

# CANCER REGISTRATION IN INDIA

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## History of Population Based Cancer Registries in India

The challenge of population based cancer registration in developing countries is enormous. The first population based cancer registry named Bombay Cancer Registry, was established by the Indian Cancer Society in Mumbai (formerly Bombay) in 1963 covering the urban population of the Mumbai Agglomeration. This was followed by the setting up of three satellite registries of the Bombay Cancer Registry in the State of Maharashtra at Pune (in 1972), Aurangabad (in 1978) and Nagpur (in 1983). Realising cancer as a significant health problem and the need to implement cancer control activity in the country, the National Cancer Registry Programme (NCRP) was launched by the Indian Council of Medical Research of Government of India. The main objectives of NCRP were (i) to generate authentic data on the magnitude of cancer problem (ii) to undertake epidemiological investigations and advise control measures and (iii) to promote human resource development in cancer epidemiology. By this way, two new population based cancer registries were founded in Chennai (formerly Madras) and Bangalore in 1981, besides augmenting the Bombay Cancer Registry, with the systematic data collection starting on 1<sup>st</sup> January 1982. Subsequently, new population based cancer registries were commissioned in Bhopal (in 1984) and New Delhi (in 1986) and a rural registry in Barshi, Maharashtra (1987). All of the above mentioned urban population based cancer registries cover about 13% of the country's urban population<sup>1</sup> and rural registry covers 0.1%<sup>1</sup> of rural population. The existence of the population based cancer registries of India, to date, is given in Table 1.

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## Morbidity Data Collection

In India, cancer is not a notifiable disease and registration of cases has to be essentially done by an active method. The trained social investigators of the registry visit all the government and private hospitals, nursing homes, radiation centers, pathology laboratories and imaging centres in and around the registry area to collect the required data in a standardized proforma by interviewing the cases and/or from medical records. The number of sources covered by the registries has increased over the years consequent to the establishment of new hospitals in and around the registry areas. Bhopal registry has developed a method to regularly collect information on resident cancer cases from hospitals situated within and outside the home state. Cancer registration in rural areas of India poses a number of challenges. Barshi Rural Registry has developed a unique method of case finding<sup>2</sup>. Case identification is undertaken not only by contacting all health services and medical practitioners in the area, but also by holding group meetings among the villagers to improve cancer awareness, conducting systematic survey of households for cancer, every year and visiting neighbourly cancer registries in Mumbai, Pune and Aurangabad. Only invasive cancers are reported. A resident criteria that "a cancer case should have been living in the registry area for at least a year at the time of first diagnosis of cancer", for inclusion in the registry, is followed to avoid registering cases from a



**Figure 1. Registries in India**

floating population. Benign tumours and in-situ cancers are excluded<sup>3</sup>. International Classification of Diseases for Oncology (ICD-O), first edition<sup>4</sup> and International Classification of Diseases, Injuries, Causes of death, ninth revision<sup>5</sup> were being used to code the morphology and topography till 1997. ICD-O, II edition<sup>6</sup> is being followed since 1998.

About 3–12 % of cases were first identified through a

*Madras Metropolitan Tumour Registry, Cancer Institute (WIA), Chennai – 600 020.*

'death certificate notification' (DCN) only. All registries in India employ trace back procedures (hospital/house visits) to varying extent. This method has facilitated collection of additional details on socio-demographic and clinical characteristics retrospectively, resulting in the elimination of non-residents, identification of new potential sources (especially minor private clinics, nursing homes) of data collection and collection of additional information on the site of cancer that was not stated on the death certificate<sup>3,7</sup>.

## Mortality Data Collection

Trained social investigators visit the vital statistics divisional offices pertaining to the registry area to abstract information from death certificates in a standardized format, of deaths whose cause is mentioned as "Cancer" or "Tumour" on the death certificate.

