

# Chapter 4

## CANCERS IN CHILDHOOD

Cancers in childhood constitute one of the most important groups of tumours, not only because of the age of occurrence, connoting a different set of aetiological factors from those commonly seen in adult cancers, but also because, in the past decade or so, with advances particularly in chemotherapy, many of the childhood cancers have gained a remarkably high potency for cure.

The childhood cancers for the 0-14 age group have been reported for the **period 2006-2011** in this chapter. The proportion of childhood cancers relative to cancers in all age groups varied between 0.5-5.8% (Table 4.1). In boys, the relative proportion was lowest in East Khasi Hills (0.8%) and highest in Delhi (5.8%). In girls, it varied from 0.5% in East Khasi Hills to 3.4% in Ahmedabad Rural. Cancer incidence rates for childhood cancers are generally expressed per million children and not as per hundred thousand that is followed for cancers in all ages or in adults (IARC - 1996).

Table 4.2(a), 4.2(b) and 4.2(c) give the number and relative proportion of Childhood Cancers by 5-year Age Group among boys, girls and both sexes respectively.

Figure 4.1 compares the AARpm of broad types of childhood cancers in boys and girls among all the PBCRs. Chennai had higher AARpm than other PBCRs for all types of childhood cancers in both boys and girls at 159.6 and 112.4 respectively. Among the North East registries, Aizawl District showed the highest AARpm (107.8) in boys and Imphal West District was the highest (69.3) in girls.

Registries contributing small numbers have been excluded in depicting broad types of childhood cancers in the figures 4.2 to 4.11.

Figure 4.2 and 4.3 compare the AARpm of broad types of childhood cancers in boys and girls among 15 PBCRs.

Figure 4.4 to 4.11 compare the AARpm of broad types of childhood cancers in boys and girls among six PBCRs namely Bangalore, Chennai, Delhi, Mumbai, Ahmedabad Urban and Kolkata.

**Table 4.1: Number (#) and Relative Proportion (%) of Cancers in Childhood relative to all Cancers (2006-2011)**

Registry	Boy			Girl			Both Sexes		
	All Cancers	#	%	All Cancers	#	%	All Cancers	#	%
<b>Bangalore</b> (2006-2009)	11823	320	2.7	14563	224	1.5	26386	544	2.1
<b>Barshi Rural</b> (2006-2010)	662	31	4.7	696	15	2.2	1358	46	3.4
<b>Barshi Expanded</b> (2007-2009)	2336	73	3.1	2895	39	1.3	5231	112	2.1
<b>Bhopal</b> (2006-2010)	3479	116	3.3	3387	85	2.5	6866	201	2.9
<b>Chennai</b> (2006-2009)	10011	306	3.1	10662	217	2.0	20673	523	2.5
<b>Delhi</b> (2006-2009)	28897	1675	5.8	26440	733	2.8	55337	2408	4.4
<b>Mumbai</b> (2006-2010)	26689	767	2.9	29197	448	1.5	55886	1215	2.2
<b>Cachar District</b> (2007-2010)	3134	41	1.3	2196	29	1.3	5330	70	1.3
<b>Dibrugarh District</b> (2006-2011)	2913	45	1.5	2082	25	1.2	4995	70	1.4
<b>Kamrup Urban District</b> (2006-2011)	4415	53	1.2	3179	38	1.2	7594	91	1.2
<b>Manipur State (MR)</b> (2006-2010)	3316	88	2.7	3498	58	1.7	6814	146	2.1
<i>Imphal West District</i> (2006-2010)	977	20	2.0	1160	22	1.9	2137	42	2.0
<i>MR - Excl. Imphal West</i> (2006-2010)	2339	68	2.9	2338	36	1.5	4677	104	2.2
<b>Mizoram State (MZ)</b> (2006-2010)	3231	55	1.7	2661	36	1.4	5892	91	1.5
<i>Aizawl District</i> (2006-2010)	1618	28	1.7	1379	14	1.0	2997	42	1.4
<i>MZ - Excl. Aizawl</i> (2006-2010)	1613	27	1.7	1282	22	1.7	2895	49	1.7
<b>Sikkim State</b> (2006-2011)	1234	30	2.4	1134	27	2.4	2368	57	2.4
<b>Ahmedabad - Rural</b> (2006-2010)	2388	84	3.5	1720	58	3.4	4108	142	3.5
<b>Ahmedabad - Urban</b> (2006-2010)	9750	271	2.8	7700	134	1.7	17450	405	2.3
<b>Aurangabad</b> (2005-2010)	1415	49	3.5	1484	43	2.9	2899	92	3.2
<b>Kolkata</b> (2006-2009)	9846	207	2.1	9304	116	1.2	19150	323	1.7
<b>Kollam</b> (2006-2010)	8405	181	2.2	7809	112	1.4	16214	293	1.8
<b>Nagpur</b> (2005-2009)	4585	191	4.2	4886	127	2.6	9471	318	3.4
<b>Pune</b> (2006-2010)	6848	159	2.3	7489	109	1.5	14337	268	1.9
<b>Thiruvananthapuram</b> (2005-2011)	5337	93	1.7	5554	92	1.7	10891	185	1.7
<b>Meghalaya</b> (2010-2011)	1520	16	1.1	859	9	1.0	2379	25	1.1
<i>East khasi Hills</i> (2010-2011)	944	8	0.8	563	3	0.5	1507	11	0.7
<b>Tripura State</b> (2010)	1051	23	2.2	785	20	2.5	1836	43	2.3
<b>Nagaland</b> (2010)	218	5	2.3	110	2	1.8	328	7	2.1
<b>Wardha</b> (2010-2011)	760	15	2.0	822	16	1.9	1582	31	2.0

