

Epidemiological overview of new cases of leprosy in West Java In 2021-2023, Indonesia

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Abstract

One of the infectious tropical diseases still found in Indonesia is Leprosy. Based on WHO data from 2019, Indonesia is in the top three countries with the most significant contributors to leprosy cases after India and Brazil. Moreover, in 2022, West Java Province was ranked second with the highest number of new leprosy cases in Indonesia. This quantitative descriptive study aims to provide an epidemiological overview of new cases of leprosy in West Java Province in 2021-2023 based on people, place, and time. The data used in this study is secondary data sourced from the West Java Provincial Health Profile in 2021-2023. The results of this study indicate that new cases of leprosy in West Java Province are mostly adults aged ≥ 15 years, are male, have multibacillary (MB) type, and have grade 0 disability. The areas with the highest increase in cases are Bogor Regency, Bekasi City, Bekasi Regency, Karawang Regency, Subang Regency, Indramayu Regency, and Cirebon Regency. The trend of new cases of leprosy in 2021-2023 in West Java Province tends to increase yearly.

Keywords: Epidemiology; Leprosy; People; Place; Time

1. Introduction

Infectious diseases are still a health problem in tropical countries. One of the infectious tropical diseases still found in Indonesia is leprosy. According to WHO, leprosy is included in the Neglected Tropical Diseases (NTDs), which are still found in more than 120 countries, with the number of new cases each year reaching more than 200,000.

Leprosy is a chronic infectious disease caused by the bacteria *Mycobacterium leprae* or *Mycobacterium lepromatosis* [1]. Transmission of leprosy through contact between leprosy sufferers and healthy individuals. Individuals with close contact with leprosy patients for a long time can contract leprosy through infectious aerosols (droplets) released when coughing or sneezing [2]. In addition, the possibility of leprosy transmission can also be anthroponotic and zoonotic because the strain of *Mycobacterium leprae* is identical to that of humans and armadillos.

It is not uncommon for the discovery of new cases of leprosy to be accompanied by disabilities. The presence of disability in new cases of leprosy is an indicator of late detection. Early detection of leprosy is crucial because it can reduce the transmission of *Mycobacterium leprae*, decrease new cases of leprosy each year, and prevent disabilities [3]. Most leprosy attacks the skin and peripheral nerves, which can cause neuropathy and long-term effects such as deformities and disabilities [4]. The diagnosis of leprosy is confirmed if at least one of the primary signs of leprosy is present. These signs include the following: loss of sensation in pale skin patches (hypopigmentation) or redness, thickened or enlarged peripheral nerves accompanied by loss of sensation or weakness of the muscles that are innervated by these nerves, and the presence of acid-fast bacilli in skin smears. In the first years of an individual's initial contact with the bacteria that cause leprosy, this disease is often not visible. This disease has complex symptoms characterized by skin,

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polymorphic, and peripheral neuropathy. Leprosy presents with varying clinical symptoms based on the individual's immune response to the infection [5]. The main body parts involved when infected with leprosy are the skin, peripheral nervous system, and reticuloendothelial. In addition, body parts that can be affected if an individual suffers from leprosy include the upper respiratory tract, bones and joints, eyes, testicles, and adrenal glands.

WHO classifies leprosy into two types, namely Paucibacillary (PB) and Multibacillary (MB) based on the number of skin lesions, nerve involvement, and identification of bacilli in the skin gap. Paucibacillary leprosy is characterized by 1 to 5 skin lesions, with no bacilli found in the skin smear. Meanwhile, Multibacillary is a type of leprosy where an individual has more than 5 skin lesions and nerve involvement, or bacilli are found in the skin gap smear regardless of the number of skin lesions.

