VACCINE IMPACT
MODELLING CONSORTIUM

VIMC NEWSLETTER

November 2024

SUCCESSFUL CONCLUSION OF THE 2024 MATHEMATICAL MODELLING FOR VACCINE-PREVENTABLE DISEASES COURSE IN NAIROBI

Highlights from the recent course in Nairobi, focusing on advanced modelling techniques for vaccine-preventable diseases, are available on Pages 2-3.

MEET VIMC'S LATEST AFFILIATES

Get to know the newest members of our community! Learn more about VIMC's latest affiliates on Pages 4-6.

## REQUESTS FOR PROPOSALS: MENINGITIS MODELLING GROUP

We currently have an open call for proposals for the establishment of a Meningitis Modelling Group. For details on submission and requirements, see Page 7.

MEASLES ANALYTICS HUB - LAUNCH MEETING

Join us as we kick off the Measles Analytics Hub! Full details of the launch meeting are available on Page 9.

NEW VIMC PUBLICATIONS NOW AVAILABLE

Explore the latest research and publications from VIMC. Full details can be found on Page 8.
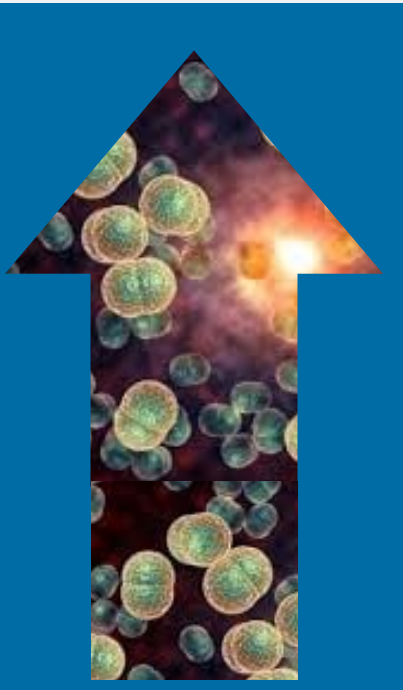
SHORT COURSE: MATHEMATICAL MODELLING FOR VACCINE-PREVENTABLE DISEASES

Nairobi, Kenya
9-15 September 2024

SUCCESSFUL CONCLUSION OF THE 2024 MATHEMATICAL MODELLING FOR VACCINE-PREVENTABLE DISEASES COURSE IN NAIROBI

We are pleased to report the successful conclusion of the 2024 intensive short course on **Mathematical Modelling for Vaccine-preventable Diseases,** hosted by the **Vaccine Impact Modelling Consortium (VIMC)** and the **Centre of Epidemiological Modelling and Analysis (CEMA)**. Held from **9-15 September in Nairobi**, Kenya, this transformative 6-day programme brought together participants from low- and middle-income countries, fostering a collaborative environment for learning and innovation.

A Week of Intensive Learning and Collaboration

The course was designed to equip participants with advanced skills in mathematical modelling, focusing on the dynamics of vaccine-preventable diseases. Through a carefully crafted blend of lectures, discussions, and hands-on practical sessions, attendees were able to deepen their understanding of the theoretical foundations of disease modelling while applying these concepts using the R programming language.

The week began with a refresher on calculus and an introduction to computer programming, setting a solid foundation for the more complex topics that followed. Participants, ranging from life scientists to public health professionals and medical or veterinary practitioners, engaged with topics such as infectious disease dynamics, vaccine impact assessment, and the application of these models in both human and animal health contexts.