**Table 4.2(a): Number (#) and Relative Proportion (%) of Childhood Cancers by 5-year Age Group (2006-2011) - BOYS**

Registry	Age Group (years)						All Childhood Cancers
	0-4		5-9		10-14		
	#	%	#	%	#	%	
<b>Bangalore</b> (2006-2009)	99	30.9	116	36.3	105	32.8	320
<b>Barshi Rural</b> (2006-2010)	8	25.8	16	51.6	7	22.6	31
<i>Barshi Expanded</i> (2007-2009)	16	21.9	29	39.7	28	38.4	73
<b>Bhopal</b> (2006-2010)	19	16.4	43	37.1	54	46.6	116
<b>Chennai</b> (2006-2009)	126	41.2	95	31.0	85	27.8	306
<b>Delhi</b> (2006-2009)	587	35.0	592	35.3	496	29.6	1675
<b>Mumbai</b> (2006-2010)	230	30.0	270	35.2	267	34.8	767
<b>Cachar District</b> (2007-2010)	15	36.6	11	26.8	15	36.6	41
<b>Dibrugarh District</b> (2006-2011)	18	40.0	11	24.4	16	35.6	45
<b>Kamrup Urban District</b> (2006-2011)	19	35.8	17	32.1	17	32.1	53
<b>Manipur State (MR)</b> (2006-2010)	25	28.4	34	38.6	29	33.0	88
<i>Imphal West District</i> (2006-2010)	2	10.0	10	50.0	8	40.0	20
<i>MR - Excl. Imphal West</i> (2006-2010)	23	33.8	24	35.3	21	30.9	68
<b>Mizoram State (MZ)</b> (2006-2010)	25	45.5	19	34.5	11	20.0	55
<i>Aizawl District</i> (2006-2010)	11	39.3	13	46.4	4	14.3	28
<i>MZ - Excl. Aizawl</i> (2006-2010)	14	51.9	6	22.2	7	25.9	27
<b>Sikkim State</b> (2006-2011)	7	23.3	14	46.7	9	30.0	30
<b>Ahmedabad - Rural</b> (2006-2010)	28	33.3	35	41.7	21	25.0	84
<b>Ahmedabad - Urban</b> (2006-2010)	103	38.0	93	34.3	75	27.7	271
<b>Aurangabad</b> (2005-2010)	10	20.4	19	38.8	20	40.8	49
<b>Kolkata</b> (2006-2009)	67	32.4	66	31.9	74	35.7	207
<b>Kollam</b> (2006-2010)	73	40.3	53	29.3	55	30.4	181
<b>Nagpur</b> (2005-2009)	47	24.6	72	37.7	72	37.7	191
<b>Pune</b> (2006-2010)	38	23.9	74	46.5	47	29.6	159
<b>Thiruvananthapuram</b> (2005-2011)	30	32.3	32	34.4	31	33.3	93
<b>Meghalaya</b> (2010-2011)	3	18.8	5	31.3	8	50.0	16
<i>East Khasi Hills</i> (2010-2011)	1	12.5	3	37.5	4	50.0	8
<b>Tripura State</b> (2010)	6	26.1	11	47.8	6	26.1	23
<b>Nagaland</b> (2010)	0	0.0	3	60.0	2	40.0	5
<b>Wardha</b> (2010-2011)	5	33.3	4	26.7	6	40.0	15