Based on WHO data in 2019, the discovery of new cases of leprosy reached 202,256 cases that had been detected in 118 countries, and Indonesia was one of the top three countries with the most significant contributor of cases, along with India and Brazil [6]. Based on the 2022 Indonesian Health Profile, the prevalence rate of leprosy is 0.54 cases per 10,000 population, while the number of new cases found is 4.6 cases per 100,000 population. Based on PERMENKES Number 11 of 2019 concerning Leprosy Control, 2024 is the target for leprosy elimination at the district/city grade. The indicator for achieving the leprosy elimination target in a region is a prevalence rate of <1 per 10,000 population. In 2022, West Java Province was ranked second with the highest number of new leprosy cases found after East Java Province, with a new case-finding rate reaching 3.4 cases per 100,000 population. Therefore, this study aims to describe the epidemiology of new cases of leprosy in West Java Province in 2021-2023 based on people, place, and time.

2. Material and methods

This study uses a descriptive method with a quantitative approach to provide an epidemiological overview of new cases of leprosy in West Java Province in 2021-2023. It uses secondary data sourced from the West Java Provincial Health Profile in 2021-2023. The population in this study was 26 regencies/cities in West Java Province. The presentation of data in graphs was processed using Microsoft Excel software, and the presentation of data in the form of maps was processed using Health Mapper software version 4.3.0.0.

3. Results

3.1. Epidemiology of New Leprosy Cases Based on Person Variables

3.1.1. Distribution of New Leprosy Cases by Age Group

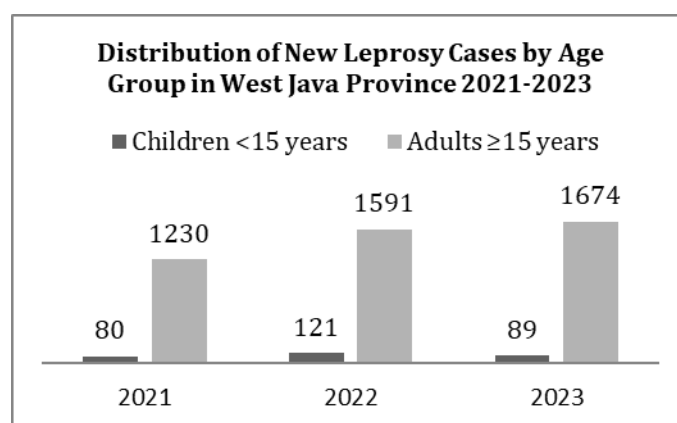


Figure 1 Distribution of New Leprosy Cases by Age Group in West Java Province in 2021-2023

The figure above shows that new cases of leprosy occur every year in the adult age group ≥ 15 years. In 2021, there were 1,230 new cases of leprosy in the adult age group (93.9%) and 80 cases in the child age group (6.1%). In 2022, there were 1,591 new cases of leprosy in the adult age group (92.9%) and 121 cases in the child age group (7.1%). In 2023, there were 1,674 new cases of leprosy in the adult age group (95%) and 89 cases in the child age group (5%).

3.1.2. *Distribution of New Leprosy Cases by Gender*

Based on the figure above shows that every year, new cases of leprosy are mostly male. In 2021, there were 877 new cases of leprosy in men (66.9%) and 433 cases in women (33.1%). In 2022, there were 1,134 new cases of leprosy in men (66.2%) and 578 cases in women (33.8%). Moreover, in 2023, there were 1,130 new cases of leprosy in men (64.1%) and 633 cases in women (35.9%).

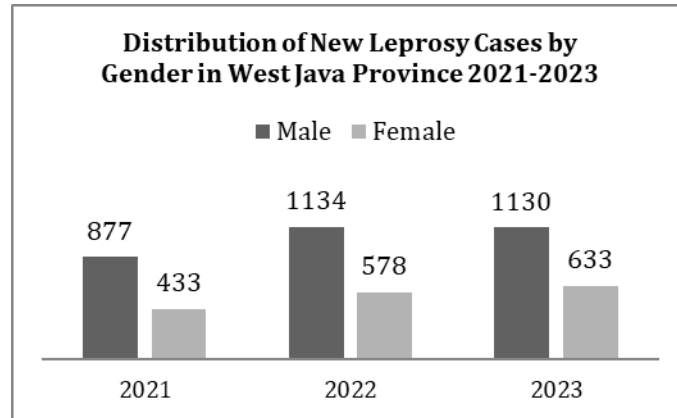


Figure 2 Distribution of New Leprosy Cases by Gender in West Java Province in 2021-2023

