

# The Effect of Environmental Factors on Leprosy in Children in Urban Areas (Surabaya City)

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**Abstract-** The leprosy of one of the most contagious diseases that causes problems is complex, not only in medical terms but extending to social, economic, cultural, security, and national security issues. Problems faced by the sufferer may be social, homeless, tuna, and environmental disturbance. The purpose of this research is to know the effect of environmental factors on the incidence of leprosy in children in urban areas (Surabaya City). This research is an observational analytic study with case control study design. The population in this study ie all individuals (children) who live in Surabaya East Java. The sample in this study is part of the population because it is part of the subject in the cuplik to be observed and measured by the researchers. The sample is divided into two parts: the sample case and the control sample are 60 samples consisting of 13 cases and 52 controls. Sampling technique by total sampling. The results of this study showed that the temperature (P value = 0.608) and humidity (P value = 0.802) did not affect the leprosy incidence in children in urban area (Surabaya), while the lighting (P value = 0.021) had an effect on the incidence of leprosy in children urban areas (Surabaya City). So it can be concluded that environmental factors affect the incidence of leprosy in children in urban areas (Surabaya City). The need for parents who have children make efforts to prevent leprosy as early as possible.

**Index Terms** - Leprosy, Child, temperature, humidity, lighting.

## 1. INTRODUCTION

Leprosy is a chronic disease with slow progression that first attacks the peripheral nerve structure, subsequently invading the skin, mucosa (mouth), upper respiratory tract, endothelial reticulo system, eyes, muscle, bone and testes caused by *M. leprae* [1]. Leprosy is mainly obtained from tropical and subtropical regions where the air is hot and humid in an unhealthy environment [2].

The leprosy of one of the most contagious diseases that causes problems is complex, not only in medical terms but extending to social, economic, cultural, security, and national security issues. Problems faced by the sufferer may be social, homeless, tuna, and environmental disturbance [3].

In the world the largest number of leprosy patients is in India with 134,759, then Brazil 33,303 new cases, and third place is Indonesia with 18,994 cases, Nigeria 3,805 cases and fifth place Bangladesh with 3,688 cases. Indonesia for the last three years has always ranked third in the world in terms of the number of new leprosy patients [4].

In Indonesia itself based on Indonesia health profile data, data center and information year 2013 East Java ranks first in the number of patients with

new cases. Where the number of PB and MB leprosy patients reached 4,132 cases, then West Java 2,180 cases, third place of Central Java with 1765 cases for the fourth and fifth is Papua with 1,180 cases and 1,172 South Sulawesi cases. Indonesia's health profile data in 2014 reported there were 17,025 new cases of leprosy with 83.5% of cases being MB type [5].

Another indicator used in leprosy is the proportion of MB leprosy and the proportion of leprosy sufferers in children among new patients showing the primary source and rate of transmission in the community. Leprosy can attack all ages not excluded in children, or infants. During the period of 2008-2014 the number of new case findings in 2014 was still high at 11.12 per 100,000 population. The proportion of MB leprosy in the period 2008-2014 is relatively static ie 80% - 83% [6].

The proportion of child leprosy found in the province of East Java has decreased in 2011 and 2013. But the proportion of child leprosy in East Java province is still above the national target of 5%. Based on the data in the last year the proportion of leprosy children 9% is still far from the indicator of national achievement can be concluded that child leprosy is one of the problems in East Java province. The proportion of child leprosy (0-14 years) found in the

city of Surabaya in the period 2013 to 2016 has decreased, but increased by 1.12% in 2016 and still far from the national target of 5% [7]. Based on the description of the problems above, it is determined that the problem of research will be analyzed in depth is the influence of environmental factors on the incidence of leprosy in children in urban areas (Surabaya City).

## 2. METHODS

This research is an observational analytic study with case control study design. The population in this study is all individuals (children) who live in Surabaya East Java. The sample is divided into two parts, namely case samples and control samples. Case samples are individuals (children) who tested positive for leprosy by examination and diagnosis of local health center, and located in high and settled in Surabaya in 2016. The control sample is individual (children) who stated negative leprosy as well as residing and settled in Surabaya City and have the same possibility of exposure with case group. The sample size was 60 samples consisting of 13 cases and 52 controls. Sampling technique by total sampling.

## 3. RESULT

Based on the results of interviews on parents who have children as many as 60 people where case samples as many as 13 cases and 52 controls. The results of this study can be seen in Table 1 below:

Table 1. The Result of Simple Logistic Regression.

Variables	<i>p</i> value	OR (CI 95%)
Temperature	0.608	1.406 (0.382-5.178)
Humidity	0.802	0.856 (0.252-2.902)
Lighting	0.021	12.000 (1.453-99.096)

$p < 0,05$  (Significant)\*

Table 1 shows that environmental factors (P value = 0.608) and humidity (P value = 0.802) have no effect on leprosy occurrence in children in urban area (Surabaya city). While lighting (P value = 0.021) have an effect on the occurrence of leprosy in children in urban area (Surabaya City).

## 4. DISCUSSION

Temperatures in the house from the results of this study showed that in the area of Surabaya City either the home of leprosy patients or the temperature in the house of children who are not suffering from

leprosy or control are largely unqualified. The result of the analysis shows that the temperature in the house there is no significant influence to the incidence of child leprosy in urban Surabaya city. Syamsir (2012) states that people who live with leprosy patients with unqualified home temperatures, the chances for contracting very large. It should be supported by the frequency or intensity of prolonged and continuous contact with leprosy patients [7].

The circumstances of the leprosy house in urban areas of Surabaya City show the humidity condition of the house that has great potential for the development and transmission of bacteria leprosy *Mycobacterium Leprae*. However statistically humidity in this study did not have a significant effect on the incidence of leprosy in children in urban areas.

This is because the transmission of leprosy not only see the humidity of the room, humidity is only a potential means for leprosy development. According to Chin (2000) Transmission of leprosy in the home and close contact in the long span of time has a very big role [8].

Indoor lighting is needed either by light or artificial light. Lighting requirements as recommended (Kemenkes, 2005) is 60 Lux if measured with Lux Meter is not dazzling nor dark. Indoor lights other than useful for illuminating the room are also useful for membunuh bacteria, pathogens, and expel bacteria carriers such as mice and insects that became one of the chain of transmission of disease [9].

The results of this study indicate that lighting has a significant effect on the incidence of leprosy in children in urban areas, with residential conditions and density of urban dwelling greatly affect the lighting. This situation is in line with research that has been done by Patmawati (2014) which menyatakan that there is a significant relationship with  $p = 0,005$  between lighting with the incidence of leprosy. Lighting affects the state of room temperature and humidity. Sufficient light for the room can help to neutralize the room from the growing bacteria in the room. The description in the field found that the existence of windows and ventilation at home is very less [10].

## 5. CONCLUSION

Conclusion in this research that environmental factor that is temperature and humidity do not have an effect on leprosy incidence in child in urban area (Surabaya city). While the lighting affects the incidence of leprosy in children in urban areas (Surabaya City).

## 6. SUGGESTIONS

It is expected that the community will make some efforts to prevent leprosy by maintaining the environmental condition.

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