

Patterns of Morbidity and Malaria in Kolayat Tehsil of Bikaner District

Abstract

This study is related to the patterns of morbidity and malaria in Kolayat Tehsil of Bikaner district, situated in the Thar Desert of Rajasthan. Patterns of occurrence of various diseases have been analysed according to age-group, gender and community of the rural people of Kolayat. The results indicate that incidences and types of morbidity show variations according to biological (age-group, gender) and socio-cultural (caste) aspects of the people.

Keywords: Morbidity, Malaria, Patterns, Age-Groups, Gender, Caste, Kolayat, Thar Desert.

Introduction

The patterns of morbidity in any region are consequences of both natural as well as anthropogenic factors. The natural factors behind morbidity patterns may be traced, for e.g., to the geology, groundwater conditions and, above all, various climatic elements including humidity, temperature and winds. There are a plenty of man-made factors behind nature of morbidity in an area. These may include economic conditions; various socio-cultural features and practices, such as educational levels and gender discrimination; as well as technological advancements of the concerned community (Misra, 2007). In fact, various natural and manmade factors interact in a complex manner in order to generate specific morbidity patterns in a particular region or place.

The hot deserts of the world are characterised by high temperatures; low humidity and rainfall; and a dusty ambience. Scarcity of water, its salinity and alkalinity, particulate matter in the atmosphere, *inter alia*, create various health problems related to respiratory system, skeletal system, skin and stomach disorders. Lack of farming opportunities, and of nutritious food, create various deficiency-based health problems. Introduction of canal irrigation in the hot deserts often brings into play new biological factors of morbidity. In mineral- rich desert regions, such as the study area of Kolayat, the mining depressions with stagnant waters- besides the canals- may become additional factors for greater growth and development of disease vectors.

Review of Literature

Basu (1993) found the health status of tribal women to be lower than that of the Indian women in general. According to WHO (1996) malaria is the third major infectious disease, accounting for 2.3% of all such global diseases, after acute respiratory infections 3.5% and TB 2.8%. Alderete (1999) pointed that health status of indigenous peoples is severely affected by low income levels, and by low availability of safe water, food, sanitation and access to health services. Malnutrition and communicable diseases such as malaria, cholera and TB affect a large proportion. Smoking and alcohol abuse are significant health and social problems.

Sharma (2001) carried out a study in order to determine prevalence rate of coronary heart disease in rural population of Nagaur district in Rajasthan. Opie & Seedat (2005) reported that mass migration from rural areas to urban areas, and lifestyle changes may be associated with high prevalence of hypertension in sub-Saharan Africa. Webb (2002) found important differences in prevalence rates for various nutrient deficiencies by age and gender.

Alimova (2009) reported that increased mortality due to cardiovascular diseases, external and alcohol-related causes explains life expectancy differences between the Caspian region and Kazakhstan as a whole. Ishengoma (2011) informed that *P. falciparum* affects RBCs of all ages, *P. vivax* and *P. ovale* affect only the youth while *P. malaria* hits only



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adult RBC's. Kekan *et al.* (2012) found in a review that both in India and Maharashtra illiteracy and caste, besides poverty, contribute to ill health among many underprivileged populations. Burton *et al.*(2013) explored the scope and sources of poverty and race inequalities in rural America and what these inequalities meant for the future of health disparities within rural USA.