3.1.3. *Distribution of New Leprosy Cases According to Leprosy Type*

The figure above shows that new cases of leprosy are mostly multibacillary (MB) every year. In 2021, there were 1,220 new cases of multibacillary (MB) leprosy (93.1%) and 91 cases of paucibacillary (PB) leprosy (6.9%). In 2022, there were 1,581 new cases of multibacillary (MB) leprosy (92.3%) and 131 cases of paucibacillary (PB) leprosy (7.7%). In 2023, there were 1,651 new cases of multibacillary (MB) leprosy (93.6%) and 112 cases of paucibacillary (PB) leprosy (6.4%).

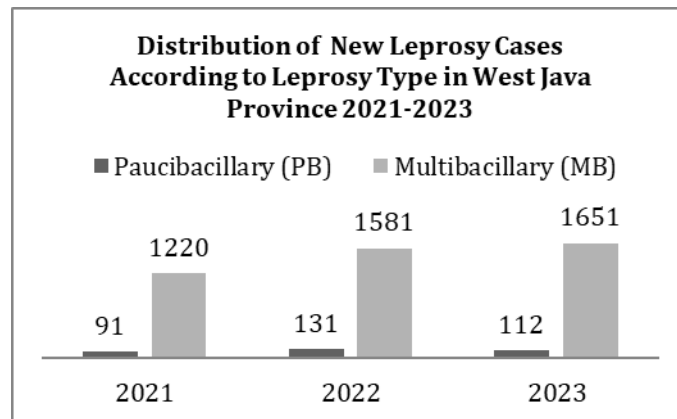


Figure 3 Distribution of New Leprosy Cases According to Leprosy Type in West Java Province in 2021-2023

3.1.4. *Distribution of New Leprosy Cases According to Disability Grade*

Based on the figure above shows that every year, most new cases of leprosy have grade 0 disability. In 2021, there were 1,073 new cases of leprosy with grade 0 disability (81.9%), 132 cases with grade 1 (10.1%), and 105 cases with grade 2 (8%). In 2022, there were 1,262 new cases of leprosy with grade 0 disability (73.7%), 298 cases with grade 1 (17.4%), and 152 cases with grade 2 (8.9%). In 2023, new cases of leprosy with grade 0 disability were 1,371 cases (77.8%), grade 1 was 247 cases (14%), and grade 2 was 145 cases (8.2%).

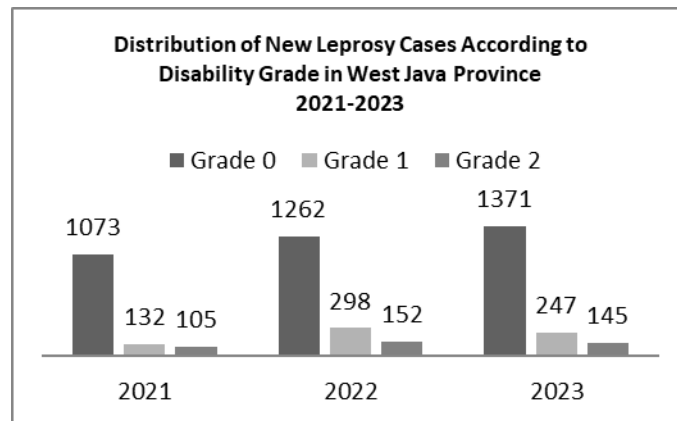


Figure 4 Distribution of New Leprosy Cases According to Disability Grade in West Java Province in 2021-2023

3.2. Epidemiology of New Leprosy Cases Based on Place Variables

3.2.1. Distribution of New Leprosy Cases in West Java Province by regency/City in 2021

The map above shows the most significant increase in new leprosy cases in 2021 in West Java Province in six regions. These regions are Bogor Regency, Bekasi Regency, Karawang Regency, Subang Regency, Indramayu Regency, and Cirebon Regency, all marked by the red area with an addition of 100 cases or more. There has been an increase of 50 to 99 new leprosy cases, marked by the orange area, in Bekasi City only. Moreover, areas with additional new cases of leprosy <50 cases marked with yellow areas as many as 19 areas including Depok City, Bogor City, Cirebon City, Sukabumi Regency, Sukabumi City, Cianjur Regency, Purwakarta Regency, Bandung Regency, Bandung City, West Bandung Regency, Cimahi City, Garut Regency, Sumedang Regency, Majalengka Regency, Tasikmalaya Regency, Tasikmalaya City, Kuningan Regency, Banjar City, and Ciamis Regency.