**Table 4.2(b): Number (#) and Relative Proportion (%) of Childhood Cancers by 5-year Age Group (2006-2011) - GIRLS**

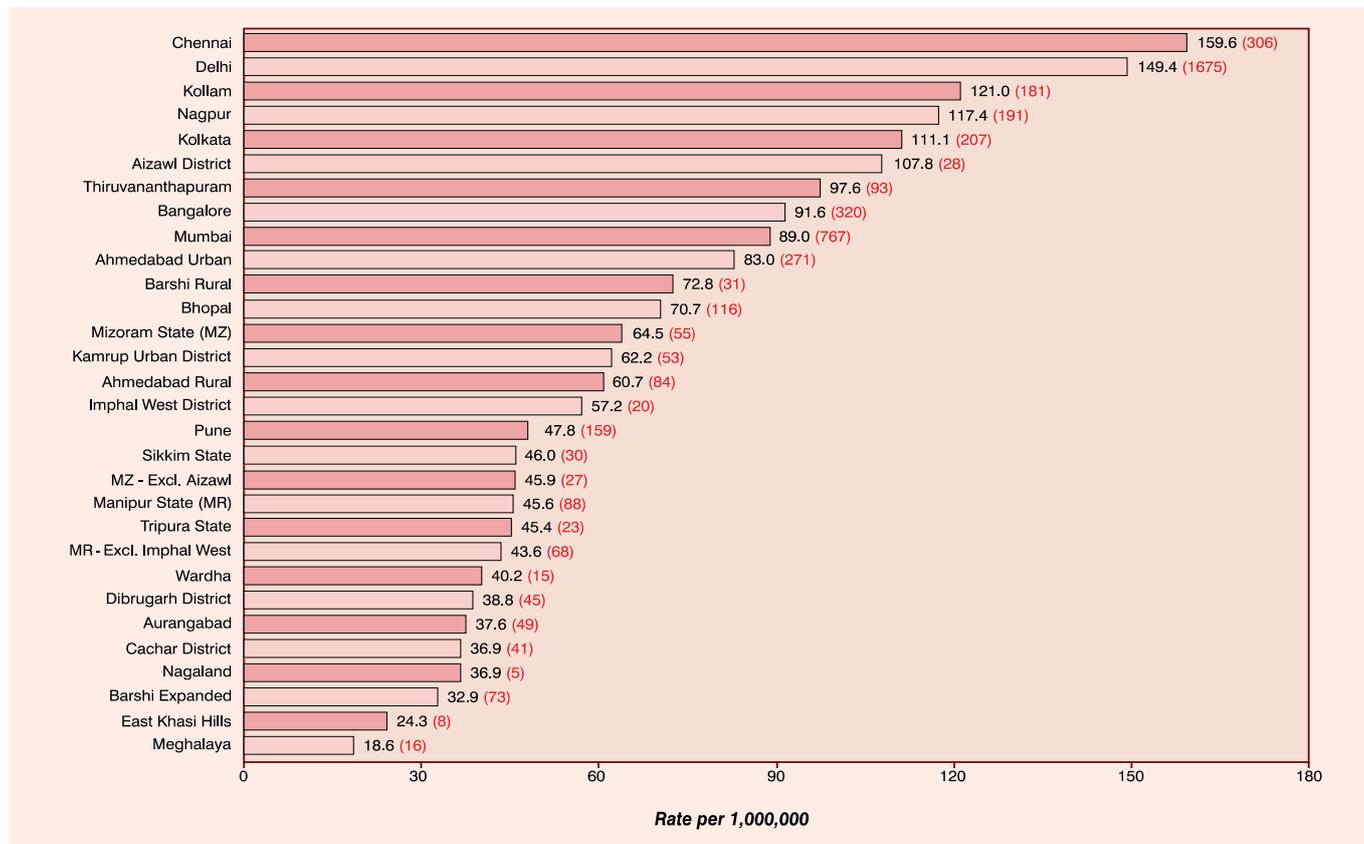
Registry	Age Group (years)						All Childhood Cancers
	0-4		5-9		10-14		
	#	%	#	%	#	%	
<b>Bangalore</b> (2006-2009)	86	38.4	63	28.1	75	33.5	224
<b>Barshi Rural</b> (2006-2010)	5	33.3	4	26.7	6	40.0	15
<i>Barshi Expanded</i> (2007-2009)	6	15.4	11	28.2	22	56.4	39
<b>Bhopal</b> (2006-2010)	27	31.8	28	32.9	30	35.3	85
<b>Chennai</b> (2006-2009)	73	33.6	75	34.6	69	31.8	217
<b>Delhi</b> (2006-2009)	278	37.9	224	30.6	231	31.5	733
<b>Mumbai</b> (2006-2010)	166	37.1	127	28.3	155	34.6	448
<b>Cachar District</b> (2007-2010)	6	20.7	7	24.1	16	55.2	29
<b>Dibrugarh District</b> (2006-2011)	5	20.0	9	36.0	11	44.0	25
<b>Kamrup Urban District</b> (2006-2011)	12	31.6	13	34.2	13	34.2	38
<b>Manipur State (MR)</b> (2006-2010)	15	25.9	19	32.8	24	41.4	58
<i>Imphal West District</i> (2006-2010)	4	18.2	9	40.9	9	40.9	22
<i>MR - Excl. Imphal West</i> (2006-2010)	11	30.6	10	27.8	15	41.7	36
<b>Mizoram State (MZ)</b> (2006-2010)	22	61.1	6	16.7	8	22.2	36
<i>Aizawl District</i> (2006-2010)	9	64.3	2	14.3	3	21.4	14
<i>MZ - Excl. Aizawl</i> (2006-2010)	13	59.1	4	18.2	5	22.7	22
<b>Sikkim State</b> (2006-2011)	7	25.9	7	25.9	13	48.1	27
<b>Ahmedabad - Rural</b> (2006-2010)	22	37.9	17	29.3	19	32.8	58
<b>Ahmedabad - Urban</b> (2006-2010)	46	34.3	36	26.9	52	38.8	134
<b>Aurangabad</b> (2005-2010)	15	34.9	13	30.2	15	34.9	43
<b>Kolkata</b> (2006-2009)	33	28.4	42	36.2	41	35.3	116
<b>Kollam</b> (2006-2010)	36	32.1	34	30.4	42	37.5	112
<b>Nagpur</b> (2005-2009)	42	33.1	34	26.8	51	40.2	127
<b>Pune</b> (2006-2010)	28	25.7	38	34.9	43	39.4	109
<b>Thiruvananthapuram</b> (2005-2011)	35	38.0	25	27.2	32	34.8	92
<b>Meghalaya</b> (2010-2011)	4	44.4	2	22.2	3	33.3	9
<i>East Khasi Hills</i> (2010-2011)	1	33.3	2	66.7	0	0.0	3
<b>Tripura State</b> (2010)	10	50.0	4	20.0	6	30.0	20
<b>Nagaland</b> (2010)	0	0.0	1	50.0	1	50.0	2
<b>Wardha</b> (2010-2011)	7	43.8	4	25.0	5	31.3	16

**Table 4.2(c): Number (#) and Relative Proportion (%) of Childhood Cancers by 5-year Age Group (2006-2011) - BOTH SEXES**

