



Black Fever: A Serious Threat on Human Health in West Bengal, India

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Abstract

Black Fever or Kala-azar is one of the deadly diseases that have affected mankind from time immemorial. The carrier of the disease is the leishmania parasite which spreads from the bite of an adult female sand fly. The disease has been found to be endemic in selected states of India like Bihar, Jharkhand, West Bengal among the eastern states and Uttar Pradesh, the state in the northern region of India. About 33 districts of Bihar are affected with the disease accounting to fatalities every year. Almost same scenario prevails for other states as well. In case of West Bengal ten districts have been identified as endemic which includes Darjiling, Koch Bihar, Jalpaiguri, Maldah, Uttar Dinajpur, Dakshin Dinajpur etc. The disease spreads mainly during the monsoon and retreating monsoon thus reflecting strong association of the disease with the environment. In recent years with tremendous initiatives of the Government the case fatality rate of the disease has been reduced to some extent though in some districts the effort is limited in the urban areas exhibiting some amount of negligence in the rural areas.

Keywords: Visceral leishmaniasis, attack rate, endemicity, case fatality rate.

Introduction

Black Fever popularly known as *Kala-azar* is one of the oldest diseases known to mankind. Black Fever or *Visceral leishmaniasis* (VL) is the most severe form of leishmaniasis which is caused by protozoan parasites of the *Leishmania* genus. The disease is the second largest parasitic killer in the world after malaria responsible for an estimated 500,000 incidences every year worldwide. Along with Chagas disease and sleeping sickness, Black Fever is one of the most dangerous and neglected tropical diseases. The disease is endemic in 47 countries. About 90 per cent of the cases are reported from India, Bangladesh, Nepal, Sudan and Brazil. According to World Health Organization, one of the emerging health hazards in the world is the co-infection of HIV and VL.

Objectives of the Study: The study has been initiated to fulfil the following objectives: i. To study the reasons of outbreak of Black Fever. ii. To identify the endemic states of India as well as in West Bengal. iii. To understand the causes behind its massive prevalence in the State under focus. iv. To evaluate the Government initiatives to combat the disease

Area under study: The State of West Bengal covers an area of 88,752 km² and has a latitudinal extension of 22°N to 27°N and longitudinal extension of 86°E to 89°30'E. The State has 20 districts though the 20th one has recently been created in June, 2014. The State is divided into three Administrative Divisions namely: Jalpaiguri, Barddhaman and Presidency Divisions. The Jalpaiguri Division comprises of districts like Darjiling, Koch Bihar, Jalpaiguri, Maldah, Uttar Dinajpur and Dakshin Dinajpur while Barddhaman Division comprise of Birbhum, Barddhaman,

Puruliya, Purba Medinipur, Paschim Medinipur, Hugli and Bankura districts. The Presidency Division consists of Nadia, Murshidabad, North and South 24 Parganas, Haora and Kolkata districts. The city of Kolkata under the administrative jurisdiction of Kolkata Municipal Corporation (KMC) consists of 15 Boroughs comprising of 141 municipal wards. The city is the administrative and health hub of the State with all modern medical facilities available.

Material and Methods

The work has been accomplished through both primary and secondary data. The endemic states of India have been identified on the basis of incidences of the disease under study each year. Reports published by State Bureau of Health Intelligence, Government of West Bengal have been extensively studied to understand the true scenario of the disease. Apart from these, articles from various journals have been consulted for the purpose. Extensive field visits have been conducted in the healthcare institutions especially in the city of Kolkata where the referral patients come for treatment from surrounding states and districts due to the availability of sound healthcare infrastructure here.