Figure 5 Distribution of New Leprosy Cases in West Java by Regency/City in 2021

3.2.2. Distribution of New Leprosy Cases in West Java Province by regency/City in 2022

The map above shows the most significant increase in new leprosy cases in 2022 in West Java Province in seven regions. These regions are Bogor Regency, Bekasi City, Bekasi Regency, Karawang Regency, Subang Regency, Indramayu Regency, and Cirebon Regency, all marked by the red area with an addition of 100 cases or more. Moreover, areas with additional new cases of leprosy <50 cases marked with yellow areas as many as 19 areas, including Depok City, Bogor City, Cirebon City, Sukabumi Regency, Sukabumi City, Cianjur Regency, Purwakarta Regency, Bandung Regency, Bandung City, West Bandung Regency, Cimahi City, Garut Regency, Sumedang Regency, Majalengka Regency, Tasikmalaya Regency, Tasikmalaya City, Kuningan Regency, Banjar City, and Ciamis Regency.



Figure 6 Distribution of New Leprosy Cases in West Java by Regency/City in 2022

3.2.3. Distribution of New Leprosy Cases in West Java Province by regency/City in 2023

Based on the map image above it shows that the most significant addition of new leprosy cases in 2023 in West Java Province marked with red areas with additional cases ≥ 100 cases are in 7 areas, namely Bogor Regency, Bekasi City, Bekasi Regency, Karawang Regency, Subang Regency, Indramayu Regency, and Cirebon Regency. The addition of new cases of leprosy, as many as 50 to 99 cases marked with orange areas, is only found in 2 areas, namely Majalengka Regency and Kuningan Regency. Moreover, areas with the addition of new cases of leprosy < 50 cases marked with yellow areas as many as 17 areas including Depok City, Bogor City, Cirebon City, Sukabumi Regency, Sukabumi City, Cianjur Regency, Purwakarta Regency, Bandung Regency, Bandung City, West Bandung Regency, Cimahi City, Garut Regency, Sumedang Regency, Tasikmalaya Regency, Tasikmalaya City, Banjar City, and Ciamis Regency.



Figure 7 Distribution of New Leprosy Cases in West Java by Regency/City in 2023

3.3. Epidemiology of New Leprosy Cases Based on Time Variables

The figure above shows that the trend of new leprosy cases in West Java Province from 2021 to 2023 tends to increase. The number of new leprosy cases in 2021 was 1,310 cases; in 2022, it was 1,712 cases; and in 2023, the addition of new leprosy cases was 1,763 cases.