The reliability on cause of death stated on the death certificate is relatively low in developing countries. To

**Table 1 Population Based Cancer Registries in India.**

Name of the Registry	Data collection Starting date	
<b>Began</b>		
<b>REGISTRIES UNDER THE NCRP NETWORK</b>		
1. Bombay Cancer Registry Indian Cancer Society, Mumbai	1963	1965
2. Bangalore Cancer Registry Kidwai Memorial Inst. of Oncology	1981	1982
3. Madras Metropolitan Tumour Registry Cancer Institute (WIA), Chennai	1981	1982
4. Delhi Cancer Registry Inst. Rotary Cancer Hospital, New Delhi	1986	1988
5. Bhopal Cancer Registry Gandhi Medical College, Bhopal	1984	1986
6. Barsi Rural Cancer Registry Ashwini Rural Cancer Research & Relief Society, Maharashtra	1987	1988
<b>REGISTRIES IN THE IARC COLLABORATION</b>		
1. Trivandrum Cancer Registry Regional Cancer Centre, Trivandrum.	1994	1991
2. Calcutta Cancer Registry Chittaranjan National Cancer Institute.	1996	1997
3. Ambilikai Rural Cancer Registry Ambilikai, Tamilnadu	1995	1995
<b>OTHER CANCER REGISTRIES</b>		
1. Karunagapally Rural Cancer Registry (Natural Background Radiation Registry), Kerala. (Founded by DAE, Bombay)	1990	1991
2. Ahmedabad Population Based Cancer Registry Gujarat Cancer Research Institute, Ahmedabad, Gujarat	1980	1983
3. Poona City Cancer Registry Sassoon Hospital, Pune, Maharashtra	1972	1973
4. Aurangabad Cancer Registry Aurangabad, Maharashtra	1978	1978

overcome these lacunae, since 1992, Chennai registry had started collecting information on all deaths, irrespective of cause, occurring in the registry area<sup>8</sup>. This has resulted in more than doubling the availability of number of deaths of incident cancer cases in the registry mortality database which enable us to estimate accurately relative survival of cancer cases in Chennai. This method of mortality registration is an alternative to active follow up which is not an easy task in a developing environment and the data are obtained in this method from a single and reliable source. This has been recommended for implementation by all population based cancer registries in India.

## Data Quality

The collective review of data annually by all the registries is a unique feature of activity of the NCRP. With the increase in the automation of registries, computer software for validity, consistency checks and check for completeness of details have been developed by individual registries. Software developed by the International Agency for Research on Cancer<sup>9</sup> is also being used to detect unlikely age, site and morphology combinations, to find out invalid site and morphology codes and, to convert topography codes from one classification to another. Apart from these, exercises on recoding and re-abstractation have been carried out by the registries as part of data quality exercises.

The data on cancer incidence from the three older registries in India viz. Chennai, Bangalore & Mumbai are featured in the Volumes V, VI, VII of the quinquennial publication titled "Cancer incidence in Five Continents" by the International Agency for Research on Cancer, Lyon, France.

## Characteristics of Cancer Registries in India

The description of the basic characteristics of the six population based cancer registries in the network of NCRP are given in Table 2. The area covered by urban registries varied between 170 km<sup>2</sup> in Chennai and 624.3 km<sup>2</sup> in Delhi. The population covered varied between 1.3 million in Bhopal registry and 10.67 million in Mumbai registry. The Barshi rural cancer registry covers the maximum area of 3713.4 km<sup>2</sup> and the least population of about 500,000 among the registries under NCRP. The sex ratio in the population indicated a male preponderance in all registries.

## Estimated Cancer Incidence in India – 1995

The burden of new cancer cases has been estimated based on data from 5 PBCRs in the network of NCRP in India<sup>10-14</sup>. The estimated number of new cancer cases in 1995 was 311,460 in men and 340,683 in women. Lung (n=23,785; 7.6%), oesophagus (n=21,713; 7%) and stomach (n=21,264; 6.8%) among males and cervical (n=83,146; 24.4%) and breast (n=70,137; 20.6%) cancers among females were the most common cancers in India. The tobacco related cancers (TRC: n=213576) constitute 32.7% of total cancers seen in

**Table 2. Area and Population Covered, Numbers of Cases, Proportion of Histologically Verified (HV %) Cases, Incidence Rates and Ratio at Risk of Getting Cancer in the PBCRs in the Network of NCRP, 1995\***

