Read online

Newsletter Collaborating Platform for Epidemic Modelling and Data Analytics

Year 2025, Edition 2, 24 October 2025

Table of content

Funding Update & Next Steps

VWS has been unable to reinstate structural funding for pandemic preparedness, and therefore for the collaborative platform as well. The future of the platform remains uncertain. After the upcoming elections, the discussion about follow-up funding will resume.

Nevertheless we will continue with numerous activities in 2025 and 2026, such as workshops, and establishing a National Knowledge Agenda for Infectious Disease Modelling and Data Analytics. Activities in 2026 will be communicated in the next newsletter in Q1 of 2026.

Infectious Disease Models in Crisis Decision-Making: Roles, Pathways, and Realities in the Policy Arena

Workshop 12th December 2025

In this interactive workshop for infectious disease modellers and policymakers, we will explore how information needs, information exchange, and decision-making unfold during an infectious disease crisis, illustrated with recent examples. The session will provide an overview of the national crisis structure and highlight the roles of infectious disease modellers at RIVM, research institutes and in academia. We will also discuss the information needs of expert panels and policymakers that shape policy advice and development during an outbreak.

If you are interested and would like to receive an invitation to this workshop, please send an email to collabforepidememodatanalytics@rivm.nl.
Please note that spaces are limited.

Collaborating ZonMw-funded project: Real-time spatial data-driven modelling of infectious disease outbreaks

Project leader: Nelly Litvak (Eindhoven University of Technology)

Collaborating partners: RIVM, Utrecht University, UMC Utrecht, Leiden UMC, Tilburg University, and Eindhoven University of Technology
Programme: ZonMw Pandemic Preparedness

At the start of a pandemic, effective containment is urgent, and manpower is scarce. Therefore, it is crucial to know in advance which real-time data sources are most informative and how they can best be used in epidemiological models.

Our project aims to:

1. Integrate spatial real-time information on wastewater, mobility and contact behavior in epidemiological transmission models;
2. Identify which data sources and modelling approaches are most essential for accurate predictions at the start of a pandemic.

The project has three research lines.
Comparison of two spatial infectious disease transmission models
We compare agent-based and metapopulation models that both incorporate mobility between regions. The goal is to understand the relationship between their parameters so that they can enhance each other in nowcasting and scenario analysis. Since real-time mobility data are often difficult to obtain, incomplete, and inaccurate, we also investigate whether simpler mobility models, such as the gravity model, can already capture spatial patterns effectively.

Integration of wastewater loads in transmission models
At the start of a new outbreak, existing wastewater infrastructure can provide real-time information on the epidemic trajectory. However, forecasting based solely on viral load trends is challenging, as the underlying epidemiological dynamics are not explicitly modelled. Conversely, compartmental models struggle when pathogen characteristics, including shedding rates in wastewater, are still unknown. We work on integration of both approaches in a generalized profiling framework, that aims to produce short-term predictions during the early stages of a pandemic.

Framework for integration of several models and data sources
Current approaches to model initialization and parameter estimation differ from each other depending on which data source they use, e.g., self-reported risky behavior, hospitalizations, or wastewater data. We are developing a mathematical optimization framework to unify these different approaches. Most common machine learning methods such as regression can also be represented within this framework. This allows us to simultaneously optimize model design and fit the available data to these models.

Lessons learned
High-granularity data and complex models can be (partially) replaced by simpler models for some tasks/steps in predicting epidemiological growth and risk. This could be useful for incorporating different data sources in epidemic modelling and predictions.

Recent publications / code / presentations

- **Martijn H. H. Schoot Uiterkamp, Willian J. van Dijk, Hans Heesterbeek, Remco van der Hofstad, Jessica C. Kiefte-de Jong, Nelly Litvak** (2025+). Value of risk-contact data from digital contact

monitoring apps in infectious disease modelling. https://arxiv.org/abs/2503.21228. Code available at https://github.com/mhhschootuiterkamp/DCM-data-integration-in-SEIR-models

- **Wouter Hetebrij, Michiel van Boven, Deb Panja, Matthijs Romeijnders, Lotte Weedage**. Generalized profiling for wastewater-based epidemiology - Talk during EcoSta2025 https://www.cmstatistics.org/RegistrationsV2/EcoSta2025/viewSubmission.php?in=882&token=22sq94964p7p869r4r96404n97pn3855
- **Matthijs Romeijnders, Michiel van Boven and Deb Panja**. (2025+) Risk mapping novel respiratory pathogens with large-scale dynamic contact networks. In review.

Collaborating ZonMw-funded project: Modelling the interplay between TRansmission of (mis)informatioN and INfectious diseases (TRENDING)

Project leader: Dr. Janneke Heijne, GGD Amsterdam en Amsterdam UMC

Background and objective

The TRENDING project aims to increase our understanding of the interplay between infodemic (information) and pandemic (infection) transmission dynamics. While mathematical models have long supported public health decision-making, they rarely include the dynamics of (mis)information. This is important, as (mis)information can spread as rapidly as a virus and may undermine trust in public health measures or reduce adherence to interventions.

TRENDING bridges this gap by developing a mathematical model that links infection and (mis)information transmission. The model will be informed by real-life data collected during the project. It will help estimate how different infodemic management strategies could affect infection dynamics, providing new insights to strengthen both infodemic and pandemic preparedness.

Involved researchers and organisations

The TRENDING team bridges academia (Amsterdam UMC) and public health practice at the local (GGD Amsterdam), national (RIVM) and international (WHO) levels. The consortium also benefits from

communication expertise through the involvement of a science journalist. The project is carried out by Kirsten Bisschops (junior researcher) and Natcha Jitsuk (postdoctoral researcher).

