

Chapter 3

CANCER INCIDENCE AND LEADING SITES OF CANCER IN POPULATION BASED CANCER REGISTRIES

This chapter gives a summary of the incidence rates of leading sites of cancer in the population based cancer registries (PBCRs) both under the NCRP and others.

The PBCRs under the NCRP include those at Bangalore, Barshi, Bhopal, Chennai (Madras), Delhi and Mumbai (Bombay). As an outcome of the cancer atlas project, under the auspices of the NCRP-ICMR, six PBCRs have commenced functioning since January 2003. These are in Aizawl (covering Mizoram state), Dibrugarh (covering Dibrugarh district), Gangtok (covering Sikkim state), Guwahati (covering Kamrup district), Imphal (covering Manipur state) and in Silchar covering Silchar town. A PBCR has also been started at Ahmedabad to cover Ahmedabad rural district but no results are as yet available. The other PBCRs comprise those at Ahmedabad (urban), Ambillikai (rural), Aurangabad (urban), Karunagappally (urban-cum-rural), Kolkata (urban), Nagpur (urban), Pune (urban) and Thiruvananthapuram (urban-cum-rural).

The overall profile consisting of the 'write-up' of the PBCRs/centres with PBCRs, is given in Chapter 7. The incidence rates and bar charts depicting the leading sites of cancer are given below.

Incidence Rates

Cancer incidence refers to the number of new cases of cancer seen in the population of a defined geographic area over a definite period of time. Usually the rate is calculated per 100,000 population. The period of time is generally for one year and when data is available for more than one calendar year the average annual rates are calculated.

The crude incidence rate refers to the number of new cases of cancer that occur in the total population of that area per year per 100,000 persons. The age adjusted incidence rate of cancer also denoted as the age standardised incidence rate, means that the rate is adjusted to the five-year age population distribution of the world standard population.

The definitions and details of these calculations are given in the Appendix II.

Table 3.1 gives the average annual crude (CR) and age adjusted incidence rates (AAR) per 100,000 population in these PBCRs during the time period indicated in parentheses. Delhi PBCR showed the highest AAR, in both males and females. The registry at Barshi recorded the lowest AAR in both males and females. For the PBCRs under NCRP the period (calendar years), is 1997-99 and for the others 1993-97 (Parkin et al, 2002) except Kolkata (Sen et al, 2002), where it is 1998-99.

International Comparisons of AAR

Figure 3.1 gives the international comparison of AAR for all sites in males and females. The figure shows the highest and lowest AAR in all the continents, viz., Africa, Asia, Central and South America, Europe, North America and Oceania (Parkin et al, 2002). Besides, the rates of Indians in Singapore are compared with that of the PBCRs in India.

Table 3.1 : Average Annual Crude (CR) and Age Adjusted Incidence Rates (AAR) per 100,000 population in Indian PBCRs during the time period indicated in parentheses.

Registry	Males		Females	
	CR	AAR	CR	AAR
Bangalore (1997-1999)	57.2	92.1	73.6	115.5
Barshi (1997-1999)	36.5	42.8	44.6	52.5
Bhopal (1997-1999)	62.4	117.0	62.0	107.8
Chennai (1997-1999)	88.2	112.3	101.9	124.4
Delhi (1997-1999)	71.4	126.1	85.4	142.0
Mumbai (1997-1999)	69.7	116.8	84.2	126.7
Ahmedabad (1993-1997)	68.8	107.2	56.8	82.9
Karunagappally (1993-1997)	89.2	102.6	72.2	76.0
Kolkata (1998-1999)	82.8	102.1	93.4	114.6
Nagpur (1993-1997)	85.0	118.4	88.3	118.8
Pune (1993-1997)	64.4	103.9	76.8	115.3
Thiruvananthapuram (1993-1997)	73.9	87.8	73.9	81.1

Source: NCRP, Bangalore

The highest AAR in males was seen among the black population of Detroit, Michigan State, USA, whereas the highest AAR in females was seen in Geneva, Switzerland. In both males and females the highest rates seen in other registries were considerably higher than that observed in the Indian PBCRs. Some of the lowest rates seen in the other registries were also higher. However, the AAR from India was comparable with the AAR of the Indian population of Singapore. Moreover, the picture becomes much different and more meaningful (see Chapter 6) when such comparison of AAR is done for specific anatomical sites.

Leading Sites of Cancer

Figure 3.2 gives the bar charts of leading sites of cancer in twelve PBCRs (six under the NCRP and six others) in India.

