of Cancer Cases and Percentage	2519 (57.38%)	1871 (42.62%)	2913 (56.44%)	2248 (43.56%)	2564 (57.84%)	1869 (42.16%)
Crude Incidence Rate	95.0	80.3	94.4	80.9	80.7	65.3
Age Adjusted Incidence Rate	127.6	91.4	107	85.3	90.3	68.2
Truncated Incidence Rate	226.8	188.2	192.3	172.1	170.2	140
Crude Mortality Rate	32.5	24.0	35.2	22.1	26.8	18.4
Age Adjusted Mortality Rate	44.7	28.1	40.9	23.5	29.8	19.3
Truncated Incidence Rate	77.5	56.5	72.1	48.4	58.4	38.8
Death Certificate Only	49 (1.9%)	27 (1.44%)	12 (0.44%)	8 (0.4%)	11 (0.4%)	5 (0.3%)
Microscopically Confirmed	2356 (93.5%)	1769 (94.5%)	2594 (89.0%)	1974 (87.8%)	2457 (95.8%)	1761 (94.2%)

INCIDENT CASES AND INCIDENCE RATES

Incident Cases:

All new cases of cancer diagnosed in a defined population during a specified period of time are considered as incident cases. Hence all new cases of cancer diagnosed in the defined area of Ahmedabad Urban Agglomeration during the year 2012-13 (1st Jan 2012 to 31st Dec 2013) formed the incident cases. A total number of 9594 cases have been registered as incident cases during this period with 5477 males and 4117 females (including the DCOs).

Incidence Rates:

In general, a rate is defined as frequency of a disease or characteristic, per unit size of population or group in which it is observed. A rate measures the number of events occurring in a defined population in a period, in relation to the size of the population. Rates may be expressed per 1000, per 100000, per million, or other bases dependent on particular circumstances. Rates for cancer are usually expressed per 100,000 populations. The commonly measured types of rates in cancer are Crude Incidence Rate (CIR), Age specific Incidence Rate (ASpR), age adjusted or Standardized Incidence Rate (AAR/ ASR) and Truncated Incidence Rate (TR)

Crude Incidence Rate (CIR):

The CIR can be easily calculated by dividing total number of new cases (C) registered during a year by corresponding population of that year (N) and multiplying the result by 100,000.i.e. $CIR = (C / N) \times 100,000$

Age Specific Rate (ASpR):

This rate can also be simply calculated by dividing number of cases of a given age-group (C_i) by corresponding population of same age group (N_i) and multiplying result by 100,000
i.e. $ASpR = (C_i / N_i) \times 100,000$

Age Adjusted/ Standardized Rate (AAR):

One of the most frequently encountered problems in cancer epidemiology is comparison of incidence rates for a particular cancer between two different populations, or for same population over time. If one population is on average younger than other, then even if age specific rates were same in both populations, more cases would appear in older population than in younger. Hence, in order to make rates of cancer comparable between two populations or countries a world standard population that takes into account such disparities is used to arrive at age adjusted or age standardized rates (AAR).

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

Where a_i is the age specific rate in age class i

w_i is the world standard population in age class i

A is the number of age class interval

Truncated Rate (TR):

Truncated Rate (TR) is the rate similar to AAR except that it is calculated for the truncated age group of 35-64 years of age.

CANCER REGISTRATION SYSTEM

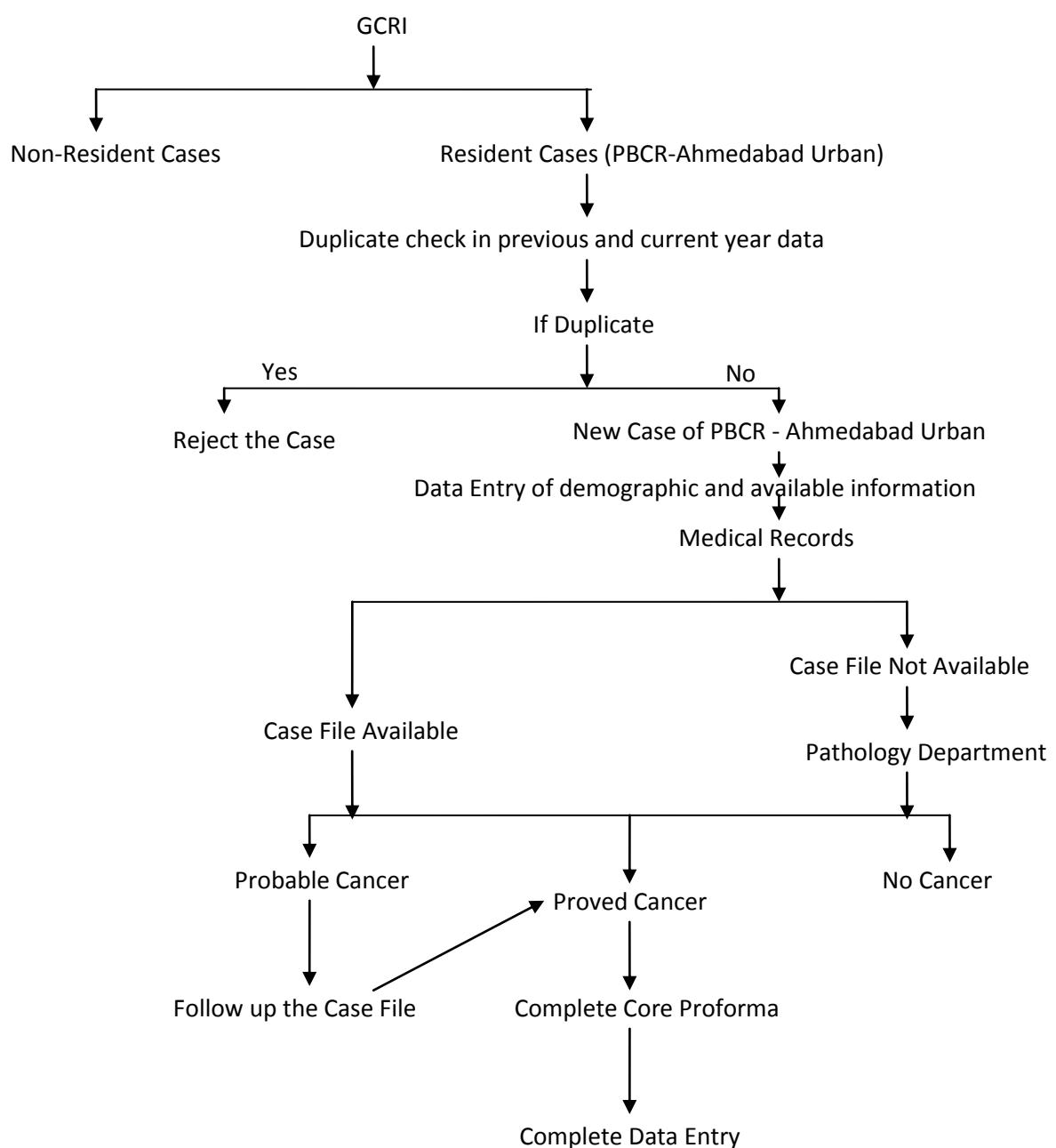
The physical location of PBCR - Ahmedabad Urban Agglomeration area is based at the Gujarat Cancer and Research Institute (GCRI). At GCRI, trained cancer registry personnel fill the core performa by direct interview with patient / relative at the time of registration every day.

Besides the base Institution (GCRI), the registry staff visits various sources of registration in coverage area namely all Government hospitals, Private hospitals, Nursing homes, Diagnostics centres and Death registration units. They actively pursue and collect information on cancer cases reported.

At GCRI, each and every patient is interviewed and their socio-demographic details are collected at the time of registration. Later, the case records of these patients are obtained by the registry to extract information on clinical items such

as method of diagnosis, site of cancer, treatment details etc. The inclusion criteria for registration of cases is that patients who have lived in the defined areas of Ahmedabad Urban for a minimum period of one year at the time of first diagnosis of cancer. Only invasive cancers (5th digit morphology code 3 or 6) are reported. Benign tumors and in-situ cancers are not included for analysis. Working of registry at GCRI is presented by a flowchart (a).

(a) Working of Registry at the Gujarat Cancer and Research Institute (GCRI):