	Chennai	Bangalore	Mumbai	Delhi	Bhopal	Barsi
Area covered (in km <sup>2</sup> )	170.0	276.4	603.0	624.3	284.9	3713.4
Population (in millions)	4.12	4.80	10.67	10.00	1.30	0.48
Male	2.13	2.52	5.81	5.44	0.68	0.25
Female	1.99	2.28	4.86	4.56	0.62	0.23
M : F	1:0.934	1:0.905	1:0.836	1:0.838	1:0.912	1:0.920
No. of cases	3486	3241	7960	7611	733	204
Male	1702	1533	4075	3751	402	93
Female	1784	1708	3885	3860	331	111
M : F	1:1.05	1:1.11	1:0.95	1:1.03	1:0.82	1:1.19
HV%	78.7	78.0	77.9	78.6	76.3	90.2
DCO%	3.3	10.4	6.8	10.2	5.0	0.5
CIR/100,000						
Male	80.0	60.9	70.2	68.9	59.0	37.6
Female	89.8	74.9	79.9	84.5	53.7	47.6
AAR/100,000						
Male	105.9	92.8	109.1	112.7	102.0	47.5
Female	111.7	116.5	114.1	130.4	90.3	54.8
TR/100,000						
Male	178.4	157.0	158.4	190.1	184.7	75.4
Female	234.4	237.4	215.9	274.3	193.9	129.7
Ratio at risk						
Male	1 : 9	1 : 10	1 : 8	1 : 8	1 : 9	1 : 18
Female	1 : 8	1 : 8	1 : 8	1 : 8	1 : 10	1 : 17

HV%:Histological verification; % CIR:Crude incidence rate; AAR:Age adjusted incidence rate (world population)

TR: Truncated incidence rate (35-64 years; world population)

Ratio at risk: Estimates based on cumulative incidence rate (%) in 0-74 years of age.

DCO: Cases based on Death Certificate only

\* Source: A consolidated study of Population based cancer registries data – cancer statistics 1995-96. National Cancer Registry Programme, Indian Council of Medical Research, New Delhi, 2000.

India (Tables 3a & 3b; Figure 2).

### Regional Variation

The number of cancer cases registered in 1995 ranged between 204 in Barshi and 7960 in Mumbai. The age adjusted incidence rates (AAR) standardised to world population<sup>15</sup> ranged between 92.8 in Bangalore and 112.7 in Delhi among males and 90.3 in Bhopal and 130.4 in Delhi among females. The ratio at risk based on cumulative incidence rate (%) ranged between 1:10 and 1:8 among males and females. The rural cancer incidence rates from Barshi registry were lower than urban registries. The truncated incidence rate (TR; world standardised) in the age group 35-64 years was higher among females than males in all registries (Table 2). The average annual AARs of the top five cancers in different registries from India in 1995 are given in Fig.3.

In Chennai, stomach is the commonest cancer followed by lung in men and cervix uteri followed by breast in women.

The incidence of stomach cancer is the highest in both sexes among the six registries.

In Bangalore, oesophagus is the most frequent cancer followed by stomach in men. Among women, the top two cancers are cervix uteri followed by breast, similar to Chennai. The incidence of oesophageal cancer is the highest in both sexes among six registries and the incidence of mouth cancer in women is the highest among six registries.

In Mumbai and Delhi, lung cancer is the commonest in men. The incidence of prostate cancer is the highest in Mumbai and Delhi compared to other registries in India. Among women, breast is the leading site followed by cervix uteri. The incidence of cancers of breast, ovary and gall bladder in women and larynx in men in Delhi are the highest among six registries.