Among males cancer of the stomach was the leading site of cancer in Bangalore and Chennai. Cancer of the lung was the leading site of cancer in six of the twelve PBCRs. These six PBCRs are Bhopal, Delhi, Mumbai, Ahmedabad, Karunagappally and Kolkata. It was the second leading site of cancer in Chennai and Thiruvananthapuram and the third leading site at Bangalore, Nagpur and Pune. Cancer of the oesophagus was an important leading site of cancer and was the leading site at Nagpur. It was the second or third leading site of cancer at Bangalore, Barshi, Chennai, Mumbai, Ahmedabad, Karunagappally and Pune. Other sites of cancer associated with use of tobacco, viz., tongue, mouth, hypopharynx and larynx are among important leading sites. Besides, cancer of the prostate was the third leading site in Delhi and among the leading sites in Bangalore, Chennai, Mumbai, Ahmedabad, Kolkata and Pune. Non-Hodgkin's lymphoma as a leading site was seen in almost all PBCRs.

In females, cancer of the breast and cervix were the two leading sites. Cancer of the breast was followed by cancer of the cervix in all the twelve PBCRs except, Barshi and Chennai where cancer of the cervix was followed by cancer of the breast. Among the sites of cancer associated with the use of tobacco, cancer of the mouth, oesophagus and lung were important. The incidence rates of cancer of the oesophagus, in Bangalore females have over the

years paralleled that in males. Cancer of the thyroid was the third leading site in Karunagappally and Thiruvananthapuram. It was also among the ten leading sites in Bangalore, Barshi and Nagpur. Cancer of the gall bladder was the third leading site in Kolkata, fourth in Delhi and sixth in Bhopal. This site of cancer, is not among the ten leading sites of cancer in other PBCRs. Cancer of the ovary was one of five leading sites in all the PBCRs except, Karunagappally where it was the sixth leading site of cancer.

FIGURE 3.1(a) : International Comparisons of AAR with that of PBCRs in India
All Sites (ICD-10:C00-C96) - Males

