



## **Leprosy in India- Past, Present and Future Trends.**

<sup>1</sup>Sayan Konar, <sup>2</sup>Muskaan Yadav

<sup>1,2</sup>Anhui Medical University, Hefei, China  
19, RPM Road, Parivaar-6, Uttarpara, Hooghly, West Bengal, India.

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### **Abstract**

Leprosy is one of the oldest diseases known to mankind, it continued to be an incurable dreaded disease for centuries. But the situation has altered significantly in the last few decades with the introduction of multidrug therapy in 1982. The prevalence rate has gone down from more than 5 million cases in the 1980s to around 1,27,558 cases in the year 2020. In India the National Leprosy Eradication Programme (NLEP) witnessed significant milestones being achieved, with India declaring by the end of 2005 that it had achieved the World Health Organization's (WHO) target of eradication as a public health problem. In spite of the milestones achieved India still continues to account for more than 60% of the global leprosy cases annually, much work still needs to be done to completely eradicate the disease from community. In this article we give an overview of the present situation of Leprosy in India and the measures being taken by the competent authorities to improve the situation. This article also highlights the various areas of concern hampering the efforts against the spread of Leprosy and how to correct them.

**Keywords:** Leprosy, multi-drug therapy, National Leprosy Eradication Programme, areas of concern, World Health Organization.

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### **Introduction**

Leprosy (also known as Hansen's disease) is a chronic infection caused by slow growing bacteria *Mycobacterium leprae*. It is considered to be among the oldest infectious diseases known to humankind. The evolution of *M. leprae* is closely related to that of humans; in fact, it has been estimated that the ancestors of *M. leprae* and *M. tuberculosis* split 36 million years ago. It was given the name "Hansen's disease" because the bacterium was found in 1874 by Dr. Gerhard Armauer Hansen, a Norwegian physician who was looking for the unknown bacteria in the skin nodules of lepers.

It primarily affects the peripheral nerves. It also has an impact on the internal organs, muscles, bones, eyes and testicles. The onset of symptoms may take up to 20 years. Approximately 2 million individuals all over the world are said to be permanently crippled due to Leprosy. Leprosy's exact mode of transmission has not been determined. It is likely that the transmission occurs via droplets from the mouth and nose when people come into close and repeated contact with untreated instances of the disease. Clinically, leprosy is distinguished by one or more of the following cardinal characteristics- patches of hypopigmentation, a partial or complete loss of cutaneous sensibility in the affected locations, swollen nerves and the presence of acid-fast bacteria in skin or nasal smears. The presence of nodules or lumps, particularly in the skin of the face and ears, plantar ulcers, the loss of fingers or toes, nasal depression, footdrop, claw toes, and other abnormalities are stark indications of advanced stage of the disease. Multidrug therapy is effective in curing the illness. The medications rifampicin, dapsone and clofazimine make up the current MDT regiment. For pauci-bacillary instances, this treatment lasts six months, and for multi-bacillary cases, it lasts 12 months. MDT eliminates the infection while healing the patient.

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### **Discovery and origin of Leprosy**

Leprosy cases were first documented 3000 years ago wherein it was perceived as a divine curse, sin-related retribution, or an inherited illness. The superstitions and misleading informations regarding Leprosy were debunked over a century ago in 1873 after the discovery leprosy bacillus by Norwegian physician Gerard Hansen. The illness is currently named after him as an homage to this brilliant researcher. The disease originated in Asia or Africa from where it spread to Europe, South America and the Middle East.

