

Population Based Cancer Registries at Kathmandu, Bhaktapur, Lalitpur, Siraha, Saptari, Dhanusha, Mohattari, West Rukum and East Rukum Districts, Nepal, 2018



Government of Nepal

Nepal Health Research Council

Ramshah Path, Kathmandu



**Report of Population Based Cancer Registries at
Kathmandu, Bhaktapur, Lalitpur, Siraha, Saptari, Dhanusha,
Mohattari, West Rukum and East Rukum Districts, Nepal, 2018**

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Preface

The burden of Non Communicable Disease is increasing globally. Currently, Nepal is also facing increasing double burden Non communicable disease like other developing countries. The major NCDs like cardiovascular disease, cancer, diabetes and chronic respiratory diseases are increasing in recent years. Cancer has become one of the major public health issues in Nepal which demands huge investment for prevention and treatment. It is reported as fifth leading cause of death in Nepal. In this context population based evidence of cancer is the primary need of government of Nepal in order to develop country specific strategies and programs to prevent, control and treat the diseases.

Population Based Cancer Registry has been established by Nepal Health Research Council since January 1, 2018 in close collaboration with Ministry of Health and Population (MoHP), WHO country office Nepal and International Agency for Research on Cancer (IARC) Regional Hub, Mumbai. The main aim of the registry is generating evidence on cancer incidence, mortality, pattern and trends in Nepal. The findings of the study will help in the development of cancer control strategy as per the need of the country. It also helps in providing the information regarding the geographical variation in the pattern of cancer which eventually helps the national, provincial and local governments to plan and develop targeted interventions to control cancer. It will serve as a basis in developing evidence based cancer control and prevention programs for the policy makers and planners.

I would like to take this opportunity to thank all who have supported and contributed in establishing the registry and generating the evidence. I express my sincere gratitude to the support of MoHP, technical assistance of IARC, Regional Hub and WHO Country Office for Nepal. I am very thankful to BP Koirala Memorial Cancer Hospital, Chitwan for their strong support and collaboration to continue the Population based cancer registry in Nepal. I extend my thankfulness to all the hospitals, hospice, ayurvedic centers, pathology laboratories, social security and nursing division, civil registration, local bodies like municipalities, DHOs/DPHOs, Health posts, ward offices and community leaders in helping us in providing the data. Finally, I appreciate NHRC team members for their continuous effort in making registry successful and providing such a valuable evidence to the country.

Prof. Dr. Anjani Kumar Jha

Chairman

Nepal Health Research Council

Contribution in Population Based Cancer Registry in Nepal

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Director	Civil Service Hospital	Member
Director	Patan Hospital	Member
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BACKGROUND

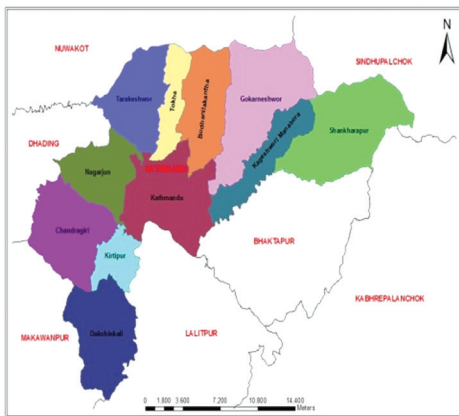
Nepal Health Research Council (NHRC) has started Population Based Cancer Registry (PBCR) since January 2018 in close collaboration with Ministry of Health and Populations and with technical support from WHO Country Office for Nepal and International Agency for Research on Cancer (IARC). Currently, three PBCRs have been established in 9 districts out of 77 districts of the country. They are Kathmandu, Bhaktapur and Lalitpur districts in Bagmati Province (PBCR representing of hill region), Siraha, Saptari, Dhanusha and Mohattari in Province no. 2 (PBCR representing of low land terai region), and East and West Rukum in Province no. 5 and Karnali Province (PBCR representing mountain region). The objective of the registry is to generate evidence on cancer incidence, patterns and trends and mortality related to cancer in the given territory and defined population, and to enhance national capacity for sustainable PBCR in the country. The registry data are useful to plan cancer control activities as well as to strengthen cancer care services by the government of Nepal.

POPULATION COVERED

With three registry sites, PBCR Nepal cover all urban/rural municipalities of nine districts of Nepal which include Kathmandu, Bhaktapur, Lalitpur, Siraha, Saptari, Dhanusha, Mahottari, East Rukum and West Rukum with an estimated population of covering 20.27% population of Nepal according to the census 2011. The Kathmandu Valley registry is an urban registry, Siraha, Saptari, Dhanusha and Mahottari (SSDM) Registry a semi urban registry and Rukum registry is predominantly rural registry. For the purpose of analysis, the population has been estimated for 2018 on the basis of population of 2001 and 2011. The estimated population distribution of 2018 is shown in table below

Cancer Registry	Province	Area	Population	% of population Covered of Nepal
PBCR Kathmandu valley	Bagmati	Urban	3071932	10.48%
Kathmandu			2165764	
Lalitpur			551083	
Bhaktapur			355085	
PBCR Siraha, Saptari, Dhanusha and Mahottari (SSDM)	2	Semi Urban	2846036	9.71%
Siraha			680249	
Saptari			683194	
Dhanusha			807858	
Mohattari			674734	
PBCR Rukum	5 and Karnali	Rural	221376	0.75%
Total			5940105	20.27%

AREA COVERED



Kathmandu District



Lalitpur District



Bhaktapur District



Rukum West District



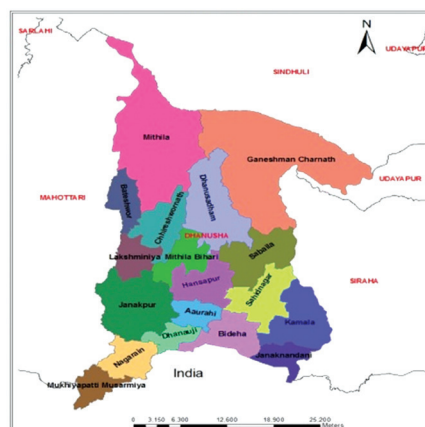
Rukum East District



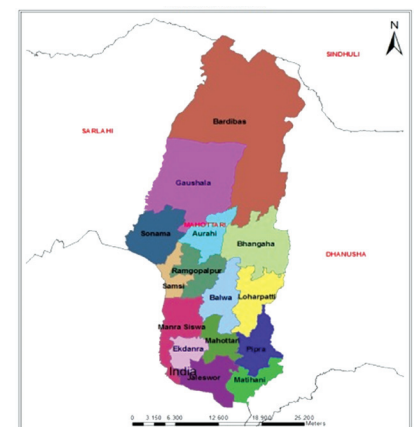
Siraha District



Saptari District



Dhanusha District



Mohattari District

CANCER INCIDENCE AND MORTALITY

Population Covered, Incidence Cases Registered and Incidence Rate by Sex:2018

	Rukum	Kathmandu Valley	Kathmandu District	Lalitpur District	Bhaktapur District	SSDM	Siraha District	Saptari District	Dhanusha District	Mohattari District
Male										
Average Population Covered	101530	1587691	1127450	279848	180393	1372101	321188	328124	397066	325723
Number of cases registered	44	999	630	222	147	564	166	175	120	103
AAR per 100000	59.1	95.3	90.4	101.3	112.5	47.1	59.1	58.7	35.8	37.0
Cumulative risk of getting the disease (0-74 age group)	1 in 15	1 in 8	1 in 9	1 in 8	1 in 7	1 in 20	1 in 15	1 in 15	1 in 29	1 in 25
Female										
Average Population Covered	119846	1484241	1038314	271235	174691	1473935	359062	355070	410792	349011
Number of cases registered	43	1157	721	262	174	542	154	123	143	122
AAR per 100000	51.4	98.1	92.6	109.2	107.8	44.6	50.5	40.1	44.2	43.5
Cumulative risk of getting the disease (0-74 age group)	1 in 18	1 in 9	1 in 9	1 in 8	1 in 8	1 in 20	1 in 6	1 in 17	1 in 21	1 in 22

Population Covered, Death due to Cancer and Death Rate by Sex:2018

	Rukum	Kathmandu Valley	Kathmandu District	Lalitpur District	Bhaktapur District	SSDM Registry	Siraha District	Saptari District	Dhanusha District	Mohattari District
Male										
Average Population Covered	101530	1587691	1127450	279848	180393	1372101	321188	328124	397066	325723
Number of cases registered	16	365	210	91	64	155	57	44	20	34
AAR per 100000	21.4	36.3	31.6	43.3	49.4	13.1	20.2	15.4	6.0	11.8
Cumulative risk of getting the disease (0-74 age group)	1 in 50	1 in 20	1 in 25	1 in 17	1 in 17	1 in 100	1 in 50	1 in 100		1 in 100
Female										
Average Population Covered	119846	1484241	1038314	271235	174691	1473935	359062	355070	410792	349011
Number of cases registered	22	305	183	82	40	135	38	34	26	33
AAR per 100000	25.1	27	24.9	34.7	34.7	11.1	13.0	11.3	8.8	11.6
Cumulative risk of getting the disease (0-74 age group)	1 in 50	1 in 33	1 in 33	1 in 25	1 in 33	1 in 100	1 in 50	1 in 100		1 in 50

CANCER INCIDENCE BY SEX

Cancer incidence rate varies according to geographical areas in Nepal. Among the three registries the Age Adjusted incidence Rate (AAR) and Mortality Rates were found higher in both male and female in Kathmandu valley followed by Rukum and SSDM. Though SSDM is semi urban area, the incidence and mortality rates are found to be lesser in SSDM than Rukum. The AAR and Age Adjusted Mortality Rate irrespective of sex and according to sex of the 3 registries are shown in figure below.

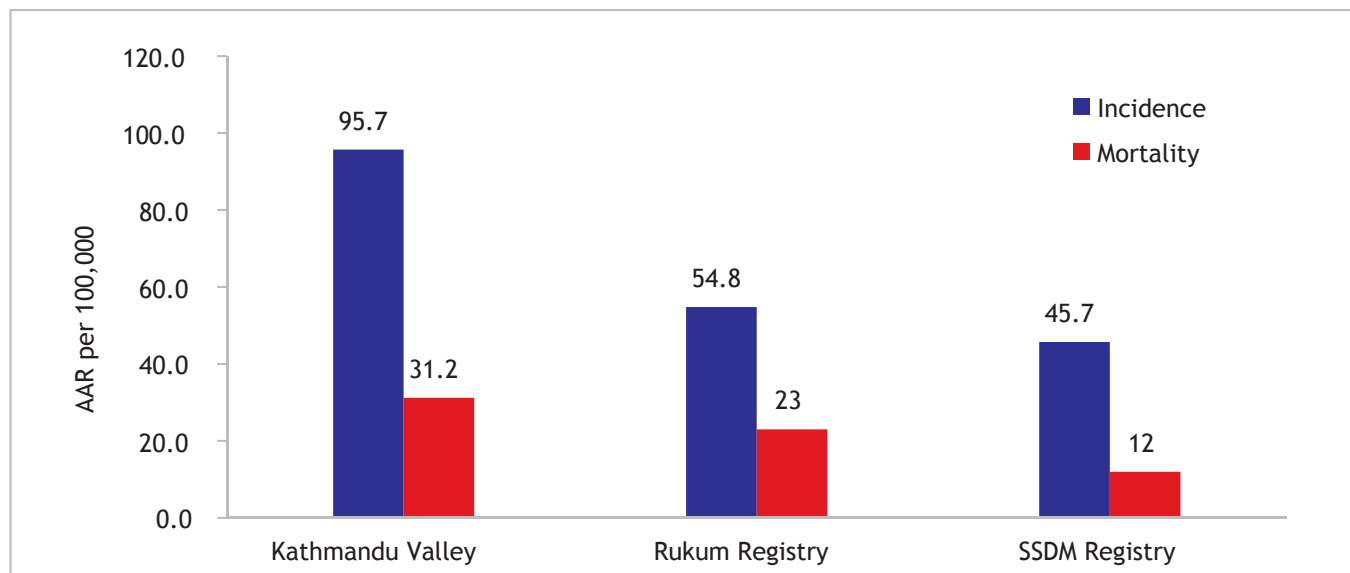


Figure 1. Age Standard Incidence and Mortality Rates in both Sexes in Three Registries of Nepal.

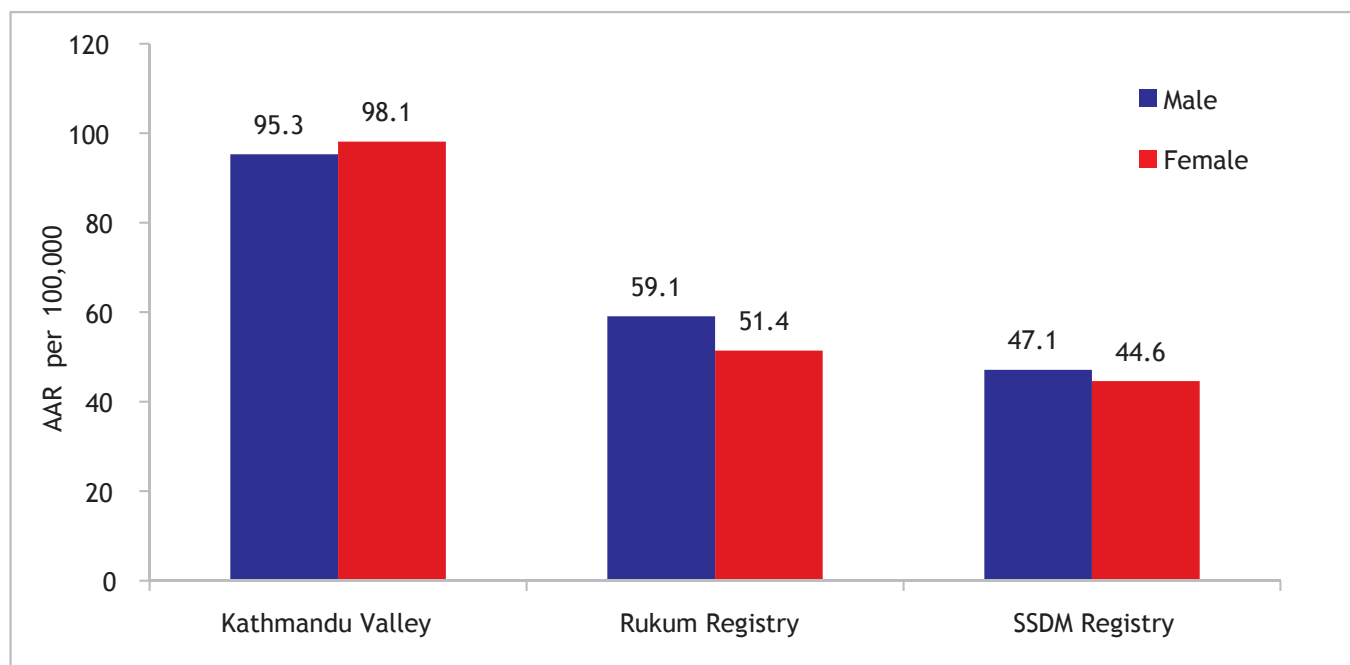


Figure 2. Comparisons of Age Standard Incidence Rates by Sex in Three Registries of Nepal.

Looking at all the districts within the three registries separately, higher incidence rate is found in urban areas and lower incidence rate is found in semi urban and rural areas. Among all registry sites, the highest cancer burden is found in Bhaktapur district among males and females both and lowest burden is found in Dhanusha District for males and among females the incidence rate is lowest in Saptari district. The figure shows the rate of cancer incidence in various districts of Nepal.

