VACCINE IMPACT
MODELLING CONSORTIUM

VIMC NEWSLETTER
February 2025

IDM CONFERENCE, BANGKOK, 6-8 NOVEMBER 2024

⇒ Highlights and reflections from the IDM Conference held in Bangkok from 6–8 November 2024, featuring opinion pieces from VIMC attendees, are available on **Pages 2–6**.

NEW PWG SOP

⇒ An overview of the new PWG SOP, outlining updated guidelines and processes, is available on **Page 6**.

VIMC MODELLERS SHAPE GLOBAL RUBELLA VACCINATION POLICY

Insights from Emilia Vynnycky, Amy Kaye Winter, and Matthew Ferrari on influencing global rubella vaccination strategies. See **Page 8.**

VACCINOLOGY SYMPOSIUM IN NAGASAKI & HPV VACCINE WORKSHOP IN TUNIS

Insights from the Vaccinology Symposium and Short Course in Nagasaki, Japan (September 2024) by Kaja Abbas, and highlights from the Workshop on HPV Vaccine Introduction with Tunisian Policymakers by Slimane Ben Miled (Institut Pasteur of Tunisia, Tunis – 15 November 2024) are available on **Page 7**.

PRIORITY WORKSTREAMS FOR 2025: ADVANCING VACCINE IMPACT MODELLING

Introducing VIMC's new workstreams focused on vaccine impact assessment and health economics. See **Page 9**.

ESTIMATING VACCINE IMPACT WITH *VIMPACT*

A new cheat sheet covering installation, burden estimates, and impact calculations. See **Page 9**.

INFECTIOUS DISEASE MODELLING CONFERENCE

Bangkok, Thailand
6-8 November 2024

The **Infectious Disease Modelling Conference 2024**, held in **Bangkok, Thailand**, from **6–8 November**, brought together researchers, policymakers, and health professionals from across the globe to explore how modelling can shape effective public health policies.

With a strong focus on the needs of low- and middle-income countries (LMICs), the conference showcased cutting-edge methodologies, engaged decision-makers in evidence-based discussions, and highlighted strategies to strengthen local modelling capacity.

A key theme was **bridging the gap between research and implementation**, ensuring that models are not just theoretically robust but also actionable in diverse epidemiological and resource-constrained settings. Discussions also emphasised the **importance of equitable access to modelling tools**, so all countries—regardless of resources—can leverage advanced methodologies to inform public health responses.

VIMC was proud to support several members of our consortium through our travel fund, enabling them to attend this vital event. Attendees engaged with leading experts, shared insights from vaccine impact modelling, and gained valuable perspectives on the latest developments in infectious disease modelling.

In this edition, we are pleased to **share opinion pieces from some of the travel fund recipients**, offering their reflections on key sessions, emerging themes, and how these discussions can inform and enhance modelling efforts in their regions. Their insights reinforce VIMC's commitment to fostering collaboration, improving modelling capabilities, and ensuring that evidence-driven policy remains at the heart of global health decision-making.

We look forward to integrating these perspectives into our collective work and continuing to support efforts that make modelling more accessible, impactful, and globally inclusive.

All photos on pages 2-6 are official images provided by the IDM Conference Organising Committee.

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HAN FU

The IDM Conference was one of the first IDM-focused conferences in Asia, attracting many researchers based in the Asian and Pacific region.

One of the sessions showcased several local research networks, such as Modelling Infectious Diseases in South East Asia. I was impressed by the energy and dedication of these network coordinators in building capacity and connections for infectious disease modellers, especially for early-career researchers.

During our stay in Bangkok, Dr Kaja Abbas and I **visited the infectious disease modelling team led by Dr Wirichada Pan-ngum** at the **Mahidol Oxford Tropical Medicine Research Unit (MORU)**. The MORU site visit was a valuable experience — we had a fruitful discussion about research and training ideas with the MORU team, and both sides are keen to develop research projects together in the future.

Following **my presentation on using seroprevalence data to estimate measles transmissibility across settings**, I connected with fellow modellers working on measles at the conference. Despite being a small group among the conference attendees, we identified common research interests in modelling measles transmission and vaccination.

