

Epidemiological Trends of Leprosy Cases in Pre- and Post-Elimination Era: A Comprehensive District-Level Data from an In-Situ Leprosy Center

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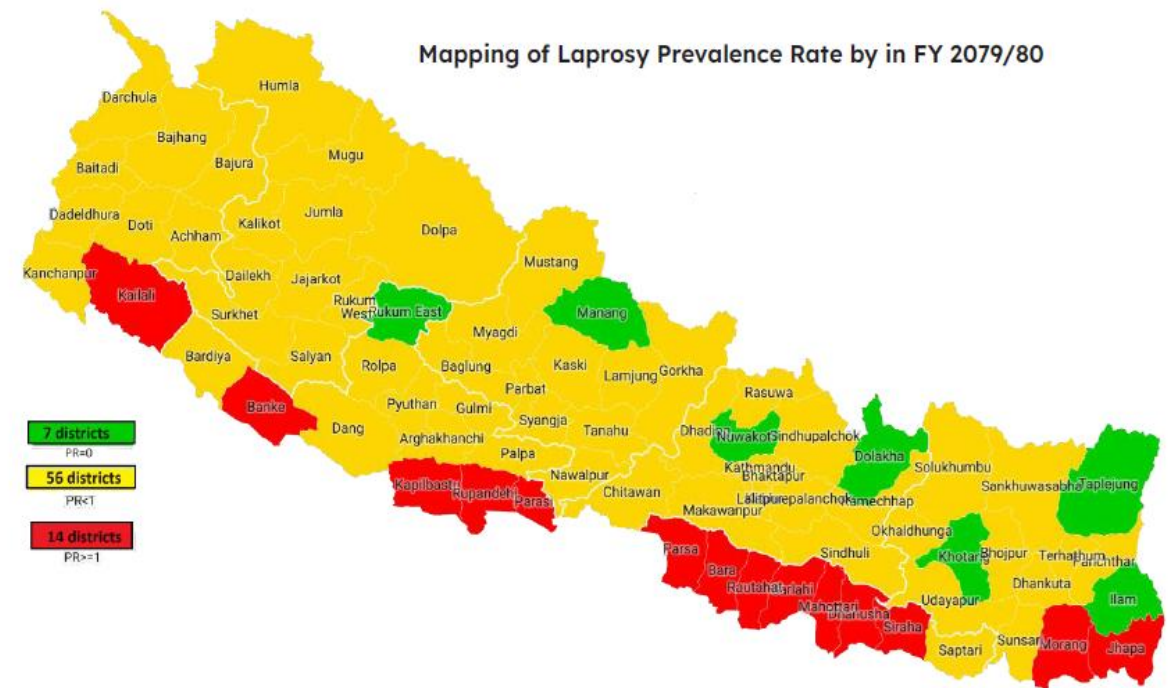
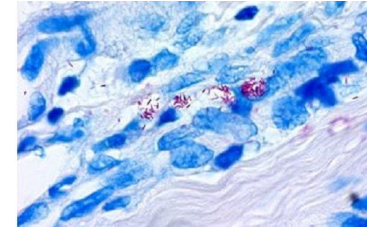


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Background and Objective

- Leprosy is a chronic infectious disease caused by *Mycobacterium leprae* and/or *Mycobacterium lepromatosis* affecting mainly the skin and peripheral nerves and delay diagnosis may lead to disability and deform
- Nepal achieved the elimination target for Leprosy in 2009 and declared elimination in 2010.
- However, few districts (n=14) still have prevalence above 1 per 10,000. (DOHS, 2079/80)



Source: DOHS (2079/80)