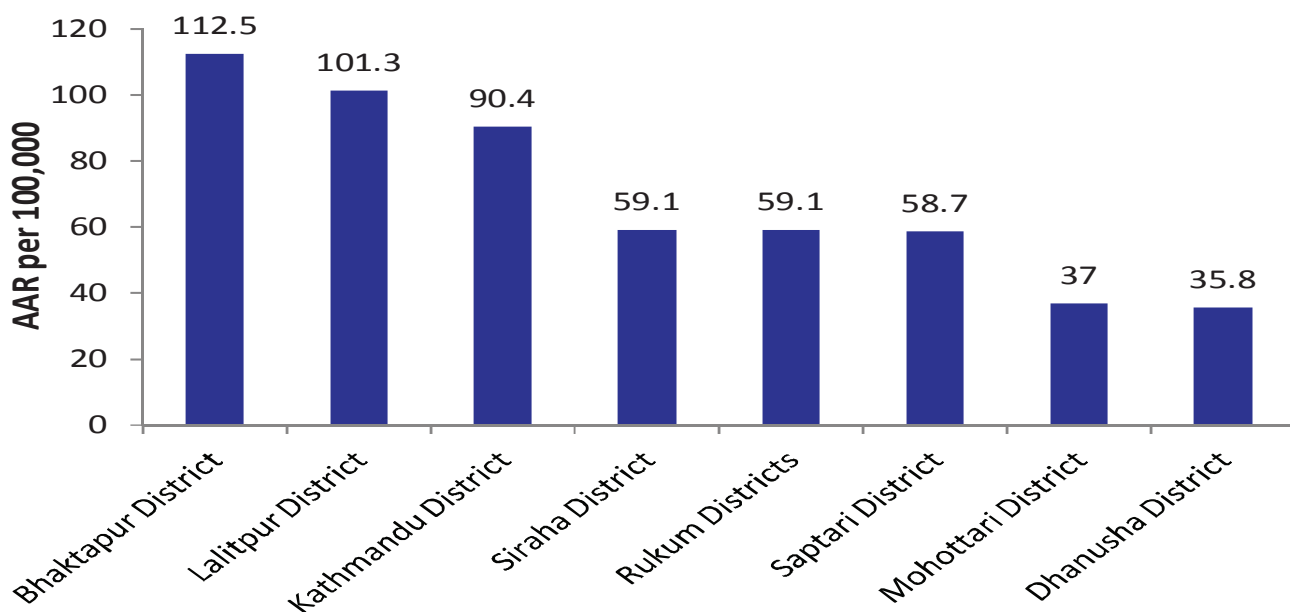


Figure 3. Comparison of Age Standard Incidence Rates in Males in the Districts of Nepal.

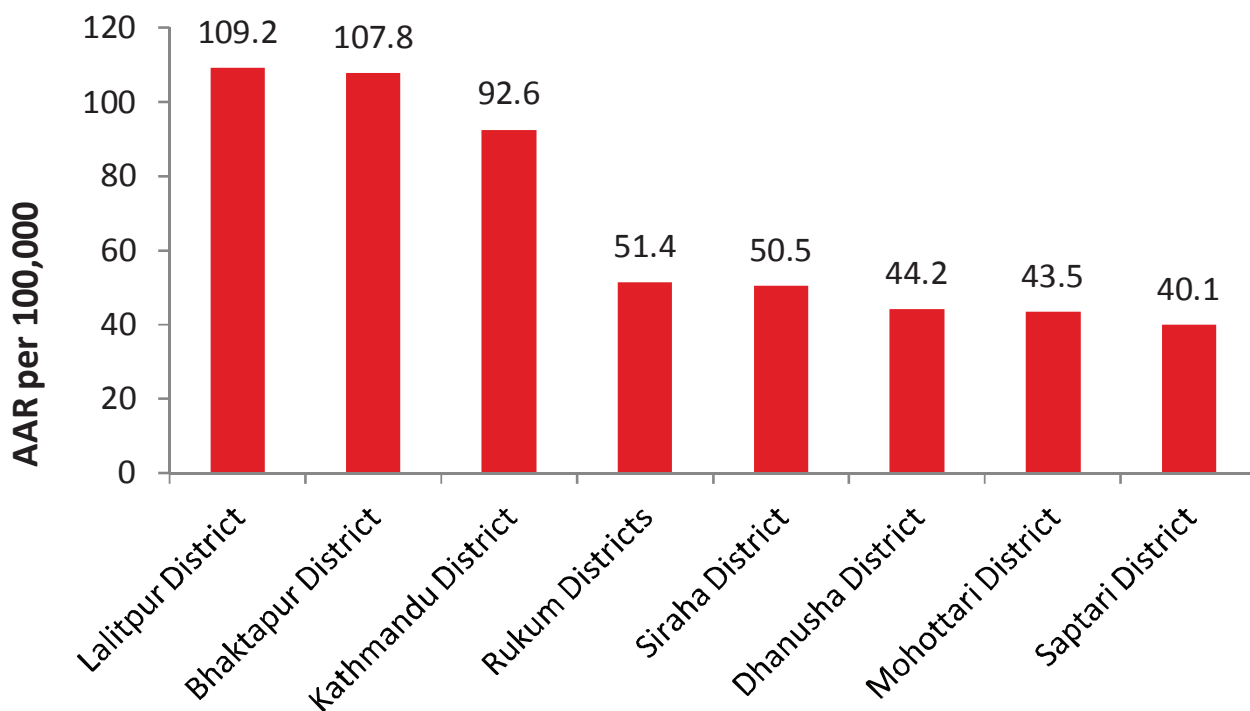


Figure 4. Comparison of Age Standard Incidence Rates in Females in the Districts of Nepal.

LEADING CANCER SITES

Lung cancer is the leading cancer site in male with AAR 18.1 in Kathmandu valley followed by stomach, urinary bladder, gall bladder and NHL. Similarly, breast cancer is the top most leading site for female in Kathmandu Valley followed by lungs and cervix as second and third leading sites respectively. Gall bladder cancer ranks fourth leading cancer in both male and female of Kathmandu Valley. Interestingly, ovary cancer is among the top fifth leading cancer site in Females.

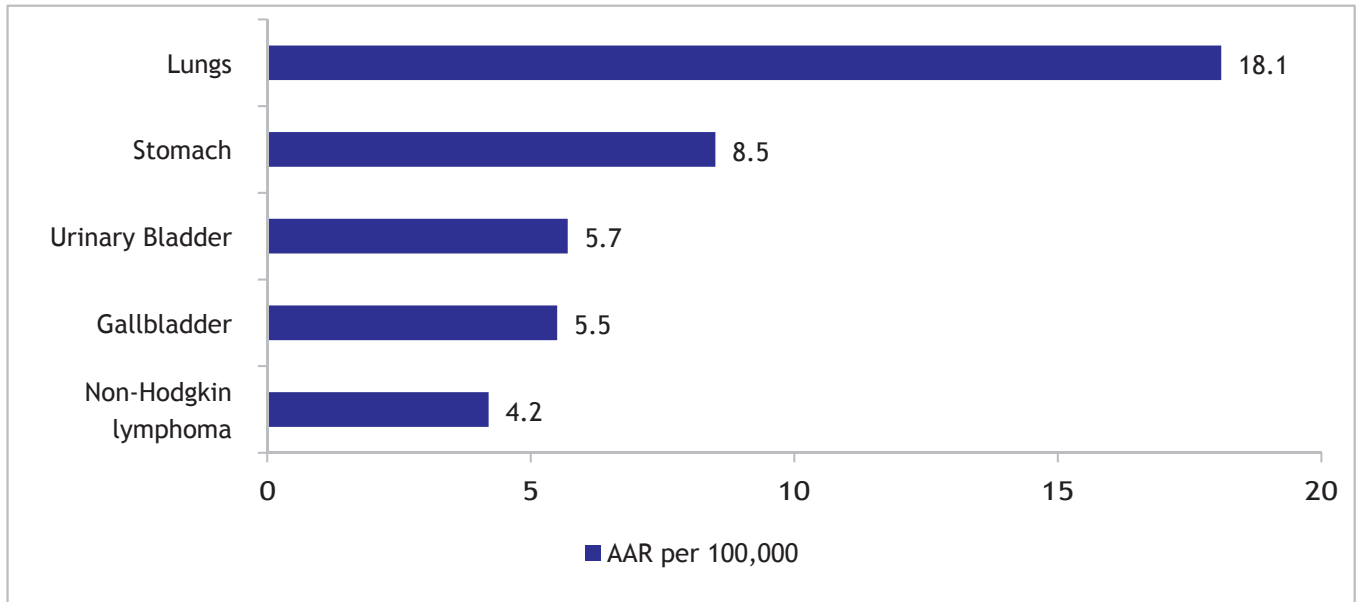


Figure 5. Leading Cancer Sites in Males, Kathmandu Valley.

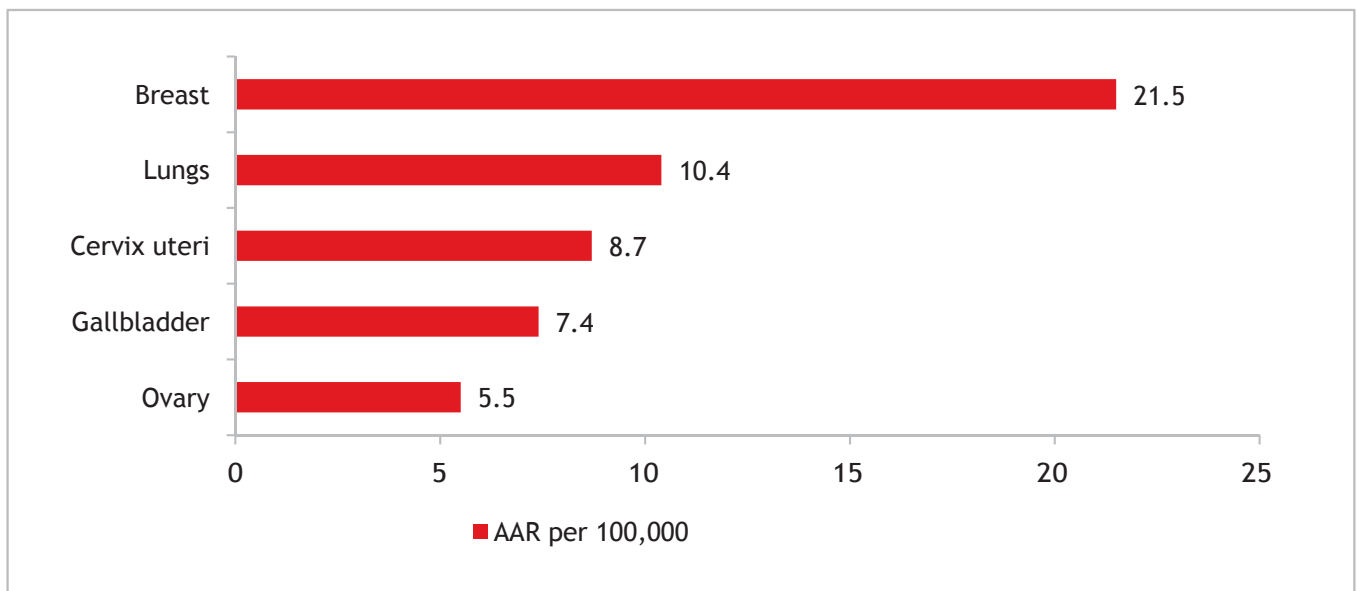


Figure 6. Leading Cancer Sites in Female, Kathmandu Valley.

In Kathmandu district, the top five leading cancer sites in male are as similar as with Kathmandu valley where lung is the top most followed by stomach, urinary bladder, gall bladder and Non- Hodgkin's Lymphoma . The most common site in female of Kathmandu district is the breast where the cervix and lung cancer ranks as second and third leading site respectively with little difference in AAR.

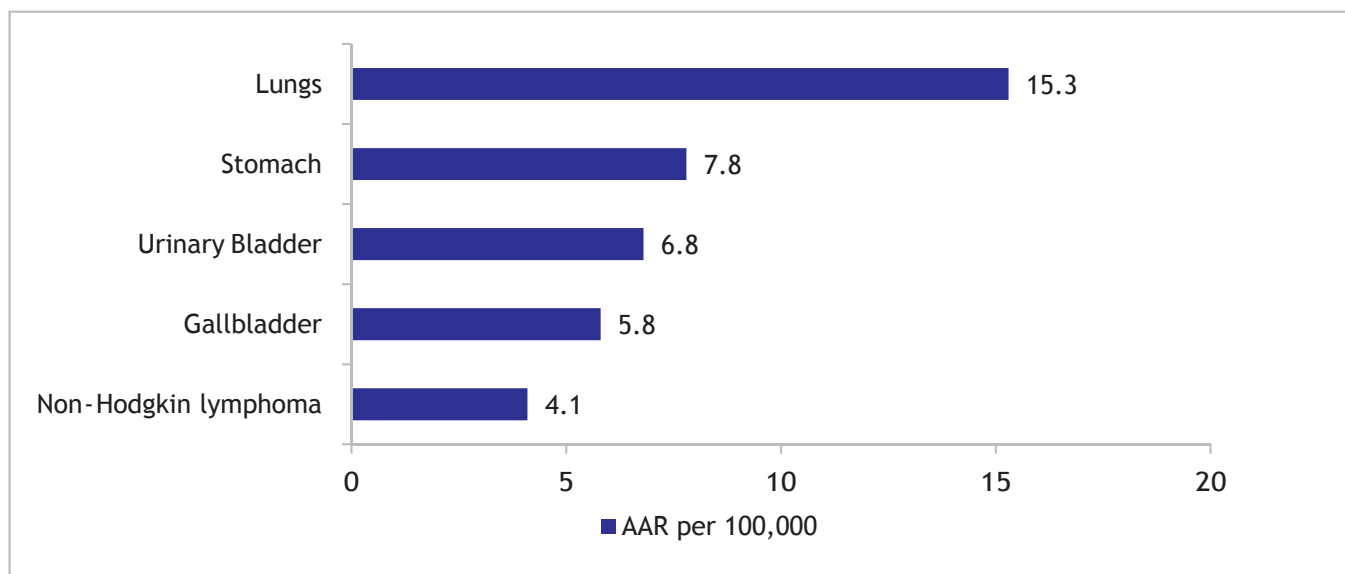


Figure 7. Leading Cancer Sites in Male, Kathmandu District.

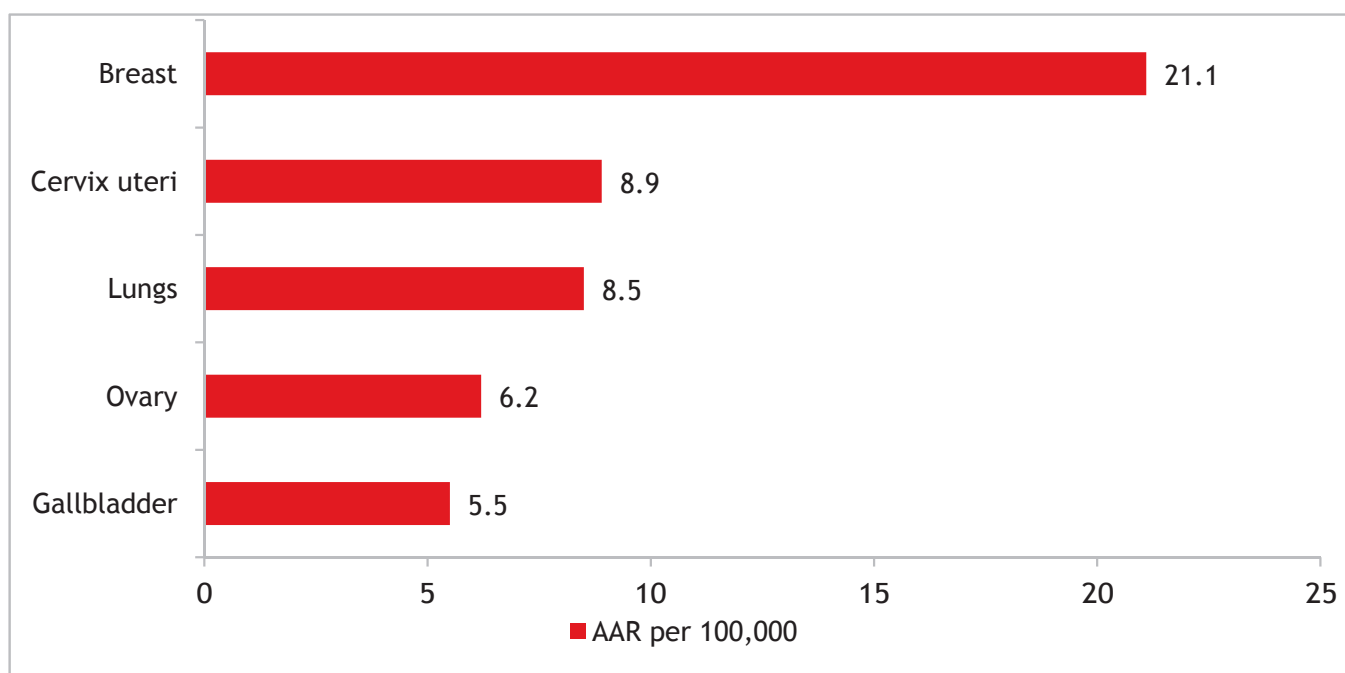


Figure 8. Leading Cancer Sites in Females, Kathmandu District.

