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Communicable Diseases Incidence in Meghalaya

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Abstract

Communicable diseases are the world's biggest killers of children and causes of preventable deaths among adults in the developing world. This paper analyses the spatial pattern in the prevalence of communicable diseases in different district of Meghalaya as a whole and West Khasi Hill District in particular. The major communicable diseases have been taken for consideration as these have a direct relation with the environment. The main objective is to analyse the spatial patterns and to identify and map the endemic areas of diseases related to specific environmental characteristics. This will help to understand the disease ecology of different districts in Meghalaya and the state as a whole as well. It will see the prevalence of diseases in the Khasi and Garo hills in relation to the altitude, climate and the environment. It will help to understand the differences in the occurrence of diseases between the cooler region and the hot and humid region.

Relevant data has been collected from the Directorate of Health Services, Meghalaya for the year 2011, the District Medical & Health Officer (DMHO) West Khasi Hills, Nongstoin for the year 2011 and from the Directorate of Census Operations, Meghalaya.

Keywords: Diseases, Environment, Altitude

Introduction:

Communicable diseases are easily preventable if adequate health coverage is provided and that its occurrence, trend etc. provide a clue to the utilization of available healthcare facility. It has been noted by many that the health facilities are extremely inadequate in many parts of Meghalaya. This may explain a higher incidence in the prevalence of communicable diseases in those areas. Among the most prevalent communicable diseases observed in Meghalaya and the Khasi Hills, Acute Respiratory Infections (hereafter ARI), Malaria (hereafter Ma), Acute Diarrheal Diseases (hereafter ADD), Enteric Fever (hereafter EF), pneumonia (hereafter PN), Whooping Cough (hereafter WC), Measles (hereafter MS), Viral Hepatitis (hereafter VH) and Pulmonary Tuberculosis (hereafter PTB) have been recorded in order of numerical importance.

The state, though an administrative unit is also a geographical unit too by and large coinciding with a detached plateau, structurally linked to the peninsular upland. The plateau is however characterized by enormous variation in its physical and cultural set up. The topography is highly dissected and is accompanied by substantial differences in rainfall, temperature, soil characteristics, vegetal cover etc. Culturally too the region supports a very high percentage of tribal population, notably the Khasi-Jaintia and the Garo, concentrated almost exclusively in three distinct hills comprising the bold features of the plateau.

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Considerable differences in the physio-cultural characteristics of the region have been responsible for wide ranging disease environments neatly carving out separate regions on the basis of disease prevalence. At a very broad level, the state can be divided into two distinct physio-cultural regions:

(i) The Eastern Meghalaya which includes four districts namely Jaintia Hills, East and West Khasi Hills and the Ri Bhoi districts. Together, these four districts account for three fifths of the total geographical area of the state. This part of the state is almost entirely hilly excepting a few areas in its northern and southern face. The altitude varies greatly ranging between 50 to well over 1600 metres. The central plateau ridge runs in an E-W direction and abruptly slopes down in the southern part. The eastern Meghalaya in general is characterized by a much higher spatial variation in the distribution of rainfall and temperature. The central ridge acting as the boundary between the world's highest rainfall zone located in the south and the rain shadow zone towards the north represents the most prominent relief feature in this part. By and large, a long wet season and short dry months characterize the climate in this part of Meghalaya. The Khasi-Jaintia tribesmen belonging to the same cultural group predominantly inhabit the area.

(ii) The remaining three districts comprising the East, West and South Garo Hills constitute the physiographic region of Western Meghalaya. The distinctive characteristic of this region is its relatively low relief consisting of subdued hills and intermittent plains bordering Assam and Bangladesh. The central plateau ridge in this part degenerates into low hills. Consequently, the region enjoys relatively higher temperature but much lower rainfall compared to the eastern parts of Meghalaya. The Garo tribesmen, culturally distinguished from the Khasis in a number of ways predominantly inhabit this region. The density of population is much higher in this part as the fertility of the soil supports relatively higher population pressure.

Vast majority of the population in Meghalaya irrespective of these two broad regions is rural (79.92 per cent) in its population composition. The socio–economic under- development of the region is evident from the fact that a significant proportion of the population is dependent upon a very traditional method of cultivation–i.e. shifting, slash and burn cultivation. However, as a consequence of the mortality control experienced during the past few decades coupled with high birth rates, the region is experiencing a phenomenally high growth rate of population (27.82 per cent) adding enormous pressure to already deforested and degraded soils of the hill slopes (Census of India, 2011). Ironically, the population grows at a faster pace in spite of a very high crude death rate, i.e. 9.2 per thousand, which is much higher than the all India average (Goel, 2005). The recently conducted NFHS survey recorded that one out of every 12 children dies before attaining the age of five and only 10 per cent of the children are fully vaccinated while 55 per cent do not get vaccinated at all. Over two fifths (i.e. 42.3 per cent) of the rural population is not served by any kind of institutional health care network. Only one hospital bed is available per thousand of population and this figure is attained by including the private sector too.

Ranking of Diseases

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One of ways to understand and analyse incidence of communicable diseases in Meghalaya is to rank each one of them in terms of relative occurrence in different districts that permit one to assess prevalence of such diseases. Disease ranking gives an idea to know the level or position of the diseases in various ways. It is also very essential in order to understand the distributional pattern of diseases in particular area as it helps us to know the prevalence of different diseases in order of importance.

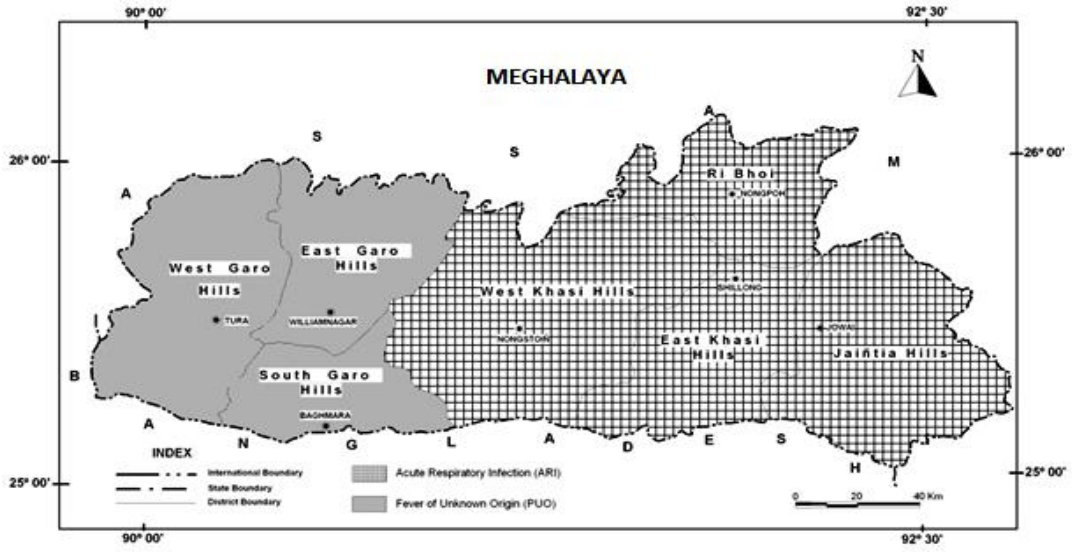

Fig 1.1 First Ranking Communicable Diseases 2011

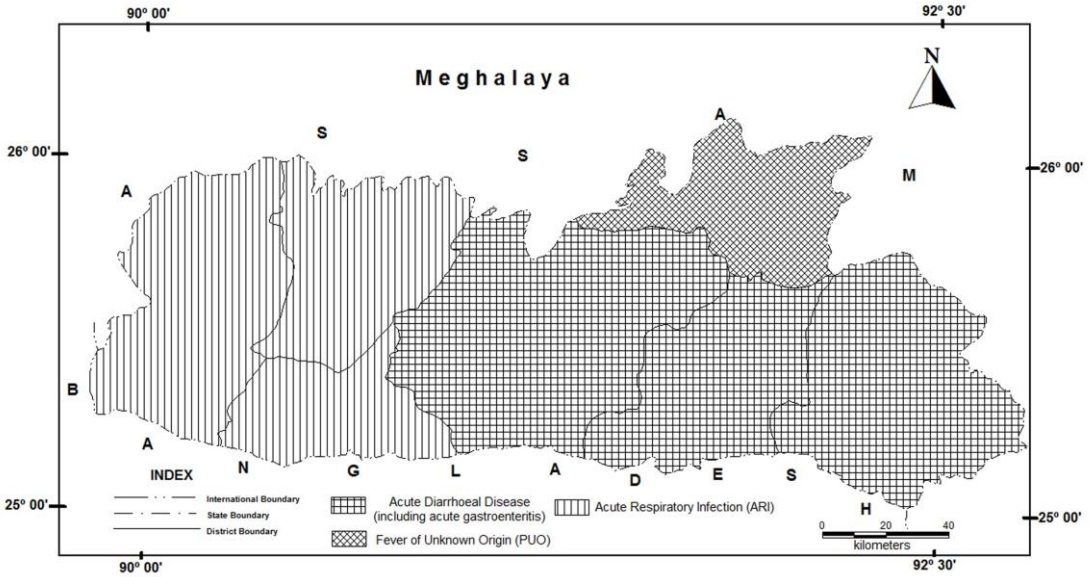

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Fig 1.2 Second Ranking Communicable Diseases 2011

