

Innovation and Equity: Shaping the Future of Typhoid and Other Invasive Salmonellosis

Agenda

Tuesday, March 24

07:00-08:30

Registration

8:30-08:40

Welcome Remarks

Rebecca Martin, Sabin Vaccine Institute, USA

08:40-09:00

Opening Keynote Address

Denise Garrett, Sabin Vaccine Institute, USA

09:00-10:00

From Trials to Triumph: Implementation and Real-World Impact of Vaccination

Plenary session moderated by:

Kirsten Vannice, Gates Foundation, USA

Eileen Quinn, PATH, USA

- **Innovating for Equity: The Real-World Success of Typhoid Conjugate Vaccines in Endemic Settings.**
Matthew Laurens, University of Maryland, USA
- **Early Signals of Changing Typhoid Trends in Bangladesh After TCV Introduction**
Senjuti Saha, Child Health Research Foundation, Bangladesh
- **Assessing the Impact of Typhoid Conjugate Vaccine Introduction in Burkina Faso: Early Signals from Ileal Perforation Surveillance**
Lady Rosny Wandji Nana, Université Joseph KI-ZERBO, Burkina Faso
- **The Journey to Impact: Reaching 150 Million Children with TCV Campaign in Seven Years**
Emmanuel Mugisha, PATH, Uganda

10:00-10:30

Coffee Break

Poster Viewing

10:30-12:30

The Power of Protection: Real-World Vaccine Performance

Oral abstract session moderated by:

Shruti Murthy, University of Otago, New Zealand

Isaac Bogoch, University of Toronto, Canada

- **Effectiveness of the TYPHIBEV® (Vi-CRM197 conjugate) Vaccine Introduction in Nepal: A Test-Negative, Case-Control Study**
Dipesh Tamrakar, Dhulikhel Hospital, Kathmandu University Hospital, Nepal

- Assessing the Long-Term Protection of Typhoid Conjugate Vaccine among Bangladeshi Children: Evidence from a Cluster Randomised Trial
Farhana Khanam, icddr,b, Bangladesh
- Immunogenicity of a Heterologous Typhoid Conjugate Vaccine Booster with Different Dosing Intervals in Nepali Children: An Observational Study
Huma Subhani, Patan Academy of Health Sciences, Nepal
- Medium-Term Effectiveness of Typhoid Conjugate Vaccine in Nepal: Evidence from TyVAC and TyVOID study
Shrijana Shrestha, Patan Academy of Health Sciences, Nepal
- Antibody Response and Safety After Booster Vaccination with Heterologous Typhoid Conjugate Vaccine 5–6 Years After Primary Vaccination in Burkinabe Children
Jean Sawadogo, Groupe de Recherche Action en Santé, Burkina Faso
- From Crisis to Control: A Study of Typhoid Conjugate Vaccine Impact in Harare, Zimbabwe (2017–2024)
Talent Bvochora-Mudavanhu, Harare City Health Department, Zimbabwe
- Two Year Outcome of an Island-Wide Typhoid Vaccination Campaign in the Northern Division of Fiji
Alumita Vuakanisakea, International Vaccine Institute (Ty-Five Project), Fiji
- Evaluating the Impact of Typhoid Conjugate Vaccine Introduction on Typhoid Burden in Pakistan
Farah Naz Qamar, Aga Khan University, Pakistan

12:30-14:00

Lunch

13:00-14:00

Tackling Invasive Non-Typhoidal Salmonella in Africa: Integrating Genomics, Epidemiology, and One Health Strategies for Sustainable Antimicrobial Resistance and Disease Control

Lunchtime workshop chaired by:

Melita Gordon, University of Liverpool, UK

John Crump, University of Otago, New Zealand

- Carriage and Shedding of MDR iNTS Strains in Kenyan Children: Genomic Characterization and Vaccine Implications
Kelvin Kering, Kenya Medical Research Institute, Kenya
- Longitudinal High-Resolution Household Transmission Dynamics and Latent Infection Modelling of NTS in Malawi
Peter Johnston, University of Liverpool/Malawi Liverpool Wellcome Research Programme, UK
- Genomic And Metagenomic Insights into Environmental Reservoirs of Nontyphoidal *Salmonella* Among Children in a Disease-Endemic, Resource-Challenged Setting
Collins Kebenei, Kenya Medical Research Institute, Kenya
- Leveraging Sero-Epidemiological and Functional Immunological Findings from Four Contrasting African Site Cohorts to Understand iNTS Exposure and Protection
Helen Dale, University of Edinburgh, Scotland