As similar with other district, lung cancer ranks as first cancer site with highest AAR in Lalitpur district followed by stomach and gall bladder in second and third position respectively. Contrast to the other registry sites larynx and colon are the fifth common sites in males. Similarly, in female breast cancer is first leading site in females of Lalitpur district followed by lungs, gall bladder, cervix and thyroid cancer as second to fifth leading site respectively.

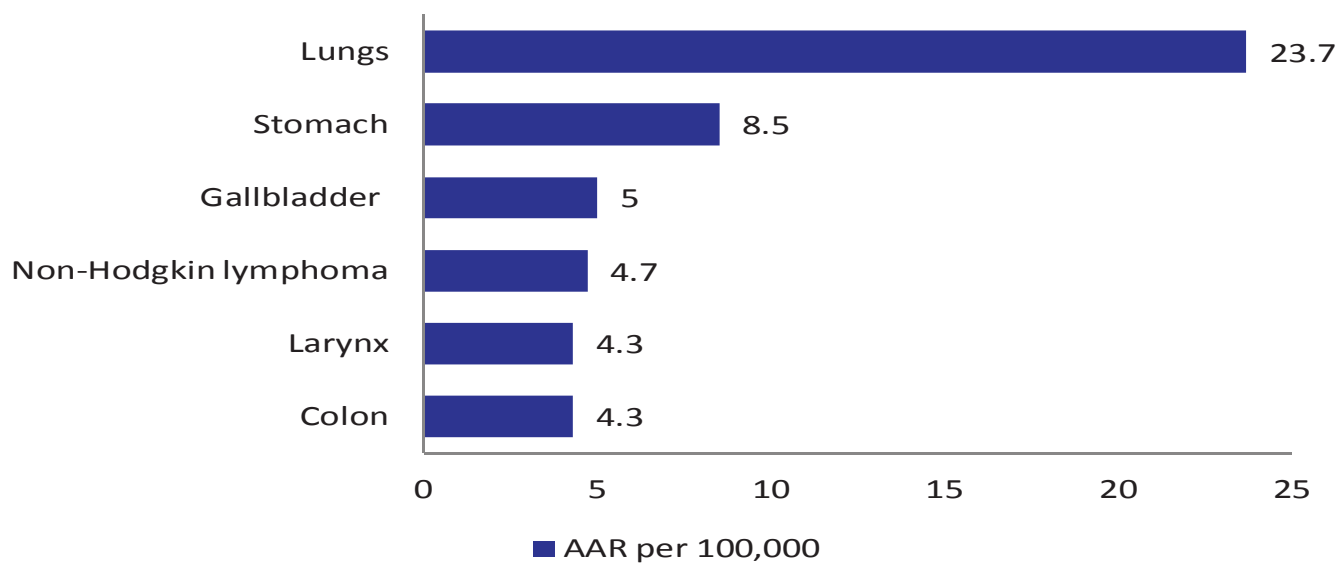


Figure 9. Leading Cancer Sites in Males, Lalitpur District.

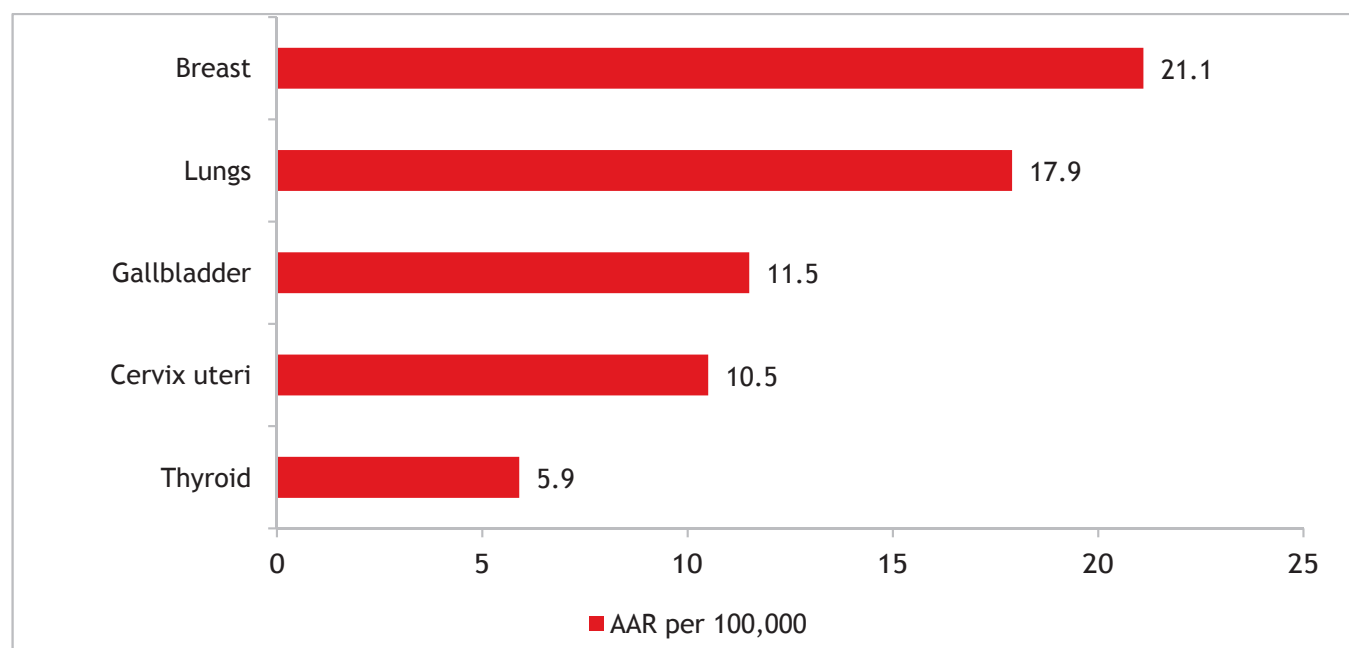


Figure 10. Leading Cancer Sites in Female, Lalitpur District.

Lung is the commonest site of cancer in males of Bhaktapur district followed by stomach cancer. Surprisingly, unlike Kathmandu and Lalitpur districts, the cancers of mouth and larynx are more common in Bhaktapur district. In female the leading sites were breast, gallbladder, lungs, thyroid and NHL. In contrast to other two districts, the AAR of cervix uteri in females in Bhaktapur district has been found low, not even in the top five.

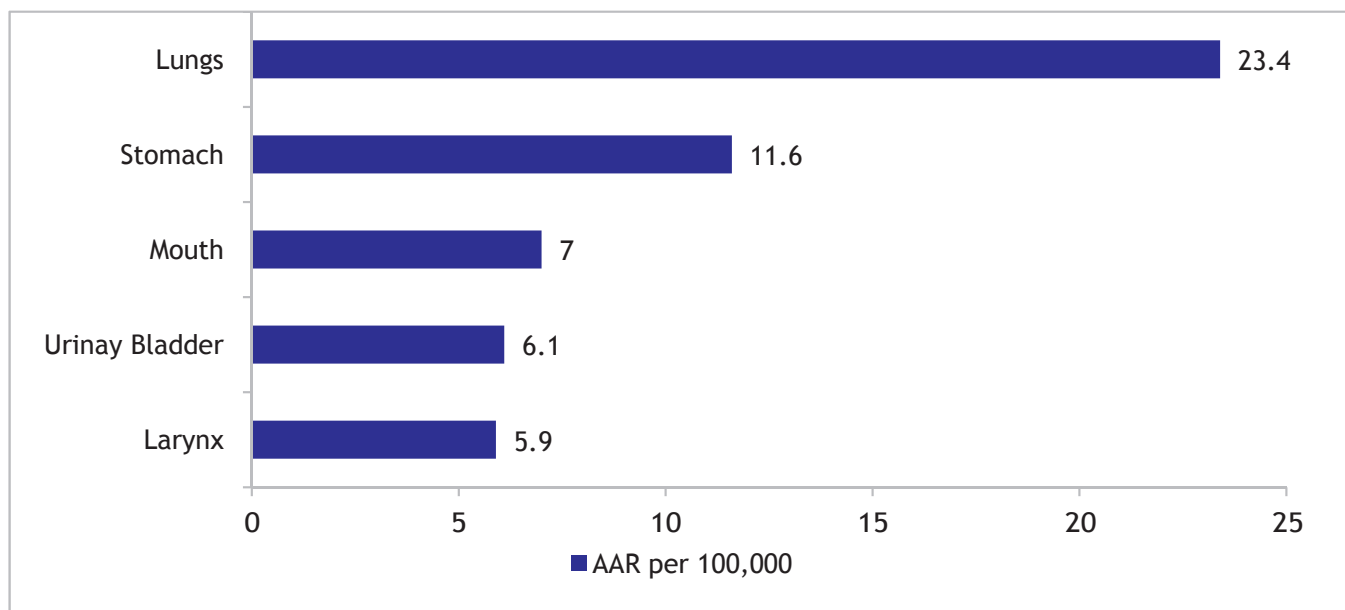


Figure 11. Leading Cancer Sites in Males, Bhaktapur District.

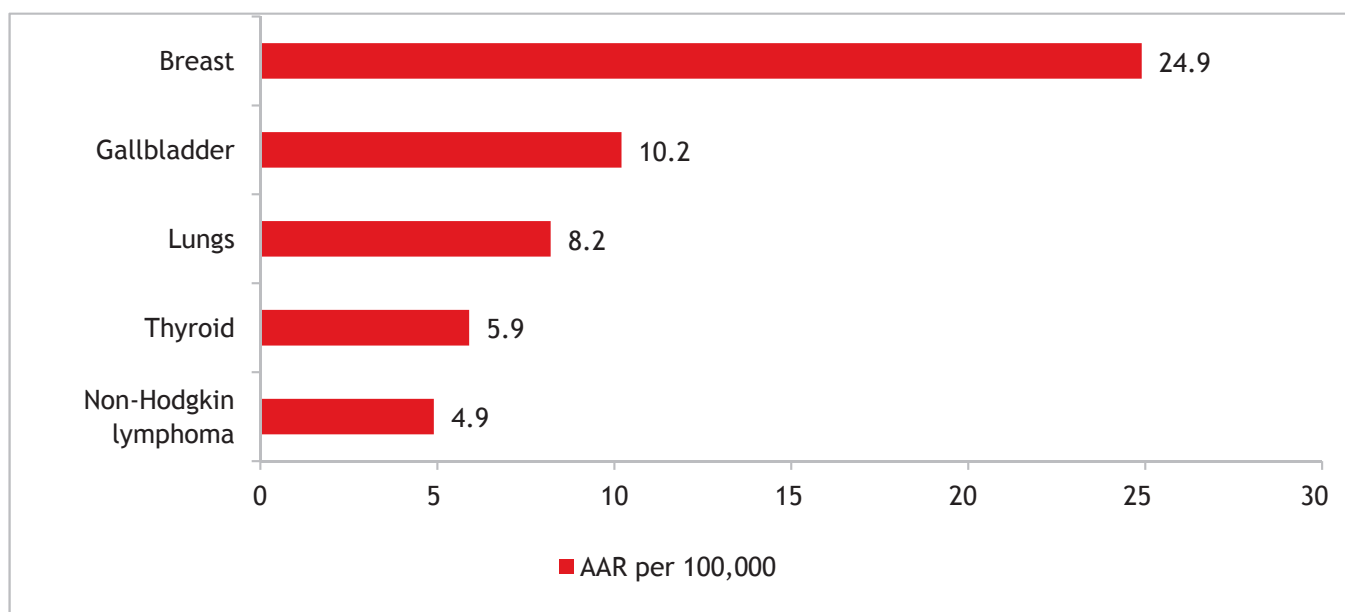


Figure 12. Leading Cancer Sites in Females, Bhaktapur District.

The leading site in males in Rukum is lungs followed by stomach, thyroid, prostate and gallbladder. In females, the most common site is cervix uteri followed by lungs, uterus, ovary and breast.

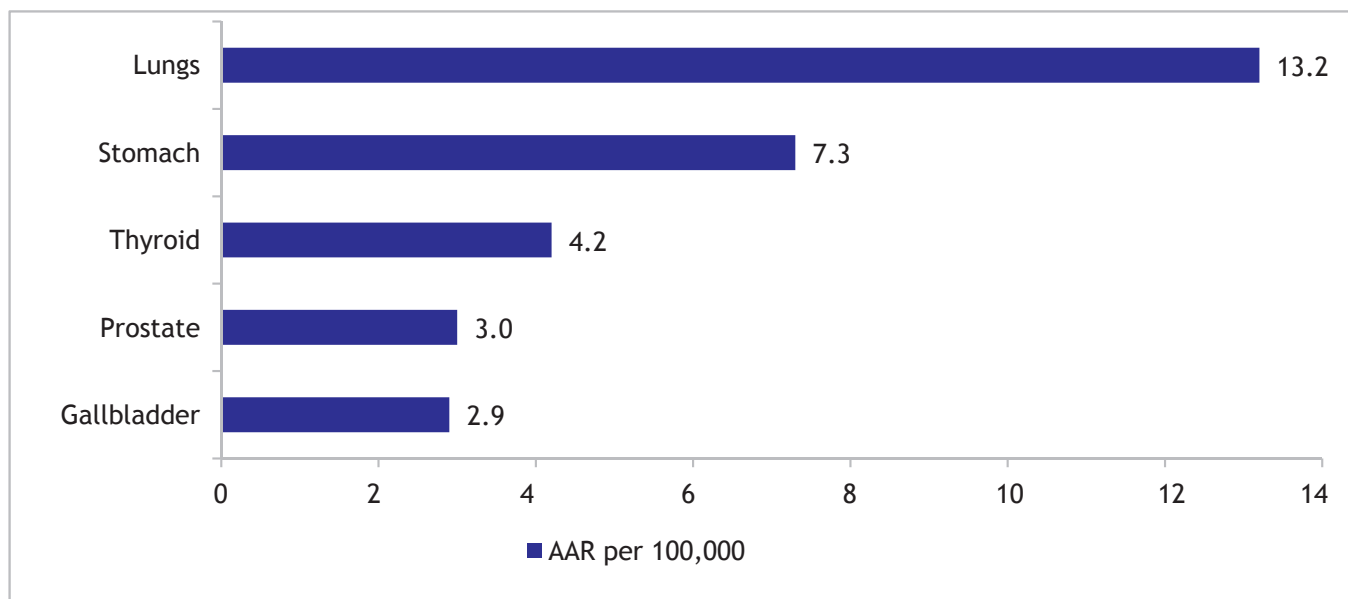


Figure 13. Leading Cancer Sites in Males, Rukum District.