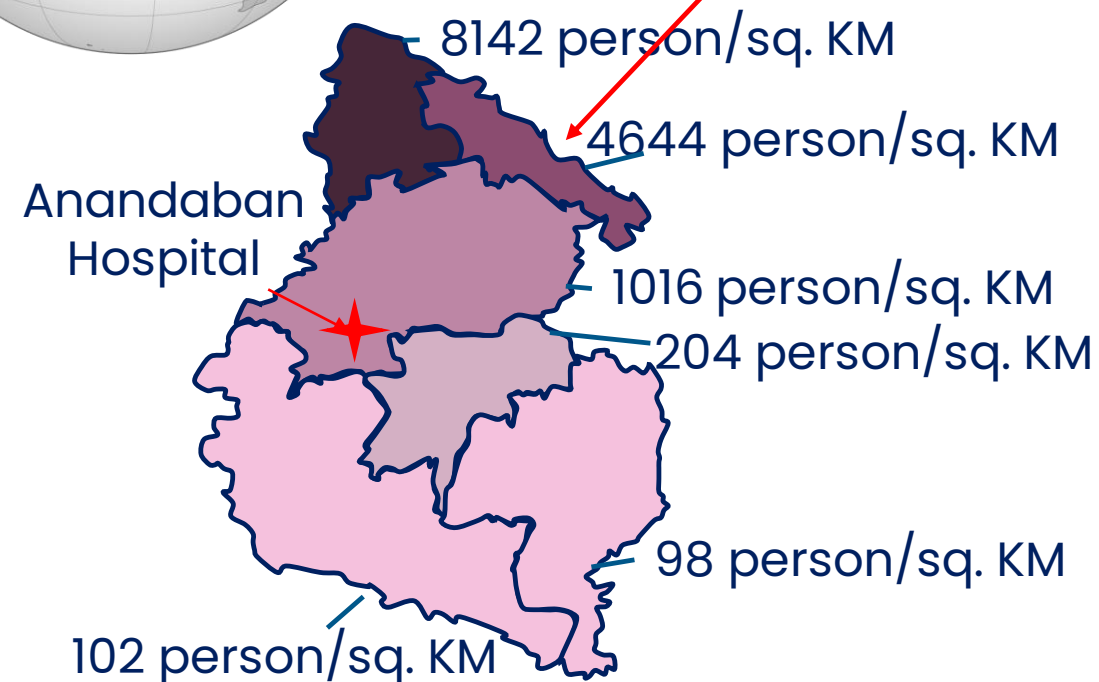
Scenario and Objectives

- It is difficult to identify differences in epidemiological trends of leprosy in Pre- and Post- Elimination era
- Our hospital, situated in Lalitpur district, serves as the major treatment site for all leprosy cases arising in the district
- To identify the differences in leprosy epidemiological parameters **Pre- (2003-2010)** and **Post- (2011-2023)** elimination in Nepal based on comprehensive data from Lalitpur



Lalitpur: Introduction

- Lalitpur is situated in central Nepal and comprises a highly dense metropolitan city in North to highly sparse rural area in the South.
- Population 550 thousands (2021)
- Average density: 1433/sq. KM
- Anandaban Hospital, a national referral center for leprosy, was established in 1957 in rural outskirts of Central Lalitpur



Municipalities and their Population Densities in Lalitpur



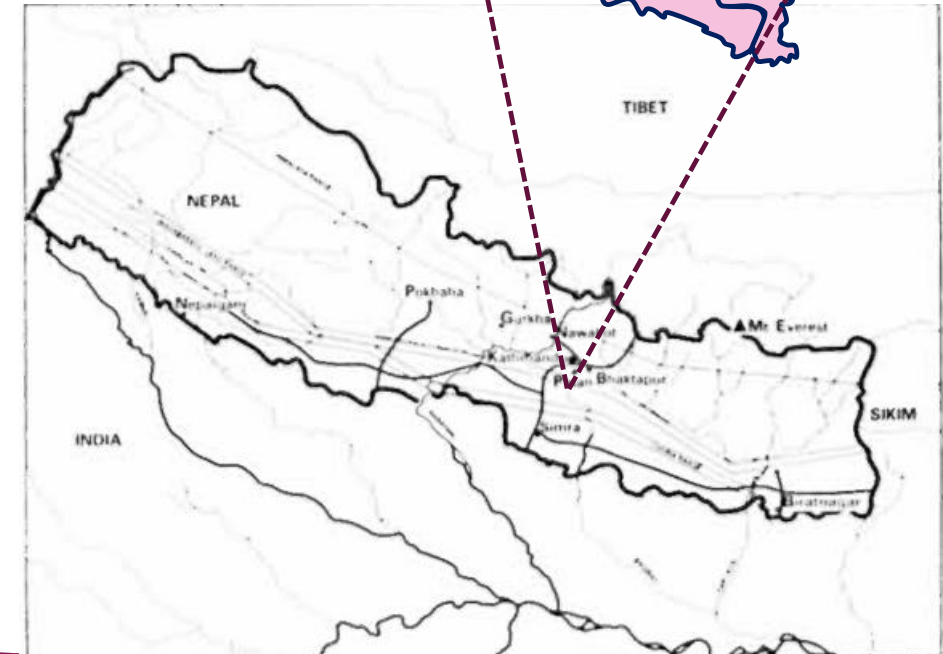
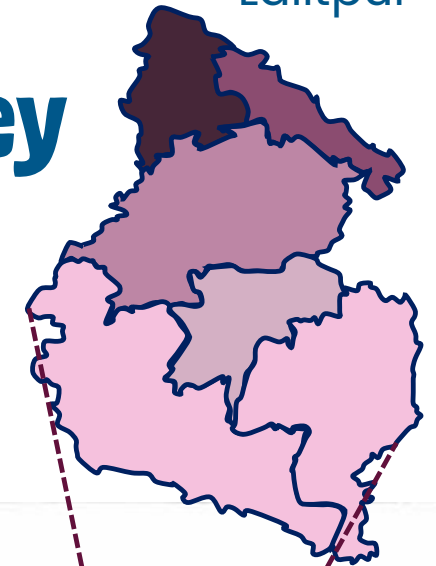
Lalitpur District: 1986–1990 Leprosy Survey