Results and Discussion

The life cycle of *Leishmania* parasite, the causative agent is completed in two hosts- human beings and sand flies. The adult female sand fly is a blood sucker usually feeding at night on sleeping prey. When the fly infected with leishmania parasite bites a person the pathogen is ingested along with the prey's blood. The parasite migrates to the internal organs such as liver, spleen and bone marrow. The symptoms of the disease include

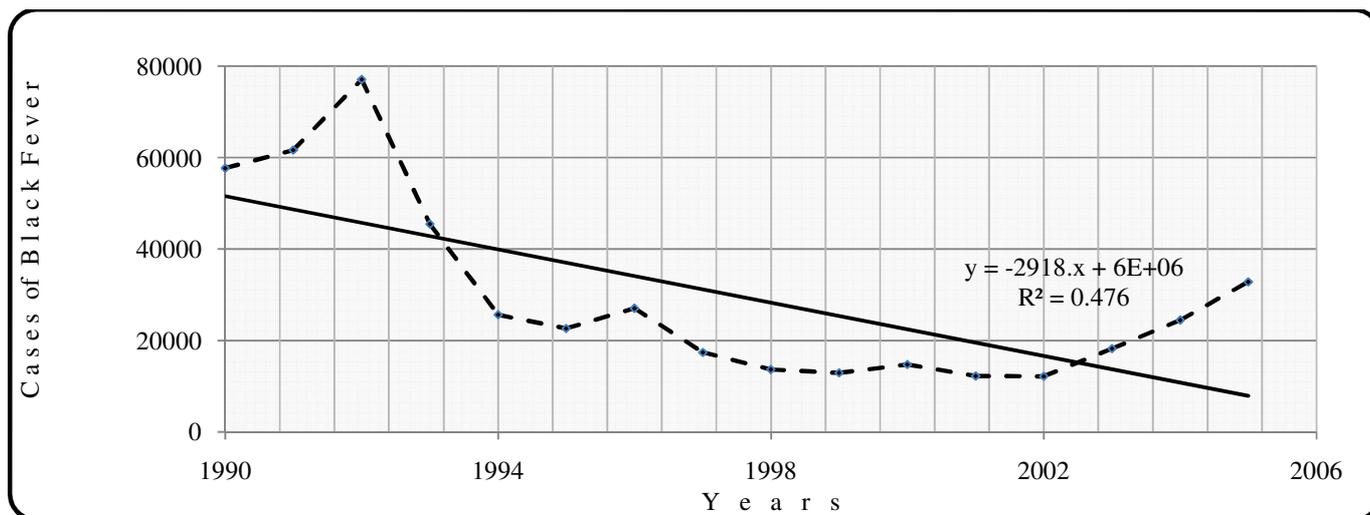
fever, weight loss, fatigue, anaemia and substantial swelling of the liver and spleen. The results and discussion have been divided under the following categories with a view for proper explanation and understanding:

History of Black Fever in India: Kala-azar is one of the oldest diseases of man¹. In India it has first came to attention in 1824 with incidences recorded in Jessore (now in Bangladesh) in undivided India when it was named as *Jwar-Vikar* meaning a peculiar fever. The disease was first discovered in India by Scottish doctor William Leishman and Irish physician Charles Denovan. It was named as Burdwan Fever by Dr. French, the Civil Surgeon of Burdwan in 1854. He observed a contagious fever with enlargement of spleen and liver accompanied with diarrhoea which was identified as Black Fever. Harold Brown investigated Black Fever in Purnea district of Bihar in 1898 which was similar to that of Assam fever observed by Clarke in 1882. Hindley described a disease in Jalpaiguri, West Bengal in 1984 as *Pushkara* different from malaria which was later recognized as Black Fever.

Scenario of Black Fever in India: In South East Asian region Black Fever is reported from Bangladesh, India and Nepal where 147 million people are at risk which accounts to 20 per cent of the global incidences. Black Fever has typically been a disease which spreads in particular environmental conditions due to the interaction of the agent and the host. The disease has always been endemic in the eastern states of India especially in Bihar, Jharkhand and West Bengal and Uttar Pradesh among northern states. In India in 1986 total number of reported cases was 17,806 with 72 deaths. In 1990, total 57,742 cases were recorded with quite a high death toll of 606 figure-1. At present, *Kala-azar* is a serious problem in Bihar, West Bengal and eastern Uttar Pradesh. In 1996, Bihar and West Bengal had 33 and 10 affected districts respectively. Sporadic cases as well as outbreaks have also been