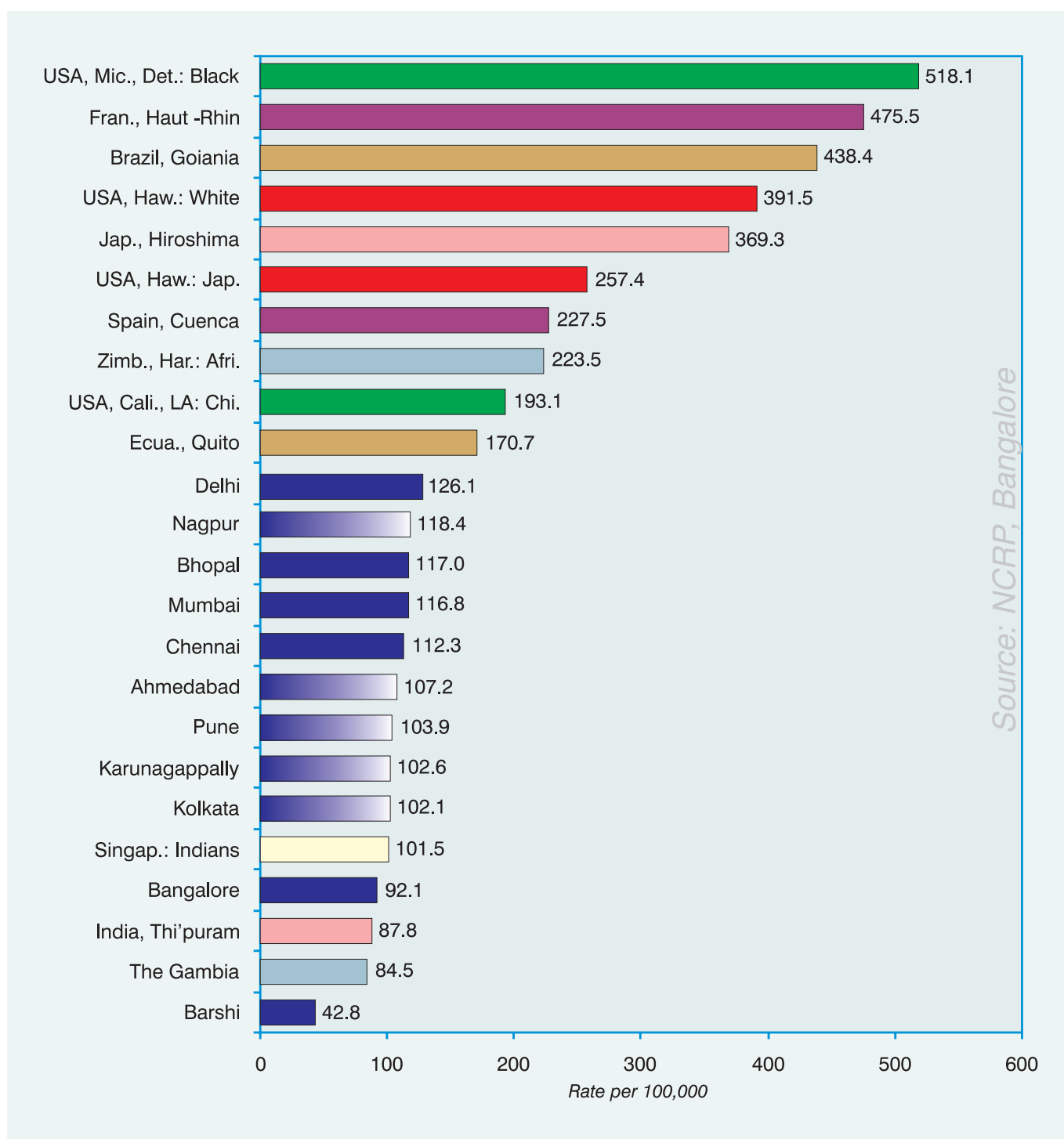


FIGURE 3.1(b) : International Comparisons of AAR with that of PBCRs in India
All Sites (ICD-10:C00-C96) - Females

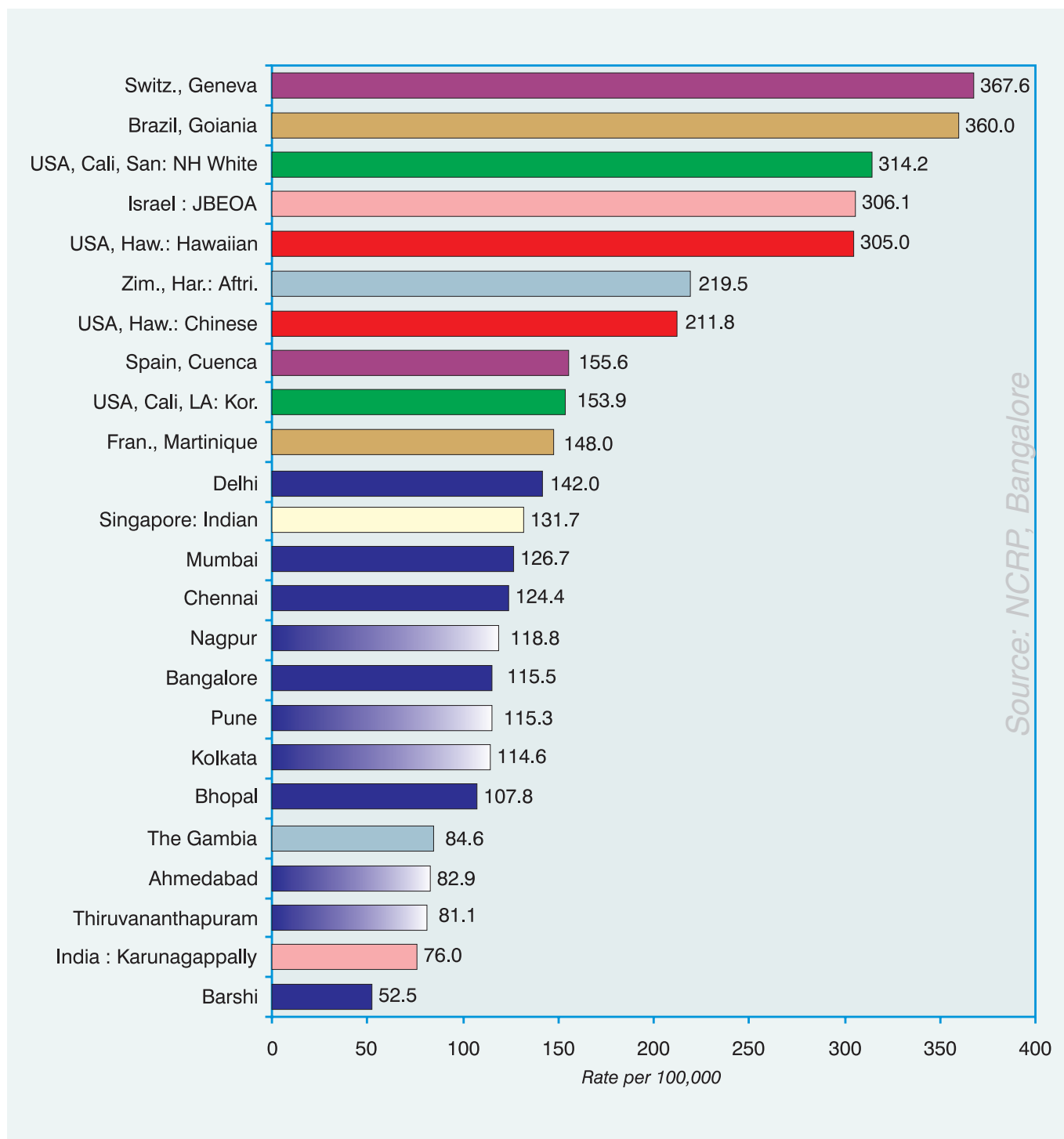


FIGURE 3.2 : Ten Leading Sites of Cancer in Indian PBCRs
Age Adjusted Incidence Rates given in parentheses