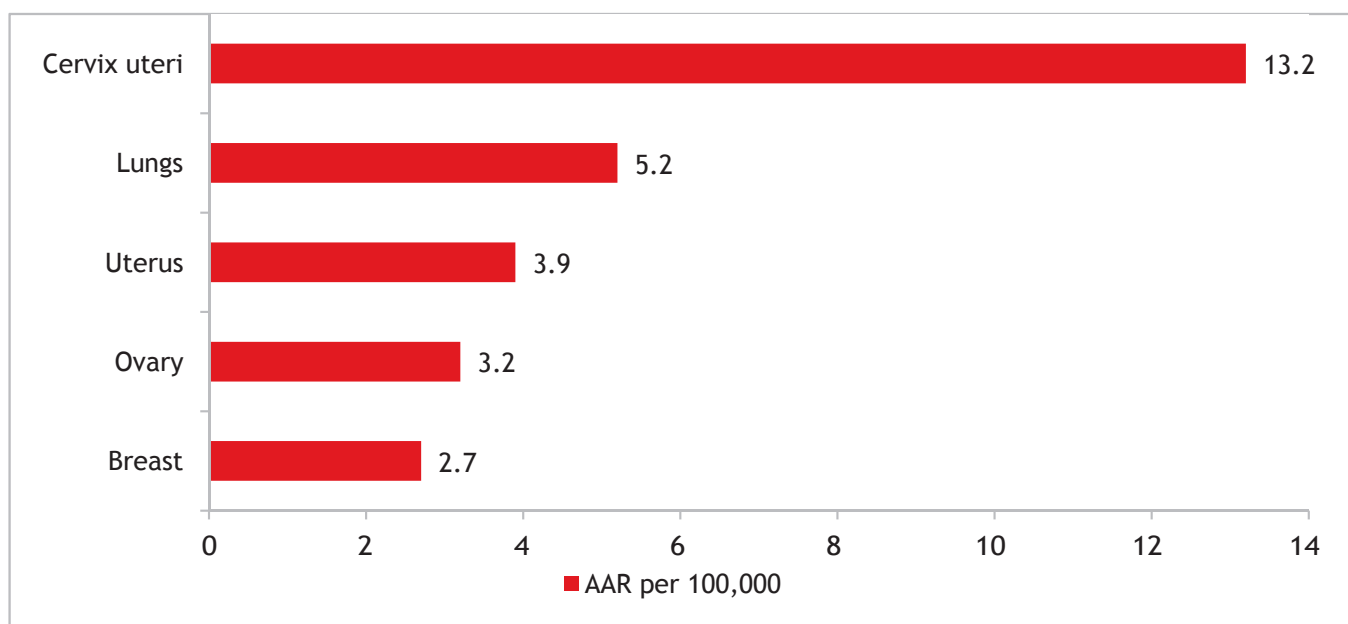


Figure 14. Leading Cancer Sites in Females, Rukum District.

In SSDM, the leading sites of cancer in male in 2018 were mouth, lungs, gallbladder, liver and stomach. In female breast, cervix uteri, gallbladder, lungs and stomach were the leading sites. The top five leading sites in male and female is presented in figure below.

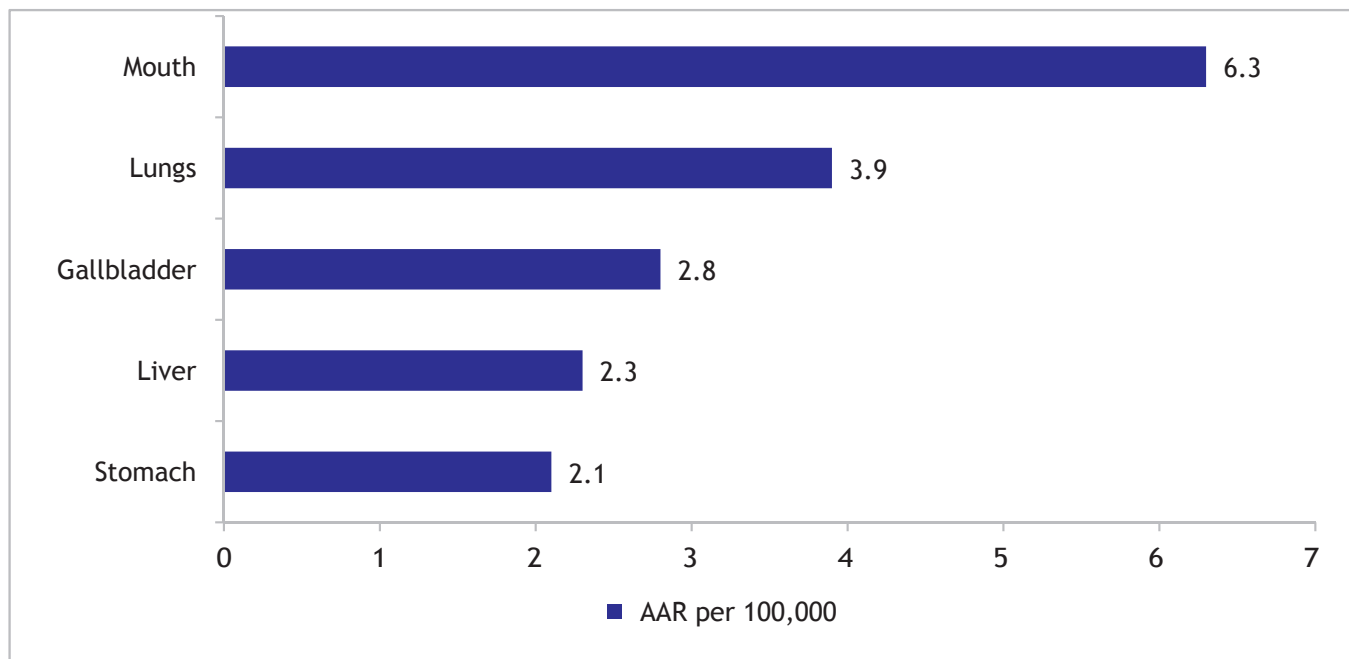


Figure 15. Leading Cancer Sites in Males, Siraha, Saptari, Dhanusha and Mohattari District.

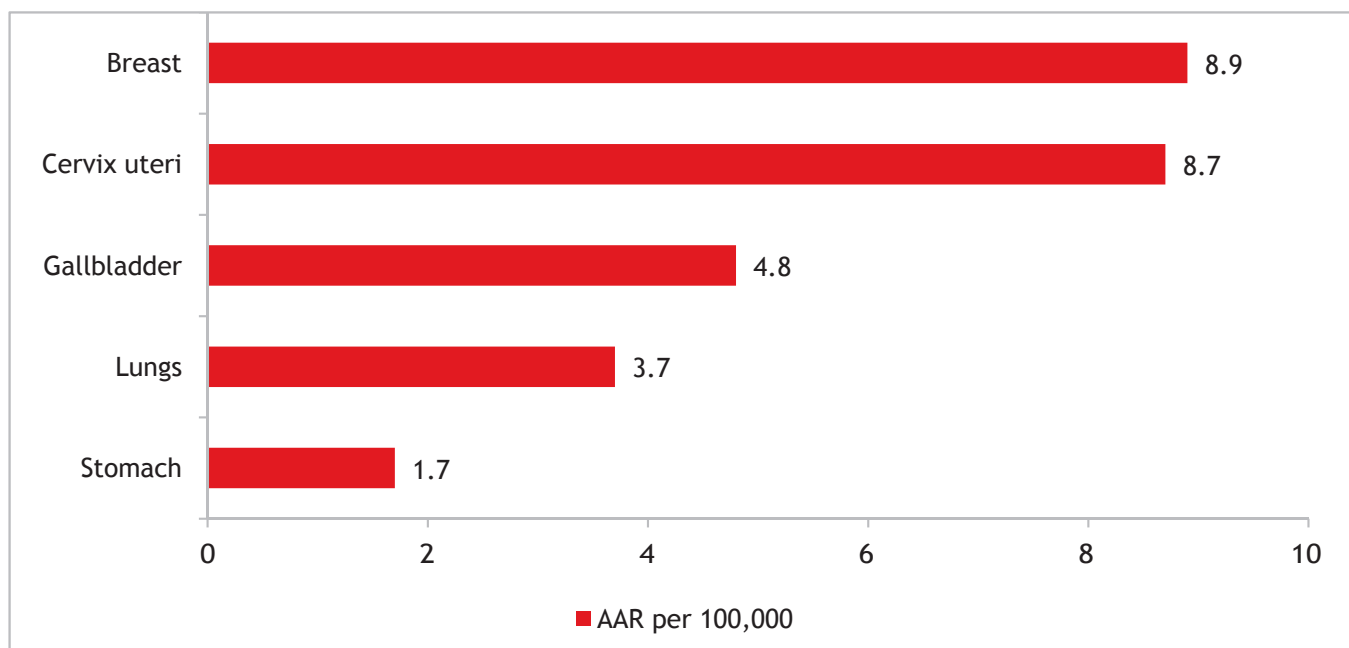


Figure 16. Leading Cancer Sites in Females, Siraha, Saptari, Dhanusha and Mohattari District.

Lung cancer ranks among the first leading cancer site in male population of Siraha district followed by liver, mouth, gall bladder in second, third and fourth position respectively. Surprisingly, cancer of brain and nervous system ranks among fifth leading site in this population. The incidence rate of breast cancer is the highest among the female population of Siraha district followed by cervix, lungs, gall bladder and ovary second to fifth common site respectively.

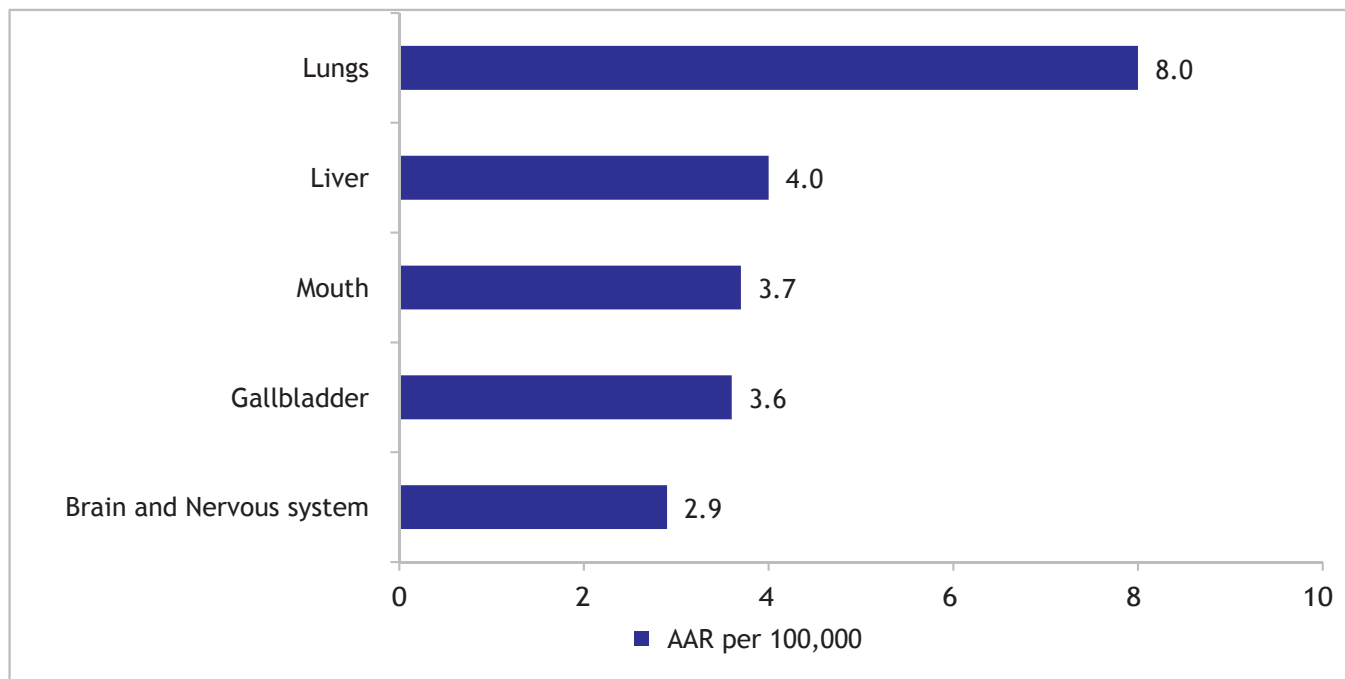


Figure 17. Leading Cancer Sites in Males, Siraha District.

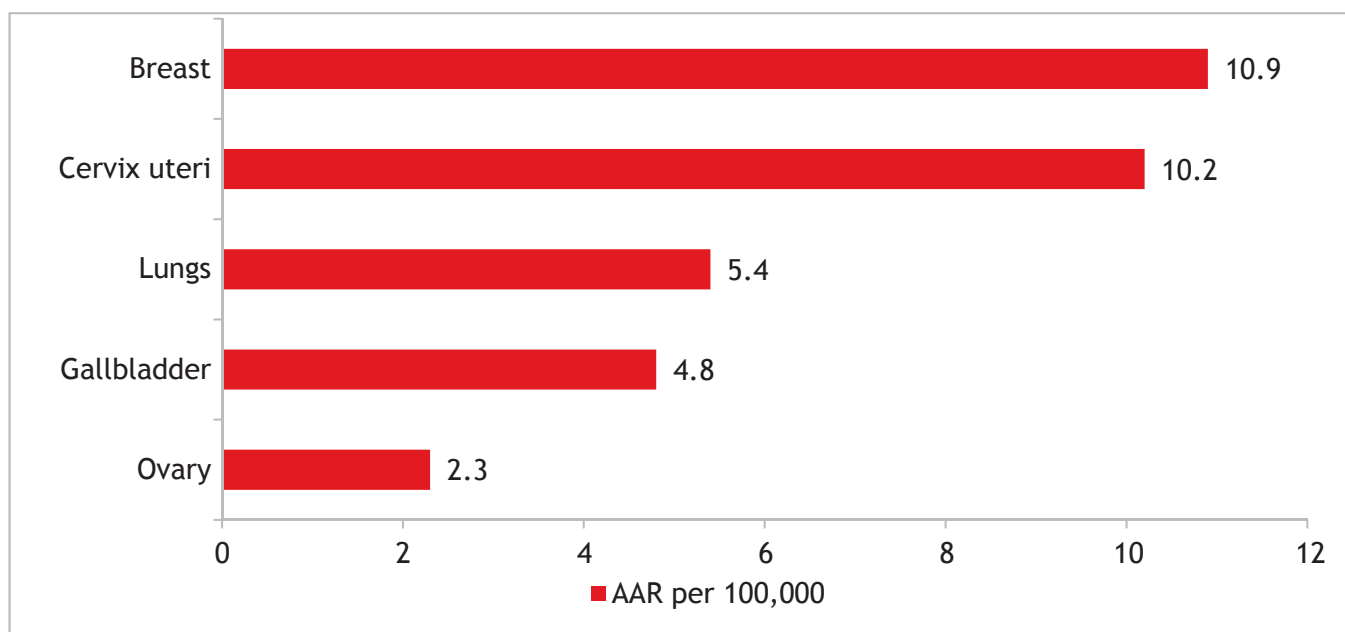


Figure 18. Leading Cancer Sites in Females, Siraha District.

The commonest sites in Males in Saptari district in 2018 were mouth, lungs, liver, gallbladder and rectum. The leading sites in Saptari were similar to Siraha district. Similarly in females the top leading sites were cervix uteri, breast, gallbladder, mouth, lungs and liver as described in figure below.

