

NEWSLETTER

Welcome to the sixth issue of our newsletter, covering updates, activities and highlights from April to June 2026.

Modelling Highlights: Tuberculosis

Identifying the Gaps: Who is Most at Risk?

Programmatic data from over 320,000 adult TB patients in Maharashtra (2021–2022) were analysed to pinpoint which factors lead to unfavorable treatment outcomes and mortality

- **The High-Risk Profile:** The risk of death or treatment failure is significantly higher in individuals over 60, males, and those with HIV or diabetes
- **The Weight Factor:** Nutritional status is a critical predictor. Patients weighing less than 20 kg faced the highest risks
- **The "Unknown" Hazard:** Data-entry gaps and incomplete clinical assessments are major risk factors for patient survival
- **Programmatic Takeaway:** A standardised reporting framework for digital health data would help frontline workers better identify and triage these high-risk individuals

Risk factor	Unfav. outcome aOR (95% CI)	Mortality aOR (95% CI)
AGE (REF: 15–29 YEARS)		
30–44 years	1.90 (1.82–1.98)	2.72 (2.56–2.90)
45–59 years	2.64 (2.52–2.75)	4.67 (4.39–4.96)
≥60 years	3.85 (3.69–4.01)	8.06 (7.60–8.54)
SEX		
Male	1.50 (1.46–1.55)	1.47 (1.41–1.52)
SUBSTANCE USE		
Tobacco – Yes	1.20 (1.14–1.26)	1.11 (1.04–1.18)
Tobacco – Unknown	1.43 (1.38–1.48)	1.45 (1.39–1.51)
Alcohol – Yes	1.67 (1.57–1.77)	1.57 (1.46–1.69)
Alcohol – Unknown	1.44 (1.39–1.49)	1.46 (1.40–1.52)
COMORBIDITIES		
Diabetes – Yes	1.43 (1.36–1.50)	1.56 (1.48–1.65)
Diabetes – Unknown	2.57 (2.40–2.74)	2.61 (2.41–2.84)
HIV – PLHIV	2.84 (2.69–3.00)	3.40 (3.19–3.63)
HIV – Unknown	3.48 (3.10–3.89)	3.68 (3.22–4.22)
WEIGHT (REF: 61–80 KG)		
>80 kg	1.02 (0.89–1.18)	0.99 (0.83–1.20)
41–60 kg	1.21 (1.16–1.27)	1.31 (1.23–1.40)
21–40 kg	2.14 (2.03–2.25)	2.72 (2.55–2.91)
<20 kg	3.29 (2.63–4.11)	5.34 (4.18–6.82)
DISEASE SITE		
Extra-pulmonary	0.95 (0.92–0.98)	1.10 (1.05–1.14)

• Unfavourable outcome (n=323,124) • Mortality (n=315,579) | aOR adjusted for age, sex, weight.

For detailed study: <https://tinyurl.com/23wh3umm>

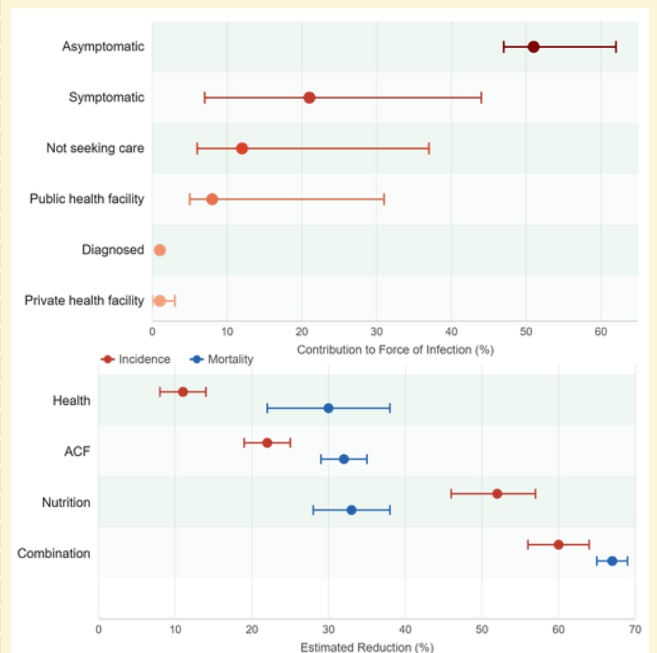


Modelling the Future:

The Power of Combined Interventions

A transmission model was developed to project the interventions that may help India meet its End TB targets by 2030

- **The Asymptomatic Reservoir:** Asymptomatic individuals are responsible for more than half (51%) of all new infections in India
- **Beyond Symptoms:** Advocacy to use symptom-agnostic tools, such as chest X-rays with AI assistance, to interrupt community transmission
- **The Multi-Sectoral Solution:** A single intervention (such as only improving health facilities) is not enough. A multi-sectoral approach, combining nutritional support, health system strengthening, and active case finding, can reduce TB incidence by 60% and mortality by 66% by 2030



For detailed study: <https://tinyurl.com/58z4u56b>



The Maharashtra study highlights low body weight as a primary driver of TB death, while the Modelling study demonstrates that providing nutritional support is one of the most effective ways to accelerate the decline in new cases.

