

## Summary of Specific Sites of Cancer

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# Chapter 6

## SUMMARY OF SPECIFIC SITES OF CANCER

The following pages provide a summary of some statistical and scientific details on specific sites of cancer. The sites are as per the International Statistical Classification of Diseases (WHO: ICD-10, 1994), and not grouped by system, mainly because of easy comparability of incidence rates with cancer registries throughout the world.

In giving an account of the individual sites (according to ICD-10) of cancer in this chapter, in general, the succeeding guidelines have been followed for selecting the specific sites: Those sites where at least five districts showed a higher or comparable MAAR with the highest MAAR of that site in the PBCRs under NCRP. A site is also included for description if the MAAR of that site in any district is comparable with the highest incidence rates in the world. Sites of cancer with less than ten cases, even if they have higher MAARs than that of the highest MAARs in the PBCRs are excluded from the bar charts so as to avoid overestimation or misinterpretation. However, in order to place the facts in right perspective the appropriate shades of colour depending on the MAAR are portrayed for districts regardless of the numbers of cancers of that site (except for oropharynx, because of numerous [55] districts). The latter would also account for districts with small populations and identify potential hot spots of high incidence that could possibly sustain over time. The bar charts and map that impart a pictorial representation are in themselves self-explanatory. Thus, only brief textual description is provided.

Two bar charts and an incidence rate graded and colour shaded district-wise map of India form the basis of the textual description. The first bar chart gives the comparison of the age adjusted incidence rates per 100,000 persons (AAR) of the specific site of cancer in registries in the continents of the world. The reference manual is Cancer Incidence in Five Continents (Parkin et al, 2002). The highest and lowest AAR (average annual of 1993-97) in each of these continents is compared with corresponding AAR (average annual of 1997-99) in the six Population Based Cancer Registries (PBCRs) under the NCRP (blue bars). Since Indians in Singapore have somewhat similar rates the bar chart depicting the AAR for Indians from that registry is also included. The second bar chart gives the comparison of the minimum age adjusted incidence rates per 100,000 persons (MAAR) of the specific site of cancer. The comparison is made between the first 30 districts in India in the order from the highest MAAR for the said site of cancer and the MAAR (average annual of 1997-99) of that site in the PBCRs under the NCRP. A map of India with the 593 districts displayed as units is also portrayed. Depending on the MAAR (higher of MAAR between 2001-2002) of that site for a given district, graded shading, of each of the districts is done. The higher the MAAR the darker the shade. Where data is sparse gray shading is done. Districts with MAAR higher than or comparable with the highest MAAR amongst the PBCRs are labelled (with values of MAARs in parentheses).

The time periods or the calendar years referred for giving the AAR and the MAAR are indicated above in parentheses. These show variation, but are the latest data that are available. It may be noted that in the preceding chapter (Chapter 5), the average annual rates for the years 2001 and 2002 has been used in most districts for depicting leading sites of cancer, as that is more appropriate for expressing the relative proportions of the common sites.

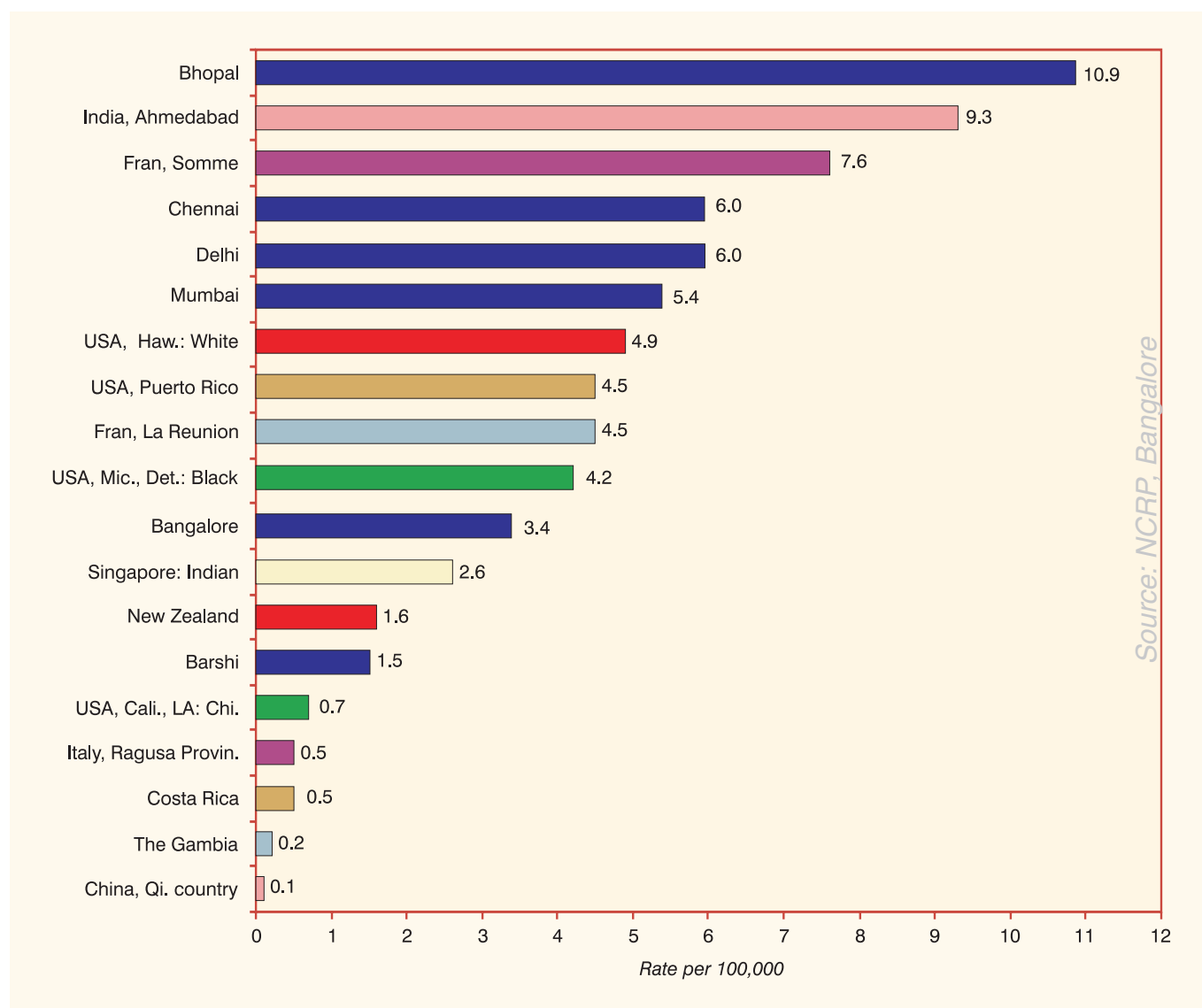
***The list of Topography sites with ICD-10 code with mode of grouping for determining leading sites of cancers and acronyms used in figures of bar charts is given in Appendix III.***

***The list of States/Union Territories with code (according to Census of India, 2001) and acronyms used in figures of bar charts against names of districts is given in Appendix IV.***

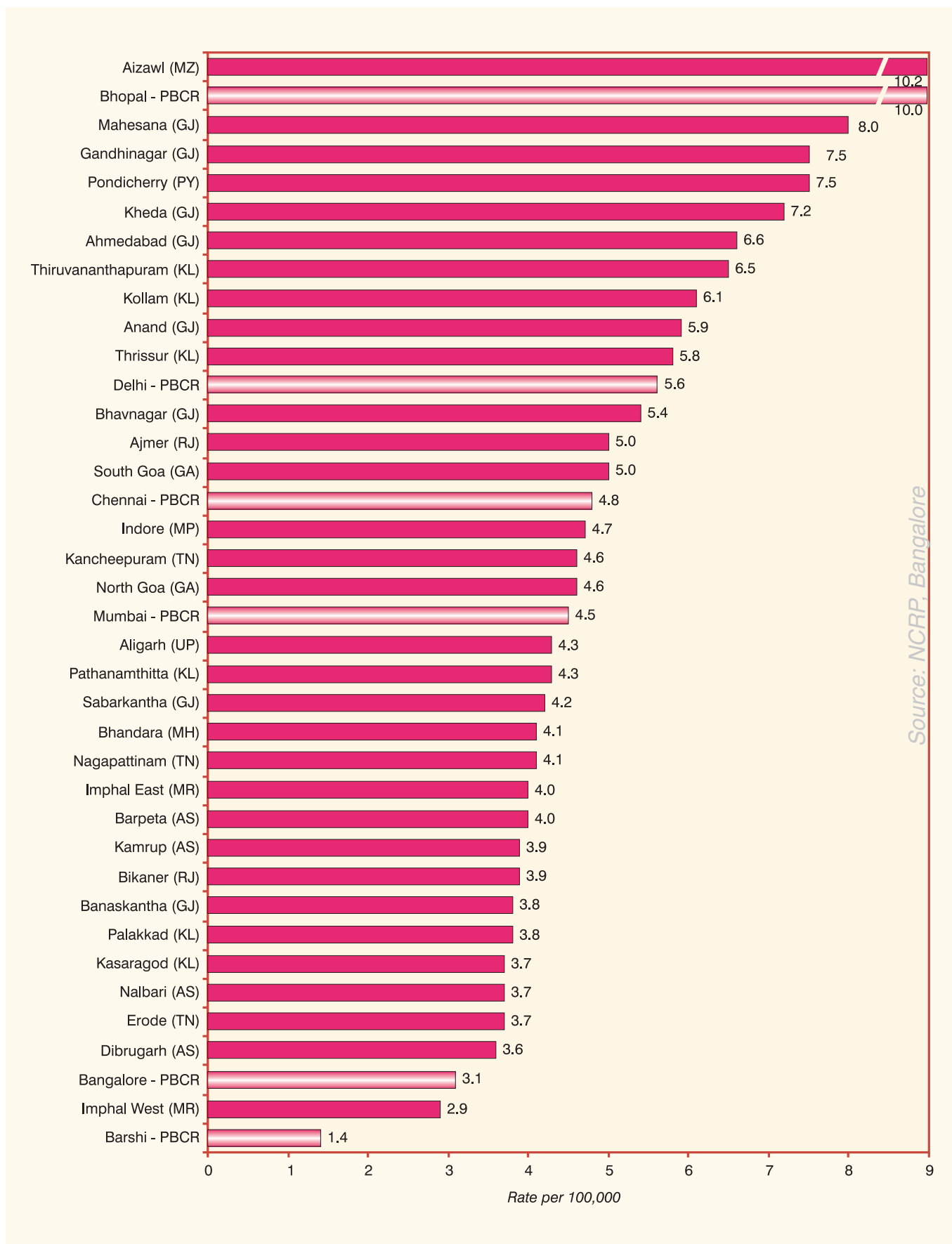
## 6.1. TONGUE (ICD-10 : C01-C02) – MALES

According to Cancer Incidence in V Continents - Vol. VIII (Parkin et al 2002) [Fig. 6.1(a)], Bhopal, PBCR has the highest AAR of 10.9 of cancer of the tongue in the world. Ahmedabad urban registry has also a high AAR of 9.3/100,000. The other urban PBCRs of India have AARs between 3.4 and 6.0. The values of the MAAR of the urban PBCRs shown in Fig 6.1(b) are not too different in this site of cancer, as proportion of microscopic confirmation of tongue cancer is fairly high. The district of Aizawl in Mizoram State, has a slightly higher MAAR compared to Bhopal, PBCR. There are several districts throughout the country that have a higher MAAR compared to the urban PBCRs. Of particular importance seems to be the State of Gujarat - several districts (Mahesana, Gandhinagar, Kheda, Ahmedabad, Anand, Bhavnagar, Sabarkantha and Banaskantha) show high incidence rates of tongue cancer.

**FIGURE 6.1(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Tongue (ICD-10 : C01 - C02) - Males**

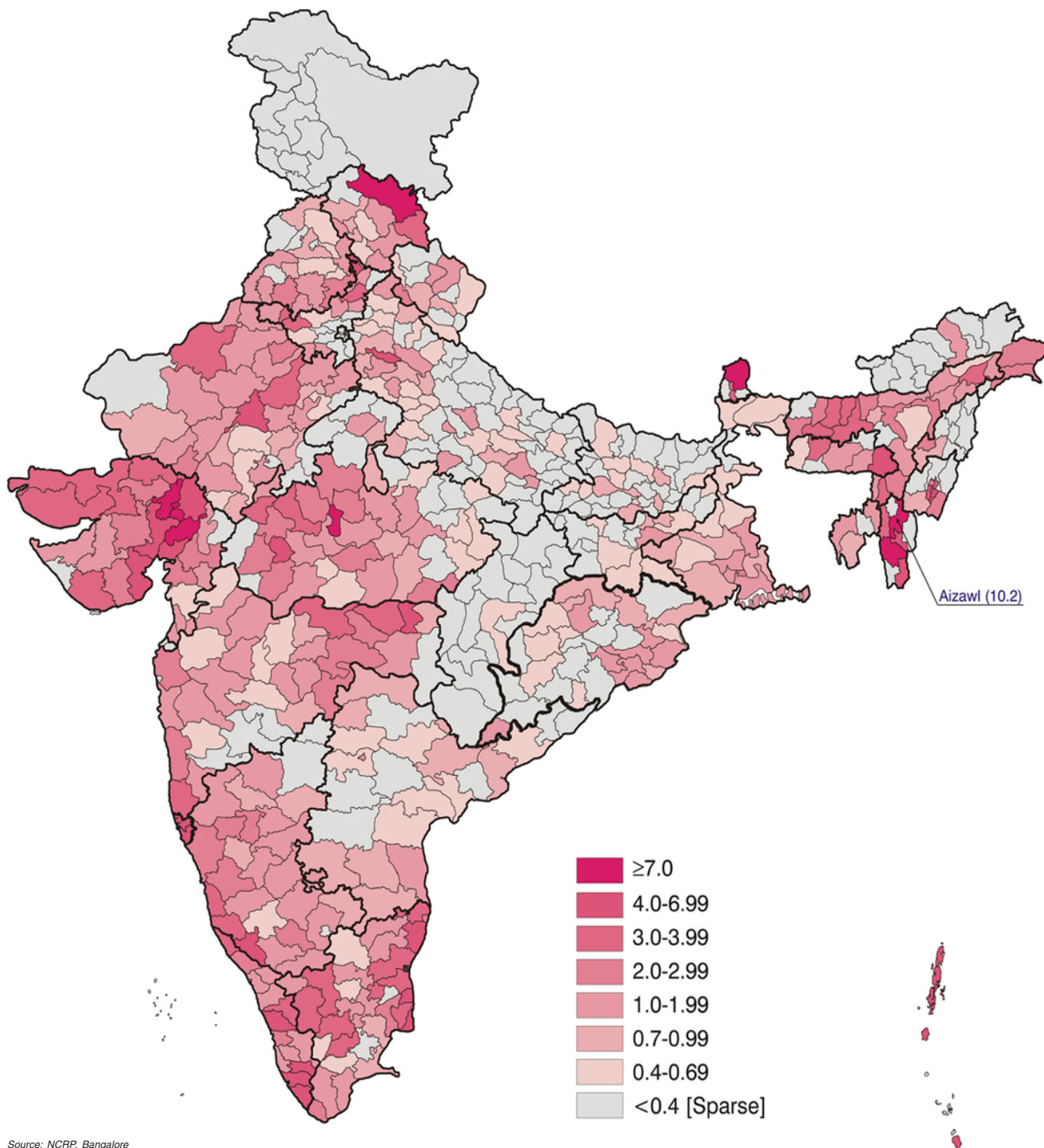


**FIGURE 6.1 (b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Tongue (ICD-10 : C01 - C02) - Males**





**MAP 6.1 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Tongue (ICD-10 : C01 - C02) 2001 - 2002 - Males**

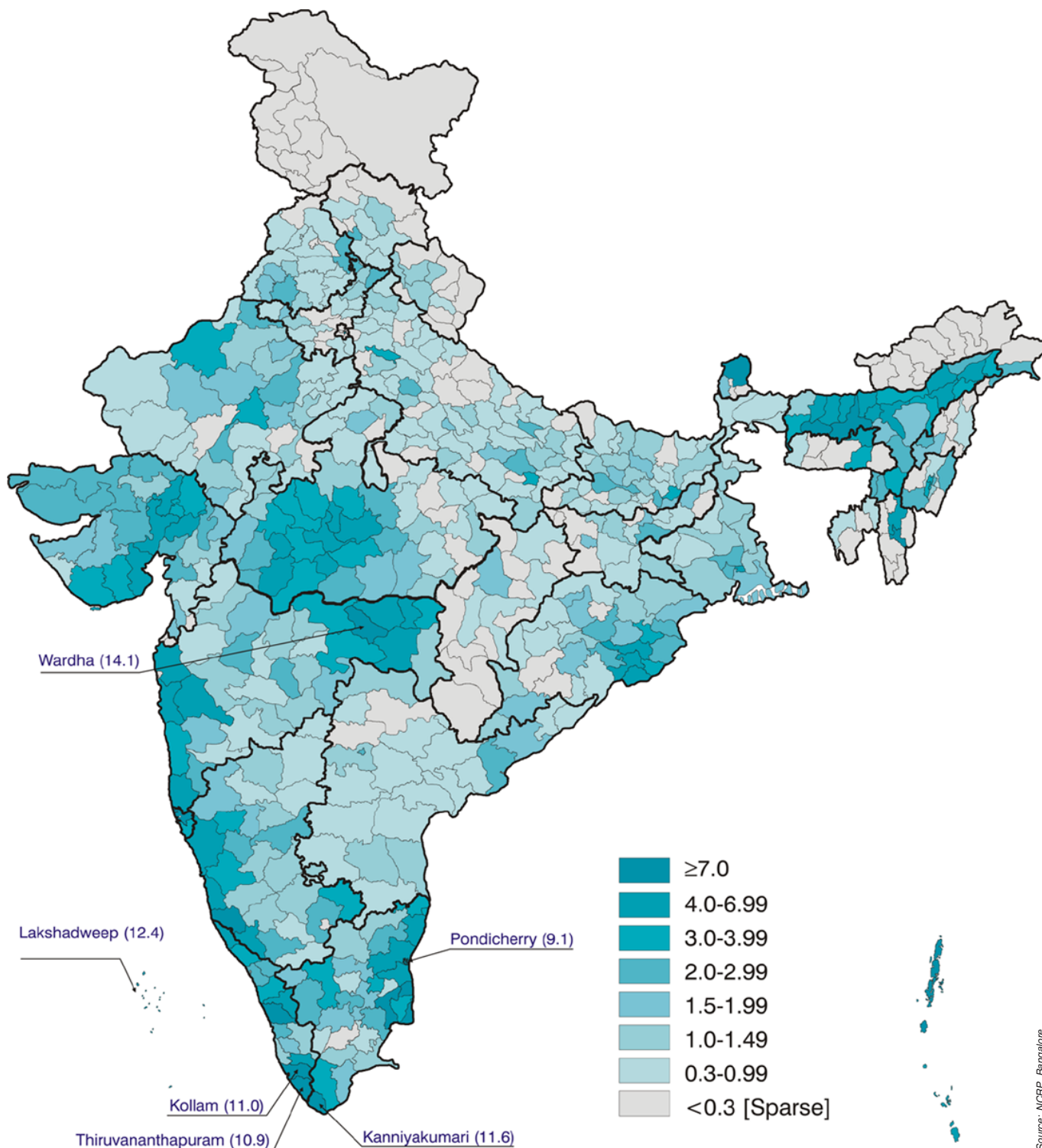


Source: NCRP, Bangalore

## 6.2. MOUTH (ICD-10 : C03-C06) – MALES

Again Bhopal, PBCR has the highest AAR of 9.6/100,000 in the world (Parkin et al, 2002). The AAR in other PBCRs varies from 2.7 in Barshi to 5.6 in Mumbai and Chennai [Fig. 6.2(a)]. The MAAR for Bhopal PBCR is 8.6. There

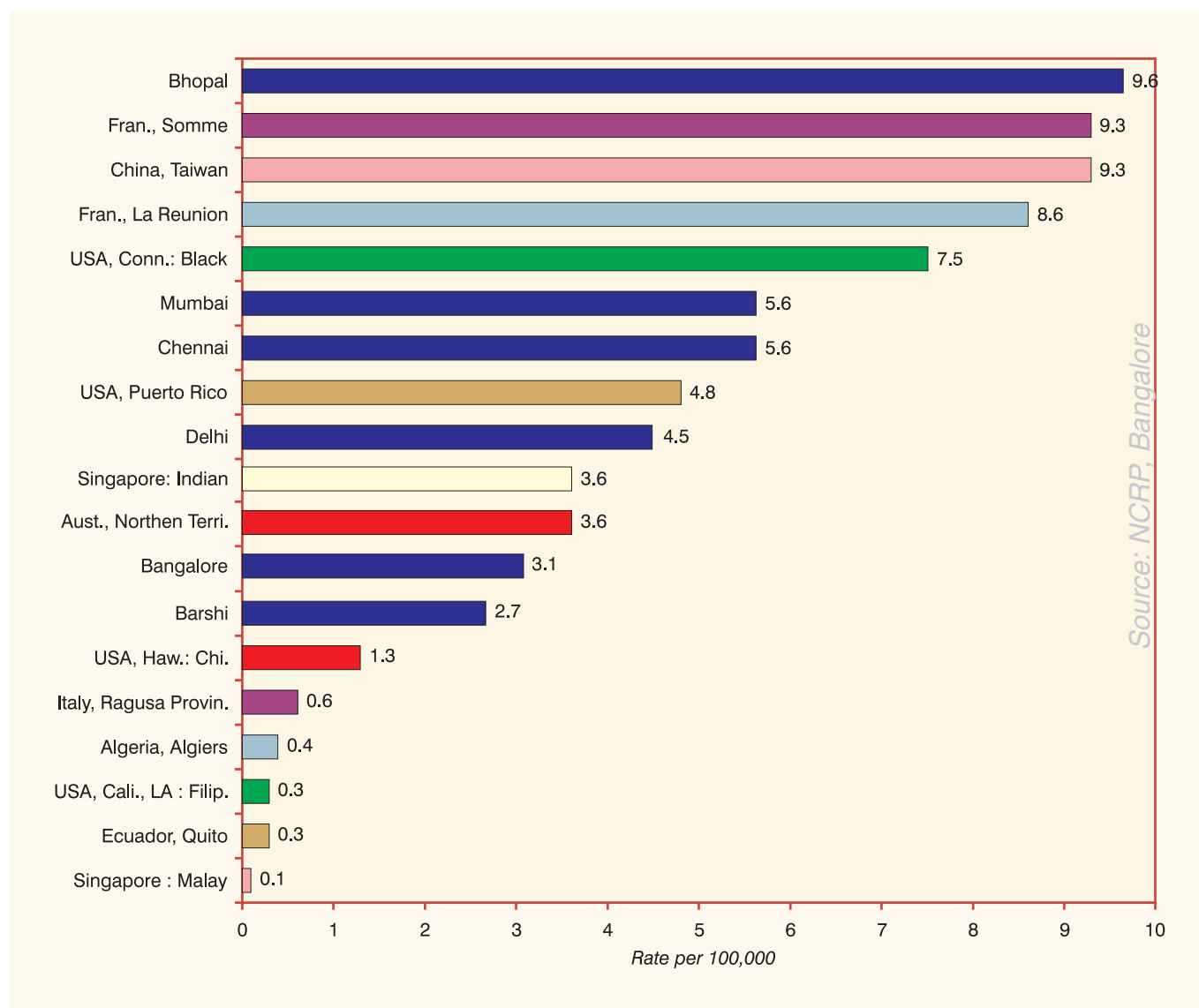
**MAP 6.2 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Mouth (ICD-10 : C03 - C06) 2001 - 2002 – Males**



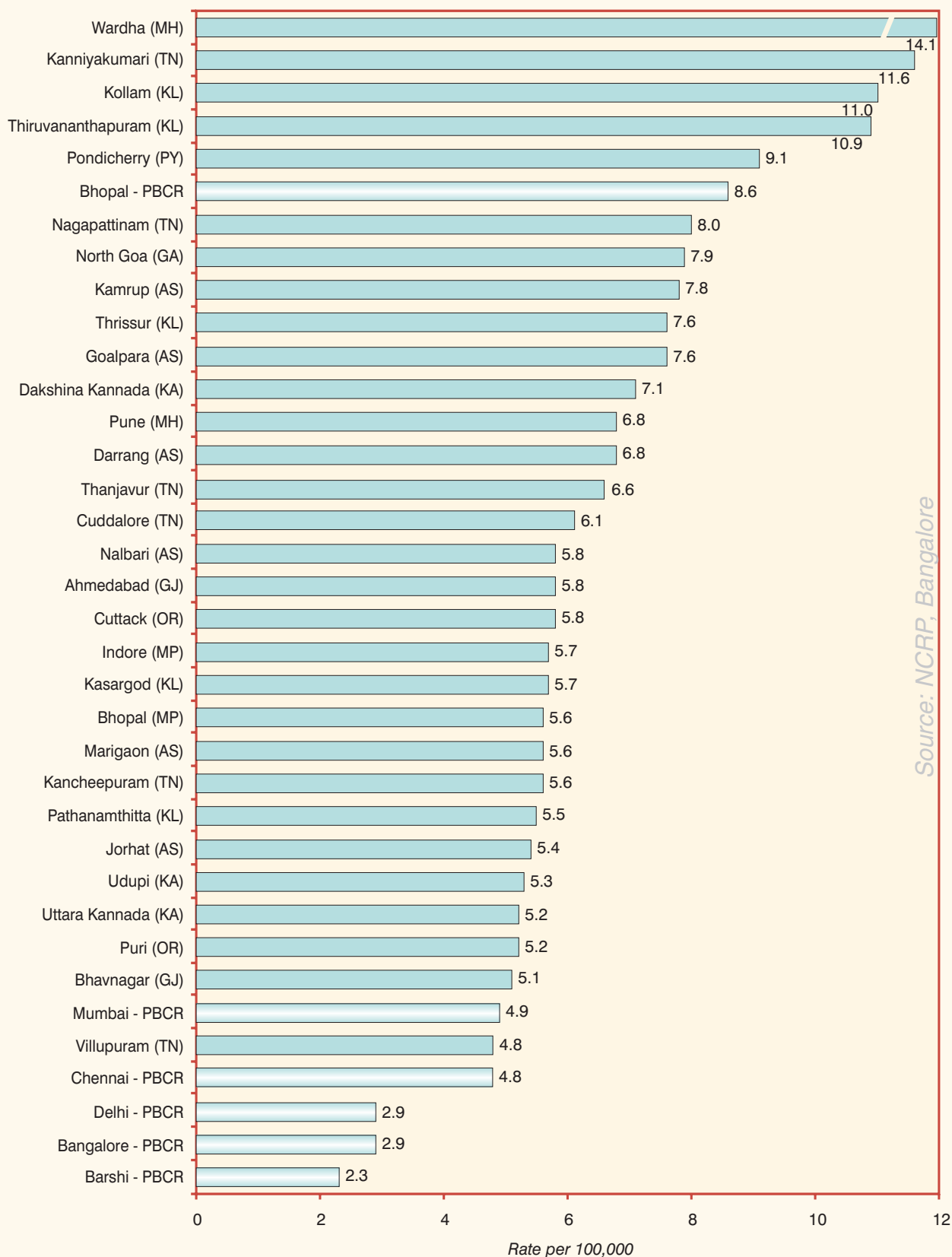
Source: NCRP, Bangalore

were five districts that had a higher MAAR than that of Bhopal, PBCR. Wardha district in Maharashtra State had a MAAR of 14.1, which is 47% higher than the AAR of Bhopal. Of the other four districts that had a higher MAAR than Bhopal, one is in Tamil Nadu State, one in Pondicherry and two in Kerala State. At least thirty other districts across the country had a higher MAAR than that of the other PBCRs. Other than several districts in Tamil Nadu State, districts in Assam State (Kamrup, Goalpara, Darrang, Nalbari, Marigaon, Jorhat) showed a high MAAR.

**FIGURE 6.2(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Mouth (ICD-10 : C03 - C06) – Males**



**FIGURE 6.2(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Mouth (ICD-10 : C03 - C06) – Males**

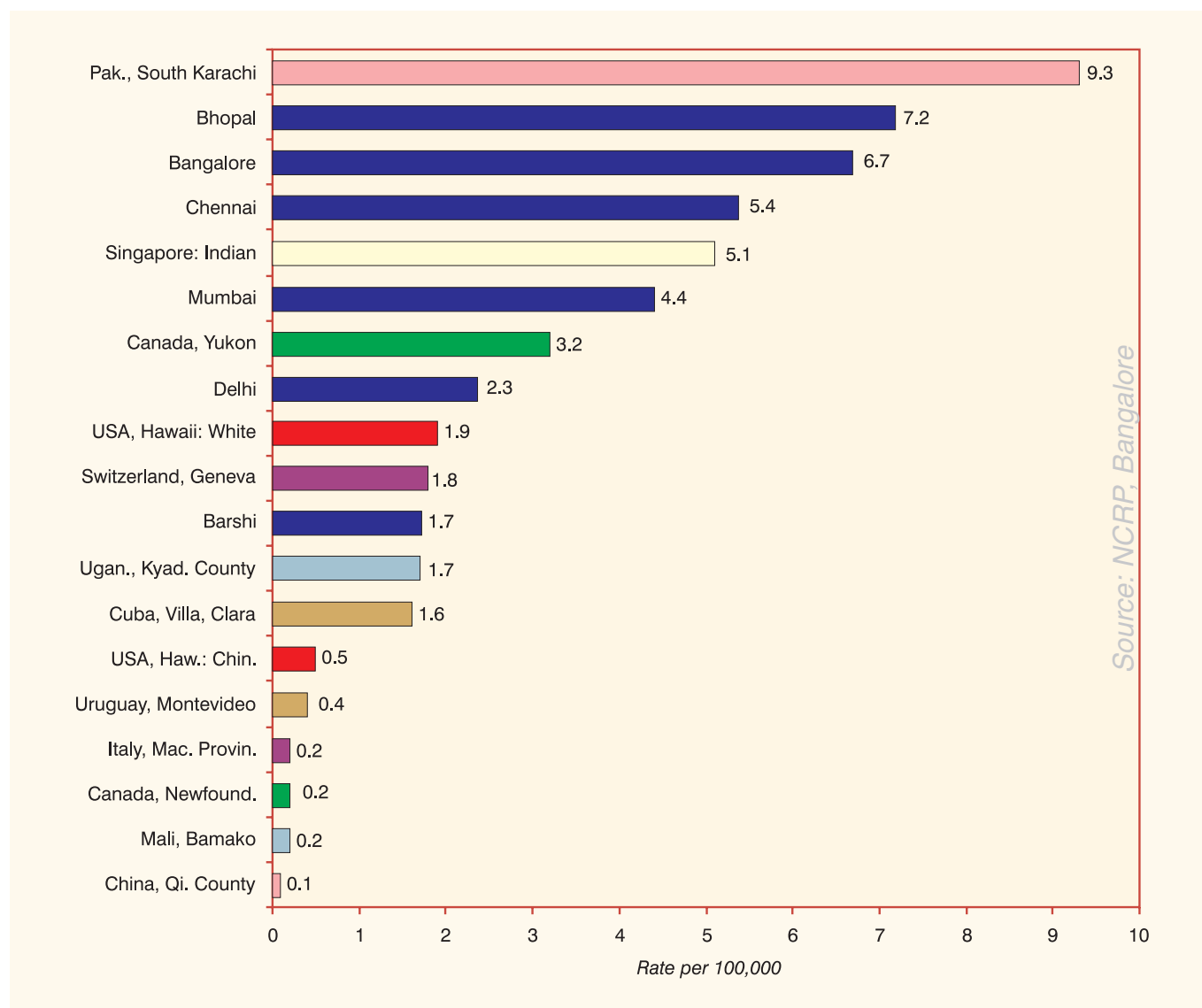


Source: NCRP, Bangalore

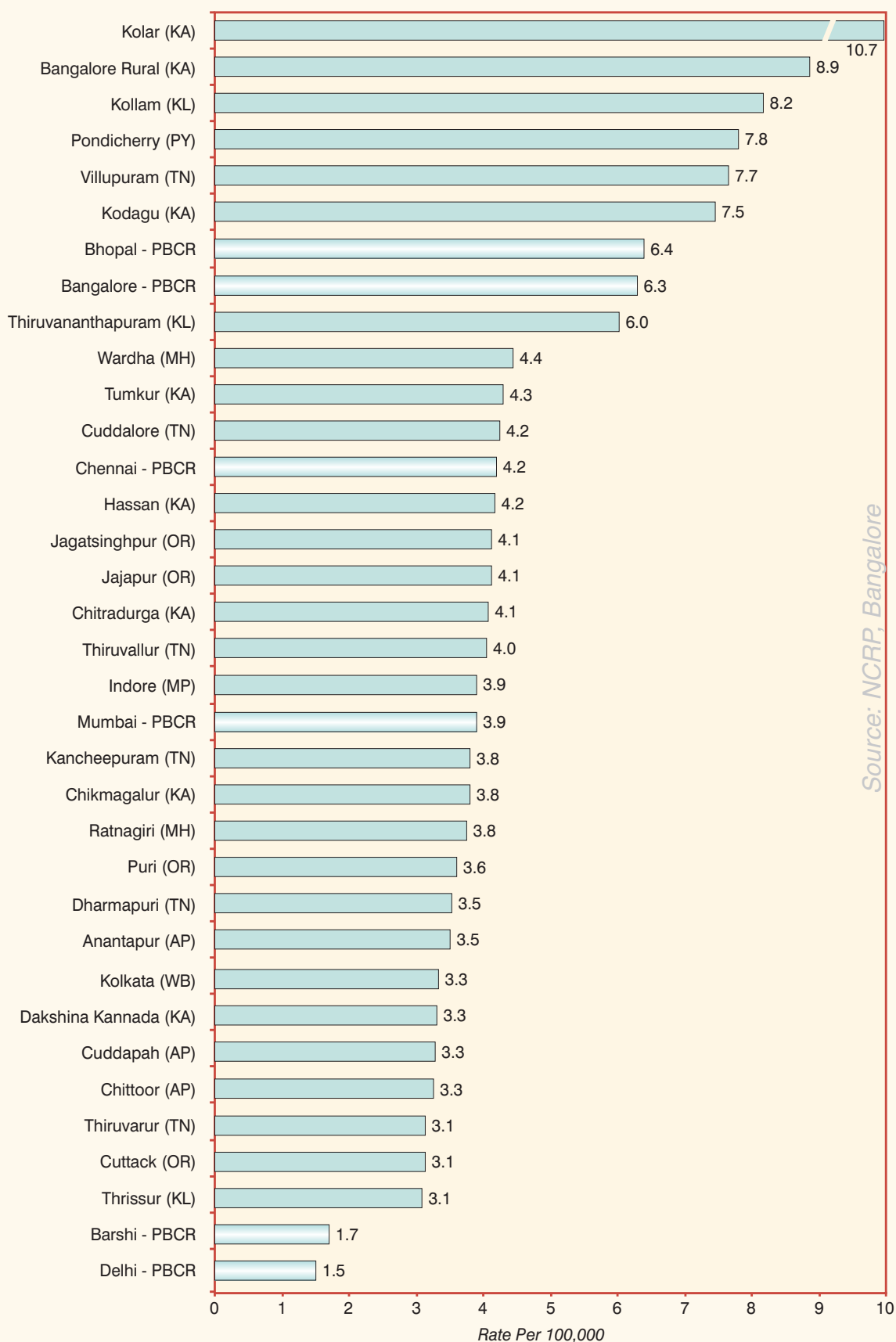
### 6.3. MOUTH (ICD-10 : C03-C06) – FEMALES

South Karachi in Pakistan has the highest AAR of mouth cancer in females (Parkin et al, 2002). Bhopal and Bangalore PBCR have comparable AARs [Fig. 6.3(a)]. The MAAR of Kolar district (10.7) in Karnataka State is even above the AAR of South Karachi. Women in Bangalore Rural and Kodagu districts in Karnataka State, Kollam and Thiruvananthapuram districts in Kerala State, Villupuram in Tamil Nadu State and Pondicherry had all high MAAR comparable with the highest in the world.

**FIGURE 6.3(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Mouth (ICD-10 : C03 - C06) – Females**

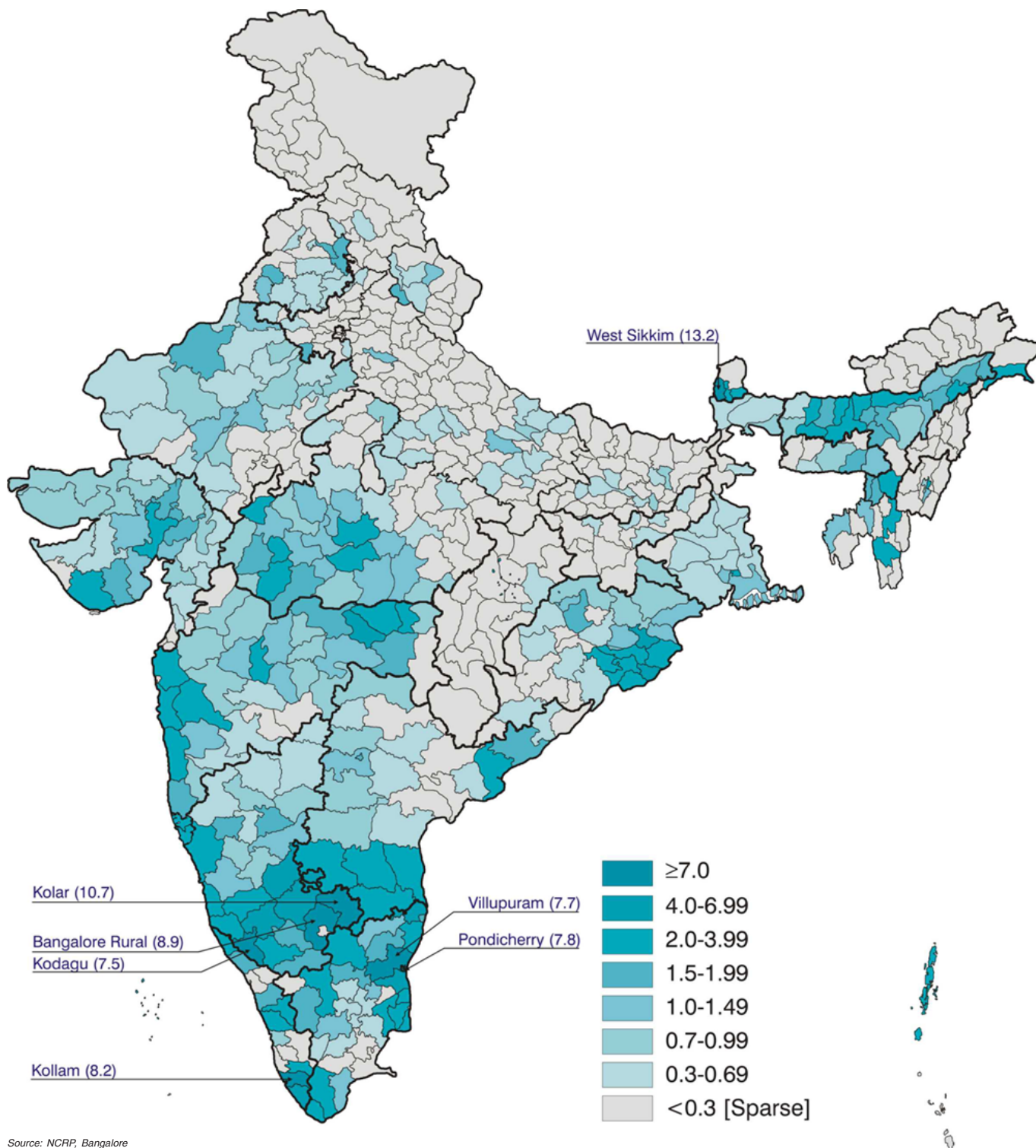


**FIGURE 6.3(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Mouth (ICD-10 : C03 - C06) – Females**





**MAP 6.3 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Mouth (ICD-10 : C03 - C06) 2001 - 2002 – Females**

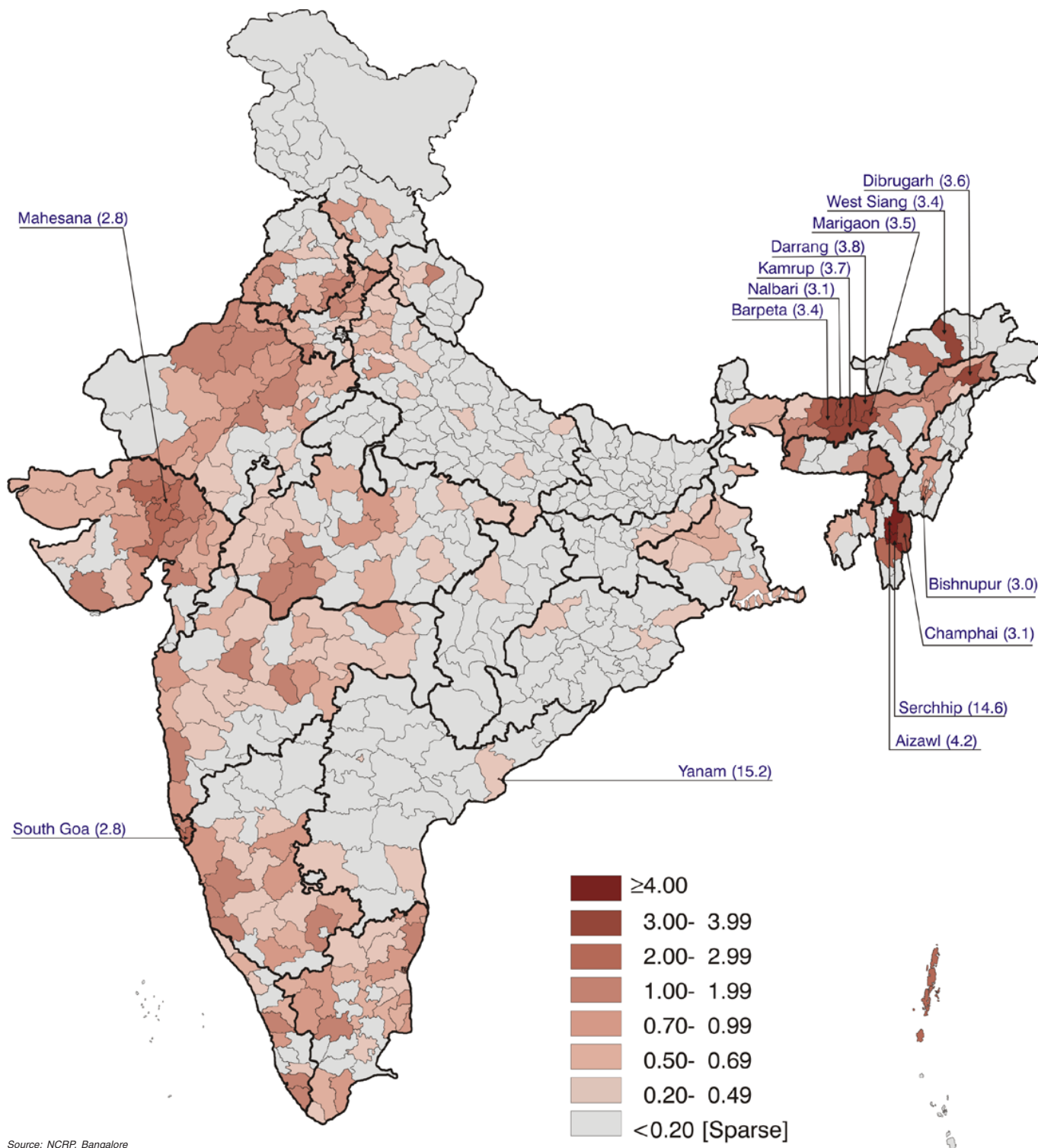


Source: NCRP, Bangalore

## 6.4. TONSIL (ICD-10 : C09) – MALES

At least five districts in Assam State and one in Gujarat State had higher MAAR than that of Bhopal PBCR which has the highest MMAR among the PBCRs. Most of the other districts that had MAAR comparable with that of the PBCRs were from the states of Assam, Gujarat and Rajasthan.