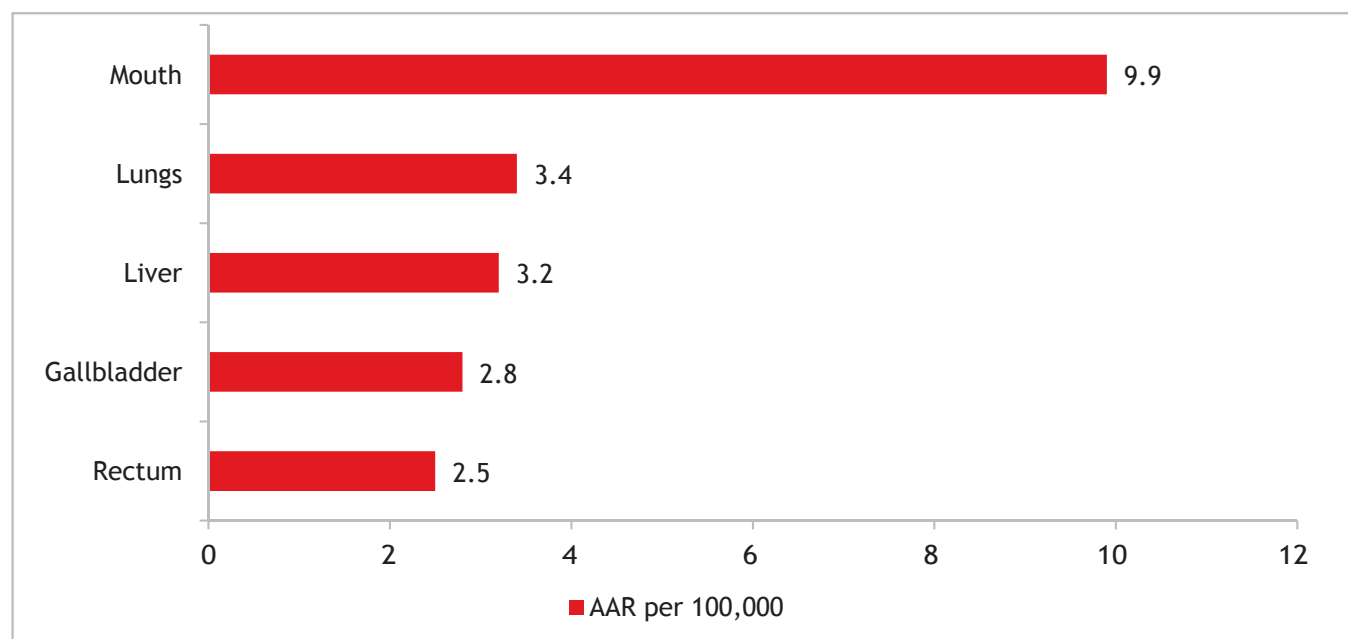


Figure 19. Leading Cancer Sites in Males, Saptari District.

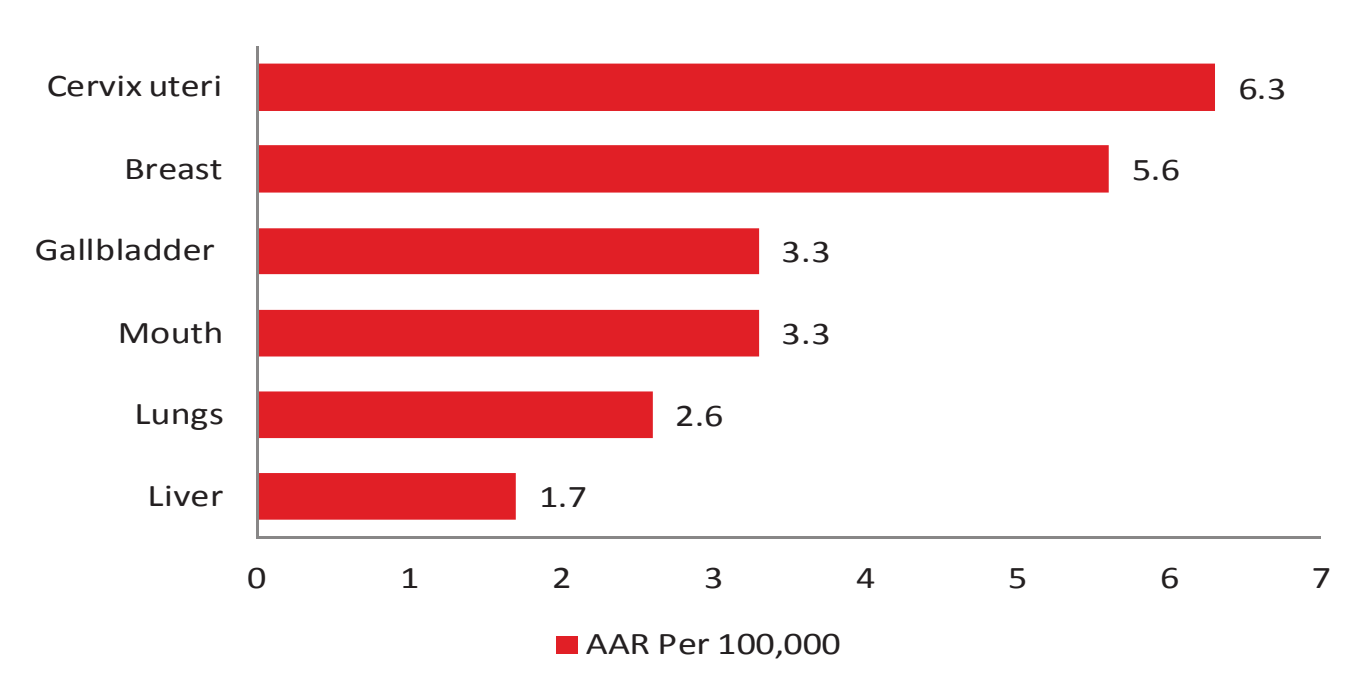


Figure 20. Leading Cancer Sites in Females, Saptari District.

The most common site of cancer in male population of Dhanusha district is mouth followed by cancer of stomach, gall bladder, tongue and bladder. Compared to other districts the incidence of Lungs cancer in males was low in Dhanusha district. In females the leading sites were breast, gallbladder, cervix uteri, lungs and stomach given in figure below.

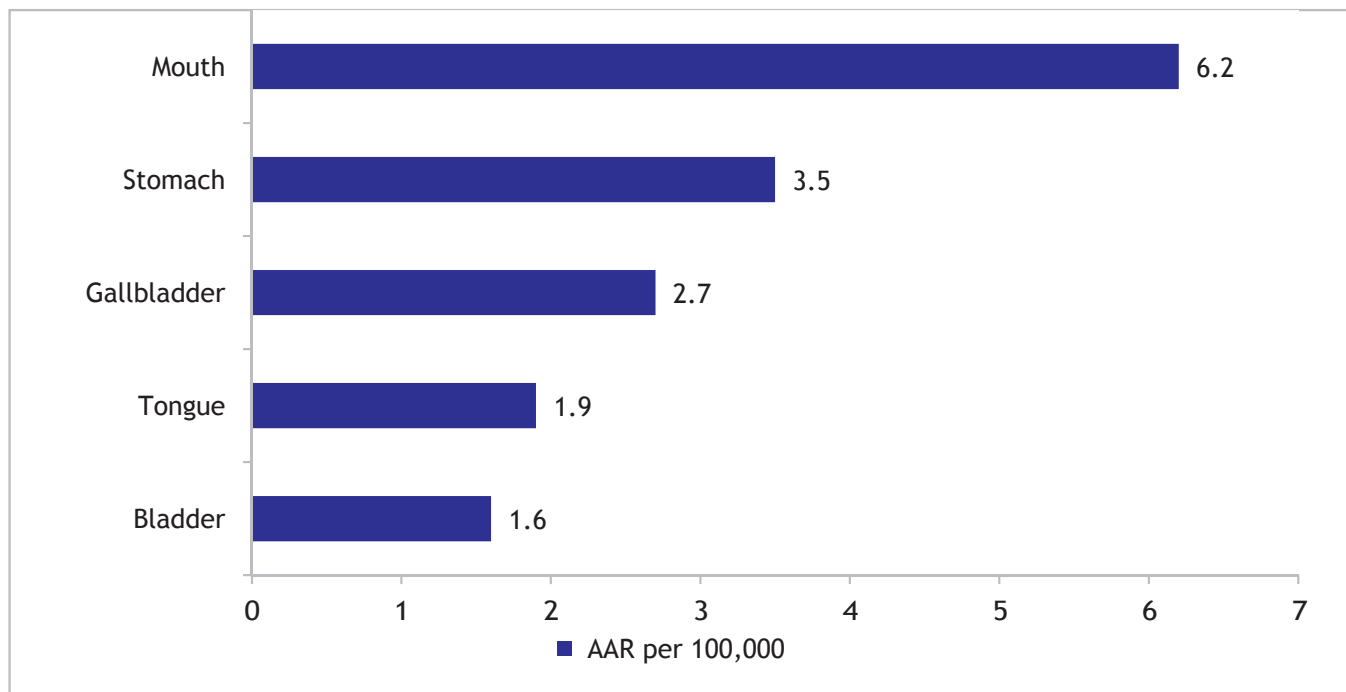


Figure 21. Leading Cancer Sites in Males, Dhanusha District.

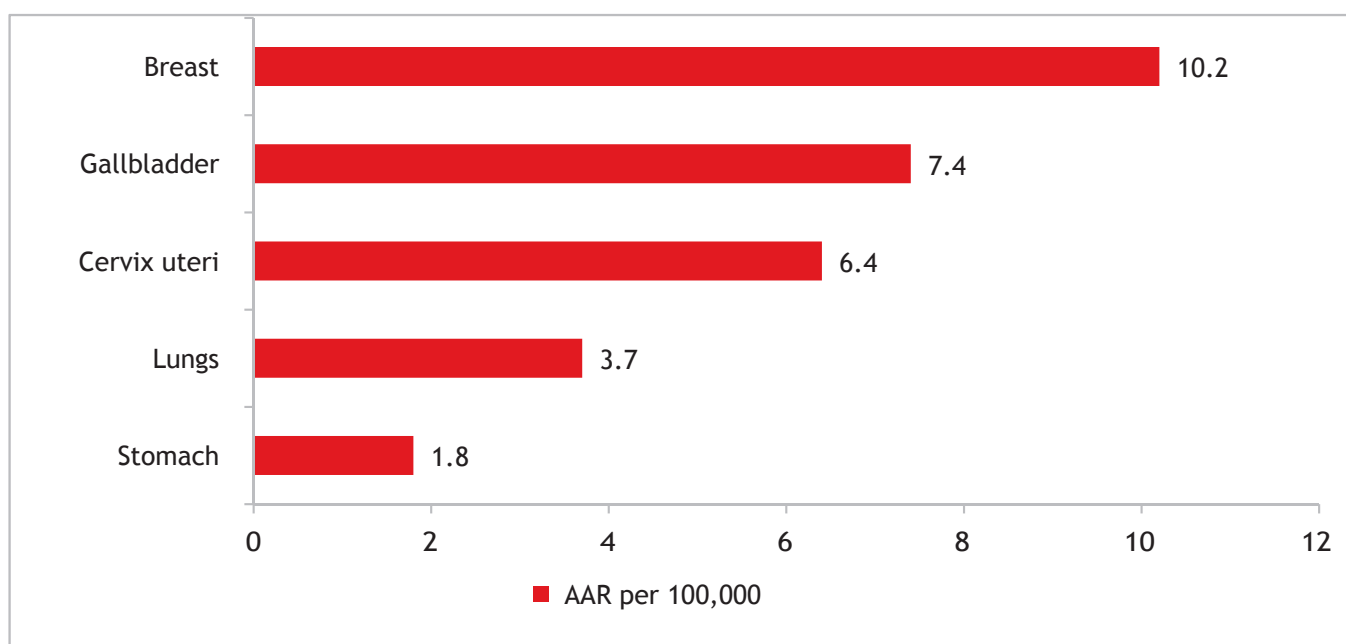


Figure 22. Leading Cancer Sites in Females, Dhanusha District.

In Mohattari district, the leading sites in male in 2018 were mouth, lungs, Non-Hodgkins Lymphoma, small intestine and tongue. Unlike Siraha, Saptari and Dhanusha districts, the incidence of Non-Hodgkins lymphoma was more in Mohattari. In female the leading sites were cervix uteri, breast, lungs, gallbladder, stomach, Liver and ovary similar to other districts.

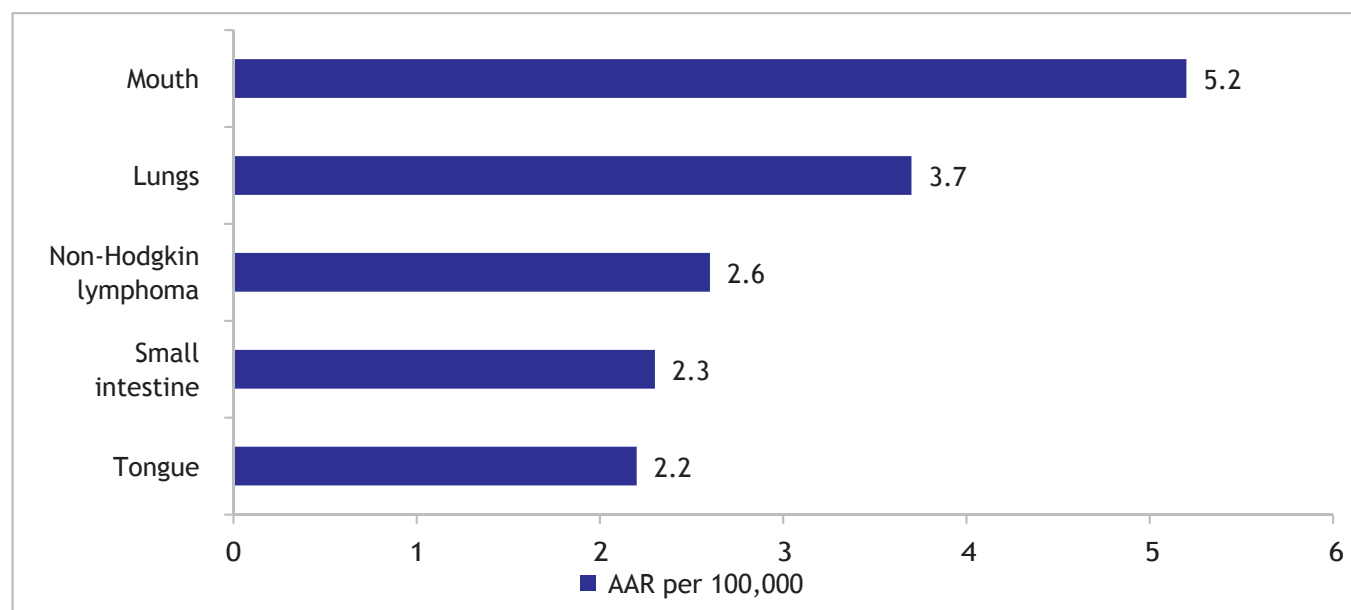


Figure 23. Leading Cancer Sites in Males, Mohattari District.