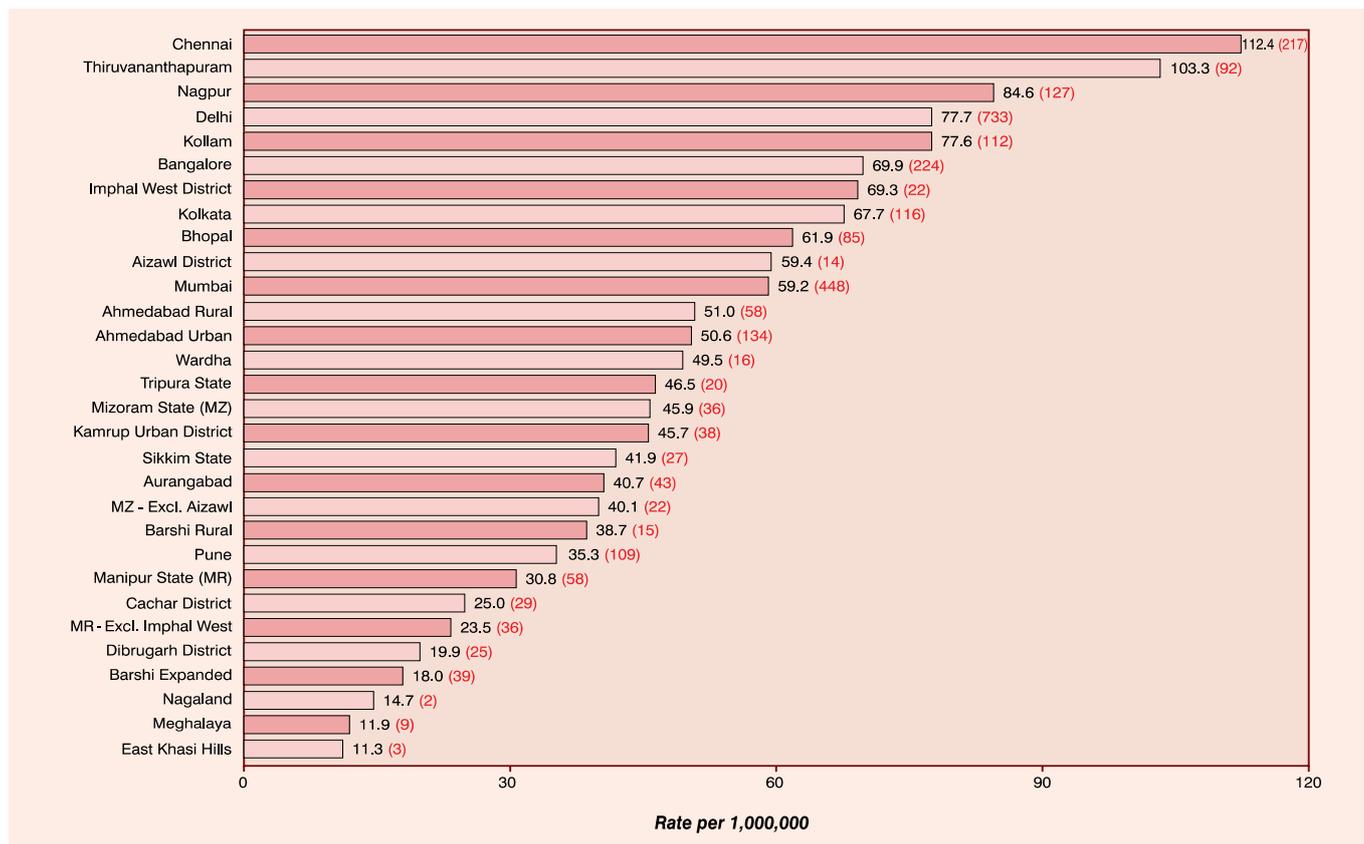
Registry	Age Group (years)						All Childhood Cancers
	0-4		5-9		10-14		
	#	%	#	%	#	%	
<b>Bangalore</b> (2006-2009)	185	34.0	179	32.9	180	33.1	544
<b>Barshi Rural</b> (2006-2010)	13	28.3	20	43.5	13	28.3	46
<i>Barshi Expanded</i> (2007-2009)	22	19.6	40	35.7	50	44.6	112
<b>Bhopal</b> (2006-2010)	46	22.9	71	35.3	84	41.8	201
<b>Chennai</b> (2006-2009)	199	38.0	170	32.5	154	29.4	523
<b>Delhi</b> (2006-2009)	865	35.9	816	33.9	727	30.2	2408
<b>Mumbai</b> (2006-2010)	396	32.6	397	32.7	422	34.7	1215
<b>Cachar District</b> (2007-2010)	21	30.0	18	25.7	31	44.3	70
<b>Dibrugarh District</b> (2006-2011)	23	32.9	20	28.6	27	38.6	70
<b>Kamrup Urban District</b> (2006-2011)	31	34.0	30	33.0	30	33.0	91
<b>Manipur State (MR)</b> (2006-2010)	40	27.4	53	36.3	53	36.3	146
<i>Imphal West District</i> (2006-2010)	6	14.3	19	45.2	17	40.5	42
<i>MR - Excl. Imphal West</i> (2006-2010)	34	32.7	34	32.7	36	34.6	104
<b>Mizoram State (MZ)</b> (2006-2010)	47	51.6	25	27.5	19	20.9	91
<i>Aizawl District</i> (2006-2010)	20	47.6	15	35.7	7	16.7	42
<i>MZ - Excl. Aizawl</i> (2006-2010)	27	55.1	10	20.4	12	24.5	49
<b>Sikkim State</b> (2006-2011)	14	24.6	21	36.8	22	38.6	57
<b>Ahmedabad - Rural</b> (2006-2010)	50	35.2	52	36.6	40	28.2	142
<b>Ahmedabad - Urban</b> (2006-2010)	149	36.8	129	31.9	127	31.4	405
<b>Aurangabad</b> (2005-2010)	25	27.2	32	34.8	35	38.0	92
<b>Kolkata</b> (2006-2009)	100	31.0	108	33.4	115	35.6	323
<b>Kollam</b> (2006-2010)	109	37.2	87	29.7	97	33.1	293
<b>Nagpur</b> (2005-2009)	89	28.0	106	33.3	123	38.7	318
<b>Pune</b> (2006-2010)	66	24.6	112	41.8	90	33.6	268
<b>Thiruvananthapuram</b> (2005-2011)	65	35.1	57	30.8	63	34.1	185
<b>Meghalaya</b> (2010-2011)	7	28.0	7	28.0	11	44.0	25
<i>East Khasi Hills</i> (2010-2011)	2	18.2	5	45.5	4	36.4	11
<b>Tripura State</b> (2010)	16	37.2	15	34.9	12	27.9	43
<b>Nagaland</b> (2010)	0	0.0	4	57.1	3	42.9	7
<b>Wardha</b> (2010-2011)	12	38.7	8	25.8	11	35.5	31