In Bhopal, lung cancer is the most frequent cancer followed by cancers of mouth and tongue in men. The incidence of these three cancer sites are the highest in men among six

**Table 3a. Estimated Average Annual Cancer Incidence : India 1995 - Males**

ICD9 SITE	NO.	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	CIR	%	AAR	0-74
CR%	CASES	-4	-9	-14	-19	-24	-29	-34	-39	-44	-49	-54	-59	-64	-69	-74	-98				
140 LIP	909	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.1	1.0	3.0	0.6	2.3	0.0	0.19	0.3	0.26	0.04
141 TONGUE	13016	0.0	0.0	0.0	0.0		0.0	0.2	0.5	1.7	3.1	5.8	9.6	16.4	19.3	25.2	20.1	27.6	2.66	4.2	
143-5 MOUTH	13280	0.0	0.0	0.0	0.1	0.3	0.2	0.6	2.6	5.2	6.5	9.2	14.9	18.2	18.7	19.7	18.8	2.71	4.2	4.06	0.48
146 ORO-PHAR	8443		0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.6	1.7	2.8	9.8	9.7	13.6	10.6	13.1	16.6	1.73	2.7	
148 HYPO-PHAR1	5752	0.0	0.0	0.0	0.0	0.1	0.4	0.5	1.1	2.0	6.2	8.9	20.5	30.2	29.6	31.3	20.0	3.22	5.1	5.01	0.65
150 OESOPHAG	21713	0.0	0.0	0.0	0.0		0.1	0.1	0.4	1.9	2.4	8.9	13.6	19.2	33.5	56.0	49.1	56.2	4.44	7.0	
151 STOMACH	21264	0.0	0.0	0.0	0.0	0.1	0.6	0.6	2.6	4.4	7.7	14.9	22.4	28.4	37.8	48.1	47.3	4.35	6.8	6.80	0.84
153 COLON	7798	0.0	0.0	0.0	0.1	0.3	0.4	0.9	0.5	1.7	2.3	7.0	5.5	8.0	17.8	13.2	29.6	1.60	2.5	2.67	0.29
154 RECTUM	8902	0.1	0.0	0.0	0.1	0.4	0.8	3.1	1.2	2.0	2.7	3.1	10.2	9.2	13.1	16.6	18.3	1.82	2.9	2.68	0.31
157 PANCREAS	5120	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	2.7	3.0	3.1	4.4	6.6	9.9	12.1	11.5	1.05	1.6	1.74	0.21
161 LARYNX	15313	0.0		0.0		0.0		0.0	0.1	0.2	0.2	1.0	2.4	5.1	11.1	18.0	22.1	38.9	40.7	36.7	3.13
162 LUNG	23785	0.0	0.0	0.2	0.1	0.1	0.1	1.1	2.9	4.2	9.3	15.9	24.9	37.7	65.8	64.5	43.4	4.87	7.6	8.53	1.13
185 PROSTATE	12674	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.7	2.3	7.7	12.8	30.8	61.7	101	2.59	4.1	5.18	0.58
187 PENIS ETC	8306	0.0	0.0	0.0	0.0	0.1	0.1	1.5	3.1	3.1	1.8	4.8	7.4	6.7	16.2	7.8	13.1	1.70	2.7		
188 U. BLADDER	9283	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.8	1.2	2.4	4.6	9.6	15.0	20.7	27.6	38.7	1.90	3.0	3.48	0.41
191-2 NERVOUS	10730	1.1	1.1	1.0	0.8	0.9	1.8	1.2	2.0	4.4	3.7	4.5	4.3	8.2	12.9	5.5	11.6	2.19	3.4	2.75	0.27
201 HODGKIN'S	4319	0.4	1.1	1.0	0.3	1.0	0.5	0.8	0.8	1.1	0.7	1.0	1.1	2.7	2.0	3.5	2.3	0.88	1.4	0.98	0.09
200,202 NON-HODG	16661	0.4	0.9	0.8	1.2	1.0	1.5	1.3	2.2	3.1	4.1	4.8	10.5	10.8	18.4	24.6	16.5	2.52	4.0	3.63	0.43
204-8 LEUKEMIA	15646	3.1	3.2	2.2	3.5	3.9	3.0	1.4	2.5	2.0	3.8	5.7	4.4	6.3	8.8	8.0	11.7	3.20	5.0	3.71	0.31
195-9 UNCERTAIN	26863	0.4	0.1	0.0	0.5	0.3	0.6	2.9	4.2	6.7	11.2	17.2	24.9	31.3	52.1	55.8	65.9	5.50	8.6	8.78	1.04
140-208 ALL SITES	311460	9.7	7.8	7.8	10.0	11.2	15.8	22.1	40.0	65	107	180	289	388	567	637	678	63.8	100	99.23	11.1