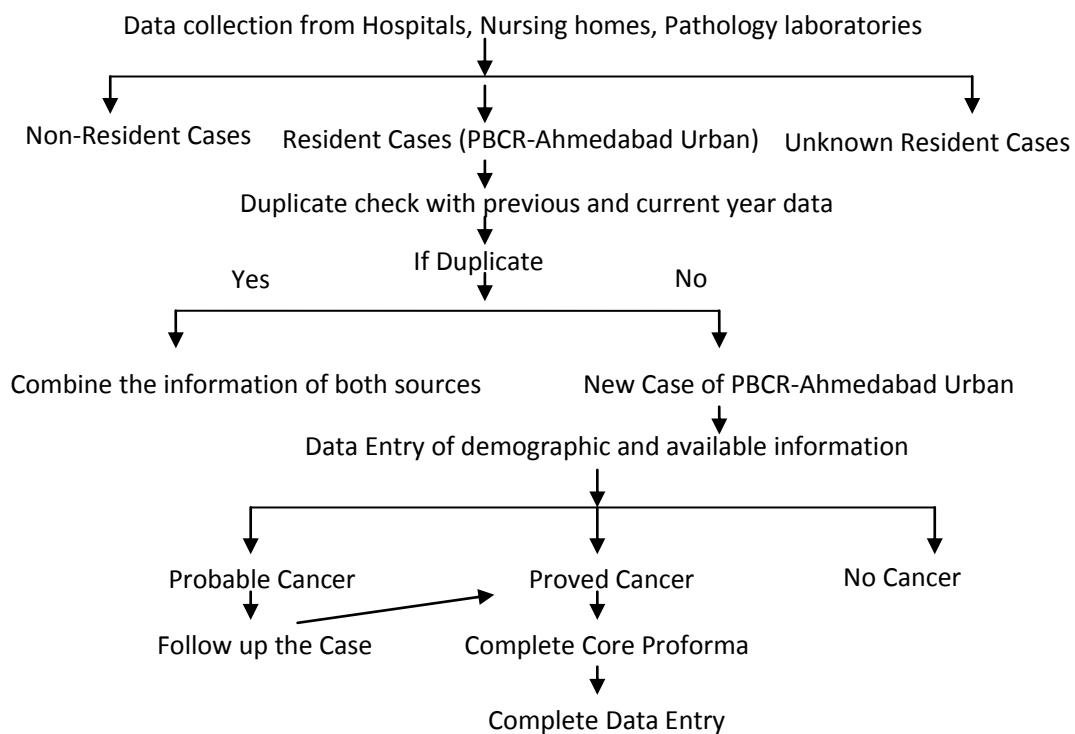


Other than GCRI, staff members personally visit the wards of the co-operating hospitals regularly to interview all confirmed cancer patients and also those who are under cancer investigation. The record files maintained by the various departments of these hospitals viz. pathology, hematology, radiology and the various specialized surgical and medical wards are also examined. The requisite details obtained for each patient are cross-checked with the information collected from the various departments of the collaborating hospitals to ensure completeness of records. Full information on every cancer patient registered at each and every hospital are thus obtained, irrespective of whether or not the patient is subsequently treated at the particular hospital. Additional information is obtained every time when a cancer patient is re-admitted or re-examined at the institution.

As a result of such data collection from different sources, one and the same patient is sometimes found to be registered at two or more sources. Care is taken to see that multiple entries for the same patients are not made in our records. On the other hand in some instances complete medical information could be obtained only by combining the data obtained from two or more hospitals of the same patient. Patients attending the clinics (outpatient departments) of various hospitals are not included in our registry, except in the case of The Gujarat Cancer and Research Institute, because of a paucity of medical details and information on the residential status, in the record files maintained in the out – patient clinics of general hospitals.

Working of registry at other than GCRI sources is presented by a flowchart (b).

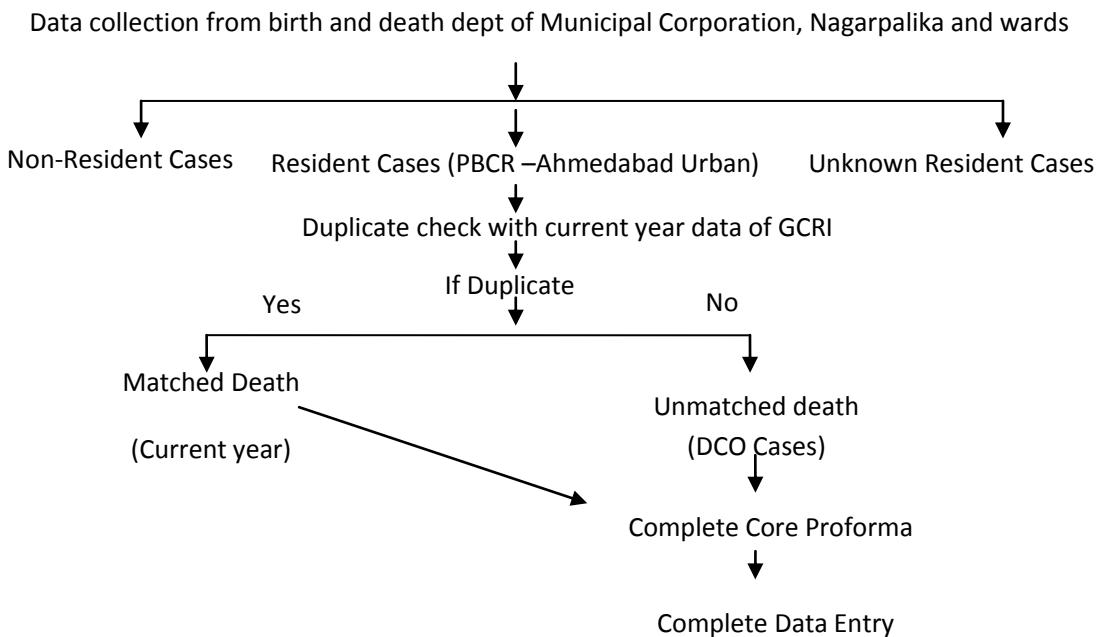
(b) Working of Registry at other than GCRI sources:



For collection of mortality data, help is taken from Ahmedabad Municipal Corporation too along with GCRI and all other sources. Supplementary information about patient could often be captured from the death records maintained by the Vital Statistics Division of Ahmedabad Municipal Corporation. Every cancer death which is not traceable or not matched with registered cases in our files, with same year cancer cases or with previous years cancer cases, is labeled as an 'unmatched death' and the date of death is then taken as the date of first diagnosis, and is so registered in the corresponding year's data file as Death Certificate Only(DCO) cases.

The known residence cases as well as those whose residence addresses are not known; both are recorded in our files after collecting necessary information from the various collaborating institutes. Non-residence cases are not considered. Working of registry for collection of Mortality data is presented by a flowchart (c).

(c) Working of Registry for collection of Cancer Mortality Data:



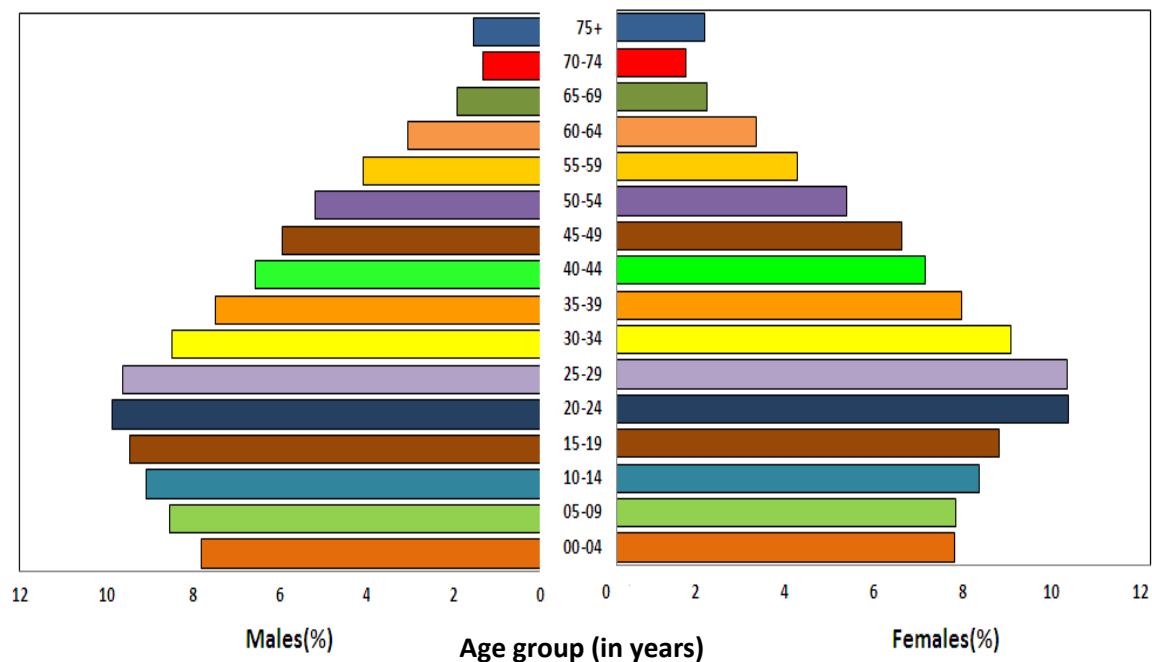
POPULATION ESTIMATES

Population data was estimated for the year 2012-13 by using difference distribution method provided by NCRP-NCDIR. The percentage distribution of population by five year age groups and gender for Ahmedabad Urban Agglomeration Area for the year 2012-13 is shown below by Population Pyramid in Figure 1.

Figure 1

Percentage Distribution of Estimated Population by five years age group and Gender

PBCR Ahmedabad Urban 2012-2013



SOURCES OF REGISTRATION

The following sources are identified as major sources for cancer data collection.

- All hospitals, nursing homes and consultants in private practice in the registry area
- The Vital Statistics Division of Ahmedabad Municipal Corporation

The Ahmedabad Urban Cancer Registry covers more than 200 hospitals and private nursing homes in the metropolitan area. There are 61 collaborating hospitals (Municipal hospitals, Government hospitals, Corporate hospitals and Trust hospitals). Our main source of cancer data collection is The Gujarat Cancer and Research Institute (GCRI), the base institution where the registry is located.