**Fig. 4.1: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)**  
**ALL TYPES** (No. of cases given in parentheses)

**Boys**

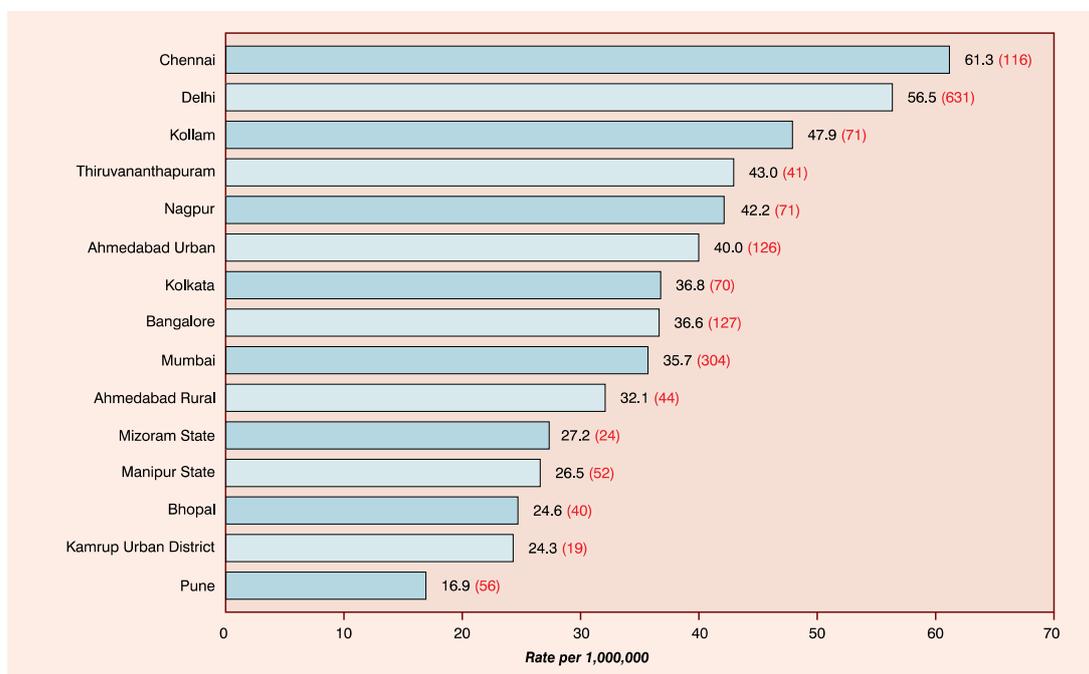


**Girls**

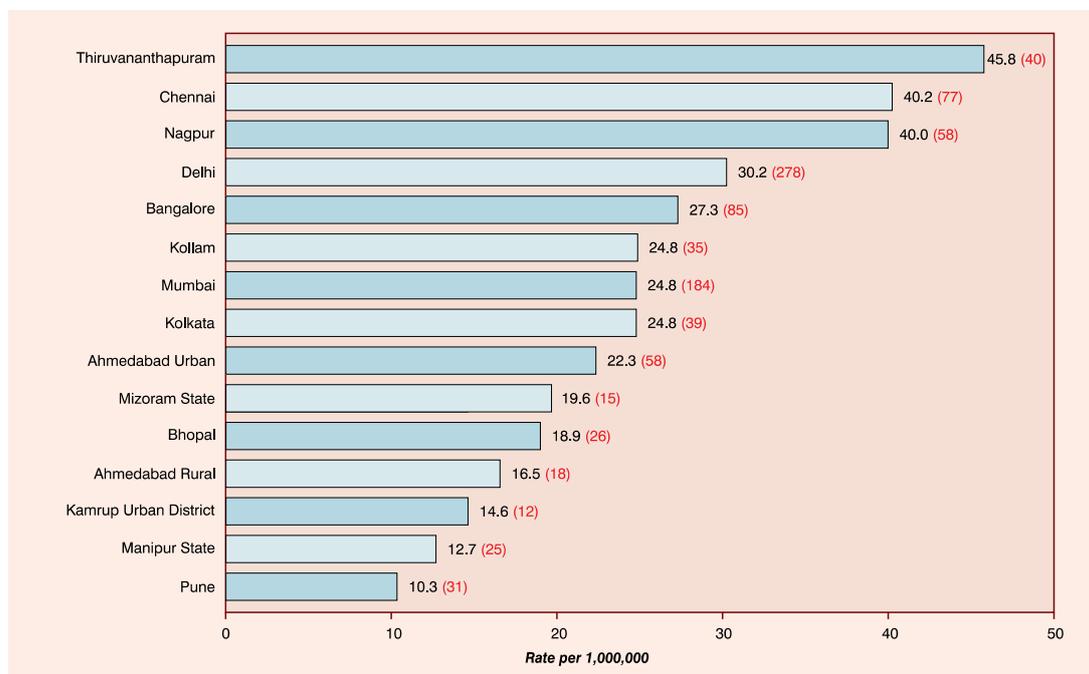


**Fig. 4.2: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14) LEUKAEMIAS (No. of cases given in parentheses)**

**Boys**



**Girls**

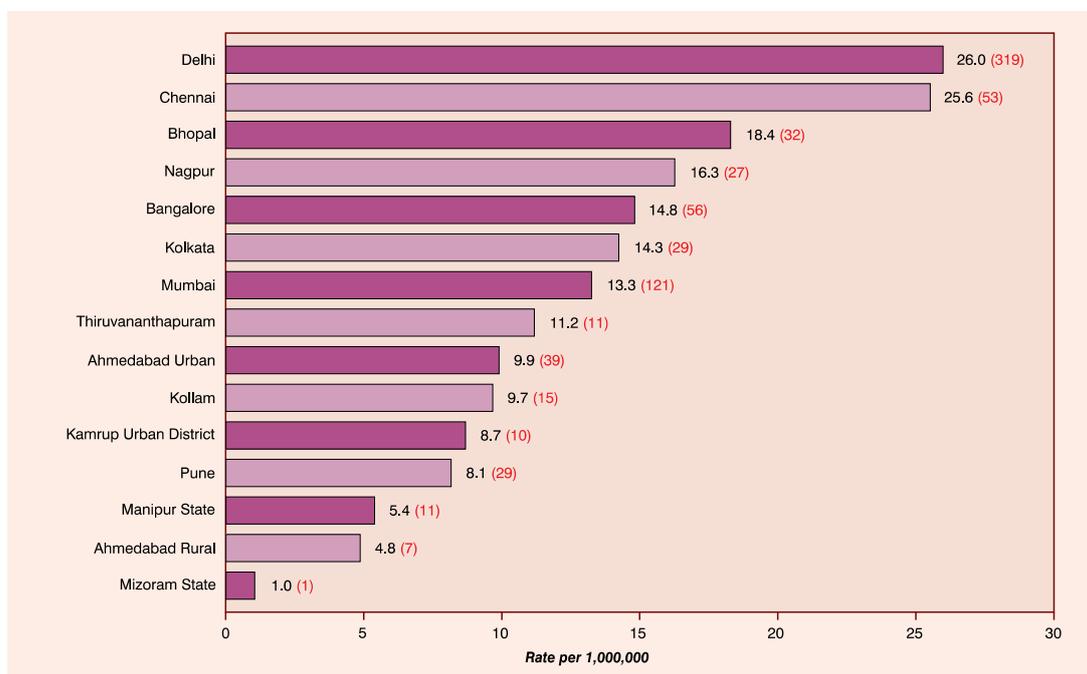