The American Public Health Service established a leprosy research and treatment facility in Carville, Louisiana, in 1921. It was a top leprosy research facility as well as a housing facility for leprosy patients, who were frequently rejected elsewhere. It was here in Carville that the effectiveness of sulfones in treating Leprosy was discovered. Sulfones had the significant problem that leprosy treatment required a series of multiple uncomfortable injections. Later oral sulfones were found to be equally effective, however drug resistance rapidly developed, making the medication worthless when taken alone. The World Health Organization then issued guidance for multi-drug therapy (MDT) in 1981 as a consequence of more, in-depth study that came after this. Around 1970, the island of Malta hosted the first trials, which have subsequently been used across much of the world. Depending on the kind and intensity of the clinical manifestation, the course of treatment may span 6 to 24 months. In order to give leprosy patients who have lost limbs or portions of their faces cosmetic and functional normalcy, significant progress has been made in rehabilitation and plastic surgery recently. The best option for

curing leprosy, preventing long-term nerve damage, the ensuing deformity and disability, and breaking the chain of transmission is still early diagnosis and treatment with the MDT.

The development of bacillus vaccines is ongoing. The development of methods to identify people and groups at high risk of catching the illness via contacts is another active effort that is being made.

### The present scenario

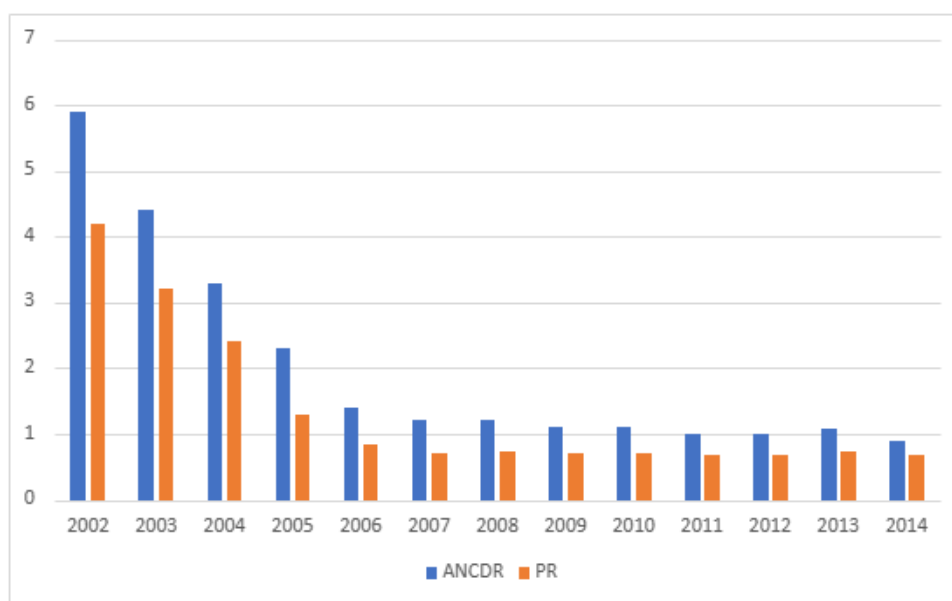
Annually, more than 200,000 new leprosy cases are found throughout the world. This number has remained largely constant over the last 8 years, but transmission is still occurring. More than 1000 new 11 cases were reported in 14 countries in 2013, with India, Brazil, and Indonesia accounting for more than 80% of all cases worldwide. Leprosy is increasingly becoming isolated to a small number of nations. Leprosy is observed to be spatially unequally distributed both between and within nations.

The goal set by WHO member states in 1991 was to reduce leprosy rates globally by more than 90%. The goal of eliminating leprosy as a public health issue globally has now been reached as a result of this accomplishment. The decrease in prevalence rate is mostly attributable to better case management, extremely low recurrence rates, high cure rates, the absence of drug resistance, and a shorter MDT treatment period.

Upwards of 16 million leprosy affected individuals have been healed in the previous 20 years. From 21.1 instances per 10,000 people in 1985 to 0.25 cases per 10,000 people in 2017, the disease's prevalence rate has decreased. Leprosy cases worldwide have substantially decreased, from 5.2 million in 1985 to 192,713 at the end of 2017. At the end of 2017, the new case detection rate was 2.77 per 100,000 people. The global detection rate of new cases is slowly declining, according to a ten-year pattern. 22 countries are currently given top attention on the global scale.

