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The Economic and social burden of Malaria- A Case Study of Tribal area in Khammam District, Telangana state

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ABSTRACT
Where malaria prospers most, human societies have prospered least. The global distribution of per-capita gross domestic product shows a striking correlation between malaria and social status and malaria-tribal and agencies areas also have lower rates of economic growth. There are multiple channels by which malaria impedes development, including effects on fertility, population growth, saving and investment, worker productivity, absenteeism, premature mortality and medical costs.Since large part of Telangana tribal is hilly, forested and inaccessible with poor communication facilities, control of malaria is logistically difficult and outbreaks are frequently recorded. The present article attempts to provide a profile of malaria in the region briefly covering various elements of disease transmission in order to asses the magnitude of problem of tribal malaria in Khammam District, Telangana state.
***Key Word**: Malaria, Tribal area and Sociology.*

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diagnostics and curative and preventive health, still there are people living in isolation in natural and unpolluted surroundings far away from civilization with their traditional values, customs, beliefs and myth intact. They are commonly known as "tribals" and are considered to be the autochthonous people of the land. About half of the world's autochthonous people, comprising 635 tribal communities including 75 primitive tribal communities live in India. They are found in all states except Punjab, Haryana and Jammu & Kashmir [1]. Telanganais, the most picturesque state in south India, occupies a unique place in the tribal map of the country having largest number of tribal communities (62 tribes including 13 primitive tribes).The primitive tribal communities have been identified by the Govt. of India [2].In 15 states/union territories on the basis of (a) pre agricultural level of technology (b) extremely low level of literacy; and (c) small, stagnant or diminishing population.

Malaria is a public health problem in several parts of the country. About 95% population in the country resides in malaria endemic areas and 80% of malaria reported in the country is confined to areas consisting 20% of population residing in tribal, hilly, difficult and inaccessible areas. Directorate of National Vector Borne Disease Control Programme (NVBDCP) has framed technical guidelines/ policies and provides most of the resources for the programme. Malaria is a major public health problem in India and its dynamics vary from place to place [3]. In central India malaria is complex because of vast tracts of forest with tribal settlement. According to a 1987 estimate , 54 million tribals of various ethnic origins residing in forested areas and accounting for 8% of the total population contributed 30% of total malaria cases, 60% of total *Plasmodium falciparum* cases and 50% of malaria deaths in the country [4]. Keeping this in view a new malaria control strategy named Enhanced Malaria Control Project (EMCP) was introduced in 1998 by the National Anti-Malaria Programme (NAMP) in seven peninsular states of India with World Bank assistance [4]. Malaria is a complex disease and various factors influenced by human activities and natural calamity like excessive rainfall, flood, drought and other disasters have great bearing on mosquitogenic conditions leading to increased potential for malaria transmission. Like any other disease, natural transmission of malaria depends on the presence of, and relationship between the three basic epidemiological factors: the agent, the host and the environment. While the malaria parasite is

the true agent of infection, the female anopheles mosquito is the agent of transmission. The environment is considered from three aspects; physical, biological and socio-economic.

Although the last century witnessed many successful programmes at country level to eliminate the parasite, the world is now facing a rapidly increasing disease burden5. This has been attributed to several causes, including population movements into malarious regions, changing agricultural practices including the building of dams and irrigation schemes, deforestation, the weakening of public health systems in some poor countries, and more speculatively, long-term climate changes such as more pronounced El Niño cycles and global warming. Furthermore, resistance to drugs and insecticides used to counter this disease has been evolving in tandem with growing caseloads. With a rapidly growing population in regions with high malaria transmission, it has been estimated that in the absence of effective intervention strategies the number of malaria cases will double over the next 20 years4.

However, this achievement is fragile as potentials for local malaria transmissions remain. The risk of getting malaria infection is partially explained by social conditions of vulnerable populations. Since vulnerability to malaria is both influenced by social and environmental factors, its complexity cannot be measured by a single value. The aim of this paper is, therefore, to apply a composite indicator approach for assessing social vulnerability to malaria in Telangana, India. This assessment informs the decision-makers in targeting malaria interventions and allocating limited resources to reduce malaria burden in Telangana tribal area district.