I also enjoyed several presentations related to vaccine modelling and epidemiology. The **keynote speech by Prof Marc Lipsitch**, Harvard University, highlighted the challenges in disentangling different mechanisms of vaccine protection and demonstrated how to approach them with various data, study designs, and simulation techniques. Other sessions on vaccine-preventable diseases covered a wide range of aspects, including vaccine impact estimation, implementation approaches, immunisation schedule planning, and cost-effectiveness analysis.

These presentations were particularly interesting because they **provided detailed analytical frameworks and methods and, at the same time, shared engagement and co-creation experiences with stakeholders.** I plan to apply some tips to facilitate communication with policy advisors in our project working group.

The IDM 2024 Conference provided great opportunities to share research findings, learn new knowledge, catch up with previous and current collaborators, and make new connections. I appreciate the support of the VIMC travel fund and look forward to the next conference!

The session was chaired by Kaja Abbas (LSHTM) and Yoonie Sim (WHO), and the presenters were Xiaozhen Lai (Peking University), Noriko Kitamura (NIID Japan), Slimane ben Miled (Institut Pasteur de Tunis), and Jong-Hoon Kim (International Vaccine Institute).

KAJA ABBAS

VIMC members and affiliates organised a session on '***Vaccine impact modelling to inform immunisation policy***' at the IDM Conference.

This session opened with an introduction to the Vaccine Impact Modelling Consortium. The presentations described the vaccine decision-making landscape in China, Japan, Tunisia, and low- and middle-income countries, highlighting the role of infectious disease modelling in informing vaccine policy decisions with specific case studies.

The case studies focused on:
(i) evidence, benefits, and priorities of adding new childhood vaccines into the National Immunisation Programme of China;
(ii) introduction of HPV (human papillomavirus) vaccines into the routine immunisation programme of Japan;
(iii) introduction of HPV vaccines into the routine immunisation programme for 12-year-old girls, along with cervical cancer screening for women starting at 38 years of age in Tunisia; and
(iv) impact modelling of cholera vaccination in low- and middle-income countries to inform resource allocation strategies.

The session ended with a discussion on the similarities and differences in the vaccine decision-making process and global perspectives on using vaccine impact modelling to inform immunisation policy.

SLIMANE BEN MILED

I had the honour of participating in the IDM Conference, where I presented research conducted at the Institut Pasteur of Tunis as part of the VIMC consortium.

My presentation, titled "***National Impact of HPV Vaccination and Screening in Tunisia: A Comparative Cost-Effectiveness Analysis for Optimal Health Outcomes***", showcased collaborative work with Dr Kaja Abbas.

Beyond sharing our findings, the conference provided an incredible opportunity to reconnect with colleagues and friends, exchange ideas, and engage in inspiring discussions.

It was truly an exceptional event that emphasised the power of collaboration and innovation in public health. The conference was very insightful.

XIANG LI

Attending the IDM Conference was an enriching and insightful experience, made possible through VIMC travel funding support. The conference brought together a diverse community of experts, fostering engaging discussions on innovative approaches and advancements in infectious disease modelling.

One of the key takeaways was the emphasis on **collaborative approaches to address real-world challenges in disease control and prevention**. The presentations and conversations highlighted the importance of integrating robust models with practical implementation strategies to improve health outcomes globally. It was particularly inspiring to see the shared commitment to tackling infectious diseases.

It was a pleasure to meet with modellers and other stakeholders collaborating with VIMC. I was truly honoured to see VIMC being highly acknowledged by the infectious disease modelling community. **The contributions of our VIMC Science and Policy Team were widely recognised and deeply appreciated**, which was both inspiring and rewarding.

Overall, the conference provided fresh perspectives that will undoubtedly influence and enhance my contributions within VIMC.

YANG LIU

Bangkok in November was a vibrant blend of warmth, sunshine, and energy. There are very few things that could have made this city more unforgettable at this time of year — attending the IDM Conference 2024 was one of them. The quality of the talks was exceptional, but as I reflect on the conference, **one aspect stands out above all: community**.