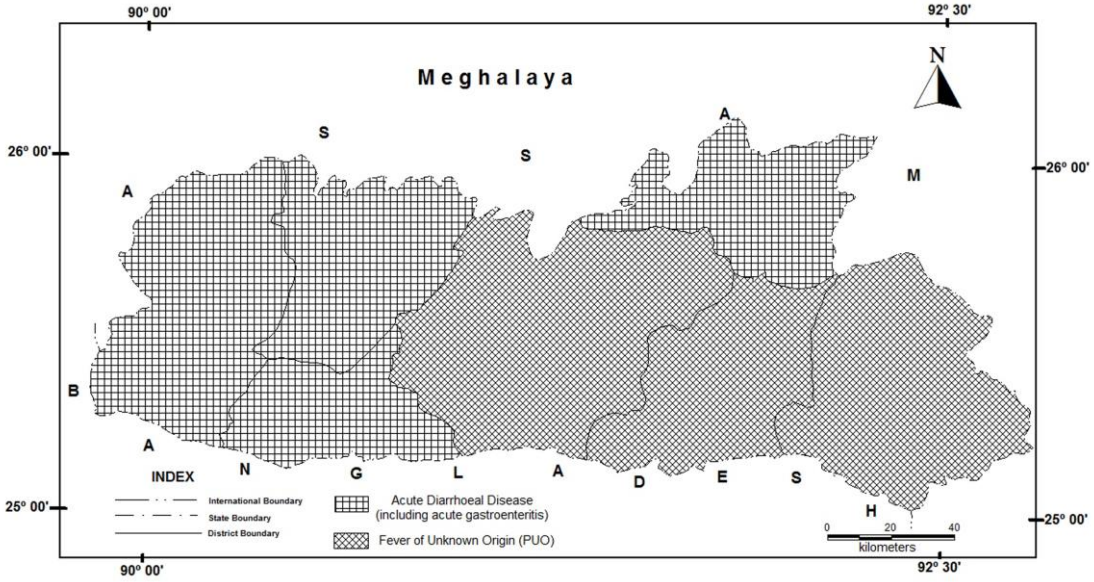

Fig 1.3 Third ranking communicable Diseases 2011

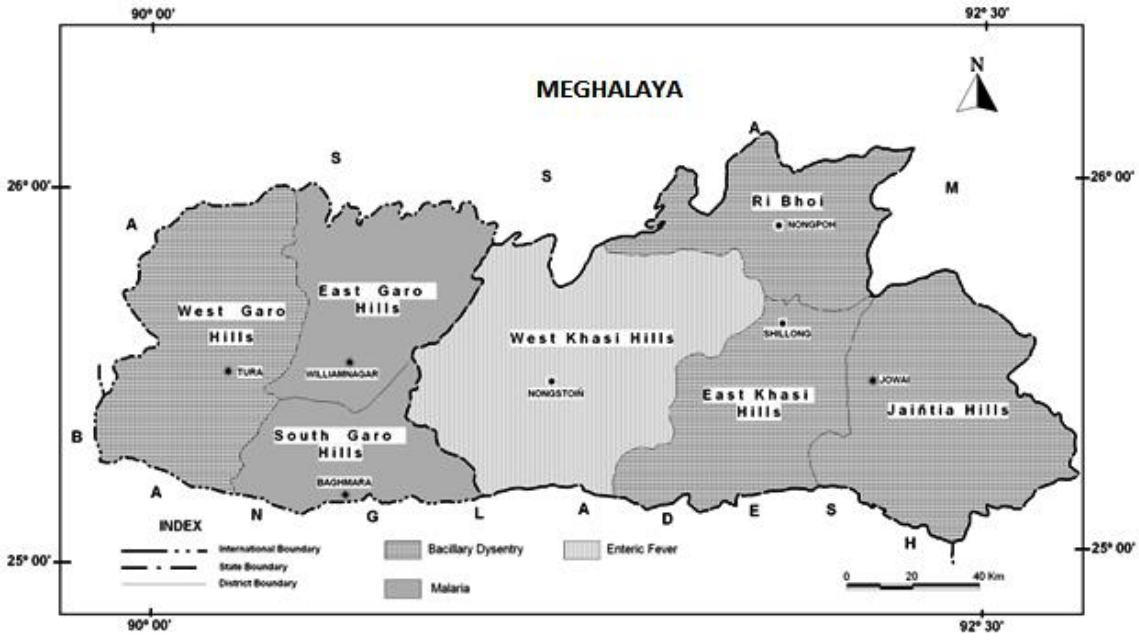

Fig 1.4 Fourth ranking Communicable Diseases 2011

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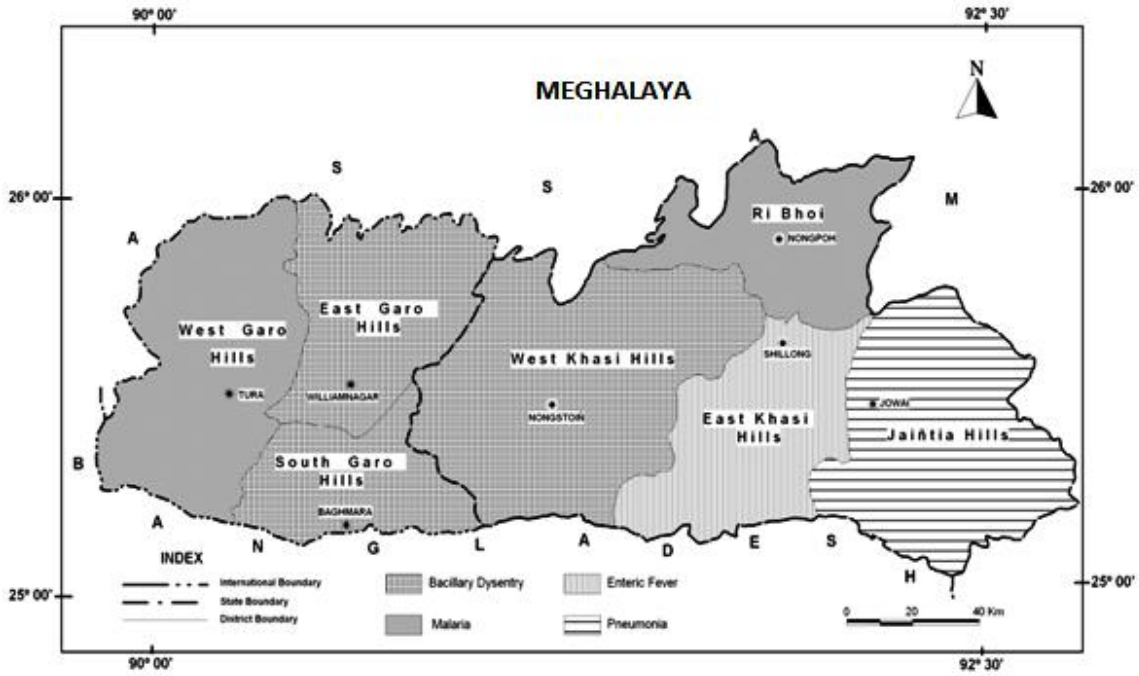

Fig 1.5 Fifth Ranking Communicable Diseases 2011

The figure 1.1 shows the first ranking of communicable diseases in all the district of Meghalaya. It is found the ARI rank first in all the district of Khasi Hills while the FUO rank first in the Garo Hills. The figure 1.2 shows the second ranking of communicable disease. ADD rank second in the Khasi Hills except in Ri Bhoi District where FOU dominates and ARI in the Garo Hills. The figure 1.3 shows the third ranking. FUO rank third in the Khasi Hills while ADD in the Garo Hills and Ri Bhoi District. The figure 1.4 shows the fourth ranking: BD rank fourth in East Khasi Hills, Jaintia Hills, Ri Bhoi and West Garo Hills while Enteric fever in West Khasi Hills and Malaria in East and South Garo Hills. The figure 1.5 shows the fifth ranking. Enteric fever rank fifth in East Khasi Hills, BD in West Khasi Hills, East Garo Hills and South Garo Hills, Pneumonia in Jaintia hills and Malaria in Ri Bhoi and West Garo Hills.