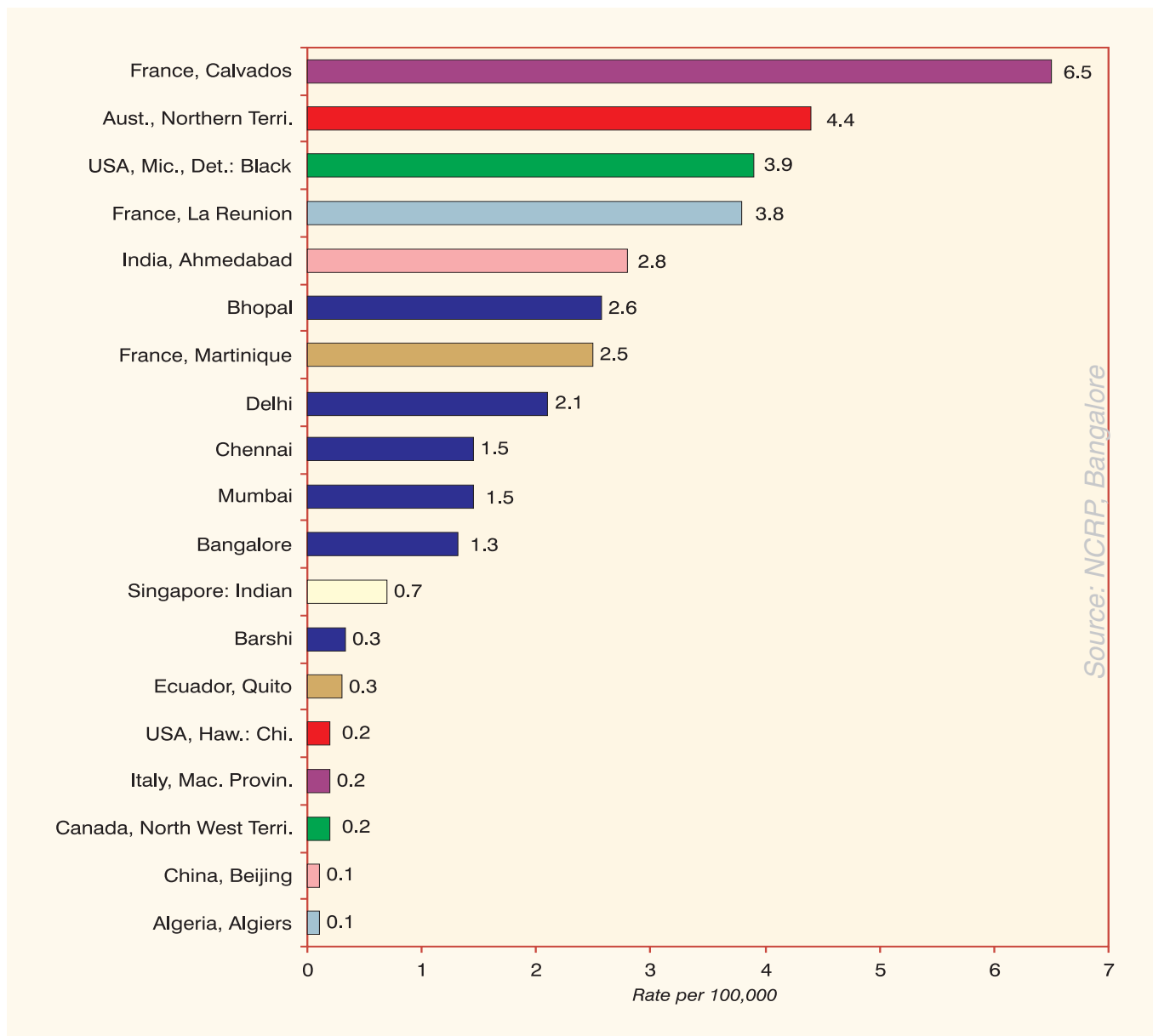
**MAP 6.4 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Tonsil (ICD-10 : C09) 2001 - 2002 – Males**



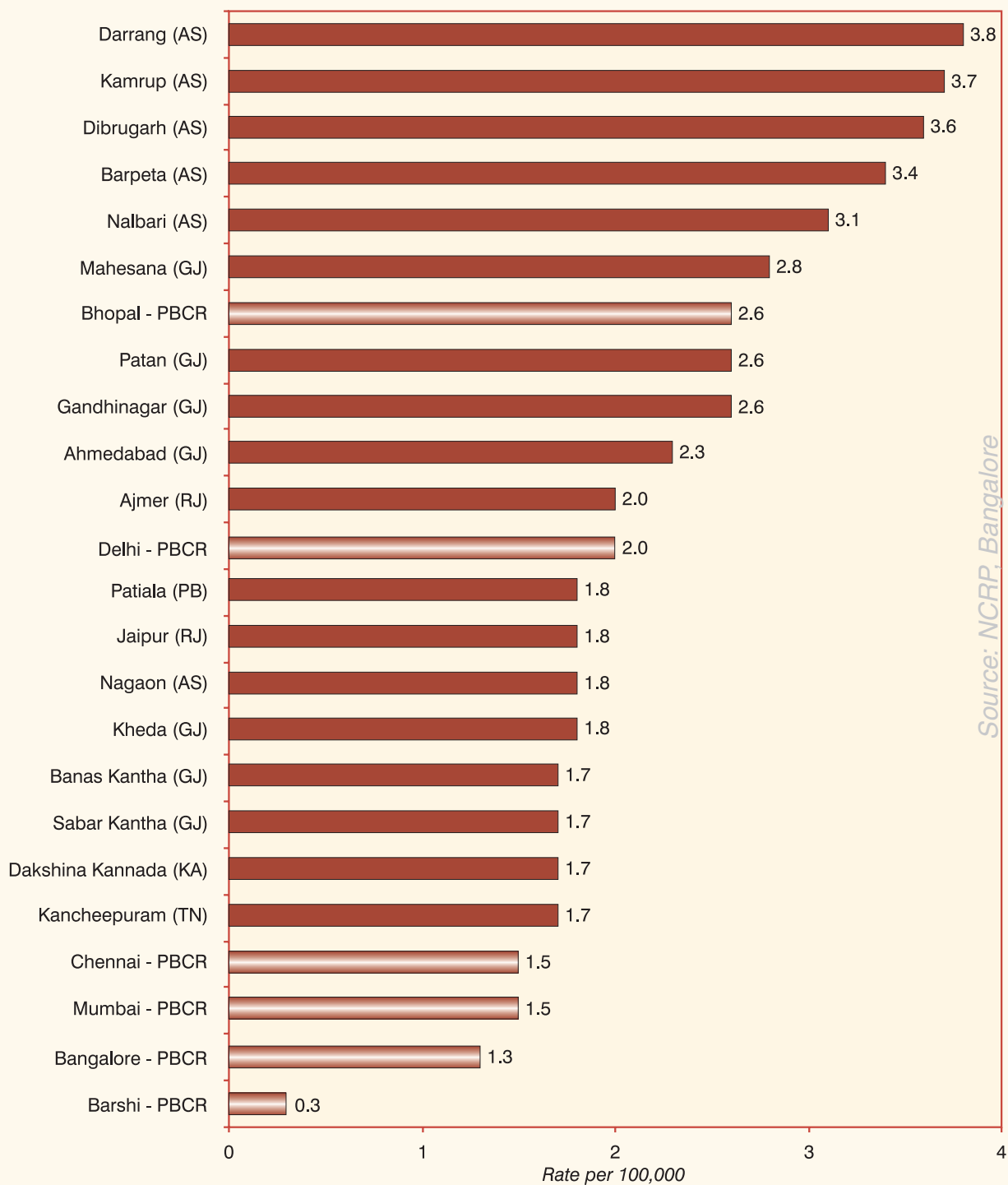
Source: NCRP, Bangalore



**FIGURE 6.4(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Tonsil (ICD-10 : C09) – Males**



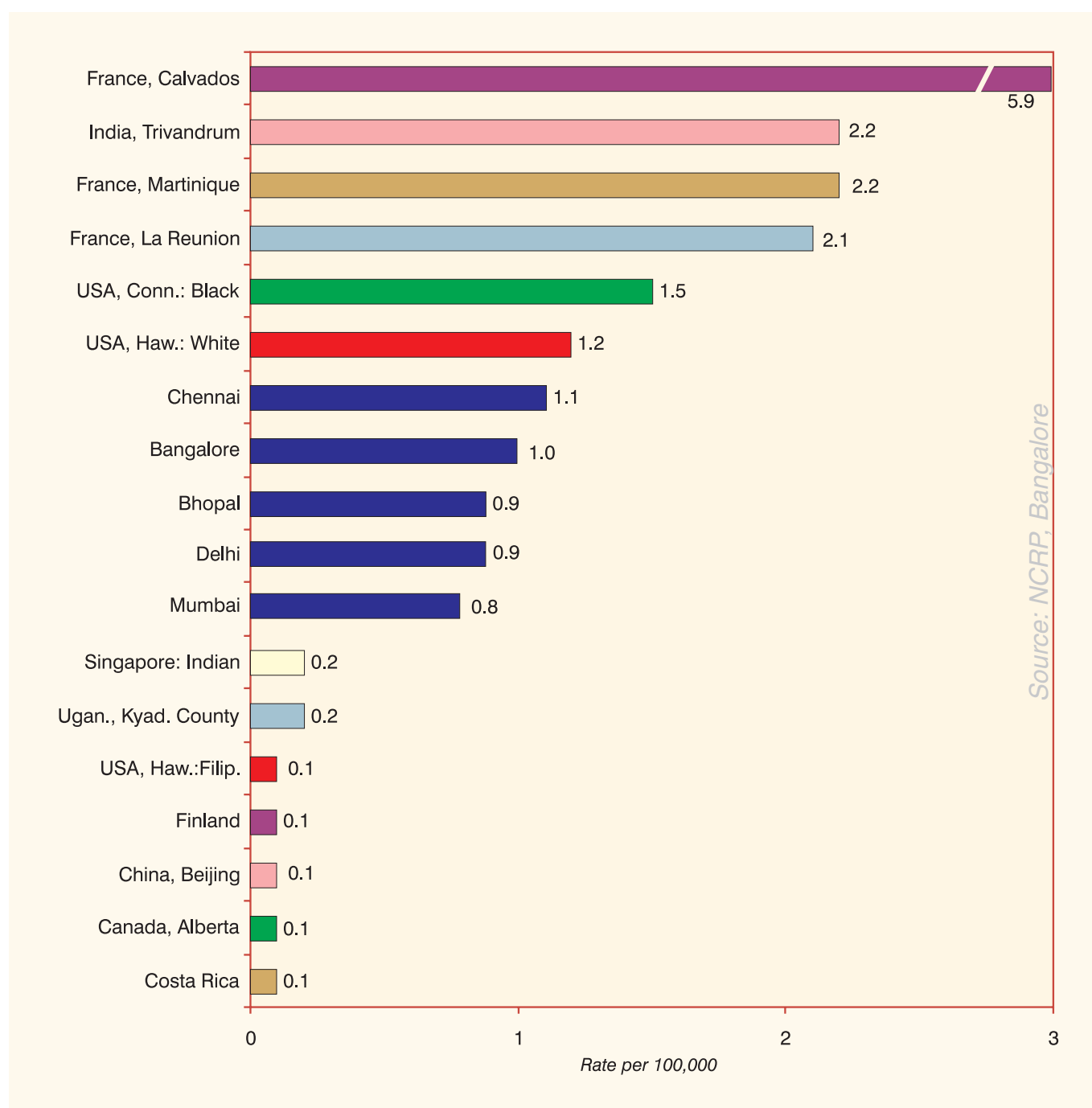
**FIGURE 6.4(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Tonsil (ICD-10 : C09) – Males**



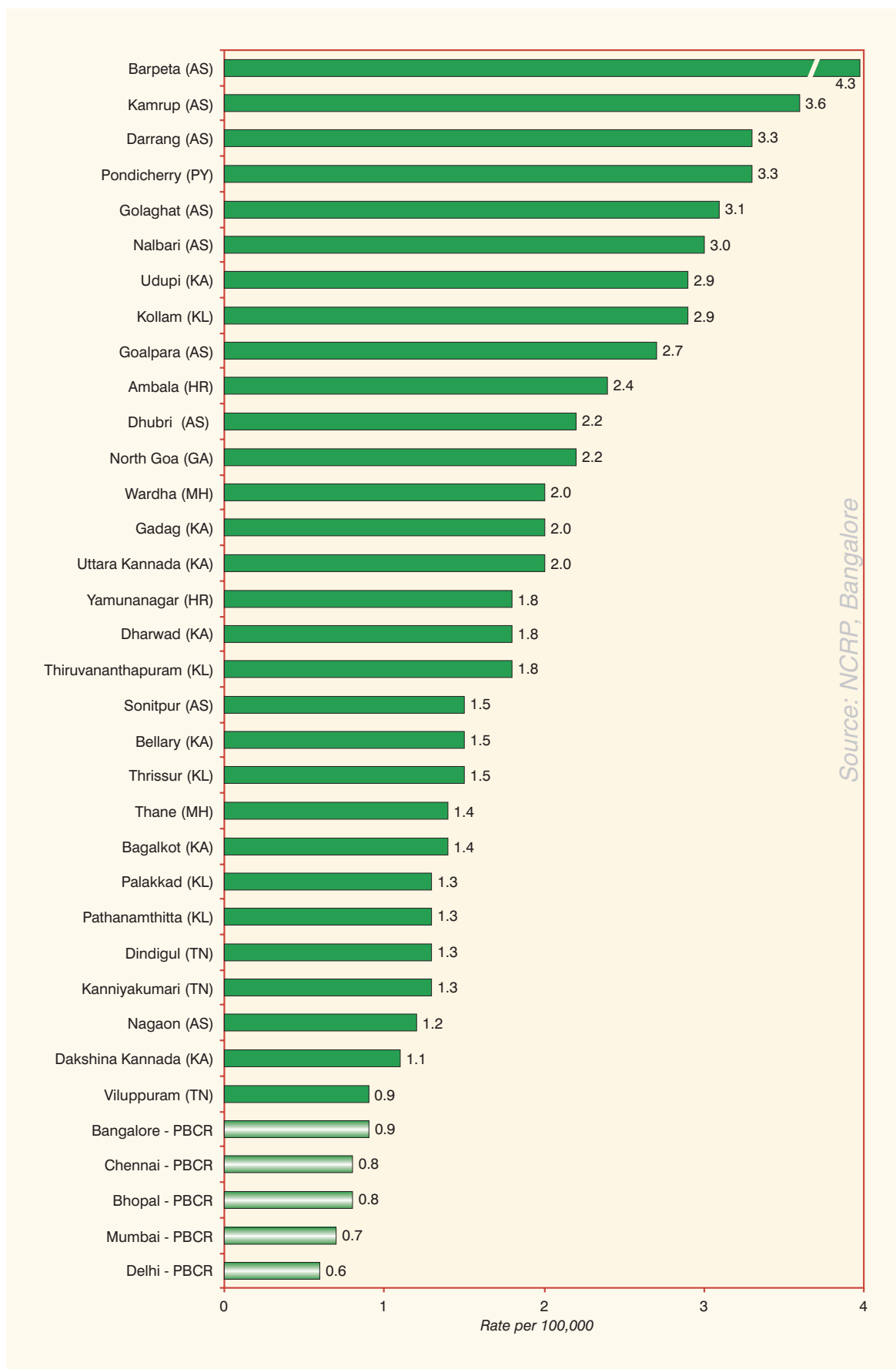
## 6.5. OROPHARYNX (ICD-10 : C10) – MALES

This site of cancer had by far the maximum number of districts (30) that had MAARs above the highest MAAR among the PBCRs [Fig. 6.5(b)]. These districts were mainly in Assam State, the west coast from Mumbai to the southern tip of the country and northern districts of Karnataka State. There were twentyfive other districts where the MAAR was above the highest MAAR of the PBCRs but these districts reported less than ten cases. Because of too many districts only the thirty districts with more than ten cases are labelled in this map of oropharynx [Map 6.5].

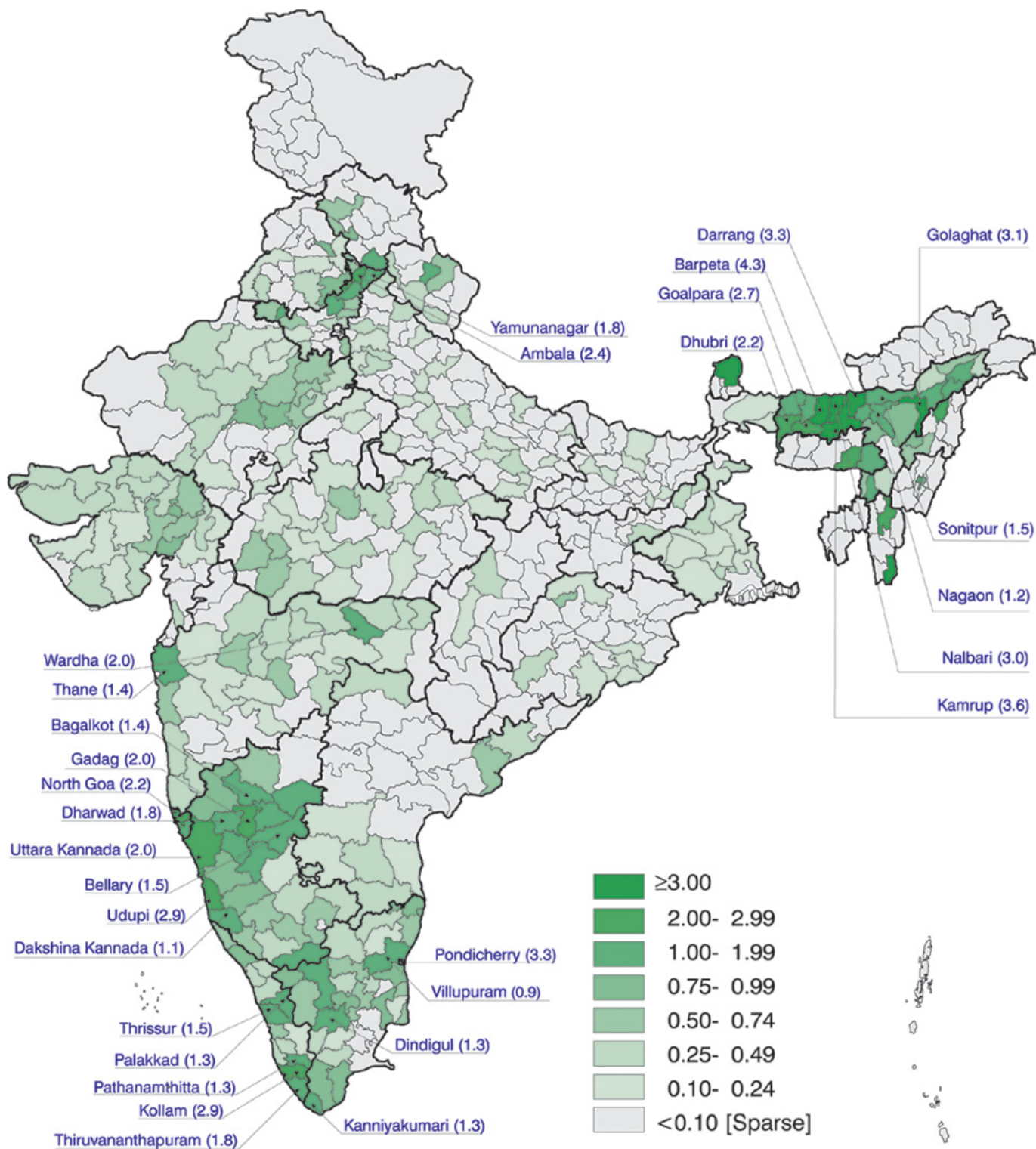
**FIGURE 6.5(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Oropharynx (ICD-10 : C10)– Males**



**FIGURE 6.5(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Oropharynx (ICD-10 : C10)– Males**



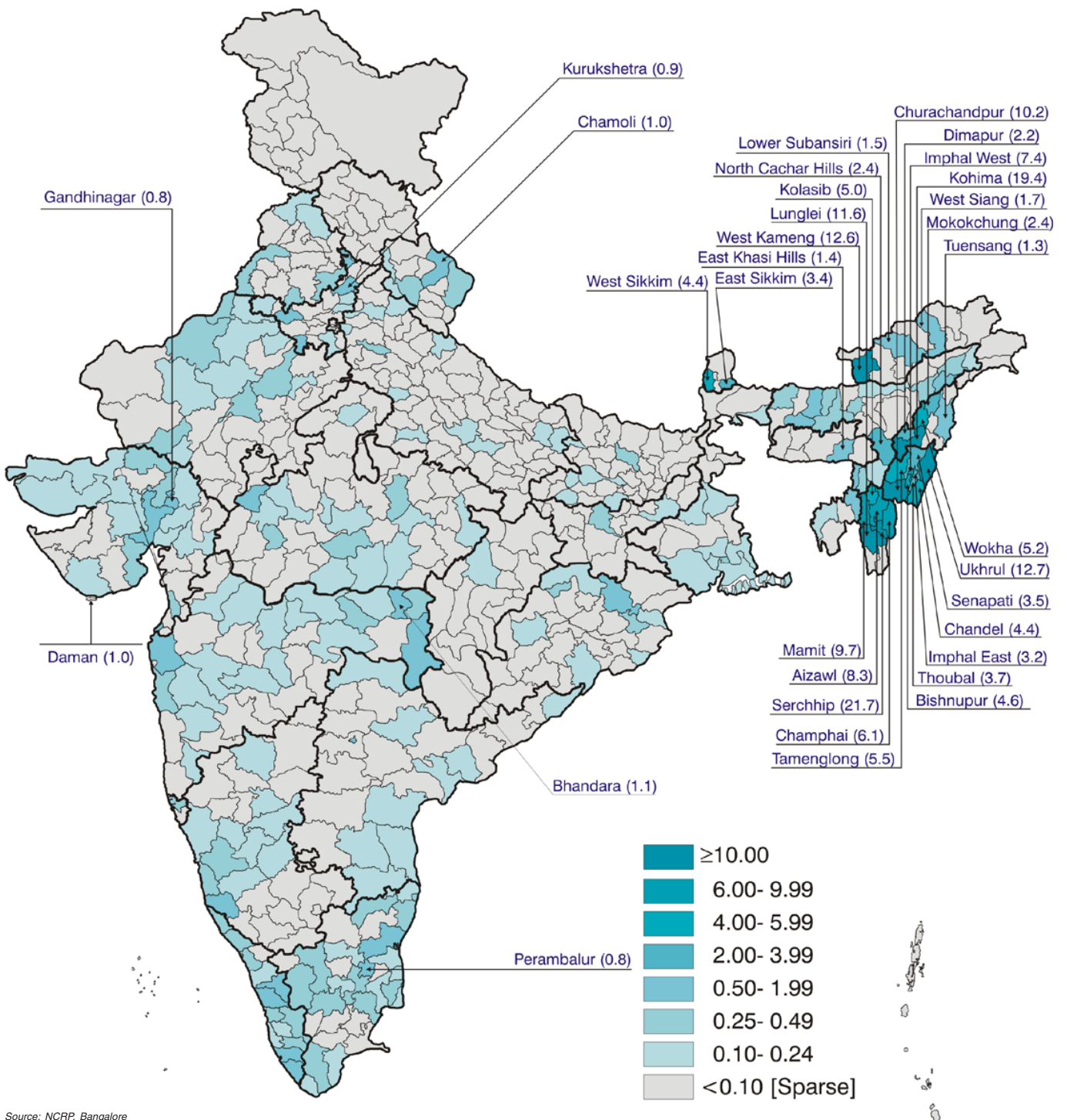
**MAP 6.5 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Oropharynx (ICD-10 : C10) 2001 - 2002 – Males**



## 6.6. NASOPHARYNX (ICD-10 : C11) – MALES

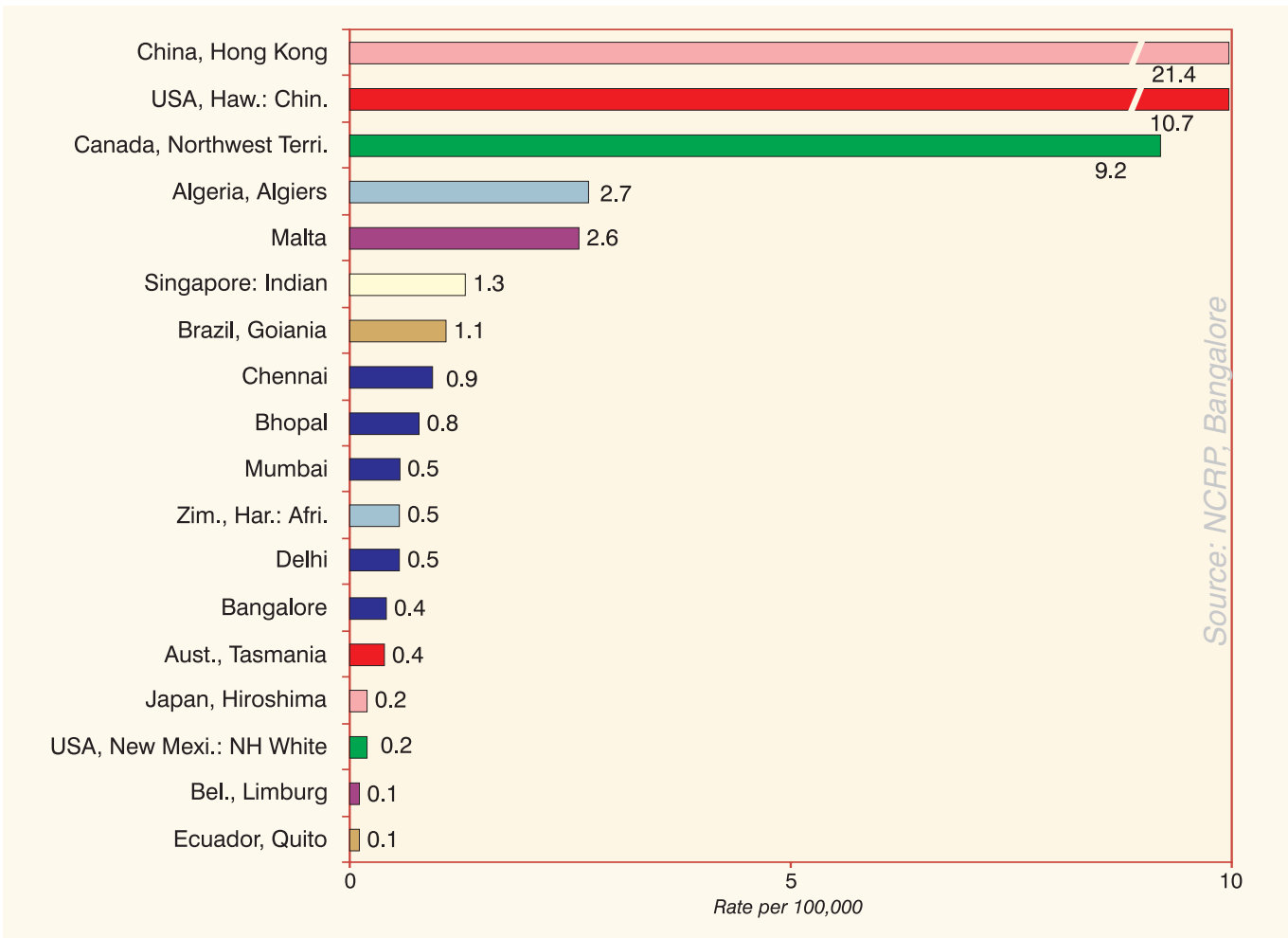
Kohima district in Nagaland State recorded a MAAR of 19.4/100,000, which is close to the highest incidence rate recorded in the world. Imphal West district in Manipur State also recorded a high MAAR of 7.4/100,000. Several other districts in the states of Mizoram and Manipur recorded high MAARs in both males and females but numbers of cancers were less than ten.

**MAP 6.6 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Nasopharynx (ICD-10 : C11) 2001 - 2002 – Males**

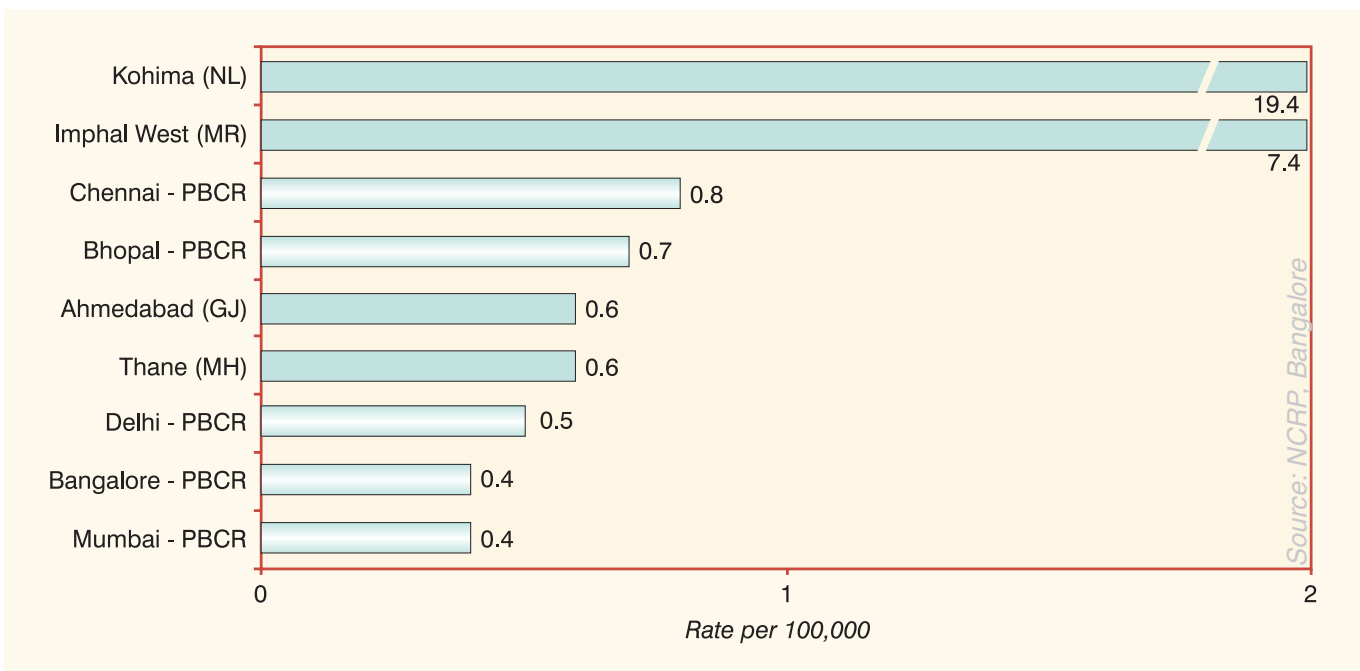


Source: NCRP, Bangalore

**FIGURE 6.6(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Nasopharynx (ICD-10 : C11) – Males**



**FIGURE 6.6(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Nasopharynx (ICD-10 : C11) – Males**

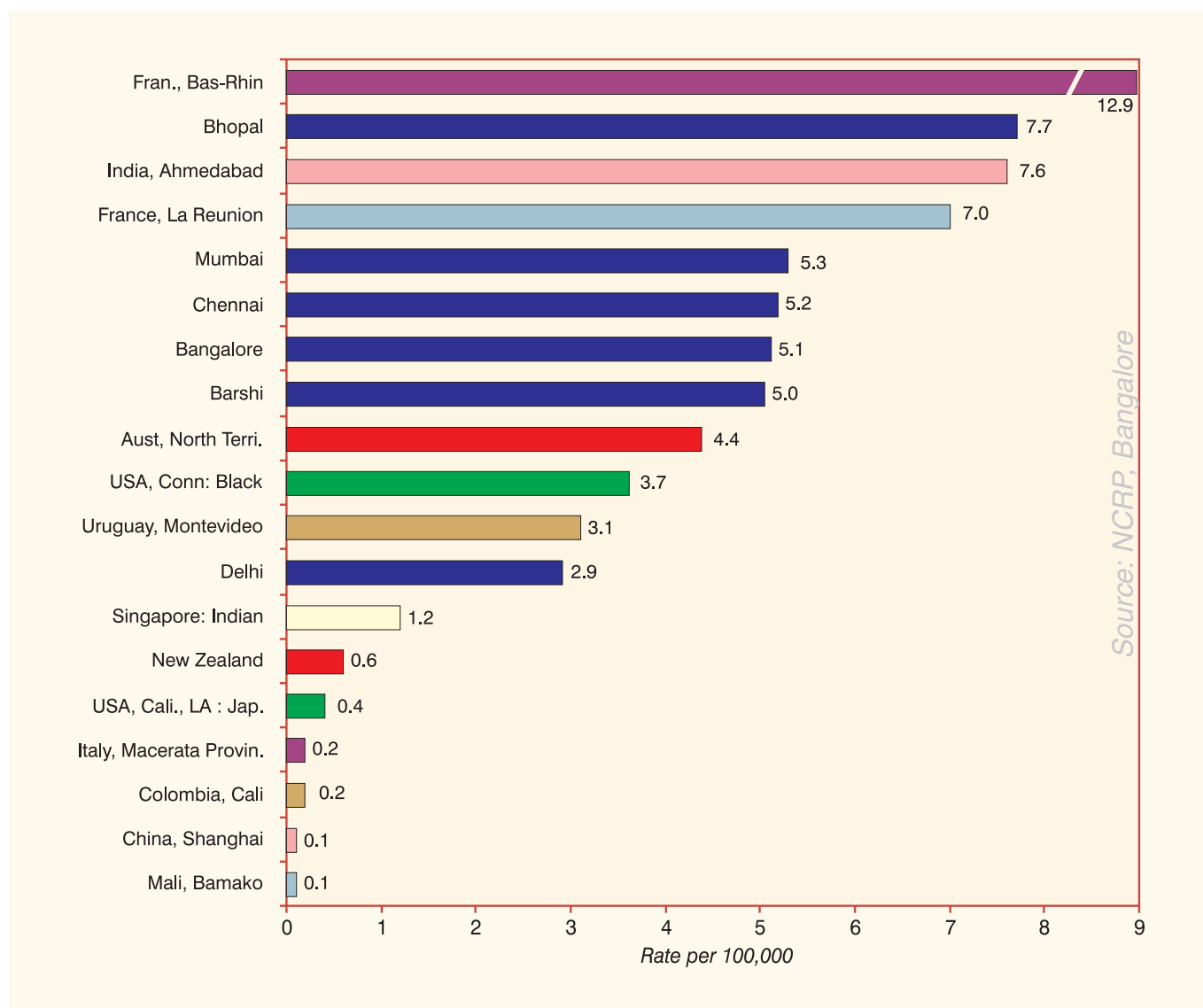




## 6.7. HYPOPHARYNX (ICD-10 : C12-C13) – MALES

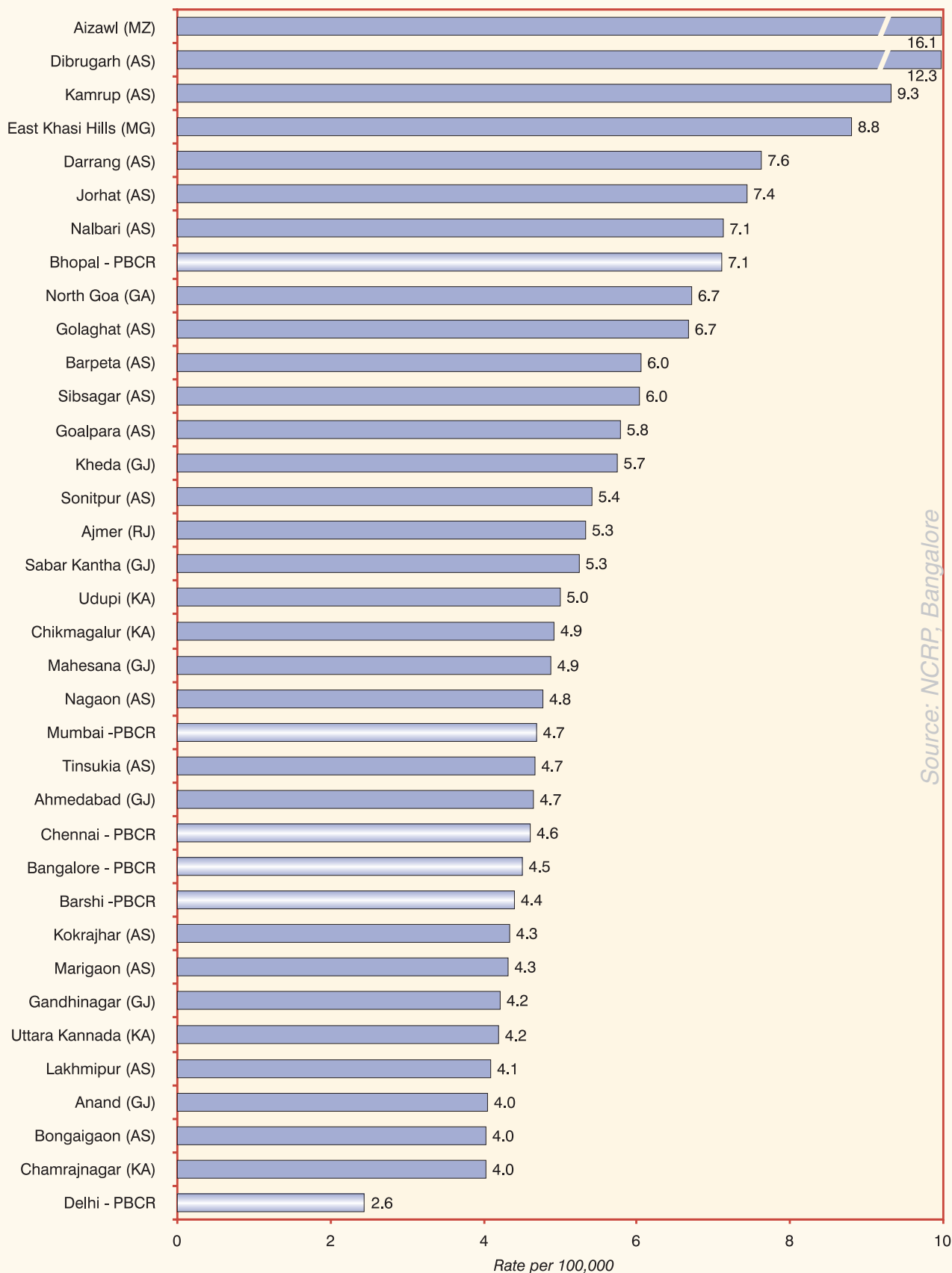
The Bas-Rhin registry in France has reported the highest AAR of 12.9/100,000 (Parkin et al, 2002). Among the PBCRs, the AAR of cancer of the hypopharynx is high in Bhopal and Ahmedabad Urban PBCR [Fig. 6.7(a)]. The bar charts in Figure 6.7(b) show that Aizawl has a higher MAAR than the AAR of Bas-Rhin. Besides, many districts of Assam State (Dibrugarh, Kamrup, Darrang, Jorhat, Nalbari, Golaghat, Barpeta, Sibsagar, Goalpara to name a few) prominently stand out in the leading rates for this site of cancer.