Highlights from the Course

One of the standout features of the programme was the practical sessions, where participants were able to directly apply what they had learned.
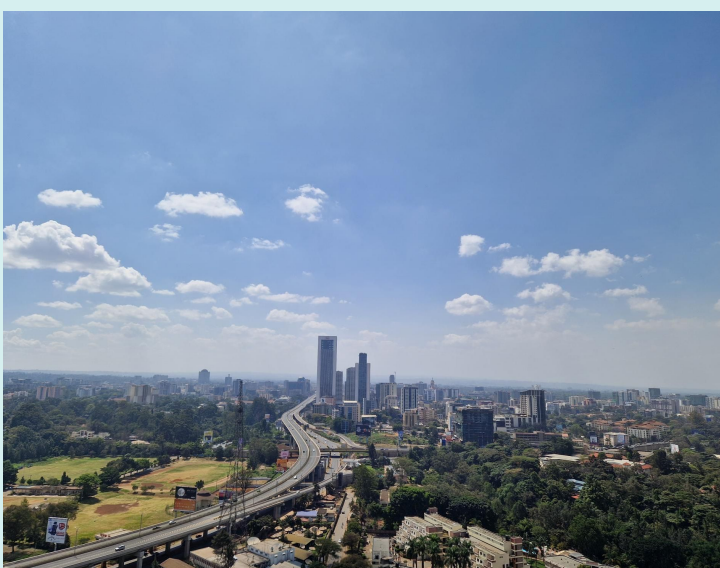
These sessions not only reinforced the theoretical concepts discussed in lectures but also provided a platform for participants to explore real-world scenarios using R. The course emphasized interactive learning, with participants working in groups to tackle challenging modelling problems, share insights, and develop solutions.

Guest lectures and panel discussions featuring experts in the field added depth to the course, offering participants unique insights into the latest research and trends in vaccine-preventable disease modelling. These sessions were particularly valuable in connecting the theoretical knowledge gained during the course with current global health challenges.

Participant Experience and Feedback

Feedback from participants was overwhelmingly positive. Many highlighted the course's practical orientation and the accessibility of the R programming language as key strengths. Participants also appreciated the opportunity to network with peers from diverse backgrounds and regions, which enriched their learning experience and opened up possibilities for future collaborations.

Acknowledgements

This course would not have been possible without the generous support of the Bill & Melinda Gates Foundation. Their commitment to building capacity in low- and middle-income countries is instrumental in the global effort to combat vaccine-preventable diseases.

We also extend our gratitude to the instructors, guest speakers, and all those who contributed to the success of the programme. Their expertise and dedication made this course a truly enriching experience for all involved.

Looking Ahead

As we celebrate the success of this year's course, we are excited about the future and confident that the skills and knowledge gained in Nairobi will significantly contribute to global efforts in controlling and preventing infectious diseases through vaccination. We encourage participants to stay connected and continue applying the methods learned, as together we can make a meaningful impact on global health. We look forward to seeing the positive outcomes from this shared learning experience and welcoming more participants in future editions.

MEET VIMC'S LATEST AFFILIATES

- Robinah Nalwanga
- Olumuyiwa James Peter
- Xiaozhen Lai
- Peixuan Zhang
- Sol Kim

VACCINE IMPACT MODELLING CONSORTIUM

Our affiliate scheme aligns with our goals to foster a diverse international community of vaccine impact modellers, and to provide training in infectious disease modelling. Affiliates benefit from opportunities to participate in webinars, submit abstracts for VIMC-wide meetings, and opportunities to be paired with another affiliate as a 'buddy'.

Apply to become a VIMC affiliate <u>here</u>.

VIMC affiliate scheme - application form

This form should be completed by the person applying to become an affiliate of <u>VIMC</u>, with input from the VIMC member who is nominating them (where applicable).

Affiliates should already have some link to VIMC and its work, and some experience of modelling. For example, they may have attended a VIMC short course, they may be PhD students or close collaborators of existing VIMC members, or they may have taken part in the VIMC fellowship scheme. Affiliates may be based in any country. In general, we expect affiliates to be based at a university, research institute, or global health organisation.

We will evaluate applications monthly on a rolling basis. The affiliate scheme will stay open throughout VIMC 2.0, so there is no application deadline.

VIMC may share the answers provided with other affiliates, VIMC members, and other key partners. (If there is specific information you prefer not to be shared, you can state this in the final section of this form.)

HOW DID YOU GET STARTED WORKING IN MATHEMATICAL MODELLING / EPIDEMIOLOGY?

During my undergraduate studies in statistics, I developed a passion for epidemiology. Pursuing a master's degree in Biostatistics, I focused on infectious disease modelling. Through coursework, research, and collaborations, I honed my skills in mathematical modelling and epidemiology. My master's project examined the impact of vaccination programs on COVID-19 dynamics in Africa, driven by a strong interest in vaccine research.