Table 1.1 Meghalaya: Ranking of Communicable Diseases 2011

DISTRICT	I	II	III	IV	V
Khasi-Jaintia Hills					
East Khasi Hills	ARI	ADD	FUO	BD	EF
West Khasi Hills	ARI	ADD	FUO	EF	BD

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Jaintia Hills	ARI	ADD	FUO	BD	PN
Ri-Bhoi	ARI	PUO	ADD	BD	Ma
Garo Hills					
East Garo Hills	FUO	ARI	ADD	Ma	BD
West Garo Hills	FUO	ARI	ADD	BD	Ma
South Garo Hills	FUO	ARI	ADD	Ma	BD

ARI -Acute Respiratory Infection (ARI)/Influenza like Illness (ILI), ADD -Acute Diarrhoeal Disease (including acute gastroenteritis); FUO -Fever of Unknown Origin (PUO), Ma - Malaria, BD- Bacillary Dysentery, EF -Enteric Fever, PN -Pneumonia

Source: Directorate of Health service, 2011

The table clearly reveals that Acute Respiratory Infection (ARI)/Influenza like Illness (ILI) hold the first rank in the Khasi Hills while Fever of Unknown Origin (PUO) in the Garo Hills predominates. It shows that there is a distinction of occurrence of the diseases in the Khasi Hills and the Garo hills. This is largely explained by remarkable difference in altitude and the climatic factors in the two hills. Acute Diarrhoeal Diseases, including acute gastroenteritis (ADD) holds the second rank in the Khasi Hills whereas in Ri Bhoi district the Fever of Unknown origin (PUO) holds the same, while in the Garo Hills Acute Respiratory Infection (ARI)/Influenza Like Illness (ILI) holds the second rank. Relatively low altitude of Ri Bhoi districts brings it closer to Garo Hills as far as its disease ecology is concerned. Fever of unknown origin (PUO) holds the third rank in the Khasi Hills except Ri Bhoi and the Garo Hills where the Acute Diarrhoeal Disease (ADD) occupied the third rank.

Here too it shows that Ri Bhoi district is somewhat similar to Garo Hills this is because of lower altitude compared to the Khasi Hills and the climatic conditions of the district. In the fourth rank, Bacillary Dysentery was found in East Khasi Hills, Jaintia Hills, Ri Bhoi and West Garo Hills. Enteric fever was found in West Khasi Hills while Malaria in East Garo Hills and South Garo hills. East Khasi Hills has Enteric Fever in the fifth rank while it was Bacillary Dysentery in West Khasi Hills, East Garo Hill and South Garo Hills, Pneumonia in Jaintia Hills and Malaria in Ri Bhoi and West Garo Hills.

It is evident that there is uniformity in the occurrence of communicable diseases in the Khasi Hills and the Garo Hills as far as 1st and 3rd ranking diseases, i.e., ARI, PUO and ADD are concerned. The diversity in diseases prevalent in the districts increases with higher rank i.e. 4th and 5th of prevailing diseases.

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1.4.2 Seasonality in Prevalence

Table 1.2 to 1.4 show the percentage of each disease for each districts of Meghalaya for the year 2011 as a whole. It has been observed that the incidence of morbidity due to each disease has shown a different trend during the period under review (Fig 1.6 to 1.8).

Seasonality of ARI occurrence varies greatly across the districts. It is clear from the table 1.2 that the seasonality varies greatly even within the two broad regions of Meghalaya. While greater number of cases is reported in East Khasi Hills during the monsoon months, such cases are more during autumn in West Khasi Hills and during Spring and summer months in Jaintia Hills. There is a greater uniformity in occurrence of ARI in Garo Hills which are confined to summer months.

Table 1.2. Meghalaya: Seasonal variation in incidence of ARI

District	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills
January	3.38	5.48	5.28	3.74	1.76	4.06	5.35
February	3.69	3.15	5.89	4.96	4.90	5.29	5.48
March	5.51	7.42	10.30	8.47	11.47	9.51	15.39
April	9.96	9.30	10.04	9.25	19.65	9.68	2.40
May	11.54	6.61	8.89	9.17	6.80	9.30	10.37
June	12.55	8.45	10.15	9.58	10.66	10.20	15.23
July	10.93	9.14	9.75	10.81	22.58	13.25	10.86
August	12.50	7.73	9.37	7.06	9.46	7.56	8.34
September	10.13	6.64	7.01	10.51	4.47	7.37	8.07
October	6.58	14.81	9.88	13.22	4.07	11.71	4.98
November	7.03	12.48	7.41	9.98	2.24	7.61	2.71
December	6.20	8.79	6.03	3.24	1.94	4.45	10.81
Total	100	100	100	100	100	100	100

Source: Directorate of Health Service 2011

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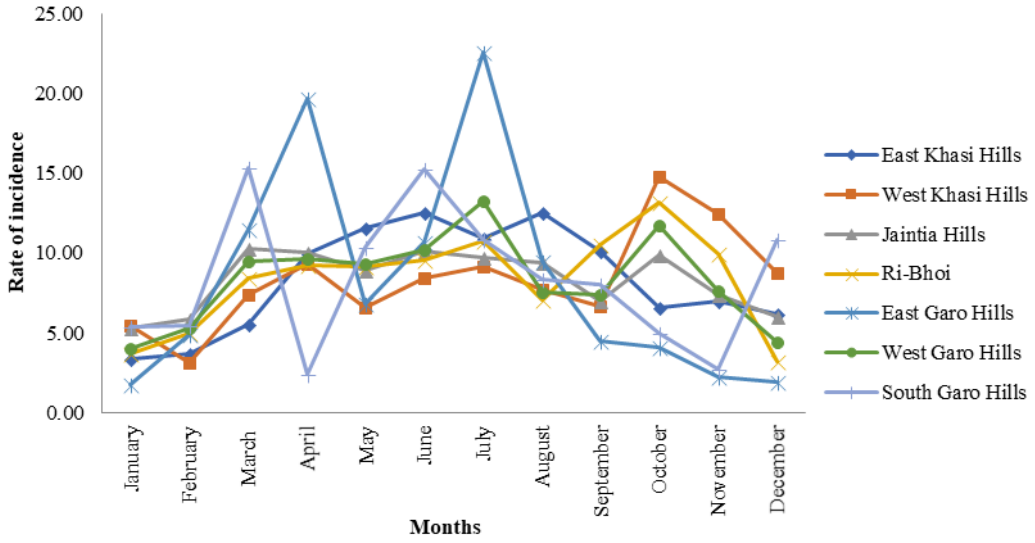

Fig 1.6 Meghalaya: Inter-District Seasonal Variation in the incidence ARI, 2011

Fig. 1.6 shows the complex seasonal pattern in the occurrence of ARI as far as different districts of the state are concerned. Incidence of ARI is very high in East Garo Hills and there are two peaks in the prevalence- one during spring and the other during the monsoon. Extreme variation in altitude and rainfall create diverse seasonal pattern in the occurrence of ARI in different parts of the state.

Table 1.3 Meghalaya: Seasonal variation in incidence of ADD

District	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills
January	2.48	7.27	4.76	4.38	1.35	5.19	3.07
February	3.63	5.33	5.11	5.58	6.66	7.54	7.37
March	5.37	5.00	9.03	6.36	12.24	11.04	17.14
April	10.53	7.27	9.26	8.41	14.14	9.26	3.10
May	13.52	10.39	13.19	13.69	8.61	11.37	13.84
June	17.52	9.98	16.19	15.77	12.68	12.76	16.47
July	10.35	10.89	9.91	10.30	16.74	9.42	6.74
August	11.23	8.89	7.82	7.68	11.92	6.65	7.67

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September	9.86	7.11	6.33	9.05	5.25	6.41	7.30
October	5.95	9.58	7.76	9.82	4.77	9.55	6.00
November	3.95	10.00	5.82	6.46	3.25	6.40	2.90
December	5.61	8.30	4.82	2.51	2.38	4.41	8.40
Total	100	100	100	100	100	100	100

Source: Directorate of Health service, 2011

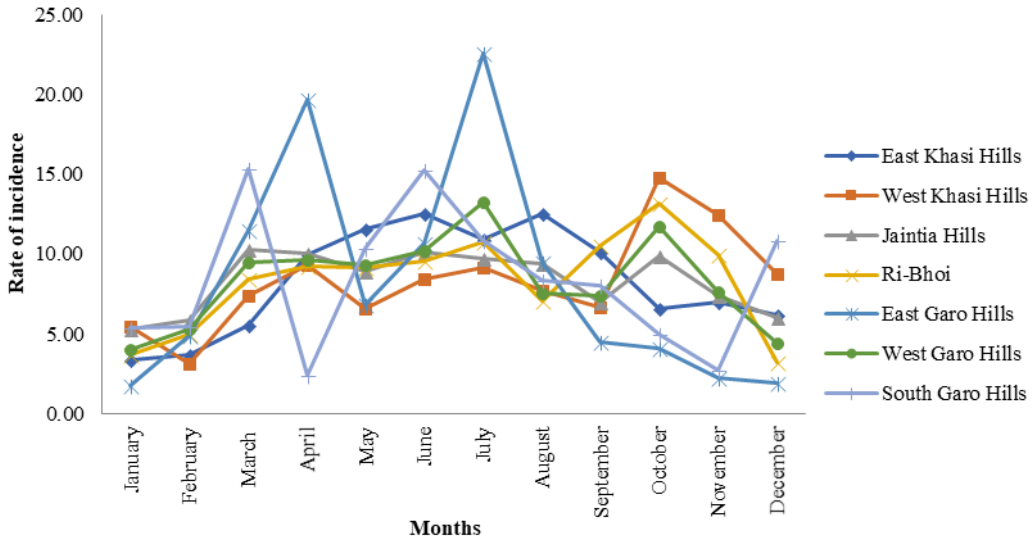

Fig 1.7. Meghalaya: Monthly Variation in ADD in Different Districts, 2011

Unlike ARI which revealed extreme inter-district variation in its prevalence in different parts of the year, ADD showed extreme concentration in its occurrence during summer months and largely coinciding with rainy monsoon months. This seasonal concentration has much less inter-district variation. The incidence is rare in winter months in almost all districts. Higher prevalence of the disease is seen for a longer period in the Khasi Hills compared to the Garo Hills. Moreover, more cases of ADD are reported from the Garo Hills during March-April months unlike in Khasi Hills where the disease is clearly associated with monsoon period.