**FIGURE 6.7(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Hypopharynx (ICD-10 : C12 - C13) – Males**

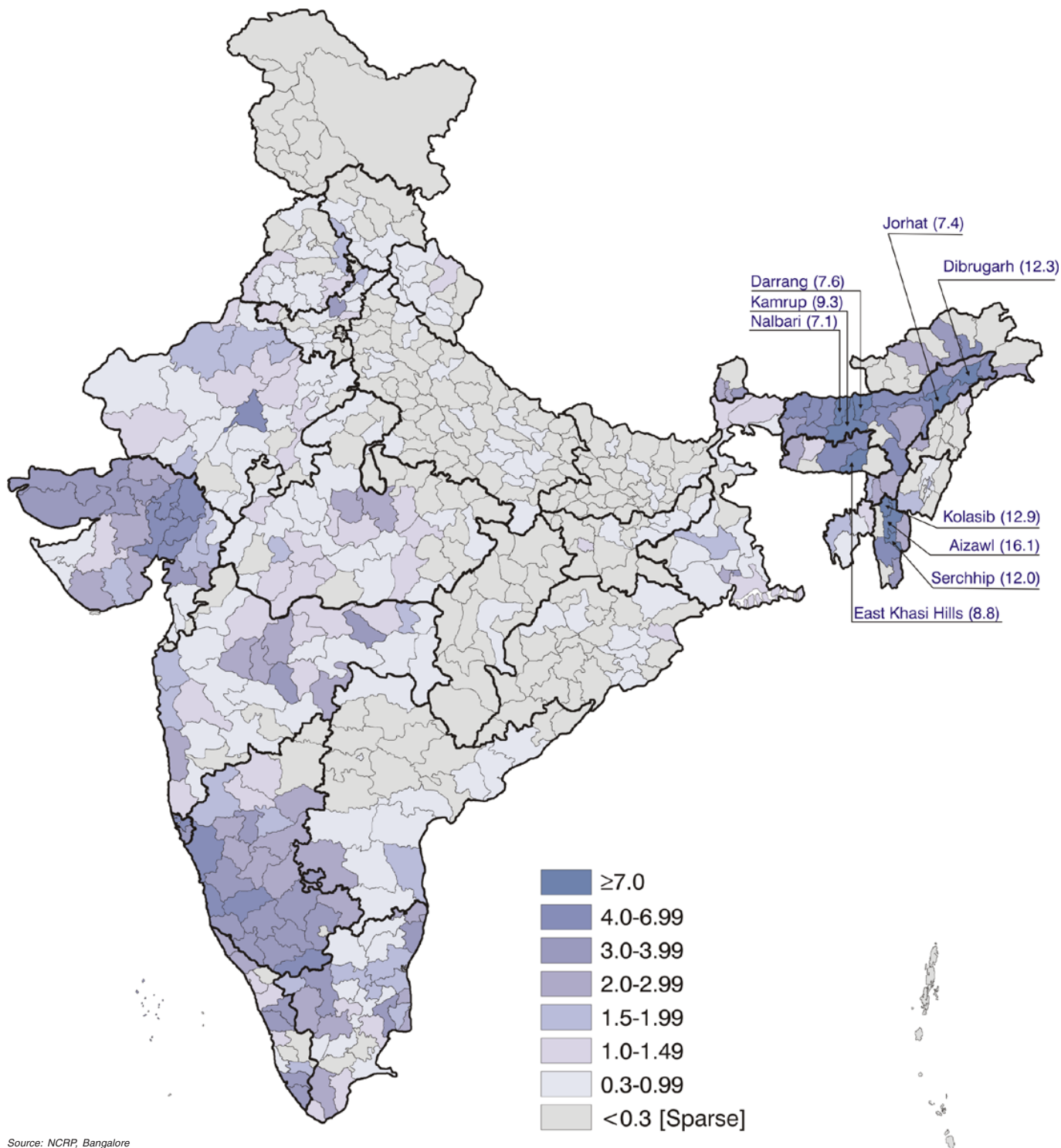




**FIGURE 6.7(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Hypopharynx (ICD-10 : C12 - C13) – Males**



**MAP 6.7 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Hypopharynx (ICD-10 : C12 - C13) 2001 - 2002 – Males**

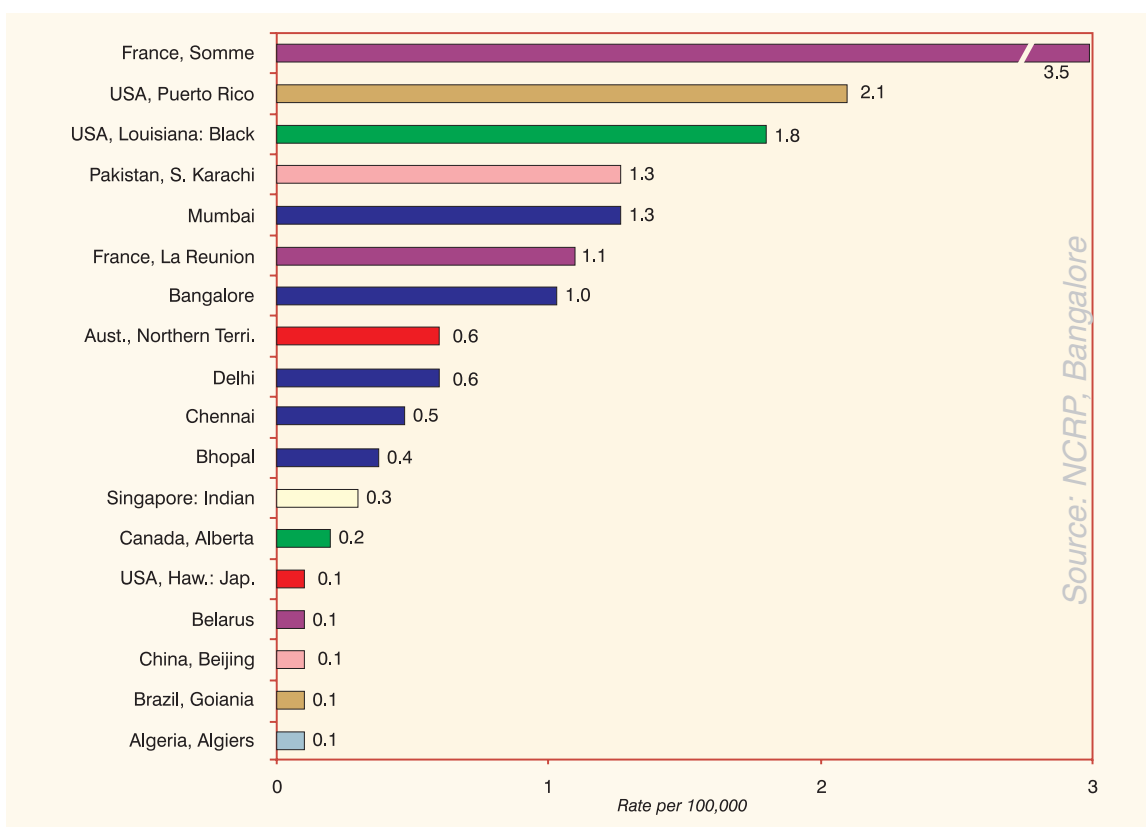


Source: NCRP, Bangalore

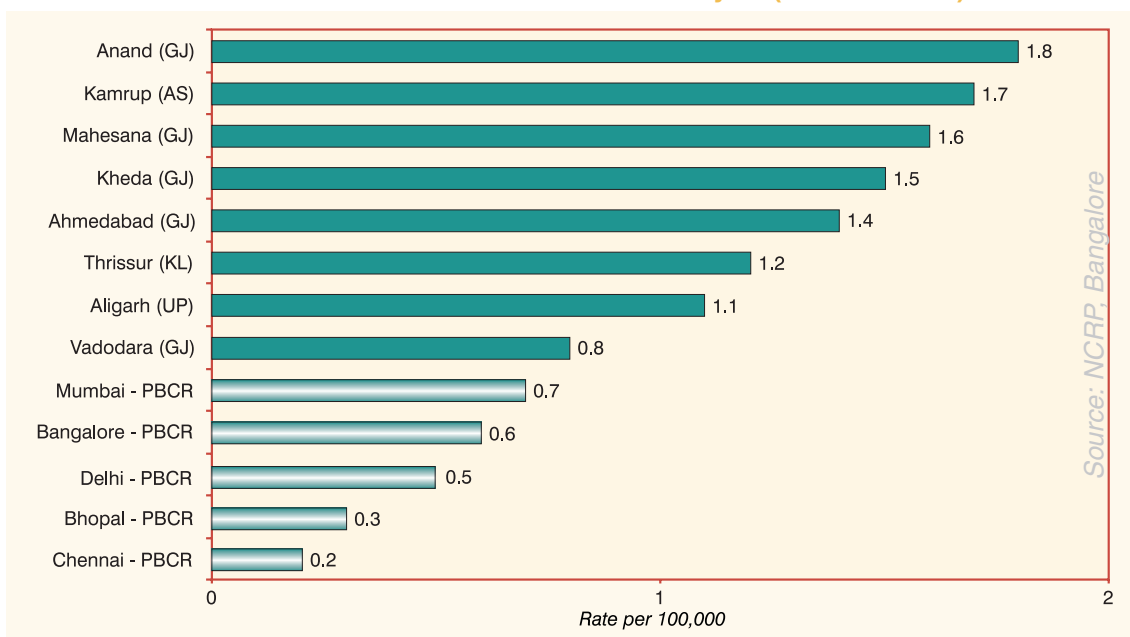
## 6.8. PHARYNX (ICD-10 : C14) – MALES

Of the eight districts that had MAAR higher than the highest MAAR in Mumbai PBCR five were in Gujarat State [Fig. 6.8(b)].

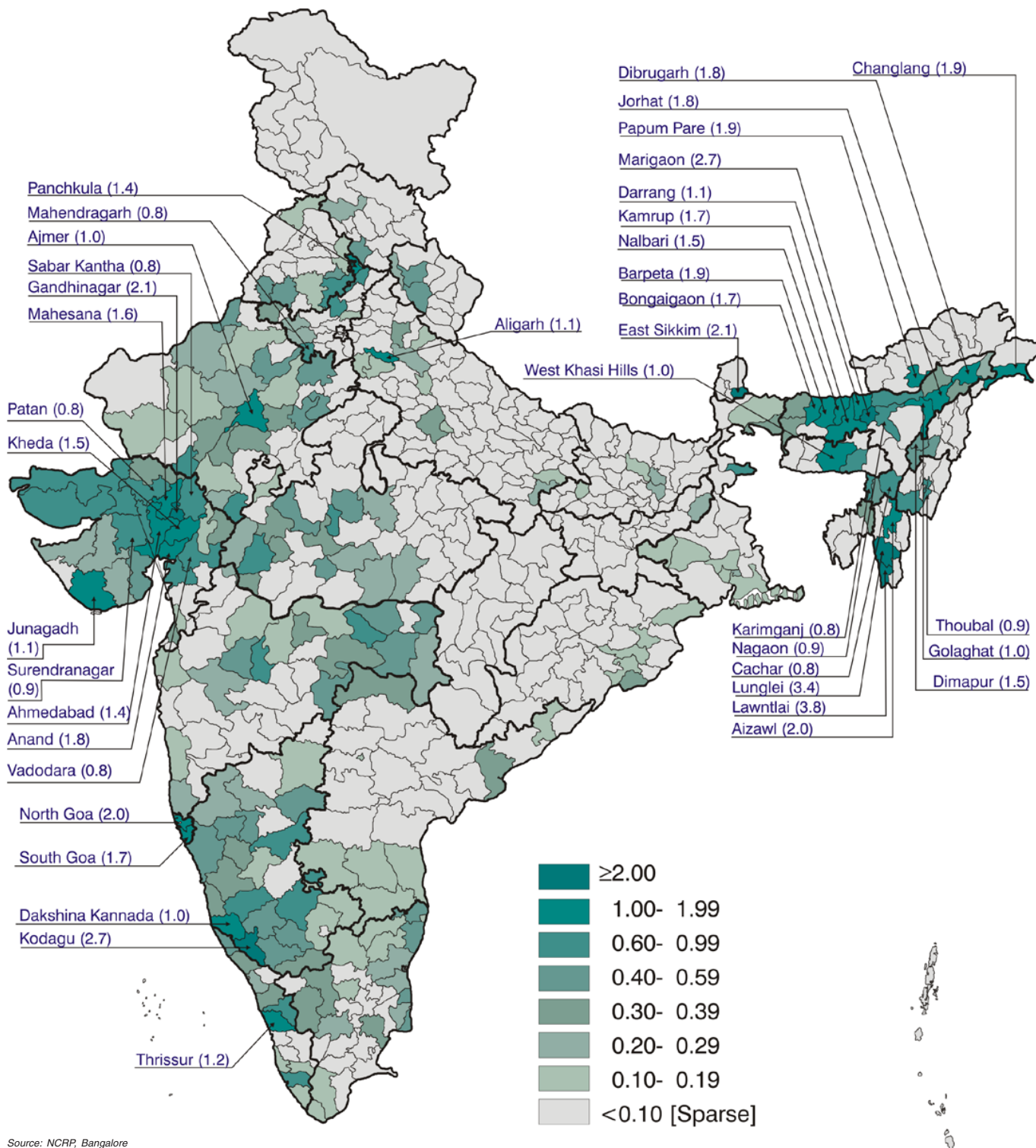
**FIGURE 6.8(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Pharynx (ICD-10 : C14) – Males**



**FIGURE 6.8(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Pharynx (ICD-10 : C14) – Males**



**MAP 6.8 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Pharynx (ICD-10 : C14) 2001 - 2002 – Males**

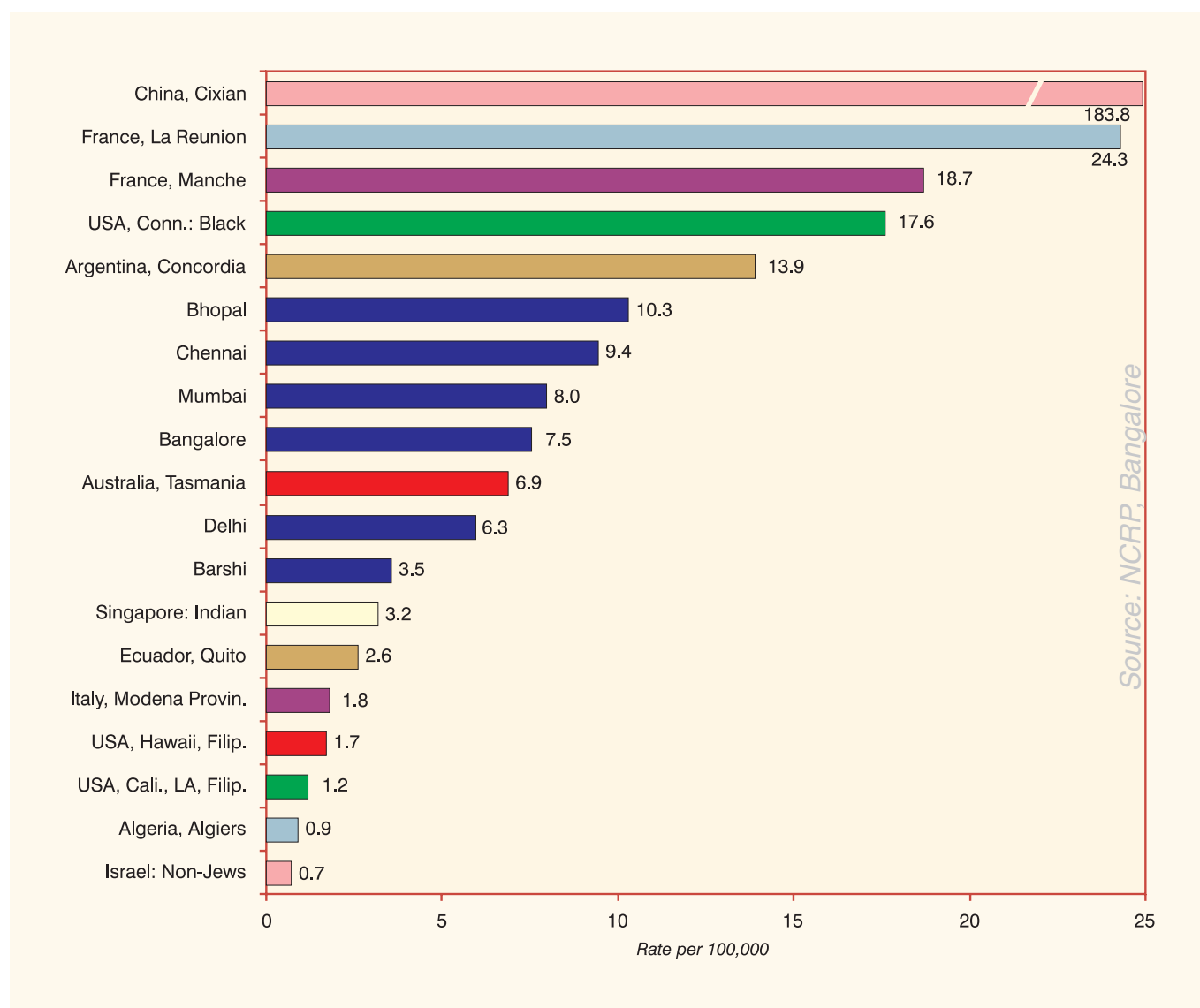


Source: NCRP, Bangalore

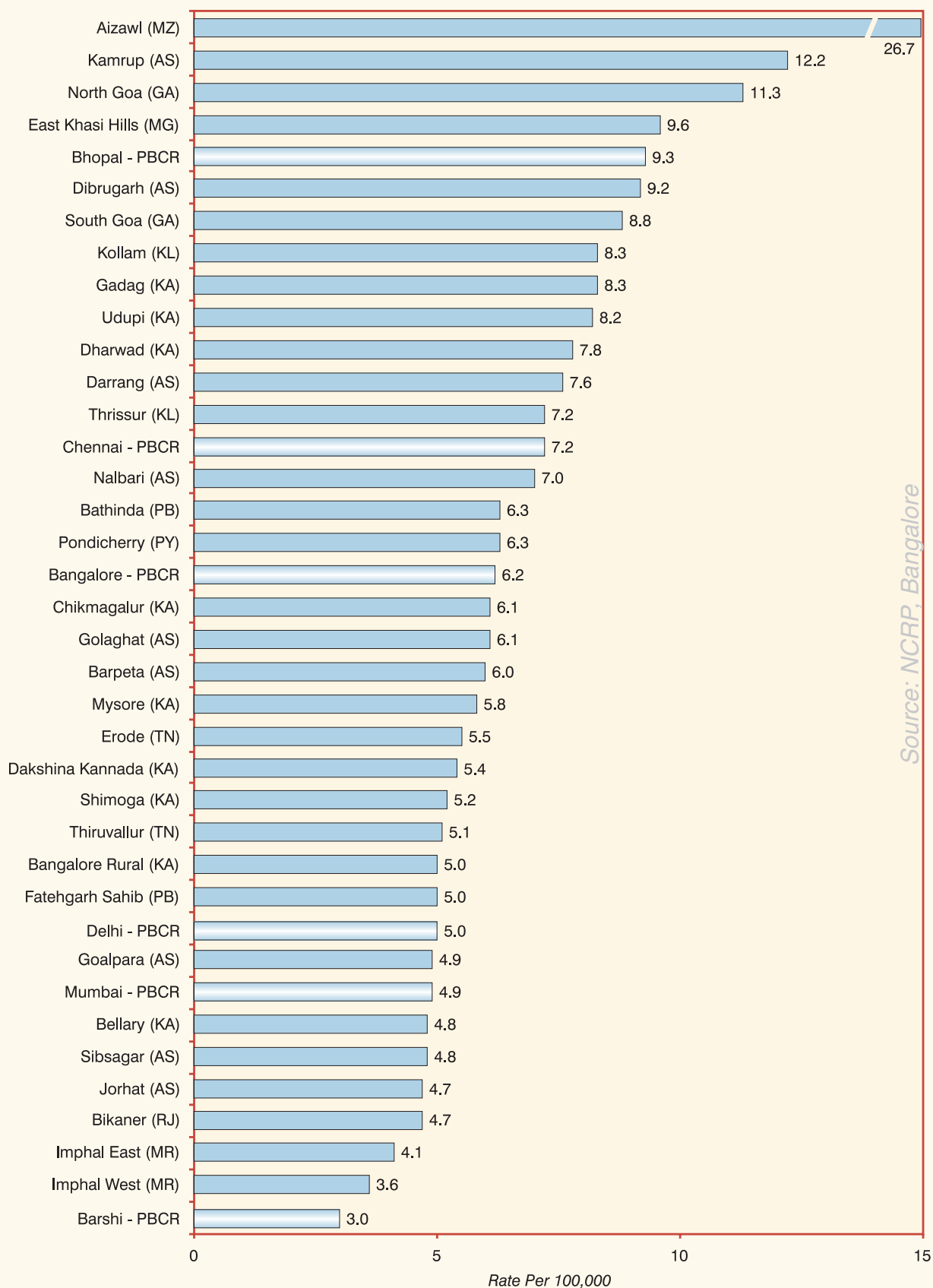
## 6.9. OESOPHAGUS (ICD-10 : C15) – MALES

Other than Cixian in China, La-Reunion in France has the highest AAR of 24.3/100,000 [Fig. 6.9(a)] (Parkin et al, 2002). The urban PBCRs other than Delhi have AARs varying from 7.5 to 10.3/100,000. The district-wise comparison of MAAR [Fig. 6.9(b)] showed that Aizawl has a higher MAAR than the AAR of La-Reunion and several districts especially in Assam and Karnataka States have MAAR comparable with the rates in the urban PBCRs. The districts of North and South Goa also had high MAARs.

**FIGURE 6.9(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Oesophagus (ICD-10 : C15) – Males**

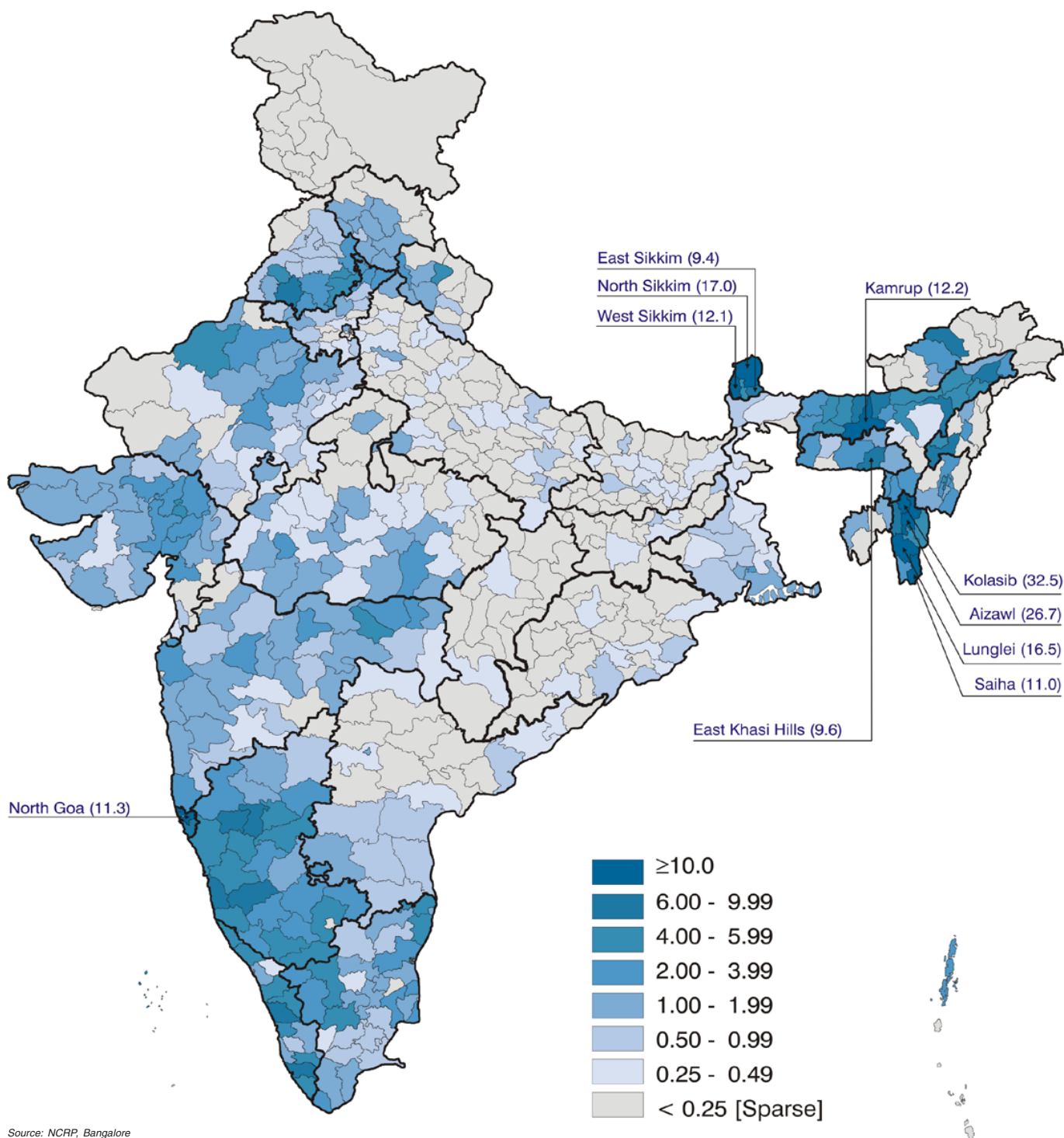


**FIGURE 6.9(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Oesophagus (ICD-10 : C15) – Males**





**MAP 6.9 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Oesophagus (ICD-10 : C15) 2001 - 2002 – Males**

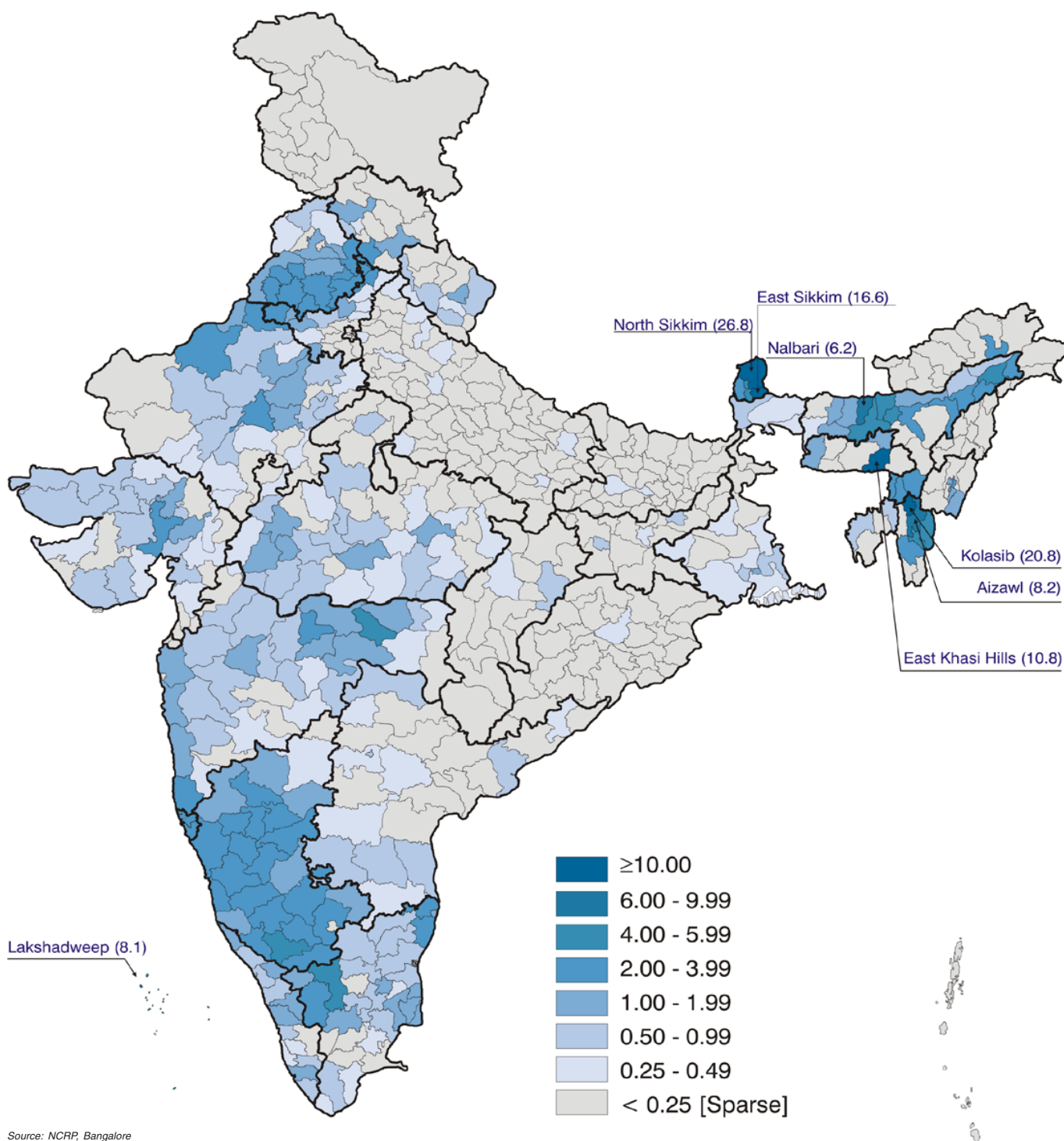


Source: NCRP, Bangalore

## 6.10. OESOPHAGUS (ICD-10 : C15) – FEMALES

Bangalore, Mumbai and Chennai showed similar AARs [Fig. 6.10(a)]. However, the MAAR in East Khasi Hills (10.8) in Meghalaya is at least 54% higher than the AAR of Bangalore. Nalbari, Kamrup, Darrang and Dibrugarh in Assam State had high rates.

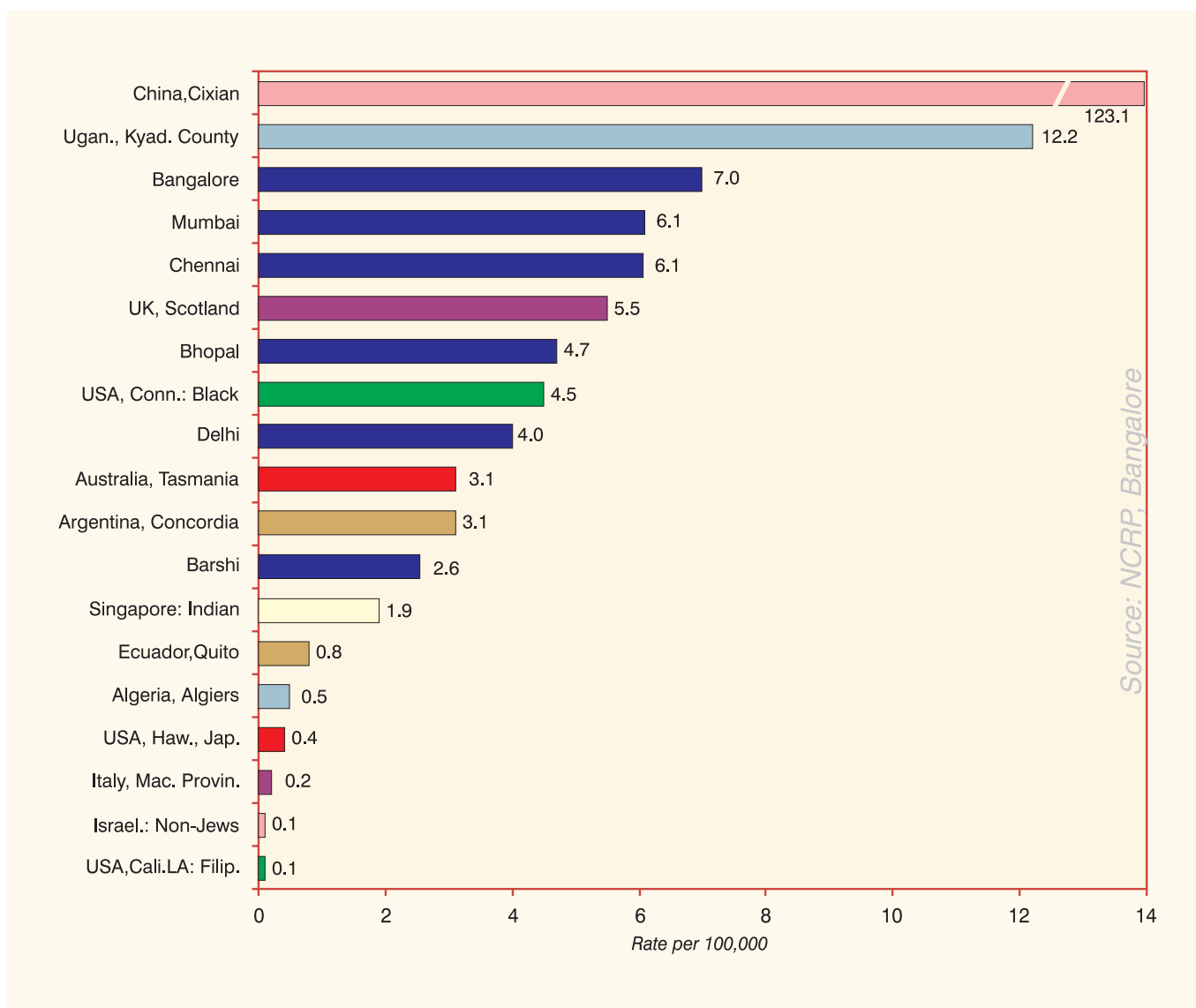
**MAP 6.10 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Oesophagus (ICD-10 : C15) 2001 - 2002 – Females**