Household Leprosy Survey* was conducted covering entire Lalitpur District during 5 years period of Spring 1986 to Autumn 1990 by Anandaban Hospital and Government of Nepal

Calculated Statistics

Annual case detection:	2.6 per 10 thousand
Disability Grade 1:	18.8%
Disability Grade 2:	12.7%
Skin smear Positivity:	20%

*Theuvenet WJ, Soares D, Baral JP, et al. Mass survey of leprosy in Lalitpur district, Nepal. *Int J Lepr Other Mycobact Dis.* 1994;62(2):256-262.



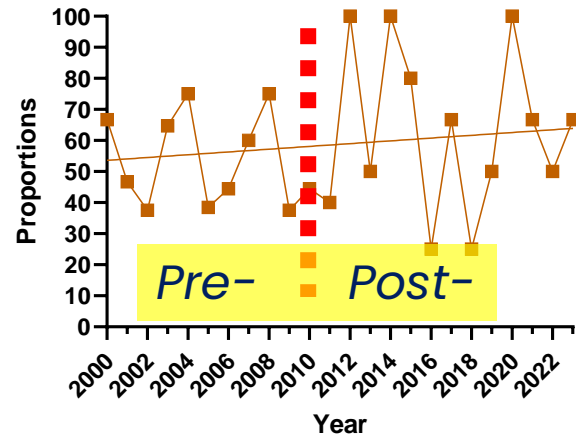
Study Methods

- A retrospective medical chart reviewed of Leprosy Patients at Anandaban Hospital in accordance with NHRC ethical review board approval.
- Records were reviewed from 2000 to 2023.
- Statistical tests were applied to compare the Pre and Post Elimination data
- Mid-point year population of Pre (2000–2010) and Post (2011–2023) durations were used for statistics (i.e 397,653 in 2006 and 516,599 in 2017).

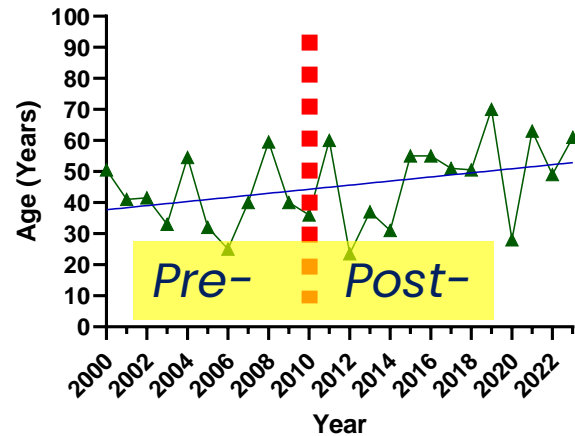


General Demographics: Pre- vs. Post-

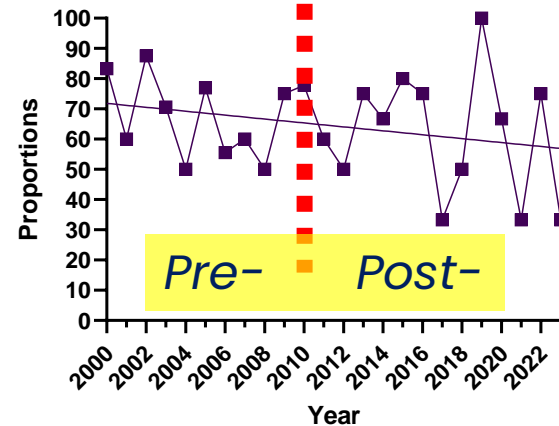
Male Proportions



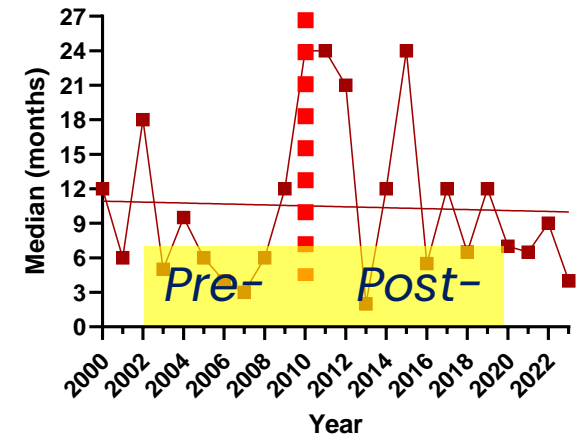
Median Ages



Voluntary vs Referred Cases (Prop.)



