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Date: 22.06.2024

### **To Whom It May Concern**

This is to certify that Dr. Pabitra Saha, Assistant Professor of Zoology, Department of Zoology, P. R. Thakur Government College, Thakurnagar is my research collaborator. We have been working together on various projects for last 9 years and the collaboration is continuing till date. Recently, we are working on a research project entitled "Prevention of resurgence of Leishmaniasis during post elimination period in erstwhile pockets of West Bengal" funded by National Health Mission, Government of West Bengal. Some of the research outputs are available at this links (<https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0012028>. & <https://link.springer.com/article/10.1007/s44197-024-00260-2#:~:text=Out%20of%204168%20previously%20treated,treated%20VL%20cases%20followed%20up>).

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## Government of West Bengal

Health & Family Welfare Department,

National Health Mission

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Memo No.: HFW-27011/146/2021-NHM SEC-Dept. of H&FW/ 2175

Date: 28.07.2021

### ORDER

Administrative Approval and Financial Sanction is hereby accorded for conducting the study on '**Prevention of resurgence of Leishmaniasis during post-elimination period in erstwhile endemic pockets of West Bengal**' at an estimated cost of ₹45,10,000.00 (Rupees forty five lakh ten thousand only).

2. The study will be implemented under Calcutta School of Tropical Medicine, Kolkata by the Principal Investigator **Professor (Dr.) Subhasish Kamal Guha**, Director, Calcutta School of Tropical Medicine, Kolkata.

3. Sanction is also hereby accorded to release fifty percent (50%) of the sanctioned amount, i.e., ₹22,55,000.00 (Rupees twenty two lakh fifty five thousand only) in favour of the **Director, Calcutta School of Tropical Medicine** to initiate the study.

4. Senior Accounts Officer, National Health Mission will act as drawing and disbursing officer for the purpose.

5. Necessary financial utilisation certificate (UC) in appropriate format shall be submitted to the State Programme Management Unit (SPMU), National Health Mission (NHM) in due course. The next instalment of the sanctioned amount will only be released after utilisation of at least 70% of this released amount and submission of an interim progress report of the study.

6. Necessary permission should be taken from the State Programme Management Unit, NHM, West Bengal before publishing or referring the study findings in any journal, article, scientific publications etc.

7. The charge is debitable to the head of accounts "**Research, Studies and Analysis**", [FMR Code 10.2.1 and Tally Code – **B20.01**] out of Mission Flexi-pool (HSS).

8. This issues with the approval of Mission Director, National Health Mission and Secretary, Health & Family Welfare Department, Government of West Bengal.

9. No price escalation will be allowed further.

10. All concerned are being informed.



Programme Officer, NHM &  
Dy. Secretary to the Govt. of West Bengal,

Memo No.: HFW-27011/146/2021-NHM SEC-Dept. of H&FW/ 2175

Date: 28.07.2021

Copy forwarded for information and necessary action to the:

1. Director, Calcutta School of Tropical Medicine, Kolkata (e-mail: drskguha@gmail.com)
2. Dr. Dipankar Maji, DDHS (PH), H&FW Dept., Govt. of West Bengal (e-mail: maji.dipankar@gmail.com)
3. Dr. Siddhartha Niyogi, DDHS (Mal), H&FW Dept., Govt. of West Bengal (e-mail: drsiddhartha.niyogi@gmail.com)
4. Dr. Ardhendu Kumar Maji, Reader in Protozoology, Calcutta School of Tropical Medicine, Kolkata (e-mail: maji\_ardhendu@yahoo.com)
5. Dr. Pabitra Saha, Asst. Professor in Zoology, P. R. Thakur Govt. College, (e-mail: pabitra.saha82@gmail.com)
6. Sr. Accounts Officer, NHM is requested to release ₹22,55,000.00 (Rupees twenty two lakh fifty five thousand only) in favour of the **Director, Calcutta School of Tropical Medicine**
7. Office Copy



Programme Officer, NHM &  
Dy. Secretary to the Govt. of West Bengal,

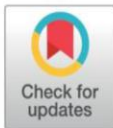
## RESEARCH ARTICLE

## Challenges for maintaining post elimination phase of visceral leishmaniasis control programme in India: A field-based study

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## OPEN ACCESS

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**Data Availability Statement:** All relevant data are within the manuscript.