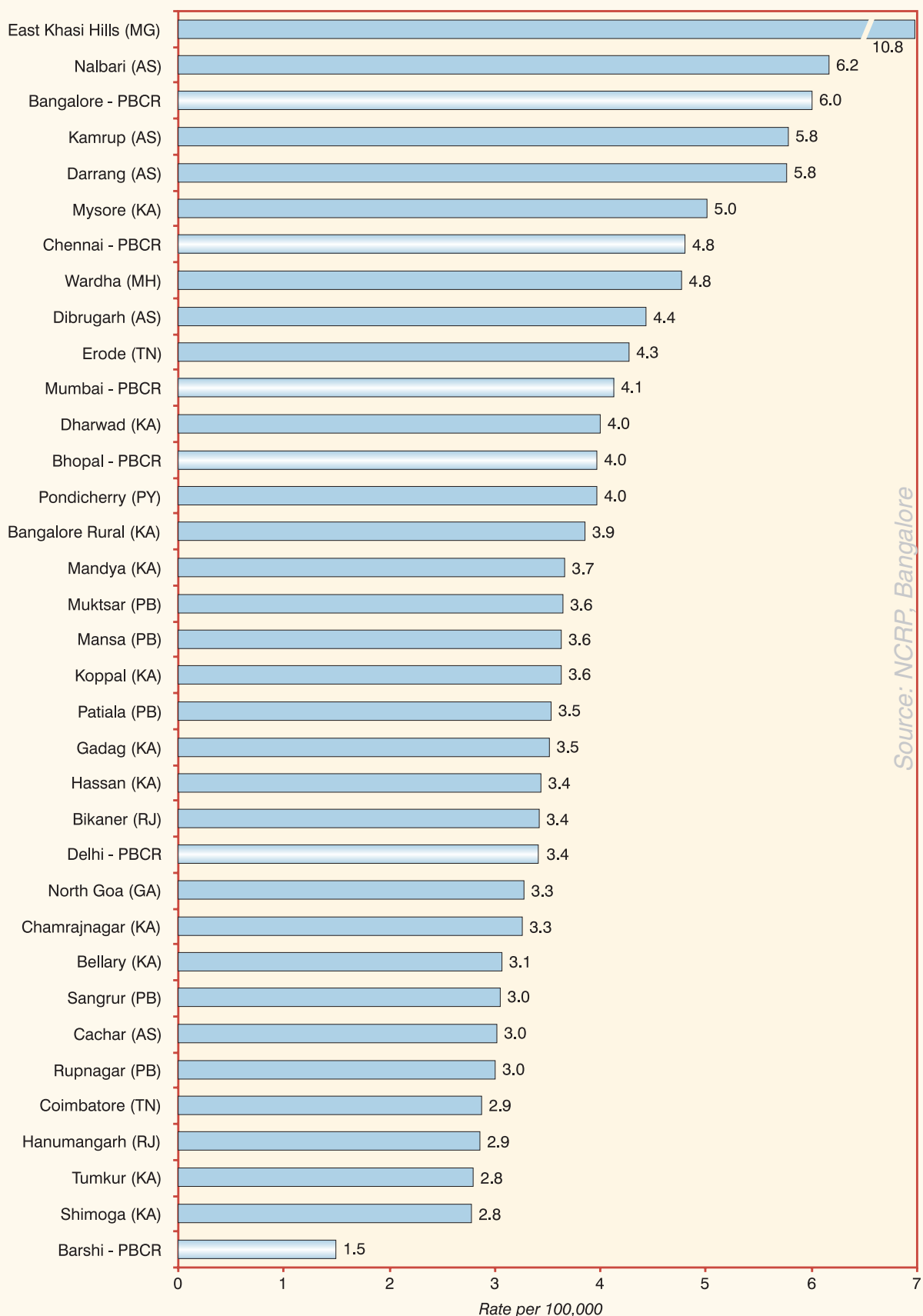
Source: NCRP, Bangalore



**FIGURE 6.10(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Oesophagus (ICD-10 : C15) – Females**



**FIGURE 6.10(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Oesophagus (ICD-10 : C15) – Females**

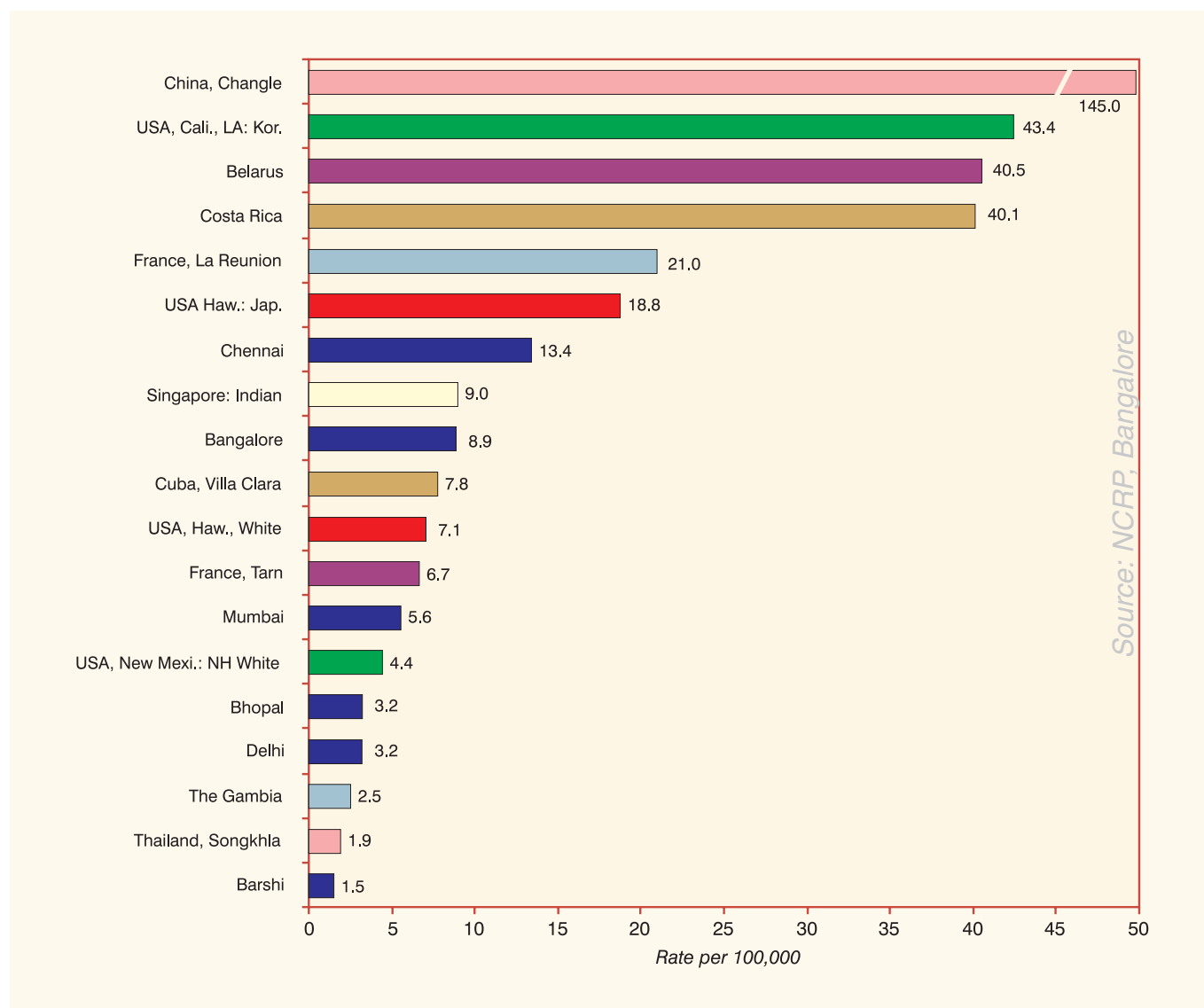


Source: NCRP, Bangalore

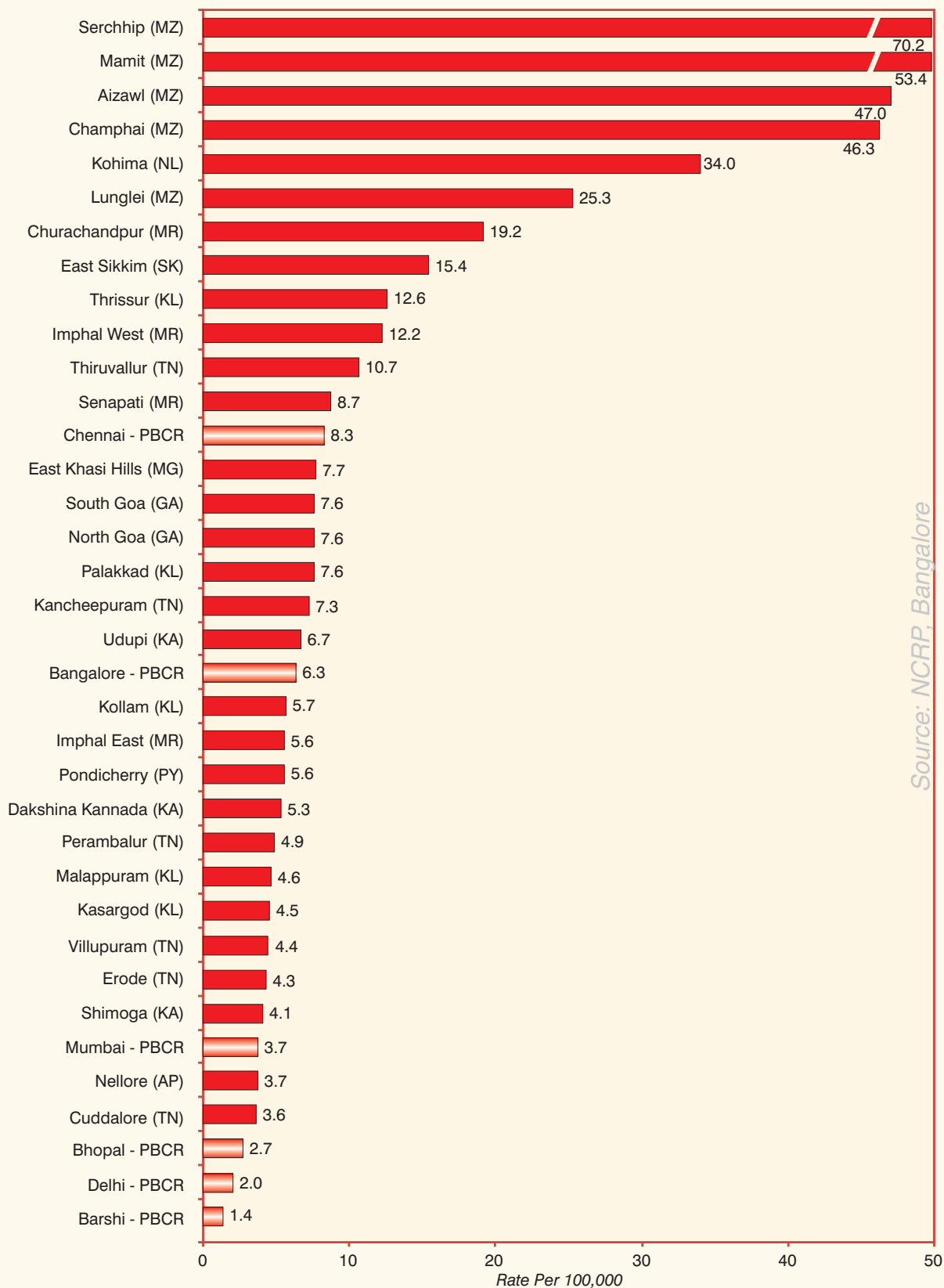
## 6.11. STOMACH (ICD-10 : C16) – MALES

Among males Chennai and Bangalore PBCRs have had cancer stomach as the leading site of cancer since the commencement of the NCRP in 1982. But the AARs in these urban areas have been much lower than that seen in Japan or in other high incidence areas of the world [Fig. 6.11(a)]. The districtwise comparison of MAARs with that of Chennai and Bangalore showed that the district of Serchhip in Mizoram State had eight and a half times higher rate of stomach cancer than that of Chennai [Fig. 6.11(b)]. Several districts in the North Eastern states of Mizoram, Nagaland, Manipur and Sikkim had MAARs equivalent to the AARs of high incidence regions of the world.

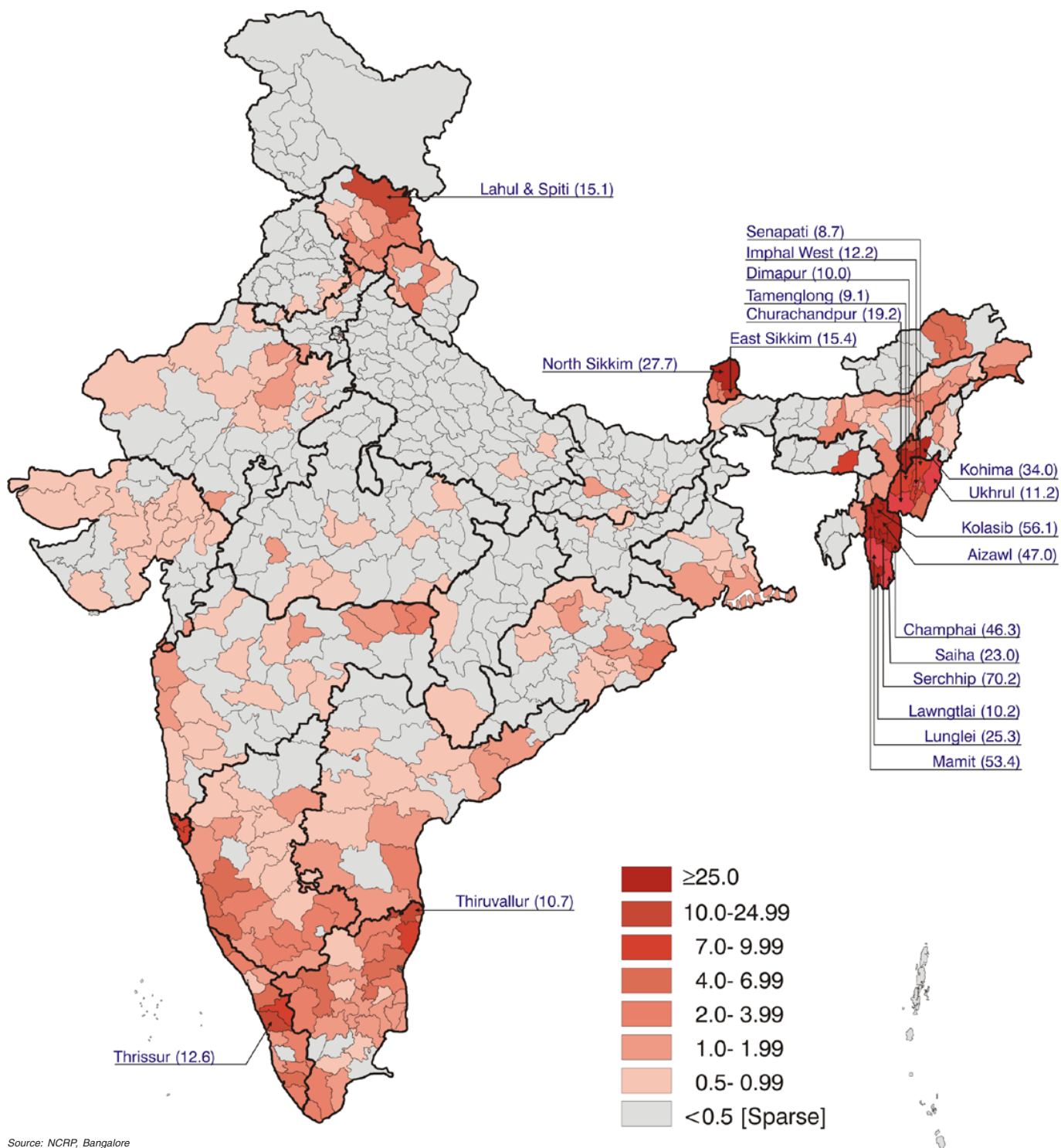
**FIGURE 6.11(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Stomach (ICD-10 : C16) – Males**



**FIGURE 6.11 (b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Stomach (ICD-10 : C16) – Males**



**MAP 6.11 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Stomach (ICD-10 : C16) 2001 - 2002 – Males**

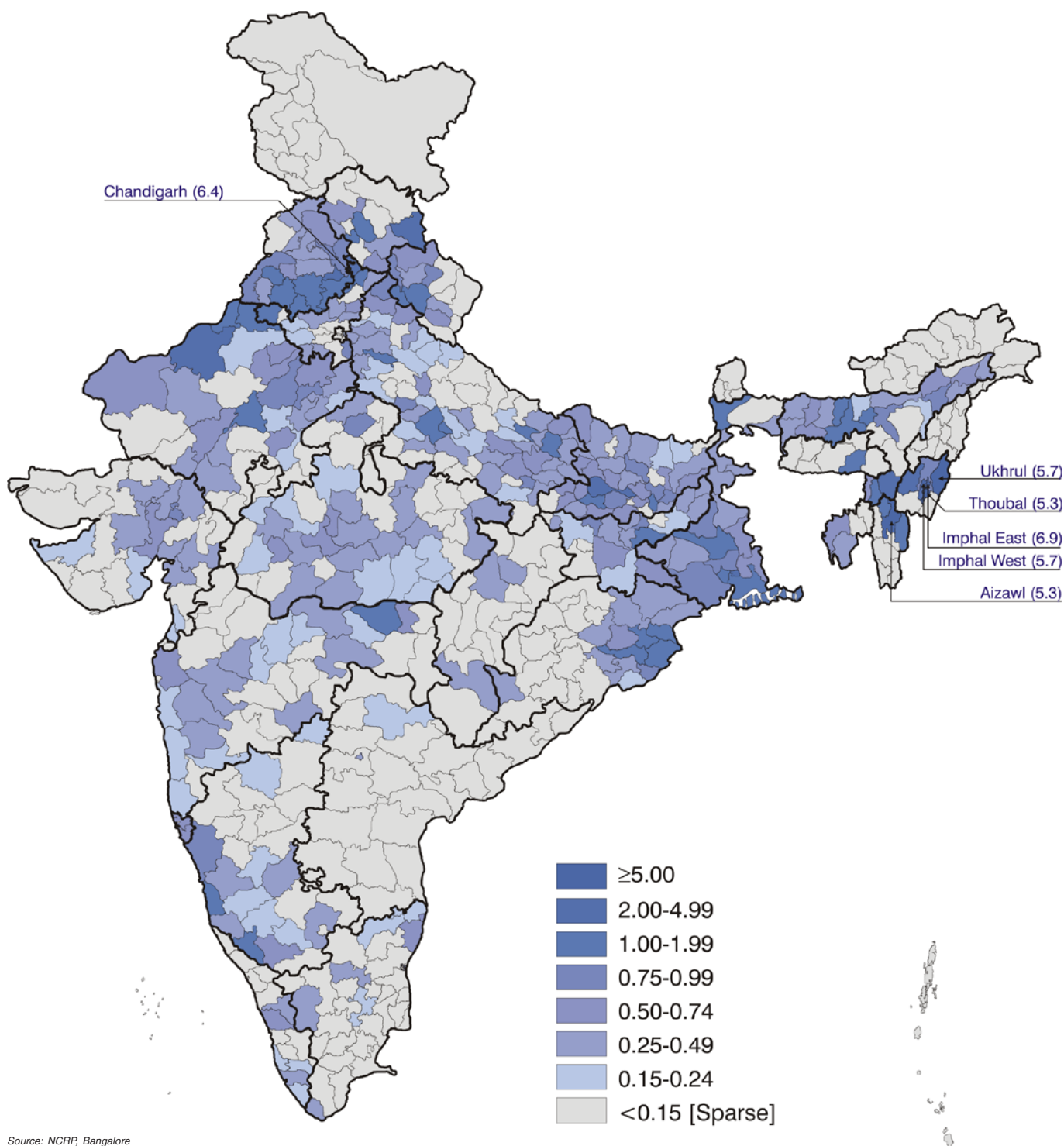


Source: NCRP, Bangalore

## 6.12. GALL BLADDER (ICD-10 : C23-C24) - FEMALES

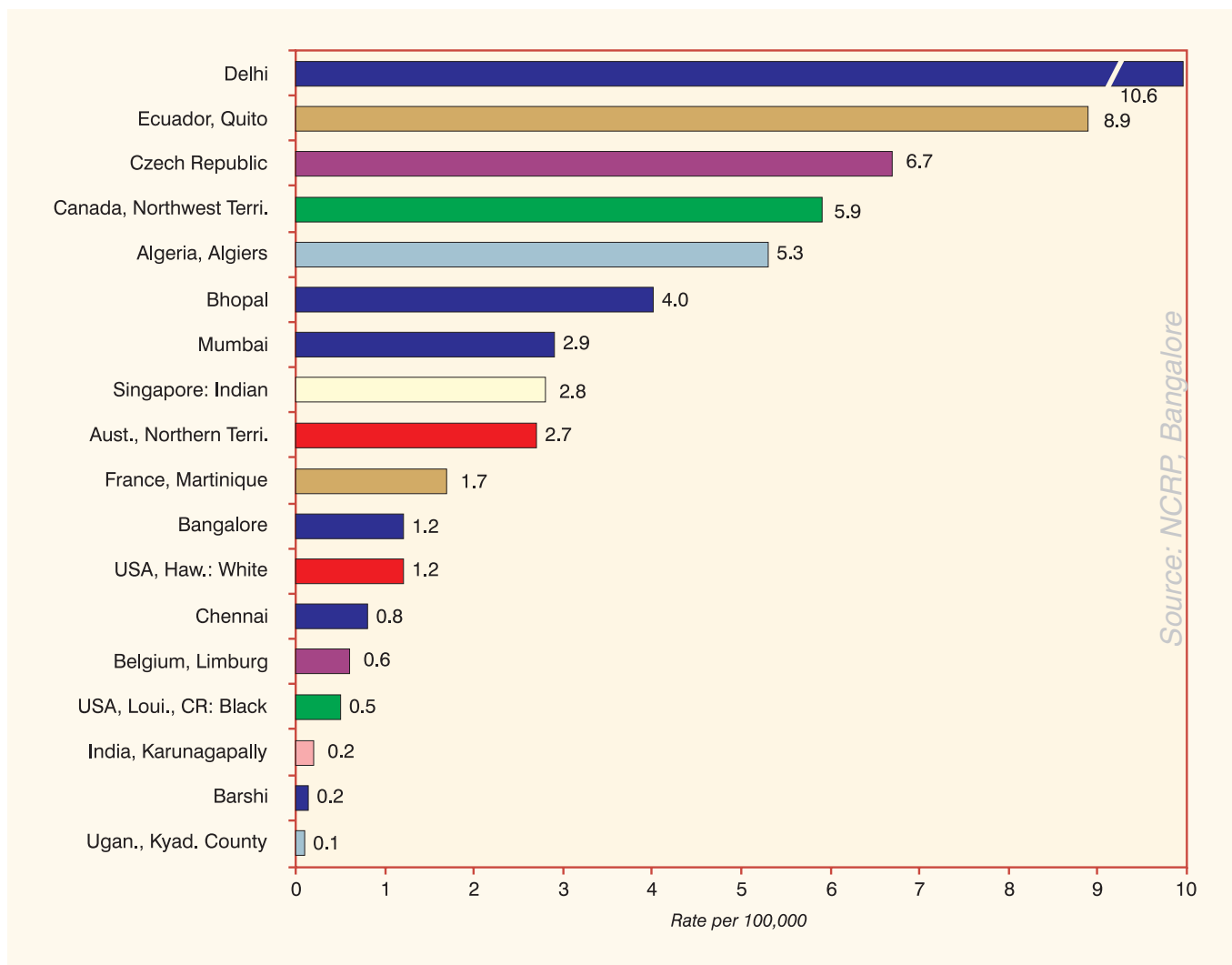
Delhi females show the highest incidence rate (AAR: 10.6/100,000) of gall bladder cancer in the world [Fig. 6.12(a)] (Parkin et al, 2002). However, the bar charts of district-wise comparison showed that Imphal East and West districts of Mizoram State and the Union Territory of Chandigarh had comparable MAAR with that of Delhi [Fig. 6.12(b)].

**MAP 6.12 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Gall Bladder (ICD-10 : C23 - C24) 2001 - 2002 – Females**

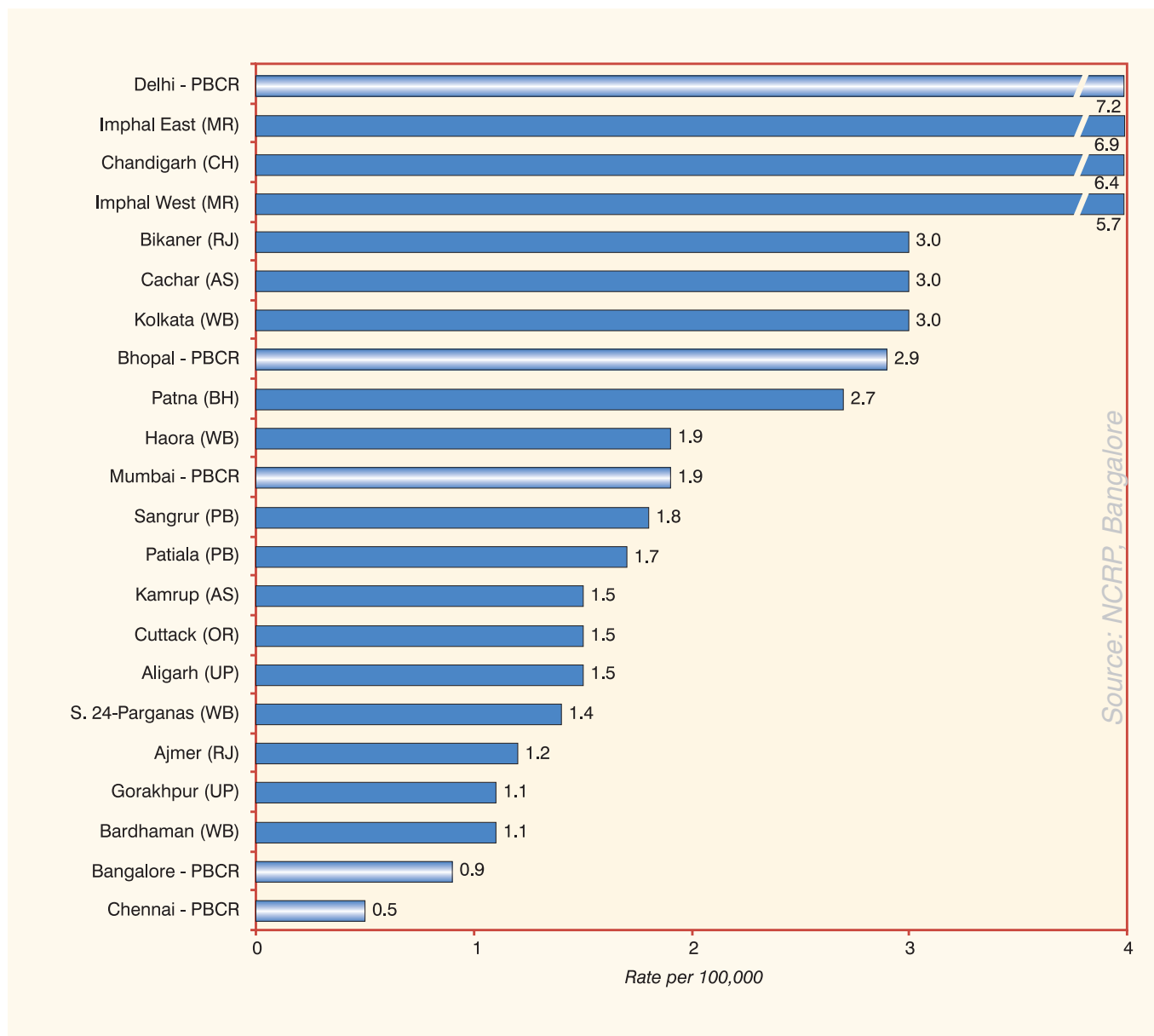


Source: NCRP, Bangalore

**FIGURE 6.12(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Gall Bladder (ICD-10 : C23 - C24) – Females**



**FIGURE 6.12(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Gall Bladder (ICD-10 : C23 - C24) – Females**

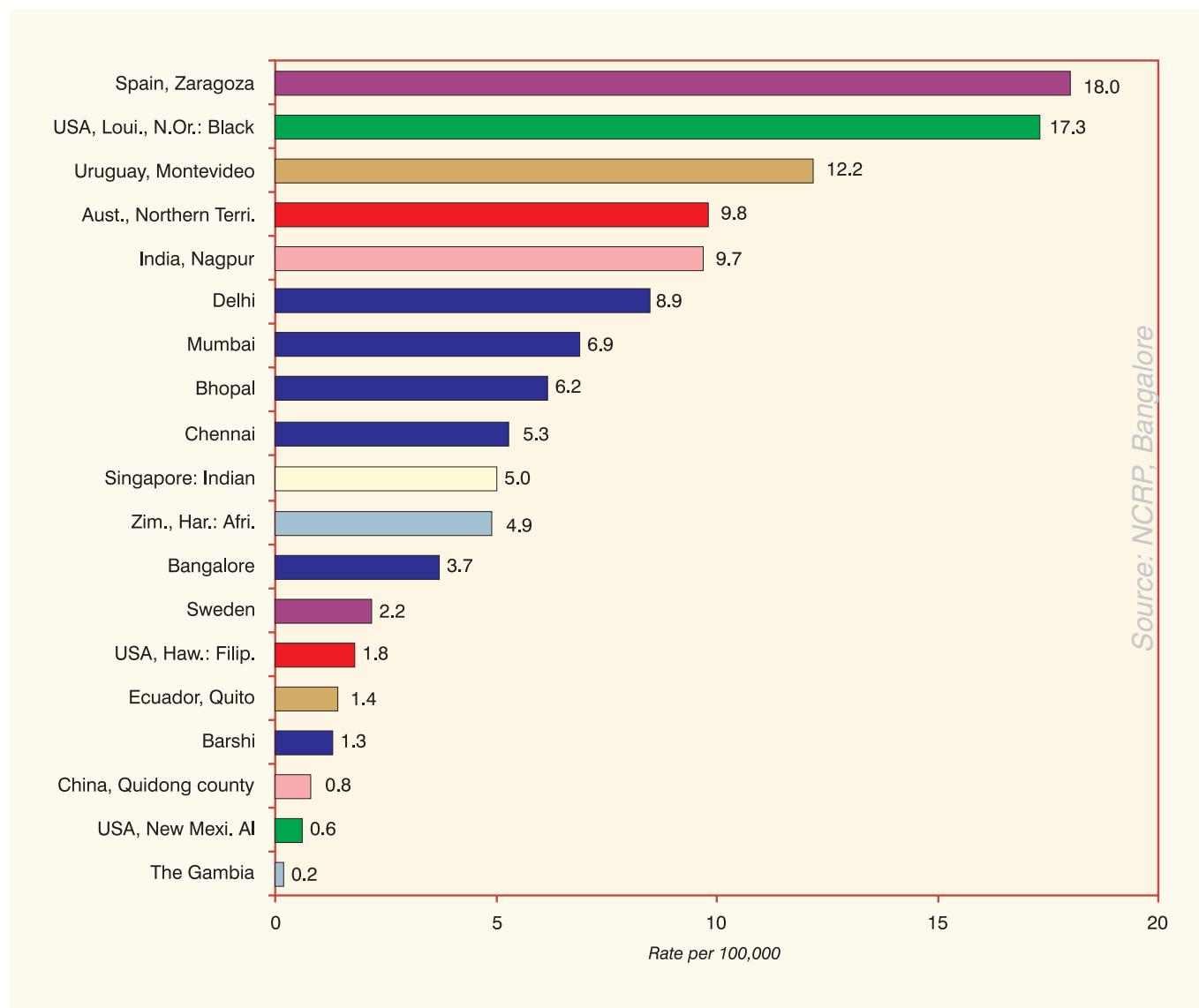




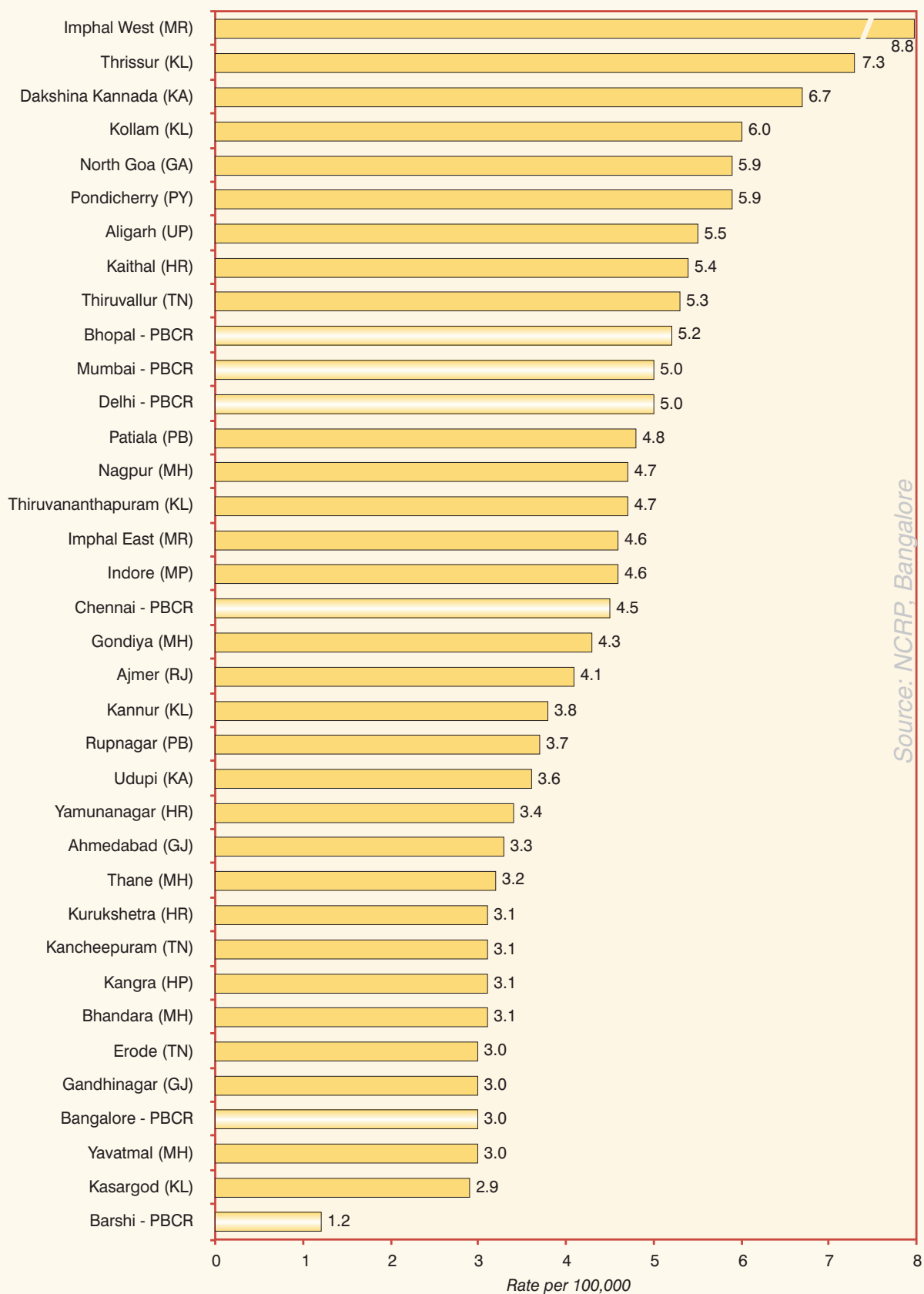
## 6.13. LARYNX (ICD-10 : C32) – MALES

Among the PBCRs in India Nagpur registry shows a high AAR of 9.7/100,000 [Fig. 6.13(a)]. The rates (AARs or MAARs) in three urban PBCRs at Delhi, Bhopal and Mumbai were comparable [Fig. 6.13(b)]. The district-wise comparison showed that at least nine districts had comparable rates with these three urban PBCRs.

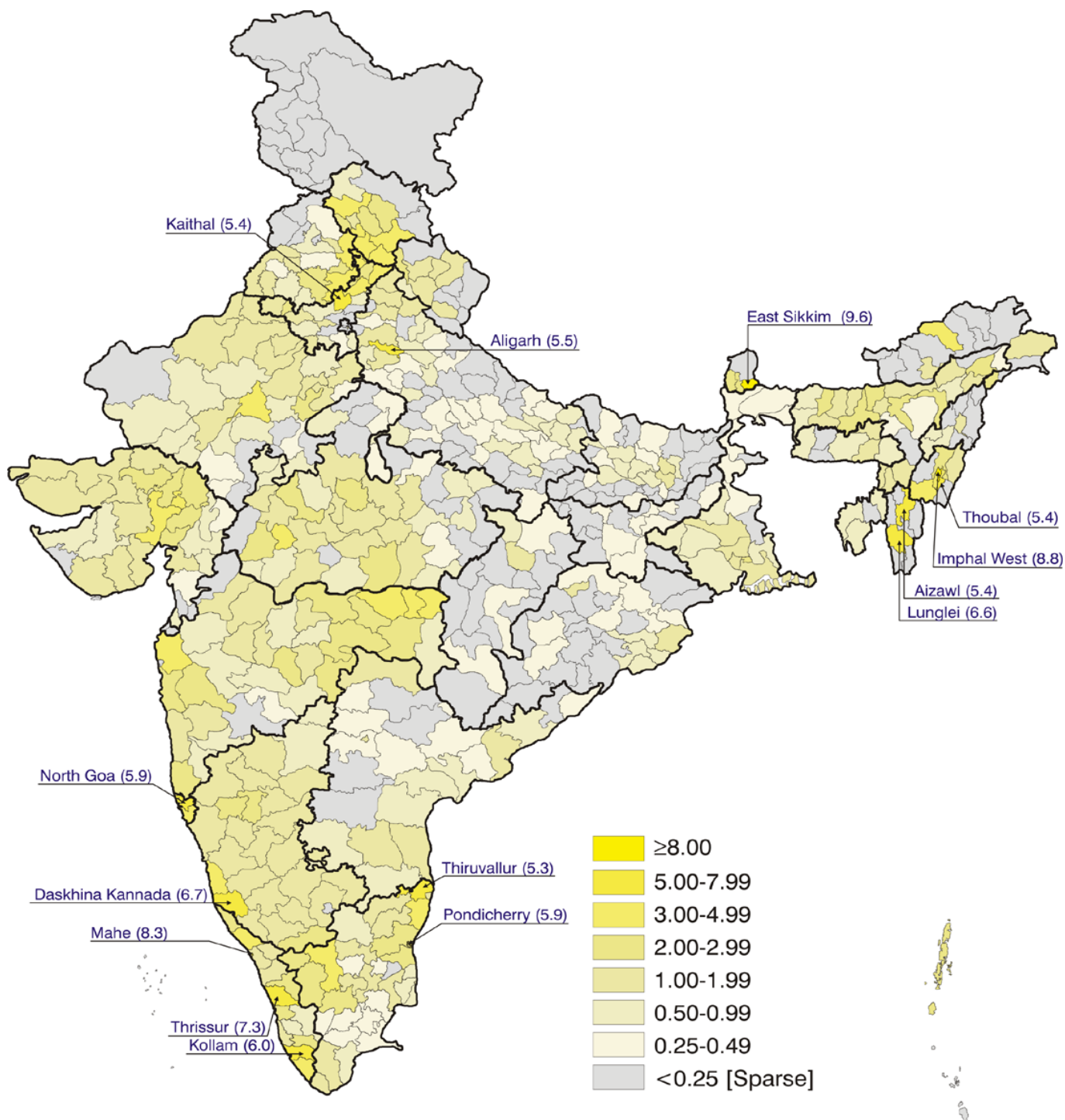
**FIGURE 6.13(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Larynx (ICD-10 : C32) – Males**



**FIGURE 6.13(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Larynx (ICD-10 : C32) – Males**



**MAP 6.13 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000  
Larynx (ICD-10 : C32) 2001 - 2002 – Males**

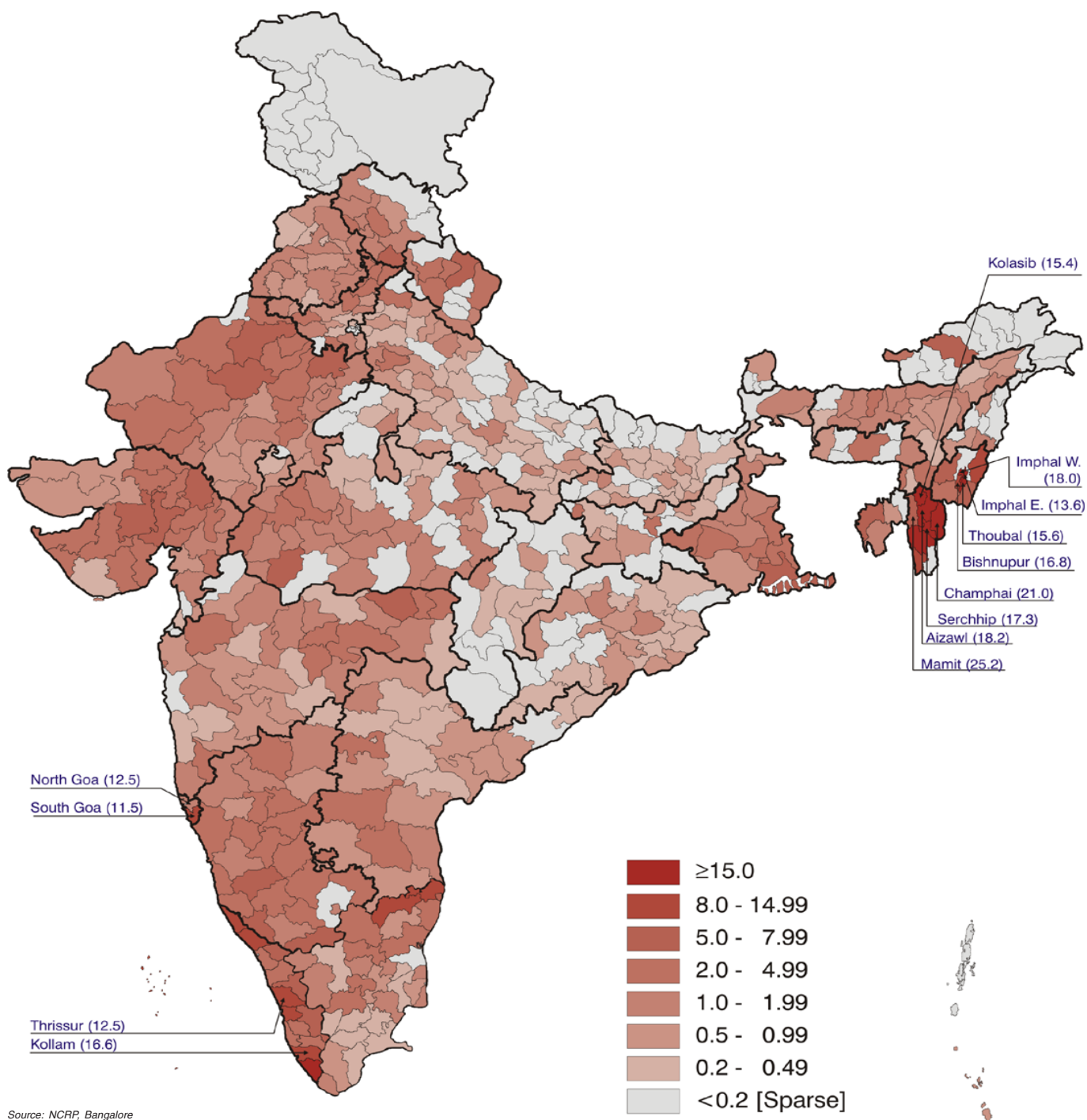


Source: NCRP, Bangalore

## 6.14. LUNG (ICD-10 : C33-C34) – MALES

The incidence rates of lung cancer in the PBCRs in India are at least as of now much lower than the registries elsewhere in the world with the highest rates [Fig. 6.14(a)]. However, the district-wise bar charts revealed that Aizawl