**Boys:** Chennai had the highest AARpm (61.3) followed by Delhi (56.5) among all the PBCRs. Mizoram State showed higher AARpm (27.2) among the North East registries.

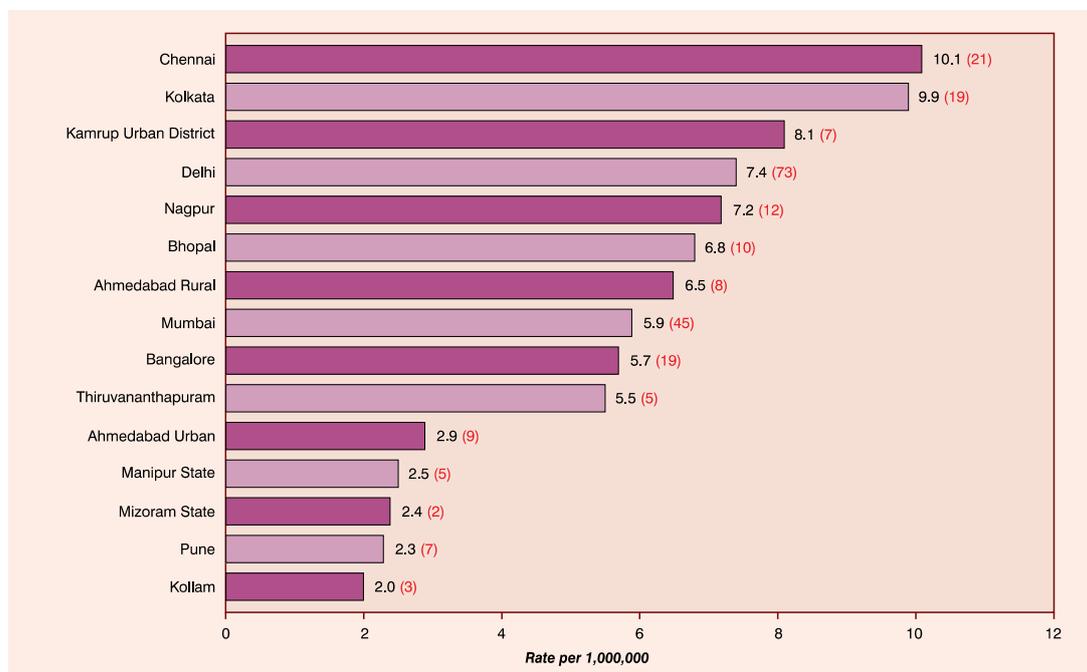
**Girls:** Thiruvananthapuram recorded a higher AARpm of 45.8 followed by Chennai (40.2) and Nagpur (40.0). Mizoram State at 19.6 was higher among the North East PBCRs.