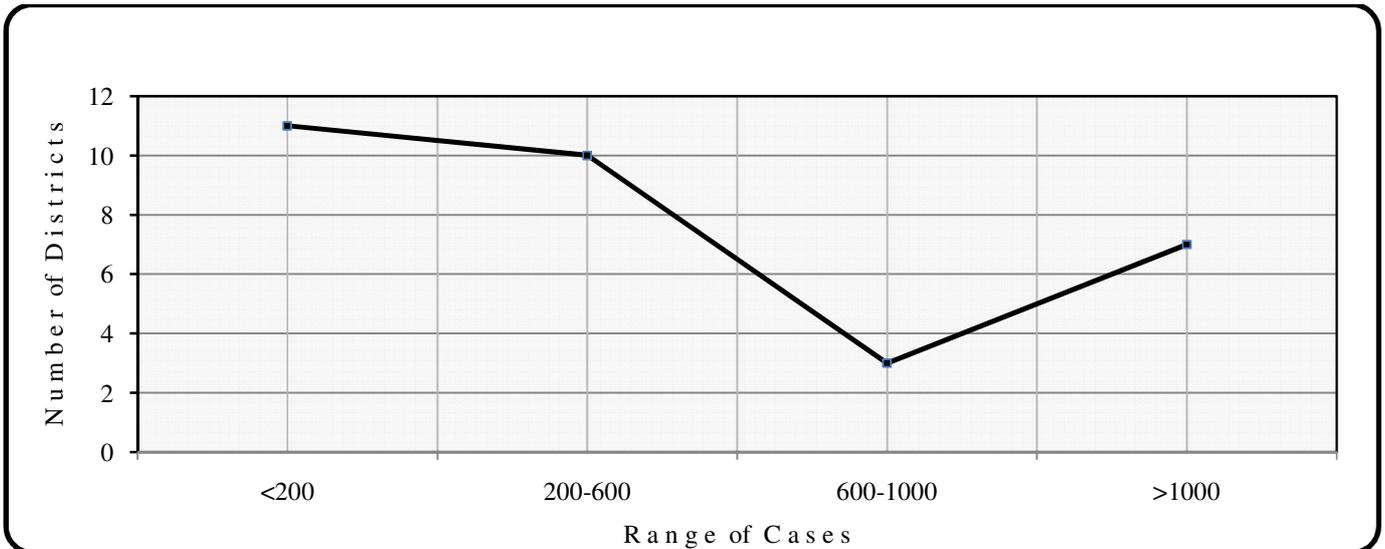
reported from other endemic and non-endemic areas. However, the disease has remained under control in Assam and Tamil Nadu since the 1950s². In 1993, the case fatality rate (CFR) of the disease was 1.56 per cent which increased to 2.54 per cent in 1996 but recorded a slight decline in 1999 with a CFR of 2.30 per cent. In 2001, the CFR recorded a further drop to 1.74 per cent. An appreciable decline in the CFR was observed in 2004 when it was 0.63 per cent and it further declined to 0.48 per cent in 2006. Thus there has been a step drop in number of cases observed since 1994; the CFR experienced a decline since 2003.

Nearly 52 districts of India has been identified as endemic areas out of which 33 districts are in Bihar, 11 districts in West Bengal and four districts each in Jharkhand and West Bengal respectively. About 80 per cent of the disease burden is contributed by Bihar. Out of 400,000 new cases of the disease in the world, a quarter has occurred in Bihar. Sodium stibogluconate was used as a first line drug during this epidemic. Out of the 33 districts in Bihar, nine districts alone contribute to 70 per cent of total cases in the state. Seven districts namely East Champaran, Muzzafarpur, Saharsa, Madhepura, Araria, Saran and Vaishali records very high incidences of the disease every year (figure-2). Purnea, Katihar, and Gopalganj records approximately 600-1,000 cases while West Champaran, Sitam, Patna, Samastipur, Darbhanga, Madhubani etc are the districts with moderately high number of cases. It is noteworthy to mention here that Kaimur, Rohtas, Aurangabad, Gaya, Nawada, Sheikhpura and Jamui are the districts with no cases of Black Fever. In 1970s Bihar experienced a massive epidemic of the disease. In 1990 the state has experienced 54,650 cases which experienced an increase by 27.64 per cent in 1992 with an appreciable drop in 1995 when 21,045 cases were recorded (figure-3). In 2000, there was a further decline with 12,909 cases which decreased to 9684 in 2002. In 2006, there was again a rise by 67.41 per cent with 162 deaths recorded from the disease.