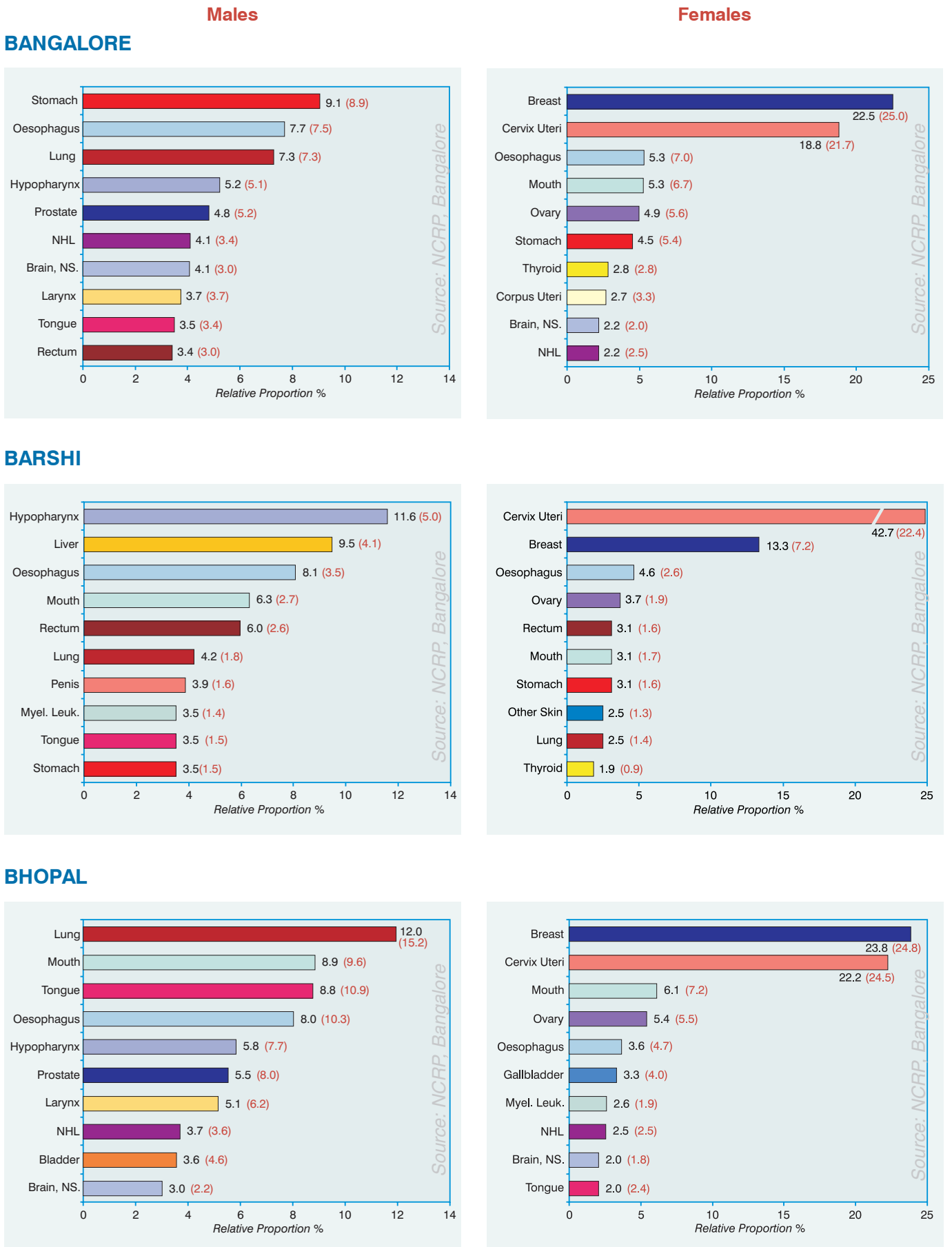


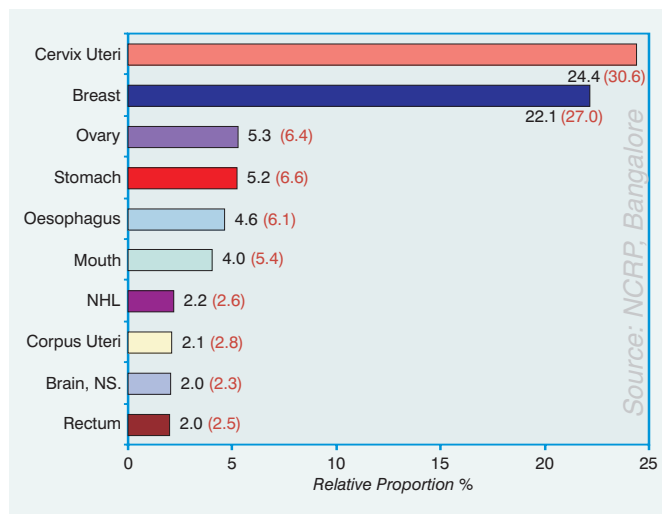
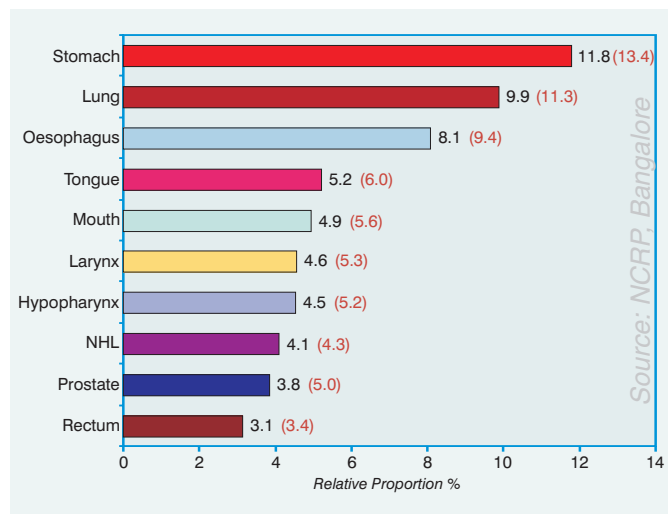
FIGURE 3.2 : Ten Leading Sites of Cancer in Indian PBCRs (Contd...)

Age Adjusted Incidence Rates given in parentheses

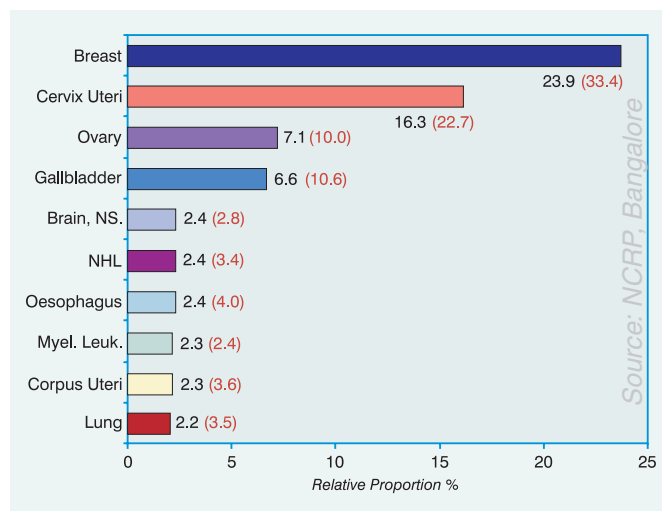
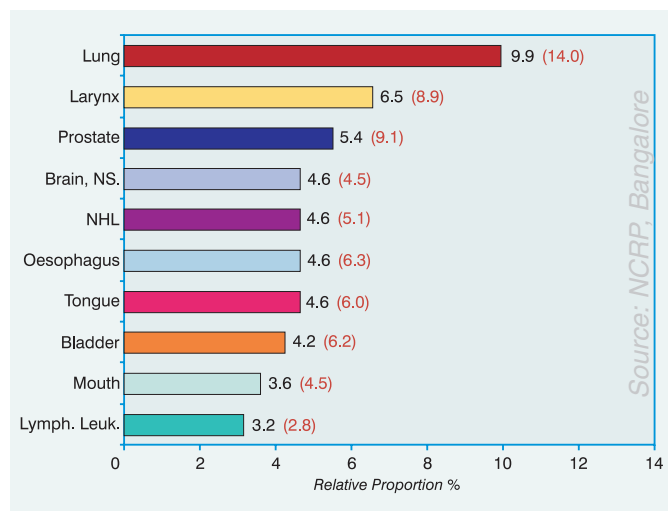
Males