**Table 3b. Estimated Average Annual Cancer Incidence : India 1995 - Females**

ICD9 SITE	NO.	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	CIR	%	AAR	0-74
CR%	CASES	-4	-9	-14	-19	-24	-29	-34	-39	-44	-49	-54	-59	-64	-69	-74	-98				
140 LIP	506	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.2	1.2	1.7	0.0	2.1	0.11	0.1	0.19	0.02
141 TONGUE	5146	0.0	0.0	0.0	0.0	0.1	0.0	0.3	1.9	3.2	1.7	3.0	2.9	8.7	12.2	8.7	4.2	1.14	1.5	1.67	0.21
143-5 MOUTH	12485	0.0	0.0	0.0	0.0	0.0	0.1	2.0	1.9	4.1	7.3	10.	11.9	21.1	27.4	20.8	17.1	2.77	3.6	4.33	0.53
146 OROPHARYNX	1147	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.4	0.8	0.8	2.3	1.1	6.7	2.1	0.25	0.3	0.43	0.06
148 HYPOPHARYNX	3801	0.0	0.0	0.1	0.1	0.1	0.1	0.4	0.3	1.2	2.8	2.3	2.0	7.1	10.8	3.4	2.3	0.84	1.1	1.24	0.15
150 OESOPHAGUS	16088	0.0	0.0	0.0	0.0	0.2	0.3	0.3		1.2	4.7	5.9	15.2	23.2	26.1	30.7	43.2	27.7	3.56	4.7	5.84
151 STOMACH	10526		0.0		0.0	0.0	0.1		0.4	0.4		1.3	3.4	1.9	6.8	9.6	4.3	16.5	19.1	23.4	12.5
153 COLON	5290		0.0		0.0	0.1	0.1	0.3	0.5	0.9	1.8	2.5	2.4	8.8	6.3	10.5	12.2	11.6			
154 RECTUM	5868		0.0		0.0	0.2	0.5	0.5	0.4	1.1	2.1	3.2	5.1	5.2	8.7	9.3	8.9	8.6			
156 GALL BLADDER	8170	0.0	0.0	0.0	0.1	0.0	0.1	0.5	1.1	2.9	5.4	7.5	8.4	14.0	12.5	12.1	25.7	1.81	2.4	3.02	0.32
157 PANCREAS	2501	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	1.0	1.2	2.7	3.2	3.1	7.2	6.9	3.2	0.55	0.7	0.97	0.13
161 LARYNX	1986		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.5	1.9	1.6	2.3	2.3	3.2	5.1	5.2	
162 LUNG	6022		0.0		0.0	0.0	0.0	0.0	0.1		0.6	0.5	1.7	2.4	6.4	6.5	9.3	12.6	13.4	15.7	
174 BREAST	70137	0.0	0.0	0.0	0.2	1.0	3.9	9.4	19.5	37.8	55.2	58.7	73.8	86.3	82.8	91.4	58.8	15.5	20.6	22.6	2.57
179,182 UTERUS	8188	0.0	0.0	0.0	0.0	0.2	0.1	0.4	0.8	2.7	4.5	6.6	7.6	12.7	19.6	22.8	12.9	1.82	2.4	2.97	0.39
180 CERVIX UTERI	82146	0.0	0.0	0.0	0.1	0.8	1.7	12.2	22.3	25.1	68.8	75.1	96.4	90.3	98.5	75.6	51.2	18.42	24.4	25.30	2.85

registries. Among females, the two leading sites are similar to Chennai and Bangalore.

In Barshi, penile cancer in men and cervix uteri in women are the leading ones and their incidence rates are the highest among six registries.

## Epidemiology of Most Common Cancers

The most frequent cancers of India are cancers of lung, oesophagus and stomach in men and breast and cervix uteri in women. These constitute 39% of total cancers. Cancers (oral cavity, oropharynx, hypopharynx, oesophagus, stomach,

larynx, lung, pancreas and urinary bladder) that are caused by tobacco constitute 48% of cancers in men and 19% of cancers in women.