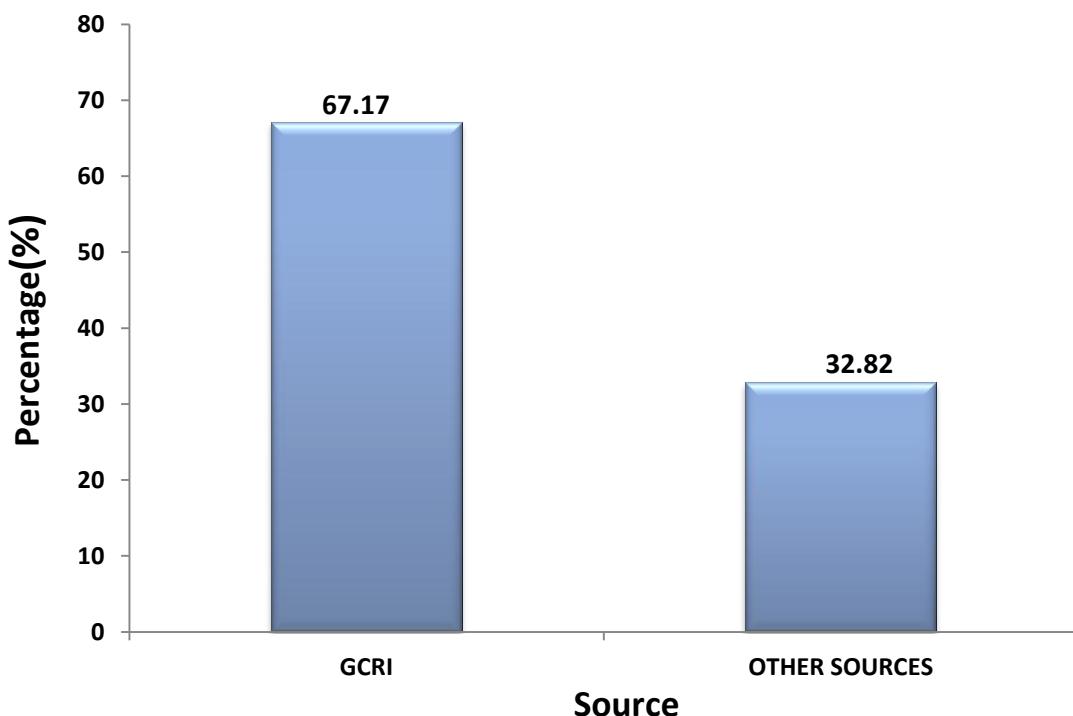
GCRI is also a Regional Cancer Centre of Government of India and now it is upgraded as a State Cancer Institute (SCI) by Government of India. It is the only comprehensive centre for cancer treatment in Gujarat and contributes a major share. The Birth & Death department of Ahmedabad Municipal Corporation is also one of the important sources of cancer cases.

A total of 6445 (67.18%) new cancer cases were registered from The Gujarat Cancer and Research Institute which is the base institute whereas 3149 (32.82%) cases were registered from other sources. Other sources are mainly divided into (1) Sources of Ahmedabad Urban Area and (2) Sources of Ahmedabad District (other than Urban Area) group. Distribution of incident cases by various sources is given in Table III given.

Table : III
Distribution of Cases by Sources:
PBCR - Ahmedabad Urban 2012-13

Source	#	%
GCRI	6445	67.18
Other Sources	3149	32.82
Total	9594	100

Figure : 2
Distribution of Cases by Sources (in percentage):
PBCR - Ahmedabad Urban 2012-13



PROPORTION OF CANCERS BY BROAD AGE GROUP

The distribution of the resident population and the new cancer cases by broad age group and gender is given in Table IV.

Table: IV

Number (#) and Proportion (%) of Population and Cancers by broad age-group:

PBCR Ahmedabad Urban 2012-2013

Age Group	Population			New Cancer Cases		
	Males	Females	Total	Males	Females	Total
00-14	25.47	23.35	24.46	2.04	1.43	1.78
15-34	37.46	37.70	37.57	9.04	8.14	8.65
35-64	32.32	33.41	32.84	62.42	66.80	64.30
65+	4.76	5.54	5.13	26.49	23.63	25.27
TOTAL	100	100	100	100	100	100

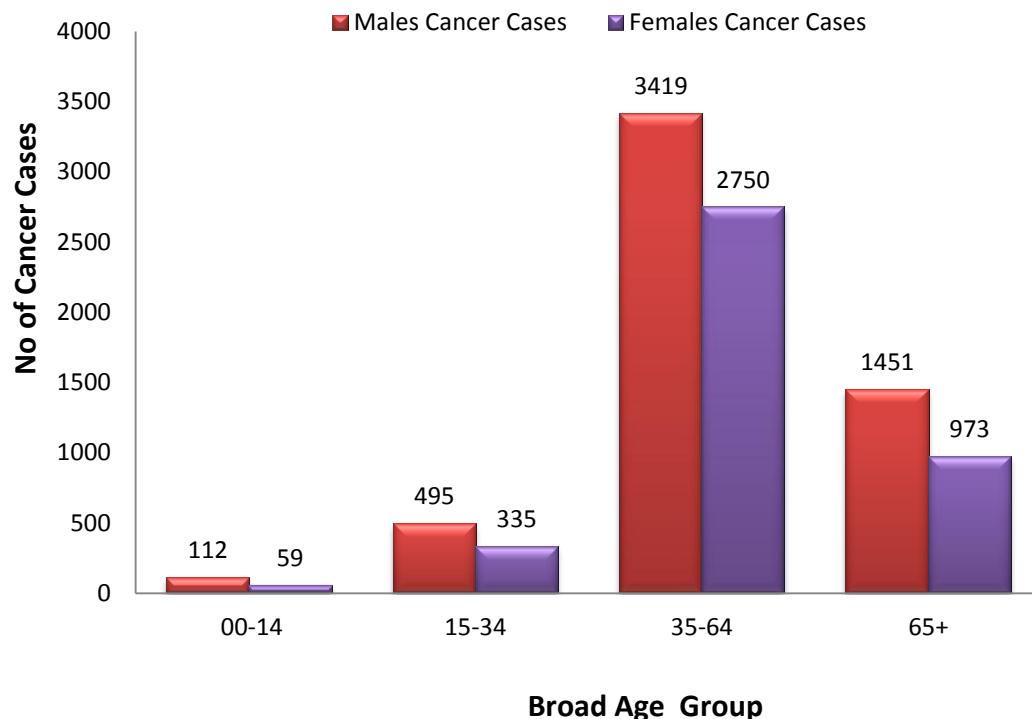
Proportions (%) of cancers are classified according to four different broad age group of 0-14, 15-34, 35-64 and 65+ years.

171(1.78%) cases occurred in pediatric age-group of 0-14 years, 830 (8.65%) cases in 15-34 years, 6169 (64.30%) cases in the truncated age group of 35-64 years and 2424 (25.27%) cases in older age group. In other words, about 89% of cancers occurred after age of 35 years, whereas total population above age of 35 years accounted for about 36% in both sexes thus indicating need for control measures to prevent cancer problem among general population at very beginning of truncated age group.

Graphical presentation of cancer cases by broad age group and proportion of population and cancer cases by broad age group are shown below.

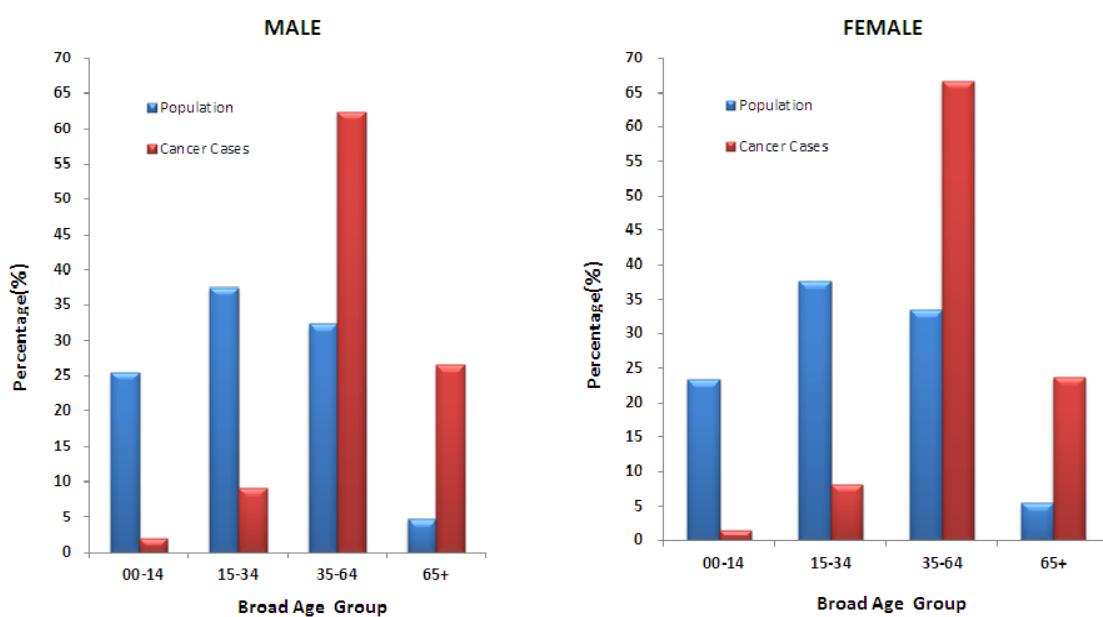
Figure: 3

Cancer Cases by broad age-groups, PBCR Ahmedabad Urban 2012-2013



Percentage of population and cancer cases by broad age-group and gender:

PBCR Ahmedabad Urban 2012-2013



AGE SPECIFIC INCIDENCE RATES

The age specific incidence rates ranges between 6.3 (05-09 years age group) to 537.7 (70-74 years age group) per 100,000 persons among males and 3.0 (05-09 years age group) to 366.1(65-69 years age group) per 100,000 populations among females. Table: V represents the age specific incidence rates with five year age group by gender in Ahmedabad Urban 2012-2013.