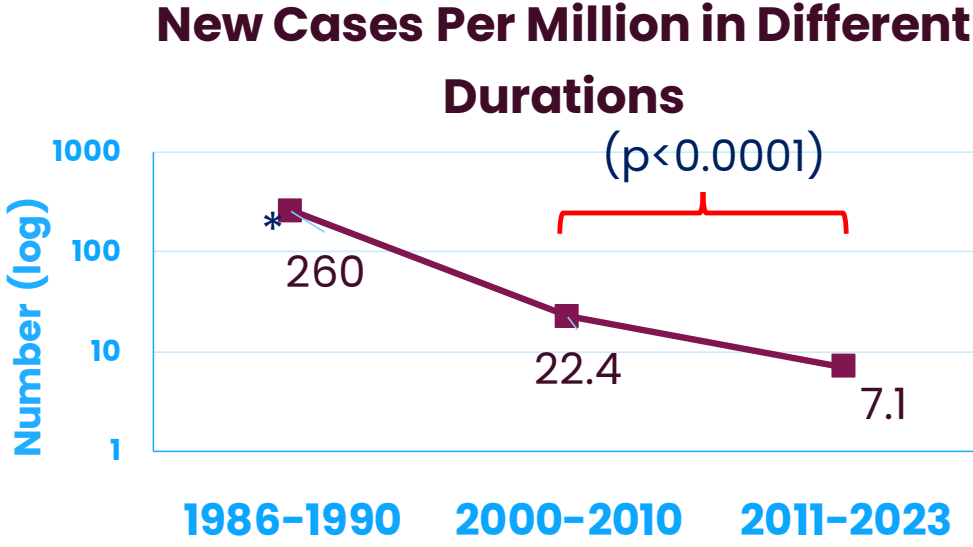
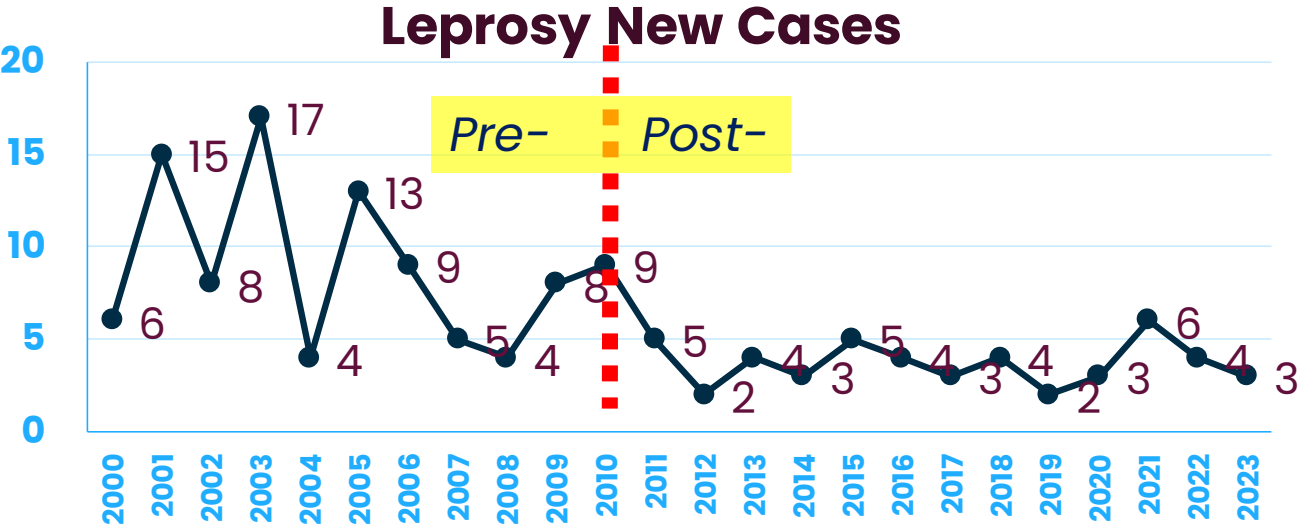
Duration at Diagnosis (Months)



- There was no significant changes in trend of male proportions (Male : Female ratio: 1.04 vs. 1.511) and duration of disease at diagnosis (7 vs. 11 months).
- Median age slightly increased (39 vs. 52.5 years, $p < 0.05$) and voluntary reporting slightly decreased (69.4% vs. 60.4%) during the 24 years period.



