

A Spatial Distribution on the Outbreak of Tuberculosis (TB) Disease in Magway Township (Tropical Region)

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Abstract

At present, the outbreak of tuberculosis (TB) disease is an important issue in the Dry Zone of Central Myanmar. This research paper investigates how the physical factors influence TB disease and how the social factors relate to the outbreak of TB disease in the study area. The study area is Magway Township lying in Tropical Region of the Dry Zone of Central Myanmar. Tuberculosis (TB) disease is a disease that is prevalent in tropical and subtropical regions. In the present day, this disease is easily transmitted from person to person in the study area because of high temperature, low rainfall, crowded population and low level awareness of the local people. The study area is still experiencing the outbreak of TB disease. There are many methods to classify the outbreak of TB disease in the study area.

Keywords: tuberculosis, outbreak, transmitted

Introduction

The research paper is entitled “A Spatial Distribution on the Outbreak of Tuberculosis (TB) Disease in Magway Township (Tropical Region)”. The outbreak of TB disease in the study area is largely depending on the physical factors as well as related to the social factors. One of the most important factors is a climatic factor in the study area. The other physical factors like relief, drainage, soil and natural vegetation also play influences on the distribution of the disease. Magway is situated in the Dry Zone of Central Myanmar. It has a very hot and dry summer. Winter and rainy seasons are rather short with low rainfall. Most of the streams in the study area are dry and intermittent. Everywhere, the soils are usually occur as not compact but are fine particles. So the outbreak of TB disease is encouraged in the study area. The effect of social factors is also important because outbreak of disease can occur according to age composition, population density, urban and rural settlement, living style and transportation networks. Special attention of this research paper is mainly carried on the effect of physical and social factors on the occurrence of outbreak disease are well seen in the study area.

Aim

- This research paper is to understand how TB disease spatially distributed throughout the study area.

Objectives

- To examine the relationship between the geographical factors and the distribution of TB disease.
- To control most significantly to exceed morbidity and mortality rate by TB disease.

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- To prevent outbreak to TB disease among non-immune and vulnerable population.
- To predict the future condition of the distribution of TB disease in the study area.

Geographical Background of the Study Area

Magway Township is one of the townships in Magway Region. It lies within the Dry Zone of Central Myanmar. It lies between north latitude of 19° 46' and 20° 22' and between east longitude 94° 52' 30" and 95° 22'. It is bounded on the north by Yenanchaung Township, on the east by Natmauk and Myothit Townships, on the south by the Taungdwingyi and Sinbaungwe Townships, on the west by Minbu and Minhla Townships. Total area of Magway Township is 682.2 square miles. It has a rectangular shape. There are 61 village tracts and 214 villages in this township. Generally, the location of Magway Township is sandy plain area between Ayeyarwady River and foot hill of Bago Yoma.

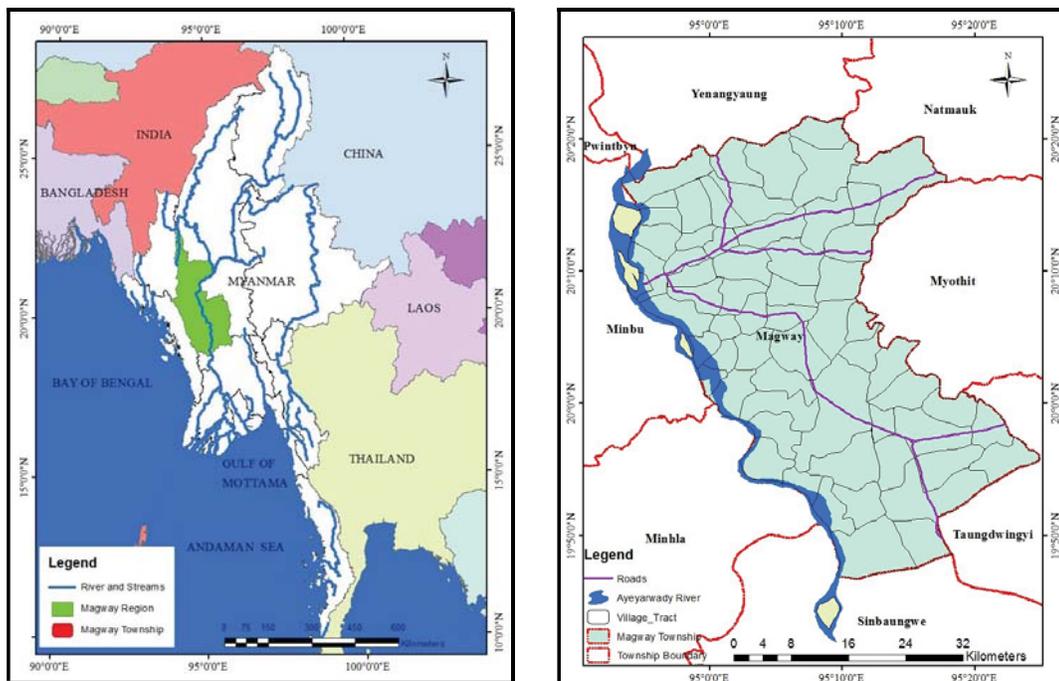


Figure 1 Location of Magway Township in Magway Region

Source: MIMU (Myanmar Information Management Units)