Table: V

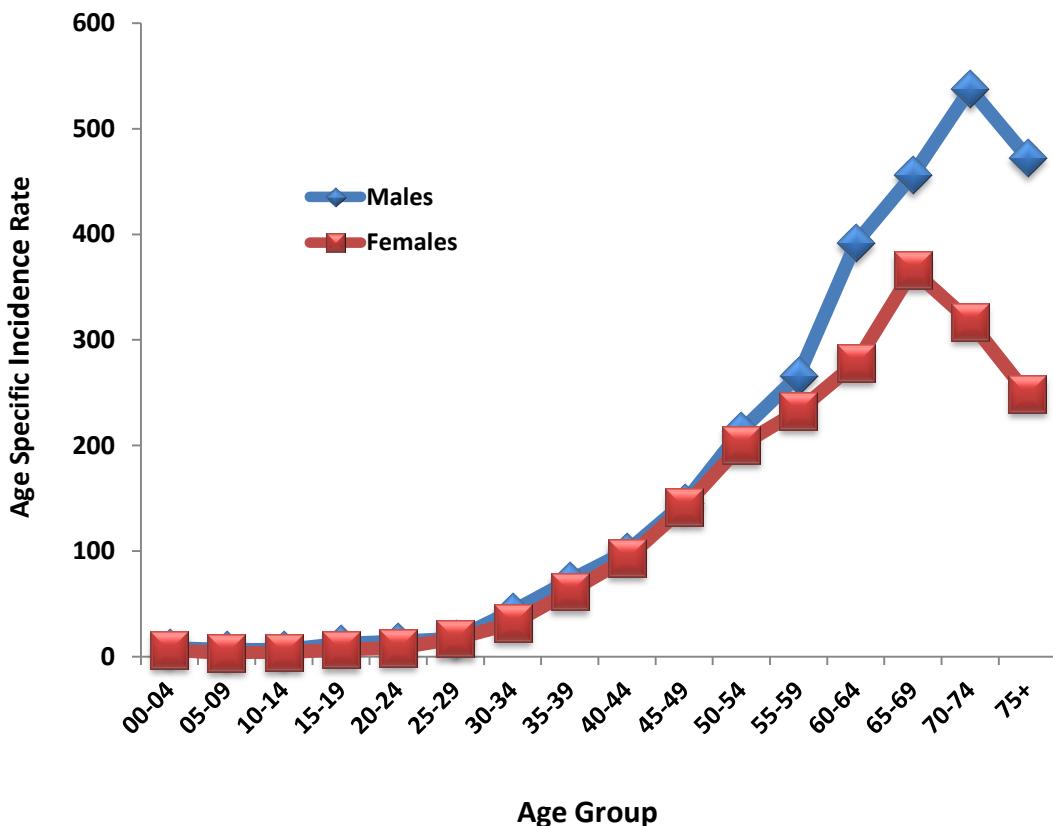
Age Specific Incidence Rates per 1,00,000 populations for all sites of cancers:

PBCR Ahmedabad Urban 2012-2013

Age Group	Males	Females
00-04	8.40	6.3
05-09	6.3	3.0
10-14	6.5	4.1
15-19	12.3	6.6
20-24	14.4	8.4
25-29	17.1	17.0
30-34	43.2	31.7
35-39	72.1	61.5
40-44	99.7	93.3
45-49	145.8	141.8
50-54	214.2	200.6
55-59	266.7	233.0
60-64	391.9	278.0
65-69	456.4	366.1
70-74	537.7	317.2
75+	472.9	248.6

Figure: 4

Age Specific Incidence Rates per 1 lac population with five year age group by gender:
PBCR Ahmedabad Urban 2012-2013



Cancer Incidence rates were found to increase sharply with age given in Figure:3. The curves for men and women however were quite distinct. The Age Specific Incidence Rates were higher in males as compared to females in all the age group. The Age Specific Incidence Rate has crossed over 100 in males as well as females in 45-49 years age group.

LEADING SITES OF CANCER

The top ten leading sites of cancer among males and females are shown in Table: VI. Ranking of these sites is based on the Age Adjusted Incidence Rates. The most common site of cancer in males is the mouth cancer constituting 20.32% with AAR of 18.11 followed by cancer of the Tongue (11.45%) with AAR 10.40, Lung (8.36%) with AAR 9.13 occupied third rank. Cancer of Oesophagus, Prostate, Larynx, Hypopharynx, Myeloid Leukemia, NHL, and Colon were accounted substantial number of cases in males. In females cancer of breast (31.53%) being the leading site with AAR of 23.76. Cancer of cervix (9.28%) with AAR of 6.91 is in second rank. Ovarian cancer (4.8%) constitutes third rank with AAR 4.02 followed by cancer of Mouth, Tongue, Oesophagus, Lung, Corpus Uteri, Gallbladder and Myeloid Leukemia.

Altogether, the first ten leading sites of cancers among males and females accounted for 64.21% of the total cancers in males and about 70.51% of the total cancers in females.

Table: VI

Number (#), relative proportion (%) and Age Adjusted Incidence Rates (AAR):

Ten leading sites of cancers:

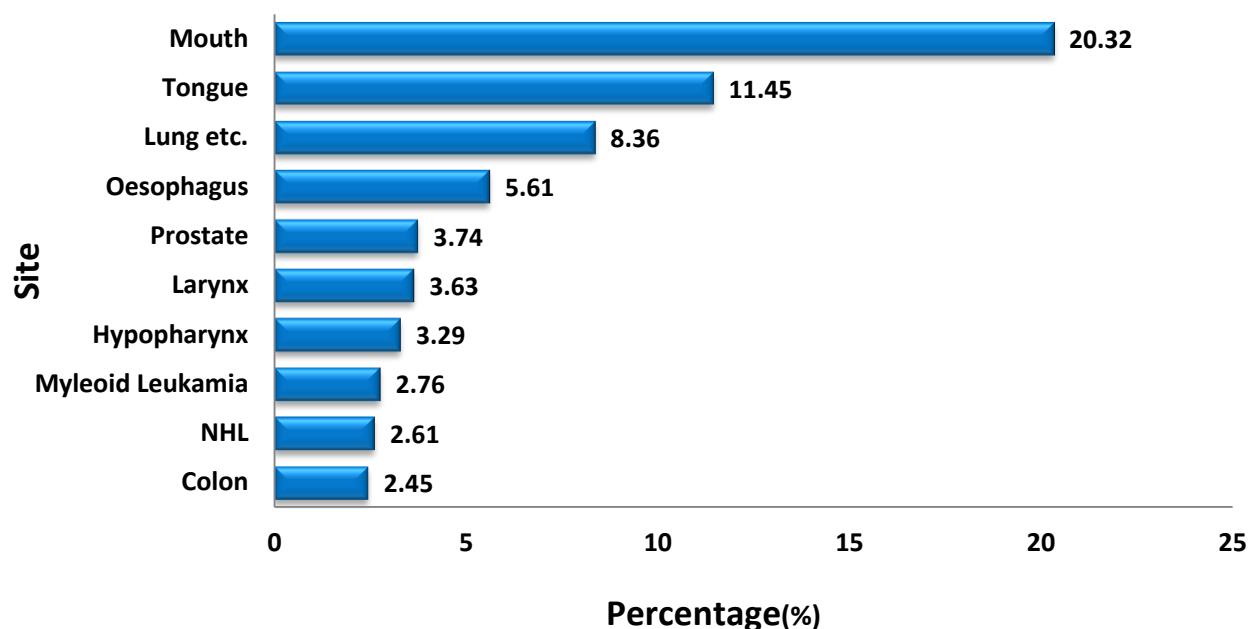
PBCR Ahmedabad Urban 2012-2013

SITE	MALE			SITE	FEMALE		
	#	%	AAR		#	%	AAR
Mouth	1113	20.32	18.11	Breast	1298	31.53	23.76
Tongue	627	11.45	10.40	Cervix Uteri	382	9.28	6.91
Lung etc.	458	8.36	9.13	Ovary etc.	220	5.34	4.02
Oesophagus	307	5.61	5.88	Mouth	197	4.79	3.63
Prostate	205	3.74	4.40	Tongue	188	4.57	3.39
Larynx	199	3.63	3.79	Oesophagus	182	4.42	3.53
Hypopharynx	180	3.29	3.51	Lung etc.	133	3.23	2.73
Myeloid Leukemia	151	2.76	2.38	Corpus Uteri	116	2.82	2.26
NHL	143	2.61	2.58	Gallbladder etc.	94	2.28	1.78
Colon	134	2.45	2.49	Myeloid Leukemia	93	2.26	1.67
Other Sites	1960	35.79	-	Other Sites	1214	29.49	-
All Sites	5477	100	98.50	All Sites	4117	100	76.50

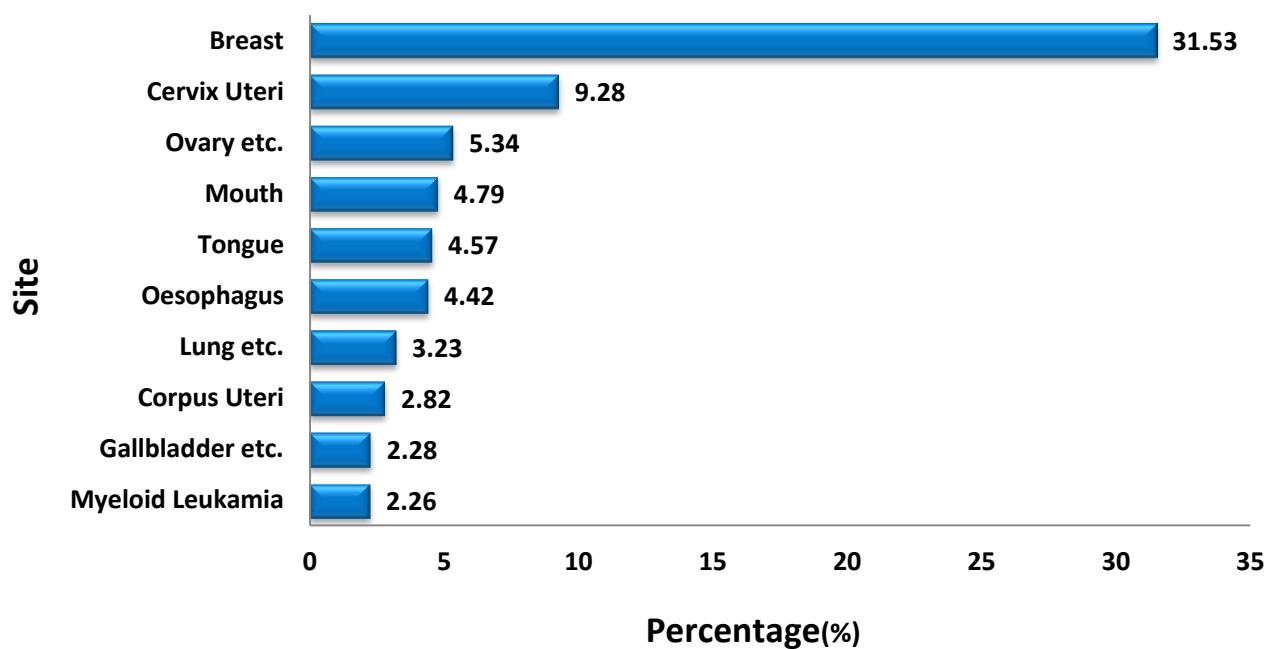
Graphical presentation of ten leading sites in Males and Females is as below.