Current status

A nationwide survey is currently being conducted among 1,600 Dutch residents aged 16 years and older. The survey collects data on demographics, psychological characteristics, information use (“infodiet”), and daily online and offline contacts. In addition, it includes a vignette-based experiment testing the effects of a graphical prebunking intervention on both accurate statements and misinformation.

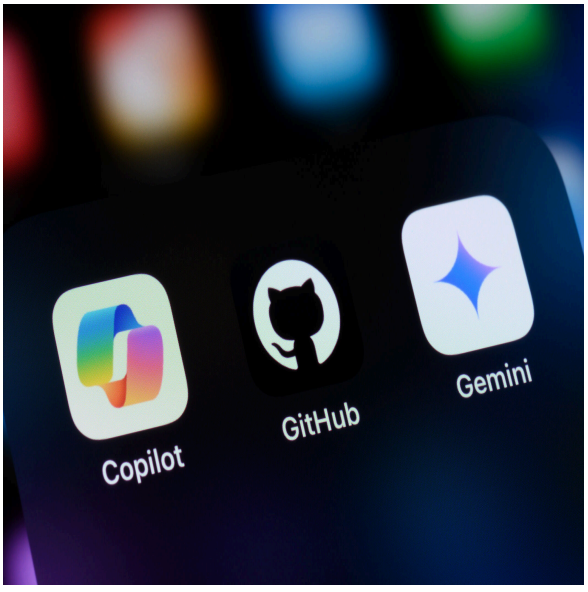
In parallel, we are developing a deterministic compartmental model simulating (mis)information and infectious disease transmission. The infection component is calibrated to the COVID-19 hospital admissions from July to December 2021. The (mis)information component will be informed by the survey data once analyses is complete. We are currently incorporating three possible infodemic management strategies whose impact on infection incidence will be compared: prebunking (proactive correction), curbing (limiting spread), and debunking (reactive correction).

Important insights

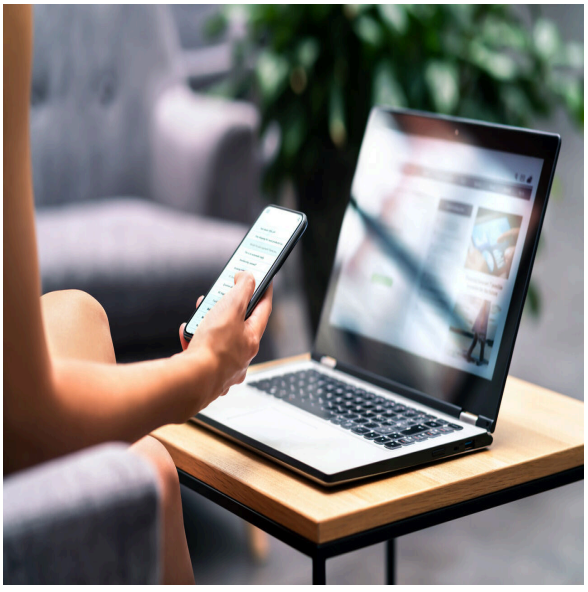
Preliminary analyses show that the timing of infodemic management interventions is crucial: prebunking is most effective in the early stages of a pandemic wave and has the potential to reduce the number of infections. Debunking initially has a smaller effect but becomes increasingly effective over time, though not to the same extent as prebunking. These findings highlight the importance of social listening to detect and address information gaps and misinformation at an early stage.

Recent publications

Not yet



GitHub Repository



Webpage

Check out our webpage, where you'll find detailed information about the Platform and its members.

Be sure to connect with us on our GitHub repository to share and access code. We will also be sharing educational material in the near future.

You can also find upcoming events, past newsletters, resources, and more.

Job Opening: Senior Modeller Infectious Diseases at RIVM

The Department for Infectious Disease Modelling at the Center for Infectious Disease Epidemiology and Surveillance (EPI) at RIVM is looking for an enthusiastic and highly motivated Senior Modeller. In this role, you will conduct research on the spread of infectious diseases, utilizing mathematical, statistical, and computational models to inform policy and response strategies.
If you have a strong background in infectious disease modelling and are eager to make a meaningful impact, we encourage you to apply. For more information and to submit your application, please visit this link.

The application deadline is November 17th, 2025.

Recent Publications

September 2025:

- **Backer, J. A., Klinkenberg, D., Miura, F., & Wallinga, J.** (2025). Estimating the effectiveness of non-pharmaceutical interventions against COVID-19 transmission in the Netherlands. PLOS Computational Biology, 21(9), e1013502. https://doi.org/10.1371/journal.pcbi.1013502

Upcoming Events

- **October 31, 2025:** Phaeton Project Workshop - Privacy-Preserving Pandemic Modeling, *TNO Leiden*
- **December 12, 2025:** Infectious Disease Models in Crisis Decision-Making: Roles, Pathways, and Realities in the Policy Arena, *VWS, The Hague*

Stay Updated: Share Our Newsletter with Your Colleagues!

Feel free to forward this newsletter to your colleagues or invite them to subscribe by contacting us at this email address: collabforepidememodatanalytics@rivm.nl. If you no longer wish to receive future newsletters, please let us know by emailing the same address.

National Institute for Public Health and the Environment Ministry of Health, Welfare and Sport
PO Box 1 I 3720 BA Bilthoven I The Netherlands

www.rivm.nl/en

More information:
collabforepidemodatanalytics@rivm.nl

RIVM privacy statement

The care for tomorrow starts now