Females

CHENNAI



DELHI



MUMBAI

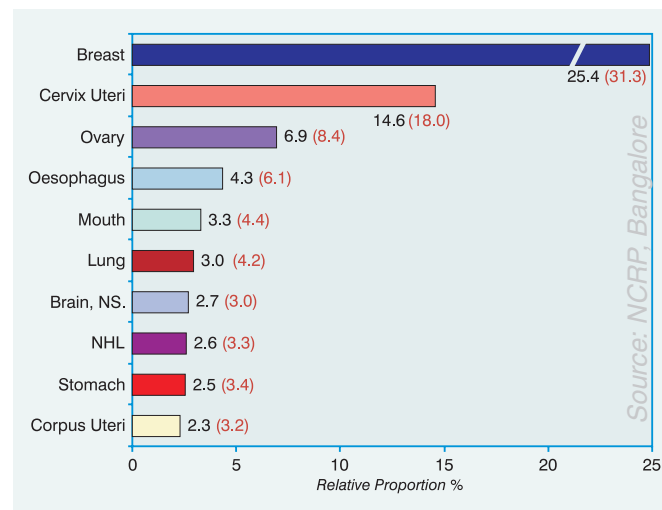
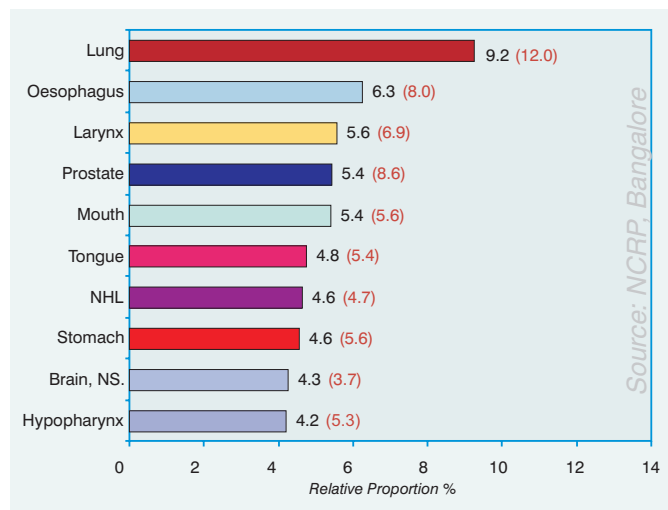


FIGURE 3.2 : Ten Leading Sites of Cancer in Indian PBCRs (Contd...)
 Age Adjusted Incidence Rates given in parentheses