It is the global infectious disease modelling community that I am referring to. Through this community, I had the opportunity to **share our COVID-19 vaccine impact modelling efforts**, supported by the Vaccine Impact Modelling Consortium (VIMC). I received friendly and constructive feedback on the design and communication of our model and results from peers representing a wide range of countries and institutions.

Beyond academic exchange, I was immersed in a professional community where I could comfortably discuss work culture and career development with colleagues from diverse career stages. It was also inspiring to engage with a multi-disciplinary research community that is growing in its ability to connect effectively with a broader stakeholder community.

IDM 2024 served as a hub for these interactions, bringing together diverse voices to advance both theory and practice in infectious disease modelling. I highly recommend this conference to anyone interested in the field and am deeply grateful for the support from VIMC, which made my attendance possible.

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YOONIE SIM - TECHNICAL OFFICER, WHO

One of the highlights of my participation in the inaugural Infectious Disease Modelling (IDM) Conference 2024 was co-chairing an organised session titled "**Vaccine Impact Modelling to Inform Immunisation Policy**" with Professor Kaja Abbas. Through a series of compelling global and country case studies, the session sparked enriching discussions about the **crucial role of infectious disease modelling in shaping immunisation policy decisions**, particularly those related to vaccine introduction, prioritisation, and vaccination delivery strategies.

Additionally, I had the privilege of **presenting a poster** on the ongoing development of **WHO Guidance to Translate Modelling to Support Evidence-Informed Decision-Making for Immunisation**, developed by the Immunisation and Vaccines-Related Implementation Research Advisory Committee (IVIR-AC) sub-group. Over the course of the three-day poster session, I engaged in valuable discussions with participants about enhancing decision-maker capacity to effectively use and apply modelled evidence in immunisation decision-making. We also explored opportunities for future collaboration in providing training and ongoing support to decision-makers.

The conference offered an exceptional platform for deepening our understanding of the specific challenges faced by low- and middle-income countries (LMICs). It provided invaluable opportunities to build connections and collaborations aimed at increasing the policy relevance of modelling towards improved health outcomes and further impact in countries—key principles at the heart of VIMC 2.0.

NEW SOP FOR VIMC 2.0 PWGS

The VIMC is pleased to announce the release of a **new Standard Operating Procedure (SOP)** for its VIMC 2.0 Project Working Groups (PWGs).

Following the renewal of VIMC for the period 2022–2027 as VIMC 2.0, this SOP has been developed to ensure that the Consortium remains responsive to policy questions while maintaining high-quality, evidence-based model updates. The SOP is designed to promote impact, collaboration, consistency, quality, and efficiency in the formation and execution of PWGs, ensuring that research outputs can be effectively translated into real-world health benefits.

Key Objectives of the SOP:
• Ensure clarity and uniformity in the execution of PWG activities.

• Clearly define roles and responsibilities within working groups.
• Establish robust procedures for communication, data management, and reporting.
• Ensure compliance with ethical standards and regulatory requirements across all activities.

The full SOP document is now available on the VIMC website **here**.

If you have any questions or would like further information, please contact us at:
vimc@imperial.ac.uk

VACCINOLOGY SYMPOSIUM AND SHORT COURSE

NAGASAKI, JAPAN / SEPTEMBER 2024

By Kaja Abbas

The Symposium on Vaccinology: Science and Public Health was held on **23 September 2024** at **Nagasaki University Sakamoto Campus.** The event was co-hosted by the Strategic Center of Biomedical Advanced Vaccine Research and Development for Preparedness and Response (SCARDA) of the Japan Agency for Medical Research and Development (AMED), in collaboration with the Nagasaki University WISE Programme, the London School of Hygiene & Tropical Medicine (LSHTM), and the Vaccine Research and Development Center, Nagasaki University (VRDC).

Following the symposium, a four-day short course on vaccinology was conducted from 24 to 27 September 2024, providing a more in-depth exploration of key topics.

The symposium and short course covered a wide range of scientific and public health aspects of vaccinology, including **vaccine development, safety, modelling, and pandemic preparedness.** A total of **82 participants attended the symposium**, while 31 participants joined the short course.