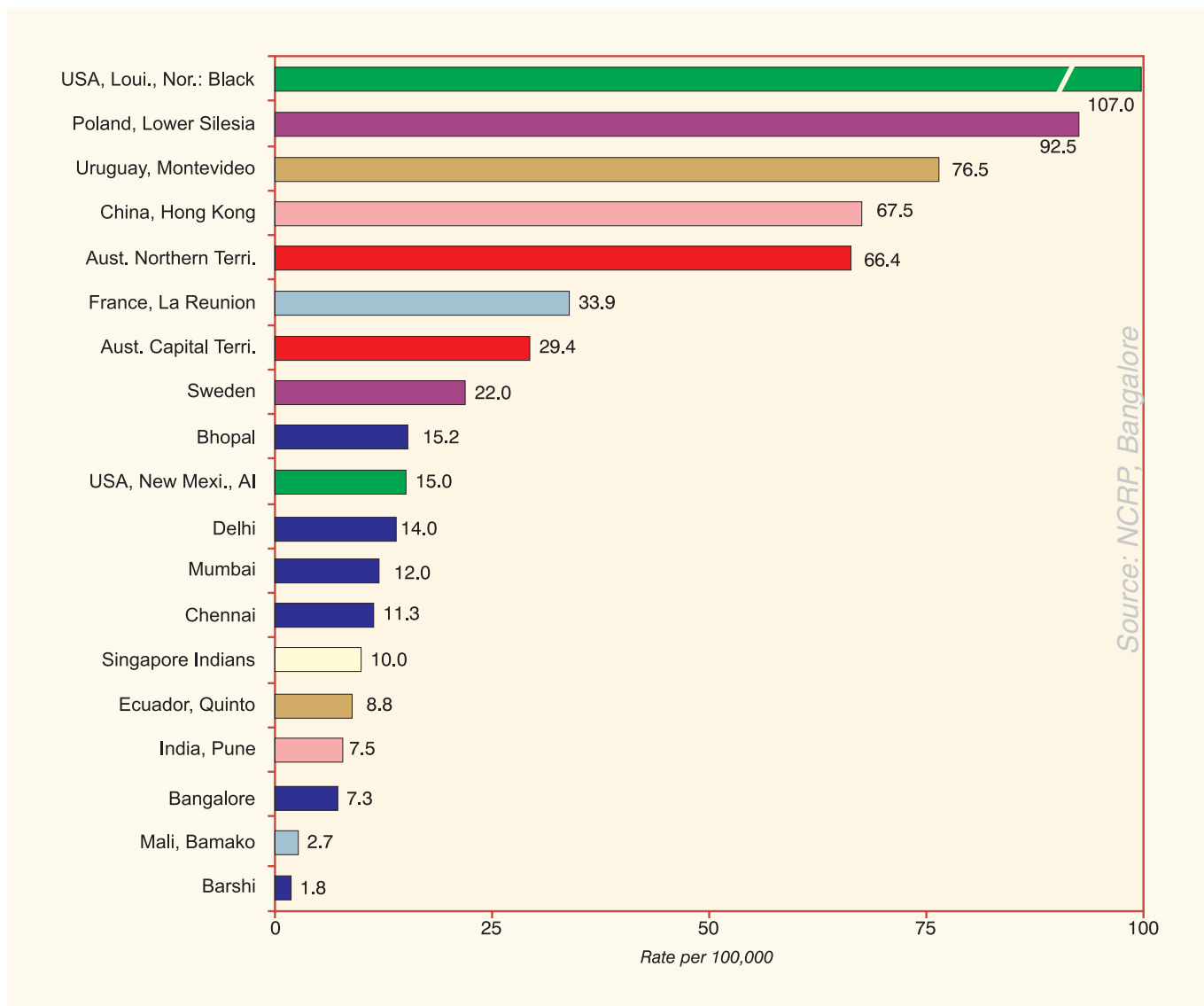
**MAP 6.14 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Lung (ICD-10 : C33 - C34) 2001 - 2002 – Males**



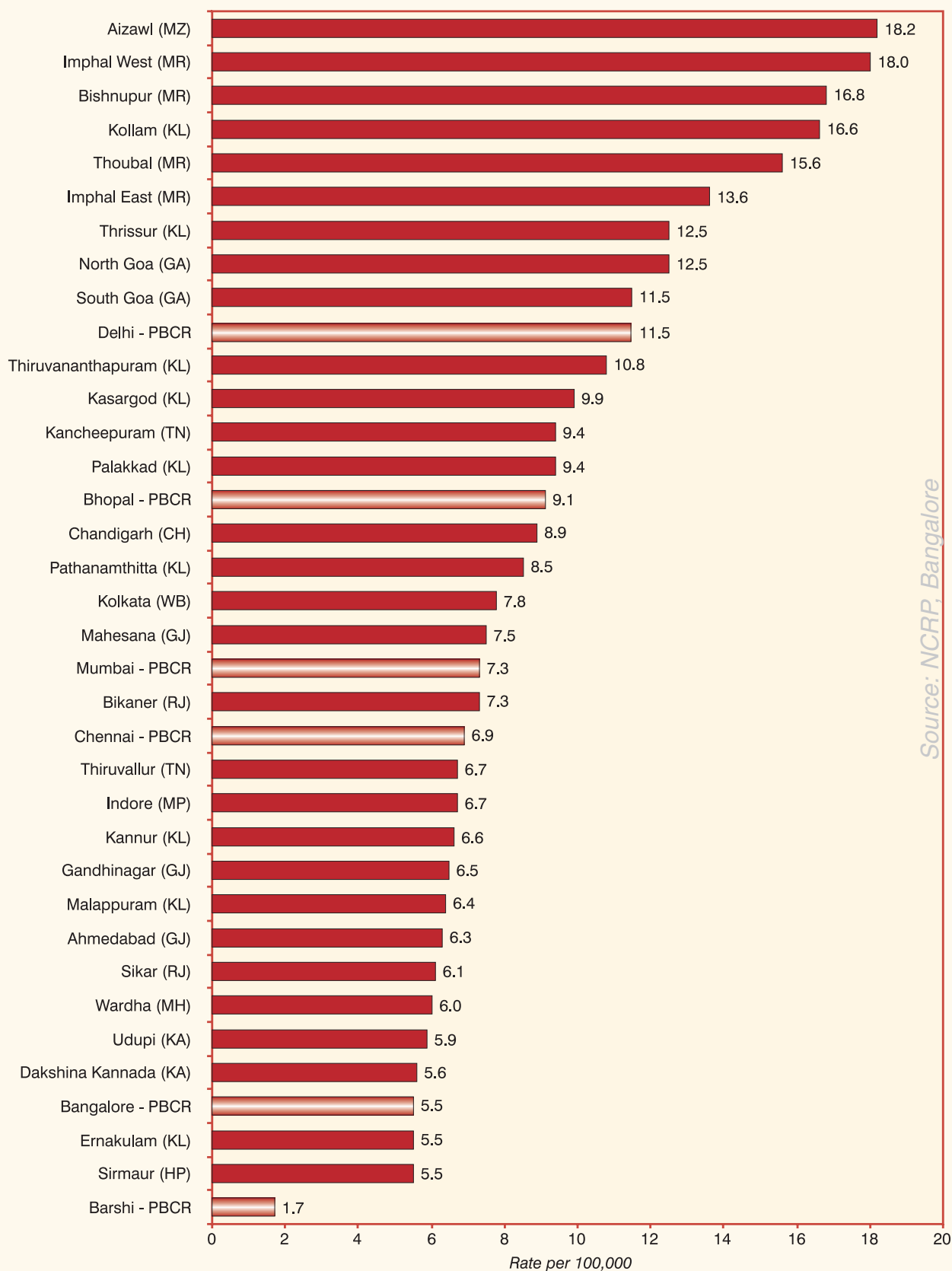
Source: NCRP, Bangalore

in Mizoram State and Imphal West in Manipur State, had 1½ times the MAAR of the highest urban PBCR - Delhi. Further at least nine other districts had MAARs higher or comparable with that of Delhi [Fig. 6.14(b)].

**FIGURE 6.14(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Lung (ICD-10 : C33 - C34) – Males**



**FIGURE 6.14(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Lung (ICD-10 : C33 - C34) – Males**

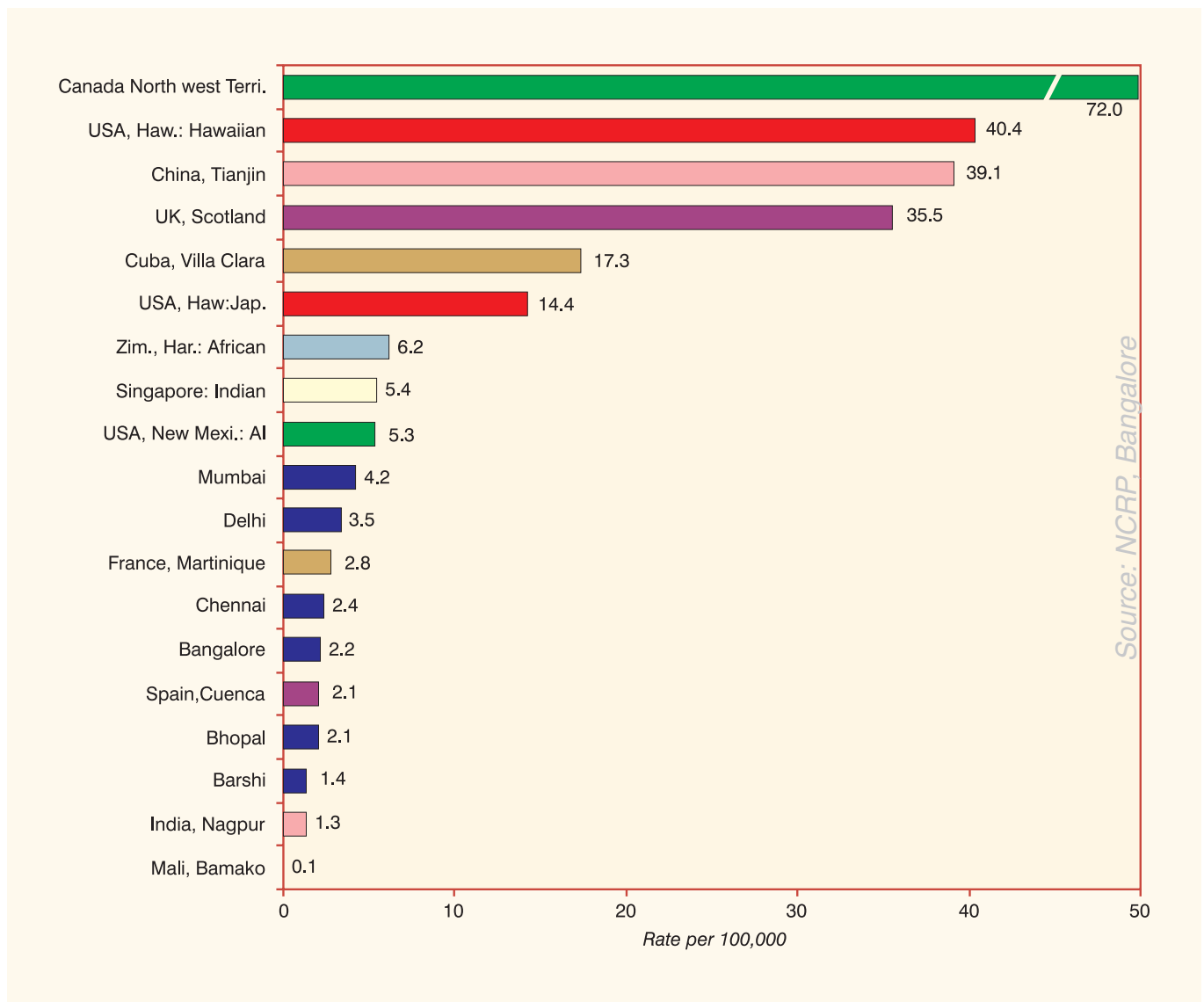


Source: NCRP, Bangalore

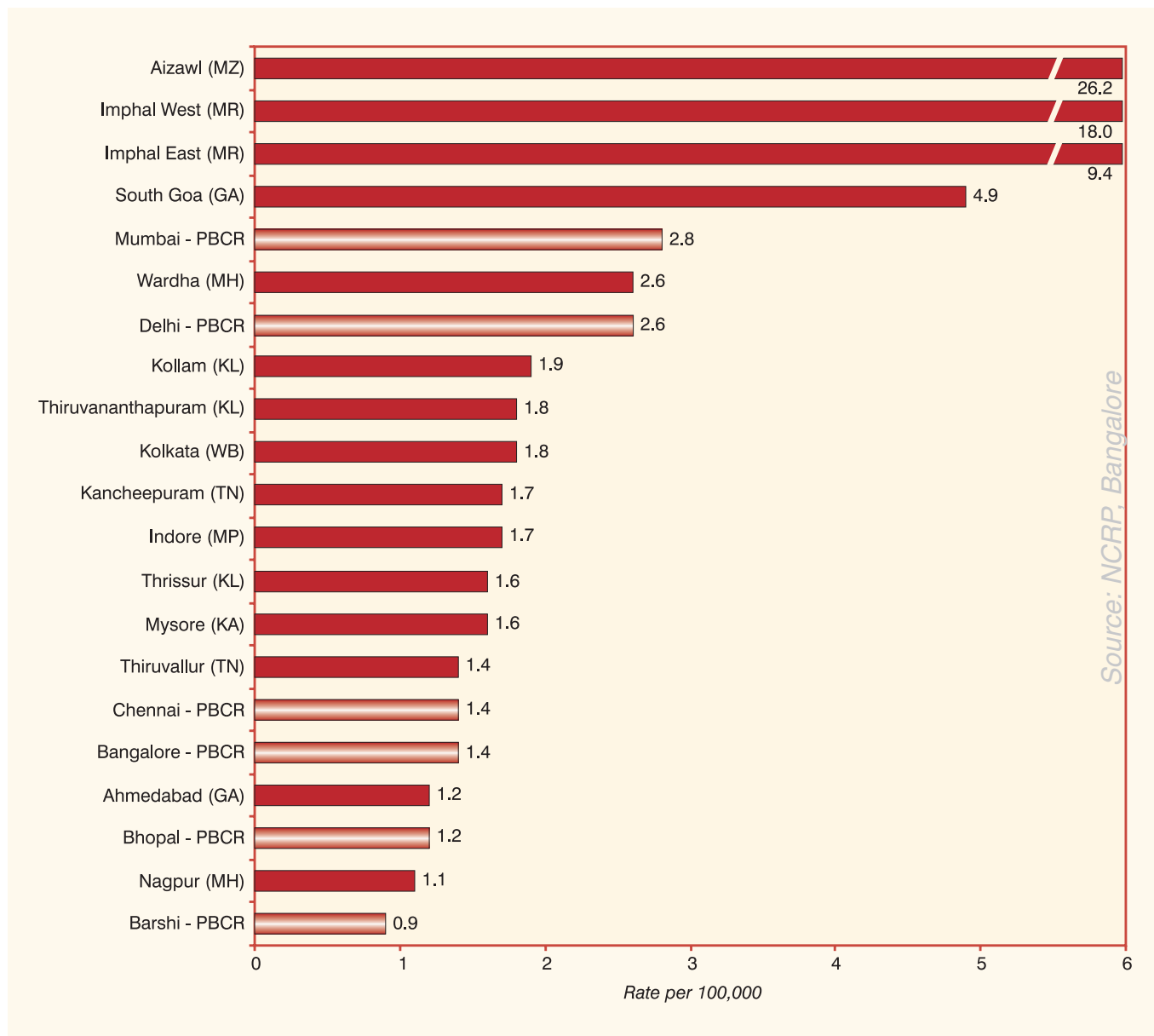
## 6.15. LUNG (ICD-10 : C33-C34) – FEMALES

Except in Mumbai PBCR, cancer of the lung in females has not been a leading site of cancer in women in the PBCRs under NCRP. Even the rate (AAR of 4.2/100,000) in Mumbai is lower than that seen in Indians in Singapore and in other women in areas of high incidence in the world [Fig. 6.15(a)]. Observation of the MAARs in the districts showed that Aizawl women had almost ten times the MAAR of women in Mumbai [Fig. 6.15(b)]. Imphal West and East in Mizoram State and South Goa had much higher MAARs than that seen in Mumbai.

**FIGURE 6.15(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Lung (ICD-10 : C33 - C34) – Females**

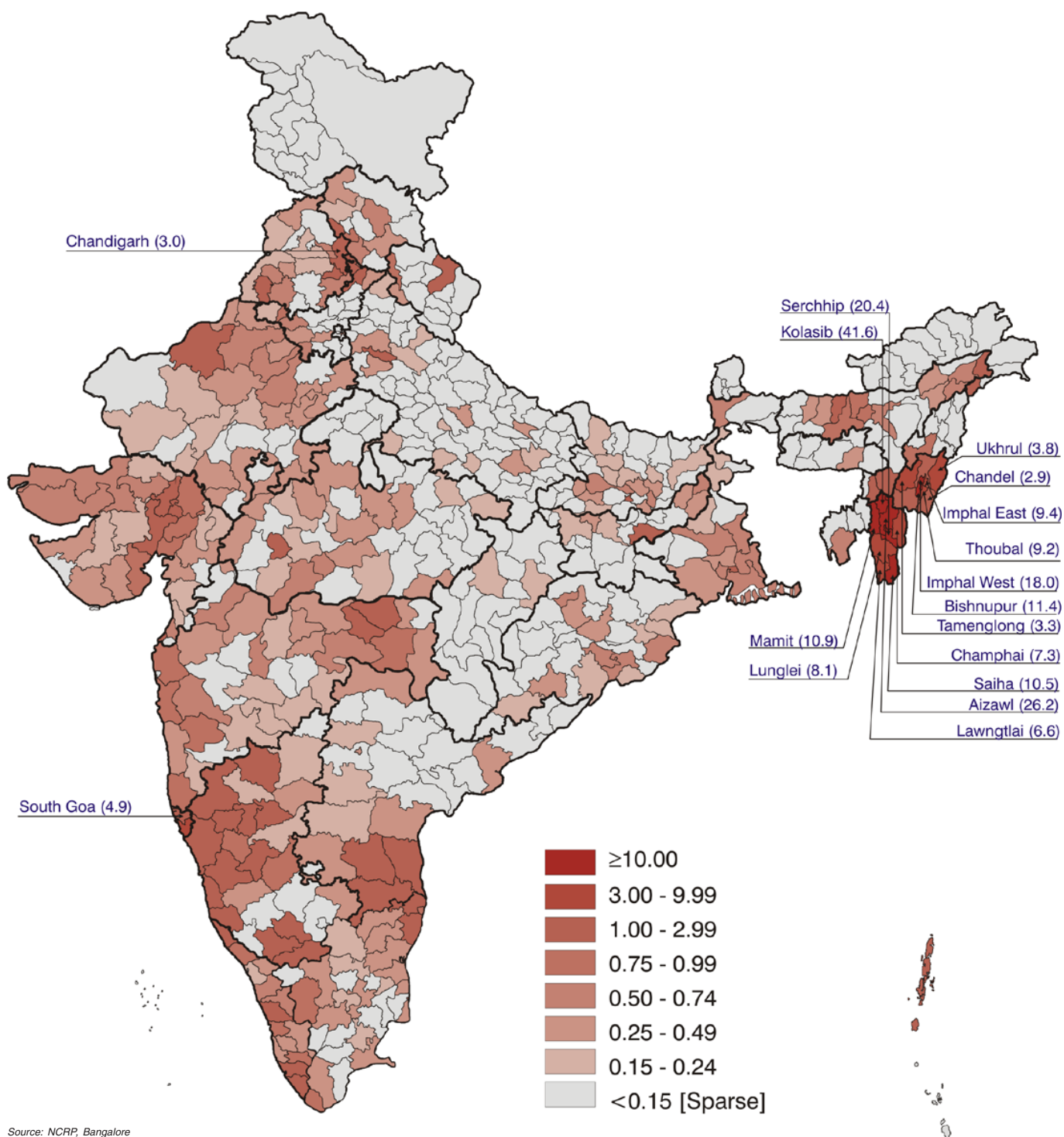


**FIGURE 6.15(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Lung (ICD-10 : C33 - C34) – Females**





**MAP 6.15 : Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Lung (ICD-10 : C33 - C34) 2001 - 2002 – Females**

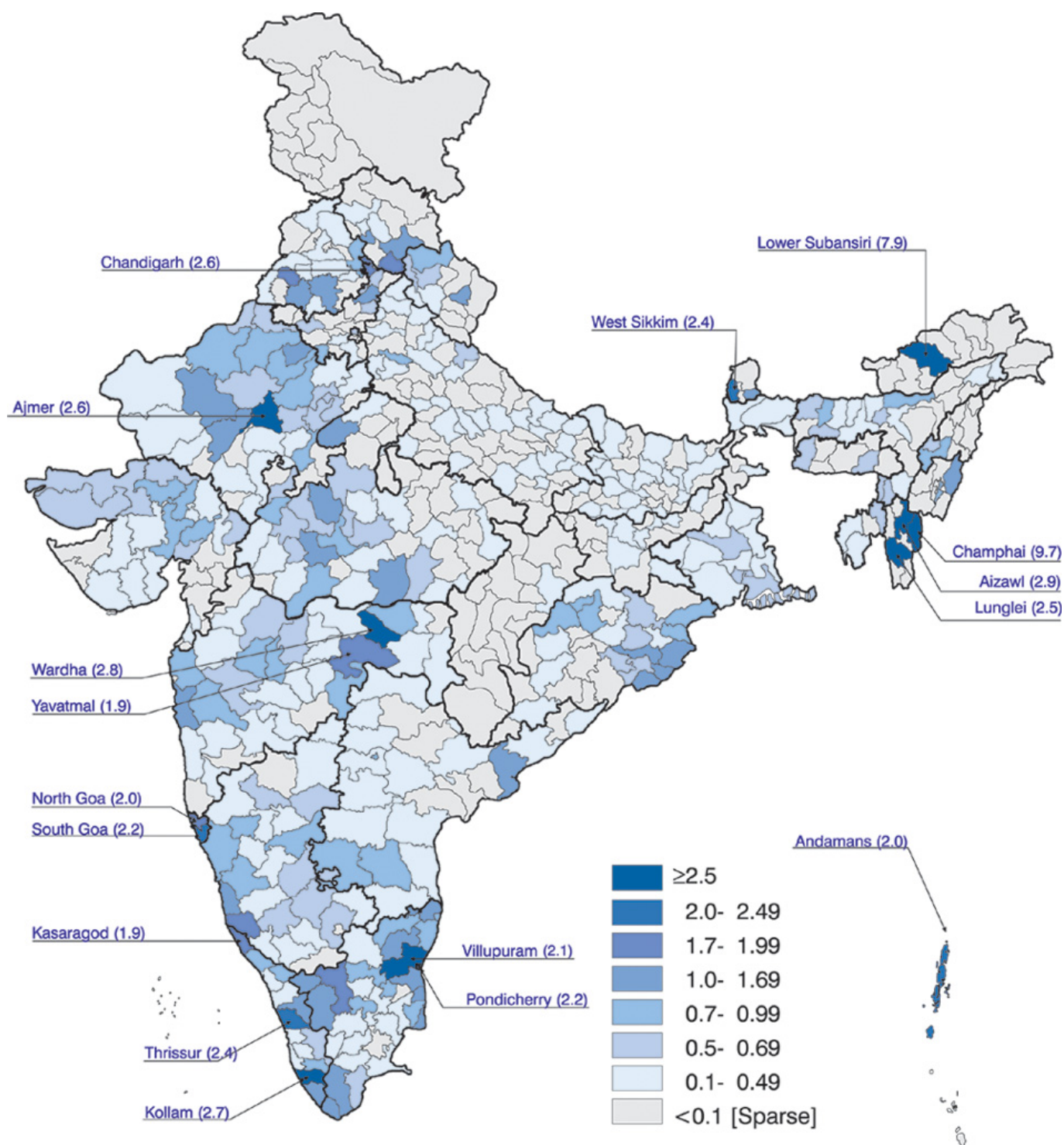


Source: NCRP, Bangalore

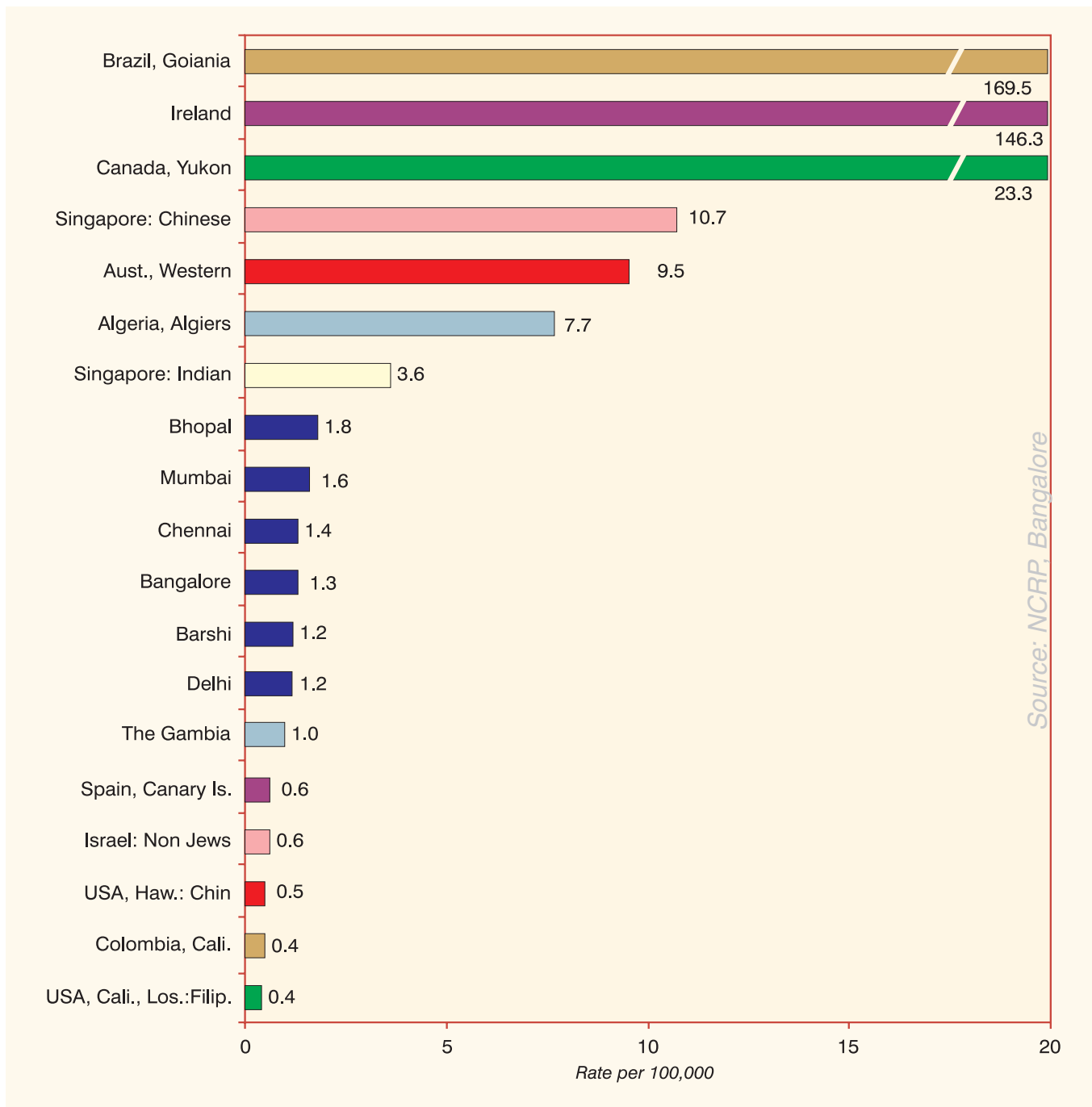
## 6.16. OTHER SKIN (ICD-10 : C44) – MALES

There was a relatively higher incidence of these cancers in some of the districts of Rajasthan (Ajmer), Kerala (Thrissur) and Tamil Nadu (Villupuram) states in both males and females. [Fig. 6.16(b) & Fig. 6.17(b) ].

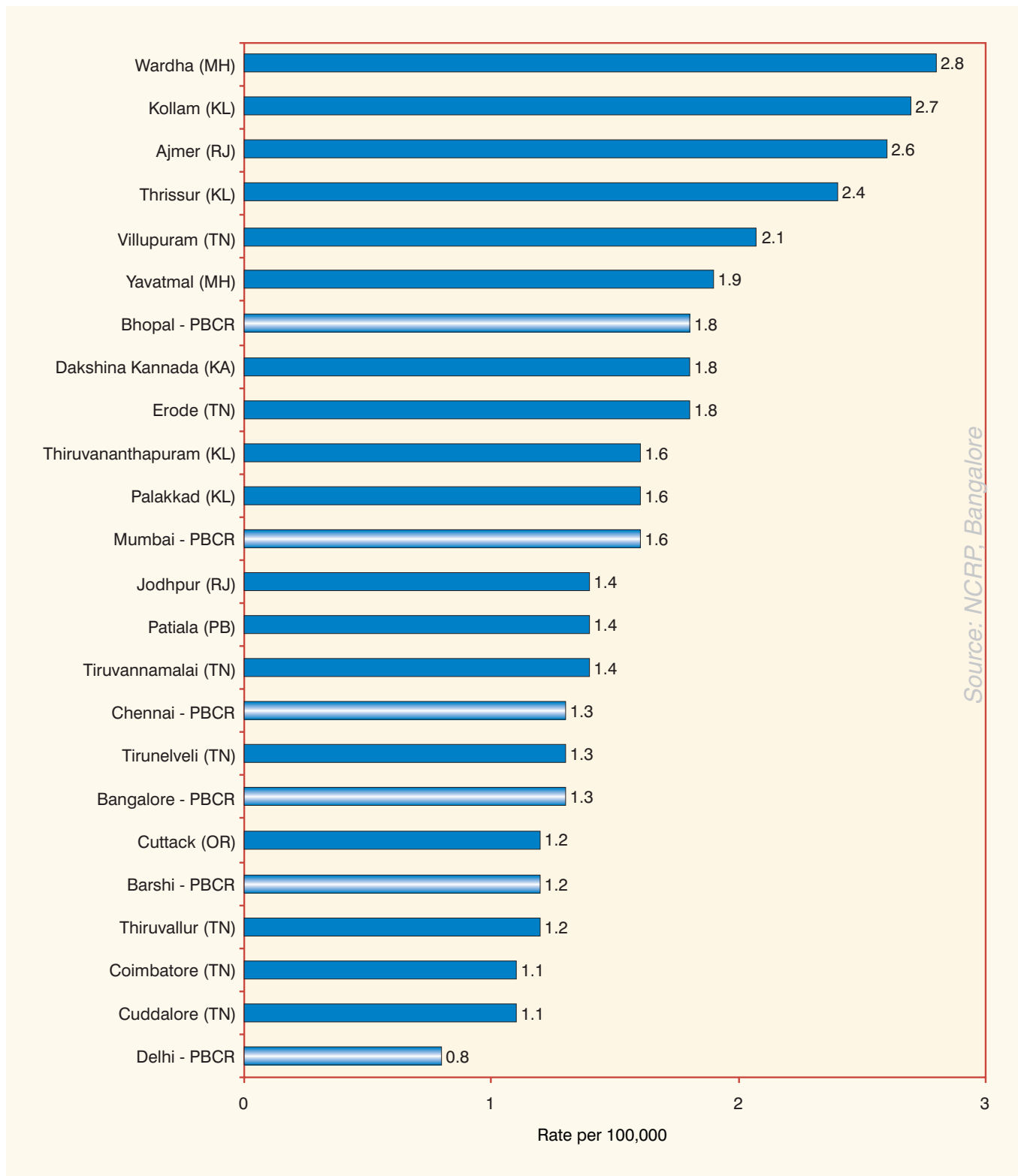
**MAP 6.16 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Other Skin (ICD-10 : C44) 2001 - 2002 – Males**



**FIGURE 6.16(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Other Skin (ICD-10 : C44) – Males**

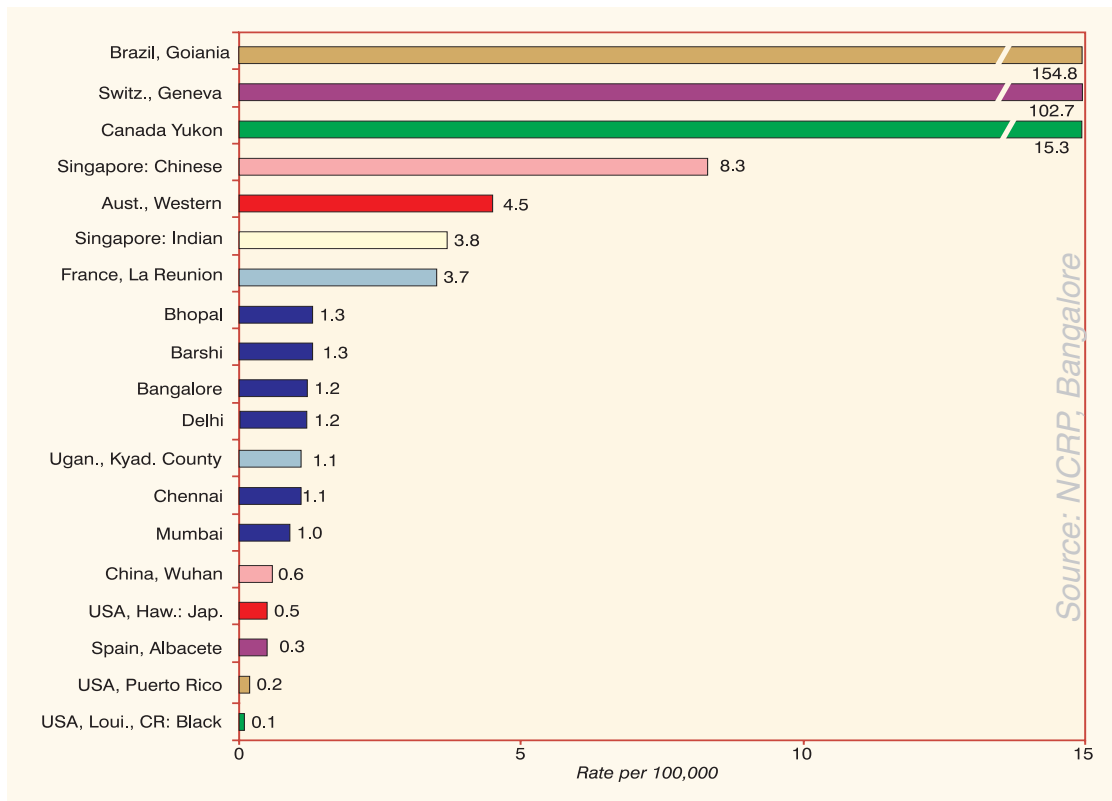


**FIGURE 6.16(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Other Skin (ICD-10 : C44) – Males**

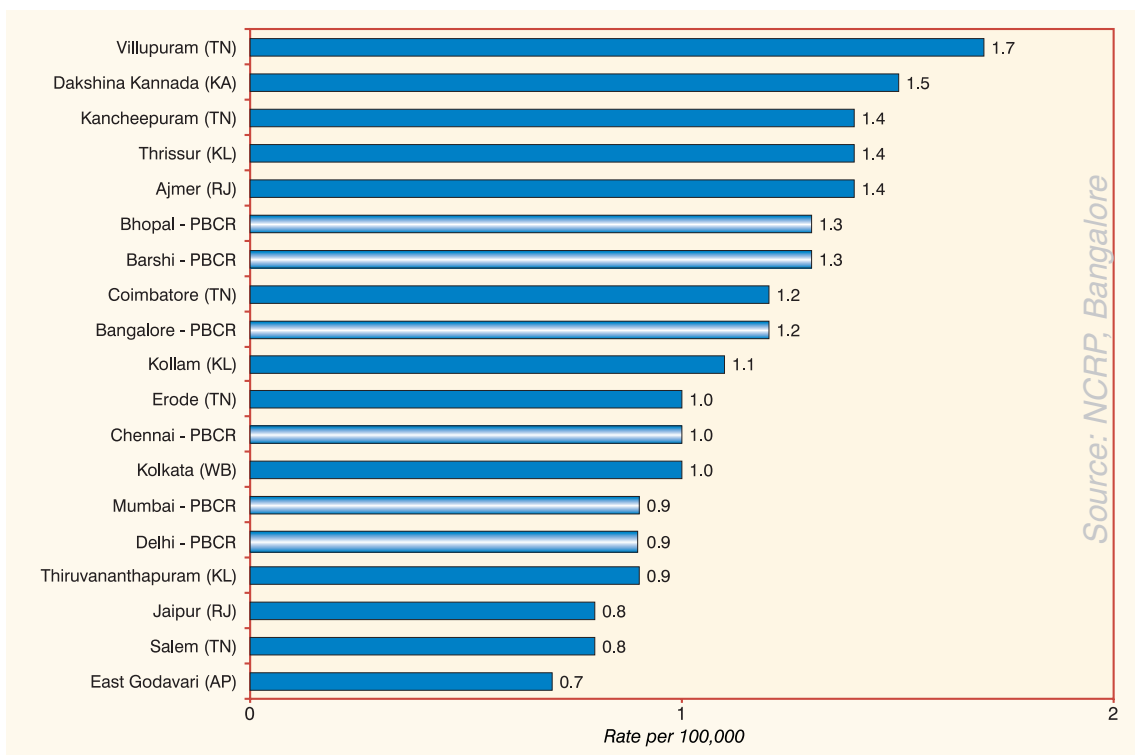


## 6.17. OTHER SKIN (ICD-10 : C44) – FEMALES

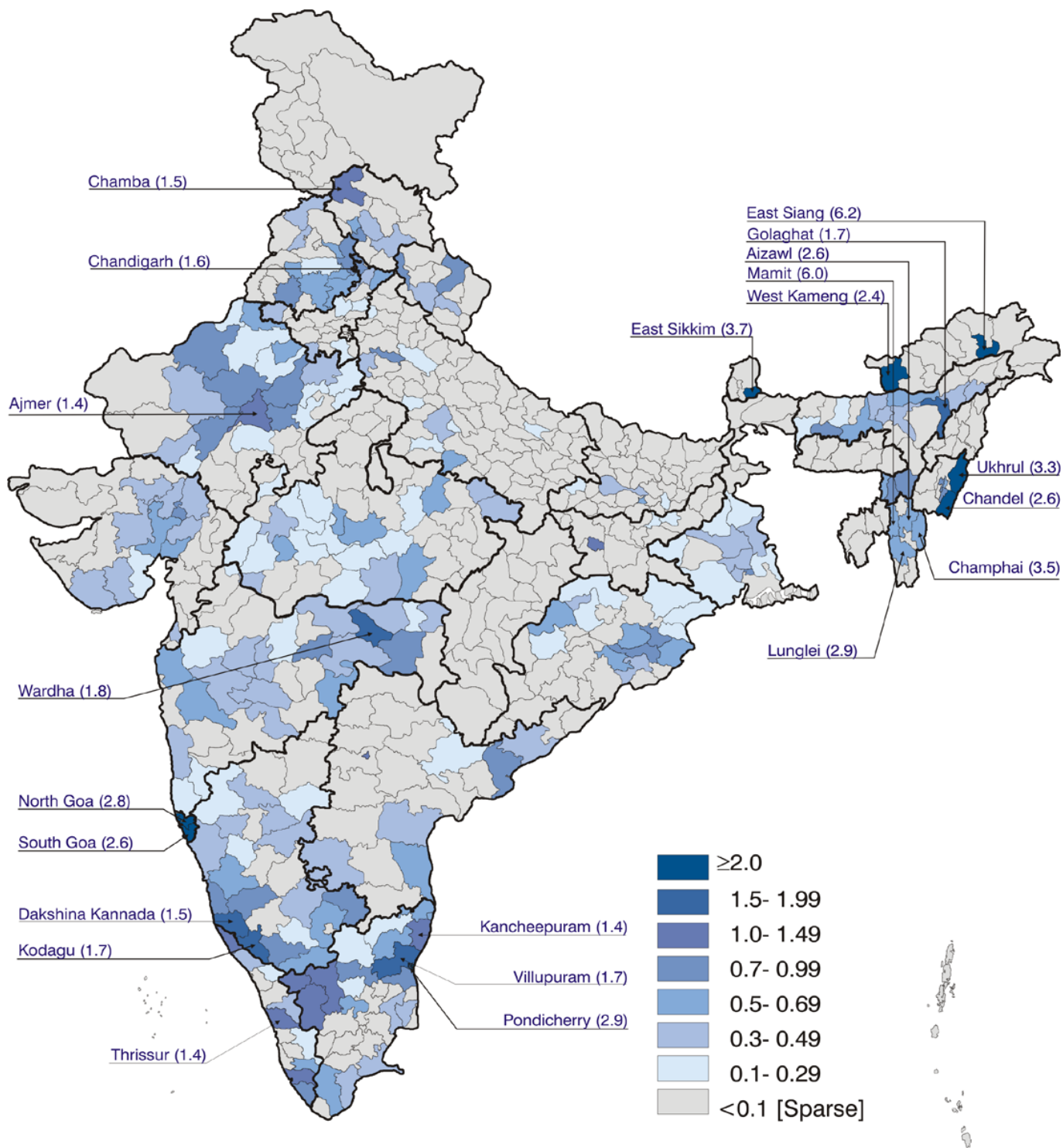
**FIGURE 6.17(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Other Skin (ICD-10 : C44) – Females**