Figure 1.7 reveals that the higher incidence of ADD is found in the month of June in the district of East Khasi Hills. It was followed by South Garo Hills where the morbidity rate is highest in the month of March. In East Garo Hills it is found that ADD is highest in the month of July while in Jaintia Hills in the month of June. The figure 2.7 reveals that ADD is highest in the

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monsoon season although it occurs throughout the year in all the district of Meghalaya.

The incidence of Fever of Unknown Origin (PUO) is far more prevalent in the summer rainy months in nearly all the districts of Meghalaya with minor variation across districts. This is understandable as many potential Malaria cases normally get recorded as PUO in the PHCs. Such cases are far more prevalent in the period between March to September while the colder months show a sharp decline in the reported cases of PUO. In Ri-Bhoi district far more cases of PUO are reported during July-October period unlike other districts. The incidence of PUO is more evenly spread out throughout the year in Garo Hills in sharp contrast to the Khasi Hills where the cases of PUO are more prevalent in summer rainy months are fewer in winter months.

Table 1.4. Meghalaya: Seasonal Variation in Incidence of PUO

District	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills
January	6.83	7.39	4.68	2.01	1.60	4.21	5.40
February	9.62	4.10	3.64	4.92	5.07	5.40	3.94
March	10.03	9.72	7.01	6.55	8.92	9.98	11.58
April	9.86	10.23	7.77	8.73	15.55	9.59	2.59
May	7.92	10.21	9.15	7.90	7.88	10.27	11.50
June	9.35	8.23	13.30	9.36	11.41	12.09	15.02
July	9.05	8.72	13.46	11.11	22.61	12.38	8.40
August	11.92	6.02	10.62	10.73	10.24	8.30	10.74
September	9.76	7.23	6.79	10.69	5.81	6.70	9.03
October	6.25	8.45	10.72	15.23	4.80	10.10	5.91
November	5.53	11.09	8.42	9.79	2.95	7.40	4.75
December	3.90	8.60	4.45	2.98	3.16	3.59	11.14
Total	100	100	100	100	100	100	100

Source: Directorate of Health service, 2011

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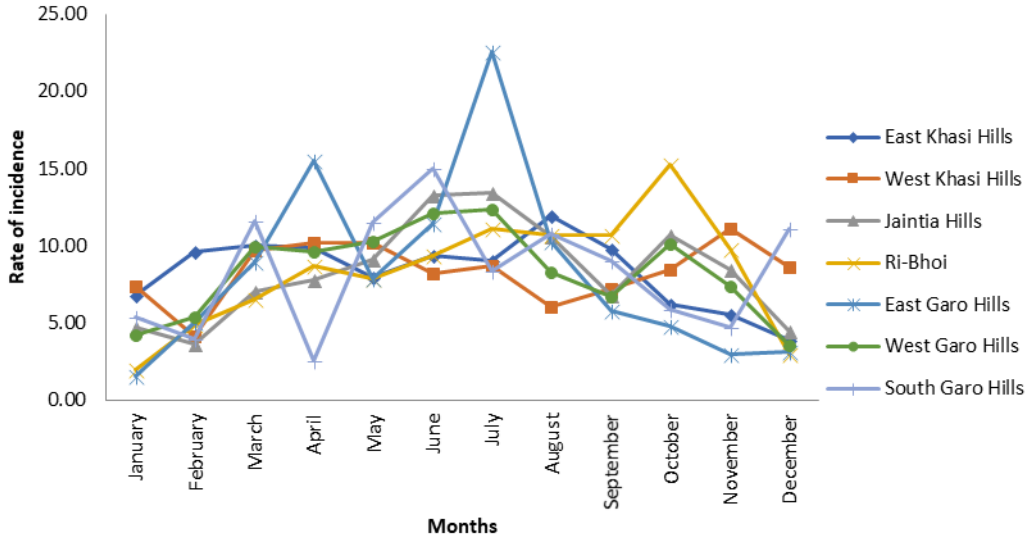

Fig 1.8 Rate of incidence of Fever of Unknown Origin (PUO) in the Districts of Meghalaya 2011

Fig. 1.8 shows that the higher incidence of Fever of Unknown Origin (PUO) is found in the month of July in the district of East Garo Hills. This is because of the climate and the altitude of the region and it is higher because it was in monsoon season. While in South Garo Hills it is found that the incidence is higher even in winter season that is in the month of December.

1.4.3 Decadal Variation

Tables 1.5-1.8 show the percentage of ADD and ARI/Influenza like Illness (ILI) for each district of Meghalaya for the year 2001 and 2011. The table 1.5, table 1.7, figure 1.9 and figure 1.11 show the incidence of diseases according to the population while table 1.6, table 1.8, figure 1.10 and figure 1.12 show the incidence of diseases according to the total number of reported cases in the state as a whole.

Table 1.5. Meghalaya: Inter-District Variation in %Population Affected by ADD

District	2001	2011
East Khasi Hills	4.06	4.55
West Khasi Hills	7.64	3.43
Jaintia Hills	7.02	7.74
Ri-Bhoi	5.38	4.32
East Garo Hills	1.25	0.58

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West Garo Hills	2.32	3.12
South Garo Hills	1.50	2.10
Total	4.21	3.95

Source: Directorate of Health service, 2014

Table 1.5 shows that ADD morbidity was the highest in West Khasi Hills in the year 2001 with 7.6 per cent of the population affected by this disease in that year. Almost an identical proportion of the people suffered from this disease in Jaintia Hills district too. With a morbidity rate of 5.38 per cent Ri-Bhoi district in Khasi Hills occupied the third position. As a whole, the Khasi Hills generally recorded significantly more cases of ADD compared to Garo Hills where the rate varied from 1.25 to 2.32 percent. In the year 2011, the ADD morbidity declined in West Khasi Hills but increased phenomenally in Jaintia Hills. In general, the people of Khasi Hills suffered more from this communicable disease compared to Garo Hills.

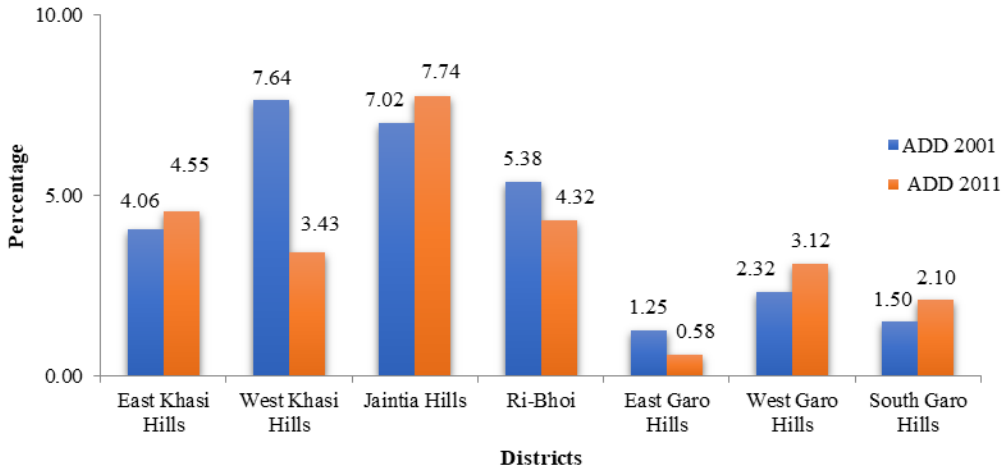

Fig. 1.9. Meghalaya: Inter-District Variation in % people suffered ADD

Fig. 1.9 shows that the incidence of acute diarrhoeal diseases increased in 2011 in East Khasi Hill, Jaintia Hills, West Garo Hills and South Garo hills district, while in West Khasi Hills, Ri Bhoi and East Garo Hills the incidence of acute diarrhoeal disease has declined. The overall decline in ADD morbidity however has been small in the state as a whole primarily due to increase in the incidence of the disease in districts which had fewer cases in 2001.