Experts involved in vaccine and immunisation research, development, epidemiology, impact modelling, and policy-making delivered presentations, including contributions from members of the Vaccine Impact Modelling Consortium (VIMC).

The symposium presentations are accessible here, and the digest video can be viewed here.

WORKSHOP ON HPV VACCINE INTRODUCTION WITH TUNISIAN POLICYMAKERS

INSTITUT PASTEUR OF TUNISIA, TUNIS / 15 NOVEMBER 2024

By Slimane Ben Miled

In 2023, the **Laboratory of Biomathematics, Bioinformatics, and Biostatistics (BIMS)** at the **Institut Pasteur of Tunis**, as part of the VIMC, initiated a study on the introduction of HPV vaccination and prevention strategies in Tunisia, where cervical cancer represents a significant public health issue.

One year later, the BIMS laboratory presented the findings of this study. The research included a cost-effectiveness analysis of HPV vaccination strategies, a cost-effectiveness analysis of screening strategies, and a qualitative survey on perceptions of HPV vaccination.

To share these results, **a half-day scientific event** was held on **November 15, 2024, in Tunis**. The event brought together around 40 participants from diverse backgrounds, including representatives from **central directorates of the Ministry of Health; experts** (Technical Vaccination Committee, pathologists, health economists, public health specialists); representatives of scientific societies such as the **Tunisian Society of Gynecology and Obstetrics; UNICEF representatives; and modellers**.

This meeting generated significant interest and led to rich and constructive discussions.

It also supported decision-makers in determining the appropriate vaccine to deploy, the target population, and the communication strategy to adopt.

This initiative represents an important milestone in the fight against cervical cancer in Tunisia and demonstrates a collective commitment to improving public health in the country.

VIMC MODELLERS HELP TO INFLUENCE GLOBAL RUBELLA VACCINATION POLICY

By Emilia Vynnycky, Amy Kaye Winter & Matthew Ferrari

VIMC modellers recently carried out important work which was influential in changing global rubella vaccination policy and which could, potentially, lead to the eventual elimination of rubella.

Since 2000, the World Health Organization (WHO) has recommended a minimum level of 80% coverage for rubella vaccination (1). Whilst rubella is a mild infection, infection during pregnancy carries a risk that the child is born with Congenital Rubella Syndrome (CRS), which is associated with severe disability, including developmental delay, heart defects, cataracts, and deafness. The WHO guidelines in place were designed to prevent potential increases in the burden of CRS which might occur if vaccine coverage is too low. For example, rubella vaccination prevents infection, and the reduced transmission in a population that occurs after vaccination is introduced leads to an increased average age at infection. If the vaccination coverage in the population is too low, a so-called "paradoxical effect" might occur, with increases in the number of infections among unvaccinated women of childbearing age and, potentially, an increase in the burden of CRS.

With high levels of rubella vaccine coverage, **the global burden of CRS decreased from approximately 100,000 in 2010 to 32,000 by 2019** (2), and by early 2024, only 19 countries had not yet introduced rubella vaccination. Further decreases in the burden of CRS, and perhaps the eventual elimination of rubella, could occur if rubella vaccination were introduced in these countries. However, attaining 80% rubella vaccination coverage, as required by WHO guidelines, is not straightforward for these countries, since rubella-containing vaccine is typically given with the first dose of measles vaccine (MCV1), and the MCV1 coverage for these countries was not always 80%. On the other hand, the introduction of rubella vaccine could be possible in these countries if the 80% coverage threshold were relaxed.

In collaboration with colleagues from the US Centers for Disease Control (CDC), WHO, and with additional funding from Gavi, in the summer of 2024, **VIMC modelling teams explored whether the guidelines could be relaxed for the countries which had not yet introduced rubella vaccination by 2024.** Some suggestion that the WHO guidelines could be relaxed had come from evidence on the

transmissibility (R0) of rubella, which has emerged since 2000.

The 80% coverage threshold in WHO recommendations assumed high values (>8) for R0. Since those guidelines were written, estimates – including those from VIMC modellers (3,4) – have indicated that R0 was somewhat lower in settings that had not yet introduced rubella vaccination by 2024 than was previously thought.