**FIGURE 6.17(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Other Skin (ICD-10 : C44) – Females**



**MAP 6.17 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Other Skin (ICD-10 : C44) 2001 - 2002 – Females**



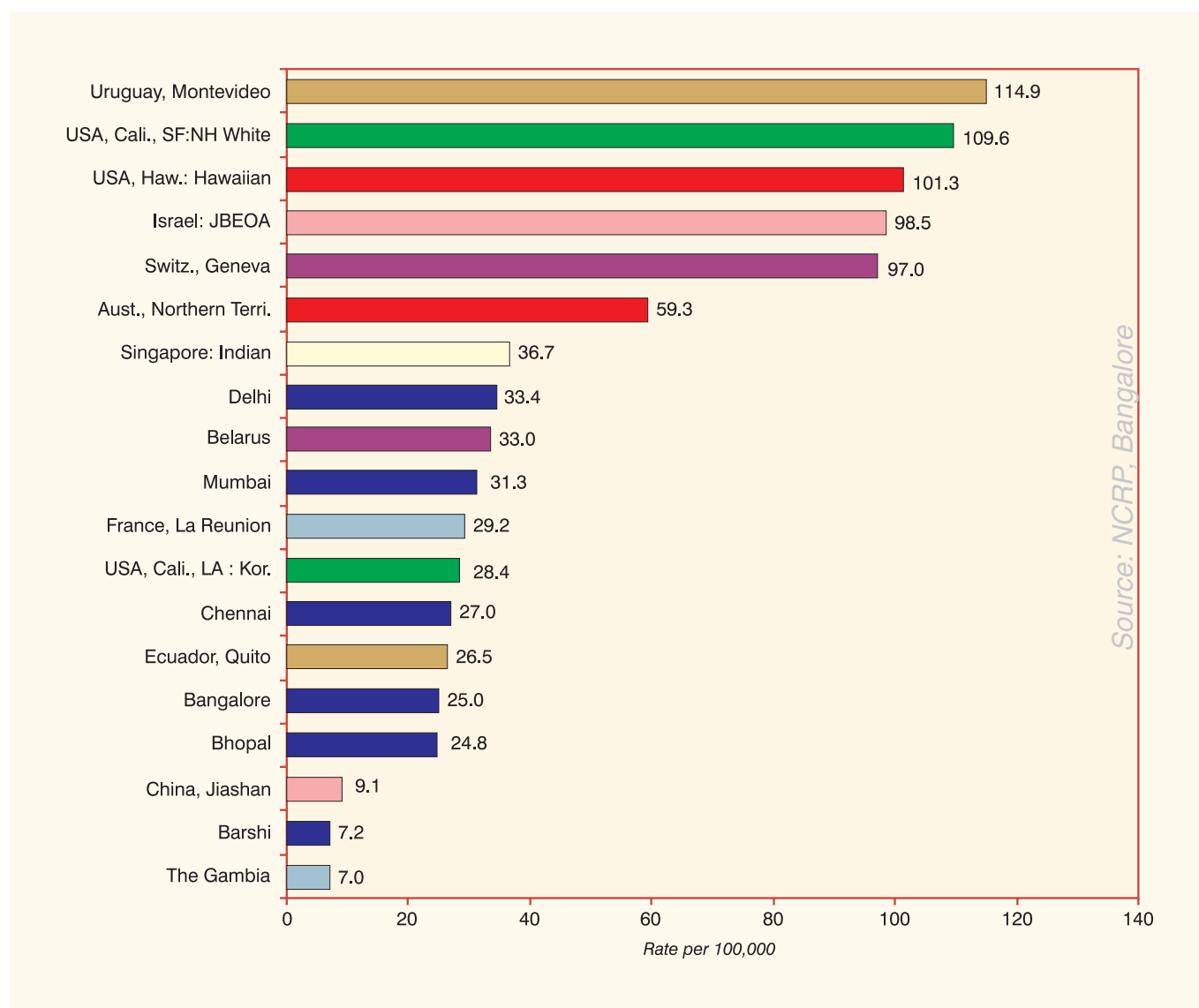
Source: NCRP, Bangalore



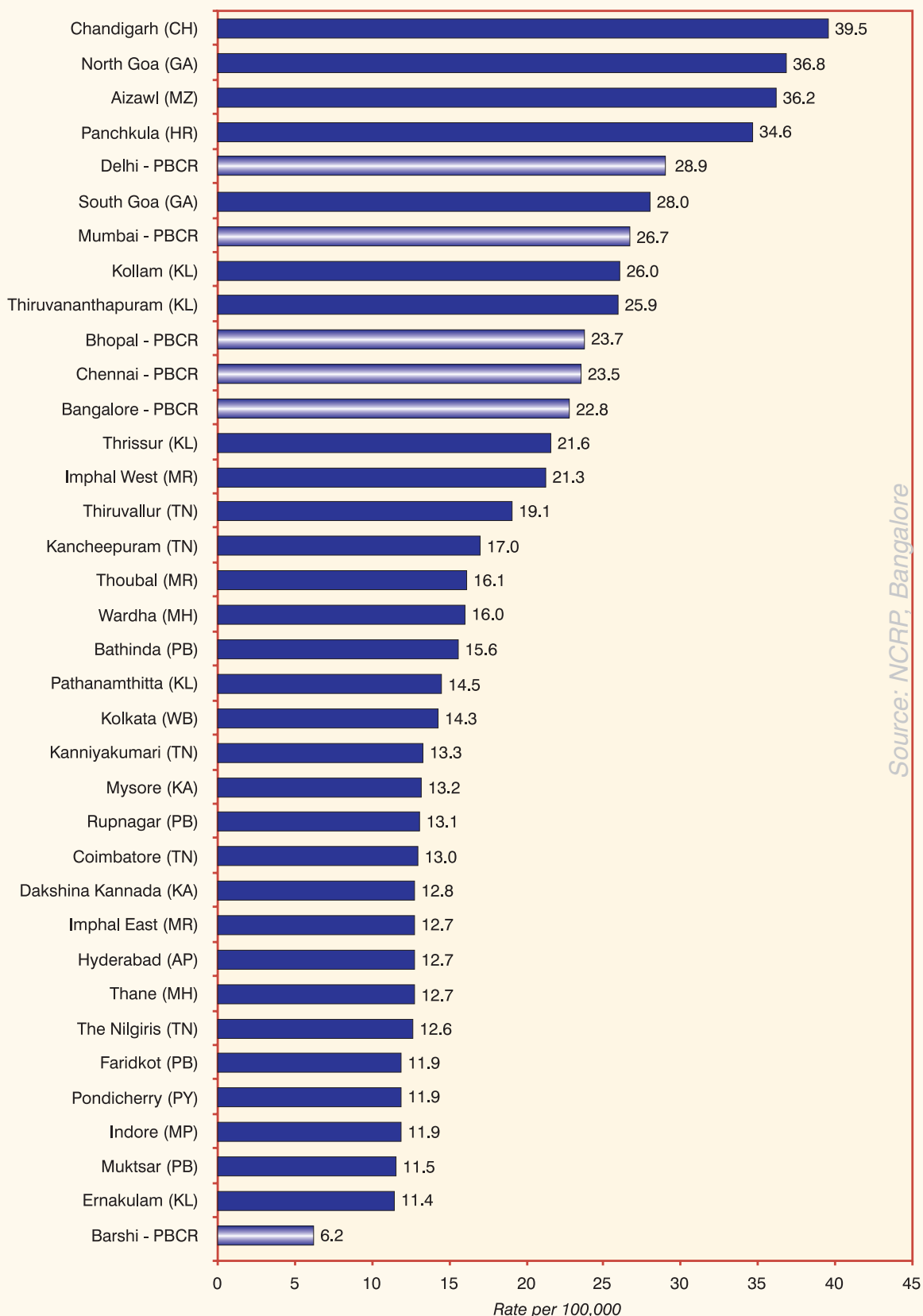
## 6.18. BREAST (ICD-10 : C50) – FEMALES

Cancer of the breast has replaced cancer of the cervix as the leading site of cancer in all urban PBCRs, except Chennai and the AARs of this site of cancer have also been on the rise. Nonetheless, the AARs in several western countries are much higher than that seen in the Indian registries. Among the Indian PBCRs, Delhi had the highest AAR of breast cancer [Fig. 6.18(a)]. Fig 6.18(b) shows that at least four districts led by Chandigarh (followed by North Goa, Aizawl in Mizoram State and Panchkula in Haryana State) had higher MAAR than that of Delhi. The rates were also comparable in three districts (Kollam, Thiruvananthapuram, Thrissur) in Kerala State and in the district of South Goa.

**FIGURE 6.18(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Breast (ICD-10 : C50) – Females**

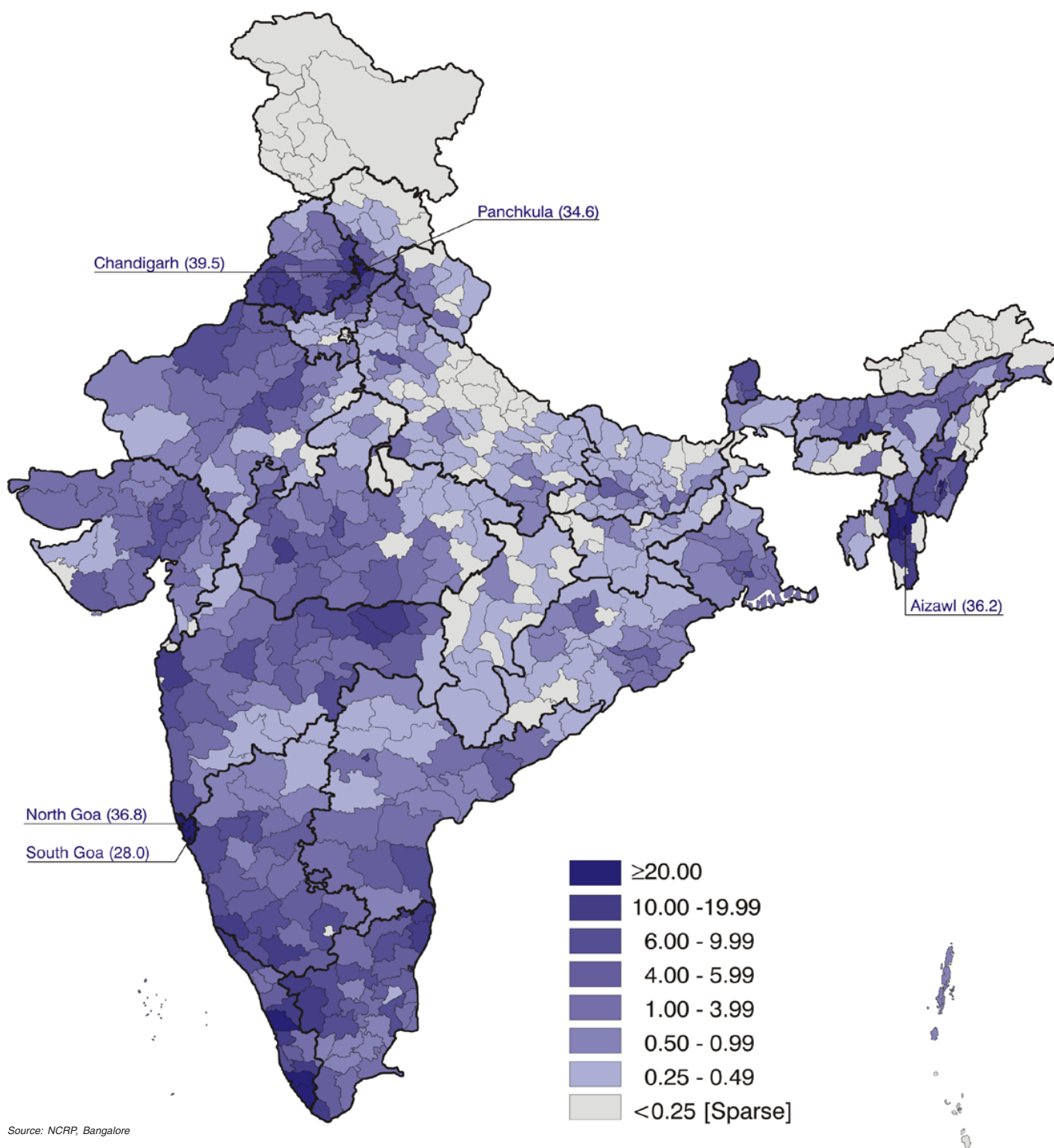


**FIGURE 6.18(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Breast (ICD-10 : C50) – Females**





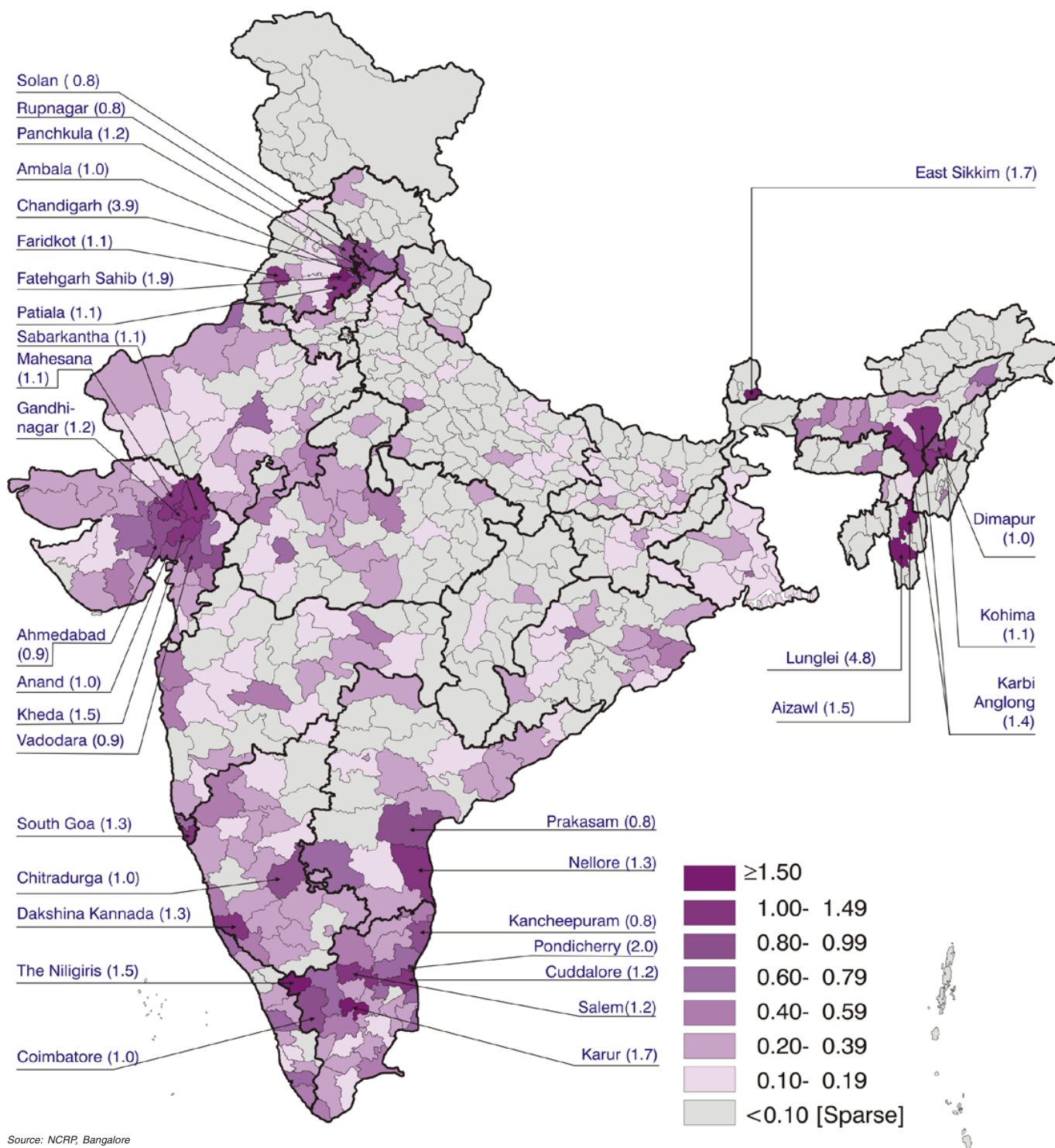
**MAP 6.18 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Breast (ICD-10 : C50) 2001 - 2002 – Females**



## 6.19. VAGINA (ICD-10 : C52)

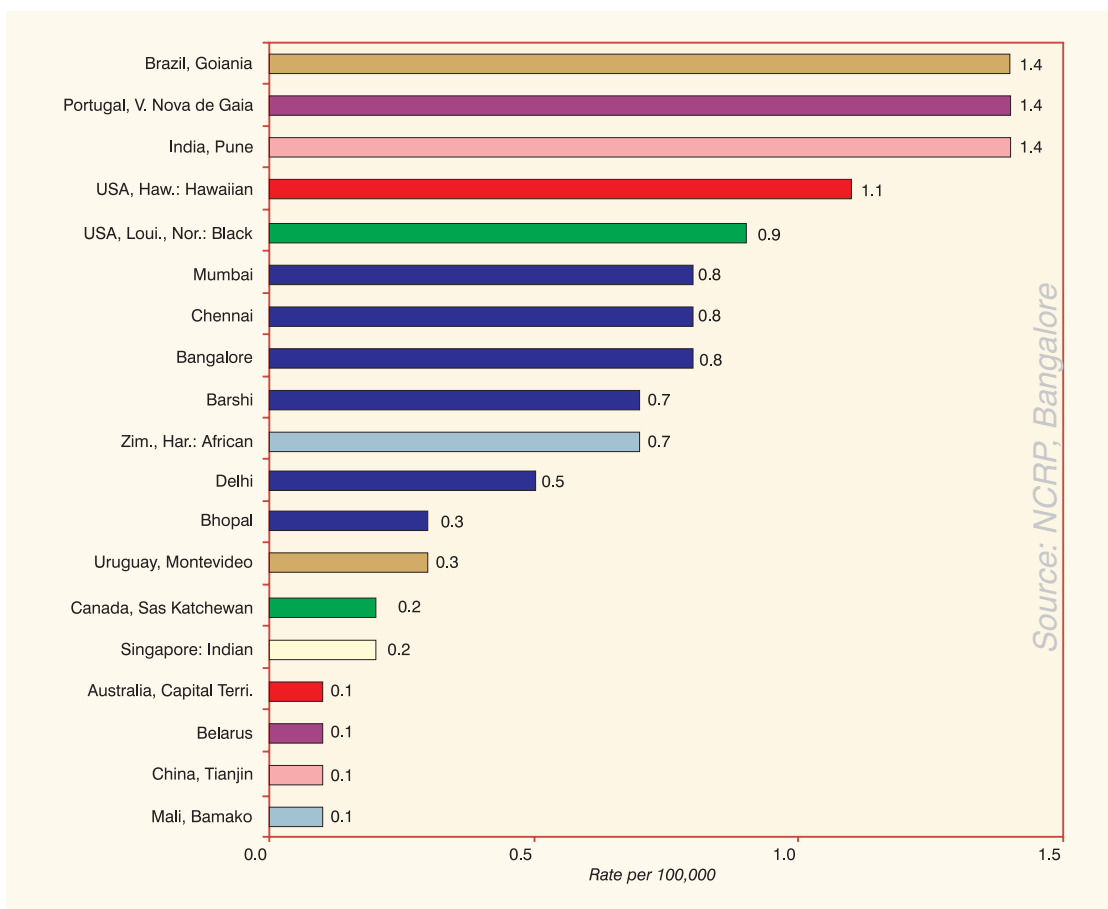
In three districts each in Gujarat and Tamil Nadu states and in Nellore district of Andhra Pradesh State, the incidence of cancer of the vagina was relatively high. [Fig. 6.19(b)].

**MAP 6.19 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Vagina (ICD-10 : C52) 2001 - 2002**

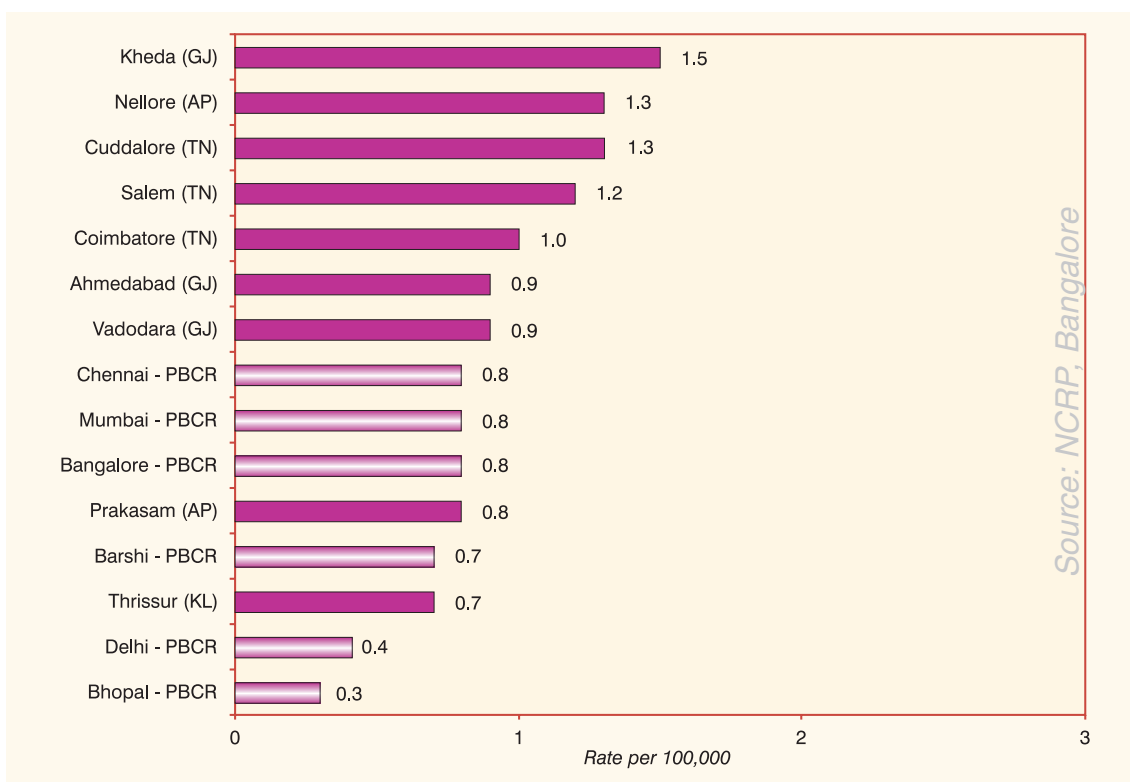


Source: NCRP, Bangalore

**FIGURE 6.19(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Vagina (ICD-10 : C52)**



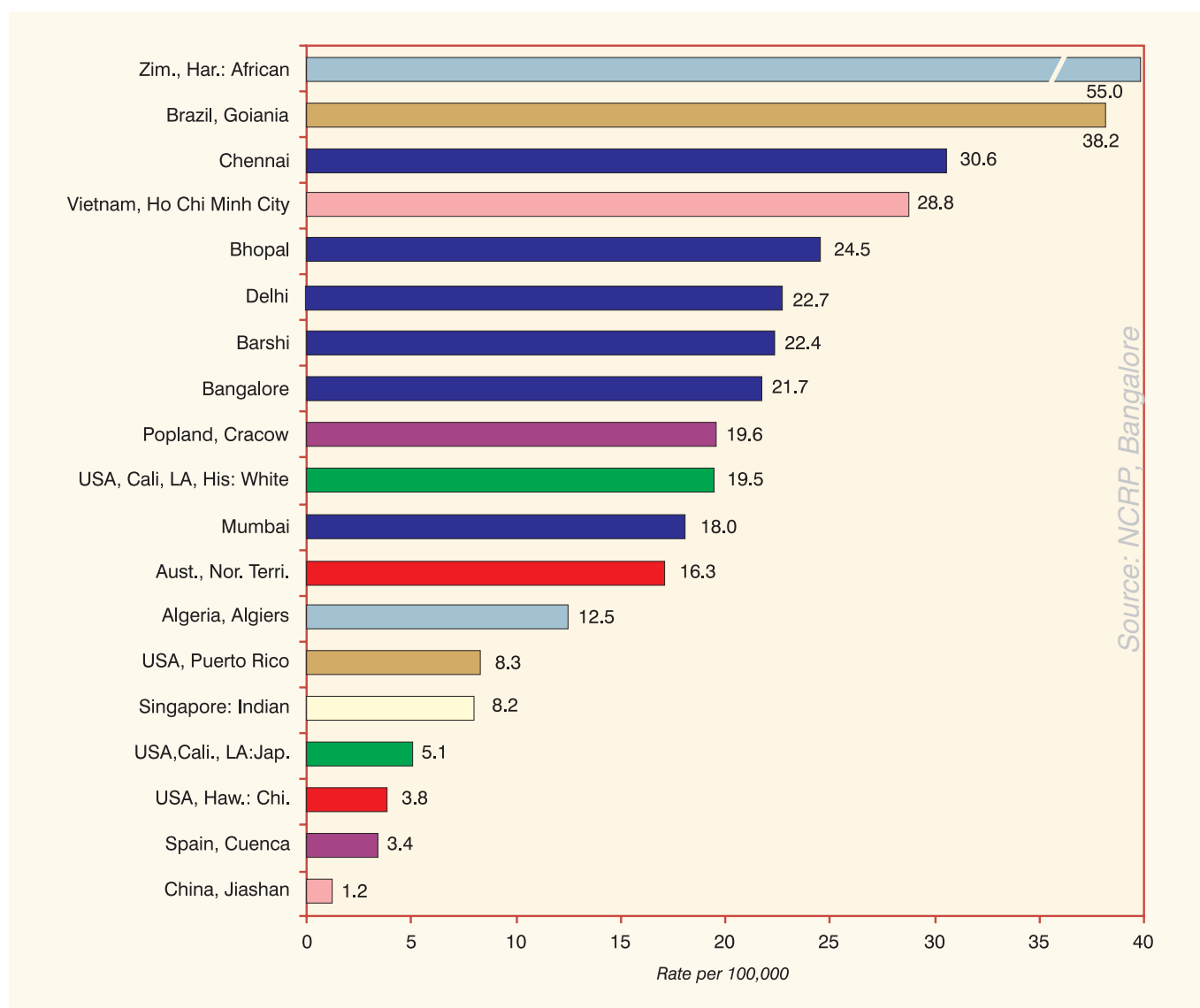
**FIGURE 6.19(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Vagina (ICD-10 : C52)**



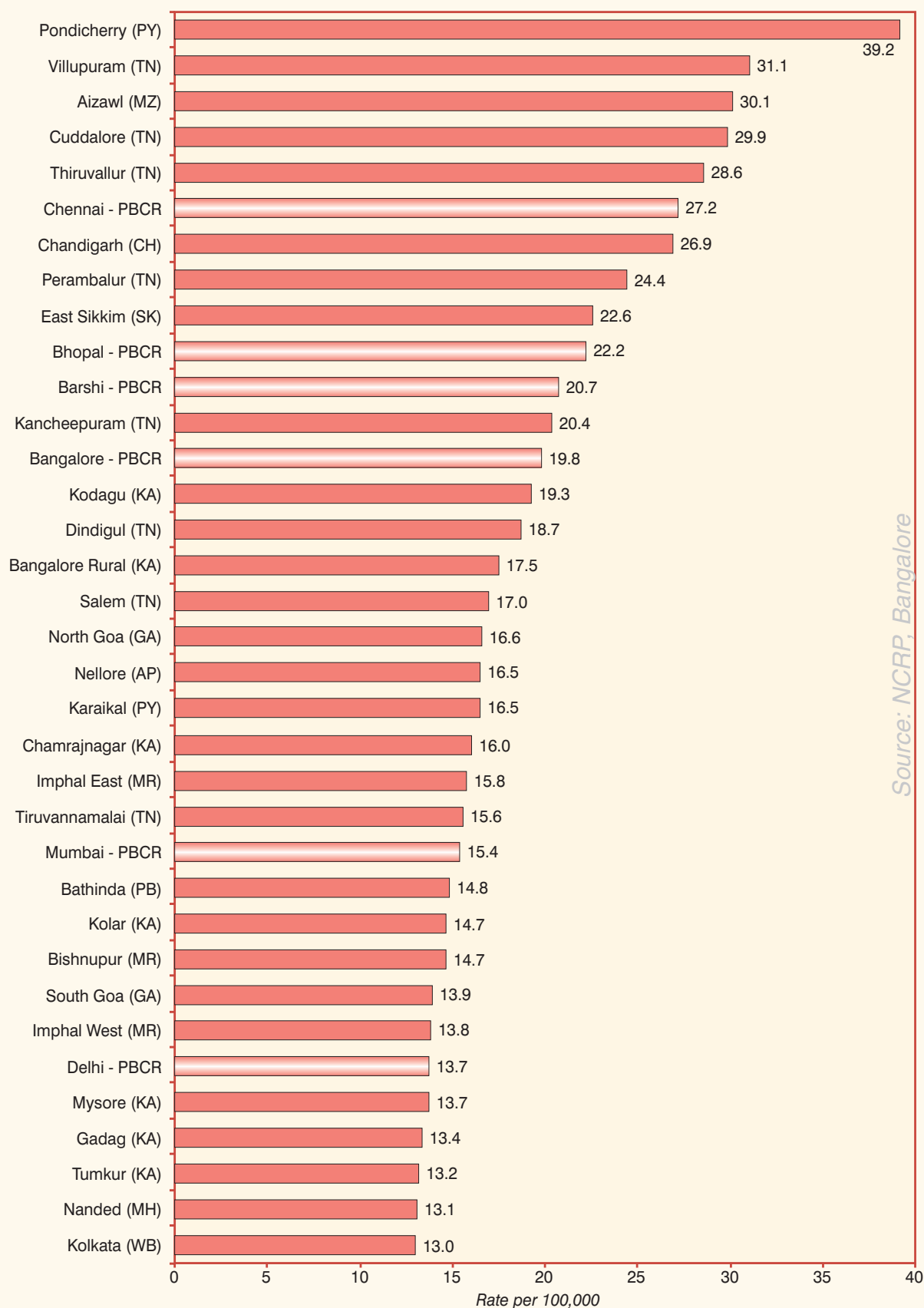
## 6.20. CERVIX UTERI (ICD-10 : C53)

Chennai PBCR has had the highest incidence rate of cervical cancer among the Indian PBCRs. This AAR is somewhat lower than that seen in the registries in Africa and Brazil [Fig. 6.20(a)] (Parkin et al, 2002). The district-wise MAARs indicate a belt of high incidence rates even higher than that in Chennai PBCR, in the North Eastern districts of Tamil Nadu State including Pondicherry which had the highest MAAR of 39.2/100,000 [Fig. 6.20(b)].

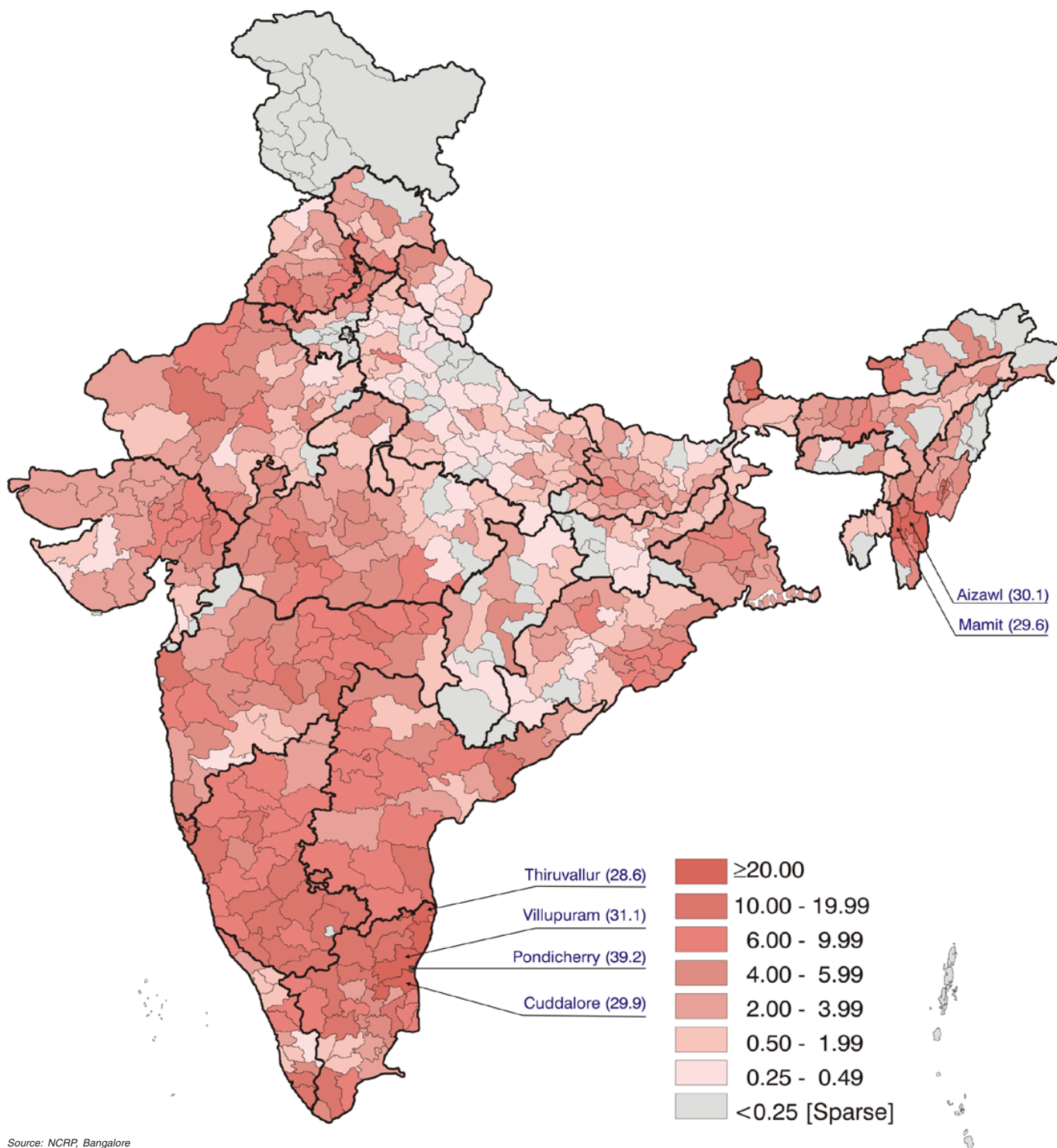
**FIGURE 6.20(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Cervix Uteri (ICD-10 : C53)**



**FIGURE 6.20(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Cervix Uteri (ICD-10 : C53)**



**MAP 6.20 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Cervix Uteri (ICD-10 : C53) 2001 - 2002**

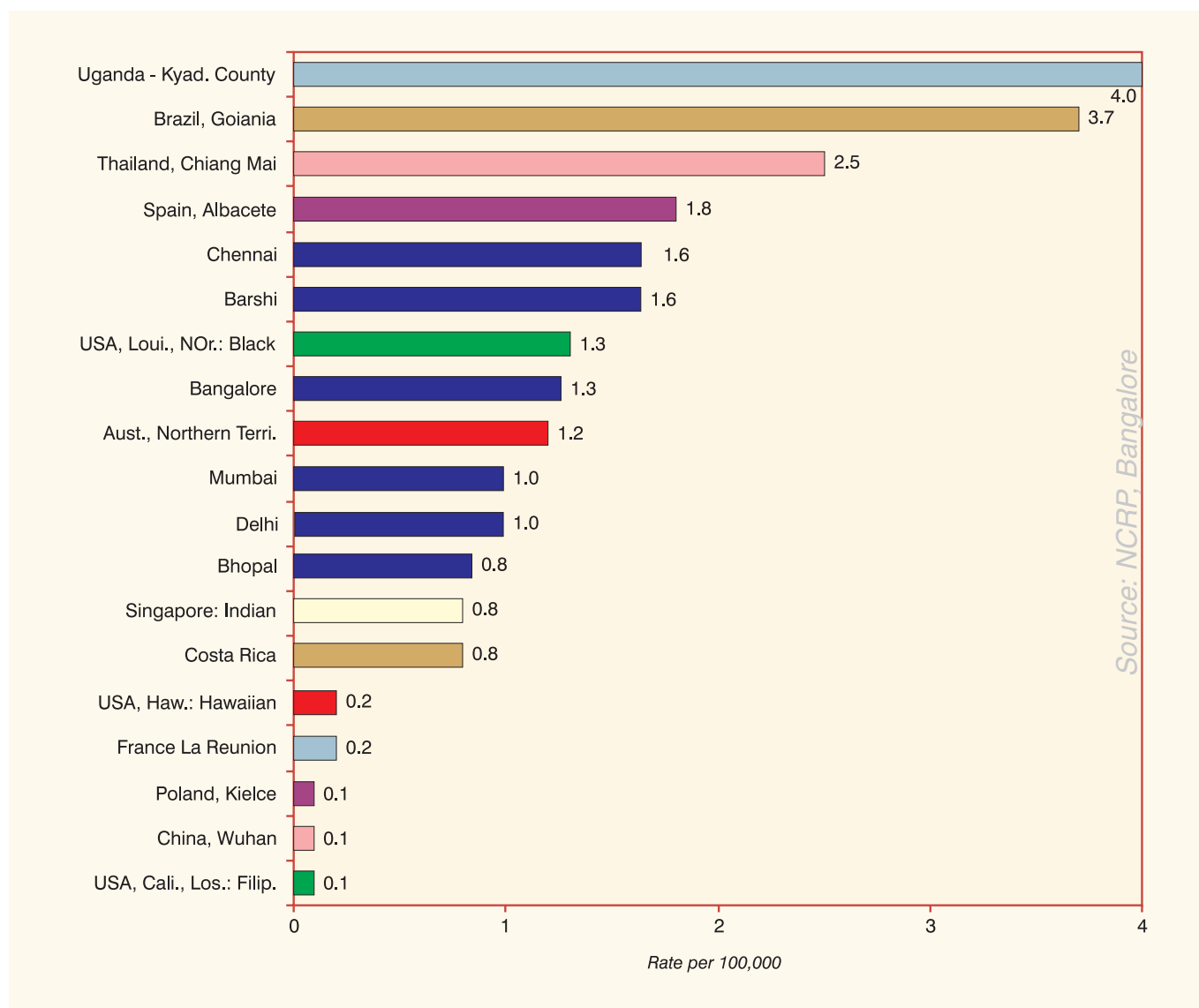


Source: NCRP, Bangalore

## 6.21. PENIS (ICD-10 : C60)

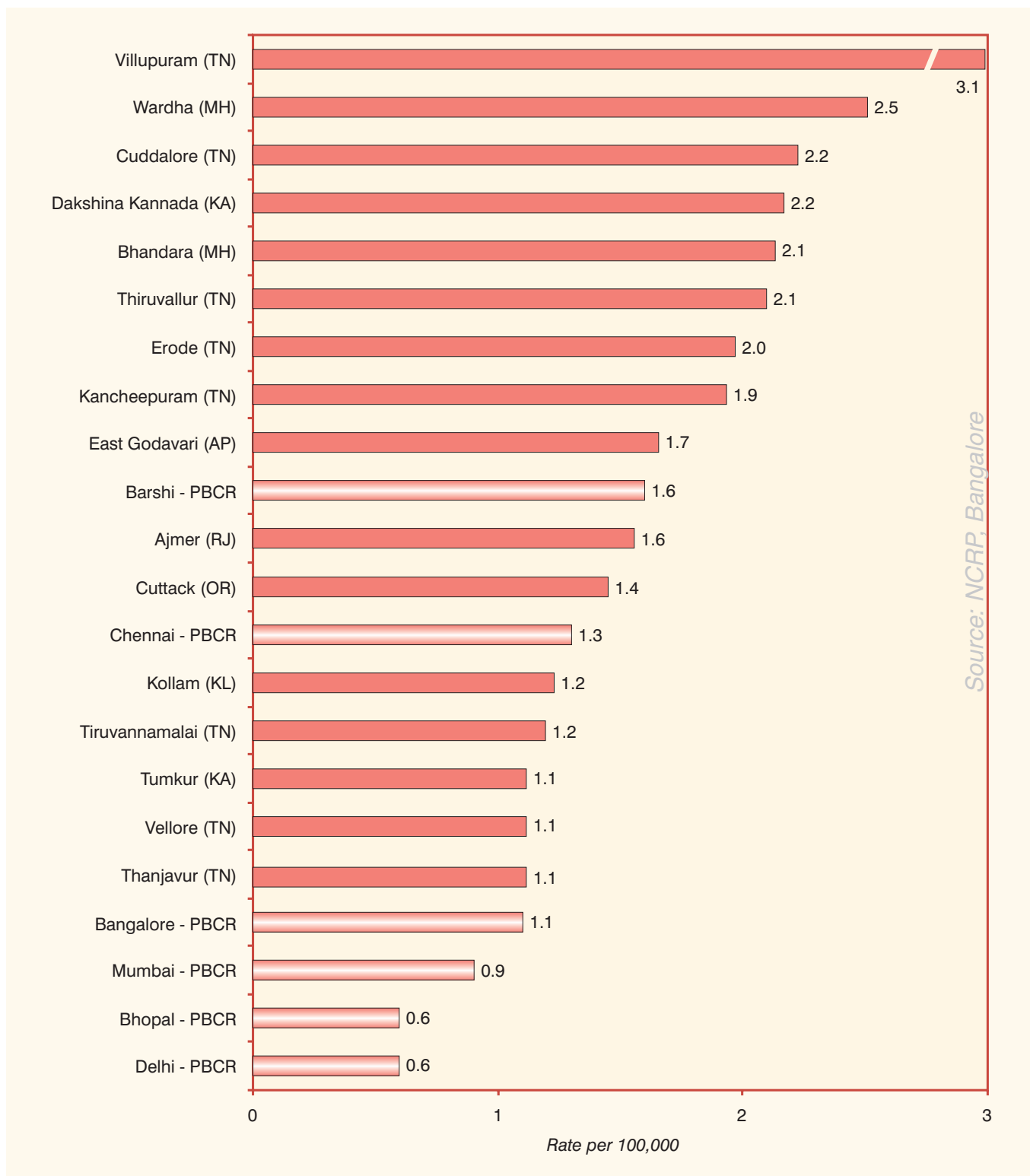
In the Indian PBCRs penile cancer has been high in Chennai and Barshi but lower than the highest AAR of 4.0/100,000 in Kyadondo in Uganda - Africa [Fig. 6.21(a)] (Parkin et al, 2002). Like for cancer cervix a concentration of high incidence penile cancer is seen in the north eastern districts of Tamil Nadu State and Villupuram district had a MAAR of 3.1.