Annual New case trends

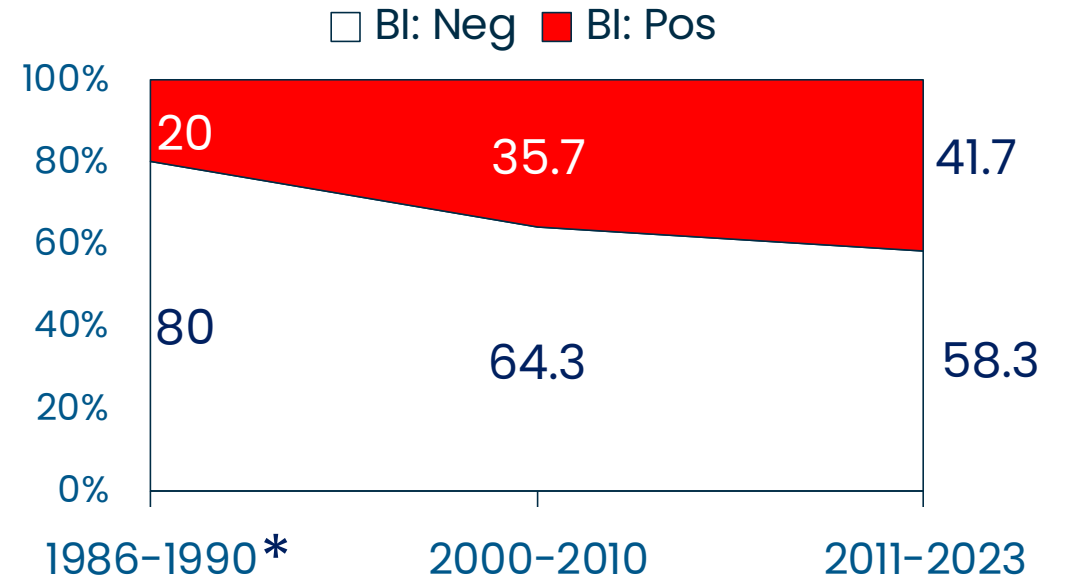
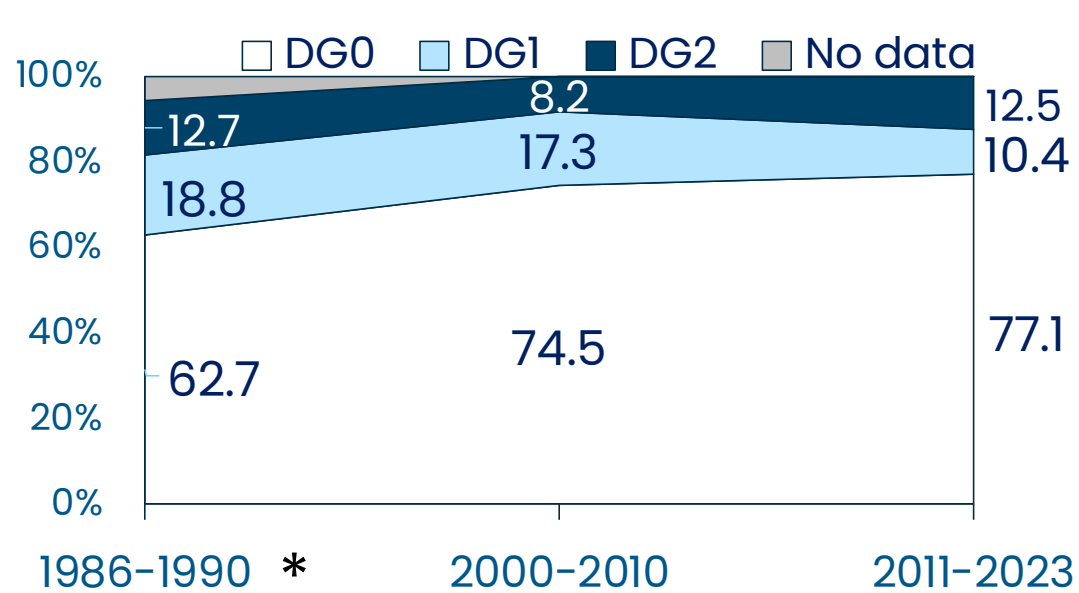


*Theuvenet 1994, Lalitpur survey

The annual new cases decreased from 0.224 new cases per 10,000 Pre-elimination to 0.071 new cases per 10,000 Post-elimination (p < 0.0001).