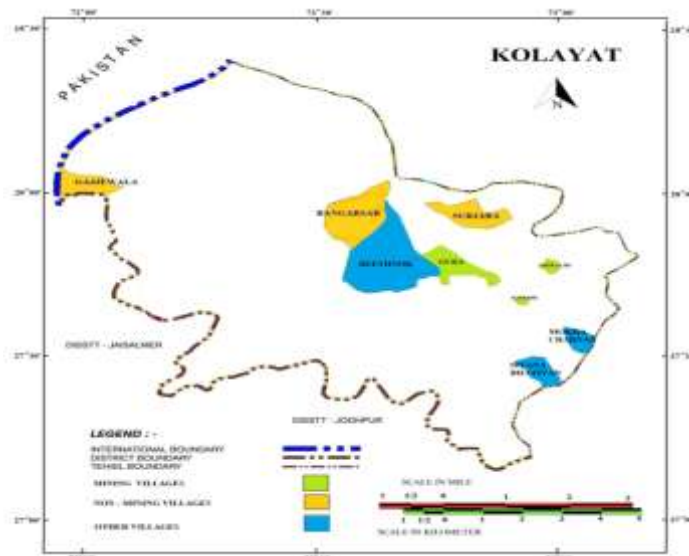
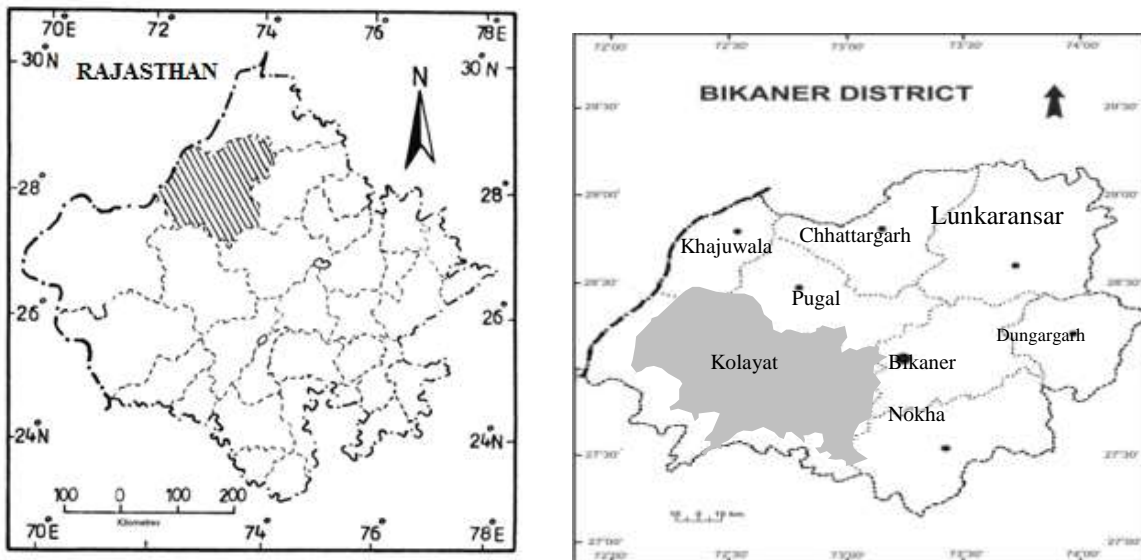
Fox (2016) explained how poverty, social relationships, and other conditions stressed individuals and populations, weakened their natural defenses, and caused exposure to disease clusters in Dallas, USA. Coelho & Belden (2016) studied the relationship between the caste system and risk factors for poor health status in India. They found that odds of mortality, poor health behaviours and poor nutritional status were higher among lower castes. Odds ratios for mortality and poor health behaviours were

significantly higher in older populations. Deribaw *et al.* (2017) analysed the incidence, prevalence and mortality rates of malaria in Ethiopia for the last 25 years and found a 94.8% reduction in malaria-related deaths in that duration.

The Study Area

The study area, Kolayat tehsil, lies in the arid Bikaner district of Rajasthan located in the Thar Desert (Fig 1). The average rainfall of the region is less than 25 cms per annum. The area contains gravelly pavements on the surface, and is rich in several non-metallic minerals like china and white clay, gravel, Fuller's Earth and lignite. Extensive quarrying for these minerals has caused numerous depressions and hills of mining over burden in the landscape of the area. There are no rivers, but lakes do occur due to rocky and gravelly structure. Northern parts are irrigated by Indira Gandhi canal.

Map 1: Location of the Study Area Kolayat Tehsil in Bikaner District



SURVEYED VILLAGES OF KOLAYAT

Objectives of the study

The objectives of this study are as follows:-

1. To study the patterns of morbidity according to age-groups, gender and caste in rural areas of Kolayat tehsil.
2. To study the incidence, types and patterns of Malaria in Kolayat region.

Hypothesis

The study is based on the hypothesis that there are variable patterns of morbidity in different age-groups, sexes and castes of Kolayat.