**FIGURE 6.21 (a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Penis (ICD-10 : C60)**

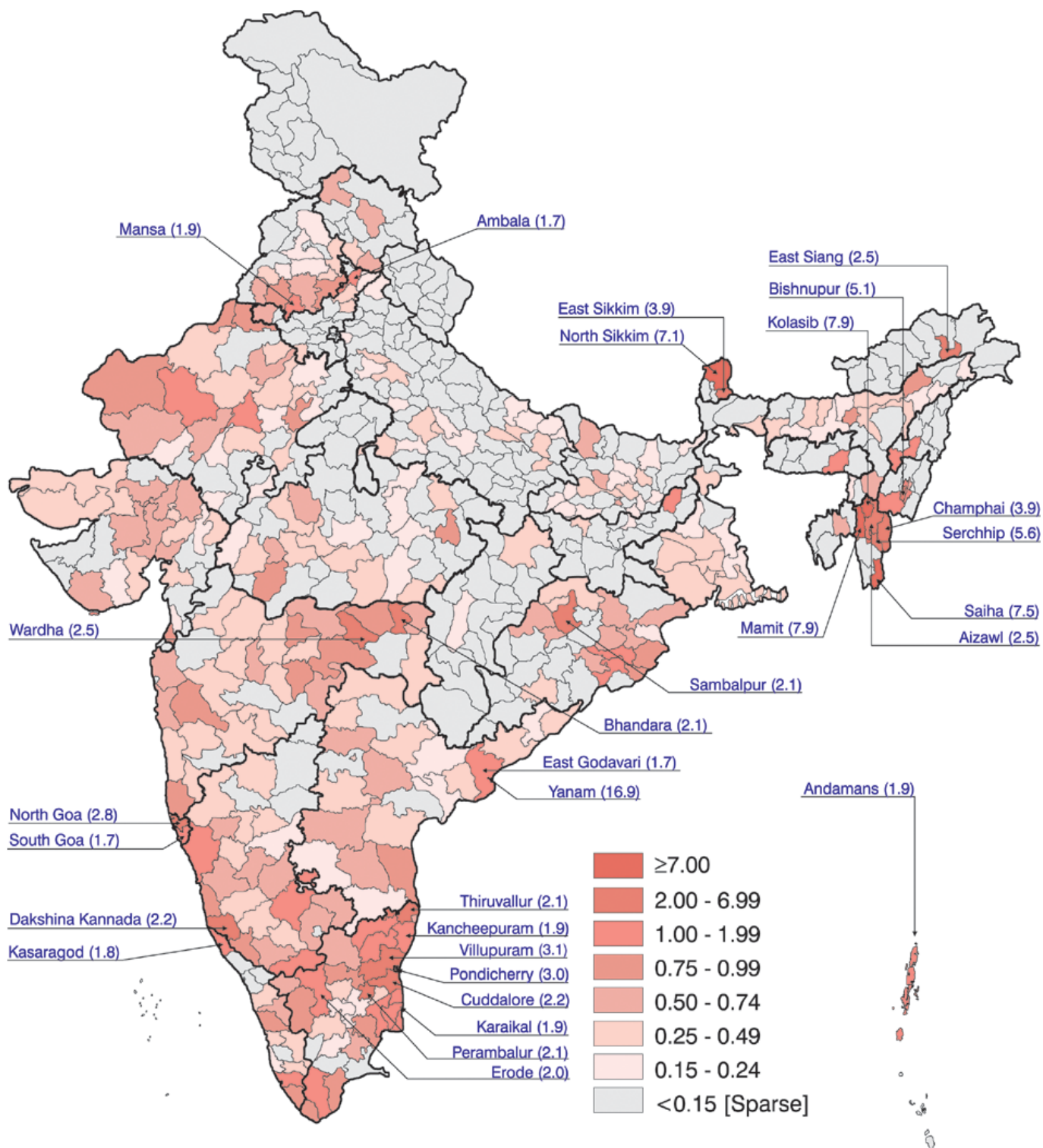




**FIGURE 6.21 (b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Penis (ICD-10 : C60)**



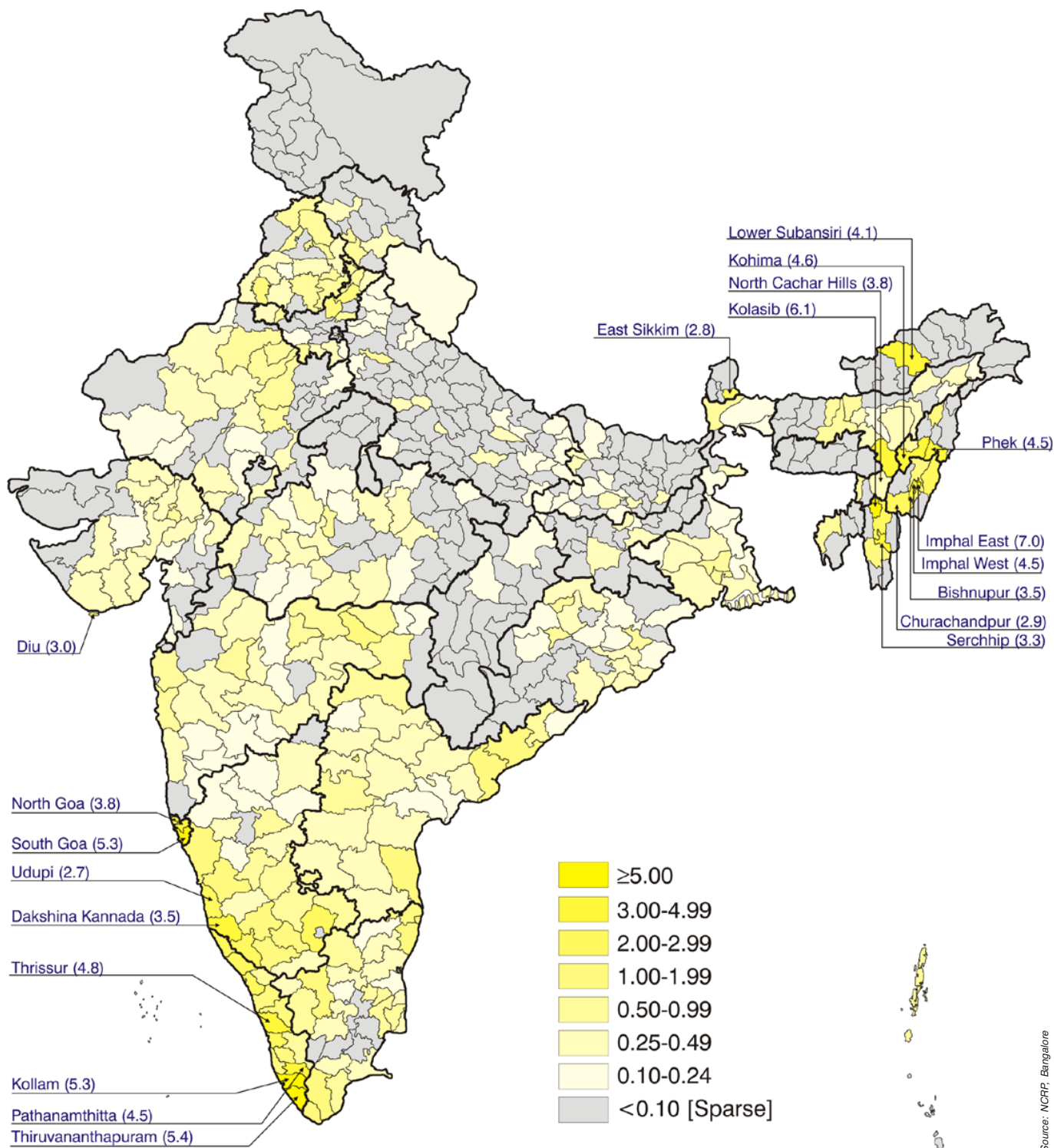
**MAP 6.21 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000  
Penis (ICD-10 : C60) 2001 - 2002**



## 6.22. THYROID (ICD-10 : C73) - FEMALES

Of the PBCRs under NCRP, Bangalore PBCR has shown the highest AAR of cancer of the thyroid [Fig 6.22(a)]. The PBCR at Thiruvananthapuram has shown a high incidence of cancer of the thyroid where it was the third leading site

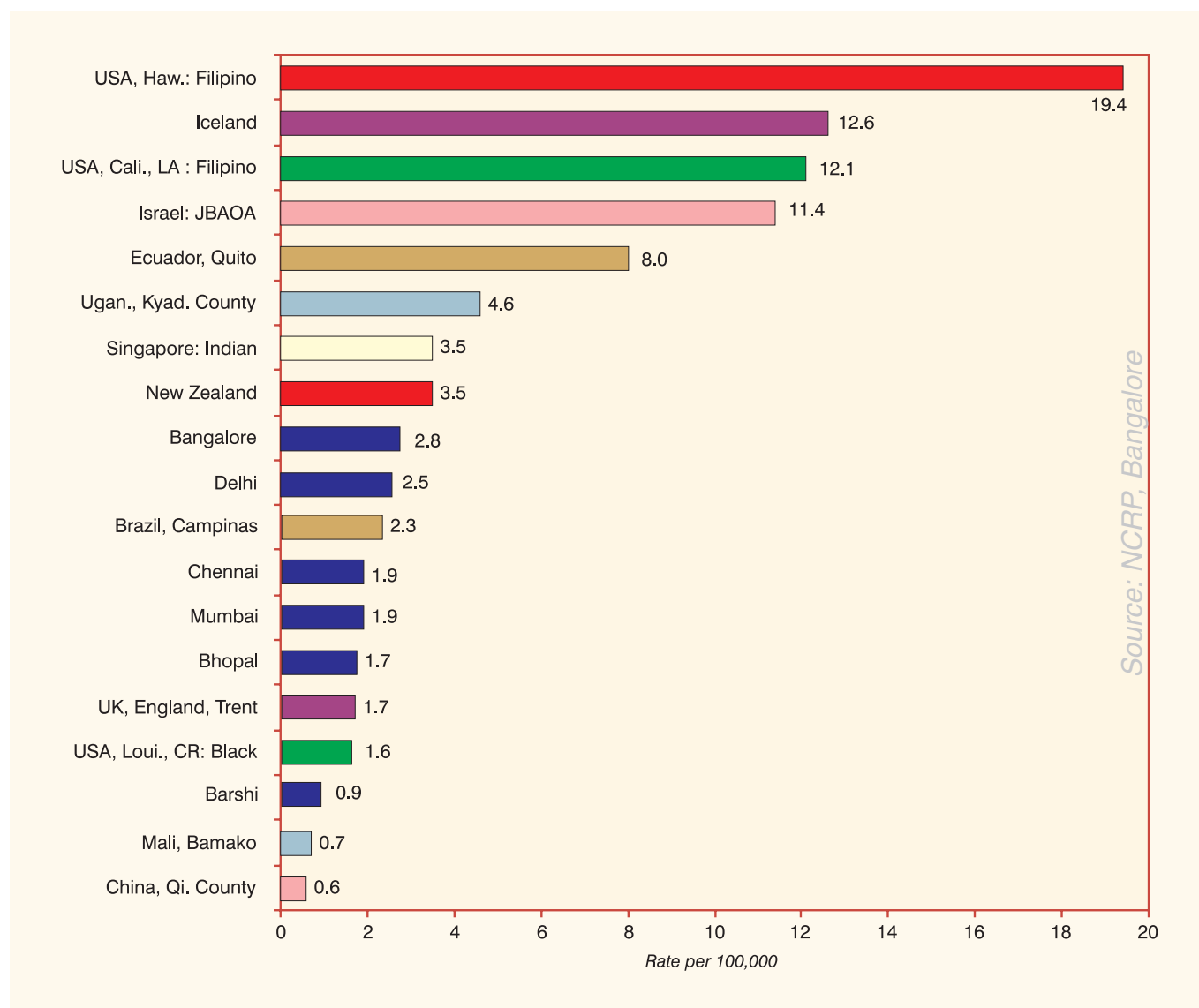
**MAP 6.22 : Districtwise Minimum Age Adjusted Incidence Rate Per 100,000 Thyroid (ICD-10 : C73) 2001 - 2002 – Females**



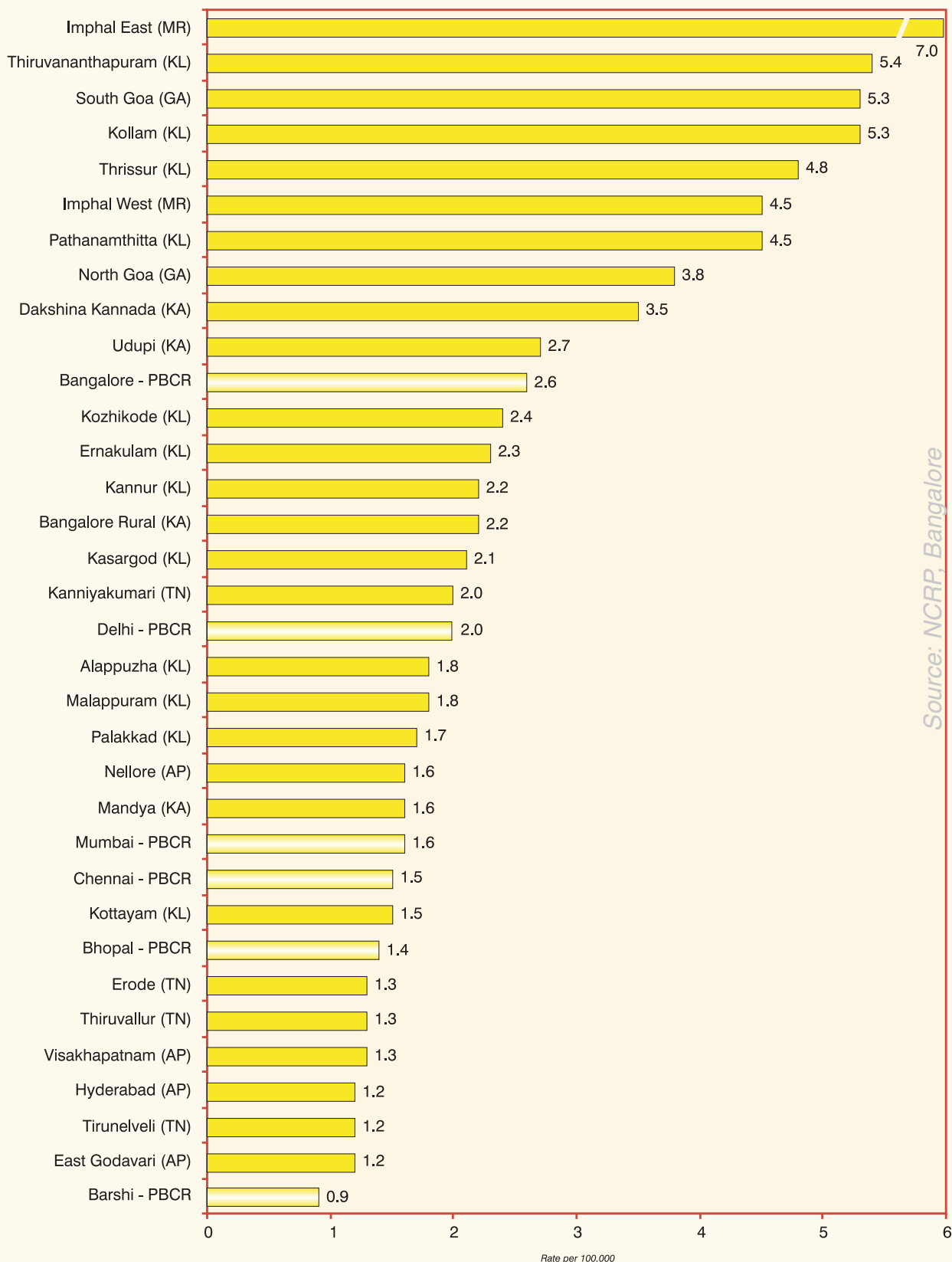
Source: NCRP, Bangalore

of cancer in women in that registry (Chapter 3 - Fig. 3.2). Similarly, the district-wise distribution shows a considerably higher MAAR than that of Bangalore. There seems to be a belt of high incidence from the southern tip of the country - Kanniyakumari in Tamil Nadu State along the coast of Kerala and Karnataka states extending on to South Goa [Fig. 6.22(b)].

**FIGURE 6.22(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Thyroid (ICD-10 : C73) – Females**



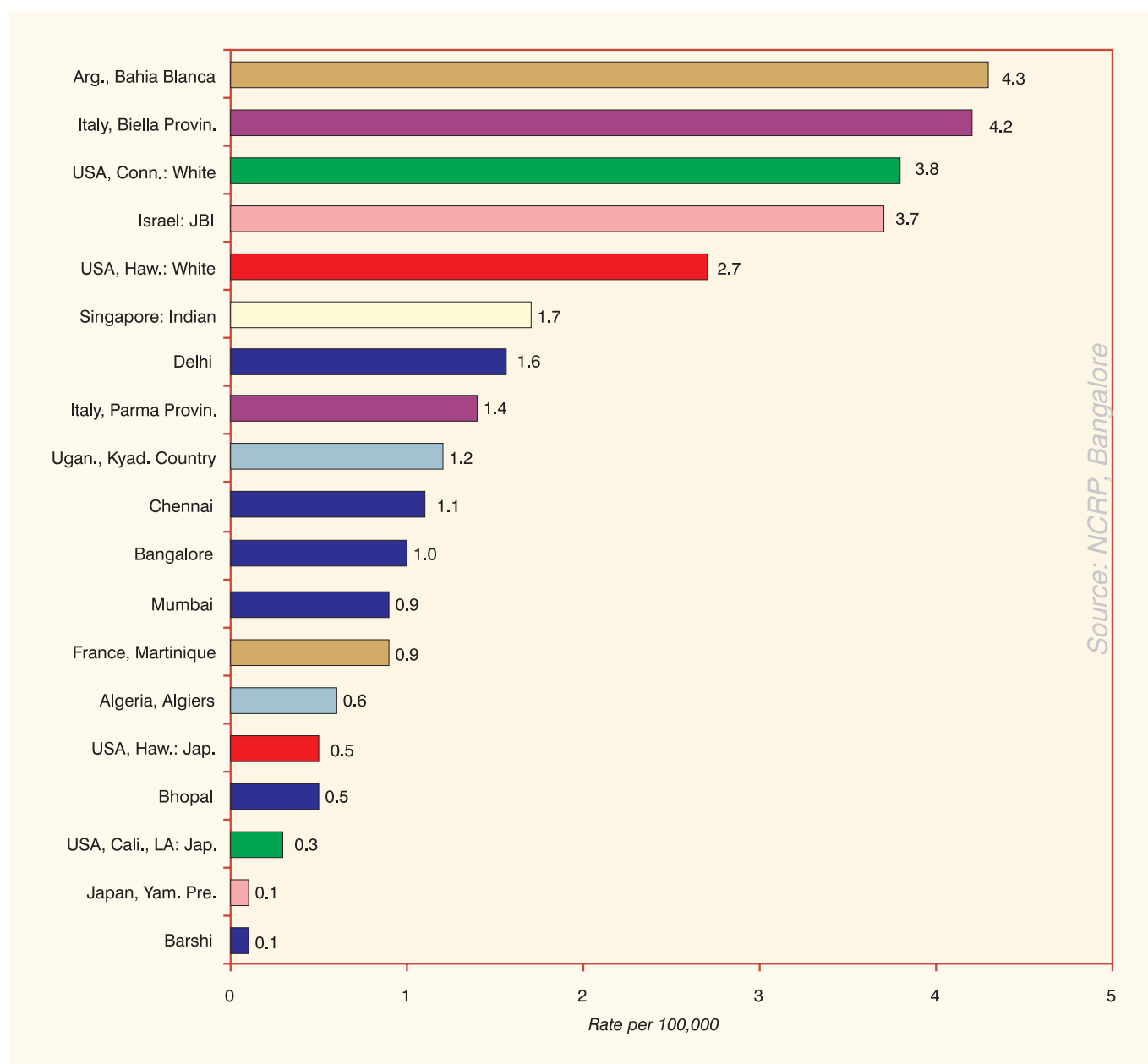
**FIGURE 6.22(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Thyroid (ICD-10 : C73) – Females**



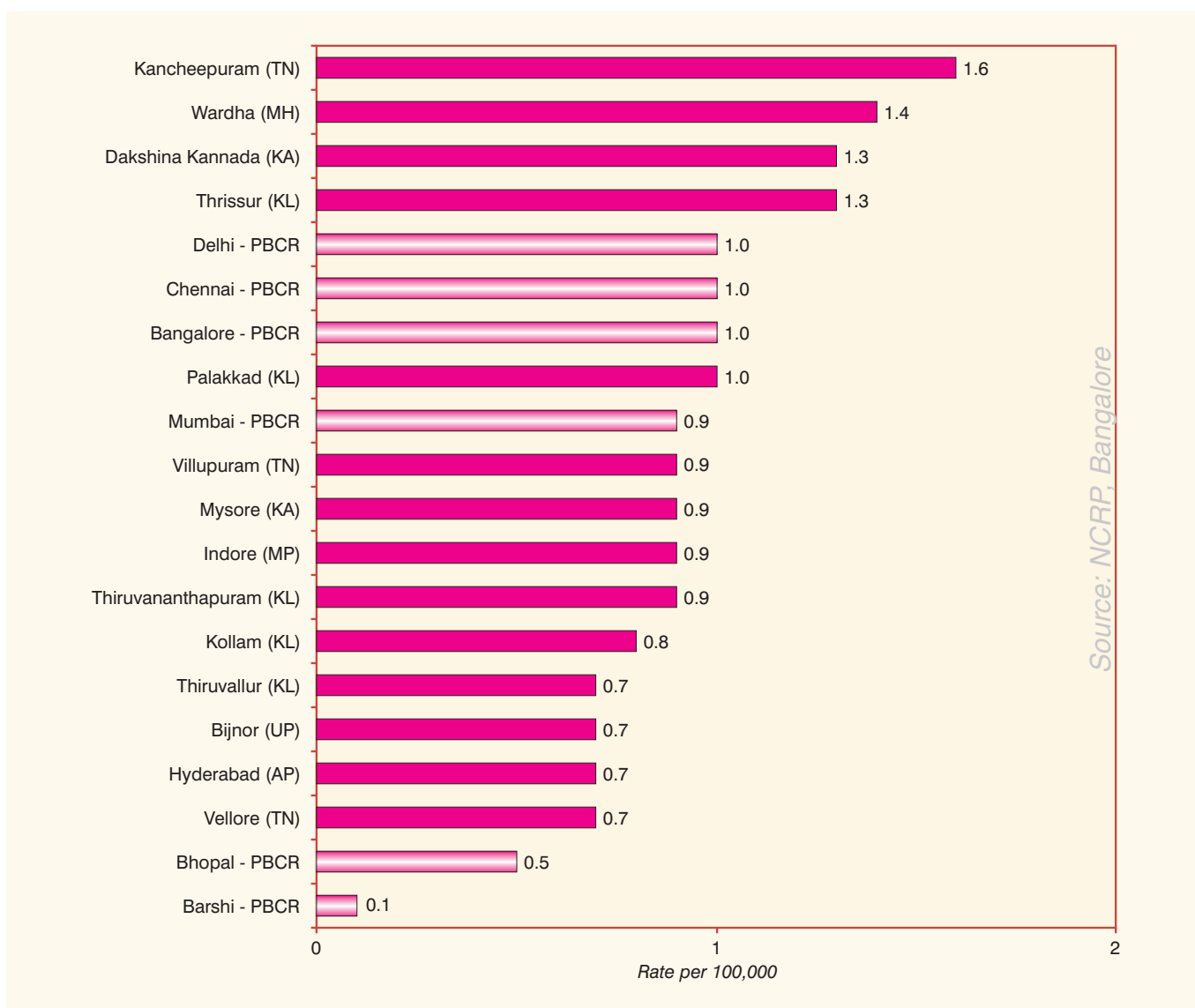
## 6.23. HODGKIN'S DISEASE (ICD-10 : C81) - MALES

Hodgkin's Disease showed a marginally higher MAAR in some districts without any geographical predominance. [Fig. 6.23(b)].

**FIGURE 6.23(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Hodgkin's Disease (ICD-10 : C81) – Males**

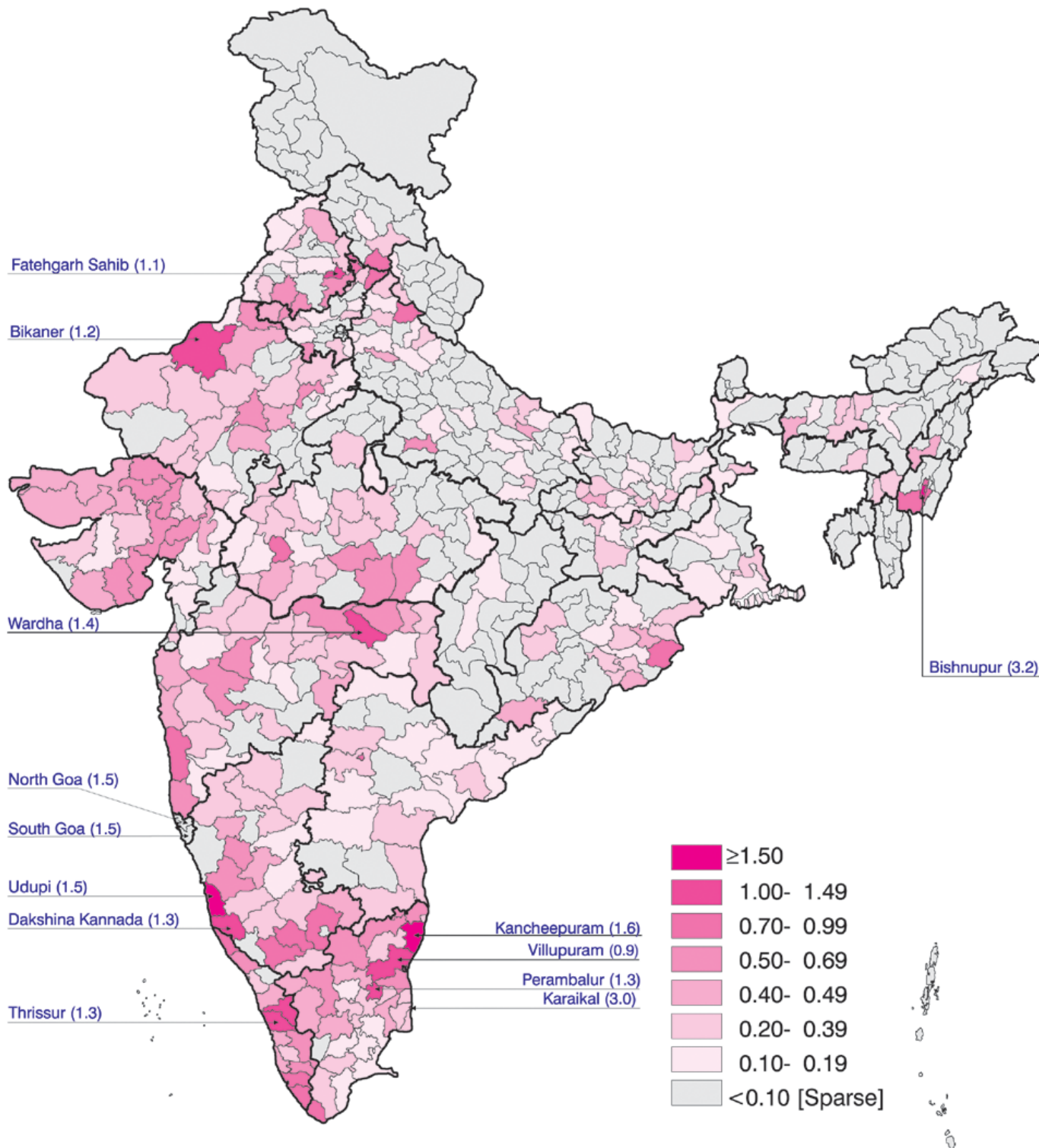


**FIGURE 6.23(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Hodgkin's Disease (ICD-10 : C81) – Males**





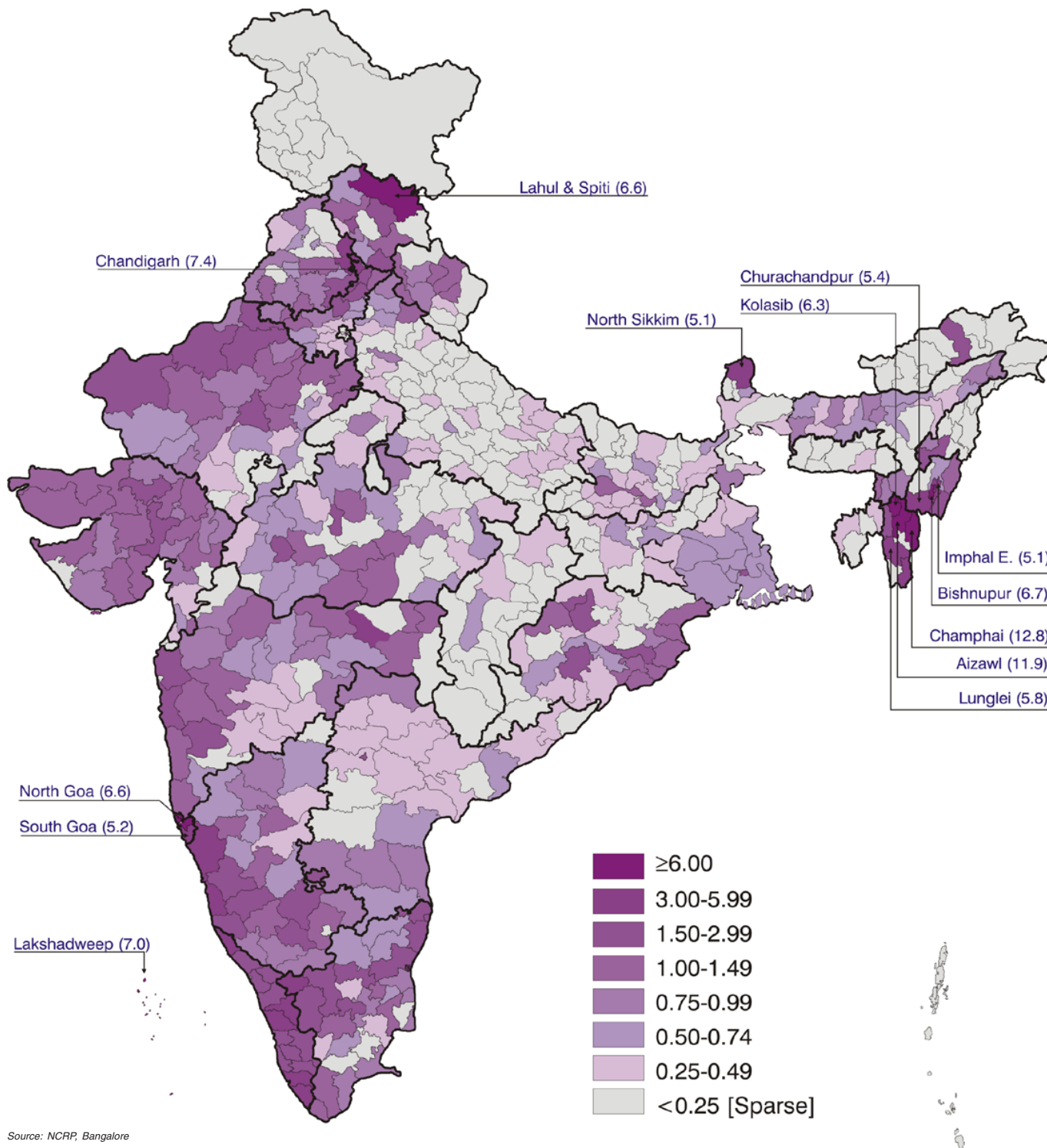
**MAP 6.23 :Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Hodgkin's Disease (ICD-10 : C81) 2001 - 2002 – Males**



## 6.24. NON-HODGKIN'S LYMPHOMA (ICD-10 : C82-C85, C96) - MALES

Non-Hodgkin's Lymphoma (NHL) has been an important leading site of cancer in the urban PBCRs, though the rates are somewhat lower than the highest rates of the world. Among Indian PBCRs Delhi had the highest rate of

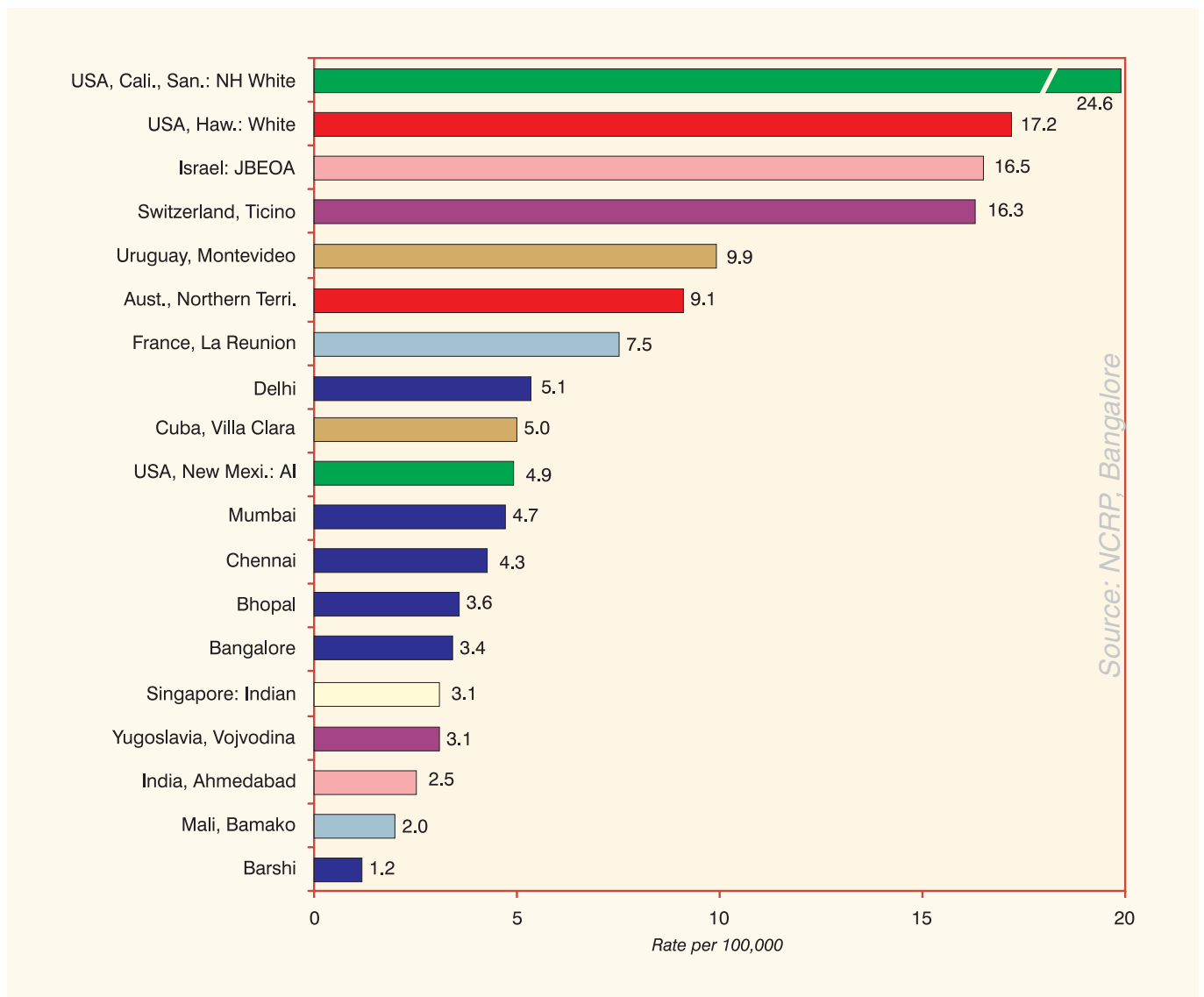
**MAP 6.24 :Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 NHL (ICD-10 : C82-C85,C96) 2001 - 2002 – Males**



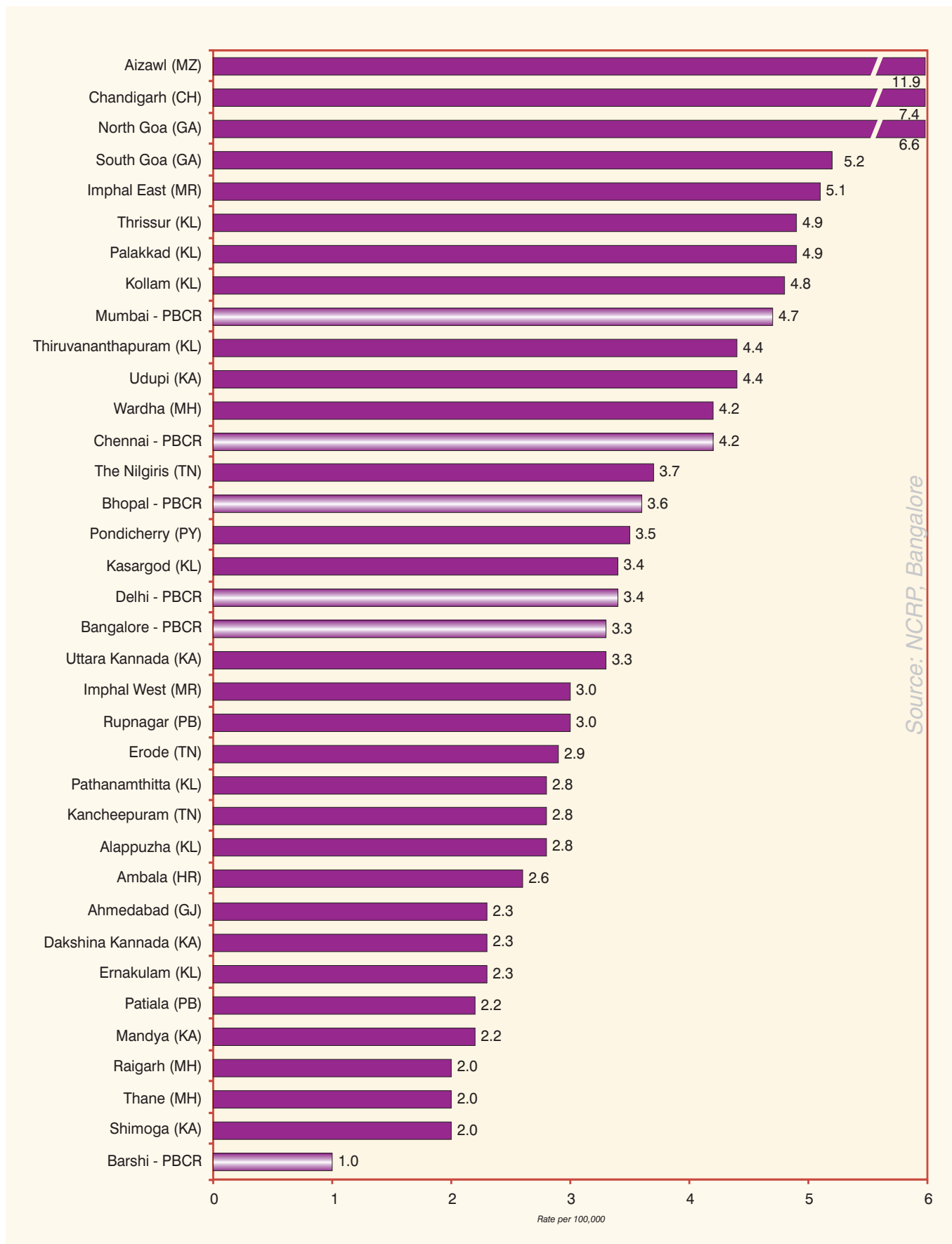
Source: NCRP, Bangalore

5.1/100,000. Mumbai and Chennai have had similar rates followed by Bhopal and Bangalore [Fig. 6.24(a)]. Since the basis of diagnosis of this site of cancer is microscopy (except in rare instances) there is little difference between the AAR and MAARs. The district-wise distribution showed that five districts had MAARs higher than that of Delhi [Fig. 6.24(b)] and at least nine other districts had rates comparable with the urban PBCRs.