Disability Grade and BI Positivity

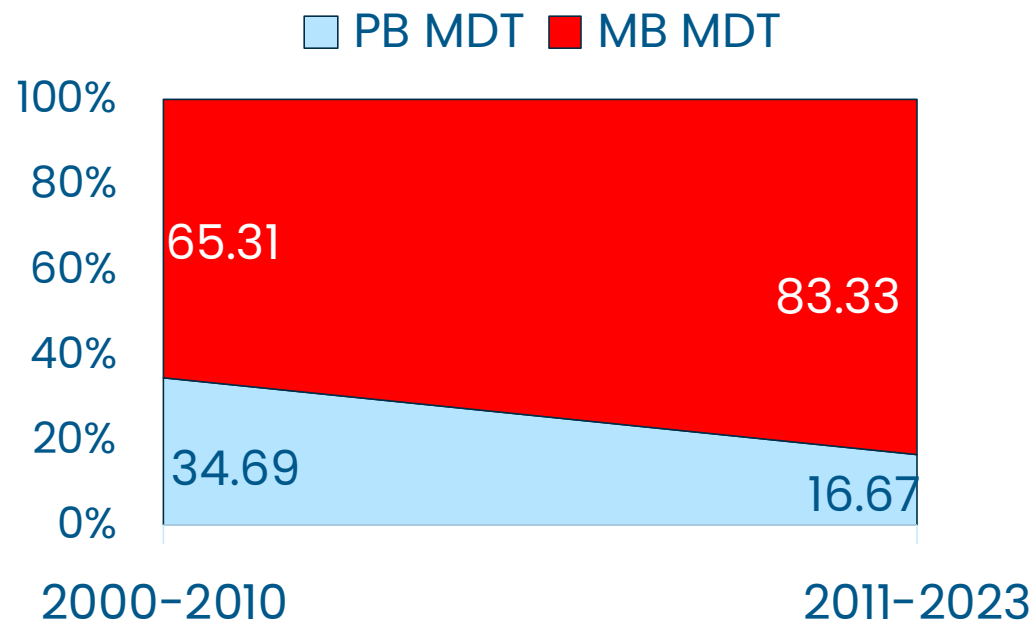
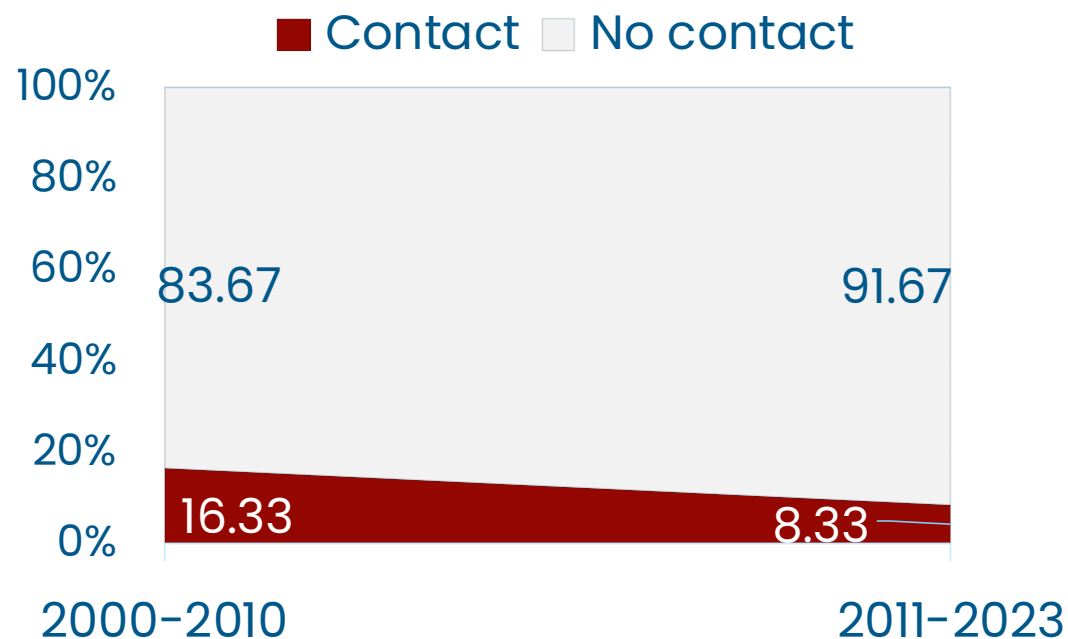


There was a general trend in decrease in any disability (1 and 2) in three periods 31.5%, 25.5% and 22.9%. Similarly, BI positivity increased from 20% to 35.7% and 41.7% in three periods. The changes were not significant between Pre- and Post- era.