Sources of Data and Methodology

This study is based on both primary as well as secondary sources of data. A field work was carried out in the selected villages of Kolayat region in order to decipher the variable patterns of morbidity according to age-groups, gender and caste groups in the study area. Secondary data have also been collected from the health department regarding the incidence, types and distribution of malaria. In order to generate primary data, a schedule was prepared and canvassed in the rural areas of Kolayat tehsil. To accommodate the geographical diversity -both manmade and natural- in the study area, three villages each pertaining to the mining areas, the canal irrigated areas and other rainfed areas were selected. The abandoned mining hollows were assumed to become breeding grounds for disease vectors after the accumulation of rainwater. Similarly, the canal irrigated areas were considered to be susceptible to

various diseases due to presence of water throughout the year.

Accordingly, three villages of Goyalari, Gura and Kotari were selected from amongst the mining areas. The villages of Gajjewala, Bangarsar and Surjara were selected to represent the irrigated region. From the rainfed areas, villages of Mokha Charnan, Siyana Bhatiyar and Beethnok were selected. From these nine villages, a fixed quota of 20 households each was selected for survey, by using stratified random sampling method, making a total of 180 households for the whole tehsil.

Results and Discussion

An analysis of the morbidity patterns in the villages of Kolayat was made on three different bases, including caste, gender and age. For caste-based analysis of morbidity, two caste categories were taken. The first included the socio-economically backward castes/communities, namely Scheduled Castes and Scheduled Tribes. The ratio of scheduled tribe population in the study area is miniscule. The 'Other Castes' category included all other castes, viz., general castes and other backward castes, from Hindu as well as Muslim background. Table-1 shows that infectious diseases like malaria, respiratory problems and stomach infections showed greater proportions amongst Scheduled Caste and Scheduled Tribe population. This might have direct relation with their social and economic conditions.

Table 1: Morbidity by Caste in the Rural Population of Kolayat Tehsil

Diseases	Other Castes	SCs-STs	Total
Malaria	36 (23.84%)	20 (33.89%)	56 (26.66%)
Respiratory	32 (21.19%)	15 (25.42%)	47 (22.38%)
Stomach infections	29 (19.20%)	15 (25.42%)	44 (20.95%)
Skin	11 (7.28%)	1 (1.69%)	12 (5.71%)
B.P.	19 (12.58%)	7 (11.86%)	26 (12.38%)
Jaundice	2 (1.32%)	1 (1.69%)	3 (1.43%)
Anaemia	2 (1.32%)	-	2 (0.95%)
Pneumonia	16 (10.59%)	-	16 (7.62%)
Diabetes	4 (2.64%)	-	4 (1.90%)
Total Patients	151 (16.77%)	59 (19.21%)	210 (17.39%)
Healthy	749 (83.22%)	248 (80.78%)	997 (82.60%)
Total Population	900	307	1207