#### Lung Cancer

The AAR of lung cancer among males, in urban Indian registries (6.9 to 12.7 per 100,000) is on the lower side among those reported worldwide (4.2 to 110.8). The least incidence (1.0) is witnessed in Barshi, a rural registry and the highest (12.7) in Bhopal among Indian registries. A steady increase in the incidence of lung cancer is seen in all urban registries in India<sup>10</sup>.

Studies show that around 83% of lung cancers are attributed to smoking<sup>16</sup>. Green vegetables and banana reduce the risk of lung cancer<sup>17</sup>. A study done in collaboration with IARC on lung cancer in Chennai showed consumption of fried non-vegetarian food increased the lung cancer risk. Smokers with lung cancer have 4-fold risk of dying compared to non-smokers with lung cancer and the risk is higher among bidi smokers compared to cigarette smokers<sup>18</sup>.

Survival: The five year relative survival from lung cancer was 7.2%<sup>19</sup>.

#### Stomach Cancer

The AAR of stomach cancer in urban Indian registries (3.0 to 13.1) is on the lower side among those reported worldwide (4.1 to 95.5). The least incidence in the world is reported from Barshi (1.0). The incidence of stomach cancer is either stable or decreasing over the years in different registries in India<sup>10</sup>. Smokers have a 2-fold risk of stomach cancer (95% CI: 1.25 – 3.78) compared to non-smokers and bidi smokers have a higher risk (OR = 3.2; 95% CI: 1.8 – 5.7) than cigarette smokers (OR = 2.0; 95% CI: 1.07 – 3.58). Attributable risk for smoking among current smokers was 60% and ex-smokers 33%. Dietary data analysis showed that consumption of fried food and salty food increases the risk whereas consumption of vegetables decreases the risk<sup>20,21</sup>.

Survival: The five year relative survival from stomach cancer

was 7.1%<sup>19</sup>.

#### Oesophageal Cancer

The incidence rates (AAR) of oesophageal cancer ranging from 3.3 in Barshi to 9.8 in Bangalore among men in India are intermediate among those reported worldwide (0.5 to 30.4). The incidence rates are either stable or increasing over the years in all urban registries in India<sup>10</sup>. Smokers with oesophageal or stomach cancer have 150 percent higher risk of dying compared to non-smokers with oesophagus or stomach cancer<sup>18</sup>. Chewing habit, with or without tobacco, was a significant risk factor in both sexes besides bidi smoking and alcohol drinking. The risk estimates showed variability according to anatomical subsite<sup>22</sup>.

Survival: The five year relative survival from oesophageal cancer was 6.8%<sup>19</sup>.

#### Cervical Cancer

The incidence of cervical cancer in Indian registries (14.9 to 29.0) is on the higher side among those reported worldwide (2.6 to 67.2). There is substantial variation within the Indian registries. The highest incidence is seen in Barshi. Penile cancer incidence is also high in Barshi. Similar findings of increased incidence of penile cancer wherever cervical cancer incidence is high is seen in other parts of the world as well<sup>23</sup>. The incidence of cervical cancer is either stable or decreasing in all registries in India<sup>10</sup>.

Higher age at marriage and improved personal hygiene among males are attributed to decreasing incidence of cervical cancer in Mumbai<sup>24</sup>.

Survival: The relative survival from cervical cancer ranged between 33–60% in various registries in India<sup>19,25-27</sup>.

#### Breast Cancer

The incidence of breast cancer in urban registries from India (18.8 to 29.3) is on the lower side among those reported worldwide (7.1 to 127.7). The AAR of breast cancer in Barshi rural registry is one of the least in the world (8.8).