Panel Discussion

- *Megan Carey, MMGH Consulting, Netherlands*
- *Tonney Nyirenda, Kamuzu University of Health Sciences, Malawi*
- *Octavie Lunguya, Institute Nationale de Recherche Biomedicale, DRC*

14:00-15:30	<p>Turning the Tide on Typhoid: TCV Introduction and Impact</p> <p>Symposium moderated by: Emmanuel Mugisha, PATH, Uganda Farah Qamar, Aga Khan University, Pakistan</p> <ul style="list-style-type: none"> • Mobilizing Momentum: How Burkina Faso Reached 10 Million Children in Seven Days <i>Eric Nebie, PATH, Burkina Faso</i> • Equity and Complexity: School-Based Vaccination During the MR/TCV Campaign in Kenya <i>Rose Jalang'o, National Vaccine & Immunization Program, Kenya</i> • Equity at Scale: Bangladesh's Road to Reaching More Than 40 Million Children With TCV <i>Muhibul Kashem, PATH, Bangladesh</i> • Vaccines of Equity: Reaching an Extended Age Cohort with TCV and MMCV In Niger <i>Rachidou Souley, Ministry of Public Health, Population, and Social Affairs, Niger</i> • Impact of TCV on Antimicrobial Use among Suspected Typhoid Fever Patients in Pakistan <i>Megan Carey, MMGH Consulting, Netherlands</i> • Modelling the Initial Impact and Predicted Future Benefits of TCV in Pakistan <i>Alicia N. M. Kraay, Institute for Disease Modelling/Gates Foundation, USA</i>
15:30-16:00	<p>Coffee Break</p> <p>Poster Viewing</p>
16:00-17:30	<p>Keeping a Watchful Eye: Surveillance and Burden of Disease</p> <p>Oral abstract session moderated by: Ali Carter, Sabin Vaccine Institute, USA Ana Belen Ibarz Pavon, World Health Organization, Switzerland</p> <ul style="list-style-type: none"> • Environmental Surveillance to Complement Clinical Surveillance in the Context of TCV Introduction in the Northern Division of Fiji <i>Raphael Zellweger, International Vaccine Institute, South Korea</i> • Using Population-based and School-Based Rapid Serosurveys to Characterize Geographic and Age Variability of Enteric Fever Burden in Pakistan <i>Mehreen Adnan, University of Oxford, UK</i> • Seroepidemiology and Serum Bactericidal Activity of IgG Antibodies to Non-Typhoidal <i>Salmonella</i> in Healthy Children in Mukuru Informal Settlement in Kenya <i>Schola Kamwethya, Kenya Medical Research Institute, Kenya</i> • Leveraging Multiplex Bead-Based Immunoassays to Identify Undiagnosed Enteric Fever: A Prospective, Hospital-Based Fever Study in Rural South and Southeast Asia <i>Sophie Kang, Mahidol Oxford Tropical Medicine Research Unit, Thailand</i> • A Machine Learning Approach to Defining and Predicting the Scale of Typhoid Fever Outbreaks <i>Zean Pithawala, Yale University, USA</i> • Post-Operative Complications and Mortality of Typhoid Intestinal Perforation: A Systematic Review and Meta-Analysis <i>Shruti Murthy, University of Otago, New Zealand</i>
17:30-19:30	<p>Evening Reception</p>

Wednesday, March 25

07:30-08:30

Use Case for TCV-Paratyphoid and TCV-MenACWYX Combination Vaccines

Sunrise workshop chaired by:

Muhibul Kashem, PATH, Bangladesh

National stakeholders are invited to discuss how they would assess potential TCV combination vaccines for their needs.

TCV Combination Vaccines, and Public Health and Market Opportunity Analysis

Farzana Muhib, PATH, USA

8:30-9:30

No Silver Bullets: Integrating AMR, WASH, and Climate

Plenary session moderated by:

Sophia Wang, Wellcome Trust, UK

Ellis Owusu-Dabo, Kwame Nkrumah University of Science & Technology, Ghana

- **Genomic Insights into Antimicrobial Resistant Typhoid: Implications for Prevention and Control**
Zoe Dyson, London School of Hygiene and Tropical Medicine, UK
- **Microbial Forecasting: How Do We Predict the Impacts of Climate Change on Typhoid Fever?**
Ginny Pitzer, Yale University, USA
- **From Water to Wastewater: Integrating Infrastructure and Surveillance for AMR and Typhoid Control**
Erica Fuhrmeister, University of Washington, USA
- **The Long View on Typhoid: Historical Paradigms and the Future of Integrated Prevention**
Jason Andrews, Stanford University, USA