Spatial Distribution of TB Disease

The source of tuberculosis disease is particularly the patient with pulmonary disease. They are transmitted to contacts of the patient through infectious aerosol droplets discharged by the patient when coughing, sneezing and talking. Transmissions are all the more intense among closely relative to contact with the patient several hours per day, live and sleep in the same house. The outbreak of TB disease is unevenly distributed in the study area. Magway urban area is significantly higher than other village tracts. It is 335 patients because this urban area has more densely population with congested household style. Therefore, regarding with TB

cases more numbers in urban area than those of rural one. Moreover, in the rural area the high number of TB patients are also found in the village tracts of Kyarkan and Kanpya with 51 and 42 patients respectively in the study area. These two village tracts are more easily accessible than other areas with convergent of transportation network and dense rural people in the township area. The lacks of TB cases are Myenu, Kwanown, Letpanto and Nyaungkyatsan village tracts with sparsely populated area within this area.

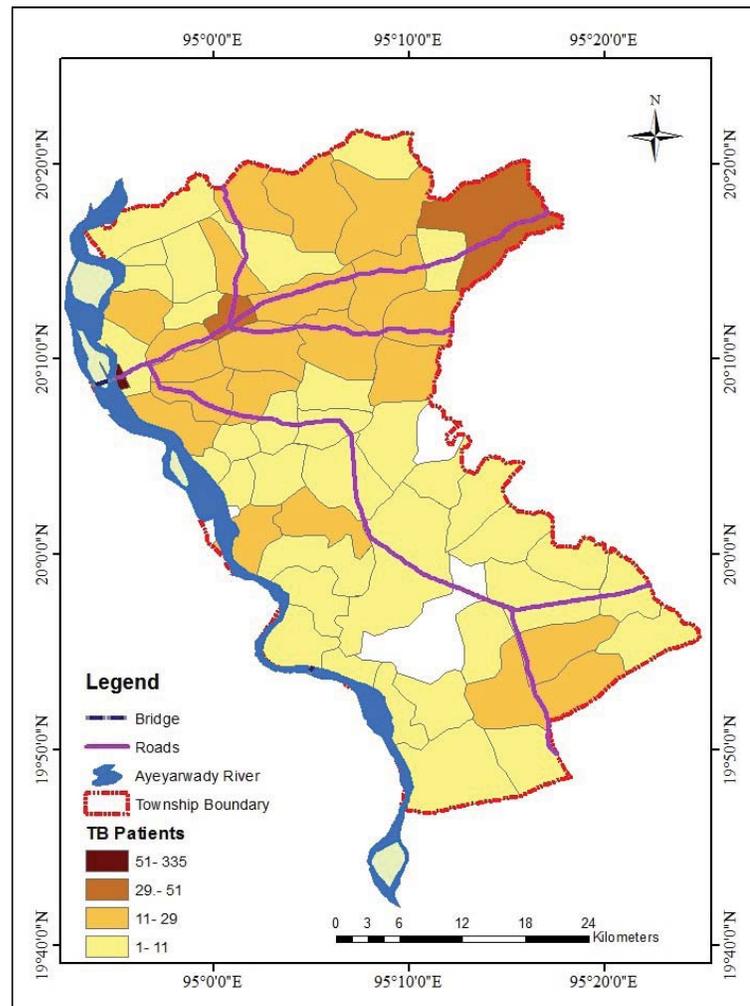


Figure 2 Spatial Distribution of TB Disease in 2019

Source: TB campaign, Magway Regional Hospital

Monthly Changes of TB Disease

In 2019, 963 TB patients were found in the study area. The numbers of infected TB patients by monthly changes did not vary much from January to December. But annual monthly changes of number in patient can point out that in which December and January during the cold season; the outbreak number of patient was lower than other months. The decrease in temperature reduced the outbreak of TB disease patients. At the beginning of summer months from April to May the temperature reaches the highest and the number of patients suddenly increased in the study area. During these months, the temperature is significantly high and low in rainfall in addition to dusty wind. The outbreak of TB is much influenced by the

climatic elements like dusty air and wind. It is easily transmitted from one person to another person who stays very close to each other. Hence, the TB infection rate is mainly related to the human impact rather than seasonal changes.