Table 1.6 Meghalaya: % Distribution of ADD Cases

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District	2001	2011
East Khasi Hills	27.52	31.98
West Khasi Hills	23.20	11.28
Jaintia Hills	21.53	25.97
Ri-Bhoi	10.64	9.53
East Garo Hills	3.22	1.58
West Garo Hills	12.35	17.11
South Garo Hills	1.55	2.56

Source: Directorate of Health service, 2011

Table 1.6 shows the percentage of incidence of acute diarrhoeal disease according to the total number of reported cases in different districts of the state. It is evident from the table that East Khasi hills has the highest percentage of ADD reported cases accounting for over 27 per cent of all reported cases in the state followed by West Khasi Hills and Jaintia Hills in the year 2001. All the three districts are located in the Khasi Hills. In 2011, percentage of ADD reported cases increased East Khasi Hills which accounted for nearly a third of all ADD cases in Meghalaya. Jaintia hills too accounted for nearly one fourth of all reported cases of ADD in the state. Together these two districts alone accounted for nearly 57 per cent of all reported cases of ADD. Within Garo Hills, West Garo Hills accounted for a substantial 17 per cent of ADD cases. Very few cases were reported from East Garo Hills.

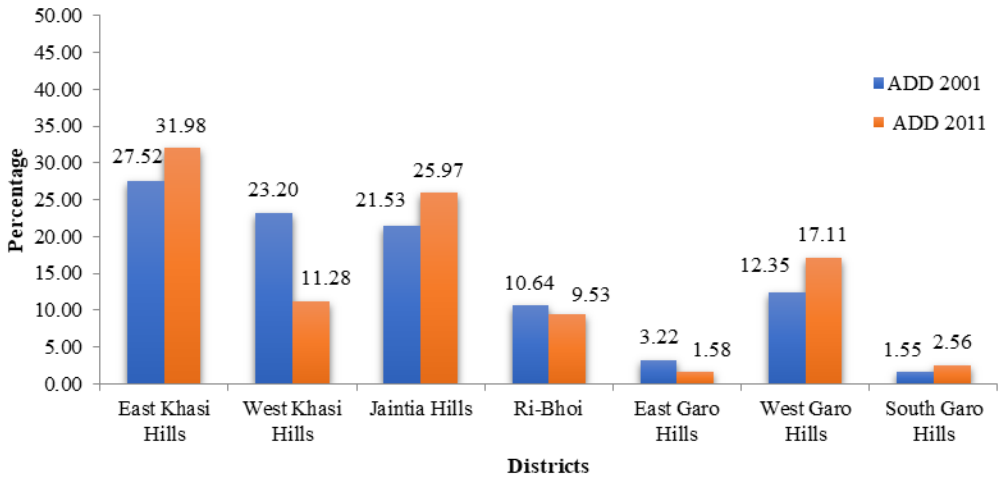

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Fig. 1.10. Meghalaya: Distribution of ADD Reported Cases

Fig. 1.10 shows the percentage of incidence of ADD according to the total number of cases in the state as a whole. It is evident from the figure that reported cases witnessed an increase in most parts of the state except West Khasi Hills and East Garo Hills. Of these two districts, significantly, there was a substantial decline in the reported cases in West Khasi Hills district.

Table 1.7 Meghalaya: Inter-District Variation in % Population Affected by ARI

District	2001	2011
East Khasi Hills	6.68	13.07
West Khasi Hills	5.27	5.83
Jaintia Hills	6.33	17.45
Ri-Bhoi	4.80	11.96
East Garo Hills	1.26	1.39
West Garo Hills	2.27	7.38
South Garo Hills	0.65	4.17
Total	4.46	9.70

Source: Directorate of Health service, 2011

As regards the ARI is concerned, table 1.7 reveals a higher incidence of the disease in 2001 in all the districts of Khasi Hills compared to those of the Garo Hills. With a rate of 6.68 per cent, East Khasi Hills district has the highest incidence of ARI followed by Jaintia hills and West Khasi Hills district. The incidence of ARI was much lower in Garo Hills with South Garo Hills recording 0.65 per cent people suffering from these diseases. In the remaining two districts of the Garo Hills, the proportion suffering from ARI ranged from 1.26 per cent to 2.27 per cent only.

Incidence of ARI witnessed a phenomenal increase in its incidence in the year 2011 with a uniform increase in the rate in all the districts. The incidence of ARI doubled in the state as a whole between 2001 and 2011. However, the rate of increase was significantly high in the districts of Khasi Hills with the exception of West Khasi Hills. Though the Garo Hills districts had far lower incidence in 2001, there was a spurt in the incidence of ARI in two out of three districts located in Garo Hills.

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Figure 1.11 Meghalaya: Inter-District Variation in % people suffered ARI

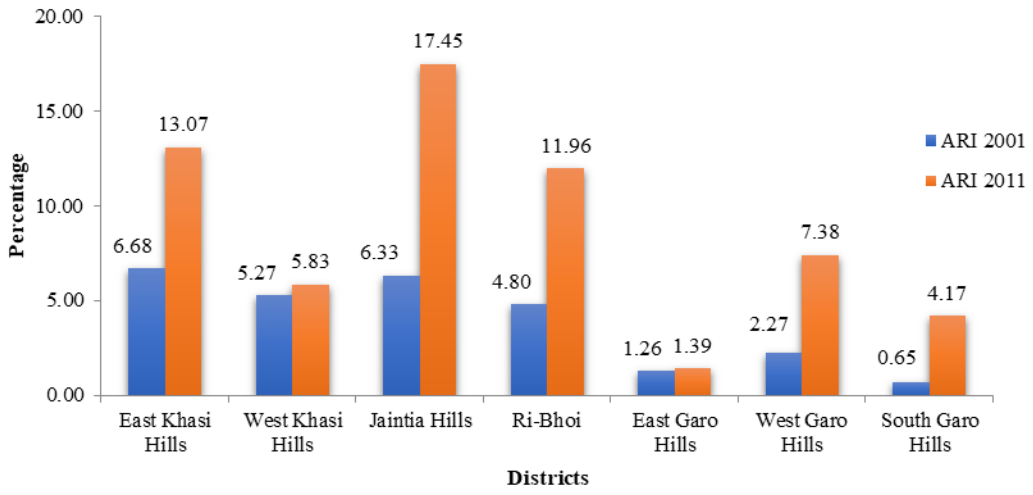

Fig. 1.11 shows that the increase in ARI morbidity was seen throughout the state but to varying extent. Maximum spurt was seen in Jaintia Hills as well as in Ri Bhoi district of the Khasi Hills. The most significant increase was seen in the Garo Hills, where ARI morbidity rates were fewer in the past. This increase in ARI morbidity in Garo Hills closed the vast gap in the incidence of the disease between Garo and Khasi Hills.

Table 1.8. Meghalaya: % Distribution of ARI Cases

District	2001	2011
East Khasi Hills	42.66	37.47
West Khasi Hills	15.07	7.82
Jaintia Hills	18.28	23.85
Ri-Bhoi	8.94	10.75
East Garo Hills	3.04	1.54
West Garo Hills	11.36	16.51
South Garo Hills	0.64	2.07

Source: Directorate of Health service, 2011

Table 1.8 shows the percentage of incidence of acute respiratory infection according to the total number of cases in the state as a whole. It is clear from the table that in 2001 East Khasi hills has the highest percentage of reported cases of ARI followed by Jaintia Hills and West Khasi Hills.

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In 2011, East Khasi Hills has the highest percentage followed by Jaintia Hills and West Garo Hills.

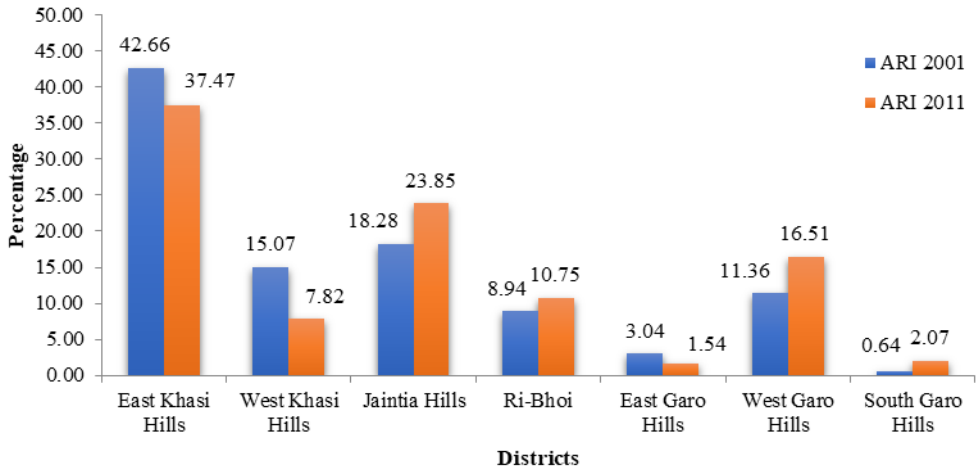

Fig. 1.12. Meghalaya: Distribution of Reported ARI Cases

Figure 1.12 shows inter-district variation in the percentage of reported cases of acute respiratory infection according to the total number of cases. The figure reveals that three of the districts namely East Khasi Hills, West Khasi Hills and East Garo Hills experienced a decline in the number of ARI cases between 2001 and 2011 while the remaining districts witnessed a jump in the reported cases.