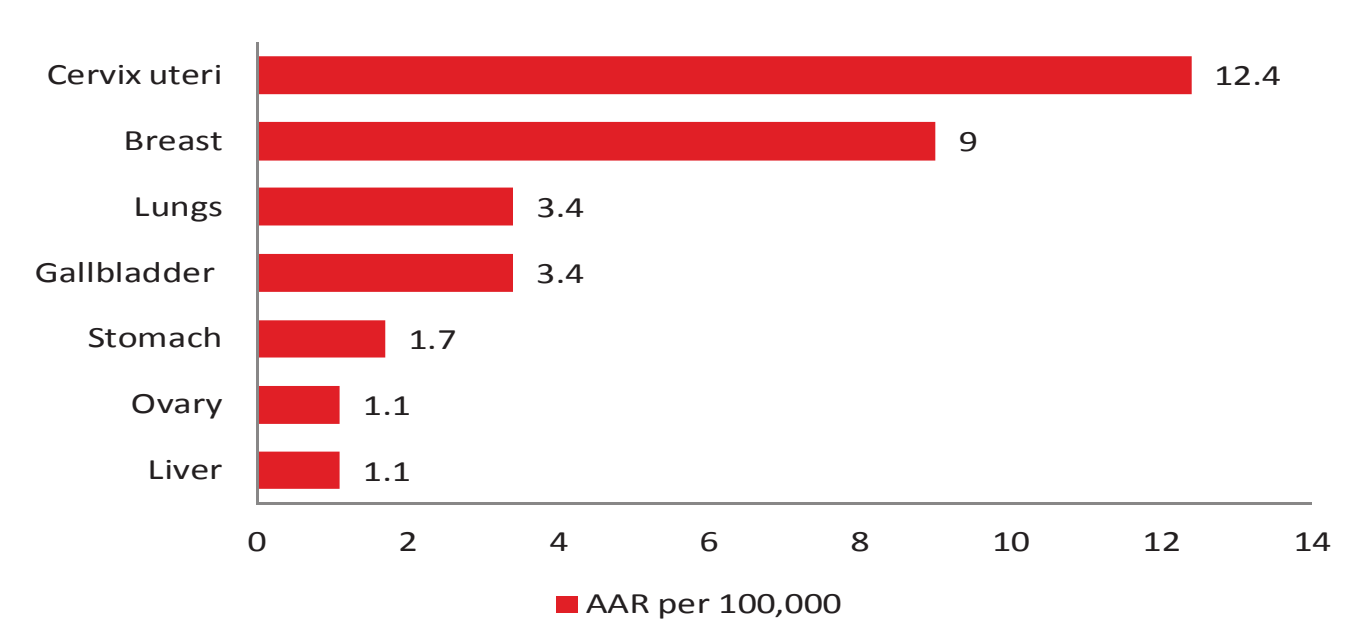


Figure 24. Leading Cancer Sites in Females, Mohattari.

COMPARISON OF CANCER INCIDENCE RATE WITH OTHER NEIGHBORING REGISTRIES

Cancer incidence in Males in the major cities of India and China such as Delhi, Chennai, Mumbai, Shanghai and Beijing are higher compared to of urban registries of Nepal. The incidence rate is higher in urban areas and lower in semi urban and rural areas compared to the estimated incidence rate of Nepal given by GLOBOCAN. The highest incidence is found in Bhaktapur and Lalitpur districts and lowest incidence is found in Dhanusha and Mahottari district of Nepal respectively. The incidence rates of semi urban and rural areas in Nepal are low however comparable to the incidence rates of rural areas of India like Sangrur and Mansa.

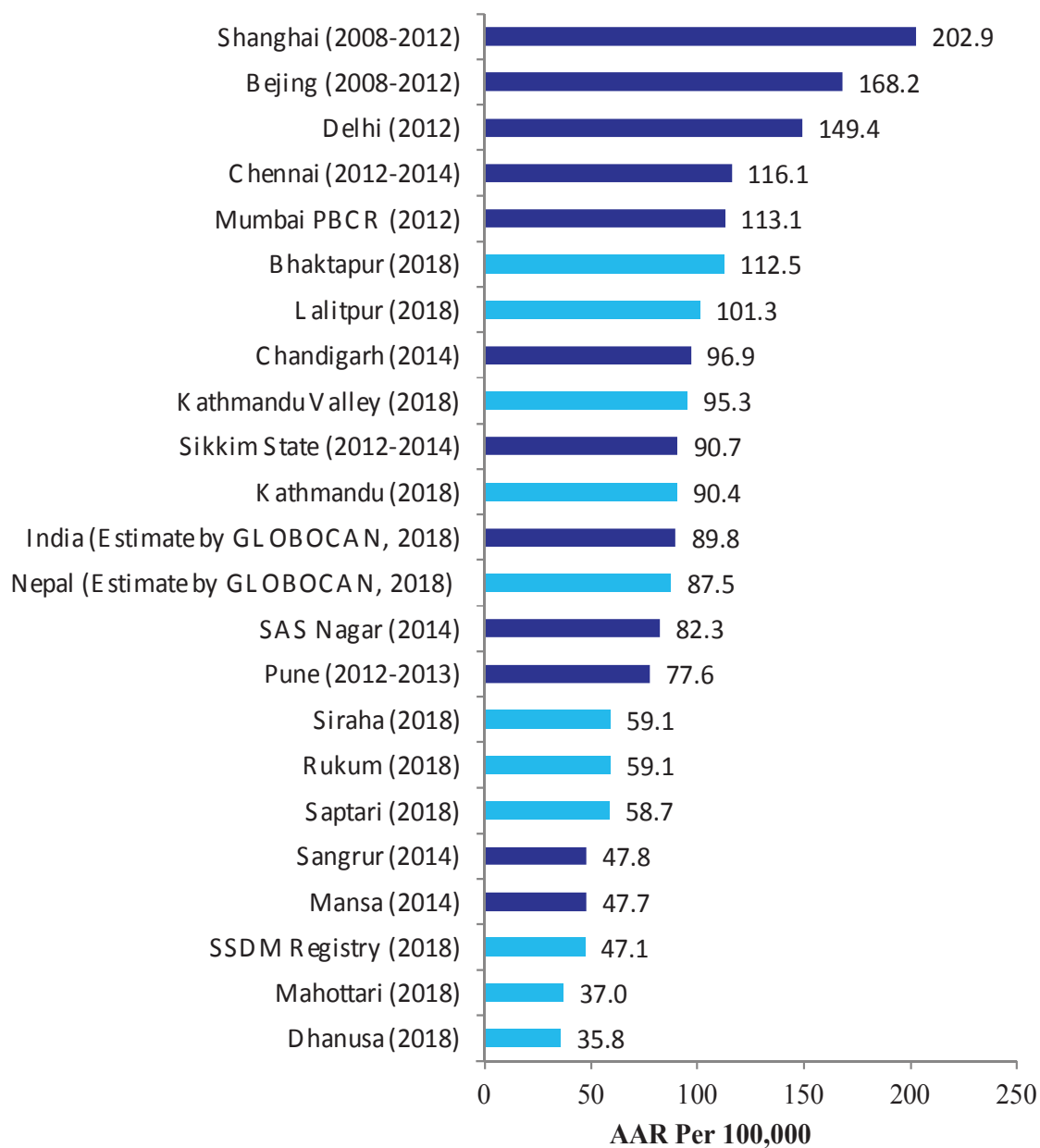


Figure 25. Comparison of Age Adjusted Incidence Rate of All Sites with Other Neighboring Registries, Males.(Ref 1-8)

Similar for females, the cancer incidence in Nepal is less than the incidence rates of major cities of India and China. In Females, Nepal has lower cancer incidence rate compared to the estimated incidence rate of Nepal given by GLOBOCAN. The highest incidence rate is found in Lalitpur and Bhaktapur districts and lowest rate is found in Saptari and Mohattari districts of Nepal respectively.

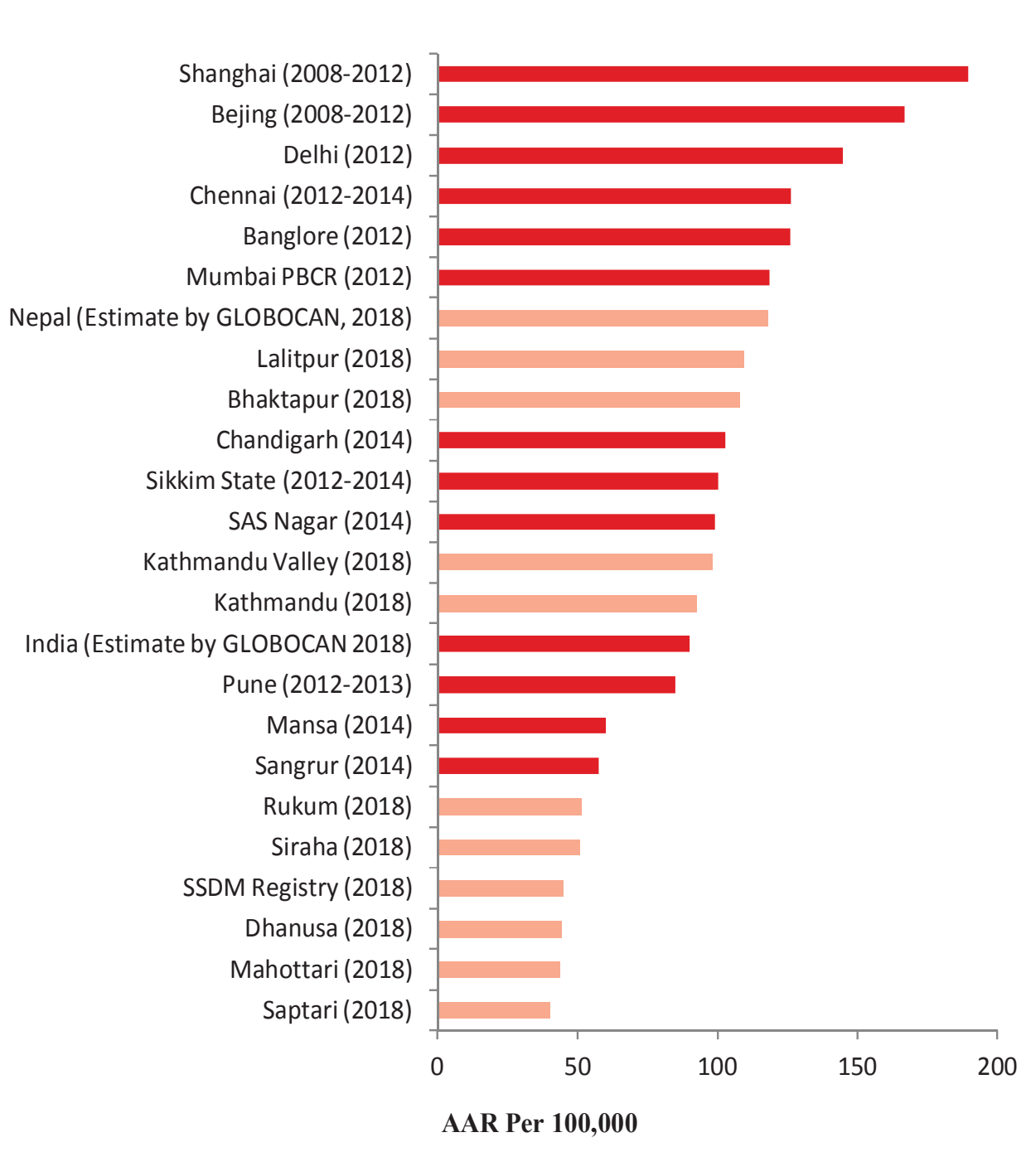


Figure 26. Comparison of Age Adjusted Incidence Rate of All Sites with Other Neighboring Registries, Females.(Ref1-8)

COMPARISON OF LEADING SITES WITH OTHER NEIGHBORING REGISTRIES

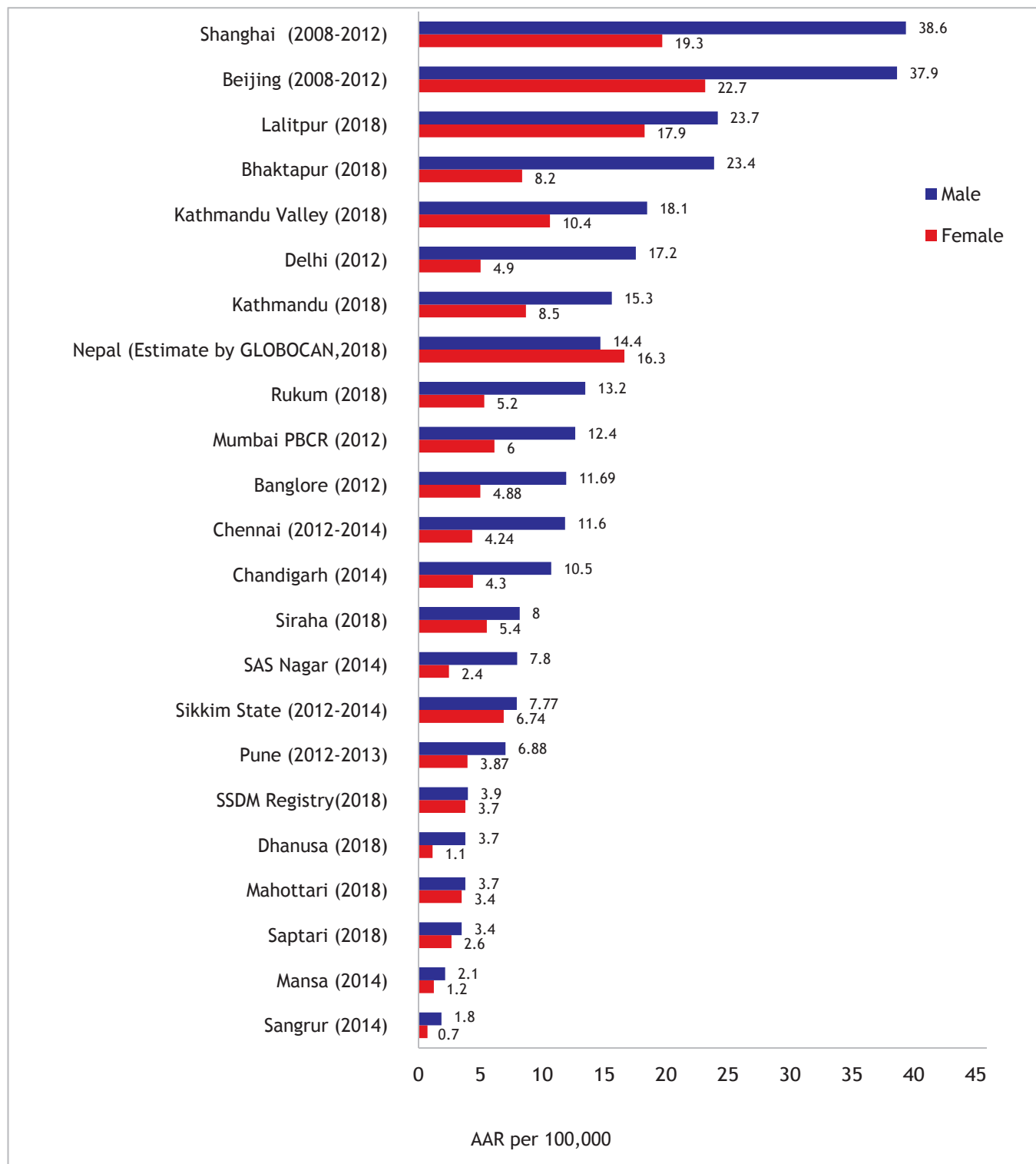


Figure 27. Comparison of Cancer of Lungs with Other Neighboring Registries. (Ref 1-8)