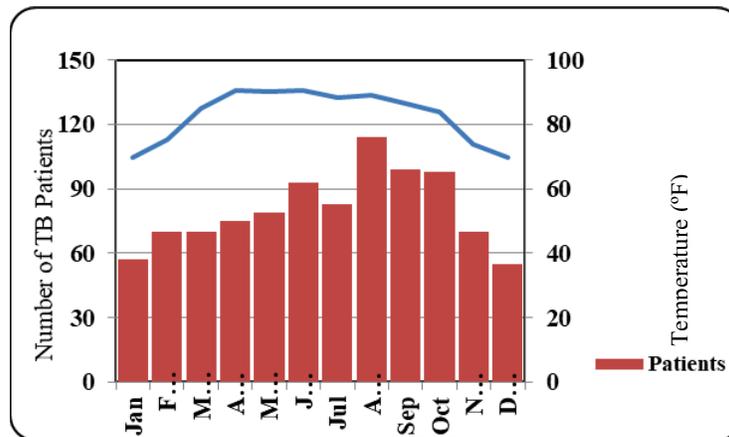


Figure 3 Monthly Changes of TB Disease in 2019

Source: TB campaign, Magway Regional Hospital

Analysis on Correlation between Temperature and TB Cases

The relation between TB cases and each of some elements of weather is also examined by using the line graphs and regression methods. In this figure 4 line graph shows monthly TB cases and monthly mean temperature of the ten years are related, in this case the years of 2010 to 2019 when the outbreak of TB cases prevailed among the studied years. The equation $y = 1.5026x - 43.596$, the determinant $R^2 = + 0.5885$ and the correlation coefficient $r = + 0.767$, and the regression line show clearly that there is a high degree of positive correlation between temperature and TB cases. Therefore, it means the two variables are directly related i.e, the higher temperature and the more occurrences of TB cases in study area.

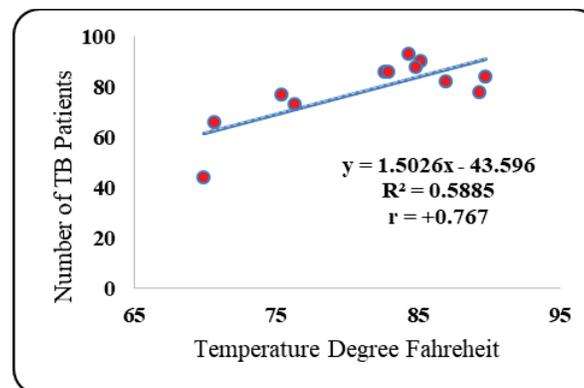


Figure 4 Correlations between Temperature and TB Cases from 2010 to 2019

Source: TB campaign, Magway Regional Hospital

Age Groups of TB Disease

Table (1 and 2) and Figure (5 and 6) show the TB patients according to age groups and gender composition is shown as population pyramid. According to this data, TB case is most common in vulnerable age groups such as children and old ages

especially those between 6 months to 9 years and 60 over, when resistant power decreases and environment pollution such as dusty area, impure air and smoking environment occurs. More dense population, urban growth as well as the congestion of transportation systems and crowded housing patterns lead to resurgence of the outbreak of TB disease. The TB infected patients are distributed from one place to another within the study area. And then, in the years 2010 and 2019, the numbers of TB patients steadily increase in this study area. According to table (1 and 2), the outbreak of TB cases, male population was more than female population. This is because; most of the male are engaged in any place where job opportunities are available. Within the study area, most of the children are easily infected by TB disease. The result of this research as to this table and figure show that in Magway Township the incidence of TB cases is found high in the 60 over age group and second mostly in the 0 to 9 age groups.

Prevention Methods

- Promptly identify, diagnose and treat potentially infectious patients.
- Establish cases finding and treatment facilities for infectious cases to reduce transmission.
- Laboratory and X-ray facilities for prompt examination of patients.
- Educate mode of spread, methods of control and the importance of early diagnosis.
- TB prevention and control programmes all institutional setting.
- Provide public health nursing and outreach services for direct supervision of patient therapy, and arrange for the examination and preventive treatment of contacts.
- BCG only for children.
- Among dairy cattle by tuberculin testing and slaughter or reactors; pasteurize or boiled milk.
- Measures to prevent silicosis among those working industrial plants and mines.
- Hospitalization may be necessary for patients who are seriously ill.

