Shifting of transmission dynamics of visceral leishmaniasis in Nepal: potential impacts of climate change

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Visceral leishmaniasis (VL) is a vector-borne disease caused by the parasite *Leishmania donovani* and transmitted by female sandflies; *Phlebotomus argentipes*. Disease is endemic in 23 (out of 77) districts and targeted for elimination as a public health problem by 2030. Recently, geographical shift of disease has been observed in previously non-endemic areas including hill and mountain districts; often considered the impacts of climate change. During 2021-2022, a descriptive cross-sectional survey was conducted in 62 clusters from 21 districts. House-to-house survey was conducted in purposively selected villages while households were selected for an interview systematically. Abstract Sandfly was also captured. Environmental characteristics and climatic data such as temperature, rainfall and humidity etc. were collected. Presences of seasonal rain water pathways, ponds, presence of animal sheds, travel exposures etc. were also collected. VL cases been shifting from east to west, lowlands to hills/mountainous regions, and the proportion of VL cases being reported in these regions has been steadily increasing, reaching >50% in 2022. A positive association of VL cases with temperature and rainfall has been observed. Significant environmental characteristics were associated with risk of VL infection: presence of seasonal rain water, ponds around houses; presence of cow dung; presence of animal shed. Seasonal variability; increased temperature and reduced precipitation remain significant predictors of VL. *Phlebotomus argentipes* vector was also present at altitudes up to 1,700 m asl. The VL elimination Initiative should therefore consider extending its surveillance and control activities in order to assure VL elimination.

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He has led and coordinated several collaborative clinical and operational research projects in epidemiology of Visceral leishmaniasis in close collaboration and coordination with Government of Nepal, Epidemiology and Disease Control Division, Department of Health Services, Ministry of Health and Population in Nepal. Over the last 15 years, he has been working to generate evidence to support the ongoing National visceral leishmaniasis elimination programme in Nepal. At present he actively involved in the Neglected Tropical Diseases- elimination of Visceral Leishmaniasis initiative in Nepal as a scientific promotor through Framework Agreement 5 DGD – ITM 2022-2026 in Nepal.