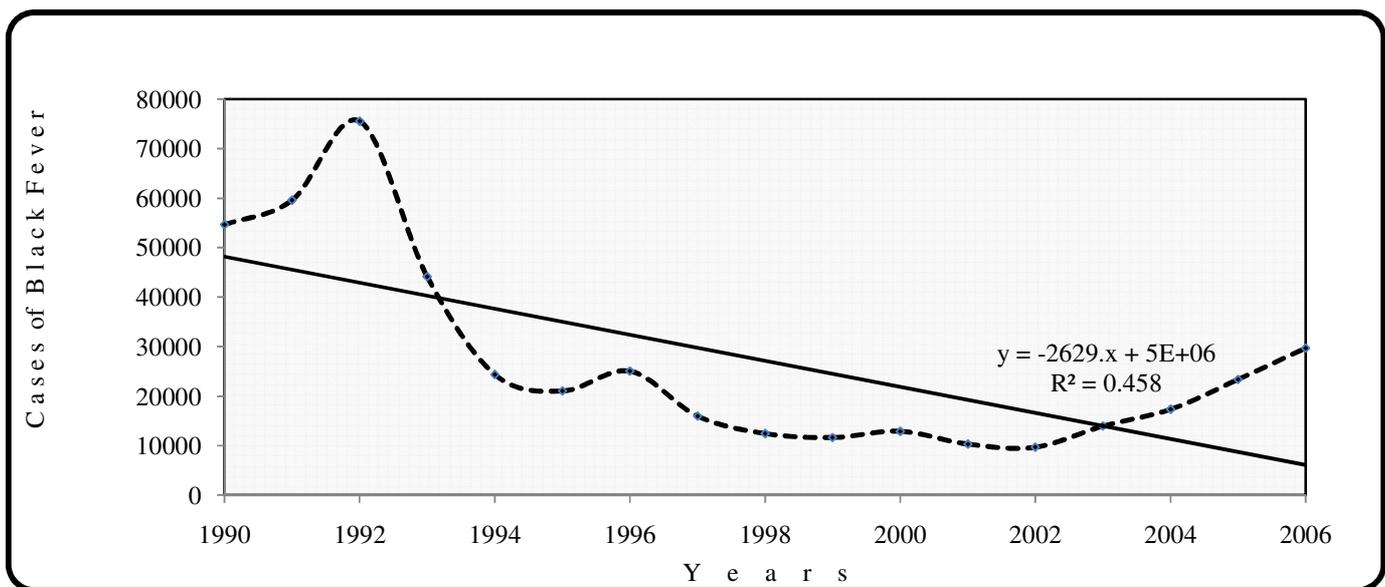
Data source: Government of India

Figure-1
Trend of Black Fever in India, 1990-2006



Data source: Government of India

Figure-2
Frequency Distribution of Districts according to Cases of Black Fever in Bihar