**Fig. 4.3: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)**  
**LYMPHOMAS** (No. of cases given in parentheses)

### Boys



### Girls



**Boys:** Delhi had higher AARpm (26.0) followed by Chennai (25.6) among all the PBCRs.

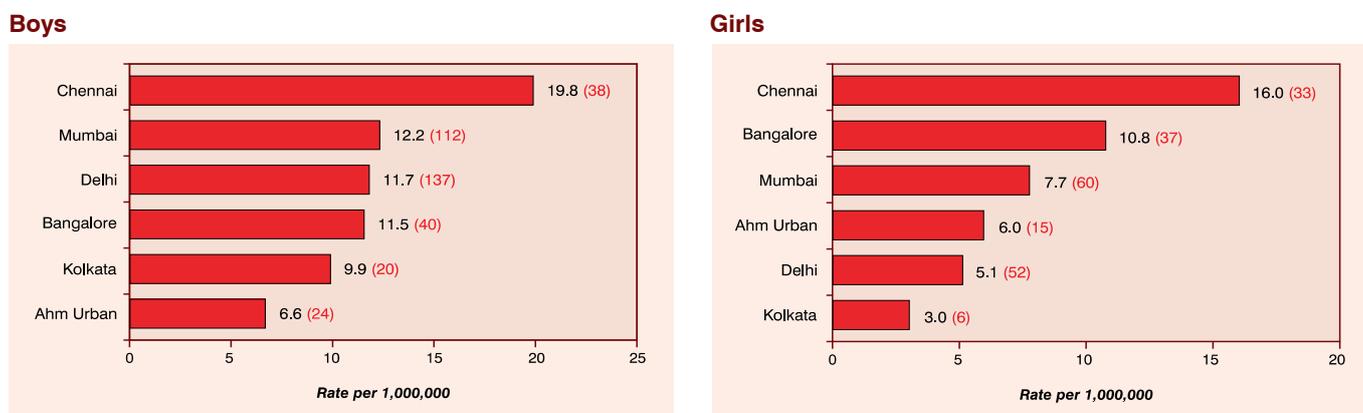
**Girls:** Chennai had higher AARpm (10.1) followed by Kolkata (9.9) among all the PBCRs. Kamrup Urban District was higher (8.1) among the North East PBCRs.