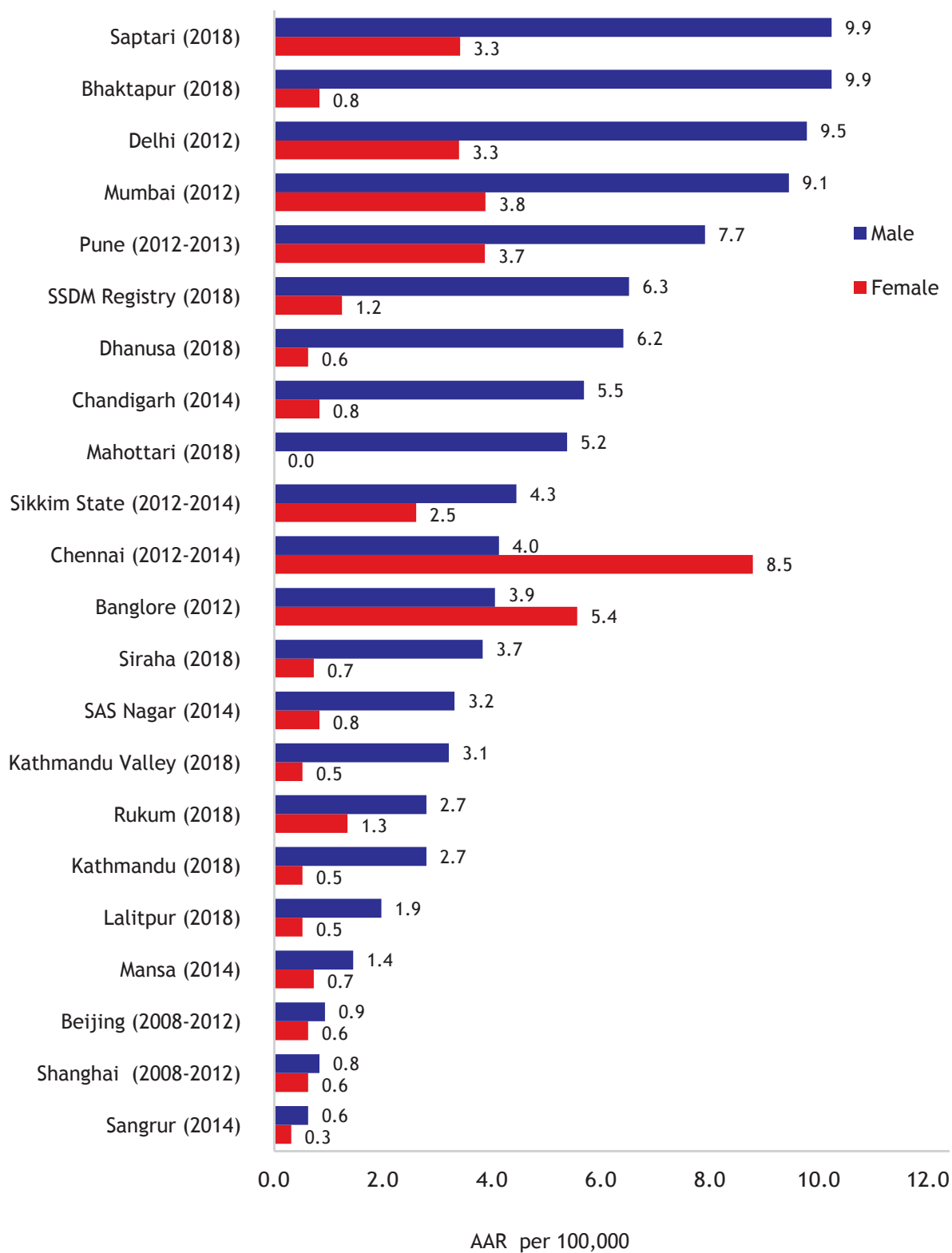


Figure 28. Comparison of Cancer of Mouth with Other Neighboring Registries. (Ref 1-8)

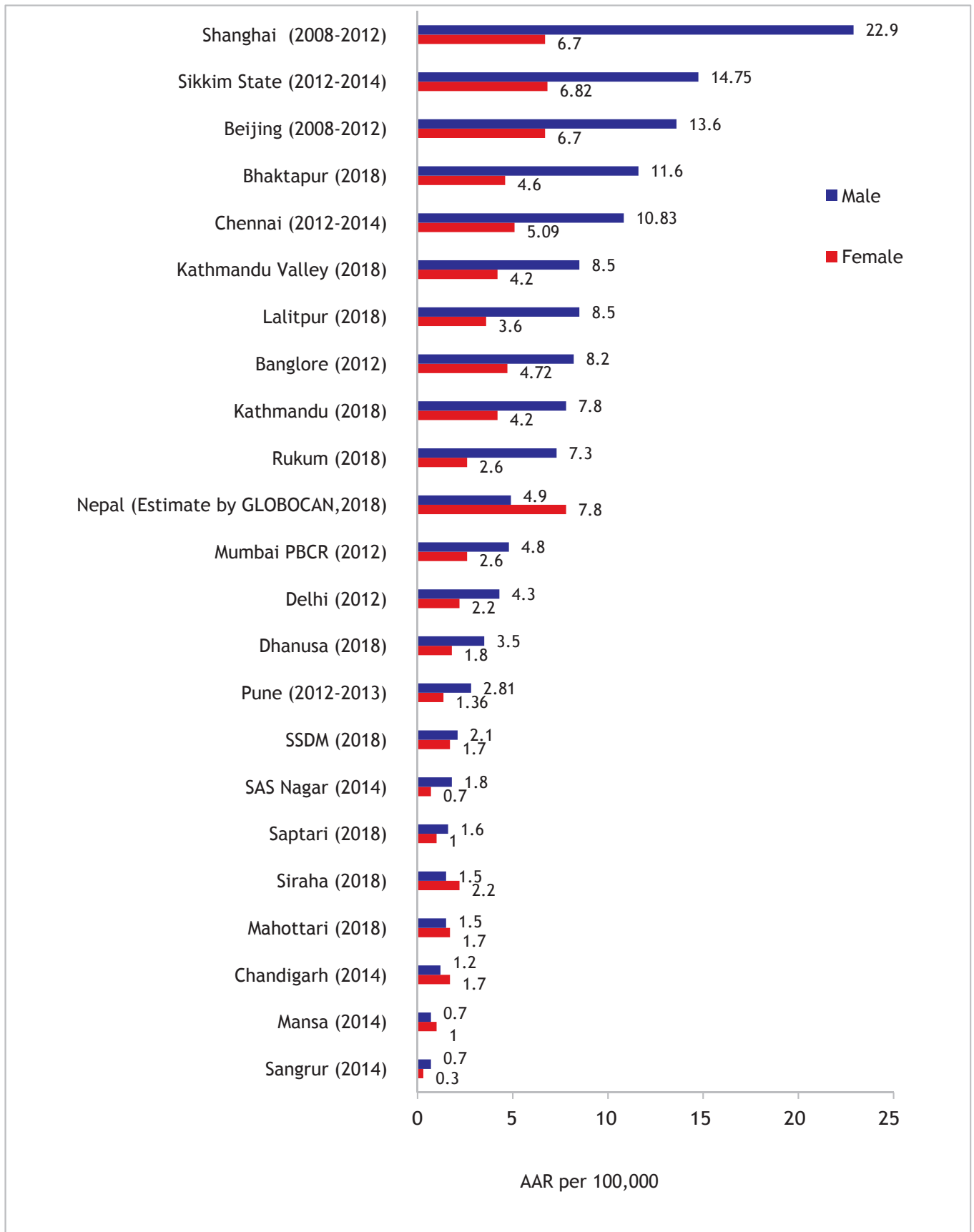


Figure 29. Comparison of Cancer of Stomach with Other Neighboring Registries.(Ref 1-8)

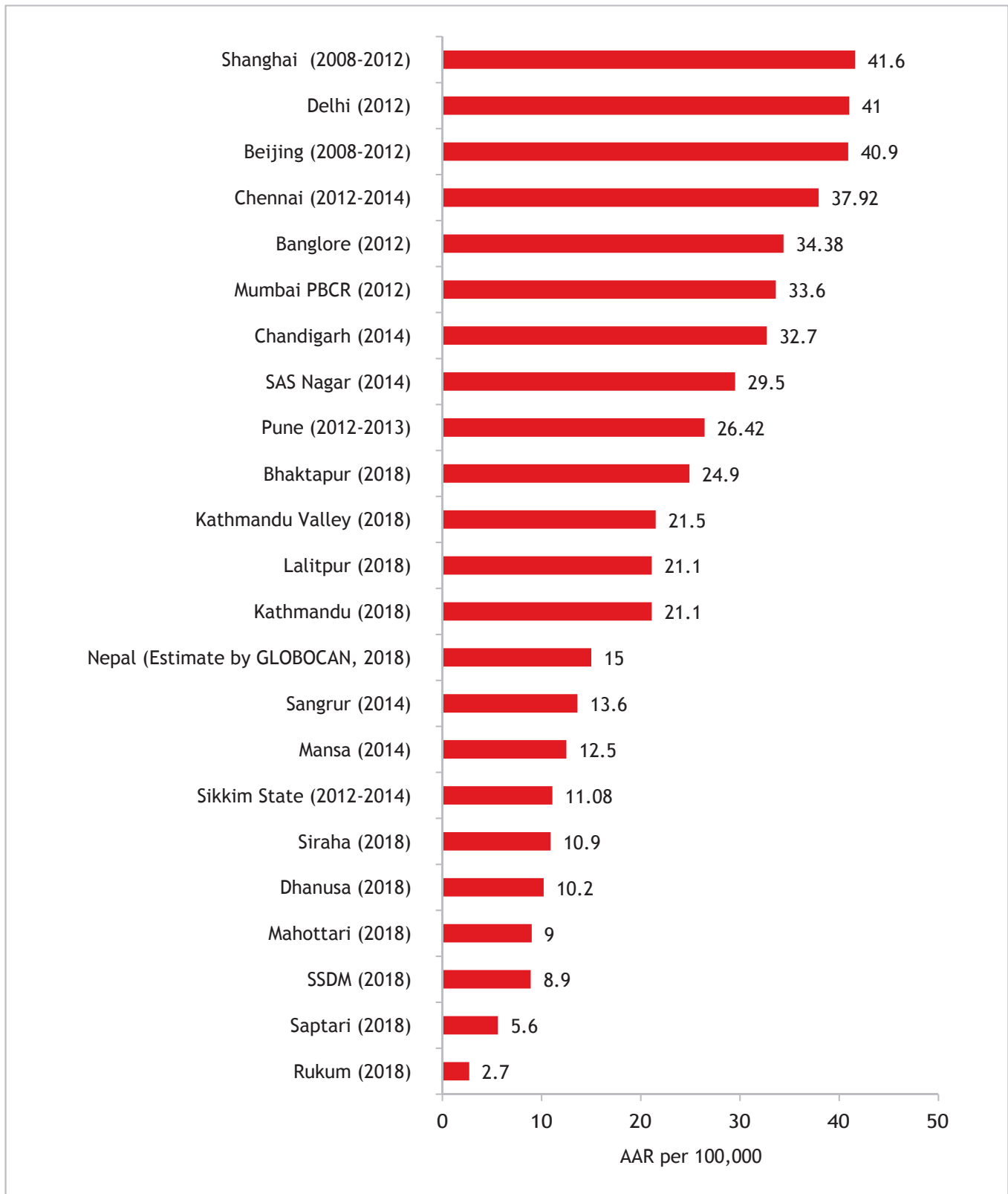


Figure 30. Comparison of Cancer of Breast with Other Neighboring Registries. (Ref 1-8)

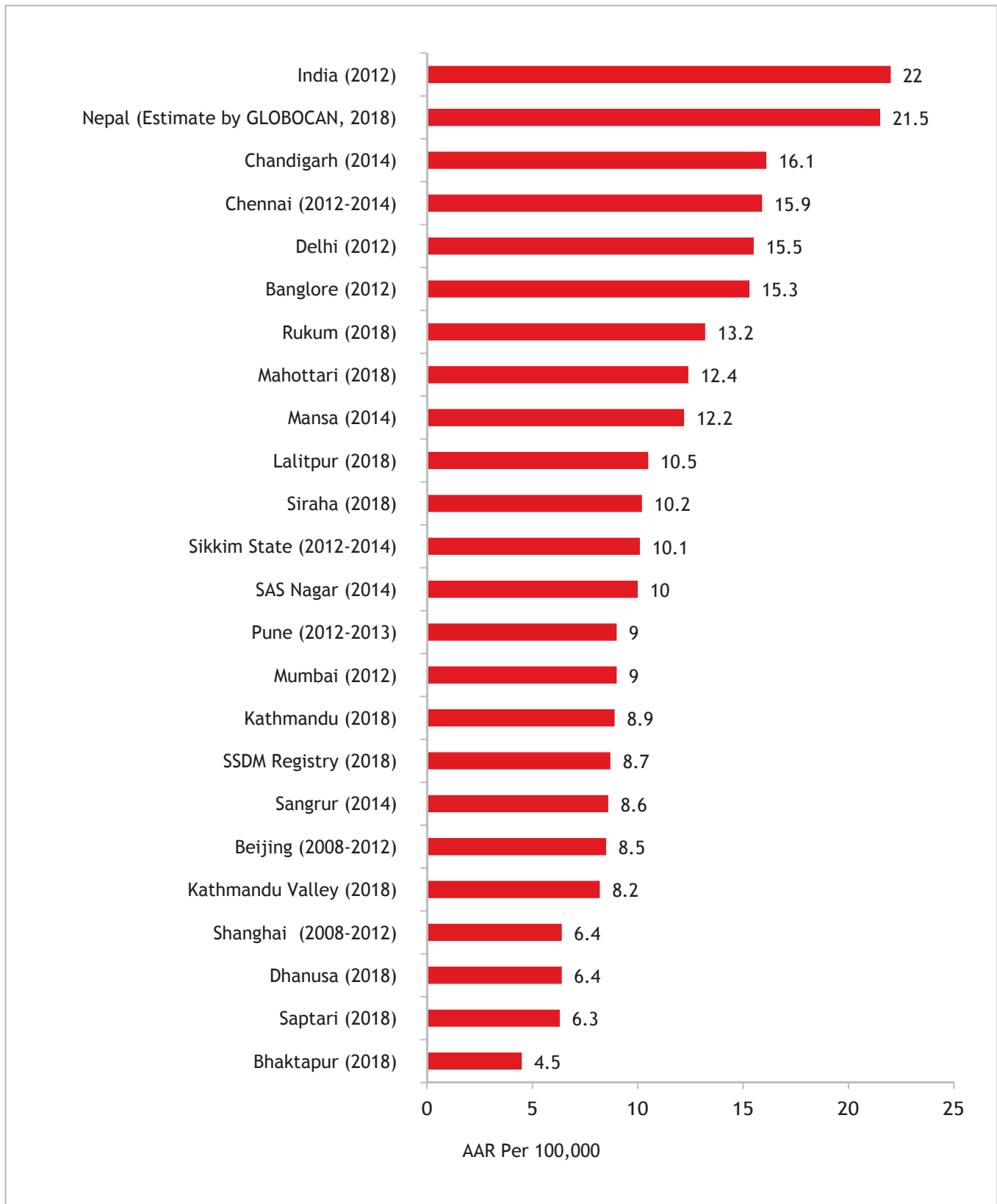


Figure 31. Comparison of Cancer Cervix with Other Neighboring Registries.(Ref 1-8)

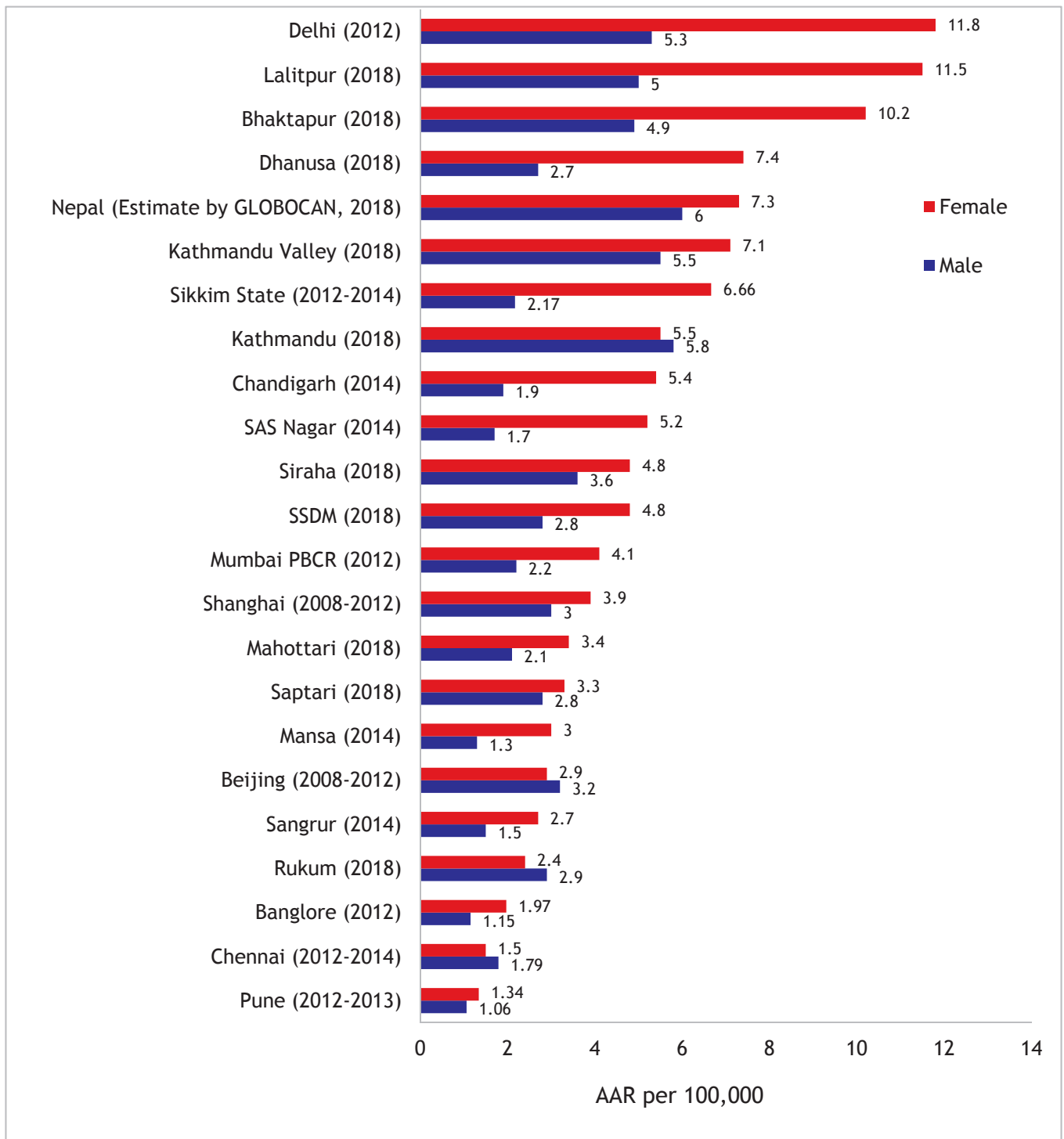


Figure 32. Comparison of Cancer of Gallbladder with Other Neighboring Registries.(Ref 1-8)

