
Original Article

Water Pollution and Vector borne Diseases – A Study Based on Geographical Location in Khammam District of Telangana state

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Abstract:

Background: Health status of the humans up to some extent is controlled by the geographical factors. Certain diseases are region specific. Thus geography has a pivotal role to play in the analysis of health related issues and area specific diseases.

Objective: To find out the trend in the incidence of vector borne diseases in the study area, to compare the prevalence of the diseases between the tribal (agency) and non tribal (plain) areas, to probe into the causal factors for the variations in the incidence, to offer policy measures and intervention

Methods: Data with regards to incidence of Malaria, Dengue and Chikungunya from 2011 to 2015. Data for 2016 up to August was collected from the 58 public health centers (PHCs) of the district of which 38 were in tribal areas, while the remaining 18 were in plain areas. Data for 2016 is related exclusively to malaria and for the sake of comparison; data pertaining to malaria was also collected PHC wise. Simple techniques of analysis like percentages and ratios were used

Results: Data with regards to malaria shows that positive cases were 3171 in 2011 out of 423040 blood samples accounting for 7.5%. They decreased in absolute number to 1153 in 2012 and increased to 1697 in 2013. Again they increased 2990 in 2014 and decreased to 1822 in 2015. A jig jag trend is evident in the prevalence. However between 2011 and 2015 total positive cases of malaria have decreased by 42.5% in the district. Further, the data reveals that PF positive represents tribal areas have been abnormally higher when compared to PV positive representing non tribal areas. It implies that the incidence of malaria in tribal area poses a threat to the health of the people. However the decreases in positive cases from 2011 to 2015 in the tribal areas were 42.83% against 20% in the non tribal area. The ratio of malaria incidence between non tribal and tribal areas is 1:78 in 2011 and it decreased to 1:56 in 2015.

Conclusion: Dengue affliction showed irregular trend. In the recent months dengue has been affecting more people in the Mandal areas. Malaria is a major public health problem in the tribal area due to the geographical factors and its incidence is mostly in the tribal habitations

Key words: Dengue, Malaria, Chikungunya, tribal areas, primary health centre

INTRODUCTION:

Geographical location of an area / region has its impact on the physical, natural and human resources, economic activities, life styles, cropping patterns, climates, rainfall, water bodies, mineral wealth, flora and fauna etc of that area. For that matter the whole gamut of ecological and environmental factors totally depend on the geographical conditions. Health status of the humans has no exception and it is controlled by the geographical factors. Certain diseases are region specific; thus geography has a pivotal role to play in the analysis of health related issues and area specific diseases.

This research paper takes Khammam district of the Telangana state for the study. Though the state has now 31

districts, earlier there were 10 districts and the study is related to the earlier phase. The district lies between 16.45 degree and 18.35 degree of northern latitude and 79.47 degree and 80.47 degree of the eastern latitude. It is bounded on the north by the Chhattisgarh and Odisha state; on the east by east and west Godavari district of the present Andhra Pradesh; on the south by Krishna district of Andhra Pradesh; and on the west by the Nalgonda and Warangal districts of the Telangana state. This district is strategically located on the borders of three states; the second largest river in country; the Godavari traverses 180 km in the district and the other rivers include Sabari, Kinnnersani, Plaeru, Akeru, Wyra and Munneru. Climate is very hot in the month of May and the normal rainfall is 1124.0 mm which is higher than the state average. The total forest area in the district is 9,59,438 hectares. Majority of the mandals (administrative unit, 29 are

under tribal sub plan while two are partially located in the Godavari basin and they receive copious rains during the monsoon. Total population of the district is 27,98,214 according to 2011 census

The tribal are rich in forest and mineral resources, including coal and granite with wide variety of species of flora and fauna. The tribal habitations are mostly located amidst lush green forest related geographical endowment close to the river Godavari

Khammam district is known as a high risk and vulnerable district for vector borne (mosquitoes) diseases like malaria, dengue, Chikungunya, Japanese Encephalitis and filariasis. Tribal living in Bhadrachalam area besides Perur and Mangapeta are highly prone to the malaria every year with onset of monsoon. Overall blood examination rate is always > 10, with < 1 annual parasite incidence. Against the background elaborated so far an attempt is made in this paper to analyze the vector borne diseases based locations in the Khammam district of Telangana state

Objectives of the study:

To find out the trend in the incidence of vector borne diseases in the study area, to compare the prevalence of the diseases between the tribal (agency) and non tribal (plain) areas, to probe into the causal factors for the variations in the incidence, to offer policy measures and intervention

METHODS:

Data has been collected with regards to incidence of three vector borne diseases namely Malaria, Dengue and Chikungunya for the period between 2011 and 2015. Data for 2016 up to August has been collected from the 58 public health centers (PHCs) of the district of which 38 are in the tribal areas, while the remaining 18 are in the plain areas. Data for 2016 is related exclusively to malaria and for the sake of comparison; data pertaining to malaria is also collected PHC wise. Simple techniques of analysis like percentages and ratios are used in the study

RESULTS:

PF refers to plasmodium falciparum species of mosquito causing malaria through their bites mostly in the tribal areas where as PV refers to plasmodium vivax present in the non tribal areas causing malaria. Data in the table with regards to malaria shows that positive cases were 3171 in 2011 out of 423040 blood samples accounting for 7.5%. They decreased in absolute number to 1153 in 2012 and increased to 1697 in 2013. Again they increased 2990 in 2014 and decreased to 1822 in 2015. A jig jag trend is evident in the prevalence. However between 2011 and 2015 total positive cases of malaria have decreased by 42.5% in the district. Further, the data reveals that PF positive represents tribal areas have been abnormally higher when compared to PV positive representing non tribal areas. It implies that the incidence of malaria in tribal area poses a threat to the health of the people. However the decreases in positive cases from 2011 to 2015 in the tribal areas were 42.83% against 20% in the non

tribal area. The ratio of malaria incidence between non tribal and tribal areas is 1:78 in 2011 and it decreased to 1:56 in 2015. It can be stated that the incidences of malaria though high has been decreasing both in tribal and non tribal areas. A distinction between tribal and non tribal locations was not seen in dengue cases which increased from 52 in 2011 to 114 in 2012 and then decreased to 57 in 2013 however it was 245 in 2014 and touched the peak of 439 in 2015. Data shows that dengue has been increasing since 2014 and in the recent months the plain areas close to the district headquarters have been reporting more cases. The increase of dengue between 2011 and 2015 is found to be 8.4 times. It has been revealed in the formal discussion that dengue makes little difference between the geographical locations of the district. Data in the table shows that the confirmed case of chikungunya is relatively low however they exhort and increasing trend from 2012 onwards. In fact they increased by 2.8 times between 2011 and 2015. It can be stated that the dengue vector borne disease in Khammam district has been increasing despite the relentless efforts of the district authorities. (Table 1)

Data in the table shows that 38 PHCs are in the tribal areas where the malaria positives cases in 2015 were 1751. At the same times 20 PHCs in the non tribal area had just 71 positives making total for the district as 1822. The total positive cases of malaria in the tribal areas account for 96.1 percent while those in plain areas are just 3.9 percent. It can also be noted that positive cases of malaria in 2016 are 601 in the district up to August. Out of the total 596 (99.2%) are in tribal PHCs while only 5 (0.8%) the non tribal PHCs. It implies that the incidence of malaria in the tribal areas between 2015 and 2016 has increased against the decreases in the non tribal areas. The PHC with higher incidences 2015 have the same trend of 2016 also. (Table 2 & 3)

DISCUSSION:

The basic revelation of this research paper as to the susceptibility of the tribal areas to vector borne diseases, especially malaria depends on the geographical factors along with the socioeconomic conditions of the tribal. Tribal habitations are located close to deep forest and the average rainfall is heavy. Flowing streams, water ponds and water storage complied with grassy and vegetation act like havens for the mosquitoes. Safe drinking water in unheard in these habitations and they use stagnated and polluted water sources for drinking and other purpose. Inaccessibility of these areas is the hindrance to the health staff to initiate mosquito control measures like DDT spraying. Illiteracy, poverty and lack of awareness come in the way of using mosquito nets and coils. Unhygienic and poor sanitary conditions encourage the growth of disease carrying organisms and mosquitoes. More over some of the Mandal face the problem of influx of migrants from Odisha and Chhattisgarh for wages work and they bring the disease with them. This the plight of ill health combined with poverty, ignorance and illiteracy keep them marginalized in India

A common / uniform strategy to combat the menace of seasonal and vector borne disease is to ensure good health needs, a reoriented mould area specific interventions suited to

the geographical surrounding and socio-economical and cultural conditions of the people are to be designed for which all stakeholders are to be involved. It is noteworthy that the district Collector of Bhadrachalam District, where majority of the tribal's live, has stated in the first press conference, that his priority is to reduce the incidence of malaria in the agency areas

CONCLUSION:

The result from the analysis of data reveals that vector borne diseases pose a threat to the health status in the district despite the sincere and committed efforts of the district authorities. Malaria and Chikungunya have been showing declining trend between 2011 -15 due to the interventions of the district authorities. However dengue affliction is in an irregular trend and in the recent months has been affecting more people in the mot of the Mandal areas. Malaria is a major health problem in the tribal area due to the geographical factors and its incidences is mostly in the tribal habitations

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Table 1: Prevalence of Vector borne diseases for the 5 years in Khammam district

Year	Malaria										Dengue (Elisa Test)			Chikungunya		
	Blood smear collected	Slide +ve			RDT +ve			Total +ve			Presumptive	Confirmed	Deaths	Presumptive	Confirmed	Deaths
2011	423040	17	1823	1840	23	1308	1331	40	3131	3171	0	52	0	0	0	0
2012	425513	6	730	736	3	414	417	9	1144	1153	350	114	0	32	19	0
2013	400285	24	1166	1190	0	507	507	24	1673	1697	160	57	0	14	7	0
2014	467319	50	1986	2036	43	911	954	93	2897	2990	549	245	0	20	16	0
2015	399359	19	1318	1337	13	472	485	32	1790	1822	1508	439	0	263	54	0

Table 2: PHC Wise Malaria Positives for the Year 2015 and up to 10.08.2016 (Tribal area)

PHC Name	2015 +ve			2016 +ve		
	Pv	Pf	Total	Pv	Pf	Total
S.N.Puram	0	101	101	1	13	14
Cherla	0	90	90	1	16	17
Edira	0	39	39	2	26	28
Wazeed	0	44	44	0	23	23
Peruru	0	36	36	1	9	10
Narasapuram	0	25	25	3	30	33
Dummugudem	0	34	34	4	4	8
Parnasala	1	80	81	0	2	2
Pinapaka	0	60	60	0	22	22
Karakagudem	0	212	212	2	68	70
Janafhpeta	0	49	49	1	14	15
Manuguru	0	150	150	0	37	37
Aswapuram	0	97	97	1	41	42
M.P.Banjara	1	27	28	1	17	18
Sulhanagar	0	35	35	0	7	7
Gundala	0	46	46	0	21	21
Allapalli	0	55	55	2	5	7
Gandampalli	0	2	2	0	0	0
Bayyaram	0	6	6	0	0	0
Mulkanuru	0	5	5	0	0	0
Rompedu	3	11	14	1	2	3
Komararam	6	31	37	1	2	3
Kamepalli	0	1	1	0	0	0
Singareni	0	10	10	0	1	1
F.rragunta	0	12	12	0	5	5
Chandrugonda	0	0	0	0	0	0
Julurupadu	0	4	4	2	0	2
Enkuru	1	7	8	0	0	0
Regalia	2	56	58	4	27	31
Sujathanagar	0	2	2	0	0	0
Penagadapa	0	4	4	1	2	3
Ulvanoor	1	34	35	1	19	20
Jaganadhapuram	1	24	25	2	9	11
Mangapeta	7	180	187	3	58	61
Vinayakapuram	2	81	83	7	23	30
Gummadavalli	0	20	20	0	10	10
Dammapeta	1	17	18	0	8	8
Patwarigudem	2	36	38	3	31	34
Tribal Area Total Malaria Positives	28	1723	1751	44	552	596

Table 3: PHC Wise Malaria Positives for the Year 2015 and up to 10.08.2016 (Non Tribal area)

PHC Name	2015 +ve			2016 +ve		
	Pv	Pf	Total	Pv	Pf	Total
Kalluru	1	4	5	0	1	1
Lankasagar	0	0	0	0	0	0
Thallada	0	3	3	0	1	1
Vemsoor	0	0	0	0	0	0
Gangaram	0	0	0	0	0	0
Banigandlapadu	0	1	1	0	0	0
Maturupeta	0	2	2	0	1	1
Wvra	0	0	0	0	0	0
Bonakallu	0	0	0	0	0	0
Tirumalayapalem	0	3	3	0	0	0
Subiledu	0	0	0	0	0	0
MV Palern	0	14	14	0	1	1
Kusumanchi	0	4	4	0	0	0
Nelakondapalli	0	1	1	0	0	0
Mudigonda	0	4	4	0	0	0
Konijerla	0	2	2	0	0	0
Pedagopathi	0	5	5	0	0	0
Chintakani	0	5	5	0	0	0
Manchukonda	1	9	10	0	1	1
Khammam(T)	2	10	12	0	0	0
Chennuru	0	0	0	0	0	0
Bodalabanda	0	0	0	0	0	0
Non Tribal Area - Total Malaria Positives	4	67	71	0	5	5

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