Table 1 TB Cases in Magway Township (2010)

Age Groups	Male	Female
0-4	11	9
5-9	25	16
10-14	5	5
15-19	11	6
20-24	17	15
25-29	20	9
30-34	21	14
35-39	34	15
40-44	22	19
45-49	31	13
50-54	32	21
55-59	26	18
60+	49	41

Table 2 TB Cases in Magway Township (2019)

Age Groups	Male	Female
0-4	66	55
5-9	29	20
10-14	14	5
15-19	12	9
20-24	33	16
25-29	36	32
30-34	52	26
35-39	43	20
40-44	63	23
45-49	52	24
50-54	34	34
55-59	43	34
60+	105	83

Source: TB campaign, Magway Regional Hospital Source: TB campaign, Magway Regional Hospital

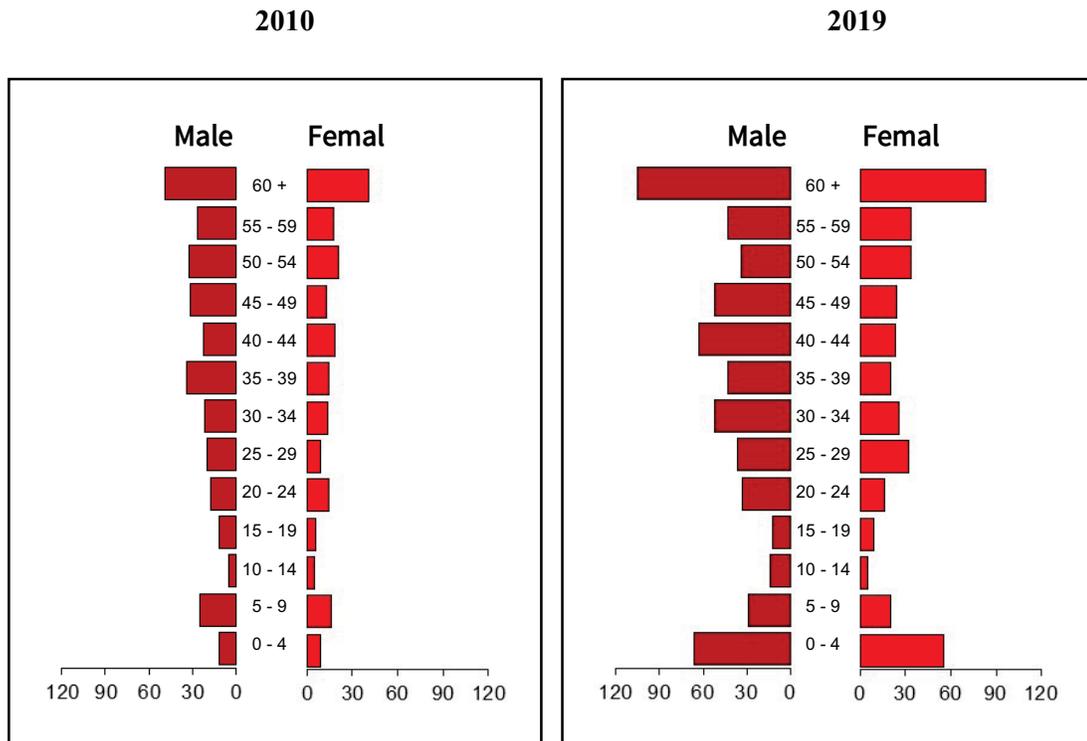


Figure 5 Age Groups of TB Cases in 2010

Source: Based on Table 1

Figure 6 Age Groups of TB Cases in 2019

Source: Based on Table 1

Conclusion

Magway Township also lies in the Central Dry Zone of Myanmar. It primarily receives Tropical Climate of Myanmar. The amount of rainfall is less than other areas. Most of the streams are broad and sandy characters which have only a little water during hot and rainless season. Hence, the outbreak of the majority of Tropical Diseases can occur in the study area. There are many tropical diseases in this area. Especially, Tuberculosis Disease mainly occurs in this region. In the future, TB disease can disappear because medical awareness level is high and treatment programmes are widely distributed in the study area. Regarding TB disease, the patients can rely only on the campaigns or TB center and the necessary medicines and treatments are also available at the campaigns or TB center. Therefore, there is no or very few facility for those patients to take consultation from the private doctor or private clinic. By examining the entire Magway Township, many tropical diseases can disappear because medical awareness level is high and treatment programmes are widely distributed in later year. But, tuberculosis is still resurgent in the study area. Dense population, urban growth as well as the congestion of housing pattern and crowded transportation systems lead to resurgence the outbreak of TB.

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တင်ရွှေ၊ ဆရာဝန် (၁၉၉၃) တီ ဝီရောဂါမိတ်ဆက်၊ တင်ရွှေပုံနှိပ်တိုက်၊ ၃၉ ဦးကြွယ်ဟိုးလမ်း၊ ကြည့်မြင်တိုင်၊ ရန်ကုန်။

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