Source: Field Survey, April 2014

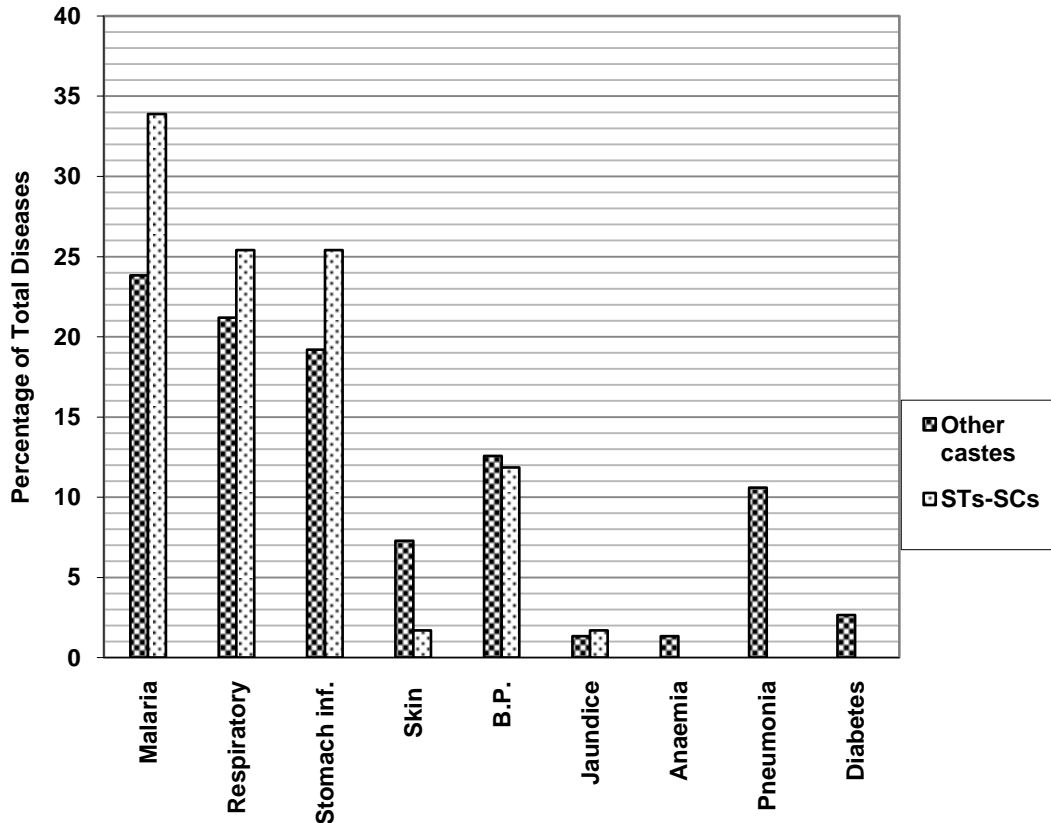


Fig. 1: Morbidity by caste in the Rural Population of Kolayat Tehsil

Morbidity patterns along gender lines also become apparent, both quantitatively and qualitatively. Quantitatively, the ratio of morbid males in the surveyed male population was 23% higher than amongst the female population. The incidences of malaria, stomach infections, skin diseases, jaundice

and anaemia were found to be higher amongst the female population. On the other hand, respiratory and lung diseases showed higher incidences in the male population. This may be due to prevalence of smoking habit and work in the mines by the male population of the poor households (Table-2).

Table 2: Gender Wise Morbidity in Rural Kolayat

Diseases	Males	Females	Total
Malaria	32 (24.80%)	24 (29.62%)	56 (26.66%)
Respiratory	36 (27.90%)	11 (13.58%)	47 (22.38%)
Stomach infections	24 (18.60%)	20 (24.69%)	44 (20.95%)
Skin	6 (4.65%)	6 (7.40%)	12 (5.71%)
B.P.	12 (9.30%)	14 (17.28%)	26 (12.38%)
Jaundice	-	3 (3.70%)	3 (1.43%)
Anaemia	-	2 (2.47%)	2 (0.95%)
Pneumonia	16 (12.40%)	-	16 (7.62%)
Diabetes	3 (2.33%)	1 (1.23%)	4 (1.90%)
Total Patients	129 (61.42%)	81 (38.57%)	210