### C.N.S TUMOURS

**Boys:** Chennai had the highest AARpm (19.8) while Ahmedabad Urban had the lowest (6.6).

**Girls:** Chennai had higher AARpm (16.0) while Kolkata had the lowest AAR (3.0).

**Fig. 4.4: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)\***



### S.N.S TUMOURS

**Boys:** Chennai had the highest AARpm (12.6) and Ahmedabad Urban had the least (1.5).

**Girls:** Chennai had higher AARpm (5.3) and Ahmedabad Urban had the least (1.8).

**Fig. 4.5: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)\***

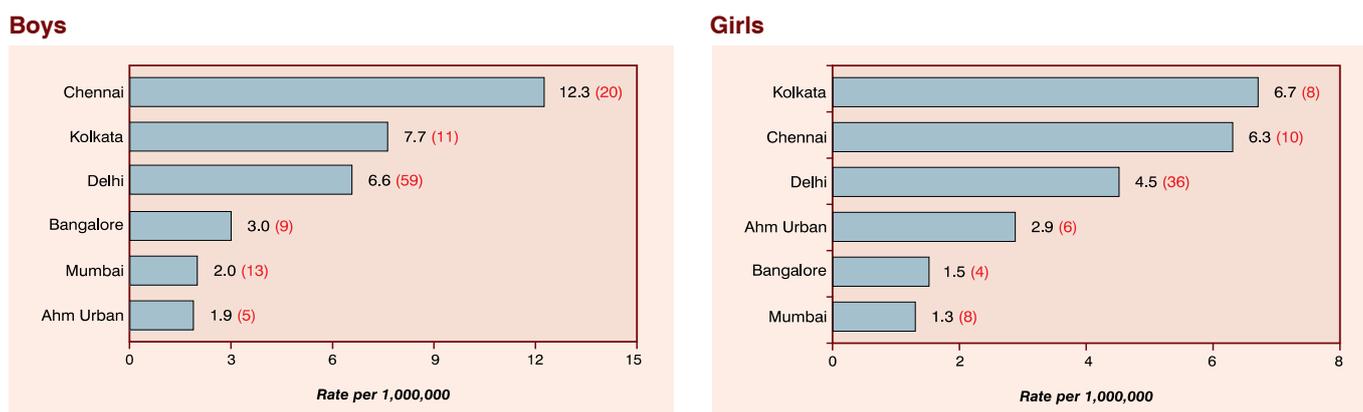


### RETINOBLASTOMA

**Boys:** Chennai had the highest AARpm (12.3).

**Girls:** Kolkata had the highest AARpm (6.7) among all the PBCRs followed by Chennai (6.3).

**Fig. 4.6: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)\***



Ahmedabad Urban is referred as Ahm Urban in the above graphs

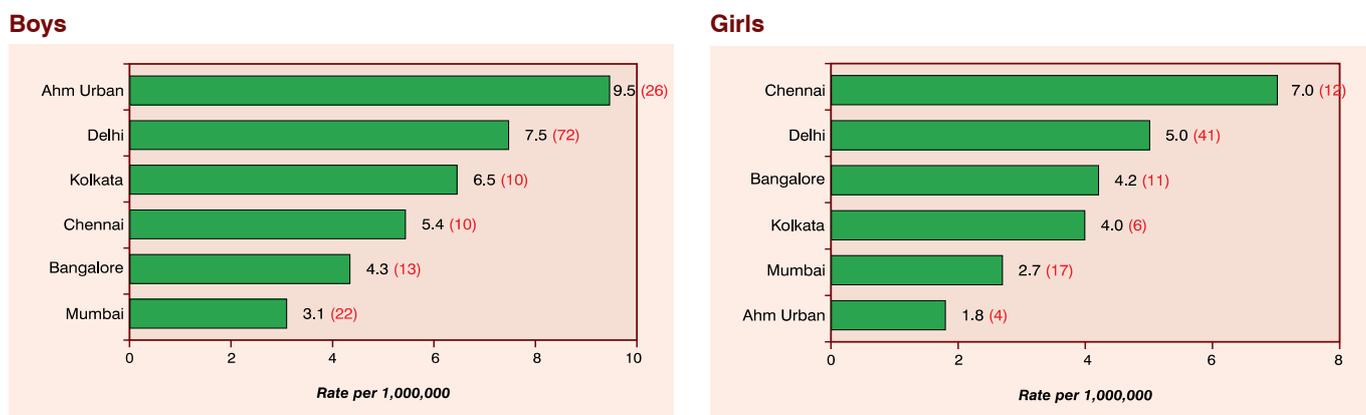
\* No. of cases given in parentheses

### RENAL TUMOURS

**Boys:** Ahmedabad Urban recorded a higher AARpm (9.5) followed by Delhi (7.5).

**Girls:** Chennai had a higher AARpm (7.0) followed by Delhi (5.0).

**Fig. 4.7: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)\***

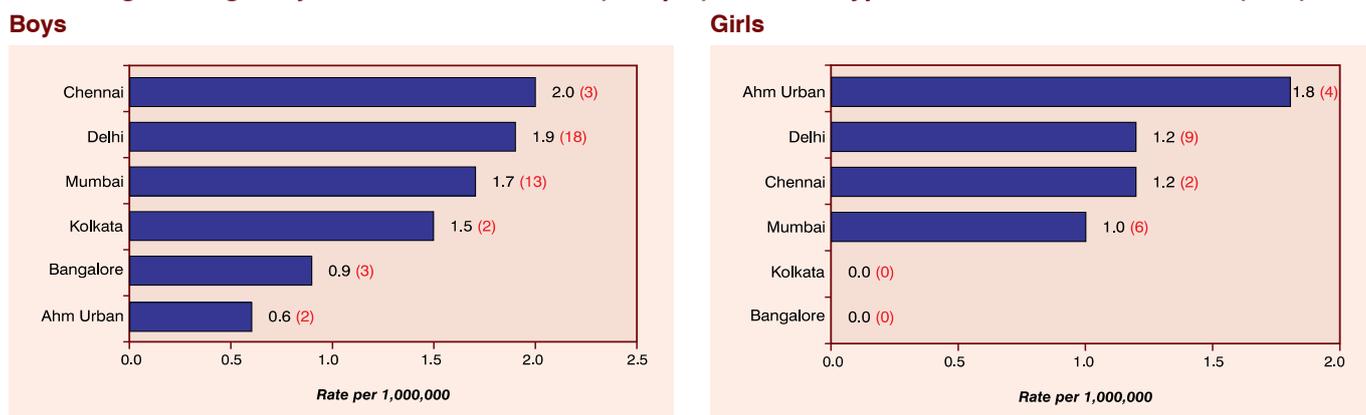


### HEPATIC TUMOURS

**Boys:** Chennai had a higher AARpm (2.0) followed by Delhi (1.9).

**Girls:** Ahmedabad Urban recorded a higher AARpm (1.8) followed by Delhi (1.2).

**Fig. 4.8: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)\***



### BONE TUMOURS

**Boys:** Delhi had higher AARpm (9.0) and Ahmedabad Urban had the least (2.8).

**Girls:** Chennai showed higher AARpm (6.2) followed by Delhi (5.5).

**Fig. 4.9: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)\***



Ahmedabad Urban is referred as Ahm Urban in the above graphs

\* No. of cases given in parentheses

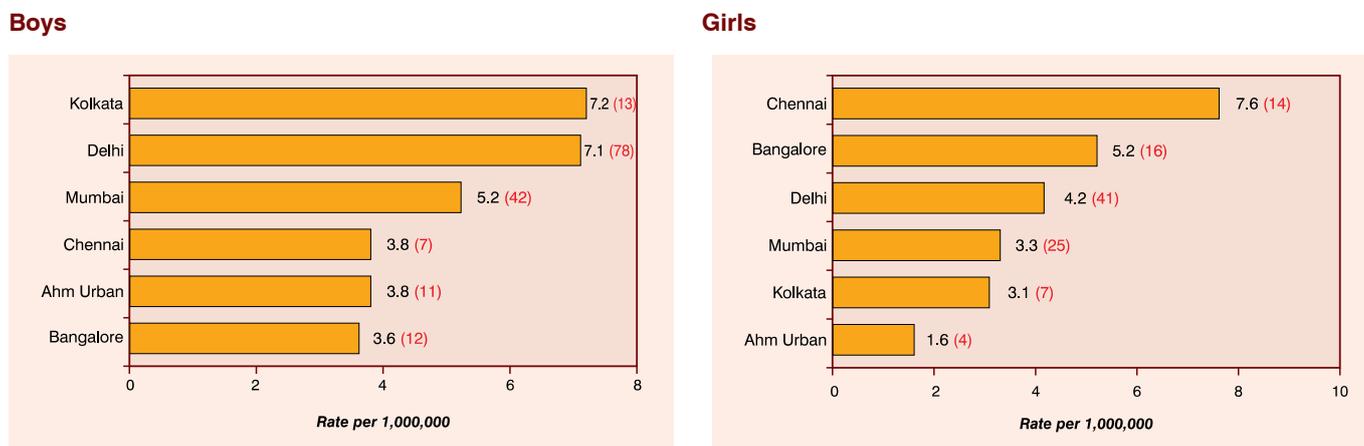
### SOFT-TISSUE SARCOMAS

**Boys:** Kolkata and Delhi were close recording AARpm of 7.2 and 7.1 respectively.

**Girls:** Chennai (7.6) had a higher AARpm and Ahmedabad Urban had the lowest (1.6).

**Fig. 4.10: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)**

(No. of cases given in parentheses)



### GERM-CELL TUMOURS

**Boys:** Delhi (2.9) was higher followed by Mumbai (2.6) and Kolkata was the least (1.3).

**Girls:** Ahmedabad Urban (1.3) was highest and Bangalore was at the bottom (0.2).

**Fig. 4.11: Age Adjusted Incidence Rates (AARpm) of Broad Types of Cancers in Childhood (0-14)**

(No. of cases given in parentheses)