In 2017, 2,10,671 new leprosy cases were found. Just like in past years, SEAR accounted for 73% of the worldwide leprosy burden, with India and Indonesia contributing 67% and 92.6 percent, respectively, of the new cases worldwide. The percentage of multibacillary leprosy cases among newly discovered cases in 2016 was almost 73.86 percent. In 2016 there were 39.9% more female instances among newly discovered cases (84,202 cases). There were 8.48 percent of children under 15 in the population (18,230 cases). 12,819 new cases of grade 2 impairments were reported (5.96 per cent). There were 281 new cases of children with grade 2 disabilities. There were 2,749 relapse instances in 2016. 11,947 cases of retreatment were involved. In paucibacillary patients, the cure rate for the 2015 cohort was 90.4%, while for multibacillary cases, it was 85.9%.

India has a significant leprosy problem. Despite being widespread across the nation, the disease has an inconsistent distribution. Leprosy prevalence in India dramatically decreased after the implementation of MDT, falling from 57.6 cases per 10000 people to less than one per 10000 people nationwide in December 2005. As a result, the nation was able to eradicate leprosy nationwide. The Government of India launched the National Leprosy Control Programme (NLCP) way back in the year 1954-55. It was from 1982 that Multi Drug Therapy (MDT) came into widespread usage and in 1983 the National Leprosy Eradication Program was launched. By lowering the population's general infection rate and the number of infectious sources, the NLEP's method aimed to break the cycle of disease transmission. The programme was launched with help from the World Bank in endemic districts before being made available to other districts statewide in 1993–1994. The four Research & Training Institutes that were established immediately under DGHS are in Chengalpattu, Gauripur, Raipur and Aska. Additionally, the ICMR created a training centre in Agra. In terms of lowering the prevalence of disease in the nation, tremendous progress has been made. In December 2005, India accomplished the National Health Policy's 2002 aim of eliminating leprosy as a public health issue, which is defined as having fewer than 1 case per 10,000 people.



India's annual new case detection rate per 10,000 people and leprosy prevalence trends.

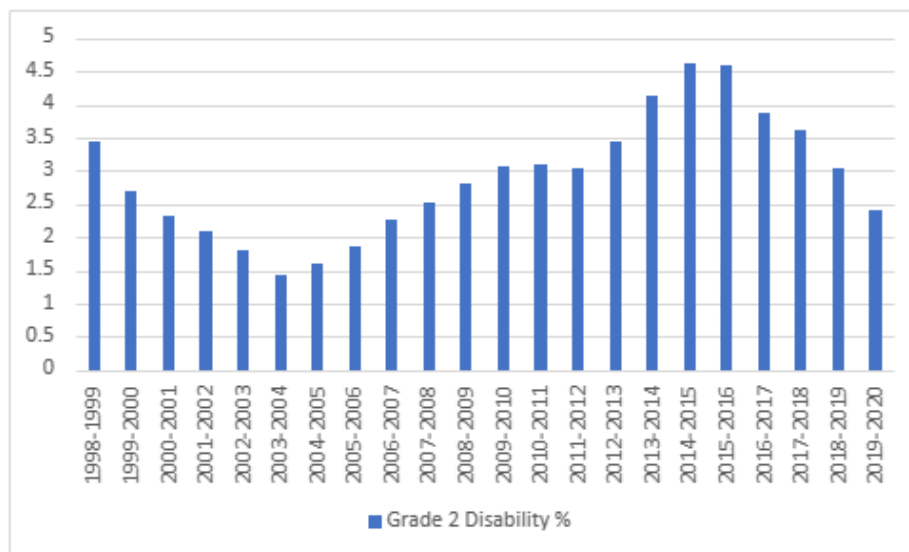
Despite being deemed "leprosy-free" in 2005, India continues to produce more than half (nearly 60%) of all new leprosy cases worldwide. According to data from the National Leprosy Eradication Programme (NLEP), Maharashtra, Bihar, Odisha, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, West Bengal, and Jharkhand were responsible for 76% of new leprosy cases. The World Health Organization (WHO) reports that 114,451 new leprosy cases were found in the nation in 2019–20, making up 80% of the cases in southeast Asian nations. According to the National Leprosy Eradication Programme (NLEP), based on reports from all the states and UTs for 2020–21, a total of 65,147 new leprosy cases were found, bringing the annual new case detection rate down to 4.56 per 100,000 people from 1,14,451 instances in 2019–20. As of April 1, 2021, there were 57,672 leprosy cases reported overall, according to the same data. 3,753 child cases in total were reported, bringing the child case rate to 5.76%.