CAN YOU TELL US A BIT ABOUT YOUR CURRENT ROLE AND RESEARCH?

I am a PhD research fellow based at the MRC/UVRI & LSHTM Uganda Research Unit and registered at the London School of Hygiene and Tropical Medicine. My research, nested within the NIHR Vanguard project, focuses on developing a modeling framework to understand the interplay between biological, social, and structural determinants of vaccine impact. I aim to inform community-based strategies for optimizing vaccine impact among vulnerable communities in Uganda and Kenya.

"I aim to inform community-based strategies for optimizing vaccine impact among vulnerable communities in Uganda and Kenya."

ROBINAH NALWANGA

HOW DO YOU LIKE TO SPEND YOUR TIME OUTSIDE OF WORK?

In my free time, I enjoy engaging in diverse activities. I love exploring new destinations particularly traveling to game parks and forests, reading to stay informed, and engaging in physical exercise like swimming, jogging, and going to the gym. Additionally, I find pleasure in cooking various dishes, with a special love for baking chocolate cakes.

OLUMUYIWA JAMES PETER

CAN YOU TELL US A BIT ABOUT YOUR CURRENT ROLE AND RESEARCH?

I am a lecturer and researcher in the Department of Mathematical and Computer Sciences, with a joint appointment in Epidemiology and Biostatistics at the University of Medical Sciences, Ondo, Nigeria. Currently, I serve as the Acting Director of the Center for Data Science and Health Metrics. My research focuses on biomathematics, mathematical modeling of infectious diseases, and vaccine control strategies.

HOW DID YOU GET STARTED WORKING IN MATHEMATICAL MODELLING / EPIDEMIOLOGY?

I started working in mathematical modelling and epidemiology during my studies in applied mathematics. My interest in understanding disease dynamics led me to focus on infectious disease modelling, where I found a perfect intersection between mathematics and public health.

HOW DO YOU LIKE TO SPEND YOUR TIME OUTSIDE OF WORK?

Outside of work, I enjoy reading, exploring new technologies, and spending time with my family. I also find relaxation in outdoor activities and staying updated with advancements in both mathematics and epidemiology.

HOW DID YOU GET STARTED WORKING IN MATHEMATICAL MODELLING / EPIDEMIOLOGY?

In 2019, I had the opportunity to contribute to the Spn and Hib disease burden modelling and economic evaluation project in China, marking my initial foray into the field. That summer, I also enrolled in vaccinology and infectious disease modeling courses. This area has since become a primary focus of my research during my doctoral studies and beyond.

CAN YOU TELL US A BIT ABOUT YOUR CURRENT ROLE AND RESEARCH?

I am currently a postdoctoral researcher at the School of Public Health, Peking University, following my studies at Peking University and University of Oxford. My current research focuses on vaccine-preventable disease burden modeling, economic evaluation and related topics both within China and globally. The primary pathogens I study include Spn, influenza, RSV, and others.

XIAOZHEN LAI

HOW DO YOU LIKE TO SPEND YOUR TIME OUTSIDE OF WORK?

Outside of work, I enjoy relaxing by watching movies, hiking, or having small gatherings with friends. I am also actively involved in volunteer work and had the privilege of serving as a volunteer at the 2022 Beijing Winter Olympics.

PEIXUAN ZHANG

CAN YOU TELL US A BIT ABOUT YOUR CURRENT ROLE AND RESEARCH?

I am currently a PhD student at LSHTM, working on estimating the health and economic impact of HPV vaccination and cervical screening programmes in China and Ethiopia. I work with local health authorities and research institutes, aiming to provide timely evidence on the implementation of cervical cancer elimination strategies.

HOW DO YOU LIKE TO SPEND YOUR TIME OUTSIDE OF WORK?

I have been into working out, especially weightlifting, for several years. Since moving to London, I have also explored different kinds of activities like playing squash and watching musicals. Good coffee and food can always make my day.

HOW DID YOU GET STARTED WORKING IN MATHEMATICAL MODELLING / EPIDEMIOLOGY?