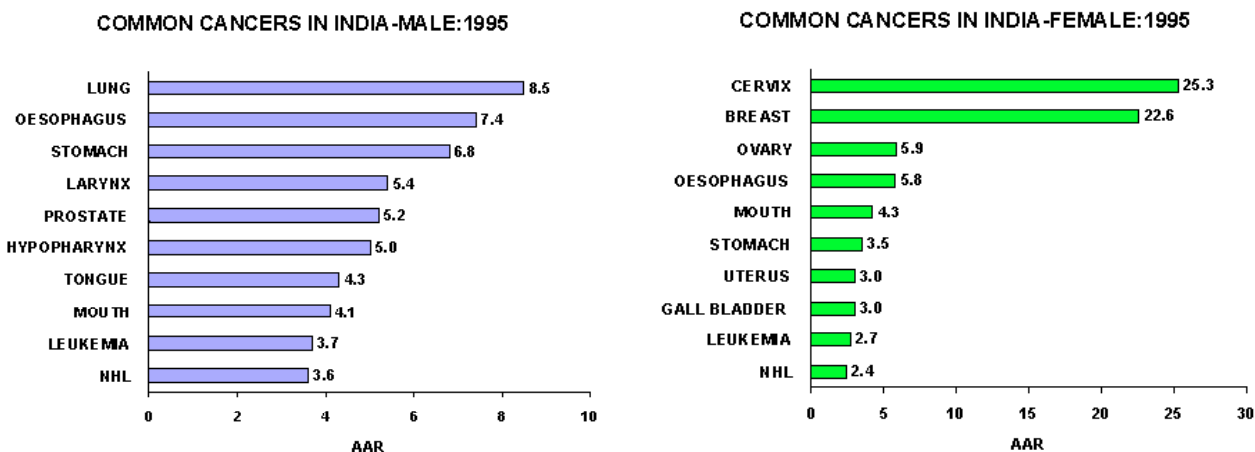


Figure 2. Common Cancers in India

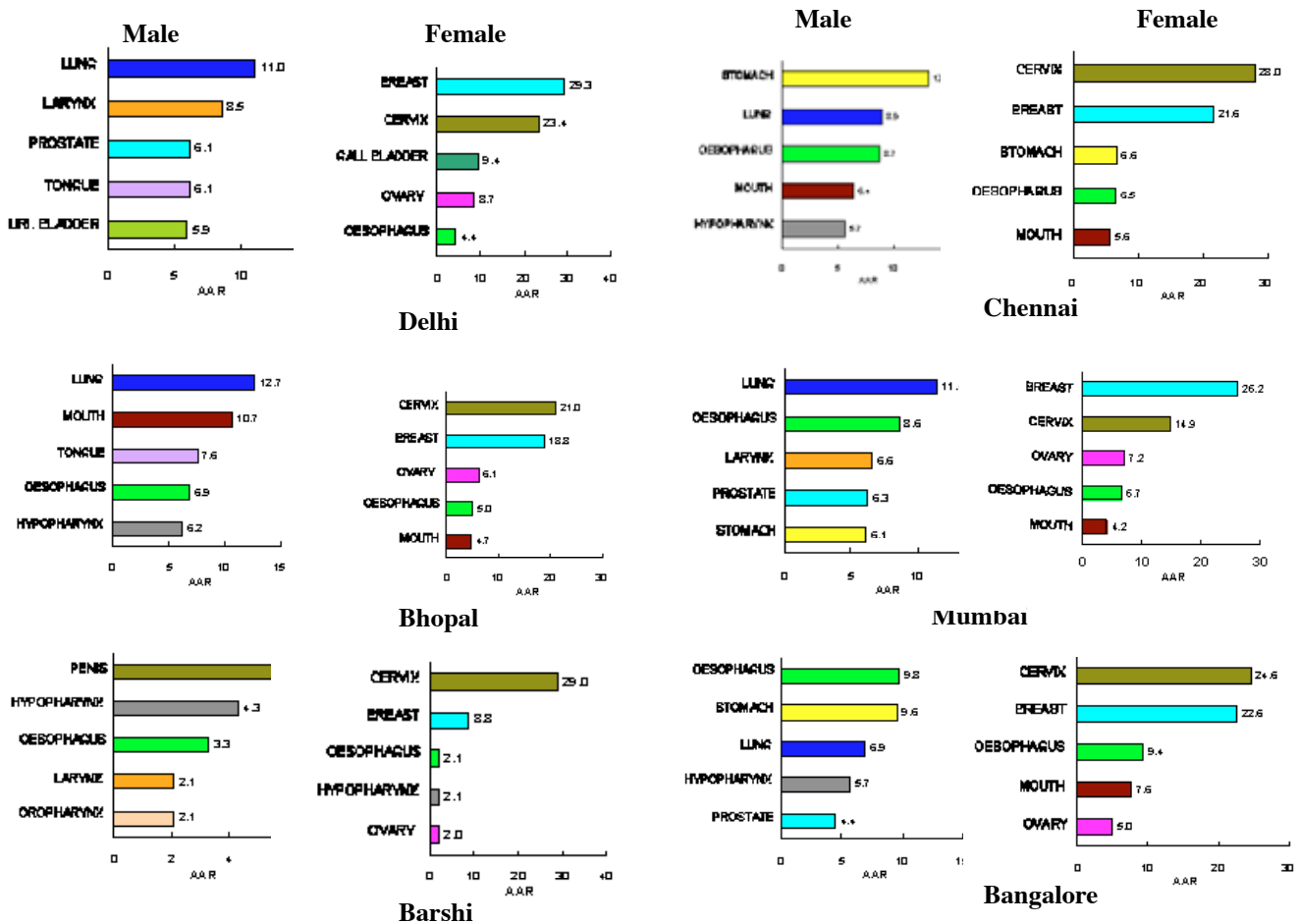


Figure 3. Regional Variation in the Most Common Cancers

The incidence of breast cancer is increasing steadily in all urban Indian registries<sup>10</sup>.

The risk of breast cancer increases with age at first child-birth. Inverse relationship is seen between parity and breast cancer risk. Nulliparity is found to be a risk factor only in premenopausal women. A 3-fold risk is found in women who attained menopause between the ages of 44-49 compared to those attaining menopause prior to 41 years of age<sup>28</sup>. Survival: The relative survival from female breast cancer varied between 45-55% in different registries in India<sup>19,25,27</sup>.

The cohort study on breast cancer patients seen at the Cancer Institute (WIA), Chennai for 20 years showed that the survival from contralateral breast cancer is not significantly different from primary breast cancer. Survival advantage is seen for those with early stage disease (primary/contralateral) compared to late stage disease and those with family history of breast cancer compared to those without<sup>29</sup>.

#### Tobacco Related Cancers (TRC)

TRC, comprising lip, tongue, mouth, oropharynx, hypopharynx, larynx, lung, oesophagus, stomach, pancreas and urinary bladder cancers, accounted for 48% and 19% of all cancers among males and females in India respectively. The AAR of TRC ranged between 18.6 in Barshi to 74.3 in

Mumbai among males and 7.6 in Barshi and 28.8 in Bangalore among females. The incidence of TRC is on the rise in all registries in India, especially among males<sup>10</sup>.