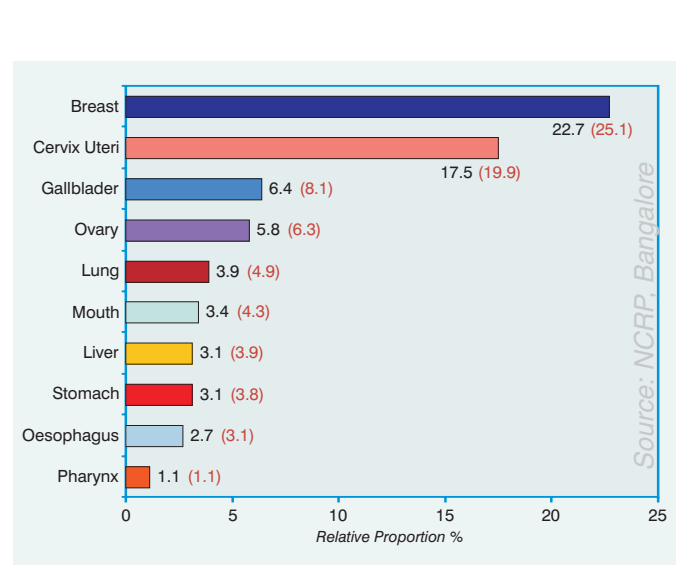
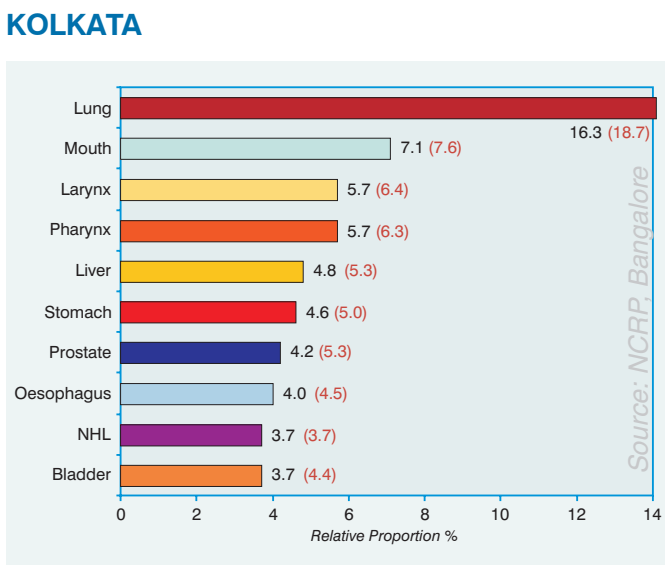
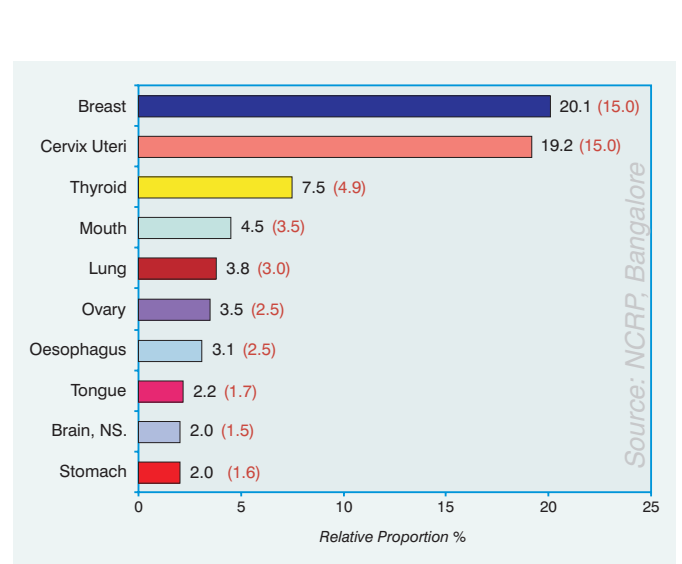
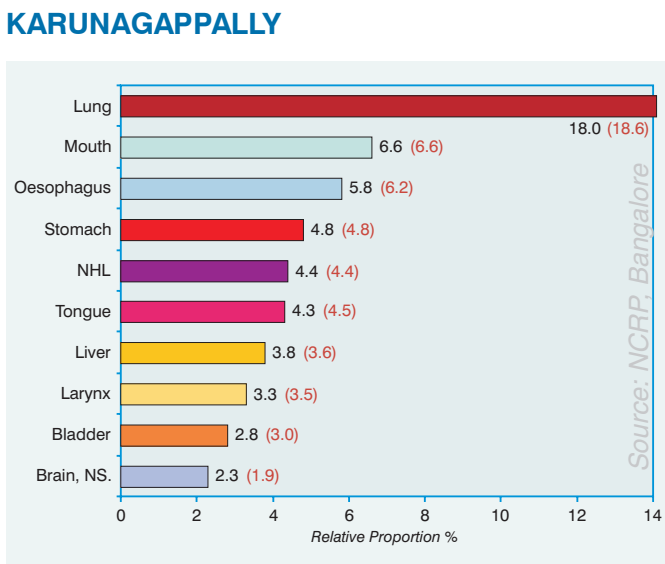