*Theuvenet 1994, Lalitpur survey



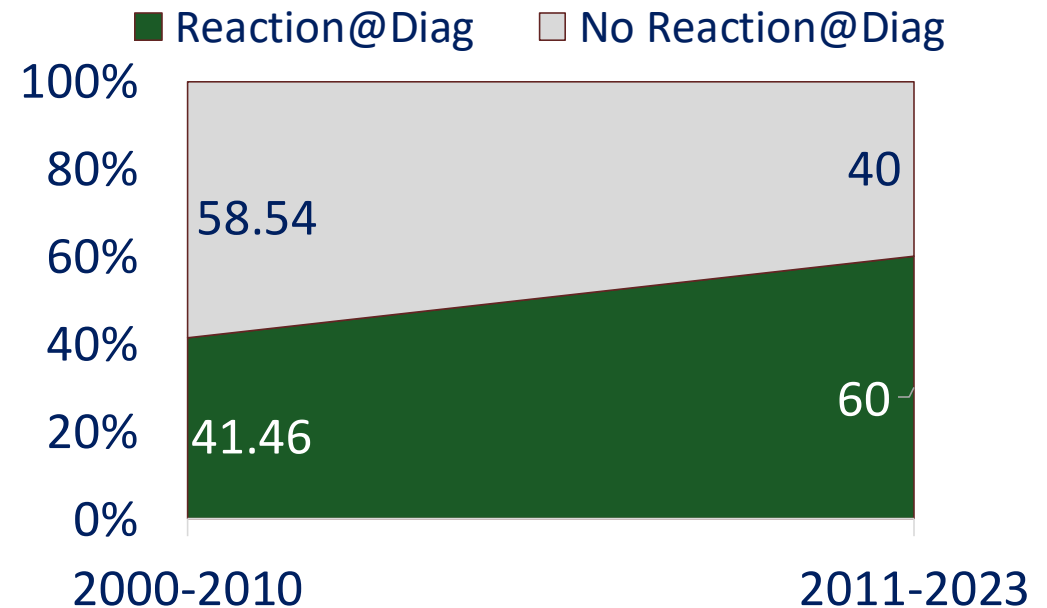
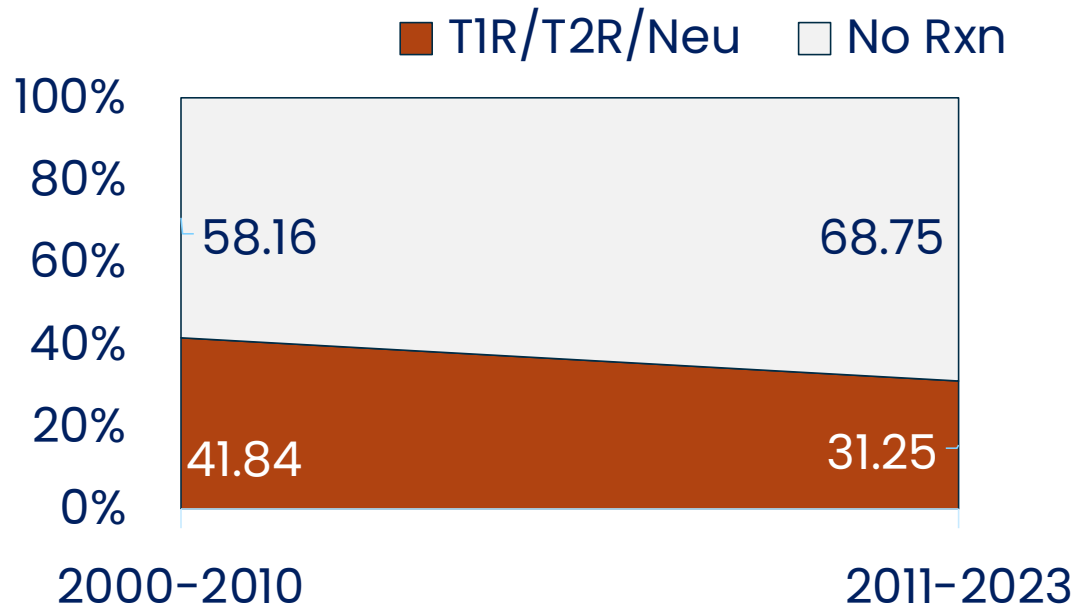
Household contacts and WHO Class (MB/PB)



The proportion of household contact patients decreased (16.3% vs 8.33%) and proportion of MB patients increased (65.3% vs 83.3%). Both changes were not statistically significant.