Survival: The 5 year relative survival of tobacco related cancer sites were as follows: Lip (46%), Tongue (26%), Mouth (33%), Oropharynx (21%), Hypopharynx (18%), Larynx (39%), Oesophagus (7%), Stomach (8%), Pancreas (5%), Lung (8%) and Urinary bladder (23%)<sup>19</sup>.

#### Research Studies

Hospital and Population based cancer registries are involved in conducting observational studies and screening programmes in the registry areas. Case control studies on cancers of the oral cavity, pharynx, oesophagus, stomach, lung, breast, cervix and ovary have been published while studies on cancers of gall bladder, prostate, oral cavity, lung, larynx, colo-rectal and cervix are in progress in various centres. Many survival studies on tobacco related and common cancers like cervix, breast and lymphoreticular malignancies have either been completed or in progress in several registries. Cohort studies to assess tobacco-attributed mortality are also in progress in three States. A study on prevalence of HPV in female general population has been completed. Randomized clinical screen-

ing trials on oral and cervical cancers are in progress.

## National Policy

The national cancer control programme was initiated in 1975 – 76 and renamed as National Cancer Control Programme in 1985. The objectives of the programme are (i) primary prevention of tobacco-related cancers, (ii) secondary prevention of cancer of the cervix and (iii) extension and strengthening of treatment facilities on a national scale. The District Cancer Control Programme for preventive health education, early detection and pain relief was undertaken in collaboration with Regional Cancer Centres besides providing assistance to 33 voluntary organizations for undertaking health education and early detection.

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