Traditionally, studies that have attempted to estimate the economic burden of malaria have focused on the private and non-private medical costs associated with the disease, as well as some measure of the income that is foregone as a result of malaria morbidity and mortality. Private medical costs refer to personal expenditures on prevention, diagnosis, treatment and care of the disease. They include such factors as expenditure on bednets, doctor's fees, the cost of anti-malarial drugs, and the cost of transportation to medical facilities and the necessary support provided there. Non-private medical care costs are public expenditures on both prevention and treatment of the disease. They include expenditures by the government on such factors as vector control, health facilities, education and research. Foregone income is generally estimated by calculating the value of lost workdays as a result of malaria and malaria-related illness, based on estimated wages. In the case of mortality, foregone income is estimated by calculating the capitalized value of future lifetime earnings that would have been earned by those who died prematurely as a result of the disease, based on projected incomes for different age groups, basic longevity data and age-specific mortality rates.

These studies have found a burden that is significant and especially severe for those in the lowest income brackets. But the estimates, which average approximately 1% of GDP, simply miss some of the most important ways in which the disease affects long-term economic growth and development. In effect, traditional studies have used accounting techniques which assume that the economic costs of malaria can be determined by the average cost of an individual episode of illness, multiplied by the total number of cases encountered, and adding any fixed costs expended in prevention and treatment. Such techniques might be appropriate when there are a few episodes of disease (for example, episodes of malaria in the United States and Europe resulting from travel in malarious regions), but make little sense when extended to situations of high transmission.

There are at least two broad categories of mechanisms through which malaria can impose economic costs well beyond direct medical costs and foregone incomes. The first is the effects that occur through changes in household behaviour in response to the disease, which can result in broad social costs. These include such factors as schooling, demography, migration and saving. The second are macroeconomic costs that arise specifically in response to the pandemic nature of the disease and that cannot be assessed at a household level. These include the impact of malaria on trade, tourism and foreign direct investment. Below we explore some of these additional pathways through.

Where malaria is highly endemic, adults generally develop partial immunity to the symptoms of the disease. Young children, however, bear a considerable burden in terms of malaria morbidity and mortality. Although this morbidity is most concentrated among pre-school children, school-age children also suffer the effects, resulting in school absenteeism. For example, in Kenya it was found that primary school students miss 11% of school days per year because of malaria, and secondary school students miss 4.3% of school days [5]. Another study attributed 13–50% of medically related school absences to the disease [6]. The adverse effects on schooling are likely to go far beyond the number of days lost per year, as absenteeism increases failure rates, repetition of school years, and drop-out rates in Telangana tribal area.

METHODOLOGY

The study was carried out in malaria endemic khammam Primary Health Centres (PHC) of khammam district. The PHC area forms the part of the tribal area in Khammam district,Telangana India. Bhadrachalam PHC includes 60 villages, out ofwhich, 15 villages were selected randomly for the present study. A total of 450 households were selected in 15 villages namely—Bandirevu ,Bhadrachalam (CT) Boddugudem,Buruguvai,ChinnaNallakunta.Chowdavaram,Fergusanpeta, Gundala, K. Narayanapuram, Kannaigudem, Kannapuram, Madimeru,Midfordpeta, Mummadivaru, Murumoor. A mass fever survey was undertaken among selected households. In each village 15 members belonging to low socioeconomic group (LSEG) and the same number belonging to high socioeconomic group (HSEG) were interviewed. Thus data were collected from 450 respondents from all the 15 villages selected. In addition, data pertaining to malaria cases during five years (2012-015) were collected with respect to each house from the records of the PHC. Information such as number of fever cases, collection of blood slides, and examination of blood slides and status of slides collected from fever cases in the selected households was obtained from health records of the PHC. Pre tested schedules were used for the data collection on sociodemographic, socioeconomic, sociocultural and health practices, migration and treatment seeking behaviour by doorto-door survey. Schedules were prepared in Telugu to avoid communication gap. Head of the household or one member >18 yr of age who was present at the time of survey was interrogated.

RESULT

One-third of the respondents had neither taken treatment for malaria nor took part in the vector control operations because they did not consider mosquito bites to be harmful and took malaria as a mild disease. Outdoor sleeping habits, sharing bed with children, uneasy and suffocation feeling in using mosquito bed nets or any other protective device also contributed to the spread of malaria in the study villages.