I first got into the epidemiology field during my undergraduate studies, where I used a simple models to predict the change in the disease burden of cardiovascular disease in Shandong province, China. Such experiences inspired me to learn more about how modelling studies can help inform decision-making.

HOW DID YOU GET STARTED WORKING IN MATHEMATICAL MODELLING / EPIDEMIOLOGY?

I began engaging more deeply in mathematical modelling during my PhD project on the Nipah virus. Previously, I worked on vaccine-related projects, focusing on the health economics side. While exploring economics and policy areas of global health, I realised mathematical modelling is a crucial tool in decision-making and wanted to develop these skills myself.

CAN YOU TELL US A BIT ABOUT YOUR CURRENT ROLE AND RESEARCH?

I am a PhD student at Nagasaki University and the London School of Hygiene & Tropical Medicine. My PhD project focuses on Nipah virus transmission modelling and vaccine impact modelling. My goal is to inform vaccine development decision-making and improve epidemic/pandemic preparedness.

SOL KIM

HOW DO YOU LIKE TO SPEND YOUR TIME OUTSIDE OF WORK?

In my free time, I enjoy relaxing by watching movies and immersing myself in different stories.

VACCINE IMPACT
MODELLING CONSORTIUM

RFP (REQUEST FOR PROPOSALS) FOR A MENINGITIS MODELLING GROUP

Request for Proposals: Meningitis Modelling Collaboration

The Vaccine Impact Modelling Consortium (VIMC) seeks to recruit one new group to evaluate the impact of meningitis A / MMCV in the 26 countries of the African meningitis belt. Applications from LMIC-based modelling groups will be given priority, with preference given to those in countries experiencing a high burden of meningitis.

This collaboration, funded by Gavi, the Vaccine Alliance, offers up to $73,000 per year in funding, with the new group joining from early 2025 through August 2027.

Eligibility Criteria

-Applicants must be based at a university or another academic/research institution.
-The Consortium anticipates that the lead institution is based in a low- or middle-income country, with the expectation that the majority of the budget will be allocated within an LMIC context. Preference will be given to groups in countries experiencing a high burden of meningitis.
-Prior modelling experience is essential; models must already be developed and in use.

VIMC is committed to fostering diversity, equality, and inclusion within the modelling community. We strongly encourage applications from groups underrepresented in the field, including female modellers in regions with a gender imbalance.

Scope of Work

The selected group will be responsible for providing age-disaggregated estimates of deaths, DALYs, and cases for 26 countries from 2000-2100, across various vaccine coverage scenarios. Central estimates as well as estimates of uncertainty will be required. Successful applicants will receive core funding and will be invited to join the VIMC Consortium as full members.

How to Apply

Full applications are due by **29 November 2024**, and should include:
 · A completed application form
 · Model documentation (e.g., a published paper or report)
 · Draft burden estimates for one pre-defined country
 · CVs for all applicants (max. 2 pages each)
 · A letter of support from the institution/department

Timeline

27 September 2024: RfP published
30 September 2024: Application period opens, with access to application forms and Montagu
29 November 2024: Application deadline
By 20 December 2024: Applicants informed of outcomes
January 2025: Subcontracts drafted

For further details, please visit our website at *vaccineimpact.org*. We look forward to receiving your application and welcoming a new partner to the consortium!

NEW VIMC PUBLICATIONS NOW AVAILABLE

We are excited to share that since our last newsletter, the Vaccine Impact Modelling Consortium (VIMC) has released 25 new publications—16 in 2023 and 9 so far in 2024.

These publications span a range of topics, offering fresh insights and advancements in vaccine impact modelling.

To explore and download the latest work from our researchers, please visit the **VIMC publications page**.

Thank you for your continued interest in our mission to improve global health outcomes through impactful research.

COVID-19 related disruption and resilience in immunisation activities in LMICs: a rapid review

Go to Publication

Year 2024
Disease / Focus COVID-19
Type Research articles
Region Global

Authors
Anna-Maria Hartner, Xiang Li, Katy Gaythorpe

Journal Details
BMJ Journals

Chikungunya seroprevalence, force of infection, and prevalence of chronic disability after infection in endemic and epidemic settings: a systematic review, meta-analysis, and modelling study.