9:30-10:00

Coffee Break

Poster Viewing

10:00-11:30

Informing Equitable and Impactful Typhoid Vaccine Distribution through Environmental and Serological Surveillance

Symposium chaired by:

Nicholas Grassly, Imperial College London, UK

Jessica Seidman, Sabin Vaccine Institute, USA

- **Expanding Seroincidence Estimation Across Settings: Methodological Insights from IgA and IgG Antibody Kinetics**
Kristen Aiemjoy, UC Davis, USA & Mahidol University Faculty of Tropical Medicine, Thailand
- **Integrating Seroepidemiologic Data into Global Enteric Fever Burden Models for TCV Decision-Making**
Zean Pithawala, Yale School of Public Health, USA
- **Assessing Enteric Fever Seroincidence Following TCV Introduction**
James Meiring, University of Liverpool, UK
- **Durability of Typhoid Vaccine Impact Following an Initial Campaign in Vellore, India: Evidence from Environmental Surveillance**
Venkata Mohan Raghava, Christian Medical College, Vellore, India
- **Early Detection of Emerging Salmonella Typhi Genotypes in Nigeria Using Environmental Surveillance**

Veronica Ogunleye, University of Ibadan, Nigeria

- Scaling Typhoid Environmental Surveillance to the National Level in Ghana
Michael Owusu, Kwame Nkrumah University of Science & Technology, Ghana

11:30-13:00

Evolution in Action: Genomics and Resistance

Oral abstract session moderated by:

Yogesh Hooda, Child Health Research Foundation, Bangladesh

Megan Carey, MMGH Consulting, Netherlands

- Global Phylogeographic Analysis of the Emergence and Spread of Antimicrobial Resistant Typhoid
Zoe Anne Dyson, London School of Hygiene and Tropical Medicine, UK
- Emergence And Circulation of Ceftriaxone-Resistant *Salmonella* Typhi 4.3.1.2.B1 Strain in Bangladesh
Yogesh Hooda, Child Health Research Foundation, Bangladesh
- Antimicrobial Resistance, Genetic Adaptations and Biofilm Formation in *Salmonella* Typhi Isolates from Asymptomatic Carriers
Peter Muturi, Kenya Medical Research Institute, Kenya
- An updated population structure and nomenclature of invasive *Salmonella* Typhimurium Ine Hoeben, University of Antwerp, Belgium
- Integrated Genomic, Epidemiologic, and Phenotypic Investigation of XDR *Salmonella* Isangi in Malawi and South Africa
Peter Johnston, University of Liverpool, UK
- AmpliconTyper – Tool for Analysing ONT Multiplex PCR Data from Environmental and Other Complex Samples
Anton Spadar, London School of Hygiene and Tropical Medicine, UK

13:00-14:30

Lunch

13:30-14:30

Shaping the Future of Enteric Fever Treatment Trials: Populations, Outcomes, and Priorities

Lunchtime workshop chaired by:

Megan Carey, MMGH Consulting, Netherlands

Christopher Parry, University of Oxford, UK

- Overview of Global Antimicrobial Resistance and Introduction to Session Format and Objectives
Megan Carey, MMGH Consulting, Netherlands
- Defining the Key Questions for The Next Generation of Randomized Controlled Treatment Trials for Typhoid Fever
Christopher Parry, University of Oxford, UK
- Identifying Regional Treatment Challenges and Trial Priorities for Typhoid Fever in India
Priscilla Rupali, Christian Medical College, Vellore, India
- Identifying Regional Treatment Challenges and Trial Priorities for Typhoid Fever in Kenya
Collins Kebenei and Kelvin Kering, Kenya Medical Research Institute, Kenya
- Identifying Regional Treatment Challenges and Trial Priorities for Typhoid Fever in Pakistan
Farah Naz Qamar, Aga Khan University, Pakistan
- Identifying Regional Treatment Challenges and Trial Priorities for Typhoid Fever in Malawi
James Meiring, University of Liverpool/Malawi Liverpool Wellcome Research Programme, UK

14:30-16:00

Correlates of Protection for Vaccine Development

Symposium chaired by:

Malick Gibani, Imperial College London, UK

Maheshi Ramasamy, Oxford Vaccine Group, UK

Xinxue Liu, Oxford Vaccine Group, UK

- Defining the Correlate of Protection for Typhoid Conjugate Vaccine Using Three-Stage Bayesian Modelling
Yiyuan Zhang, Oxford Vaccine Group, UK
- Identifying Immunological Correlates of Protection from a Vaccine Controlled Human Infection Model of *Salmonella* Paratyphi A
Naina McCann, Oxford Vaccine Group, UK
- Establishing a Controlled Human Infection Model of *Salmonella* Paratyphi A in an Endemic Setting
Saba Siddiqui, Aga Khan University, Pakistan
- Using GMMA Vaccines to Identify Mechanisms of Protection against iNTS
Leila Godfrey, University of Oxford, UK
- Establishing Correlates of Immunity from Naturally Exposed Populations
Agness Lakudzala, Malawi Liverpool Wellcome Research Programme, Malawi
- Using Human Challenge Models to Define Correlates of Protection against *Salmonella* Typhimurium
Anna Rydlova, Imperial College London, UK

16:00-16:30

Coffee Break

Poster Viewing

16:30-18:00

From Bench to Breakthrough: Immunology & Vaccine Development

Oral abstract session moderated by:

Krishna Mohan, Bharat Biotech International, India

Shailesh Mehta, GSK Vaccines, Belgium

- Safety And Immunogenicity Results of a Phase I Clinical Trial of Bivalent Typhoid and Paratyphoid A Conjugate Vaccine in Healthy Indian Adult Participants
Pavankumar Daultani, Zyodus Lifesciences Ltd., India
- Results from a Phase1/2a RCT to Evaluate the Safety & Immunogenicity of a Trivalent Vaccine Against iNTS & Typhoid in Healthy European and African Adults
Yasir Shitu Isa, GSK Vaccines Institute for Global Health, Italy
- Phase 2 Trial in Sub-Saharan Africa to Assess the Safety and Immunogenicity of a Trivalent *Salmonella* Conjugate Vaccine (TSCV)
Wilbur Chen, University of Maryland School of Medicine, USA
- A Phase 2/3 Experience to Assess the Safety and Immunogenicity of a Bivalent Typhoid - Paratyphoid A Vaccine in India and Kenya
Sanket Gaidhane, Serum Institute of India, India
- Humoral Mechanisms by which Asymptomatic Malaria Exposures in the Community May Attenuate Naturally Acquired Immunity Against iNTS Disease in Malawian Children
Agness Ethel Lakudzala, Malawi Liverpool Wellcome Research Programme, Malawi
- Novel *Salmonella* T Cell Antigens Have the Dual Potential as Vaccine Candidates and Immune-Based Surveillance Tools
Nancy Wang, Murdoch Children's Research Institute, Australia

7:30-8:30

Vaccine Schedule Modelling

Sunrise symposium chaired by:

Catherine Wenger and Virginia Pitzer, Yale University, USA

Megan Carey, MMGH Consulting, Netherlands

- Models for the Transmission Dynamics of Typhoid Fever
Kyra Grantz, Institute for Disease Modeling/Gates Foundation, USA
- Real-World Data to Calibrate Vaccine Effectiveness and Duration of Protection
Alina Muellenmeister, Burnet Institute, Australia
- Cost-Effectiveness Analysis: Parameter Identification in Light of Data Gaps
Tigist Menkir, Stanford University, USA
- Comparative Insights: Synthesizing Findings and Identifying Key Sources of Uncertainty
Catherine Wenger, Yale School of Public Health, USA
- Panel Discussion: Implications of Models for Informing Vaccine Recommendations
Firdausi Qadri, icddr,b, Bangladesh
Farah Qamar, Aga Khan University, Pakistan
Jacob John, Christian Medical College, Vellore, India

8:30-9:30

Next-Generation Tools and Innovation: Advancing Diagnostics, Vaccines, and Surveillance

Plenary session moderated by:

Supriya Kumar, Gates Foundation, USA

John Crump, University of Otago, New Zealand

- Vaccine Innovation for Salmonella: Combination Strategies and Pipeline Developments
Annelies Wilder-Smith, World Health Organization, Switzerland
- Typhoid Laboratory Diagnosis and Surveillance: Current Technologies, Critical Gaps, and WHO Target Product Profiles
Musa Hindiyeh, World Health Organization, Israel
- Innovations in Seroepidemiology: Current Landscape and Strategic Opportunities
Richelle Charles, Harvard University, USA
- Typhoid Environmental Surveillance: From Innovation to Impact
Nick Grassly, Imperial College London, UK