DISCUSSION

The study indicates that sociocultural factors are responsible for giving the environment for transmission of malaria by their living style, social behaviours, beliefs and practices, social customs, level of education, type of occupation and economic status. These factors were influencing the degree of transmission of malaria in both the groups. Surroundings of living area, practices of water storage in the containers, covering practices of water containers through lids, frequency of changing potable water in the containers, use of proper lid on water storage tanks locally referred as tanka (cement tank used for water storage), and proper sanitation, were significantly different in the study population groups. Misconceptions about malaria have been reported in research publications from all over the world. Links between malaria and supernatural forces are found almost similar. For example, in the Gambia and in Kenya, malaria, especially in children, is often perceived as the result of the child being possessed by an evil spirit [7].

Climate

The climate of the region is characterized by a hot summer (March-June), mansoon/rainy seasons (July-October) and a cool/autumn seasons (November-February). The area receives good annual rainfall which ranges between 1400 to 2000 mm. almost all the rain falls in a single rainy season between June to October. There is very little precipitation during the rest of the year. May is the hottest month and December is the coldest month.

Habit and Habitat

There are hardly any school or health centre in these tribal villages and people are mostly illiterate, scantily clothed and have immense faith in sorcery and witch craft. Their houses are scattered in agricultural fields and forest and are made of mud, thatch and bamboo. Houses are generally dark, damp and often without ventilation. Fewer than 20% house have electricity (only one point connection per dwelling). Very often domestic animals are also sheltered in the same house. Drinking water is brought from the wells or seepages or streams. A typical tribal house consists of a living room and a kitchen almost combined. The doors are low and small and windows are seldom present in about 90% of the houses. Majority of residents sleep on floor without any mattress or blanket. The family size varied from 2 to 10 with an average of 4.5 members. Most of the men and women work as labourers in forest nurseries, road construction and other casual jobs away from their home. Other communicable diseases such as tuberculosis, leprosy, yaws and venereal diseases, though have been described as significant health problems in several major tribal populations of the country, very few published reports are available concerning these diseases in the primitive tribes. In a prospective study undertaken in telangana,

Mosquito nets and others measures used by people to fight against mosquitoes

In the study area 11036 persons (33.5%) slept under mosquito impregnated nets and 695 (20.3%) under ordinary nets. Mosquito nets (52.7%) and spiral (28.8%) were the main means of prevention used against

mosquito bites. Some people have a feeling of heat (12.3%) when sleeping under a mosquito net; for others, it was the feeling of suffocation (0.7%). Some respondents used the spirals (27.6%) and aerosol sprays (10.7%) to replace the nets. Smoke (2.4%) and local plants (2.4%) were less used. The practical use of window net, smoke, local plants, ointment and cover were in similar proportions and the practices have been uniform from one district to another.

There is a need for such studies to be undertaken by others for quantification and stratification of malaria throughout the country in different communities. The concept of preventive malaria control should percolate as a top down approach to Panchayats and communities should be the major players from the very beginning. Moreover, the strategies being followed presently for malaria control seem to be grossly inadequate and need a thorough revamp. Transmission control should rely on the bioenvironmental interventions for long-term gains in malaria control. Also, the few good epidemiological data that we have, and centres from where these emanate, must be put to the best use. IEC component must be established on local area need so that malaria control programme can benefit maximally.

CONCLUSION

This review has attempted to provide important and hitherto unreported insights about tribal malaria. Food gathering and cultivation are the main occupation of tribal. The unfertile soil, lack of irrigation and primitive mode of cultivation make sustenance difficult even for 6 months a year. During the remaining 6 months the tribal depend exclusively on forest produce or on forest labour. The constant movement of people makes it difficult to treat individuals and the malaria gametocyte load remains high in communities. Although the site of anopheles infection in forest villages was obscure, the villagers frequently spent the night in the open, providing a source of infection to the anopheles prevalent outdoors. There is a strong possibility of extra domiciliary transmission and many cases may have gone unrecorded. Mosquito repellents, coils and bed nets were not used by the communities as neither have they had the knowledge about these gadgets nor they could afford such personal protection methods. But, in the evening most people burn dry leaves to drive mosquitoes out of their houses. People have faith in guniya as these traditional healers hail from the same community, live among them and are always available. Only when they did not get cured, they go to untrained and unlicensed practitioners or quacks, who may give adulterated, under dosed treatment which is often broad spectrum.

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