



MoU signed with MoHFW

A Memorandum of Understanding (MoU) was signed between the Ministry of Health and Family Welfare (MoHFW), Government of India and the National Disease Modelling Consortium (NDMC) for collaborating on specific disease modelling initiatives to address critical healthcare needs in the country.

Key Modeling updates

Vaccine Preventable Diseases

Measles

- Developing an age-stratified model for predicting and forecasting measles.
- The model studies the effect of vaccination campaigns on possible measles elimination.

Rotavirus

- Constructing a mathematical model to understand the sustained impact of vaccination on rotavirus transmission with a three-dose vaccine schedule in India.
- Additionally, conducting time series modelling of rotavirus gastroenteritis and its relation with climatic variations

Antimicrobial resistance (AMR)

- Estimating mortality blankets for AMR-related deaths.
- Preliminary estimates for disability-adjusted life years for bloodstream infections have been generated that are currently being extended to other infections.
- Additionally, developing a framework to capture the correlation structure of drug susceptibility.

Malaria

- Analyzing Land Use Land Cover factors influencing malaria in Northeast India with zero-inflated generalized linear models and modeling malaria trends, seasonality, and climatic impacts in Tripura using time series analysis.

Tuberculosis

- Developing tuberculosis-specific transmission models for burden estimation at the subnational level, while also studying the impact of intervention strategies on the TB burden.

Neglected Tropical Diseases

Lymphatic filariasis

- Proposing a compartmental model for the transmission dynamics of LF to provide block-level scenarios to achieve the elimination threshold.

Visceral Leishmaniasis

- Determining the optimal post-kala-azar dermal leishmaniasis level to prevent VL resurgence within a specified time frame using model-based estimates.

Scrub typhus

- Developing an epidemiological model considering humans, mites, and rodent populations.

Publications

- Ghosh I, Nath-Sain S, Sen Gupta S, Pant Joshi C, Jain T, Subramanian S, Banerjee S, Mitra MK. COMET-LF: A Compartmental Model of Dynamics of Infection, Disease, and Elimination Strategies for Lymphatic Filariasis. 2024. preprint
- Ghosh S, Banerjee M, Dhar SS, Mukhopadhyay S. Estimation of time-varying recovery and death rates from epidemiological data: A new approach. 2024. preprint
- Ghosh S, Kappara D, Majumder N, Nath-Sain S, and Mukhopadhyay S. A systematic review and modelling insights of factors impacting measles vaccine effectiveness. 2024. preprint
- Sam AK, Karmakar S, Mukhopadhyay S, and Phuleria HC. A historical perspective of malaria policy and control in India. *IJID Regions*. 2024: 100428.
- Stuart RM, Cohen JA, Kerr CC, Mathur P, National Disease Modelling Consortium of India, Abey Suriya RG, Zimmermann M, Rao DW, Boudreau MC, Lee S, Yang L, Klein DJ. HPVsim: An agent-based model of HPV transmission and cervical disease. *PLoS Comput Biol*. Published online July 5, 2024. doi:10.1371/journal.pcbi.1012181

NEWSLETTER

Invited Talks given by NDMC

- **Dr. Rashmi Tiwari**, panelist for the session "Innovations in Cancer Care - Bridging Research and Patient Outcomes" at the GWHIC 2024.
- **Dr. Sagar Pandhare**, Importance of disease data - analysis and use of disease data in understanding disease spread and predication: Workshop for training field workers in vector borne diseases in Panvel, October 2024
- **Prof. Siuli Mukhopadhyay**, Statistical Methods for tracking infectious diseases, Calcutta Statistical Association: Lecture Series for Propagation of Statistics Education and Research, August 2024
- **Prof. Siuli Mukhopadhyay**, Statistical Approaches to Disease Modelling, Summer School Open Stack Report on Health, Transport and Water, GISE Hub, IIT Bombay, July 2024



Conferences attended

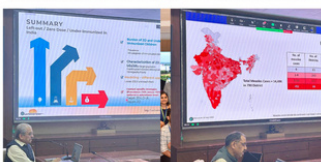
- **Dr. Esha Kashyap**, Investigating the impact of vaccination on rotavirus transmission and seasonal patterns in India with an age-structured susceptible-infected-recovered-susceptible model: 17th **ASCODD**, Kathmandu, Nepal, December
- **Mr. Shoummo Sen Gupta**, Determining the seasonal factors and background characteristics affecting rotavirus infection : 17th Asian **ASCODD** at Kathmandu, Nepal, December
- **Prof. Sudeep Bapat**, Capacity building workshop, **NCDC**, Delhi, December.
- **Prof. Harish Phuleria, Prof. Saket Choudhary, Dr. Divya Kappara, Dr. Rashmi Tiwari, Dr Suchita Nath-Sain, and Dr Yashi Raj**, Modelling updates on antimicrobial resistance, HPV, malaria, measles, and TB: **IDM Conference 2024**, Bangkok, Thailand, November.
- **Dr. Esha Kashyap**, Mathematical models of enteric disease : **Infectious Disease Modeling workshop**, Emory University, Atlanta, USA., August
- **Dr Indrajit Ghosh**, A novel compartmental framework for modelling LF dynamics and elimination strategies : 13th **ECMTB Spain**, July.
- **Prof. Siuli Mukhopadhyay**, A multi-region discrete time chain binomial model for infectious disease transmission : **44th ISF**, France, June.
- **Adithya B. Somraj**, Predictive Analytics in Public Health: Forecasting Malaria Incidence in Maharashtra : **44th ISF**, France, June.



Capacity building initiatives

Workshops

- Workshop on modelling the public health impact of enteric and respiratory vaccines, Jan 9-11, 2025
- TB India: Modelling Interest Group Workshop, Jan 27-31, 2025
- Collaboration with Women's Collective Forum to hold regional stakeholder meetings on the theme of " Technology for healthcare : India's mantra for universal health coverage",
 - Meeting at VIT-Chennai on Jan 24th 2025
 - Meeting at ICMR - NIRDHDS on Feb 15th 2025
 - Meeting at IIT Bombay on March 10th 2025
 - Meeting at ICMR - RMRC NE on March 17th 2025



NDMC Invited Talk series

- NDMC has initiated an invited talk series in which experts in the fields of community medicine, epidemiology and modeling were invited.
- Prof. Jonathan Golub and Dr. Samyra Cox, JHU, Baltimore, Prof. Swapnil Mishra, NUS, Singapore, Dr. N.K.Arora, NTAGI, Dr. Pawan Kumar, MoHFW, Dr. Kamini Walia, ICMR, Dr. Richard White, LSHTM and Dr. Rizwan SA, ICMR-NIE have delivered the talks since September 2024 till date.

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