Reaction prevalence and Reactions at Diagnosis

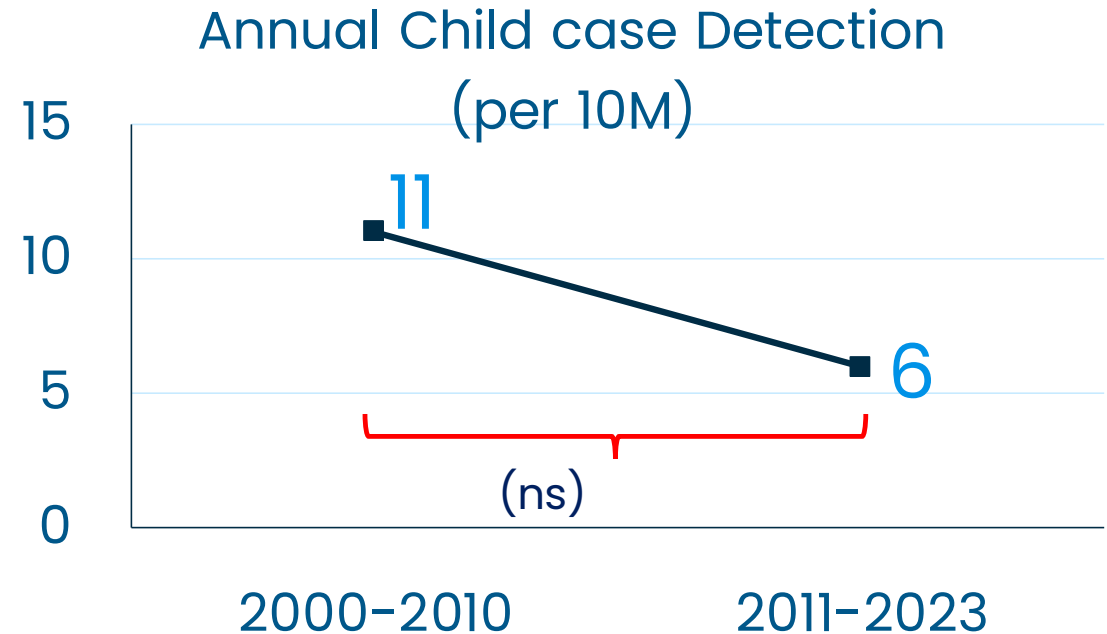
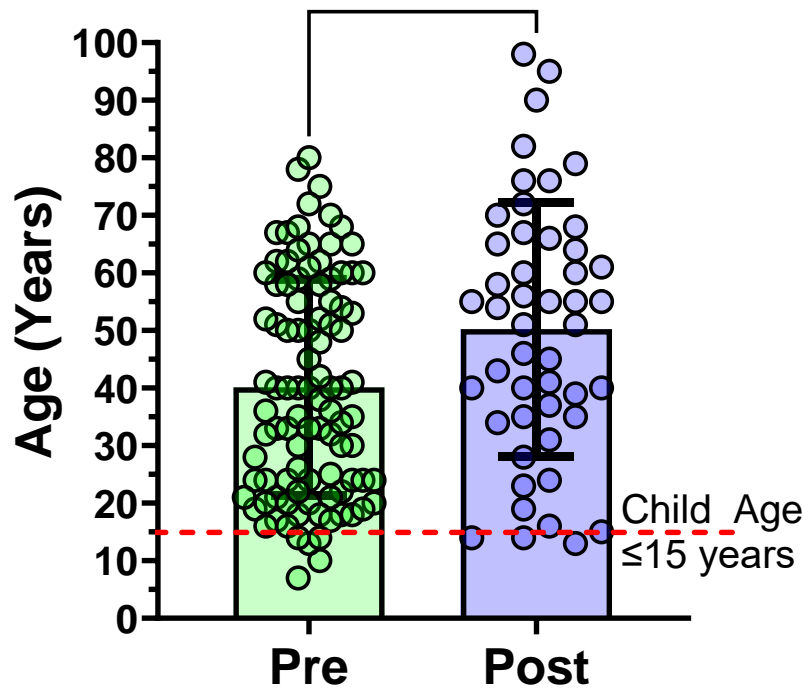


The prevalence of reaction (T1R, T2R or Neuritis) decreased in Post-elimination era (41.8% vs 31.3%) but the proportion of patients coming with reaction increased at Post-elimination (41.5% vs 60%). The changes were not significant.



Child Cases (≤ 15 years)

All Ages Pre- vs Post-



While the detection of new child cases decreased post-elimination, the decrease was not statistically significant



Limitations

- Though the study was designed to study pre- and post- elimination leprosy indicators in Nepal, the incidence in Lalitpur was lower than 1/10000 (Elimination Definition) in Pre-Elimination era (0.22/10,000).
- Thus the study may only indicate the impact of active vs passive governmental efforts in leprosy control in Pre- and Post-elimination era.



Conclusions

- Leprosy cases are seen in decreasing trend in the post-elimination era.
- Child case is an indication of active transmission. While there is decrease in child case detection, the difference is not significant.
- Two-thirds of patients in post-elimination era were skin smear positive, which means the potential for disease transmission is still significant.
- Results of this study urge the need of strategy for early diagnosis, active case finding, reaction management and disability management.



Acknowledgement

- Leprosy affected people.
- The Leprosy Mission Nepal.





Mr. Kanchha Shrestha recently retired from the post of Head of Medical Records Department of Anandaban Hospital. He served for 4 decades at the hospital. He has an MA in Economics from Tribhuvan University. He has few leprosy related articles published in peer-reviewed journals. He is a known figure in the field of leprosy in Nepal. He has participated in many governmental and non-governmental workshops related to leprosy control in Nepal. He has presented many original research in different national and international conferences.