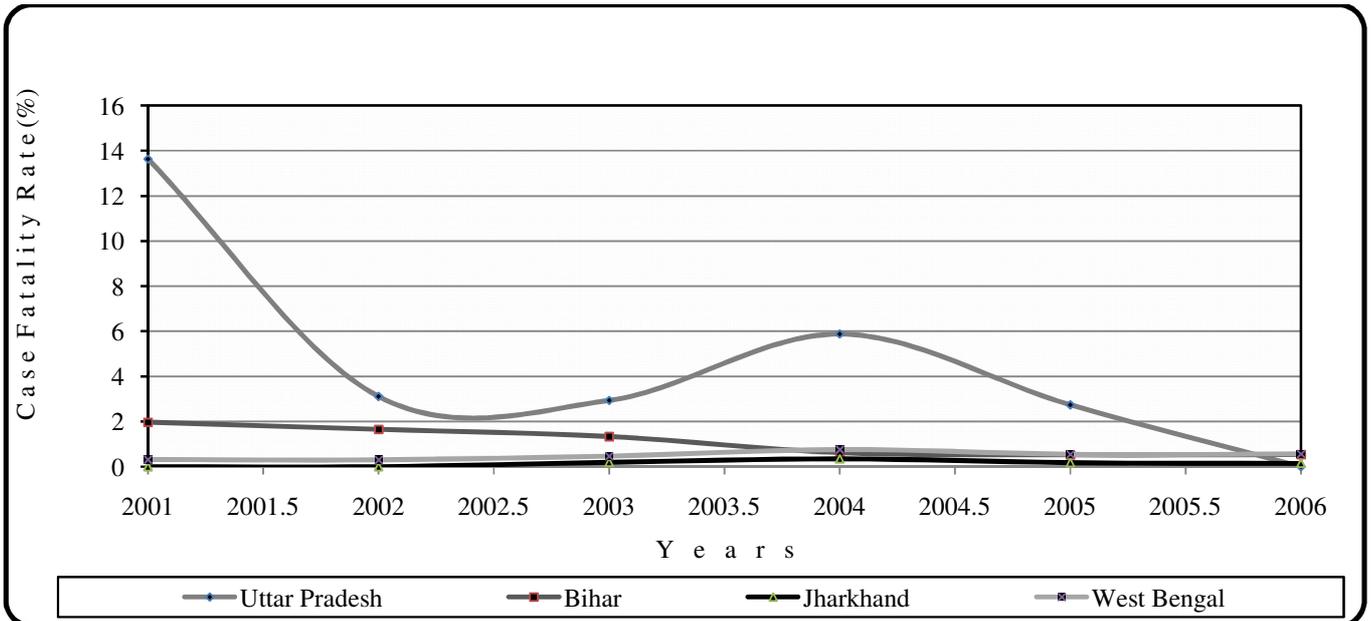
Data source: Government of India

Figure-3
Temporal Variation of Black Fever in Bihar, 1990-2006

In 2001, Jharkhand recorded 589 cases with no death while in Uttar Pradesh the CFR was 13.64 per cent and 0.32 percent in West Bengal. In 2003 however CFR was 0.19 per cent in Jharkhand when it was 2.94 per cent in Uttar Pradesh and 0.47 per cent in West Bengal. The CFR was 0 for Uttar Pradesh in 2006 when it was 0.15 per cent in Jharkhand and 0.57 per cent in West Bengal (figure-4).

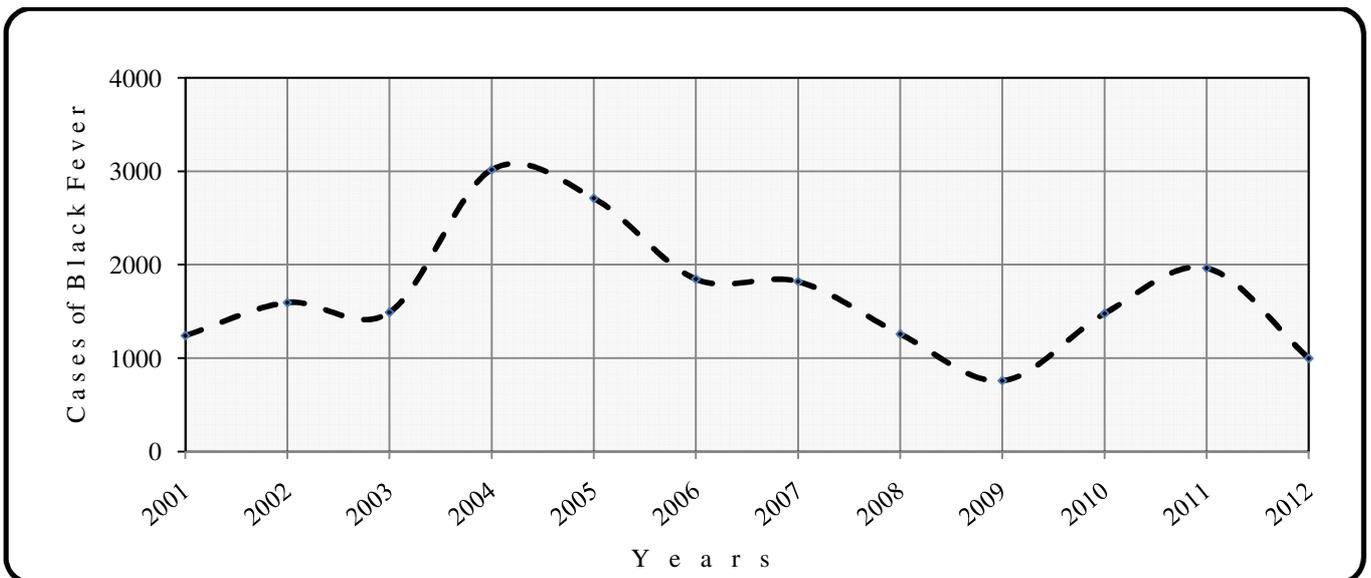
Incidences and Outbreak of Black Fever in West Bengal:
 The disease had a long history in the State. The disease was first