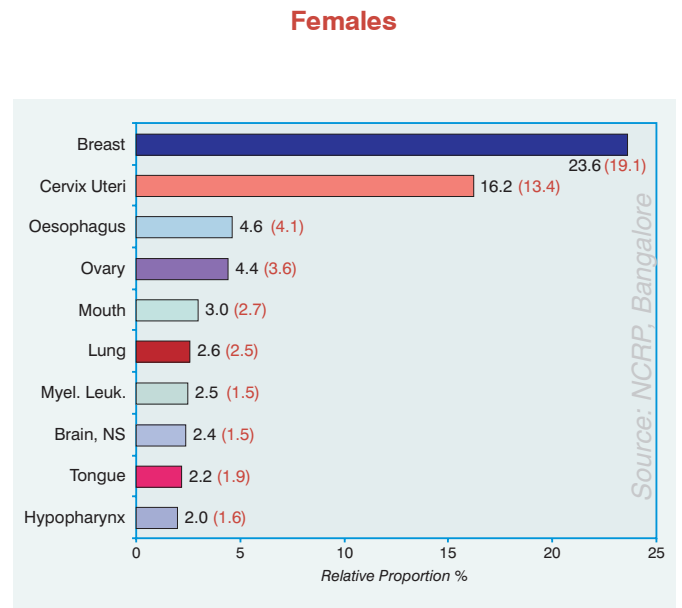
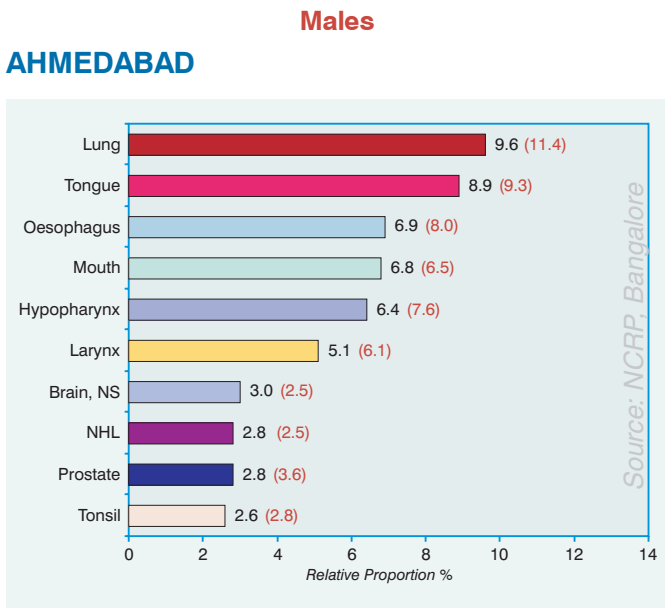
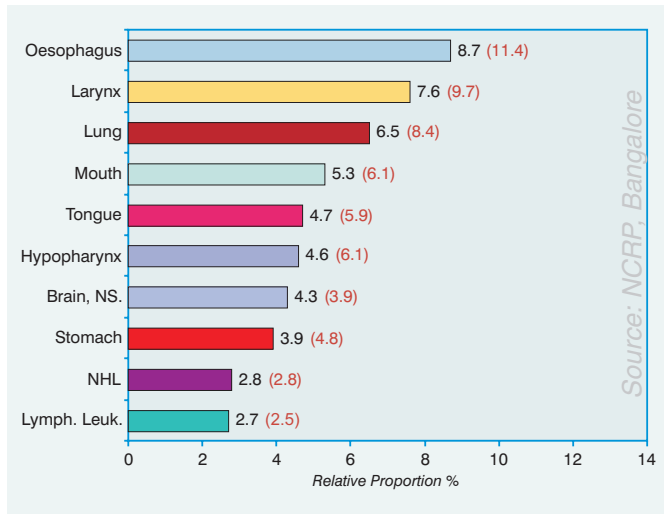