### Present and future trends and strategy

Leprosy still persists in the high-endemic zones, which account for the majority of cases in a country, even if it appears that national-level elimination has been achieved.

The WHO has implemented The Global Leprosy Strategy 2021-2030 which provides guidance to countries to accelerate their efforts towards achieving a zero-leprosy goal. The long-term implications of the movement involve zero instances of infection, zero disability, absolutely no stigma and discrimination in society. The primary objectives to be achieved include 120 nations with zero new cases of native disease, 70% decrease in the number of new cases discovered each year, 90% decrease in the rate of new cases of grade-2 disability per million people, 90% decrease in the number of new leprosy cases per million youngsters.

In India the NLEP is working actively to attain their vision of a "Leprosy-free India". In its most recent assessment, the NLEP has highlighted new concerning trends. One is that the country still contains areas with a high endemicity and continuous transmission. Two, the sample survey undertaken by the Indian Council for Medical Research found that there are several unreported cases in the community (ICMR). Three, the pace of finding new instances has essentially not changed since 2005, and four, the rate of disability in new cases has been increasing because of a delay in diagnosis. To overcome these difficulties The NLEP promoted the following strategies- (a) targeted leprosy awareness campaigns using ASHA and multipurpose health workers in "Hot Spots," where new cases with Grade 2 Disability (G2D) are discovered; (b) leprosy case detection campaigns (LCDC)" in highly endemic districts; and (c) region-specific plans for case detection in difficult-to-reach areas.



NLEP data highlighting the Grade 2 disability percentage in India over the years

It is considered that poor proactive reporting in the community is caused by ignorance as well as the ongoing fear, shame, and discrimination towards leprosy are the main causes of hidden cases. The SPARSH Leprosy Awareness Campaign (SLAC), a programme designed to raise awareness and combat issues of stigma and discrimination, was introduced on January 30, 2017. [7] More concealed cases will self-report for treatment and diagnosis according to the current strategy, which hopes to raise awareness and reduce stigma. To prevent further transmission and achieve zero disease status, new preventative techniques including chemoprophylaxis and immunoprophylaxis are being examined in addition to the continued administration of MDT to patients.

Various organisations and stakeholders in the fight against leprosy started the Leprosy Post Exposure Prophylaxis (LPEP) programme in 2014. Contact tracing, contact screening, and single-dose rifampicin (SDR) injection make up the program's three main elements. Health services actively screen and inspect the patient's family members and neighbours after a new patient has been diagnosed. Asymptomatic "contact persons" are administered a post-exposure prophylactic (single-dose rifampicin) to lower their chance of contracting leprosy by 50–60%, while symptomatic individuals are swiftly referred for MDT. Rather than working vertically, it is intended to support and be integrated with the NLEP. In the union territory of Dadra and Nagar Haveli in India, a study is now being conducted to determine whether administering a single dose of the chemotherapy drug rifampicin would be feasible and