Only two of the most important communicable diseases in Meghalaya were taken into consideration for analysis. The probe revealed the two disease ecologies in the state represented by Khasi and Jaintia Hills respectively. It also revealed the importance of local geographical factors within each of these two broad regions as far as communicable disease is concerned.

1.5 Pattern in West Khasi Hills

Since the focus of the research is West Khasi Hills district, it is pertinent to examine the patterns of morbidity in the district with reference to the communicable diseases. Relevant data for the purpose has been collected from the CHCs and PHCs located in the district. Figure 2.13 depicts the location of PHCs and CHCs in the district in relation to population densities worked out for the development blocks within the district.

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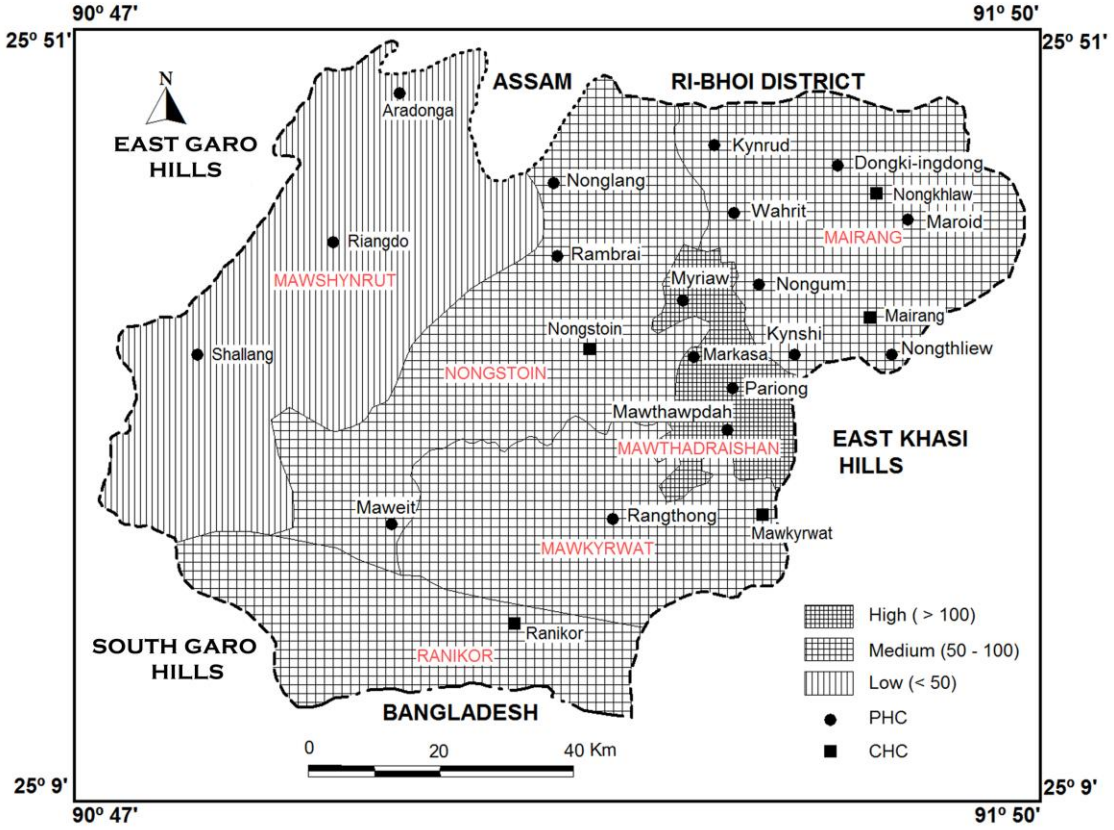

Fig 1.13 Population Density and the location of CHC and PHC of West Khasi Hills 2011

It is clear from the figure 1.13 that population densities decrease from east to west. Mawthadraishan block located in the east has the highest population density and Mawshynrut block located in the western part has the lowest density. The density figures in the former are over 100 persons per kilometre while it is as low as 50 or less in the latter. In the intervening stretch, the density of population varies from 50-100 per kiolometer. The map reveals that population pressure is generally low in the district. Available health infrastructure in Mawkyrwat, Mawshynrut, Ranikor and Nongstoin block are very poor. Ranikor for example has only one CHC located within the block.

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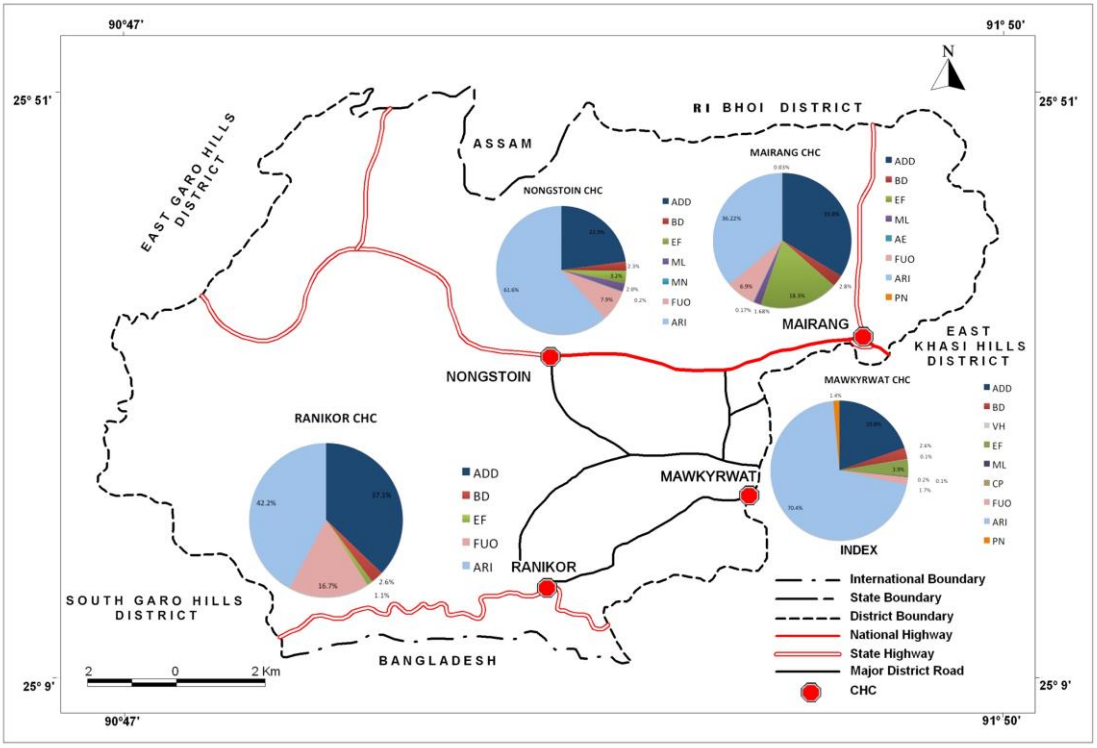

Fig 1.14 Distributions of Communicable Diseases in the CHC's of West Khasi Hills 2011

Incidence of communicable diseases in the district as revealed from the CHC data from four locations reveal wide variation. Fig. 1.14 shows that ARI and ADD dominate among all types of communicable diseases in the district. In Mawkyrwat CHC located close to East Khasi Hills in the eastern part has extreme predominance of ARI, but Mairang CHC on a similar location has both ARI and ADD almost in similar proportion. Nongstoin CHC shows dominance of ARI whereas Ranikor CHC has ADD and ARI in almost equal proportion. Enteric Fever (EF) occupies an important place as a communicable disease in Mairang CHC, but nowhere else. Likewise, PUO is an important communicable disease reported from Ranikor CHC.