Source: Field Survey, April 2014

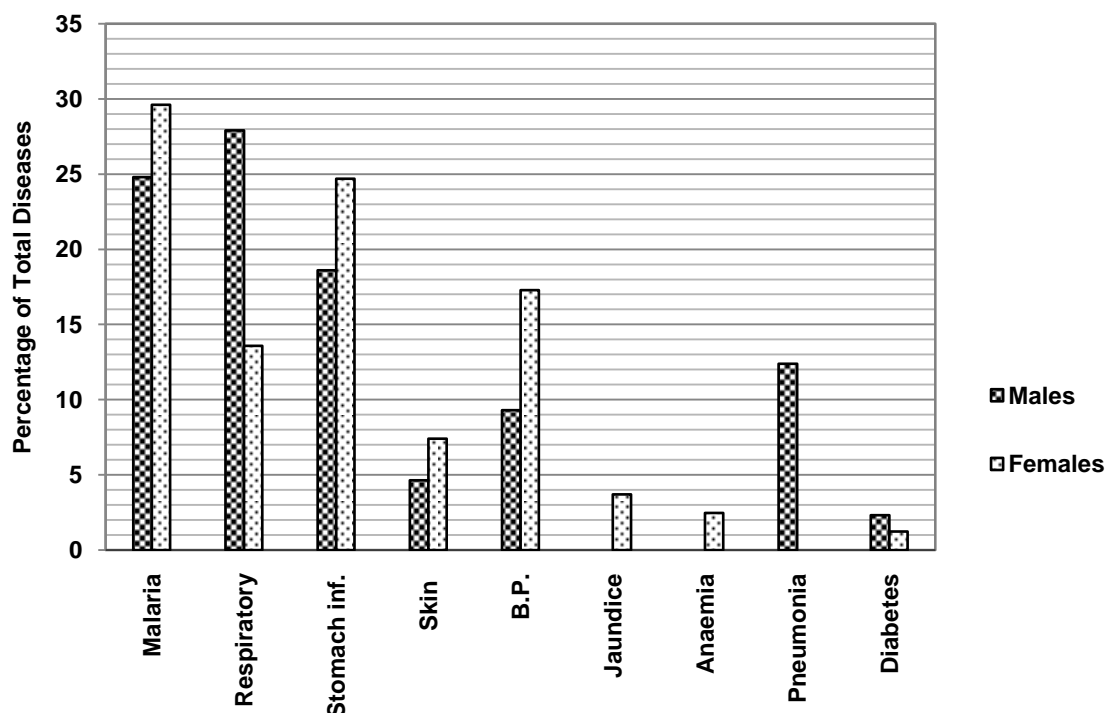


Fig. 2: Gender wise Morbidity in Rural Kolayat

The age distribution of morbidity also exhibits some specific patterns. The ratios of those affected by respiratory problems, hypertension and diabetes were found to be higher amongst old-aged people. The occurrence of malaria was highest amongst the young and adult people. This may be due to the fact that

Malaria of PV type tends to affect young people more than the others. Diseases related to stomach infections, anaemia and lung diseases, like pneumonia, were at their highest levels in the children (Table -3).

Table 3: Age-Group Wise Diseases in Kolayat's Villages

Diseases	Children (<15 Y)	Young/Adult (15-60 Y)	Old Aged (60+ Y)	Total
Malaria	14 (28.57%)	37 (37.37%)	5 (8.06%)	56 (26.66%)
Respiratory	1 (2.04%)	14 (14.14%)	32 (51.61%)	47 (22.38%)
Stomach infections	17 (34.69%)	27 (27.27%)	-	44 (20.90%)
Skin	-	6 (6.06%)	6 (9.68%)	12 (5.71%)
B.P.	-	9 (9.09%)	17 (27.41%)	26 (12.38%)
Jaundice	-	3 (3.03%)	-	3 (1.42%)
Anaemia	1 (2.04%)	1 (1.01%)	-	2 (0.95%)
Pneumonia	16 (32.65%)	-	-	16 (7.61%)
Diabetes	-	2 (2.02%)	2 (3.22%)	4 (1.90%)
Total Patients	49	99	62	210