By integrating retrospective data with predictive Modelling, the NDMC TB group emphasizes that **India's path to elimination must address the entire care cascade with active case finding and nutritional support showing the most promising impact.**





Visit by Shri. Nikhil Gajraj, Joint Secretary, Ministry of Health and Family Welfare (MoHFW), April 17, 2026

NDMC hosted Shri Nikhil Gajraj, JS-MoHFW, who chaired the 3rd Disease Specific Advisory Group (DSAG) meetings for the Tuberculosis group (led by Prof. Sarika Mehra) and Neglected Tropical Diseases group (led by Prof. Souvik Banerjee). He also met with Prof. Ravindra Gudi, Deputy Director (Finance, Infrastructure and Administration), and Prof. S. V. Kulkarni, Dean, Research & Development.

The meetings featured modelling updates and productive discussions, with valuable guidance from DSAG members and Shri Gajraj that will help strengthen ongoing work and future collaborations.

NDMC Talk Series

April 8, 2026:

Dr. Manjunath Shankar



Senior Policy Advisor at Centre for Social and Economic Progress, Health and Human Development team on

"Modelling for decision makers during Public Health Emergencies at CDC"

June 24, 2026:

Dr. Nikhil Pal



Assistant Professor, Department of Mathematics, Visva-Bharati, Santiniketan

"Mathematical Modelling of tuberculosis: Effects of Multiple Latent Classes, Saturated Treatment and Clean Cooking Fuel Programs."

3rd Tuberculosis India – Modelling Interest Group (TB-MIG) Workshop, April 20 – 23, 2026



The 3rd TBI-MIG Workshop was conducted by the TB Modelling Secretariat, under the leadership of **Prof. Sarika Mehra** and **Prof. Mithun Mitra** at IIT Bombay, in collaboration with Prof. Nimalan Arinaminpathy, Team Lead at WHO. Dr. Sandip Mandal of John Snow India presented on TB burden estimation and calibration methods, followed by Dr. Kiran Kumar Rade, STOP TB Partnership and WHO, who shared programmatic and epidemiological perspectives. Dr. Vineet Chadha, Public Health Expert and TB Epidemiologist, contributed insights on patient cost research alongside Dr. Muniyandi, ICMR-NIRT.

The workshop also featured a session by Dr. Susmita Chatterjee, George Institute for Global Health, on cost and cost-effectiveness analysis from a health system perspective, and a presentation by Dr. Sumit Godara, NDMC, on modelling TB transmission in high-risk household contacts. Participants engaged in group updates, coding exercises on interventions, including Active Case Finding (ACF), and practical skill-building sessions.

Artificial Intelligence in Health Research: From Discovery to Delivery, May 4, 2026



Prof. Siuli Mukhopadhyay (NDMC) delivered an invited talk on "Data Driven Disease Modelling: Using Integrated Biomedical Data" at a DHR-sponsored workshop organised by the National Institute for Research on Women Health (NIRWoH), Mumbai. She spoke on modelling the spread of infectious diseases, highlighting the role of statistical tools in strengthening epidemiological predictions.

Technology in Healthcare – India's mantra for Universal Health Coverage – Report launch, June 8, 2026

NDMC, in partnership with the Women's Collective Forum, launched a report at IIM Bangalore's EPHP conference, consolidating insights from six regional stakeholder consultations on Neglected Tropical Diseases, Digital Health, Vaccine-Preventable Diseases, Vector-Borne Diseases, Women and Child Health, and Non-Communicable Diseases. The report outlines key gaps and actionable recommendations for advancing Universal Health Coverage in India.



The launch, graced by Union Minister Smriti Irani and Dr. Sanghamitra Pati (ICMR), also featured a companion report on Ayushman Arogya Mandir by IIM Bengaluru. **Prof. Saket Choudhary** represented NDMC in the policy dialogue, "*India's Pathway to Universal Health Coverage: Technology, Primary Care and Implementation*" and was joined by **Ms. Sandhya Ananth** and **Dr. Rashmi Tiwari**, who presented the key findings from the stakeholder consultations.