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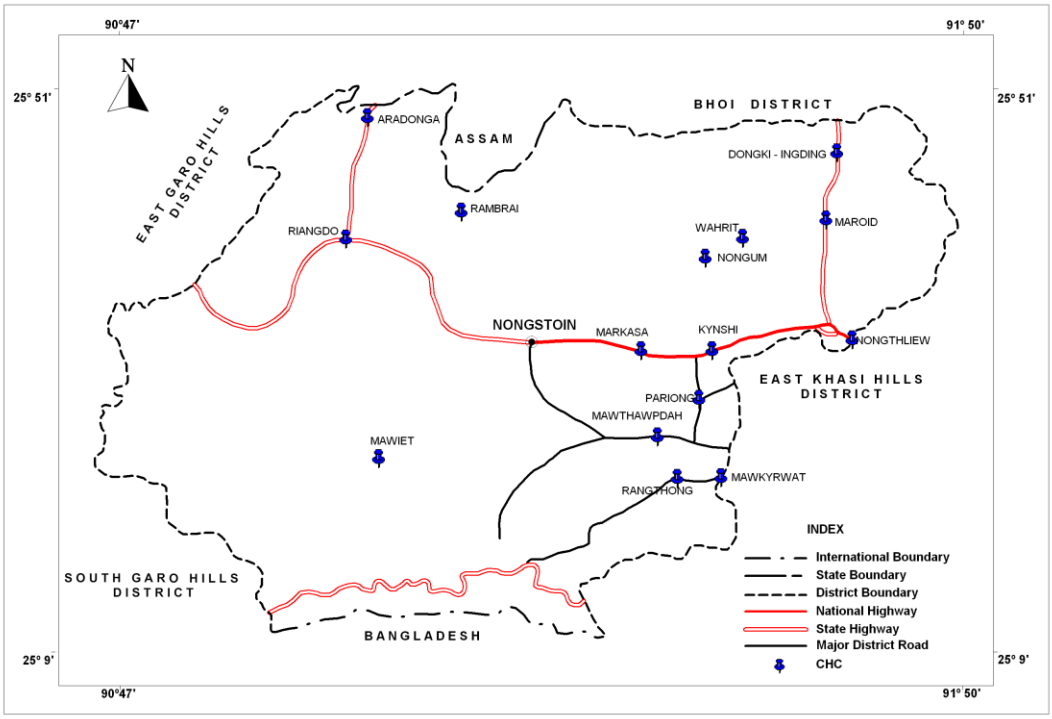
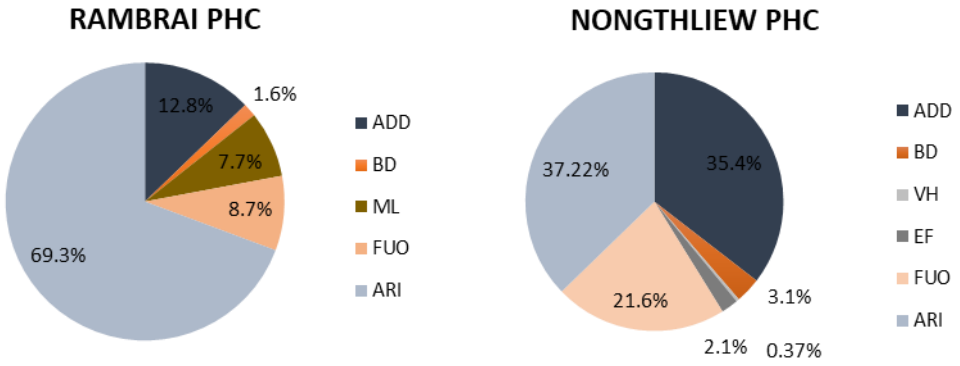


Fig 1.15 West Khasi Hills: Distribution of Primary Health Centres, 2011

Figure 1.15 shows the distribution of primary health centres in the West Khasi Hills district while the figure 1.16 depicts the composition of communicable diseases in each of these PHCs. As can be clearly seen from fig. 1.16, prevalence of communication diseases varies greatly within the district if the data available from different PHCs is any indication.

Figure 1.15 shows clear disparity in the distribution of PHCs in the district as the western and southern part of the district has fewer PHCs which are far more concentrated in the eastern part of the district.



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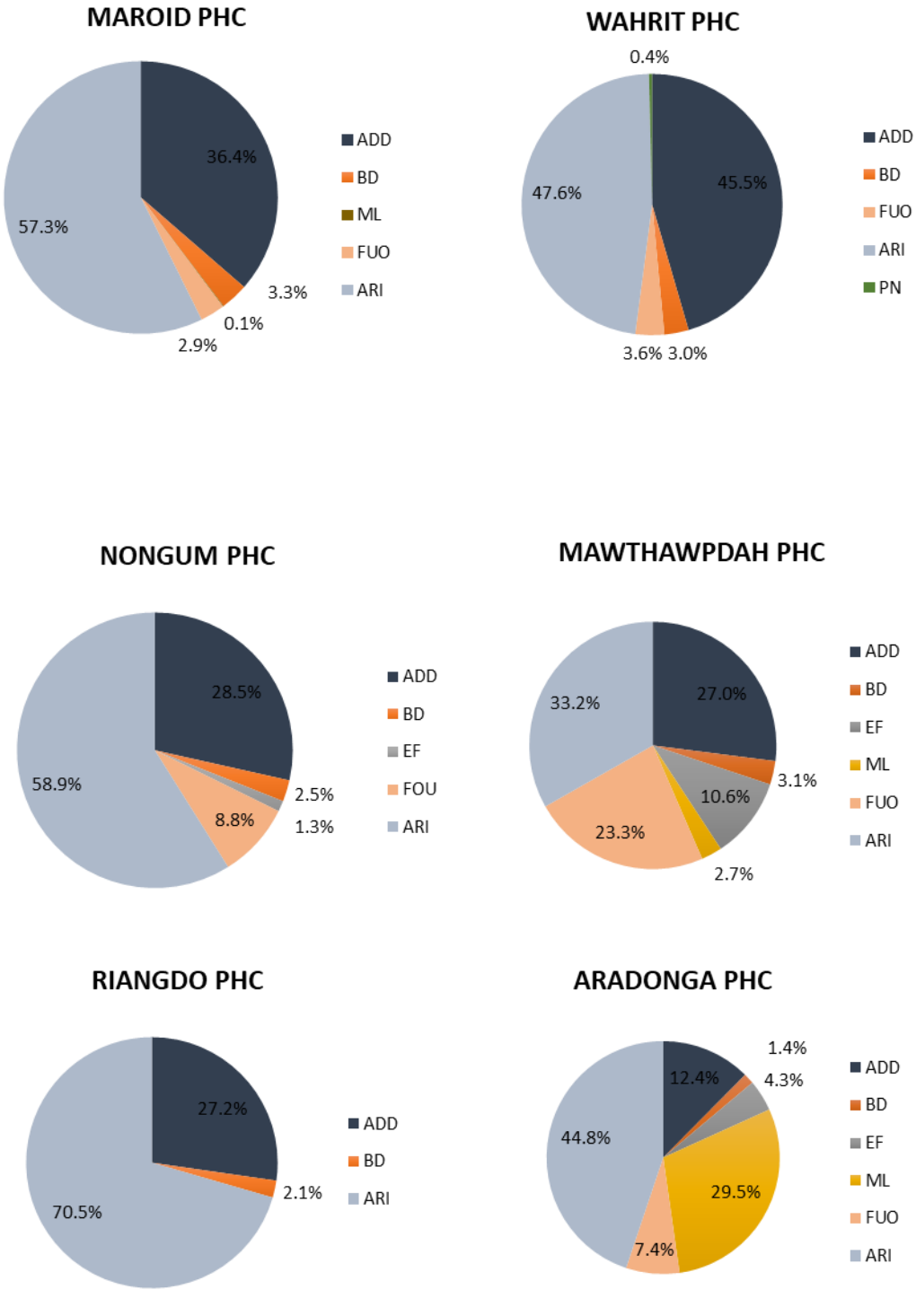