Source: Field Survey, April 2014

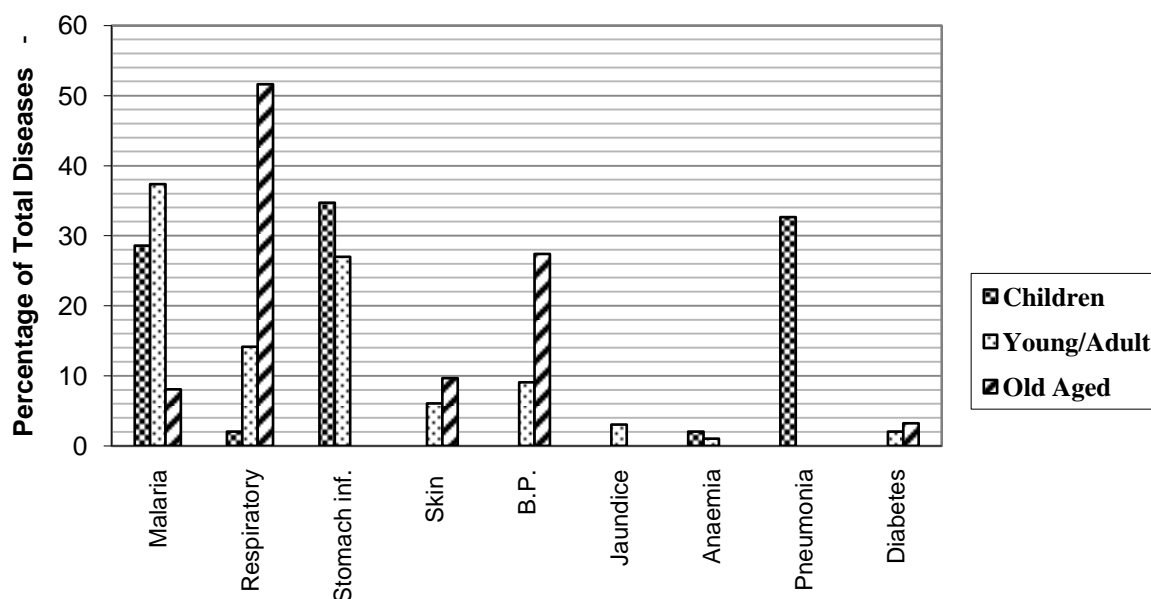


FIG. 3: AGE-GROUP WISE DISEASES IN KOLAYAT VILLAGES

Despite its location in an arid desert region, Kolayat has had comparatively higher incidence of malaria. This is because of two reasons. The first is collection of rainwater in mining depressions created by mining of gravel, China clay and lignite in mining villages of Kolayat. The second reason is passage of Indira Gandhi Canal from the northern parts of Kolayat tehsil. Other common factors like poverty and lack of awareness also play their part. The administration in the area is, therefore, very keen to

fight malaria which, sometimes, has led to spates of deaths, especially due to malaria P F type. Table 4 shows the large number of blood sample slides collected for testing malaria in different PHCs and CHC in the region. The highest proportions of positive tests were found in Diyatra (2.29%) and Akkasar (2.16%) PHCs and Kolayat CHC (1.95%). The region around tehsil HQ Kolayat is full of mines, while Akkasar is in the canal belt.

Table 4: Malaria PV / PF cases in villages of Kolayat Tehsil, 2009-2013

CHC/PHCs	Blood Slide Collection	PV & PF Cases	Percentage of PV & PF cases
Kolayat	65247	1277	1.95
R.D.-820	6916	81	1.17
Bajju	58062	273	0.47
Akkasar	18223	395	2.16
Bikamsar	24192	117	0.48
Gadiyala	37604	352	0.93
Gajner	87300	1002	1.14
Barsalpur	7984	74	0.92
Diyatra	28965	666	2.29
Godu	15687	127	0.80
Kolayat Block	350180	4364	1.24

Source: Community Health Centre, Kolayat

A look at table-5 shows that relative proportions of malaria PV and malaria PF cases in Kolayat tehsil are 96.3 and 3.7% respectively. In absolute terms, the higher numbers of PV and PF cases were reported from Kolayat CHC. The relative distribution of Malaria PF and Malaria PV cases

shows that Barsalpur (21.63% PF cases), (Bikamsar 9.41% cases), Bajju (9.16%), Godu (8.67%) and Akkasar (5.07) had the highest shares of Malaria PF cases amongst all malaria incidences. All these PHCs lie in the canal irrigated belt.

Table 5: Respective Shares of Malaria PV & PF in Kolayat tehsil, 2009-2013

CHC/PHCs	Malaria PV cases	Percentage of Malaria PV cases	Malaria PF cases	Percentage of Malaria PF cases
Kolayat	1246	97.57	31	2.43
R.D.-820	77	95.06	4	4.94
Bajju	248	90.84	25	9.16
Akkasar	375	94.93	20	5.07
Bikamsar	106	90.59	11	9.41
Gadiyala	337	95.73	15	4.27
Gajner	988	98.60	14	1.40
Barsalpur	58	78.37	16	21.63
Diyatra	651	97.74	15	2.26
Godu	116	91.33	11	8.67
Kolayat Block	4202	96.28	162	3.72

Source: Community Health Centre, Kolayat

Conclusions

Morbidity in Kolayat tehsil shows variable patterns according to age, gender and caste groups of the people. Respiratory problems have greater incidences amongst males and older people. Stomach infections are found to be higher amongst SC-ST populations, females and children. Malaria shows greater occurrence amongst SC-ST population, women and young/adult age groups. Most of the malaria cases are of PV type. The more fatal PF type malaria too has comparatively higher proportion in the study region. Malaria was found to have higher levels in canal irrigated areas. Similarly, PF type malaria also had higher occurrence in the canal irrigated regions of Kolayat.

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