Figure: 5

Ten Leading Sites in Males, PBCR Ahmedabad Urban 2012-2013



Ten Leading Sites in Females, PBCR Ahmedabad Urban 2012-2013



TOBACCO RELATED CANCERS

Cancers of the lip, tongue, mouth, pharyngeal cancers (excluding nasopharynx), oesophagus, larynx, lung and urinary bladder were considered as sites of cancer related to tobacco use in this report for comparison purpose with the other registries in the country even though, the International Agency for Research on Cancer Monograph (IARC 2004) indicated that there is sufficient evidence now to establish a causal association between cigarette smoking and cancers of the nasal cavities and nasal sinuses, stomach, liver, kidney, uterine cervix and myeloid leukemia.

Tobacco Related Cancers (TRCs) accounted for 56.34% of all cancers in males and 19.87% of all cancers in females. Among the tobacco related cancer sites in males, cancer of the oral cavity was the most common site (36.10%) followed by cancer of tongue (20.3%) and lung (14.8). These three sites together constituted 71.2% of total TRCs. In females, cancer of Mouth alone accounted for (24.1%) of the total TRCs followed by Tongue (23.0%) and oesophagus (22.2%). The numbers and proportion of tobacco related cancers by sex are shown in Table VII.

Table: VII
Number (#) and percentage (%) of TRC's by Gender:
PBCR Ahmedabad Urban 2012-2013

Site	Male			Females		
	#	(a)	(b)	#	(a)	(b)
Lip	38	1.2	0.69	8	1.0	0.19
Tongue	627	20.3	11.45	188	23.0	4.57
Mouth	1113	36.1	20.32	197	24.1	4.79
Oropharynx	29	0.9	0.53	6	0.7	0.15
Hypopharynx	180	5.8	3.29	52	6.4	1.26
Pharynx	47	1.5	0.86	10	1.2	0.24
Oesophagus	307	9.9	5.61	182	22.2	4.42
Larynx	199	6.4	3.63	20	2.4	0.49
Lung	458	14.8	8.36	133	16.3	3.23
Urinary Bladder	88	2.9	1.61	22	2.7	0.53
T.R.C Total	3086	100	56.34	818	100	19.87
All Sites	5477		100	4117		100

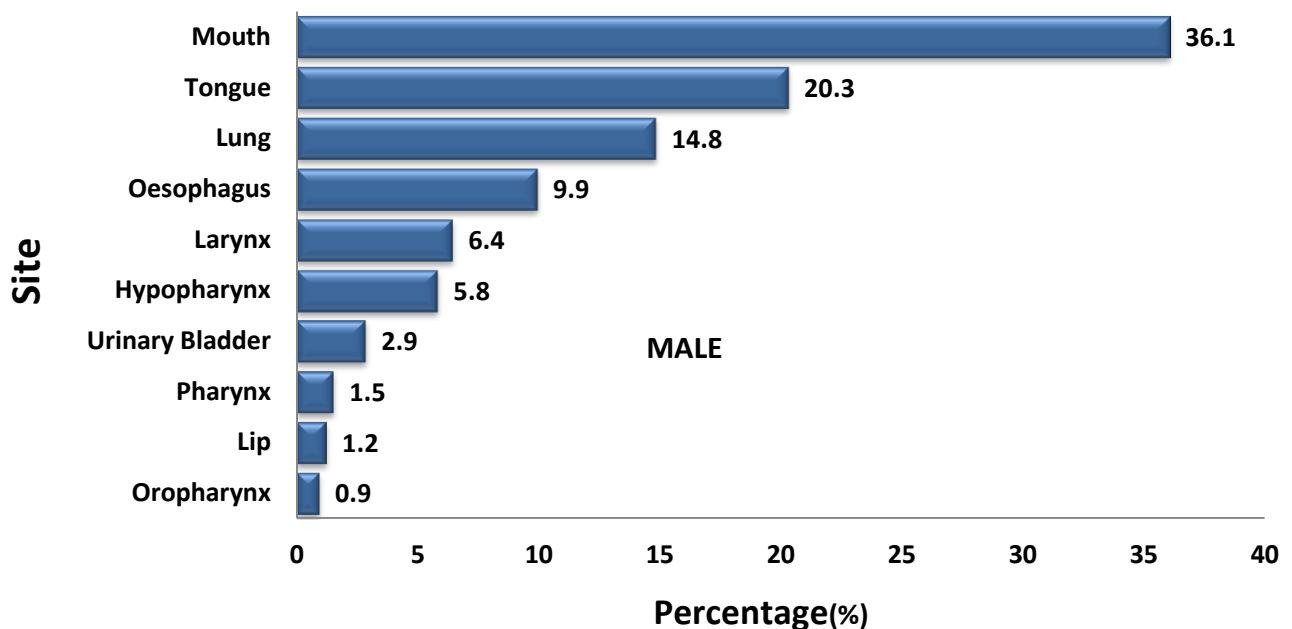
(a) Percentage to total tobacco related cancers

(b) Percentage to all sites of cancers

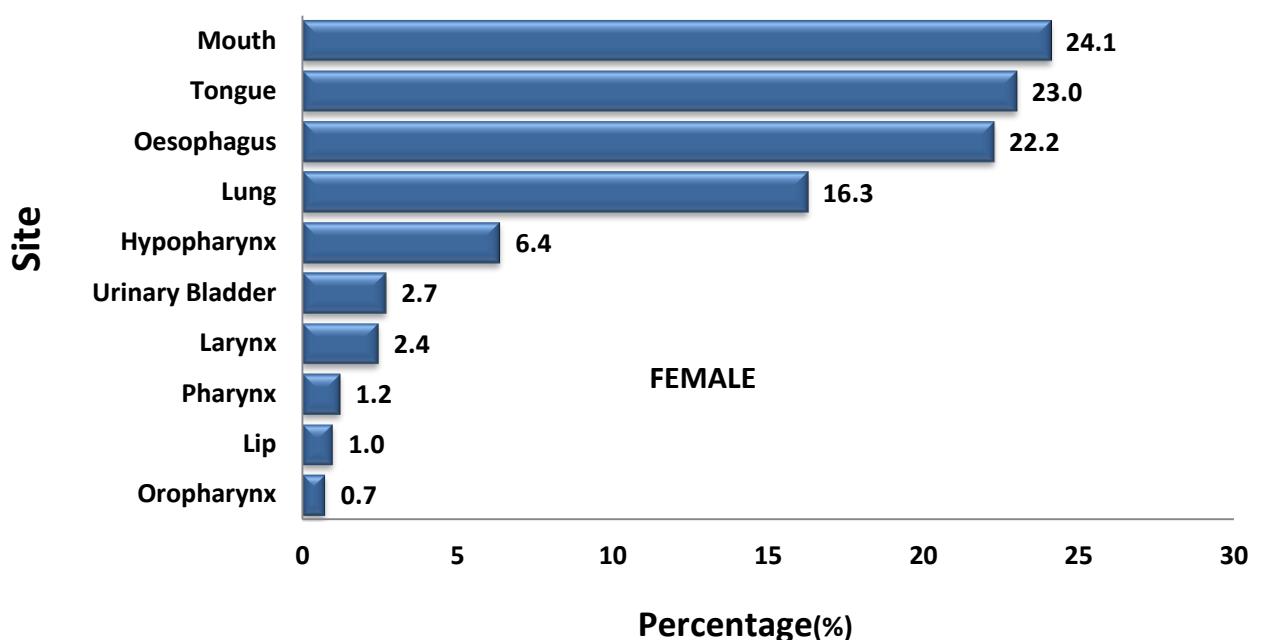
Graphical Presentation of Tobacco Related Cancers by Gender is as below.

Figure: 6

Percentage of TRC's in Males, PBCR Ahmedabad Urban 2012-2013



Percentage of TRC's in Females, PBCR Ahmedabad Urban 2012-2013



HEAD AND NECK CANCERS

The anatomical sites included as head and neck cancers were lip, tongue, mouth, salivary gland, tonsil, oropharynx, nasopharynx, hypopharynx, pharynx, nose and sinus, larynx, and thyroid in this report. The numbers and proportion of Head and Neck Cancers are shown in Table VIII. During the year 2012-13, Head and Neck cancers accounted 31.53% of total cancers. 2428 cases (44.53%) and 597 cases (14.50%) were head and neck cancers among males and females respectively. The highest M: F Ratio is 10:1 for the cancer of larynx. Graphical presentation of Head and Neck cancer related leading sites are given in Figure: 5.