CANCER MORTALITY

Looking at Kathmandu Valley and SSDM registry, the Mortality Rates in males is higher than females in Kathmandu valley, whereas, in Rukum females have the higher mortality rates than males. There might be under reporting of the death cases. Government of Nepal is also facing challenges in recording the death cases as cancer. However, a combined effort is going on to capture as much mortality cases as possible. While comparing the three registries, the Age Standard Mortality Rates for both Males and Females are found to be higher in Kathmandu Valley followed by Rukum. The mortality rate in SSDM was low and the death cases might be under reported.

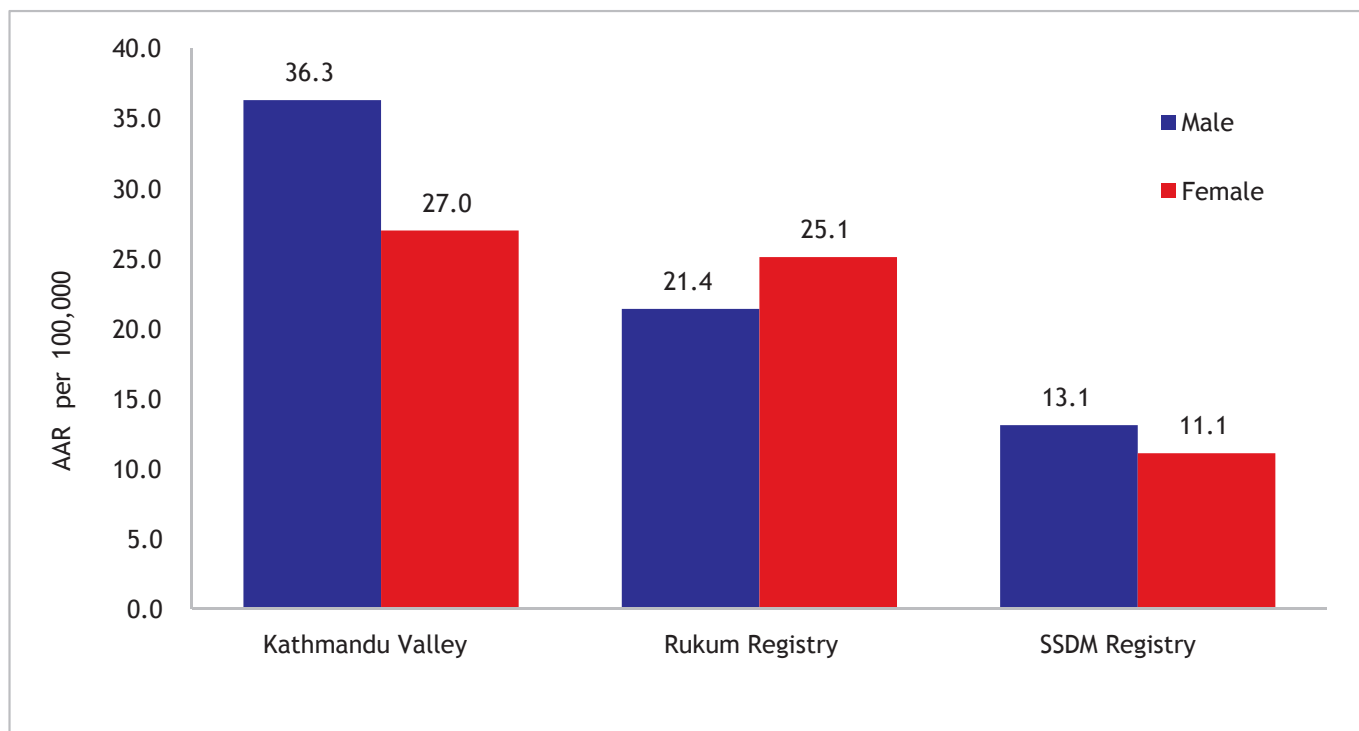


Figure 33. Cancer Mortality by Sex in Three Registries of Nepal, 2018.

Comparing all the districts separately within the three registries the mortality rates are highest in Lalitpur and Bhaktapur districts and lowest in Mohattari and Dhanusha districts respectively.

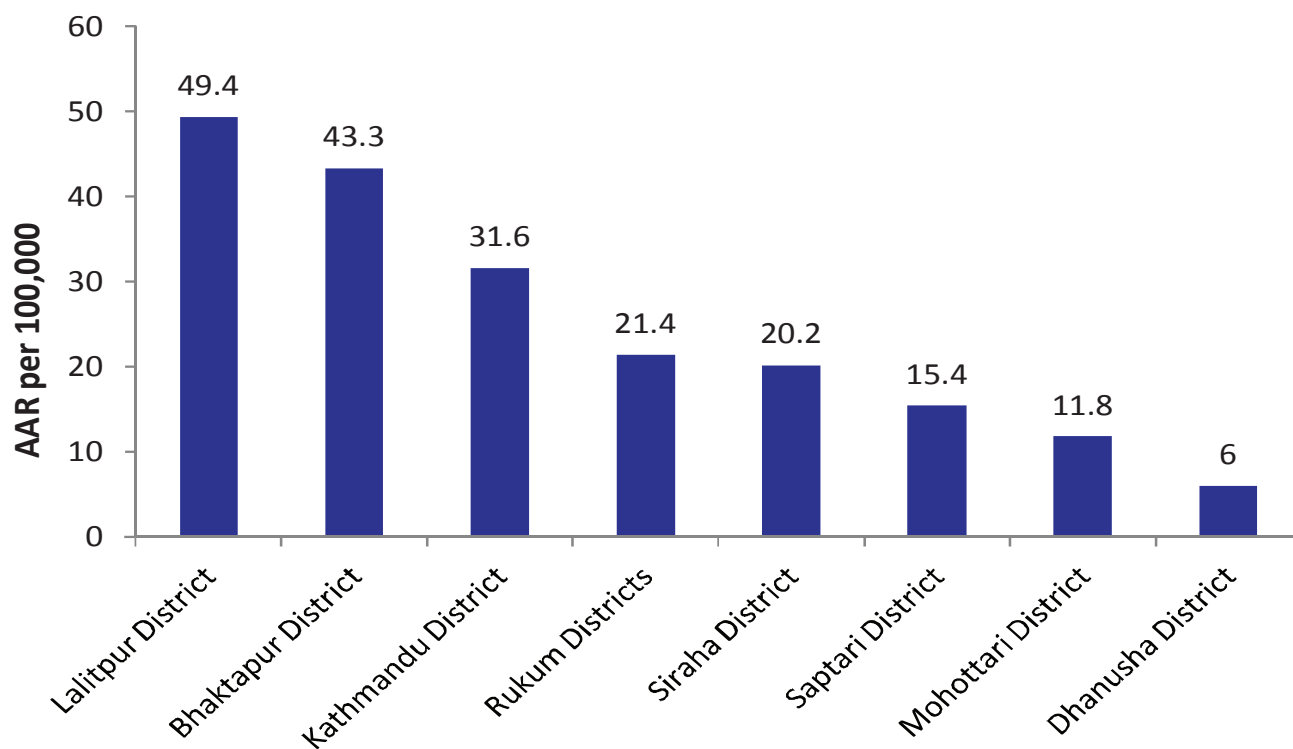


Figure 34. Cancer Mortality in Males in Districts of Nepal, 2018.

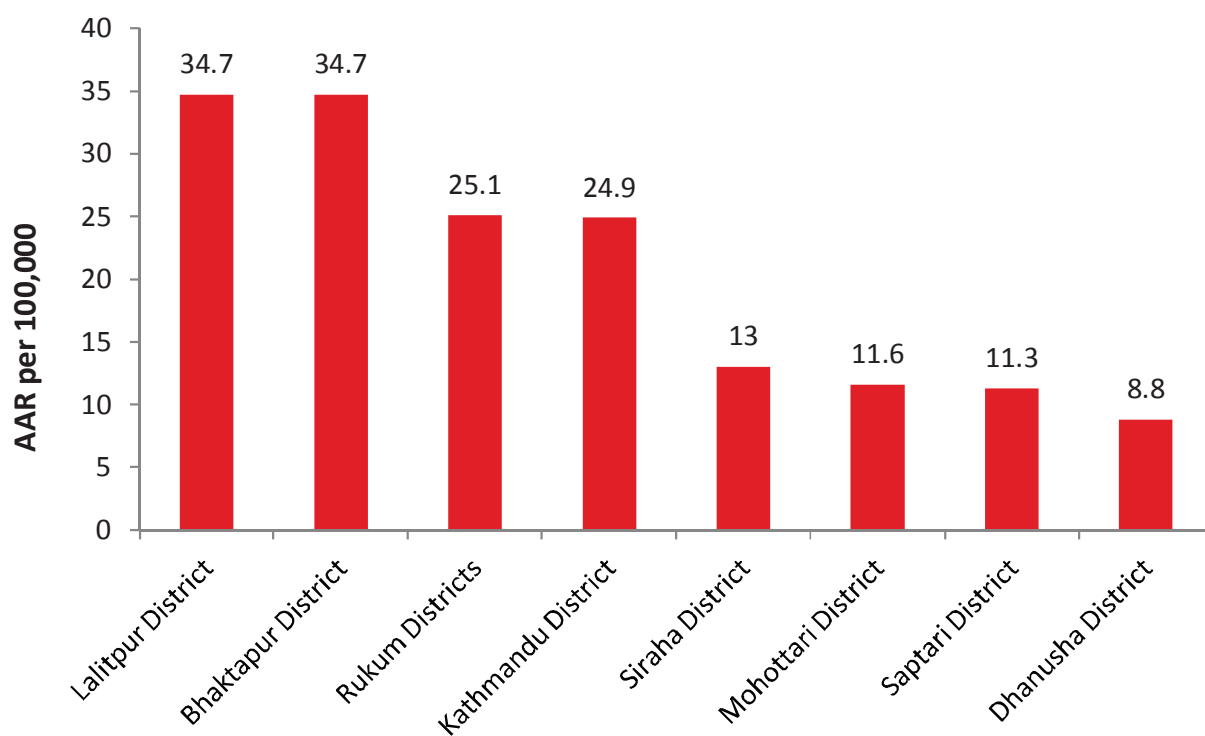


Figure 35. Cancer Mortality in Females in Districts of Nepal, 2018.

- The three Population Based Cancer Registry in Kathmandu Valley PBCR (Bagmati Province), in Siraha, Saptari, Dhanusha and Mohattari (SSDM) PBCR (Province No. 2) and Rukum PBCR (Province No. 5 and Karnali Province) covers 20.27% of the total population of Nepal and represents Urban, Semi-Urban and Rural areas of Nepal respectively.
- The Kathmandu Valley incidence rate is higher for males and lower for females than the GLOBOCAN estimated incidence rate for Nepal, however comparable with many of the urban registries in India
- In Rukum registry, cancer incidence rates are lower than the Kathmandu Valley Cancer registry, however it is comparable with other rural registries in India.
- In SSDM registry, incidence rates are lower compared to the urban and rural registries in Nepal and India. Though all the possible ways to capture the cases have been done, we might have missed the cases in SSDM registry. The reason might be due to the lack of cancer diagnosis and treatment facilities, patient travel to India for cancer treatment as most of the area of SSDM registry borders with India and we were not able to include the sources of India at the border side. Another reason might be low awareness level of the people, under diagnosis and fear of exposing themselves as having cancer because of stigma.
- Lungs cancer is high in all the geographical areas of Nepal, the AAR ranging from 2.6 to 23.7 per 100,000.
- Cervical cancer is high in rural part of Nepal but less in urban region. In urban area breast cancer is higher.
- Within Kathmandu Valley though lungs cancer is common, the rates of lungs cancer are much higher in Lalitpur and Bhaktapur compared to Kathmandu. Similarly in Bhaktapur district the cancer of mouth and larynx is more common in contrast to other 2 districts.
- Gallbladder and stomach cancer are found to be common in all the districts among both the sexes. Within the districts, the incidence rate of gallbladder is very high in Bhaktapur and Lalitpur district and comparable to the urban areas of India.
- In the SSDM the incidence of mouth cancer is the commonest among males which was not found as common in other two registry area in the hill and mountain.

RECOMMENDATIONS

1. We suggest and recommend Ministry of Health and Population (MoHP) to develop the National cancer control strategy which is an urgent and important need of the time.
2. Based on the findings of the PBCR data, intervention programs should be planned and launched in various regions of the country focusing on the special cancer site for that region. Concerned Provincial and local government authority should be engaged in planning and intervention of the programs.
3. Establishment of a separate cancer wing in the MoHP to look after all the issues related to cancer.
4. As Lung cancer is commonest in all the areas of Kathmandu valley, existing awareness program needs to be strengthened to encourage smoking/tobacco cessation. Information Technology (IT) based and community based interventions for “quit tobacco” is a good tool for this.
5. Kathmandu Valley and SSDM PBCR shows Breast cancer as the most common cancer in female, thus government of Nepal as well as concern authority should need to give priority for the breast cancer awareness, screening and early detection to reduce the future burden of breast cancer in Nepal.
6. In SSDM and Rukum, cervical cancer is the commonest in females. Cervical Cancer is one of the Cancer amenable for all level of prevention and is the priority of Nepal Government. Activities like awareness, screening, vaccination, prevention, early detection and treatment to be carried out in a systematic manner to cover the maximum population across the country.
7. Establishment of early detection centers are highly recommended in the semi urban and rural areas like SSDM and Rukum.
8. It is necessary to conduct the risk factors study of the common cancer like Lungs, head and neck, stomach, gallbladder, urinary bladder, colorectal cancer in order to strengthen cancer prevention strategies and activities.
9. Government should need to focus towards digitalization of uniform medical recording system with some mandatory variable in all government and private health facilities. This will help to minimize work duplicate and save both human and financial resources at nation level.
10. Death is one of the vital statistics, which is also linked with human development index of the country, however, collecting death information is quite challenging in Nepal. Thus government should need to give emphasis towards strengthening the death recording system including cause of death.
11. Cancer survival studies to be undertaken. Similarly, it is recommended to do a cross sectional survey in order to check the completeness of registry data especially in the SSDM districts.

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