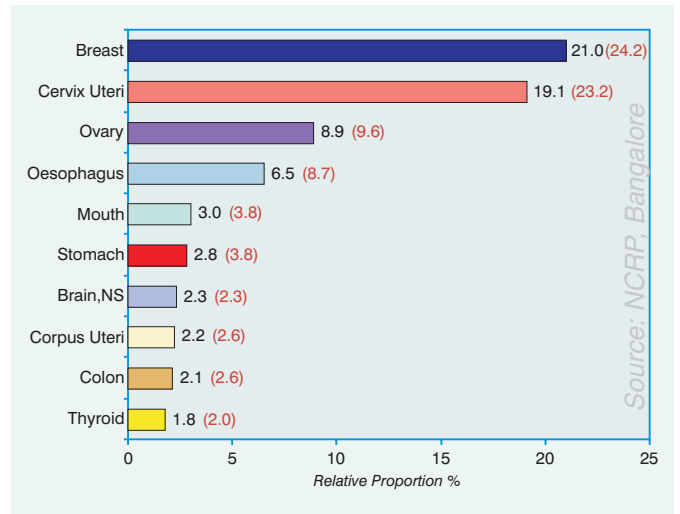
FIGURE 3.2 : Ten Leading Sites of Cancer in Indian PBCRs (Contd...)
Age Adjusted Incidence Rates given in parentheses

NAGPUR

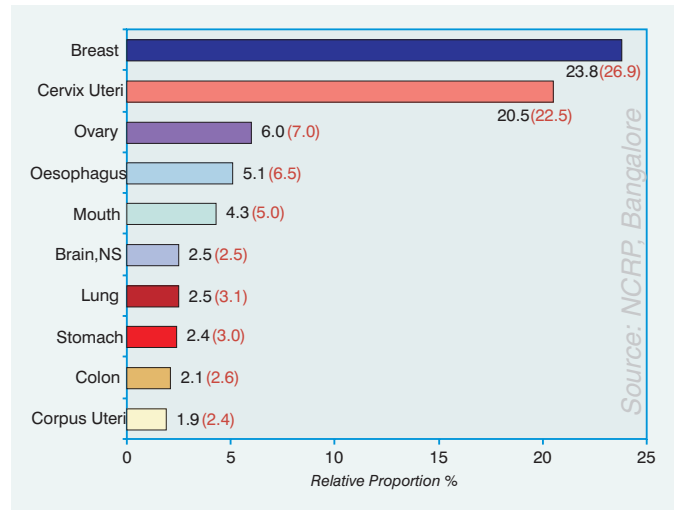
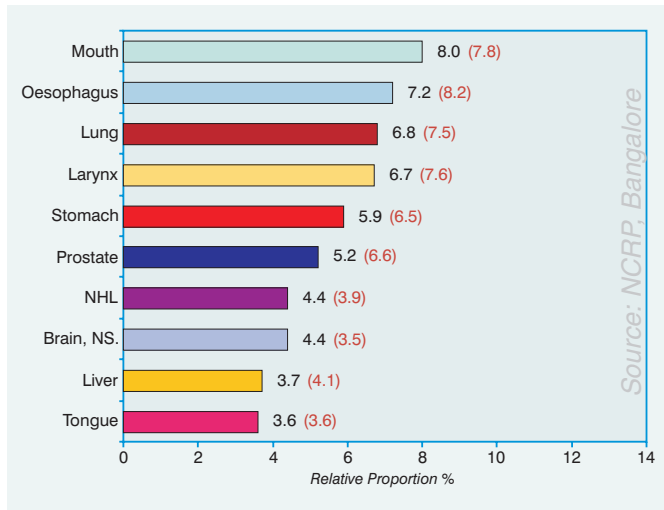
Males



Females



PUNE



THIRUVANANTHAPURAM