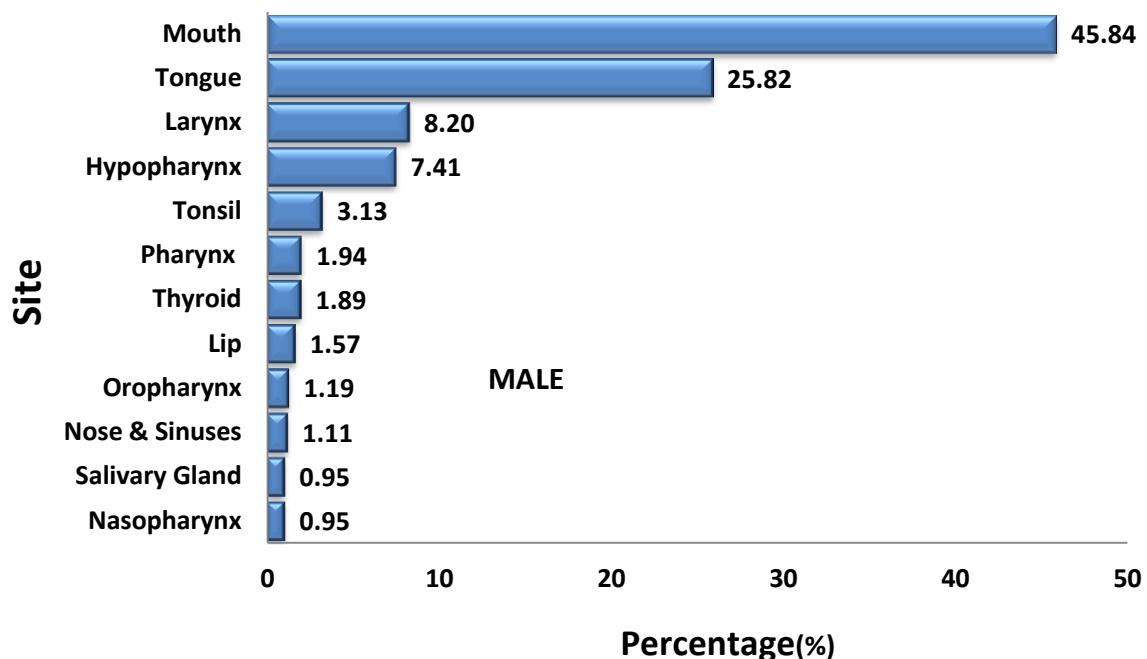
Table: VIII
Number (#) and Proportion (%) of Head and Neck cancers by Gender:
PBCR Ahmedabad Urban 2012-2013

Site	Male		Female		Total		M:F Ratio
	#	%	#	%	#	%	
Lip	38	1.57	8	1.34	46	1.52	4.8:1
Tongue	627	25.82	188	31.49	815	26.94	3.3:1
Mouth	1113	45.84	197	33.00	1310	43.31	5.6:1
Salivary Gland	23	0.95	15	2.51	38	1.26	1.5:1
Tonsil	76	3.13	11	1.84	87	2.88	6.9:1
Oropharynx	29	1.19	6	1.01	35	1.16	4.8:1
Nasopharynx	23	0.95	10	1.68	33	1.09	2.3:1
Hypopharynx	180	7.41	52	8.71	232	7.67	3.5:1
Pharynx	47	1.94	10	1.68	57	1.88	4.7:1
Nose & Sinuses	27	1.11	14	2.35	41	1.36	1.9:1
Larynx	199	8.20	20	3.35	219	7.24	10.0:1
Thyroid	46	1.89	66	11.06	112	3.70	0.7:1
Total	2428	100	597	100	3025	100	4.07:1
Proportion of Head & Neck Cancers to Total Cancers In Either Sex (%)	5477	44.33	4117	14.50	9594	31.53	-

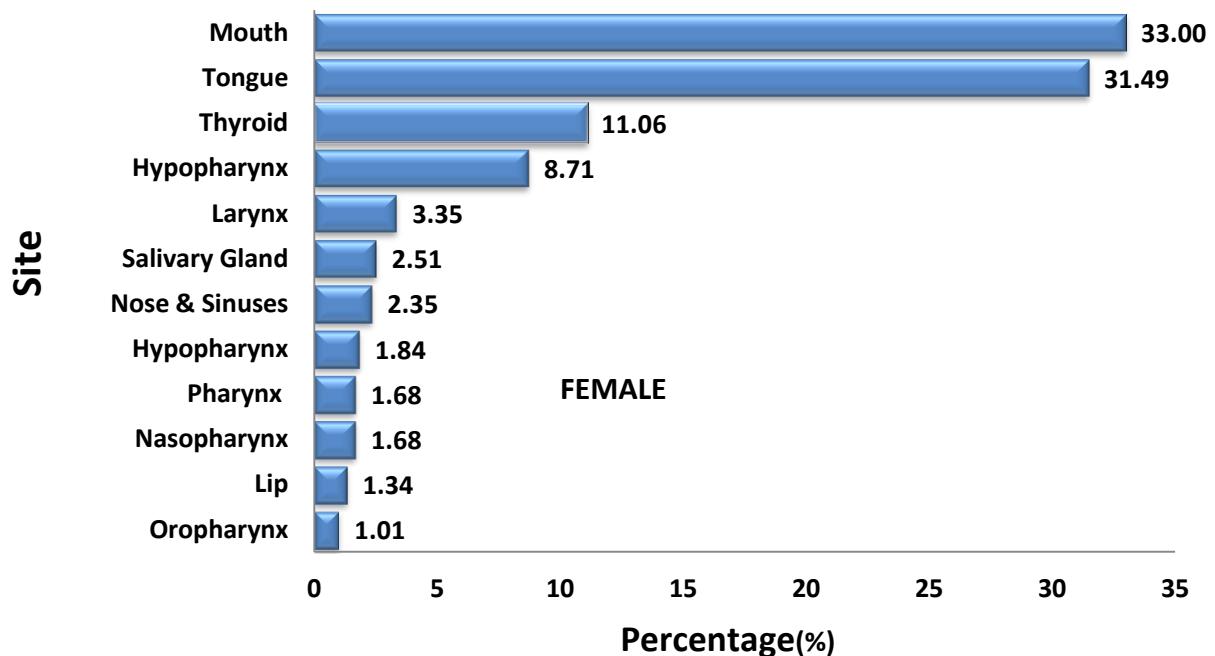
Graphical presentation of Head and Neck Cancers by Gender is as below.

Figure: 7

Percentage of Head and Neck Cancers in Males, PBCR Ahmedabad Urban 2012-2013



Percentage of Head and Neck Cancers in Males, PBCR Ahmedabad Urban 2012-2013



METHOD OF DIAGNOSIS

Although the primary site is the single most important item in the classification of cancer data, medical investigations which lead to a correct diagnosis of each case can give additional information useful in epidemiological studies. The reliability of the data collected on the incident cases of cancers is greatly dependent on the method based on which the diagnosis of cancer was made and microscopic confirmation of cancer is generally considered as the most valid basis of diagnosis.

The proportion of patients having microscopic confirmation of cancer depends primarily on the accessibility of the part affected. Histological examinations of material obtained from primary site, from metastatic site, cytological diagnoses as well as hematological examination were included in category of Microscopic Verification. Histological confirmation of cancers arising in the buccal cavity, pharynx, and the female genital tract is thus usually available with greater frequency than for tumours at inaccessible sites such as the digestive and respiratory system.

During the year 2012-13, about 91.58% of the cases are confirmed microscopically with 92.23% of males and 90.72% of females. Among microscopically confirmed cases in males and females, histology of primary was recorded in 87.05% and 89.85% of cases followed by bone marrow (6.75% and 5.06%), secondary histology (4.38% and 2.95%) and cytology (1.82% and 2.14%) respectively. In 6.66% of the cases, the diagnosis of cancer was based on clinical examination only. The Death Certificates Only (DCOs) cases accounted for 0.38% of the total incident cases. The numbers and proportion of cancer cases by method of diagnosis are shown in Table: IX.

Table: IX
Number (#) and percentage (%) of cancers by Method of Diagnosis and Gender:
PBCR Ahmedabad Urban 2012-2013

Method of diagnosis	Male		Female		Total	
	No.	%	No.	%	No.	%
Microscopic (Total)	5051	92.23	3735	90.72	8786	91.58
Primary Histology	4397	87.05	3356	89.85	7753	88.24
Secondary Histology	221	4.38	110	2.95	331	3.77
Cytology	92	1.82	80	2.14	172	1.96
Blood Film	-	-	-	-	-	-
Bone Marrow	341	6.75	189	5.06	530	6.03
X-ray/Imaging	67	1.22	45	1.09	112	1.17
Clinical	324	5.92	315	7.65	639	6.66
Others	12	0.22	9	0.22	21	0.22
DCO	23	0.42	13	0.32	36	0.38
Total	5477	100	4117	100	9594	100

Graphical presentation of distribution of cancers by method of diagnosis and gender are as shown below.

Figure: 8
Percentage Distribution of Cancers by Method of Diagnosis and Gender
PBCR Ahmedabad Urban 2012-2013