9:30-10:00

Coffee Break

Poster Viewing

10:00-12:00

Evidence that Moves Policy: Getting to Impact

Oral abstract session moderated by:

Farhana Khanam, icddr,b, Bangladesh

James Meiring, University of Liverpool, UK

- An Evaluation of Public Knowledge, Attitudes and Prevention Practices Relating to Typhoid Disease in High-Risk Urban and Peri-Urban Areas of Lilongwe, Malawi
Adriano Lubanga, Clinical Research and Education Management Services, Malawi
- Empowering Community Health Volunteers to Strengthen Typhoid Prevention and Immunization Readiness in Nairobi's Informal Settlements
Julia Macharia, Community Health Volunteer CBO, Kenya

- **Breaking Barriers: How Local Solutions in Refugee Settlements Triumph Over TCV Vaccine Hesitancy and Shatter Myths**
Zahara Nahumuza, International University of Africa, Uganda
- **From Vaccine Development to Policy Research and Implementation: WHO-Led Efforts to Combat Invasive *Salmonella* Disease**
Ana Belen Ibarz Pavon, World Health Organization, Switzerland
- **Antibiotic Treatment for Enteric Fever in Controlled Human Infection Models (CHIM) at the Oxford Vaccine Group**
Margarete Paganotti Vicentine, University of Oxford, UK
- **Cost-Effectiveness Analysis of Introduction of Typhoid Conjugate Vaccine into Indonesia's National Immunisation Program**
Jonathan Hasian Haposan, Universitas Gadjah Mada, Indonesia
- **Using Anti-Vi IgG and Machine Learning to Infer Typhoid Conjugate Vaccine Coverage after the Malawi National TCV campaign**
James Jafali, Malawi Liverpool Wellcome Research Programme, Malawi
- **Kenya's Typhoid Conjugate Vaccine Roll-out: Early Achievements, Impact, and Implications for Antimicrobial Resistance Control**
Melanie Abongo, Kenya Medical Research Institute, Kenya

12:00-13:00	Lunch
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13:00-14:30	<p>Late Breakers</p> <p>Oral abstract session moderated by: Julie Bines, Murdoch Children's Research Institute, Australia Kristen Aiemjoy, UC Davis, USA & Mahidol University Faculty of Tropical Medicine, Thailand</p> <ul style="list-style-type: none"> • Safety and Immunogenicity of a Bivalent Typhoid and Paratyphoid A Conjugate Vaccine in Healthy Indian Adults: Randomized, Open-Label, Multicenter Phase I Trial <i>Subhash Thuluva, Biological E. Limited, India</i> • Predicting <i>Salmonella</i> Typhi Incidence Using Prevalence Metrics from Sentinel Studies of Community-Onset Bloodstream Infections <i>Nienke Hagedoorn, University of Otago, New Zealand</i> • The Impact of the Malawi National Introduction Campaign for Typhoid Conjugate Vaccine on Blood Culture-Proven Typhoid Fever Incidence - MITIMA Study Results <i>Priyanka Patel, Malawi Liverpool Wellcome Research Programme, Malawi</i> • Diagnostic Accuracy of Anti-HlyE and LPS Antibodies in Typhoid Intestinal Perforation <i>Richelle Charles, Harvard University, United States</i> • Epidemiological Trends of Enteric Fever Following Typhoid Conjugate Vaccination Campaigns in Bangladesh, Nepal and Pakistan <i>Oisin Hennigan, Dublin City University, Ireland</i> • Age Distribution of Typhoid Fever, Paratyphoid Fever, and Non-Typhoidal <i>Salmonella</i> Invasive Disease <i>Rabab Batool, University of Otago, New Zealand</i>
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14:30-15:00	<p>Coffee Break</p> <p><i>Poster Viewing</i></p>
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15:00-15:10 **Poster Awards**

15:10-16:00 **Sustaining Momentum and Scaling Impact Against Typhoid and iNTS**
Discussion panel moderated by:
Andrew Pollard, Oxford Vaccine Group, UK

16:00-16:20 **Closing Keynote Address**
Rebecca Martin, Sabin Vaccine Institute, USA

16:20-16:25 **Adjourn**
Denise Garrett, Sabin Vaccine Institute, USA