National Multi-stakeholder Expert Consultation for Early Warning Signals: IHIP-2.0, June 25–26, 2026



Prof. Satish Agnihotri represented NDMC at the National Multi-Stakeholder Expert Consultation on Early Warning Signals: IHIP-2.0, convened by the National Centre for Disease Control (NCDC), MoHFW, in New Delhi.

The consultation identified key variables for an effective early warning system across diseases covered under the Integrated Disease Surveillance Programme (IDSP). This was achieved through 8 roundtables, and the resulting recommendations will be further examined for model building, a phase in which NDMC is expected to play an important role. Prof. Agnihotri also participated in a panel discussion.

National stakeholder roundtable on wastewater surveillance: From Signals to Public Health Action, April 8, 2026

Prof. Sarika Mehra participated in a national stakeholder consultation on wastewater surveillance, organised by the IDSP. The meeting brought together key stakeholders, including NCDC, ICMR, WHO, TIGS, CCMB, and THTSI, to harmonise ongoing pilot programs, address implementation challenges, and explore strategies for scaling wastewater surveillance within India's disease surveillance framework.

Did you Know?

Disease models suggest that gossip and viruses have something in common – both spread faster when people have **many contacts**.



2nd contact session of the third cohort of the Certificate Course on Mathematical Modelling for Control of Infectious Diseases in India, June 22 – 24, 2026

Prof. Usha Ananthakumar and **Dr. Yashi Aman Raj** were invited as resource persons at the 2nd contact session of the third cohort of the certificate course on Mathematical Modelling for Control of Infectious Diseases in India conducted by the National Institute of Translational Virology & AIDS Research (ICMR-NITVAR), Pune, in collaboration with the National Institute of Health & Family Welfare (NIHFW), New Delhi. Prof. Ananthakumar presented on the "*Role of NDMC in national malaria elimination efforts*," and Dr. Raj delivered a talk on the "*Introduction to AIDS Model*".

Measles Analytics Hub (MAH) Annual Meeting, June 10–12, 2026



Dr. Esha Kashyap, Senior Project Research Scientist, represented NDMC and presented the work on ‘Strategic intensification of measles immunisation in India: Lessons learned from subnational targeting’ at the MAH annual meeting in Jakarta, Indonesia.

Webinar on National Dengue Day, May 16, 2026



Dr. Avik Kumar Sam delivered a talk titled “Early Prediction of Dengue: Role of Epidemiological, Entomological, and Climatic Parameters” in the webinar on National Dengue day organised by the Directorate of National Vector Borne Disease Control Programme and MoHFW .

Meet the Team: Tropical Diseases- Lymphatic filariasis & Visceral leishmaniasis



Prof. Souvik Banerjee
Principal Investigator
Economics Dept., IITB



Prof. Mithun Mitra
Co-PI
Physics Dept., IITB



Prof. Mini Ghosh
Partner Investigator
VIT



Dr. Rashmi Tiwari
Modeller
IITB



Dr. Khushboo Balani
Health Economist
IITB



Dr. Preeti Deolia
Modeller
IITB



Dr. Divya Arumugam
Modeller
VIT



Dr. Lekhika Malhotra
Modeller
IITB



Shuommo Sen Gupta
Modeller
IITB



A Karthik
Modeller
VIT

The NTD team works on lymphatic filariasis (LF) and visceral leishmaniasis (VL), developing mathematical and statistical models to estimate the burden, understand transmission dynamics, and guide elimination strategies for both diseases. For LF, the team has developed a transmission model to predict the number of Mass Drug Administration (MDA) rounds required to achieve elimination and the impact of migration on elimination timelines. The group is also undertaking a study to assess the cost-effectiveness of various government interventions for the prevention and management of LF.

For VL, the team has built predictive models incorporating socio-economic, demographic, and environmental predictors, as well as spatio-temporal analyses and heatmaps to identify high-burden areas. A key focus has been determining, using model-based estimates, the threshold levels of post-kala-azar dermal leishmaniasis (PKDL) that can be maintained without triggering VL resurgence.

This matters because persistent PKDL cases remain a major driver of transmission even as overall case numbers decline. The team has also assessed the risk of VL resurgence in select blocks of Bihar and Jharkhand under different indoor residual spray scenarios. The team is also working towards improving model calibration by incorporating sandfly abundance data.

Furthermore, Prof. Mini Ghosh and her team work on VL-HIV coinfection, assessing the potential impact on VL resurgence, identifying key factors driving relapse and reinfection among coinfecting individuals, and analysing spatio-temporal patterns of HIV-VL coinfection using state-level surveillance data.