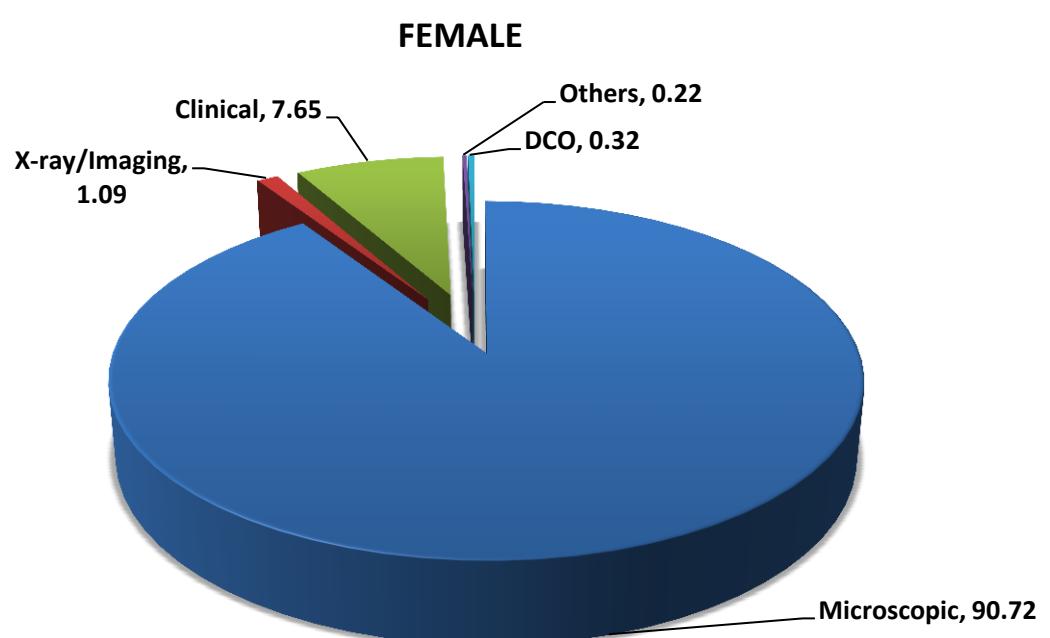
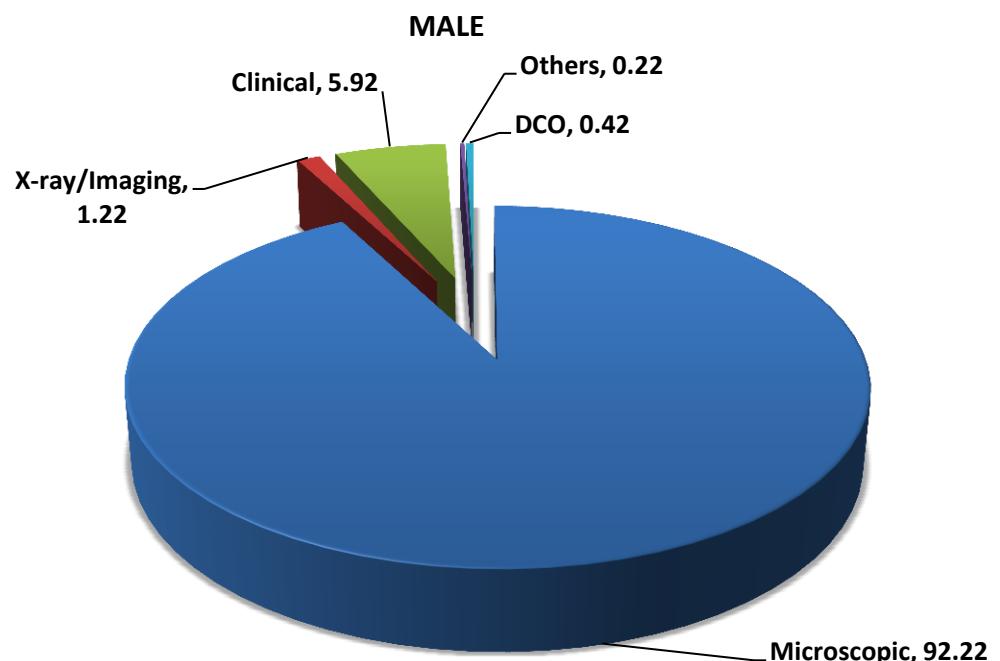
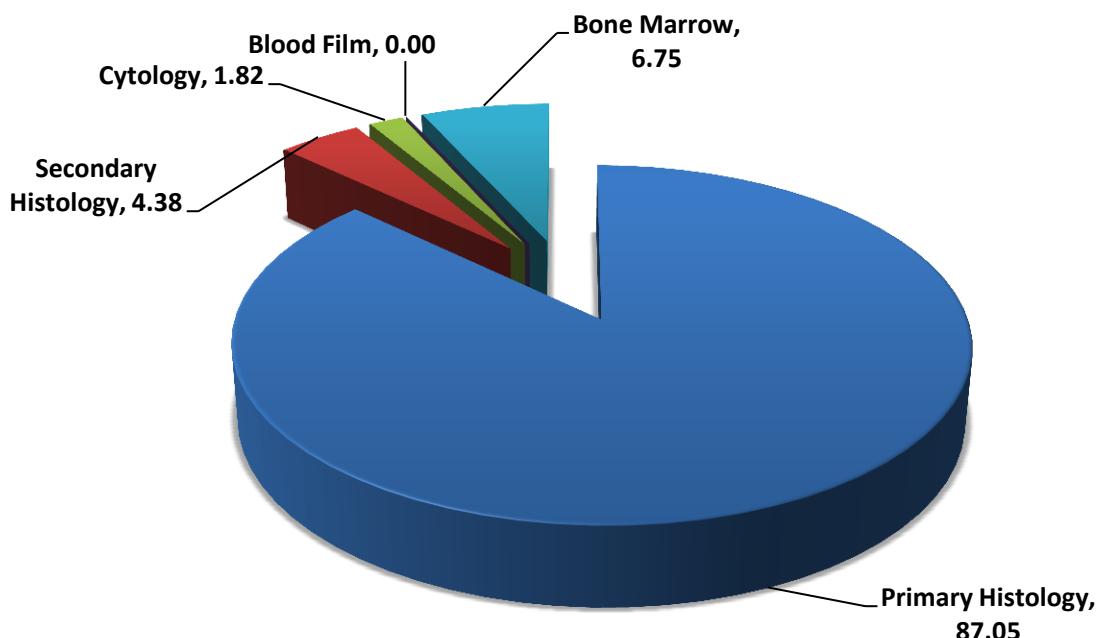


Figure: 9

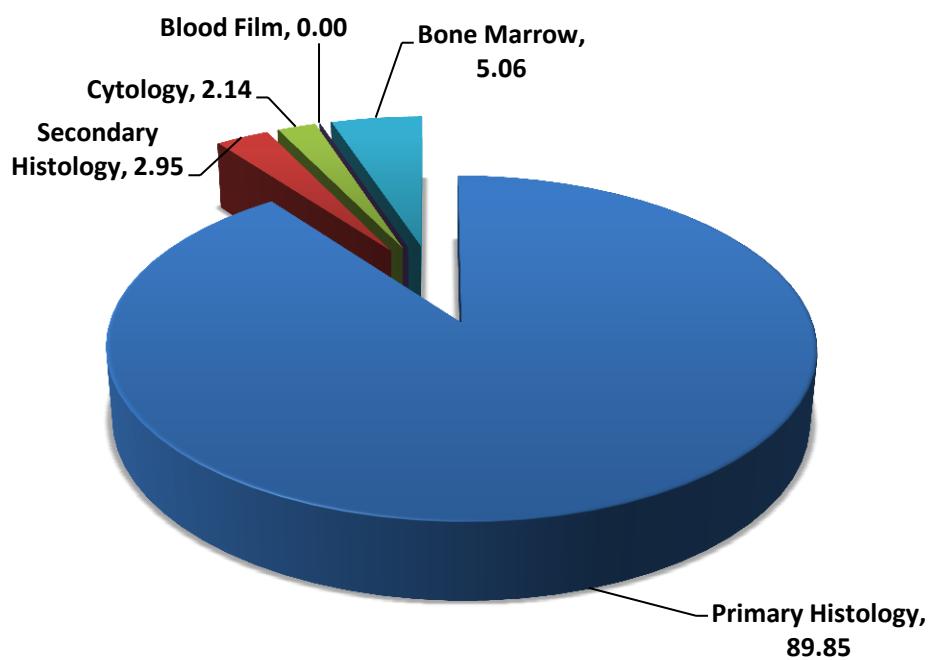
Percentage Distribution of Cancers by detailed microscopic diagnosis and Gender

PBCR Ahmedabad Urban 2012-2013

MALE



FEMALE



CANCER MORTALITY

Mortality statistics have an impressive history as a useful tool for undertaking epidemiological studies of cancer. The significant role played by mortality data in epidemiological studies, in the past was largely due to the unavailability of morbidity data, which is considered more valuable for undertaking epidemiological investigation. The mortality analysis of various occupational groups has provided the evidence, which leads to the discovery of several chemical carcinogens. Gradually, the role of mortality studies has diminished with the establishment of population based cancer registries in various countries throughout the world and the availability of adequate morbidity data. The value of mortality data has also decreased with the increasing use of epidemiological field studies undertaken to test specific etiologic hypotheses, developed as a result of analysis of mortality statistics.

At our registry, mortality data has been obtained from the death records maintained by the vital statistics department of the Ahmedabad Municipal Corporation. During the year 2012-13, 1937 deaths in males and 1141 deaths in females were registered. The mortality data were checked for matching with the morbidity data of cancer cases registered for 2012-2013. The annual Crude rate (CR) and Age Adjusted rate (AAR) were 30.9 and 35.2 among males and 20.2 and 21.4 among females respectively per 100,000 persons. The Truncated rate among males and females were 65.1 and 43.5 per 100,000 respectively. Mortality to Incidence (M/I) percentage for all cancers in males was 35.4% and in females it was 27.7%.

Total number and percentage of deaths by cancer in year 2012-13 is shown in Table: X

Table: X

Crude Mortality Rate (CMR), Age Adjusted Mortality Rate (AAMR) and Truncated Mortality Rate (TMR) by gender: PBCR Ahmedabad Urban 2012-2013

MALE			FEMALE		
CMR	AAMR	TMR	CMR	AAMR	TMR
30.9	35.2	65.1	20.2	21.4	43.5

An Age specific cancer mortality rate with five year age group by gender for the year 2012-13 is presented in Table: XI

Table: XI

Number (#) and percentage (%) of cancer deaths with five year age group by Gender:

PBCR Ahmedabad Urban 2012-2013

Age Group	Male		Female		Total	
	#	%	#	%	#	%
<5	20	1.03	10	0.88	30	0.97
05-09	18	0.93	6	0.53	24	0.78
10-14	13	0.67	3	0.26	16	0.52
15-19	9	0.46	5	0.44	14	0.45
20-24	21	1.08	6	0.53	27	0.88
25-29	31	1.60	25	2.19	56	1.82
30-34	78	4.03	31	2.72	109	3.54
35-39	97	5.01	59	5.17	156	5.07
40-44	140	7.23	107	9.38	247	8.02
45-49	189	9.76	134	11.74	323	10.49
50-54	252	13.01	163	14.29	415	13.48
55-59	263	13.58	158	13.85	421	13.68
60-64	280	14.46	142	12.45	422	13.71
65-69	211	10.89	98	8.59	309	10.04
70-74	154	7.95	92	8.06	246	7.99
75+	159	8.21	102	8.94	261	8.48
Unknown	2	0.10	-	-	2	0.06
Total	1937	100	1141	100	3078	100

The highest mortality found in the age group 55-59 years in males and in the age group 60-64 years in females.