observed in Jessore (now in Bangladesh) in 1824. Then it was termed as Burdwan Fever in 1854. It assumed the name of Jalpaiguri Fever in 1984. The disease is endemic in 11 districts with massive incidences recorded in Murshidabad district under Presidency Division. In 2001, the State has recorded 1,238 cases of Black Fever which increased by 58.94 per cent in 2004. The decline in incidences of the disease was negligible in 2007 from the preceding year 2006 (figure-5).



Data source: Government of India

Figure-4
Case Fatality Rate of Black Fever in Endemic States of India, 2001-2006



Data source: Government of West Bengal

Figure-5
Chronology of Black Fever in West Bengal, 2001-2012

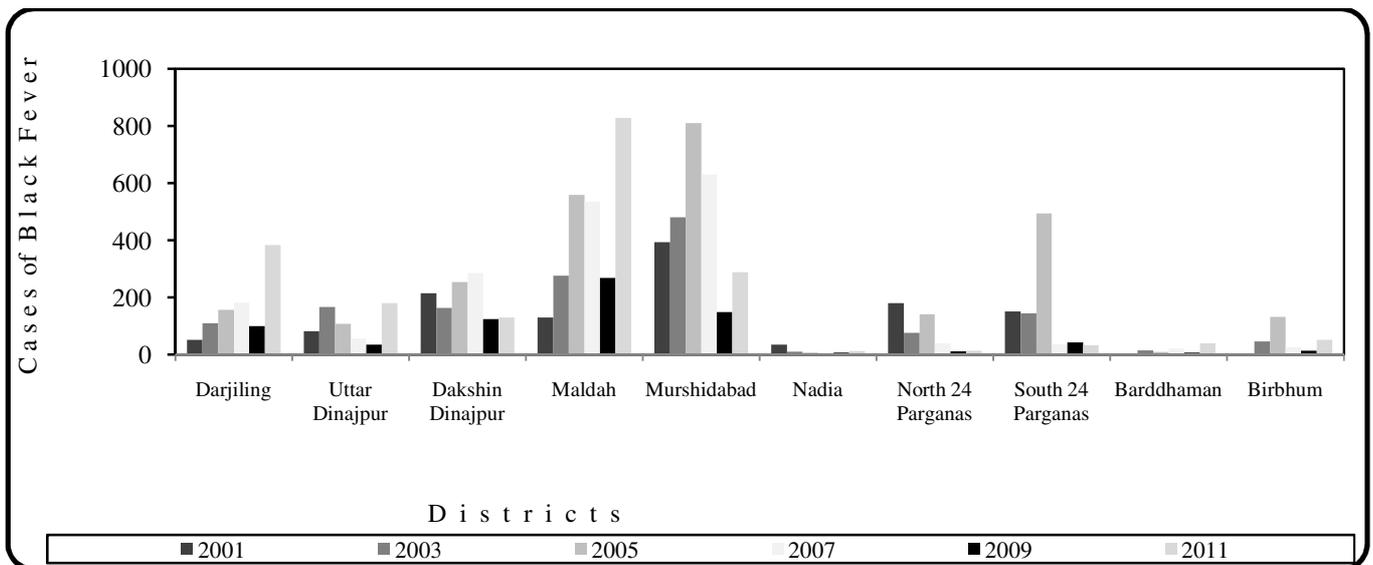
Table-1
Share of the Administrative Divisions in incidences of Black Fever in West Bengal