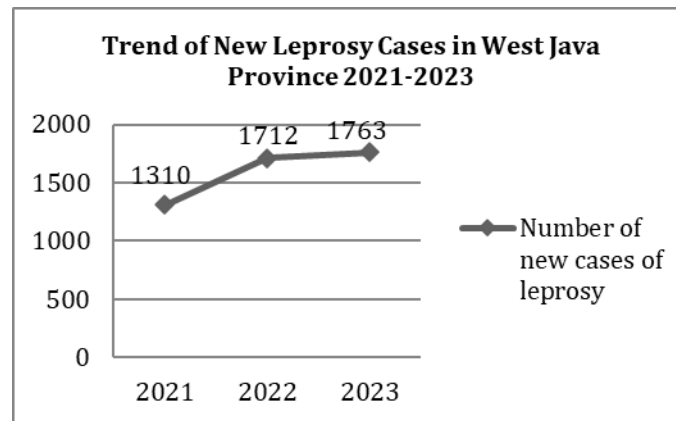


Figure 8 Distribution of New Leprosy Cases in West Java in 2021-2023

4. Discussion

4.1. Epidemiology of New Leprosy Cases Based on Person Variables

The study results show that new cases of leprosy in West Java Province in 2021-2023 were mostly in the adult age group ≥ 15 years. However, cases of leprosy in the age group of children < 15 years are still quite common. Leprosy can occur in all age groups, but it is most common in the age group of 20-30 years [7]. However, epidemiologically, the increase in leprosy cases in children indicates that there is an active spread of leprosy in the community. This is in line with research indicating that leprosy is most prevalent in the adult age group. However, leprosy, which often infects children, indicates active circulation of leprosy bacteria [8]. The occurrence of ongoing transmission in children is one form of failure of the health system in controlling leprosy. In countries with endemic leprosy, the detection rate of leprosy cases in children < 15 years can be used to monitor the endemic even though the prevalence and incidence of leprosy are decreasing.

The study results indicate that most new leprosy cases in West Java Province from 2021 to 2023 were male. This is according to Alrehaili's research [7], which indicates that the ratio of female to male leprosy sufferers is 1:2. This could be due to the possibility of limited mobility and reduced possibility of contact with leprosy sufferers. Other studies also state that male leprosy patients are more numerous than female patients [9]. This is likely because males pay less attention to their health than females, especially skin health, and female clothing tends to be more closed than males' so that it can prevent exposure to infection. In addition, males do more activities outside the home, making them more susceptible to infectious diseases.

The study revealed that most new leprosy cases in the West Java Province between 2021 and 2023 were classified as multibacillary (MB). Based on research conducted by Rosita et al. [6], it was stated that leprosy cases in Indonesia are generally MB-type. This is also in line with research showing that multibacillary leprosy is more common in Asia, and paucibacillary leprosy is more common in Africa [10].

The study's results show that new cases of leprosy in West Java Province in 2021-2023 mostly had level 0 disabilities. However, there are still quite a lot of new cases of leprosy with level 1 and level 2 disabilities. The proportion of level 2 disabilities is one of the indicators used to indicate the success of detecting new cases of leprosy. The discovery of new cases of leprosy with type 2 disabilities indicates that there is a delay in the discovery of new cases of leprosy.

4.2. Epidemiology of New Leprosy Cases Based on Place Variables

Based on the research results, it shows that the findings of new cases of leprosy in West Java Province in 2021-2023 were mainly in Bogor Regency, Bekasi City, Bekasi Regency, Karawang Regency, Subang Regency, Indramayu Regency, and Cirebon Regency. Of the seven regions, all regions are close to each other. Although West Java Province has achieved leprosy elimination, several districts/cities still need to be able to eliminate leprosy. On World Leprosy Day 2024, the Head of the West Java Provincial Health Office stated that three regions in West Java Province had not eliminated leprosy, namely Indramayu, Bekasi, and Karawang Regencies.

4.3. Epidemiology of New Leprosy Cases Based on Time Variables

The study results showed that the trend of new cases of leprosy in West Java Province in 2021-2023 tended to increase. The number of new cases of leprosy found in 2021-2023 was 2.62 per 100,000 population, 3.43 per 100,000 population, and 3.55 per 100,000 population, respectively. New cases increased from 2021 to 2023, and the prevalence of leprosy in West Java continued to increase. Even so, in the last ten years, the prevalence of leprosy in West Java Province was still <1 per 10,000 population and had achieved leprosy elimination status.

5. Conclusion

Based on this study, it can be concluded that new cases of leprosy in West Java Province in 2021-2023 occurred more in adults aged ≥ 15 years and mainly occurred in males, dominated by the multibacillary (MB) type, and most new cases had grade 0 disability. The number of new leprosy cases in the West Java Province has increased from 2021-2023, with several areas reporting more than 100 new cases yearly. This study can be used as evaluation material for leprosy control for policymakers and for people living in areas with high additions of new leprosy cases, which can increase awareness of leprosy prevention..

Compliance with ethical standards

Disclosure of Conflict of interest

No conflict of interest to be disclosed.

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