Go to Publication

Year 2024
Disease / Focus Other
Type Research articles
Region Global

Authors
Kang H, Auzenbergs M, Clapham H, Maure C, Kim JH, Salje H, Taylor CG, Lim A, Clark A, Edmunds WJ, Sahastrabuddhe S, Brady OJ, Abbas K.

Journal Details
Lancet Infect Dis.

Yellow fever outbreak potential in Djibouti, Somalia and Yemen

Go to Publication

Year 2024
Disease / Focus Yellow Fever
Type Research articles
Region African Region (AFR)

Authors
Keith Fraser, Laurence Cibrelus, Jennifer Horton, Chiori Kodama, J. Erin Staples, Katy A. M. Gaythorpe

Journal Details
Pre-print - MedRxiv

Combining clinical and diagnostic surveillance to estimate the burden of measles disease: a modeling study

Go to Publication

Year 2024
Disease / Focus Measles
Type Research articles
Region Global

Authors
T.Leung, M.Ferrari

Journal Details
medRxiv pre-print

Efficacy, public health impact and optimal use of the Takeda dengue vaccine

Go to Publication

Year 2024
Disease / Focus Dengue
Type Research articles
Region Global

Authors
B.Cracknell Daniels, N.Ferguson, I.Dorigatti

Journal Details
medRxiv pre-print

The influence of biological, epidemiological, and treatment factors on the establishment and spread of drug-resistant Plasmodium falciparum

Go to Publication

Year 2024
Disease / Focus Malaria
Type Research articles
Region Global

Authors
Masserey T, Lee T, Golumbeanu M, Shattock AJ, Kelly SL, Hastings IM, Penny MA.

Journal Details
Elife

Estimating the health effects of COVID-19-related immunisation disruptions in 112 countries during 2020–30: a modelling study

Go to Publication

Year 2024
Disease / Focus All VIMC diseases
Type Research articles
Region Global

Authors
Hartner, Li et al.

Journal Details
The Lancet Global Health

MEASLES ANALYTICS HUB - LAUNCH MEETING

LAUNCH OF THE MEASLES ANALYTICS HUB: ADVANCING MEASLES MODELLING AND POLICY IMPACT

We are excited to announce the launch of the Measles Analytics Hub (MAH), a groundbreaking initiative aimed at enhancing the measles modelling ecosystem. Designed to improve communication and collaboration among modelers, policymakers, and stakeholders, MAH will deliver high-impact research that directly informs measles-related health policies. This new Hub is funded by the Bill & Melinda Gates Foundation as an extension to VIMC's existing grant, leveraging the Vaccine Impact Modelling Consortium's expertise to drive policy-relevant analytics and ensure the inclusion of modelers from low- and middle-income countries.

Located within the VIMC Secretariat at Imperial College London's White City campus, the Measles Analytics Hub will involve a global network of collaborators working towards a unified vision for measles control. Aligned with VIMC's focus on global and regional health issues, the Hub will additionally support specific high-impact, country-level, and sub-regional measles modelling efforts.

While the primary focus is on measles, research on rubella may also be considered within the Hub's scope, given the overlap and synergies between the two diseases.

By 2027, the Measles Analytics Hub is set to achieve several core goals:

- Effective Engagement: Establish a platform where measles modelers can actively engage in addressing key policy and programmatic questions.
- Diverse and Inclusive Membership: Cultivate a diverse and inclusive Hub, welcoming modelers from high-burden settings and supporting the development of early career researchers.
- Global Recognition: Become the leading international center for expertise in measles modeling, trusted by health policymakers and organizations worldwide.

We invite you to join us in celebrating this important launch! **The inaugural meeting for the Measles Analytics Hub** will take place on **Wednesday, 27 November**, from **2:00 to 3:30 pm UK time**.

This is a pivotal moment for the measles modelling community, and we look forward to building an inclusive and impactful Hub that contributes to lasting improvements in measles control and prevention efforts globally.

For any questions or queries, please reach out to us at the dedicated MAH email: **vimc-mah@imperial.ac.uk.**

Stay tuned for more updates as the Measles Analytics Hub grows and evolves. Updates and developments will be posted regularly on our **MAH page**. Together, we can make meaningful strides toward a world free of measles.