Administrative Divisions	Share (%), 2001	Share (%), 2011
Jalpaiguri	38.53	77.59
Barddhaman	0.16	4.64
Presidency	61.31	17.77

Source: Computed from the data provided by Government of West Bengal

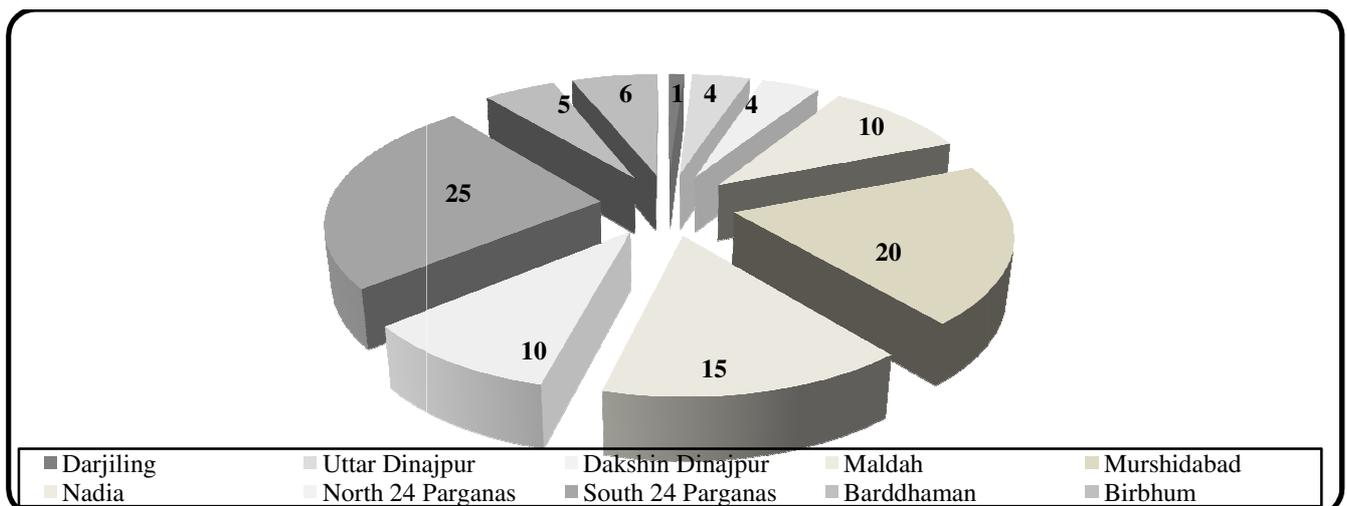
The incidences of Black Fever has been highest in the district of Murshidabad under Presidency Division from 2001-11 and has been considerably lowest Nadia. Murshidabad has experienced highest incidence of the disease in 2005 when 810 persons were reportedly suffering from the disease [Figure-6]. South 24 Parganas under the same Administrative Division has recorded an increasing trend in 2005 though the incidences of the disease were controlled appreciably in 2011 [Table-1]. Maldah is another district under Jalpaiguri Division that has been affected with the disease every year with quite high incidences. The district has recorded highest incidences in 2011 with 827 persons suffering from the disease. The incidences of the

disease were quite low in 2001 with an increasing trend in 2005. In case of the districts under Barddhaman Administrative Division incidences are recorded every year though with declining intensity in 2011. The people of the rural areas are mostly affected with the disease than their urban counterparts. The incidences of Black Fever are rare in Kolkata Municipal Corporation Area though the city healthcare institutions receive referral patients from far off districts like Darjiling, Uttar Dinajpur, Dakshin Dinajpur and Maldah. The Government run medical colleges and hospitals also receive patients from surrounding districts like North 24 Parganas and South 24 Parganas [Figure-7].