**FIGURE 6.24(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — NHL (ICD-10 : C82-C85,C96) – Males**



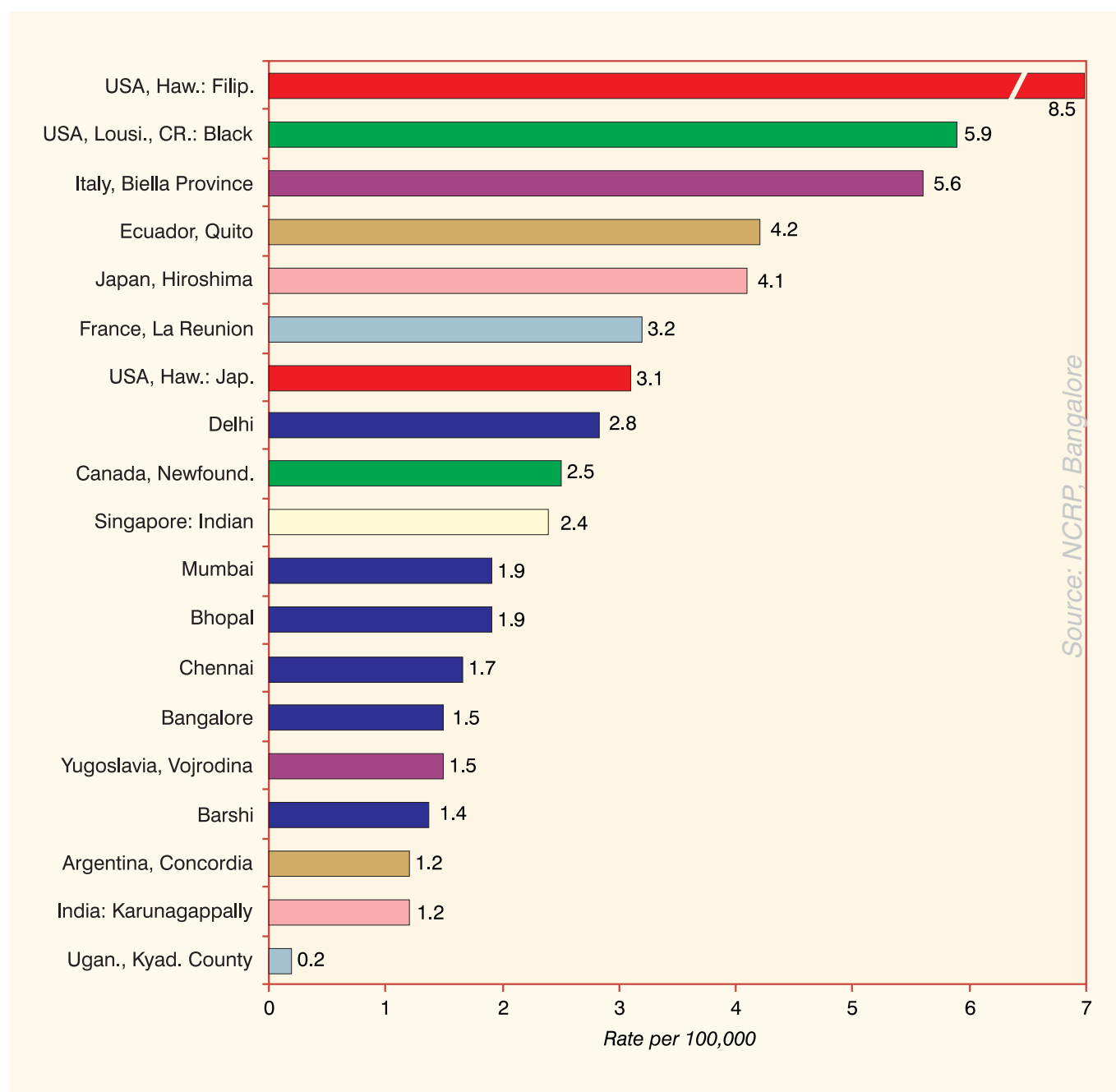
**FIGURE 6.24(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — NHL (ICD-10 : C82-C85,C96) – Males**



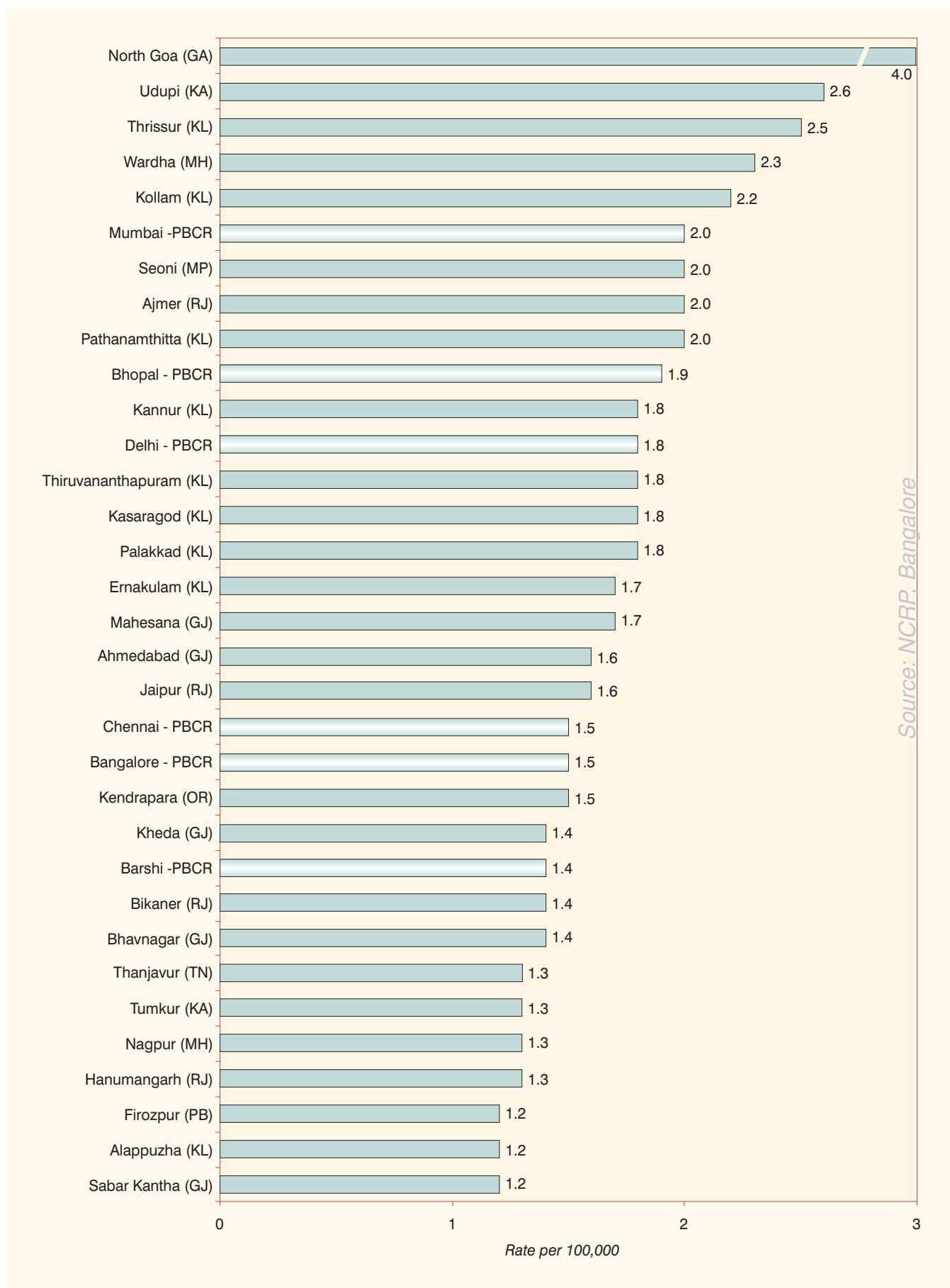
## 6.25. MYELOID LEUKAEMIA (ICD-10 : C92-94) - MALES

Myeloid leukaemia showed a relatively higher MAAR than that seen in PBCRs with concentration of higher MAARs in Manipur and Mizoram states and the south west coast in both sexes. [Fig 6.25(b) & Fig 6.26(b)] The number of cases were too small for classifying into acute and chronic myeloid leukaemia.

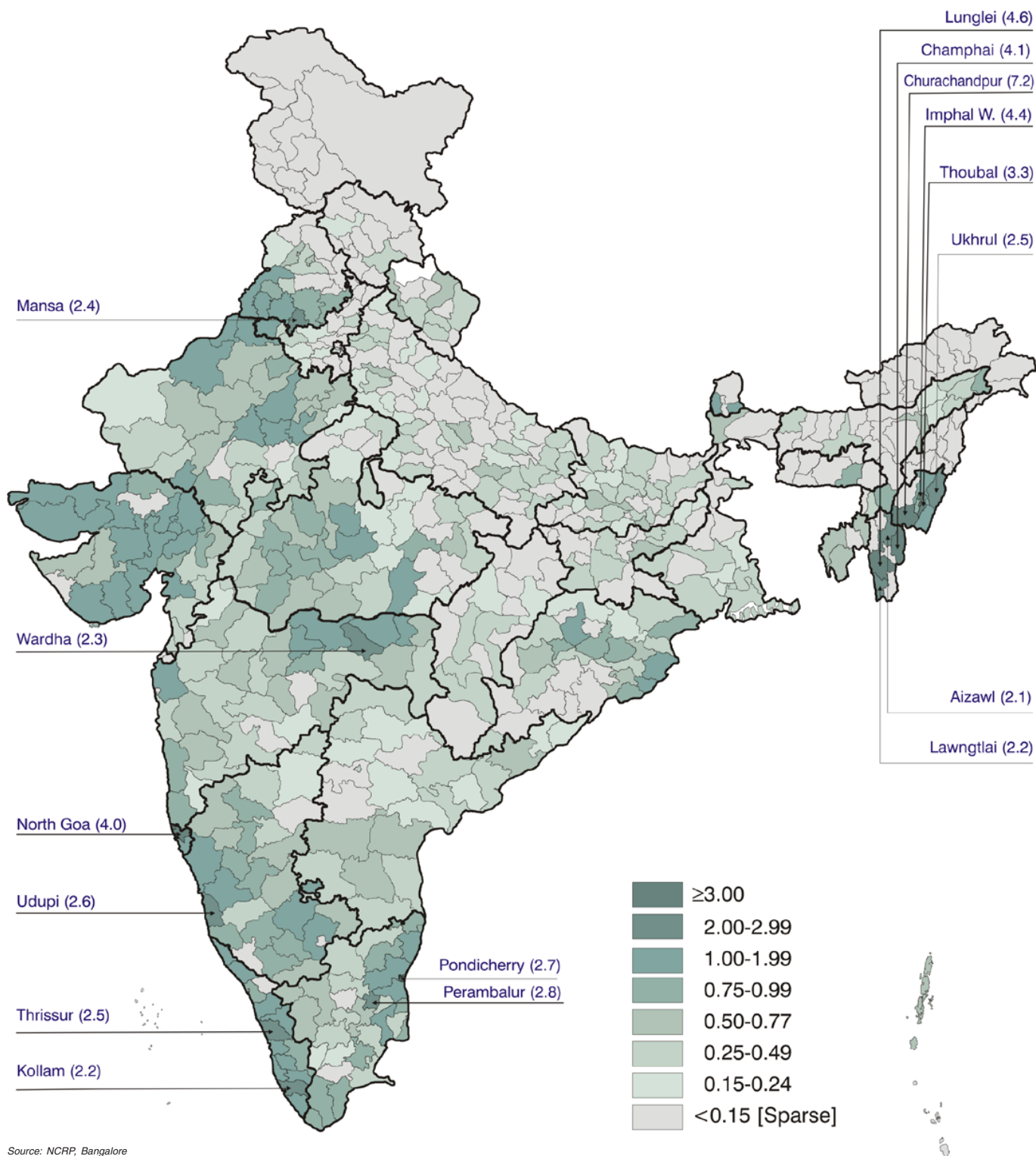
**FIGURE 6.25(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Myeloid Leukaemia (ICD-10 : C92-94) – Males**



**FIGURE 6.25(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Myeloid Leukaemia (ICD-10 : C92-94) – Males**



**MAP 6.25 :Districtwise Minimum Age Adjusted Incidence Rates Per 100,000 Myeloid Leukaemia (ICD-10 : C92-94) 2001 - 2002 – Males**

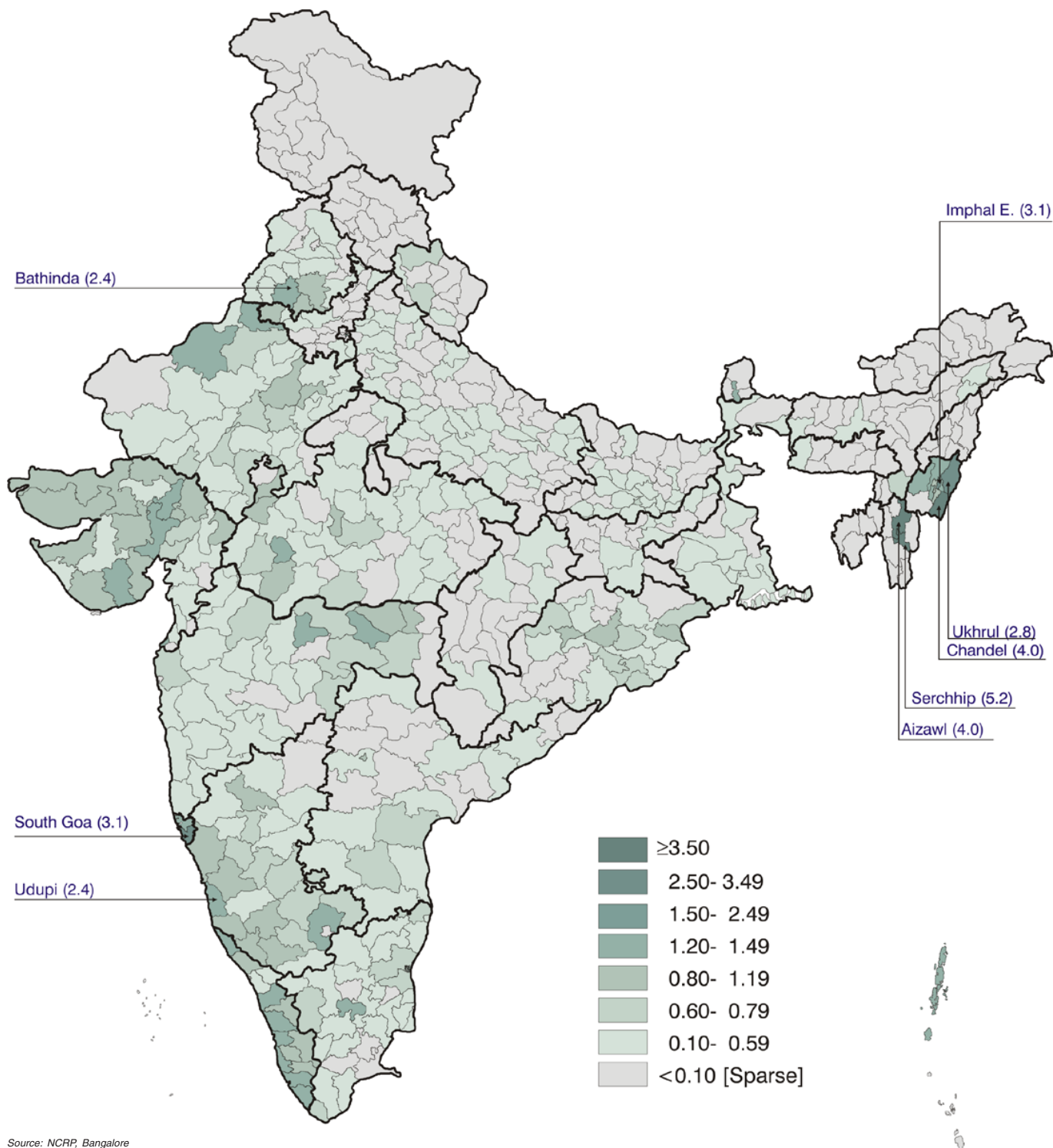


Source: NCRP, Bangalore

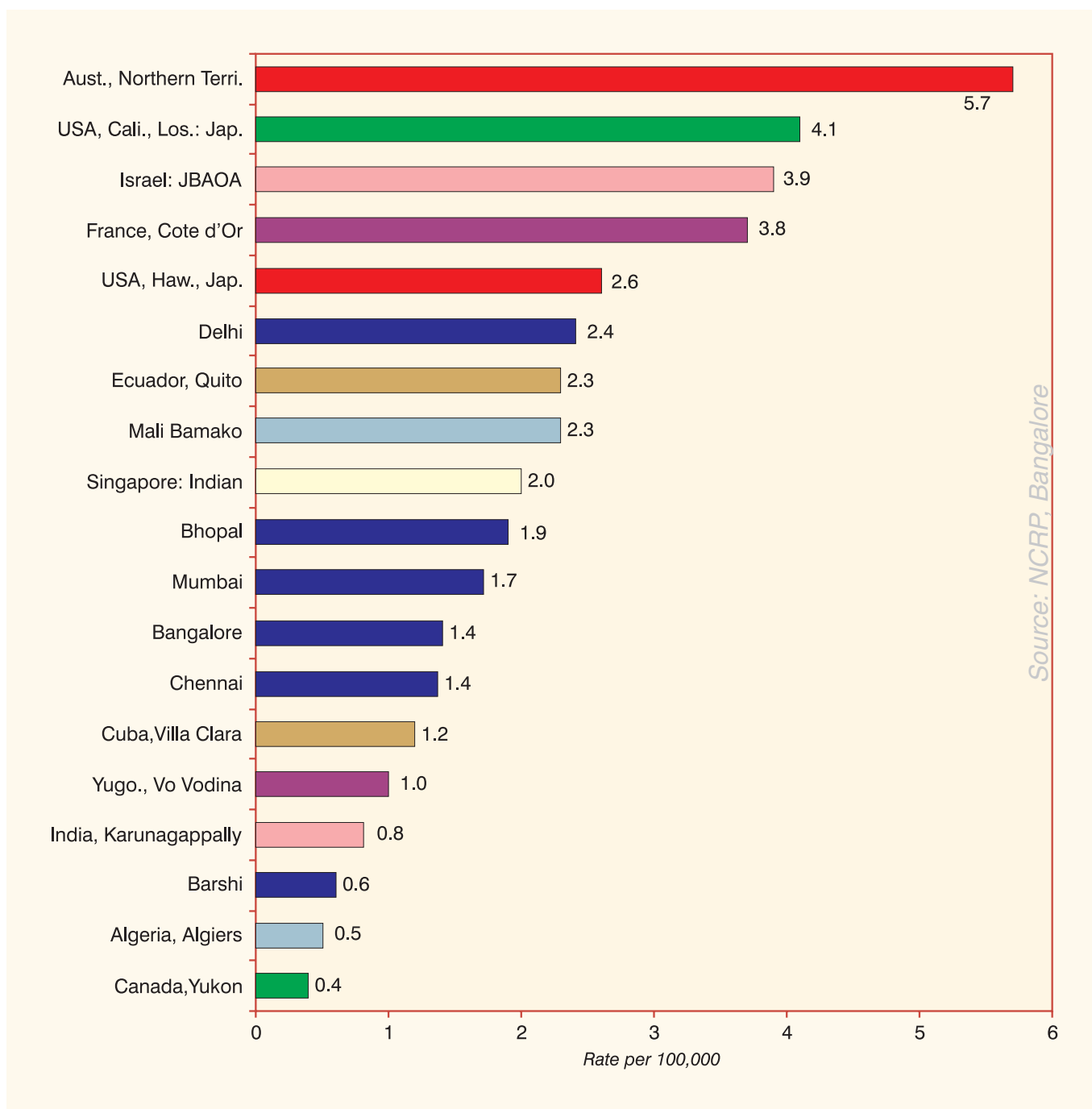


## 6.26. MYELOID LEUKAEMIA (ICD-10 : C92-94) - FEMALES

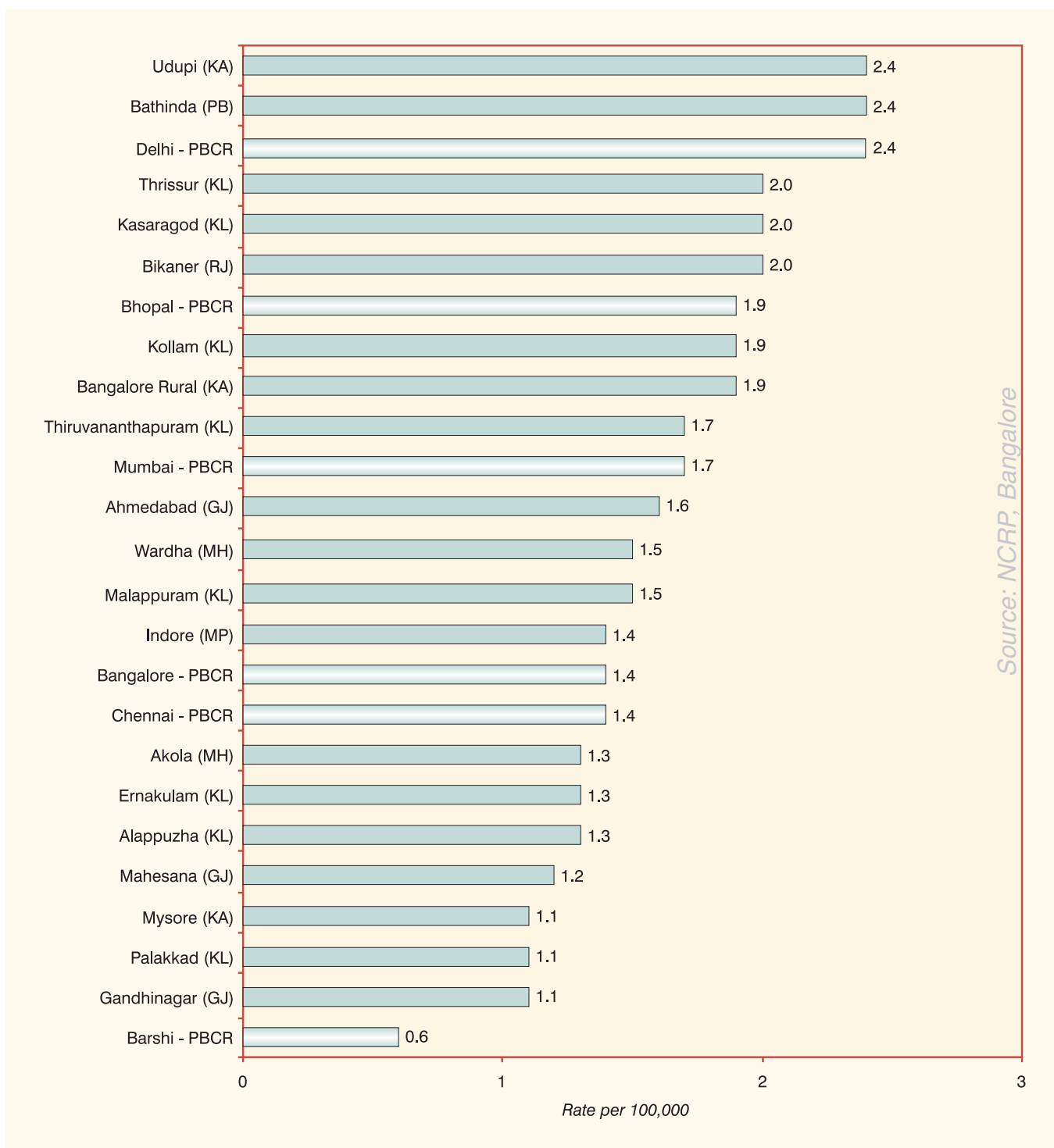
**MAP 6.26 :Districtwise Minimum Age Adjusted Incidence Rates Per 100,000  
Myeloid Leukaemia (ICD-10 : C92-94) 2001 - 2002 – Females**



**FIGURE 6.26(a) : International Comparisons of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Myeloid Leukaemia (ICD-10 : C92-94) – Females**



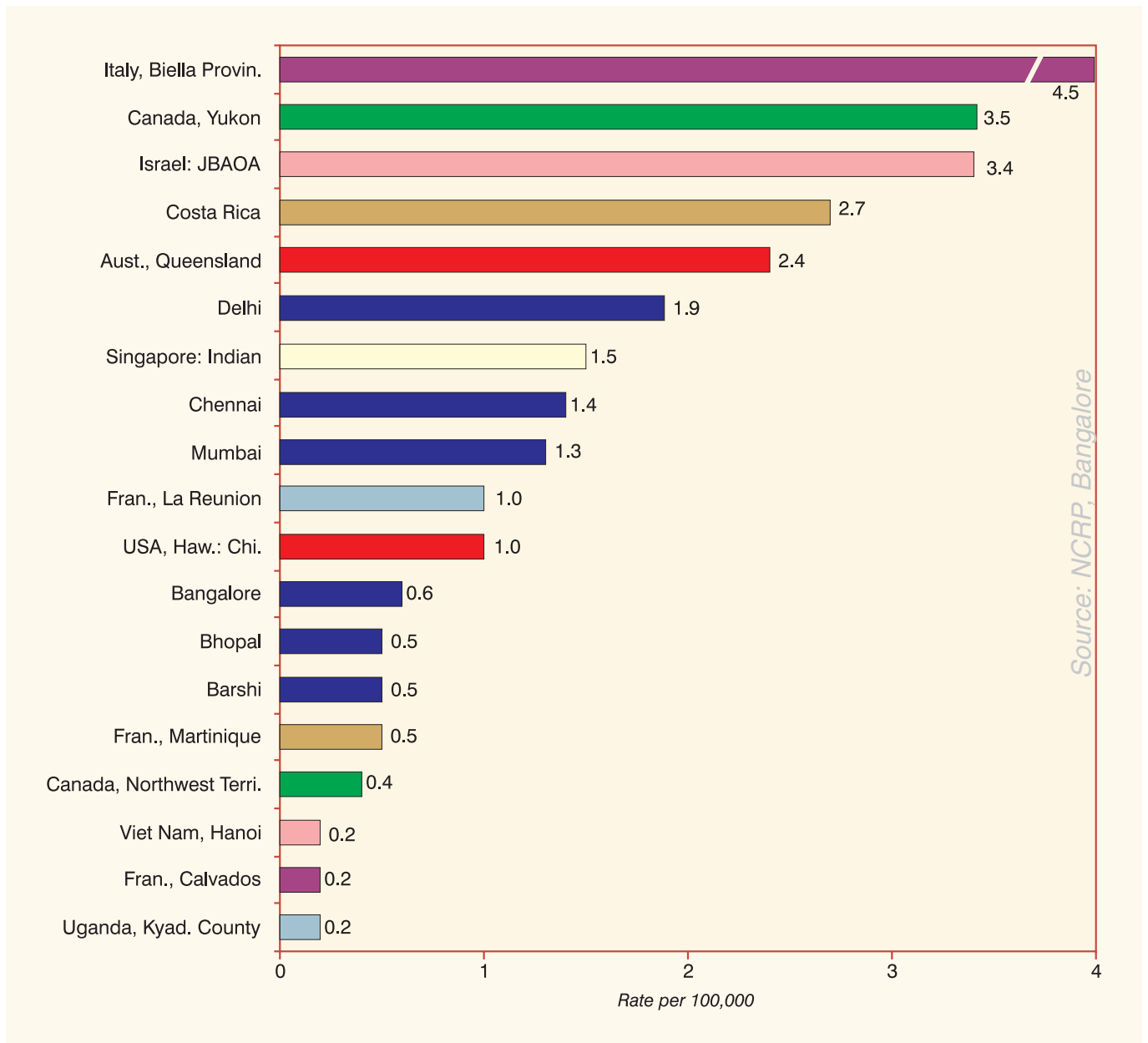
**FIGURE 6.26(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Myeloid Leukaemia (ICD-10 : C92-94) – Females**



## 6.27. ACUTE LYMPHATIC LEUKAEMIA (ICD-10 : C91.0) - MALES

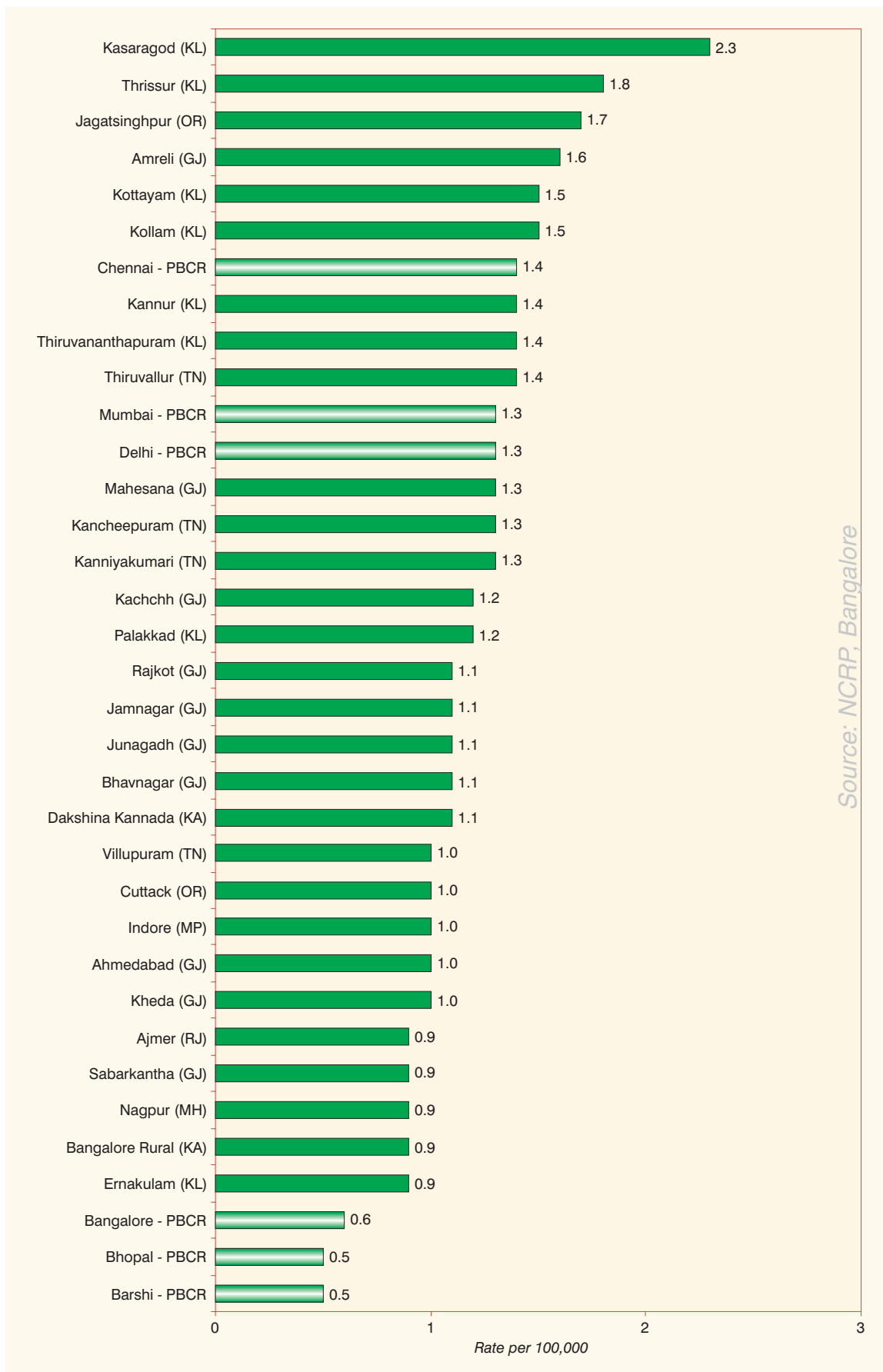
Kasaragod district in Kerala state had a higher MAAR than that of Delhi PBCR. [Fig. 6.27(b)].

**FIGURE 6.27(a) : International Comparisons\* of Age Adjusted Incidence Rates with that of PBCRs under NCRP — Acute Lymphatic Leukaemia (ICD-10 : C910) – Males**

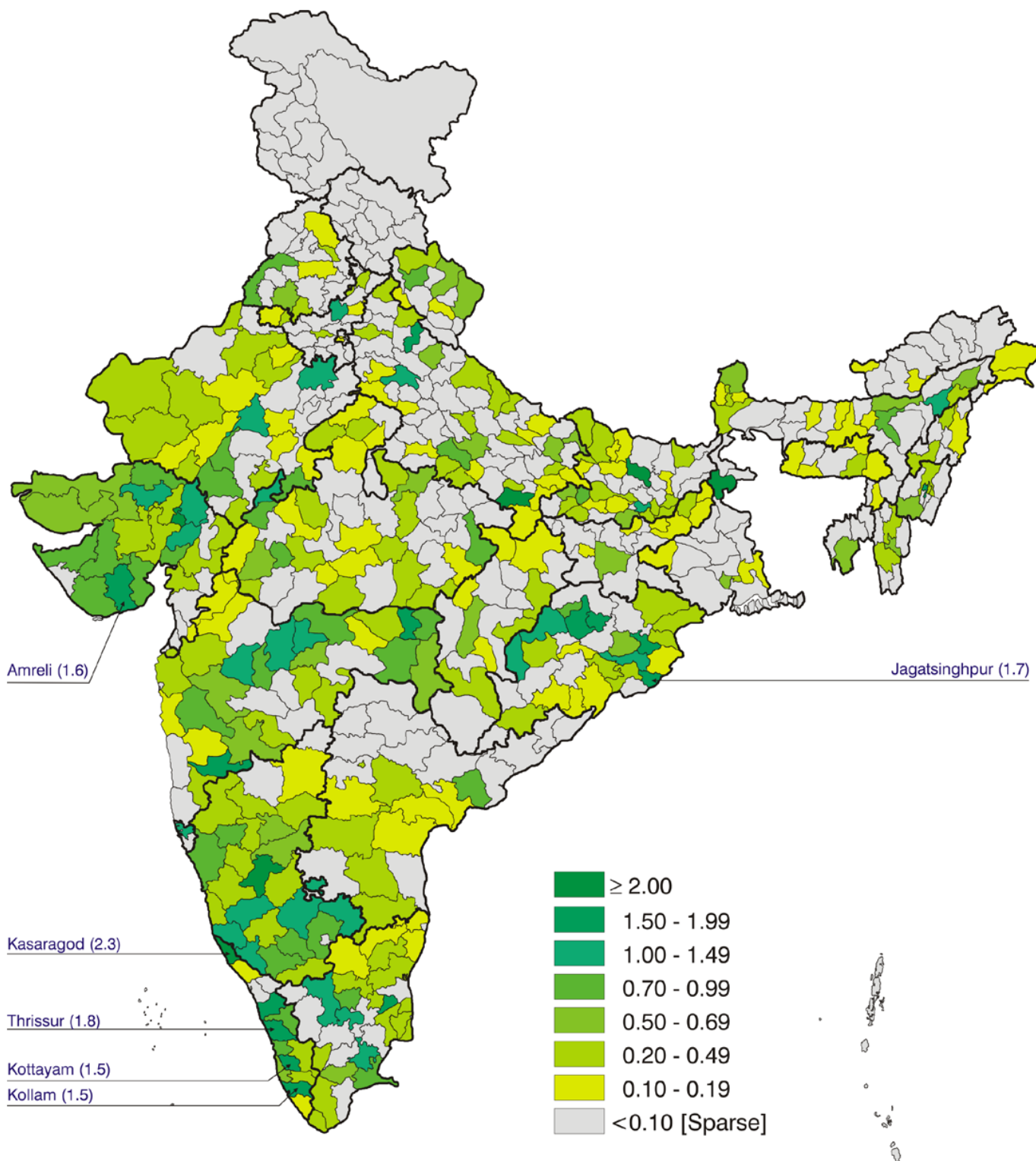


\*Data obtained through personal communication from Dr. D.M. Parkin.

**FIGURE 6.27(b) : Districtwise Comparisons of Minimum Age Adjusted Incidence Rates with that of PBCRs under NCRP — Acute Lymphatic Leukaemia (ICD-10 : C910) – Males**



**MAP 6.27 :Districtwise Minimum Age Adjusted Incidence Rates Per 100,000  
Acute Lymphatic Leukaemia (ICD-10 : C91.0) 2001 - 2002 – Males**



Source: NCRP, Bangalore