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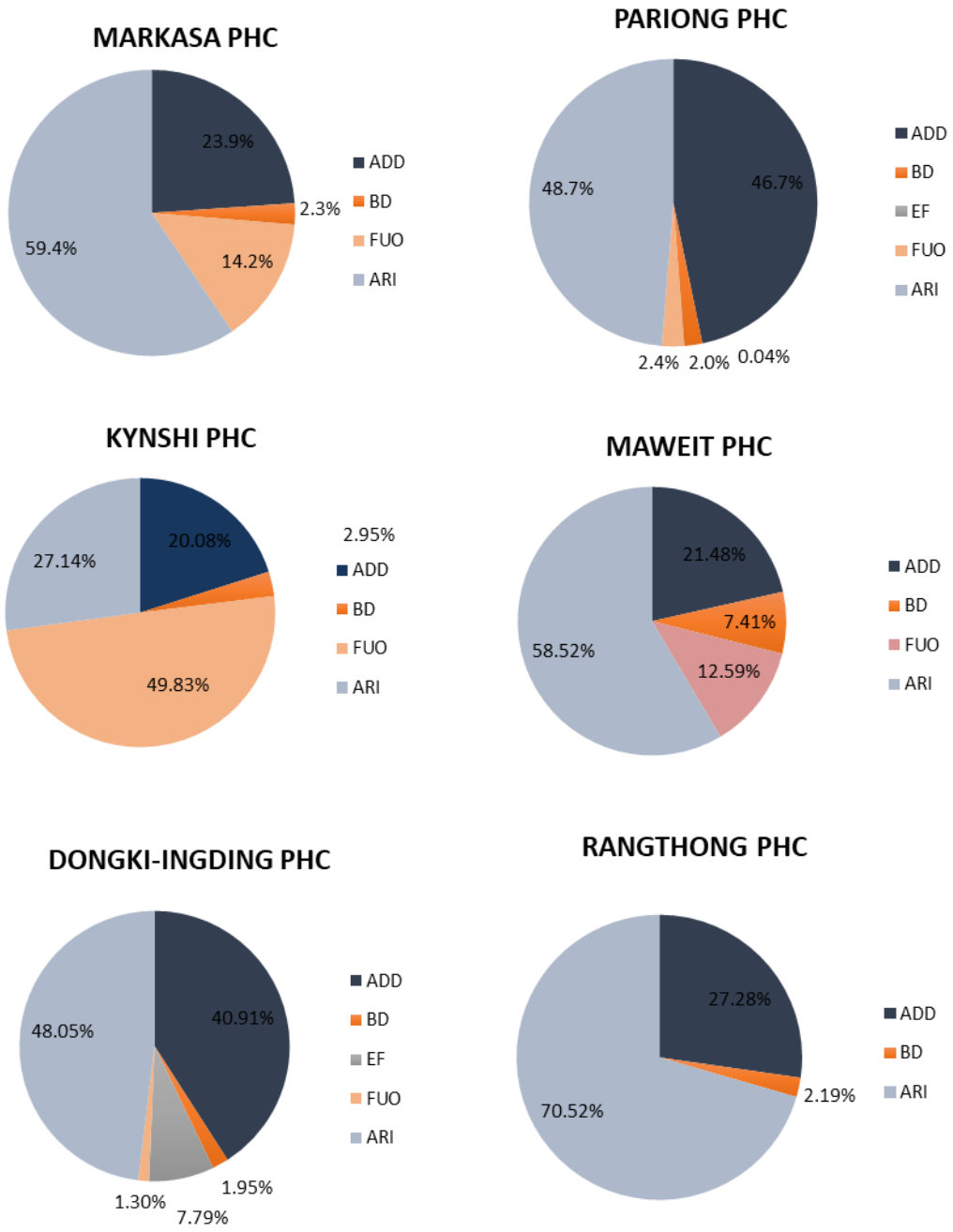

Fig 1.16. West Khasi Hills: Distribution of Communicable Diseases in the PHCs, 2011

In Rambrai PHC it is found that the ARI has the highest percentage of morbidity followed by ADD. Other communicable diseases like bacillary dysentry, malaria and fever of unknown origin (PUO) are also found in this primary health centre with percentage less than 9 percent (Fig 1.16).

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ARI, ADD and fever of unknown origin (PUO) are the main communicable diseases in Nongthliew PHC. ARI has the highest percentage followed by ADD and FUO.Bacillary dysentry, viral hepatitis and enteric fever are also found in this PHC with the percentage of less than 4 percent. In Maroid PHC, ARI has the highest percentage of morbidity followed by ADD. Other communicable diseases like bacillary dysentry, malaria and fever of unknown origin are also found in this PHC with percentage of less than 4 percent. The most common communicable diseases found in Wahrit PHC are ARI and ADD having the highest percentage of morbidity. Bacillary dysentry, fever of unknown origin (PUO) and pneumonia has the percentage of less than 4 percent.In Nongum PHC, ARI has the highest morbidity followed by ADD. Bacillary dysentry, enteric fever and fever of unknown origin (PUO) have the lowest occurence. The most common communicable diseases found in Mawthawpdah PHC are ARI, ADD, fever of unknown origin (PUO) and enteric fever. Bacillary dysentry and malaria are reported by less than 4 percent. ARI is the common communicable disease in Riangdo PHC and has the highest percentage of morbidity while ADD and bacillary dysentry accounts for 27 percent and 2 percent respectively. Aradonga PHC has ARI as the most common communicable disease while malaria and ADD affect more than 10 percent. Bacillary dysentry, enteric fever and PUOare reported by less than 8 percent. In Markasa PHC, ARI has the highest prevalence followed by ADD. ARI and ADD in Pariong PHC are the dominant communicable diseases with the percentage of more than 45 percent followed by PUO, bacillary dysentry and enteric fever. Kynshi PHC records PUO as the dominant communicable disease followed by ARI and ADD. In Maweit PHC, ARI has the highest percentage of morbidity followed by ADD. PUO and bacillary dysentry has the percentage of less than 13 percent. The most common communicable diseases found in Dongki-ingding PHC are ARI and ADD with the percentage of more than 40 percent followed by enteric fever, bacillary dysentry and PUO. In Rangthong PHC, ARI has the highest occurence and the common communicable disease in this PHC is ARI followed by ADD and bacillary dysentry with the percentage of less than 30 percent.

It is obvious from the PHC data that the district suffers from a number of communicable diseases with the dominance of ARI in nearly all the PHCs followed by ADD.

Table 1.9. West Khasi Hills: Percentage of Communicable Diseases, 2011

District Surveillance Unit	ARI	ADD	PUO	BD
Nongstoin CHC	16.34	10.29	9.79	12.56
Rambrai PHC	4.84	1.51	2.85	2.22
Mairang CHC	5.65	8.97	5.05	8.96
Nongthliew PHC	2.75	4.45	7.52	4.80
Maroid PHC	5.86	6.33	1.40	6.83
Wahrit PHC	1.14	1.86	0.40	1.48

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Nongum PHC	1.27	1.04	0.89	1.11
Mawkyrwat CHC	19.01	9.09	2.14	14.40
Mawthawpdah PHC	3.11	4.29	10.25	5.91
Riangdo PHC	2.62	1.72	0.00	1.66
Aradonga PHC	1.26	0.59	0.98	0.83
Ranikor CHC	2.09	3.13	3.91	2.68
Markasa PHC	3.71	2.53	4.16	3.05
Pariong PHC	21.47	34.99	5.05	18.19
Kynshi PHC	5.20	6.54	44.84	11.54
Maweit PHC	0.71	0.45	0.72	1.85
Dongki-ingding PHC	0.33	0.48	0.04	0.28
Rangthong PHC	2.62	1.72	0.00	1.66
Total	100	100	100	100

Source: Directorate of Health service, 2011

Table 1.9 shows the distribution of the common communicable diseases in all the CHC and PHCs of the West Khasi Hills District. The diseases were placed according to the rank. ARI ranked first followed by ADD, fever of unknown origin (PUO) and bacillary dysentery. That's mean the ARI is the common communicable diseases in West Khasi Hills District. The table 1.9 reveals that the Pariong PHC has the highest percentage of ARI followed by Mawkyrwat CHC. In ADD, Pariong PHC again has the highest percentage followed by Nongstoin CHC. While in Kynshi PHC, fever of unknown origin has the highest percentage followed by Mawthawpdah PHC. Pariong PHC again has the highest percentage of bacillary dysentery followed by Mawkyrwat CHC.

1.6. Concluding Statement

From the above analysis, it is evident that the communicable diseases continue to be the most important constituent of morbidity in the state of Meghalaya. ARI ranks first in the Khasi Hills While fever of unknown origin in the Garo Hills. This is largely determined by the climate and the altitude of the region- the two most important constituents of disease ecology in the region. It was found that the distribution of diseases in Ri Bhoi district is similar with Garo hills. This is because of the altitude and the climatic condition of the district which is similar with the Garo

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hills.

From the study, it is found that the incidence of acute diarrhoeal diseases increases in 2011 in East Khasi Hill, Jaintia Hills, West Garo Hills and South Garo hills district while in West Khasi Hills, Ri Bhoi and East Garo Hills the incidence of acute diarrhoeal disease has declined. The incidence of acute respiratory infection increased in 2011 compared to 2001 in all the districts of Meghalaya.

In West Khasi Hills district, ARI ranks first in all the CHC and PHC except in Kynshi where Fever of unknown origin (PUO) ranked first. In this district the communicable diseases have the highest morbidity rate in all the CHC and PHC. The common communicable diseases found in this district are ARI, ADD, Fever of unknown origin and bacillary dysentery.

Summer is a season for water-borne diseases like diarrhoea, viral hepatitis, bacillary dysentery, especially in areas with poor sanitation. The rainy season facilitates the breeding and proliferation mosquitoes that transmit several diseases like malaria, dengue, acute encephalitis etc. The cold winter season coupled with overcrowding, leads to easy transmission and propagation of diseases like measles, seasonal influenza and meningitis. However, acute respiratory infections can occur during any time of the year or due to a change of season.

It is found that the communicable diseases in Meghalaya occur throughout the year. But the highest morbidity of communicable diseases mostly occurred in the monsoon season. ARI, ADD and FUO are the common diseases, which need to be prevented. A healthier environment is required for the prevention of communicable diseases like safe drinking water supply, sanitary disposal of excreta and other wastes, and pollution-free housing and work places. A detailed discussion of this problem will be carried out with the help of a case study of selected villages in the next chapter.

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