Challenges in Modeling Neglected Tropical Diseases: Underreporting of Leishmaniasis in Bihar, India

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Neglected tropical diseases (NTD), account for a large proportion of the global disease burden, and their control faces several challenges including diminishing human and financial resources for those distressed from such diseases. Visceral leishmaniasis (VL), the second-largest parasitic killer (after malaria) and an NTD affects poor populations and causes considerable cost to the affected individuals. Mathematical models can serve as a critical and cost-effective tool for understanding VL dynamics, however, complex array of socio-economic factors affecting its dynamics need to be identified and appropriately incorporated within a dynamical modeling framework. Underreporting of diseases in India remains a problem to public health controls. Effective and reliable surveillance systems are critical for monitoring public health and disease outbreaks. However, in India government surveillance systems are affected by levels of scarcity in resources and therefore uncertainty surrounds the true incidence of asymptomatic and clinical cases affecting morbidity and mortality rates. Here we present a ordinary differential equation model to estimate the under-reporting and other parameters affected by underreporting.

References

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