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## Abstract

## Background

India is going through the maintenance phase of VL elimination programme which may be threatened by the persistence of hidden parasite pools among asymptomatic leishmanial infection (ALI) and PKDL. The present work was designed to determine the burden of VL, PKDL, and ALI and to assess the role of treatment of ALI in maintaining post-elimination phase.

## Methods and finding

The study was undertaken in Malda district, West Bengal, India during October 2016 to September 2021. Study areas were divided into 'Study' and 'Control' arms. VL and PKDL cases of both the arms were diagnosed by three active mass surveys with an interval of one year and treated as per National guideline. ALI of 'Study' arm was treated like VL. ALI of 'Control' arm was followed up to determine their fate. Fed sand-fly pools were analysed for parasitic DNA. No significant difference was noted between the incidence of VL and PKDL in both the arms. Incidence of ALI declined sharply in 'Study' arm but an increasing trend was observed in 'Control' arm. Significantly higher rate of sero-conversion was noted in 'Control' arm and was found to be associated with untreated ALI burden. Parasitic DNA was detected in 22.8% ALI cases and 2.2% sand-fly pools.

## Conclusion

Persistence of a significant number of PKDL and ALI and ongoing transmission, as evidenced by new infection and detection of leishmanial DNA in vector sand-flies, may threaten the maintenance of post-elimination phase. Emphasis should be given for elimination of pathogen to prevent resurgence of VL epidemics.





# Active Community-Based Case Finding of Endemic Leishmaniasis in West Bengal, India

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## Abstract

**Introduction** The ongoing visceral leishmaniasis (VL) elimination programme in India is targeting the elimination of the disease VL but not the pathogen. The persistence of hidden parasite pool may initiate a resurgence in suitable conditions. This study dealt with a novel approach to unearth such pathogen pool and their proper management to prevent the resurgence of VL.

**Materials and Methods** We deployed a new approach for detection of pathogen pool by following up the VL and post kala-azar dermal leishmaniasis patients treated during the last 10 years along with mass sero-surveillance within a radius of 500 m of recently treated individuals.

**Results** We followed up 72.6% (3026/4168) previously treated VL and post kala-azar dermal leishmaniasis patients and diagnosed 42 (1.4%) new and 38 (1.3%) recurrent post kala-azar dermal leishmaniasis. We detected 93 asymptomatic leishmanial infection, 8 VL and 1 post kala-azar dermal leishmaniasis by mass sero-surveillance.

**Conclusion** Our three-step process including mapping and follow-up of previously treated cases, mass surveillance within 500 m of radius of known cases, and 6 monthly follow-on clinical and serological screening of asymptomatic cases, enabled detection of previously undetected cases of post kala-azar dermal leishmaniasis and VL. Recurrent post kala-azar dermal leishmaniasis deserves special attention regarding their treatment guideline. Early diagnosis and effective treatment of all leishmaniasis cases will hasten pathogen elimination and prevent resurgence of VL. This may help the policymakers to develop appropriate strategy for elimination of pathogen to prevent resurgence of VL.

**Keywords** Hidden pathogen pool · Resurgence · Recurrent Post kala azar dermal leishmaniasis · Recurrent VL

## Abbreviations

VL	Visceral leishmaniasis
PCR	Polymerase Chain Reaction
WHO	World Health Organization
rK-39	Recombinant product of K39
DNA	Deoxyribo nucleic acid
HIV	Human immunodeficiency virus
p value	Probability value

## 1 Introduction

Visceral leishmaniasis (VL), also known as kala-azar, is a vector borne neglected tropical disease caused by a protozoa belonging to the genus *Leishmania* and is transmitted by

female sandfly of the genus *Phlebotomus* [1]. More than 80 endemic countries in tropical and subtropical regions reported an estimated 50,000–90,000 new VL cases annually. Ten countries i.e., Brazil, China, Ethiopia, India, Iraq, Kenya, Nepal, Somalia, South Sudan, and Sudan reported 95% of the global VL cases [2]. Three adjoining countries of WHO South East Asia region - India, Bangladesh and Nepal account for more than 50% of the global burden, to which India contributes the major share [3]. In India, about 165.4 million population of 54 endemic districts of Bihar, Jharkhand, West Bengal, and Uttar Pradesh are at risk of infection [4]. India reported 818 VL cases in 2022, of which 52 were from West Bengal [4].

India, Bangladesh, and Nepal jointly launched a VL elimination programme in 2005 supported by the World Health Organization (WHO). The initiative was aimed to eliminate VL as a public health problem by 2015 by reducing the

Extended author information available on the last page of the article