Graphical presentation of Percentage (%) of cancer deaths with five year age group is as below.

Figure: 10

Percentage (%) of cancer deaths with five year age group by gender

PBCR Ahmedabad Urban 2012-2013

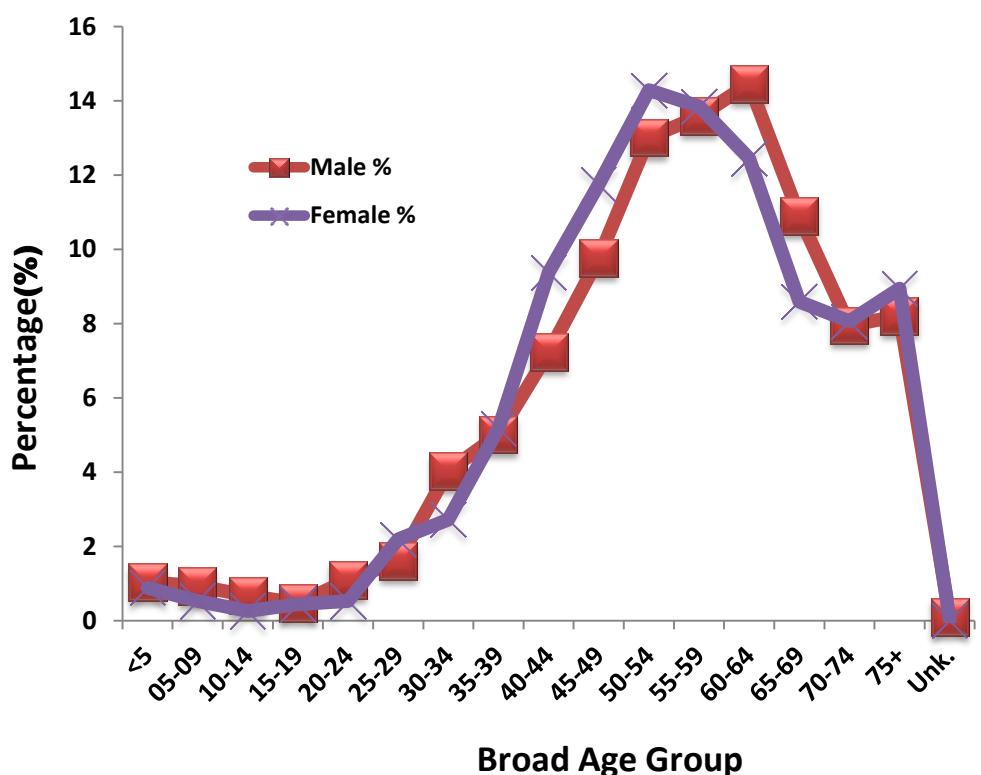


Table: XII

Age Specific cancer mortality rates per 1,00,000 population with five year age group by gender: PBCR Ahmedabad Urban 2012-2013

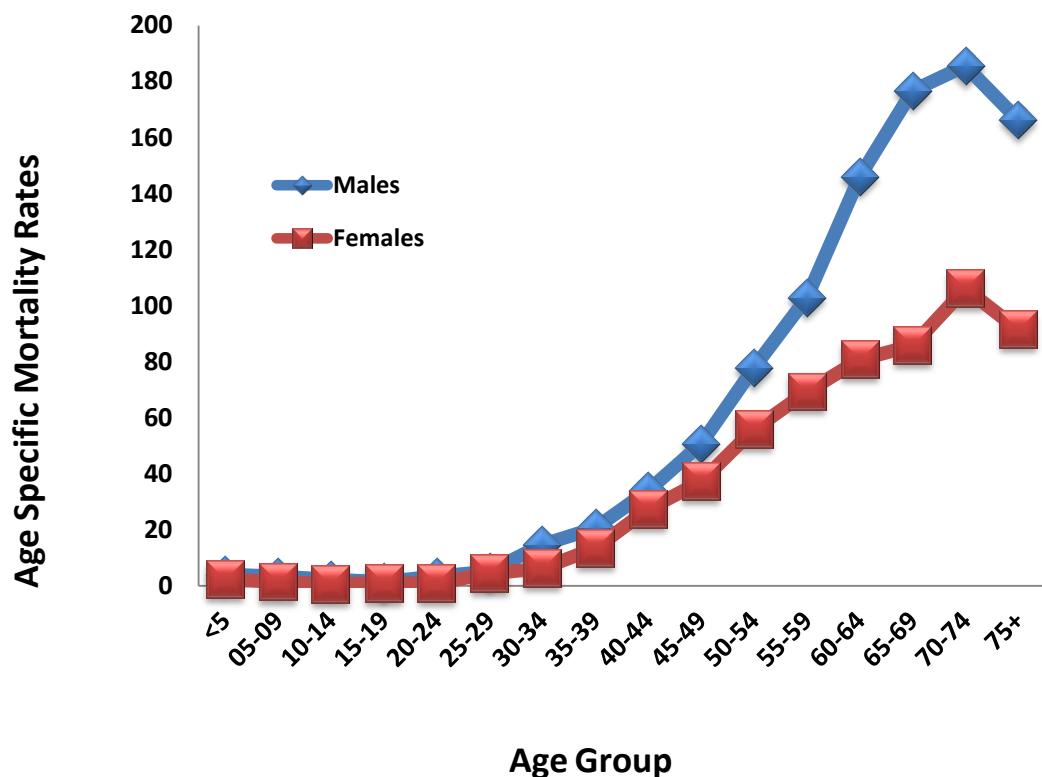
Age Group	Males	Females	TOTAL
<5	4.1	2.3	6.4
05-09	3.4	1.4	4.8
10-14	2.3	0.7	3.0
15-19	1.5	1.0	2.5
20-24	3.4	1.0	4.4
25-29	5.1	4.4	9.5
30-34	14.7	6.2	20.9
35-39	20.7	13.5	34.2
40-44	34.0	27.4	61.4
45-49	50.7	37.2	87.9
50-54	77.8	55.9	133.7
55-59	102.9	69.3	172.2
60-64	146.1	80.7	226.8
65-69	176.7	85.8	262.5
70-74	185.7	106.1	291.8
75+	166.3	91.5	257.8

Age Specific Cancer Mortality Rate was highest in the age group 70-74 years in males and 75+ years age group in females.

Graphical presentation of Age Specific mortality rates is as below.

Figure: 11

Age Specific cancer mortality rates per 1,00,000 population with five year age group by gender: PBCR Ahmedabad Urban 2012-2013



CUMULATIVE RATE AND CUMULATIVE RISK

The Cumulative rate proposed by Day (1987) is another age standardised incidence rate. The Cumulative risk is the probability that an individual will be diagnosed with cancer during a certain age period in the absence of any competing cause of death and assuming that the current trends prevail over the time period.

For practical purposes, Cumulative rate is a good approximation of Cumulative risk over the defined period of time. It is the sum of age specific incidence rates over a certain age range. This can be estimated from age specific incidence rates either for the five year age group from 0-64 years or 0-74 years.

Since the average life expectancy of the population of India had gone up, one should examine the estimate obtained from both the calculations. In this report, 0-64 years and 0-74 years are used as an approximation for an average lifetime for calculating the Cumulative rate and risk.

Cumulative risk (%) in 0-64 years:

The Cumulative risk (%) gives an idea about a person developing cancer during the life period of 0-64 years of age. In the year 2012-13, in males, 6.3% of males in the age group of 0-64 years are likely to develop cancer in their life time while in females; the cumulative risk is 5.3%. In other words, on an average 1 out of 16 persons among males and 1 out of 19 persons in females in Ahmedabad Agglomeration Area gets cancer in his/her life time (0-64 years).

Cumulative risk (%) in 0-74 years:

In the year 2012-13, among males, the cumulative risk (%) in the 0-74 year age group was 10.8% and in females it was 8.5%. If one survives upto the age of 74 years, the probability of developing any cancer in men is 1 in 9 and 1 in 12 in women.

List of Tables

PBCR – AHMEDABAD URBAN 2012-2013

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NATIONAL CANCER REGISTRY PROGRAMME

Population Based Cancer Registry : 27 Ahmedabad Urban

Estimated Population of Ahmedabad Urban Agglomeration Area by Age and Sex : Year 2012-13* Ahmedabad PBCR (Urban)

AGE GROUP	MALES		FEMALES		TOTAL		WORLD POPULATION
	#	%	#	%	#	%	
00-04	489685	7.82	427788	7.59	917473	7.71	12000
05-09	535714	8.55	429594	7.62	965308	8.11	10000
10-14	569735	9.10	459230	8.14	1028965	8.64	9000
15-19	593047	9.47	484032	8.58	1077079	9.05	9000
20-24	618278	9.87	572535	10.15	1190813	10.00	8000
25-29	602668	9.62	570705	10.12	1173373	9.86	8000
30-34	532401	8.50	498962	8.85	1031363	8.66	6000
35-39	468523	7.48	437371	7.76	905894	7.61	6000
40-44	412104	6.58	391180	6.94	803284	6.75	6000
45-49	372487	5.95	360421	6.39	732908	6.16	6000
50-54	324039	5.17	291607	5.17	615646	5.17	5000
55-59	255692	4.08	227902	4.04	483594	4.06	4000
60-64	191636	3.06	175902	3.12	367538	3.09	4000
65-69	119406	1.91	114181	2.02	233587	1.96	3000
70-74	82949	1.32	86699	1.54	169648	1.43	2000
75+	95588	1.53	111435	1.98	207023	1.74	2000
TOTAL	6263952	100	5639544	100	11903496	100	100000

* Difference Distribution Method of Takiar and Shobna, 2009 provided by NCRP-NCDIR, Bengaluru.

ADDRESS FOR COMMUNICATION

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