acceptable. In districts where LCDC is still being conducted, NLEP is also recommending the start of chemoprophylaxis with rifampicin. The NLEP has introduced "Nikusht," a web-based reporting system, in India for the convenience of reporting and management of data of registered leprosy patients. Nikusht will also be useful in monitoring all the activities carried out in accordance with the NLEP. For leprosy workers, NLEP also intends to create online training software. States and districts carry out routine IEC activities all year long, but on January 30, 2017, Anti-Leprosy Day, a special annual mass awareness campaign called Sparsh Leprosy Awareness Campaigns (SLAC) was launched with the goal of reducing stigma and discrimination towards leprosy patients. Since that time, national Gram Sabhas have been organised in villages all over the nation in collaboration and coordination with related departments of health. All members of Village council take a commitment to lessen the burden of disease in the community, and appropriate statements from District Magistrates and requests from village council's heads to eliminate discrimination against those infected with leprosy are read out.

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### Areas of Concern

In spite of all the initiatives taken by NLEP over the years there has not been a reduction in emerging cases of Leprosy in the nation. This is mainly due to a lack of robust and sustained effort to eliminate the disease from the community. The NLEP has restricted itself to merely reaching the targets set by WHO (a prevalence of <1 every 10,000 individuals) which India had achieved way back in 2005 itself. Moreover, the rollout of public health programmes for HIV/AIDS during the same period led to the overshadowing of Leprosy eradication initiatives. The initial success in Leprosy eradication has led to eliminating skin smear services, quickly integrating leprosy services into general medical health care, working to further shorten the length of therapy, and paying less emphasis to research and the funding of the overall leprosy programme. In India's leprosy programme, basic investigations like skin smear services need to be reinstated because this bacteriological test is frequently found to be just as helpful as cutting-edge PCR methods.

For the year 2016, G2D among newly discovered cases, whose decrease is a key sign of the program's effectiveness, was 5,245 (3.8%). The rate of global disability decreased from 4.5% to 3.8% in 2016 compared to 2015. The percentage of G2D amongst newly discovered cases in India, according to the NLEP website were 1.97% for the year 2005-2006, 3.10% for the year 2010-2011 and 4.61% for the year 2014-2015. In the new leprosy cases recorded in the NLEP report for the years 2015-2016, there were 5851 patients with Grade 2 Disability (disability rate of 4.46%), indicating a very slight decline. Leprosy is being discovered later than necessary, and there might be unrecognised instances in the community, according to the persistently high G2D rate amid new patients.

The need for a new drug regimen is also being felt. The same three medications have made up the MDT for leprosy since it was introduced in 1982, but due to drug resistance that is developing, more drugs are needed to treat leprosy. Clinical and laboratory research suggests that secondary drug resistance to dapsone and rifampicin is developing in people who have been treated or who have relapsed.

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### Conclusions

Although significant progress has been made in the control of Leprosy much work still needs to be done. By sustaining the level of leprosy elimination, the NLEP is having a positive effect on the leprosy problem, according to the findings and analyses of the programme indicators. Leprosy prevalence will undoubtedly decrease further with improved surveillance, Information, Education & Communication (IEC) activities, and cases released from treatment. The range of leprosy services has significantly increased as a result of leprosy's integration into general healthcare. Leprosy patients now have access to the services of surgeons, ophthalmologists, physiotherapists, and general physicians thanks to integration, which has eliminated prejudice against the disease.

Leprosy has been eradicated, although there will still be new instances for a few more years. To ensure that the disease doesn't at all resurface in the neighbourhood, constant attention is necessary. Eliminating the final instance is the most crucial stage in the elimination of any communicable disease. The community must actively participate in order to do this, which calls for intensive IEC programmes. Only an informed populace can offer a solution to any public or social health issue. The groundwork has been laid for the ultimate assault after all the spectacular victories in the war against leprosy. It is hoped that the illness will soon be exterminated. India may very easily be leprosy-free if the political will that has supported the NLEP all these years was combined with the health authorities' exceptional capabilities and complete arsenal.

### Acknowledgements

We wish to acknowledge all authors we consulted and cited their works in attaining the objective of this research work.

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