Building on these findings, **two modelling groups** (Amy Winter at the University of Georgia and Emilia Vynnycky and Timos Papadopoulos at the UK Health Security Agency) **generated predictions of the CRS incidence for the next 30 years from their models for each of the 19 countries for 18 vaccination scenarios**. The scenarios included combinations of wide and narrow age introductory and follow-up campaigns, routine coverage, and different levels of coverage. The models took account of differences in the epidemiology and plausible R0 values for rubella in each country and also included importations. The huge volume of output was processed by VIMC modeller at Penn State (Matt Ferrari) and Kurt Frey at the Institute of Disease Modelling. The findings from both modelling groups were compelling: all introduction scenarios were projected to lead to significant reductions in the CRS incidence over 10–15 years and net reductions over 30 years.

In the final stage of the work, the modelling findings were **presented to the Strategic Advisory Group of Experts on Immunization (SAGE) at WHO on 24th September 2024.** This group comprises 12–15 international experts who are tasked with advising WHO on overall global policies and strategies for all vaccine-preventable diseases. After reviewing the modelling evidence and hearing talks from CDC and WHO regional representatives on the feasibility of rubella vaccine introduction, **SAGE reached their landmark recommendation: to remove the 80% coverage threshold for the remaining countries yet to introduce rubella vaccination.** At the same time, they reinforced the importance of existing policy for follow-up campaigns, an introductory wide age range campaign, and ongoing monitoring. This historic decision paves the way for future reductions in the CRS burden and, once all countries have introduced rubella vaccination and have sufficiently high sustained coverage, **the elimination of rubella could one day be possible.**

INTRODUCING VIMC'S NEW WORKSTREAMS

PRIORITY WORKSTREAMS FOR 2025: ADVANCING VACCINE IMPACT MODELLING AND HEALTH ECONOMICS

We are pleased to announce the **launch of four new workstreams introduced by VIMC in 2025**, designed to advance modelling efforts in key areas critical to vaccine impact assessment and health economic evaluation for Years 3–5. Guided by input from funder and stakeholder discussions, these workstreams have been carefully selected as priority areas of focus for VIMC. They **reflect strategic directions that will shape future modelling activities and strengthen the use of evidence-based decision-making in global health**.

These workstreams aim to address some of the most pressing challenges in vaccine impact modelling, including enhancing the utility of country-level impact estimates, supporting recovery from immunisation disruptions, expanding outbreak response frameworks, and integrating health-economic considerations into vaccination strategies. By advancing research and collaboration in these areas, VIMC seeks to generate insights that will support effective policymaking and resource allocation in global vaccination efforts.

1. Vaccine Prioritisation and Greater Use of Country Impact Estimates

Exploring the use of VIMC's country-level impact estimates to inform vaccine prioritisation decisions, addressing increasing stakeholder interest despite capacity constraints at the country level.

2. Impact of Catch-Up Vaccination Efforts

Assessing the health impact of catch-up vaccination strategies for children beyond infancy, supporting global initiatives like the Big Catch-Up and guiding future investment decisions.

3. Expanding Outbreak Vaccine Response Impact Framework

Enhancing existing outbreak response frameworks by refining metrics, incorporating outbreak prediction, and balancing preventive and reactive vaccination efforts.

4. Supporting Health Economic Modelling

Exploring how VIMC can strengthen health-economic modelling of vaccination through targeted projects, training, and potential collaborations to support evidence-based resource allocation.

Opportunities for Modeller Engagement

We warmly invite you to get involved. If you are interested in participating in or learning more about any of these workstreams, please complete this short **Google Form** to express your interest.

Your engagement will be invaluable in shaping the future direction of our collective work.

ESTIMATING VACCINE IMPACT WITH VIMPACT

The **VIMC Science and Policy Team** have created a **cheat sheet for the *vimpact* package**, which provides functions to load datasets and quantify vaccination impact in terms of cases, deaths, and DALYs averted.

It covers:
I. **Installation**
II. **Reading burden estimates**
III. **Calculating impact estimates**

The cheat sheet is available on the VIMC website, providing a quick and accessible reference for modellers.

It can be viewed **here**.