Data source: Government of West Bengal

Figure-6
Incidences of Black Fever in Endemic Districts of West Bengal



Source: Primary data, 2013

Figure-7
Source Districts of Patient Flow in Healthcare Institutions under Kolkata Municipal Corporation Area

A history of other diseases such as tuberculosis, hepatitis, or viral fever in the past year has a significant impact on the occurrence of kala-azar because these diseases may reduce the immune status of the host. The low immunity of the host increases the risk of being infected with *L. donovani*. Multiple cases of kala-azar in a family have been reported from Bihar³. In this study, it was observed that the risk of kala-azar was higher among cases with a history of kala-azar among the family members in the past year compared with those cases with no history of kala-azar among family members. The presence of kala-azar cases in the family might aid the transmission of this disease in the presence of sand fly vectors and other conditions favorable for completion of transmission cycle within the house⁴. The use of mud for wall construction or for plastering walls was found to be significantly associated with kala-azar. Sand flies are commonly found in cracks and crevices of mud walls, mud-plastered walls, or unplastered brick walls in rural areas of Bihar. These endophagic sand flies usually breed inside cowsheds and human dwellings, especially inside cracks and crevices of walls where optimum temperature and humidity are available⁵.

Thus it has been found that Black Fever commonly known as *Kala-azar* is endemic in eastern states of India especially in Bihar, Jharkhand and West Bengal. The State of Bihar is affected every year with high incidences of the disease affecting 33 districts. The Vaishali district of Bihar was the most affected district with highest incidence rate of 5.9 per thousand in 1978. In 1977, there were 100,000 cases of the disease in the State with 28.7 per thousand was the incidence rate. The other endemic districts include East Champaran, Muzzafarpur, Saharsa, Saran etc. Apart from Bihar other endemic states of India include Uttar Pradesh, Jharkhand and West Bengal. The case fatality rate was 13.64 per cent which has appreciably declined in 2006 when no death was registered. In Jharkhand the attack rate was though very high in 2001, the case fatality rate was nil. In 2006, the number of incidences of the disease increased though no death was registered. West Bengal is another district of eastern India which is affected with the disease every year. Among the districts of West Bengal the endemic districts include Darjiling, Uttar Dinajpur, Dakshin Dinajpur and Maldah under Jalpaiguri Administrative Division. These districts have recorded moderate incidences of the disease from 2001-11 while Maldah under the same Division has recorded high incidences during the same period with considerable case fatality rate. Murshidabad and South 24 Parganas districts under Presidency Administrative Division have recorded highest incidences when compared with other districts under the same division. Other districts have fairly low incidences with declining case fatality rate of the disease. The population of the rural areas are pre-dominantly affected with the disease with maximum case fatality rate. This is related with their level of unawareness, ignorance and poor living condition. Since the disease is linked with environmental conditions therefore precaution may be taken to combat the disease. The Government of India has launched a programme to control

Black Fever in 1992. The strategies included: indoor residential spraying of insecticides to reduce and control vectors, early diagnosis and complete treatment and health education for community awareness. These strategies exerted some effects and the number of deaths reduced substantially.

Conclusion

Kala-azar was a fatal disease that occurred both epidemically and endemically in India during the colonial period⁶. The disease was prevalent in a dangerous form during the British rule in 1860s. Though the country's public health services have improved considerably in treating Black Fever, the disease caused havoc devastation especially among the country's rural population even in the 1940s. The disease still persists in the Indian villages especially in the remote areas where the population remains deprived of public healthcare facilities. It is noteworthy that the disease prevails in those states of India which has been spotted as backward in terms of human development. The only exception is the State of West Bengal which holds a commendable position in providing healthcare facilities in the national scenario. The Government at both Central and State level has taken strong initiatives to control, combat and eradicate the disease though the results have varied according to the level of regional development.

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