ASSOCIATION OF PUBLIC AND ENVIRONMENTAL HEALTH OFFICERS THE GAMBIA

BOOK OF ABSTRACTS

# National Public Health Convergence 2.0

CONFERENCE THEME

Securing Tomorrow: Strengthening Public Health through **Science, Innovation** and **Sustainable Interventions** in The Gambia

DATE
Wednesday
7 October 2026

VENUE
Sir Dawda Kairaba Jawara
International Conference Centre

IN PARTNERSHIP WITH

World Health Organization The Gambia

unicef for every child

National Environment Agency N.E.A.

MRC Unit The Gambia

London School of Hygiene & Tropical Medicine

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FROM THE PRESIDENT OF APEHOG AND THE CHAIR OF NPHC 2.0

# Welcome Message

On behalf of the Association of Public and Environmental Health Officers The Gambia (APEHOG) and the Organising Committee, it is our pleasure to welcome you to the second National Public Health Convergence (NPHC 2.0) at the Sir Dawda Kairaba Jawara International Conference Centre.

This year's theme, "Securing Tomorrow: Strengthening Public Health through Science, Innovation and Sustainable Interventions in The Gambia", reflects a simple conviction: the health challenges we face today, from climate-sensitive diseases and antimicrobial resistance to maternal and child health and the rising burden of non-communicable diseases, can only be met with good evidence, put to good use.

This Book of Abstracts brings together 31 research abstracts, presented as 14 oral and 17 poster presentations across seven sub-themes. They range from genomic surveillance and air pollution monitoring to immunisation, water safety, food hygiene and health system governance. We are especially proud that this edition features work from our Regional Associations of Public Health Officers through the 2026 Regional Scientific Research Competition, showing that research is taking root across every health region of the country.

We are grateful to the Ministry of Health, the World Health Organization, UNICEF, the MRC Unit The Gambia at the London School of Hygiene & Tropical Medicine, the National Environment Agency and the Gambia Revenue Authority for their partnership, and to the authors, reviewers, speakers, moderators and committee members whose commitment made this convergence possible.

We invite you to read, question and connect, and to carry the ideas in these pages back into practice. United we serve, health we promote.

**Sarja Jarjusey**
President, APEHOG

**Dr Alieu Sowe**
Chair, National Public Health Convergence 2.0

ASSOCIATION OF PUBLIC AND ENVIRONMENTAL HEALTH OFFICERS THE GAMBIA

# About APEHOG

## Who We Are

The Association of Public and Environmental Health Officers The Gambia (APEHOG) is the professional body for public and environmental health officers in The Gambia. It was founded in 1979 as the Gambia Association of Public Health Officers (GAPHO) by Alhagie Dawooda Jagne, widely regarded as the Father of Public Health in The Gambia. Working with health superintendents, health inspectors and students, he united public health officers under one association and served as its first President. He also helped establish the School of Public Health and trained its first cohorts, many of whom went on to become consultants, epidemiologists, planners and health specialists. In recognition of his legacy, APEHOG posthumously inducted him as the first member of its Hall of Fame. The profession traces its roots to 1935, when the first Public Health Act was passed and a Department of Public Health was created.

**OUR VISION**

A healthy Gambia in which every community lives in a safe, clean environment, protected from preventable disease by a united, skilled and respected public health workforce.

**OUR MISSION**

To protect and promote the health of the people of The Gambia by uniting public and environmental health officers. We build their skills, advance their professional interests, and lead evidence-based public health action together with government, communities and national and international partners.

## Our Aims and Core Activities

Guided by the core principles of public health in The Gambia, APEHOG works to protect and promote the health of the public. The association communicates with the appropriate authorities on matters affecting public health, and it protects the mutual interests of its members, mediating between members and authorities when needed. It builds members' capacity in the core public health functions of assessment, policy formulation and assurance, and in the delivery of public health action. It also advocates for scholarships and higher education in areas relevant to public health. APEHOG takes an active part in evidence-based public health research to guide decision-making, and it engages stakeholders in developing public health policy, practice and action. It collaborates with national and international organisations on public health issues.

In practice, the association's Technical Committee of Experts reviews public health practice across the regions, promotes best practice, advises on environmental sanitation and edits a professional newsletter. APEHOG holds Annual General Meetings with technical paper presentations and leads Public Health Awareness Week each year. It marks national and international observances such as World Health Day, World Environment Day, National Malaria Day and World AIDS Day, and its members sensitise and educate the public. The association works through regional associations in every health region and a diaspora chapter.

## What We Envision

Building on The Gambia's earlier public health successes, from the eradication of smallpox to the control of yellow fever, measles, polio and other vaccine-preventable diseases, APEHOG is preparing to meet emerging and re-emerging threats such as HIV/AIDS, tuberculosis, diabetes and heart disease. It envisions a well-trained, professionally recognised public health workforce, organised from national to regional level and in the diaspora. That workforce would work closely with the public to improve services and to reverse deteriorating environmental health conditions in growing urban centres and across the country.

***United We Serve, Health We Promote***

WEDNESDAY, 7 OCTOBER 2026

# Programme at a Glance

| | |
|---|---|
| **08:00 – 09:00** | Registration |
| **09:00 – 10:15** | **Opening Ceremony – Sana Sambou, Dr Metta K. Manneh, GRA, MRC, Guest Speaker (Africa CDC), Keynote Address (WHO Representative), official opening by Hon. Minister of Health** |
| **10:15 – 10:45** | Coffee Break |
| **10:45 – 11:30** | **Plenary A – Climate Change, Environmental Health and WASH** |
| **11:30 – 12:40** | **Oral Presentations – Session 1 (OP-01 to OP-07)** |
| **12:40 – 12:45** | Interlude |
| **12:45 – 13:30** | **Plenary B – One Health, AMR and Data-Driven Health Governance** |
| **13:30 – 14:00** | **Workshop – Africa's Health Security and Sovereignty Agenda** |
| **14:00 – 14:45** | Lunch & Prayers |
| **14:45 – 15:15** | **Oral Presentations – Session 2: Regional Health Research (OP-08 to OP-10)** |
| **15:15 – 15:45** | **Poster Presentations (PP-01 to PP-17)** |
| **15:45 – 16:30** | **Plenary C – Reproductive, Maternal, Adolescent & Child Health and NCDs** |
| **16:30 – 17:10** | **Oral Presentations – Session 3 (OP-11 to OP-14)** |
| **17:10 – 18:00** | Presentation of Certificates and Closing Remarks |

WEDNESDAY, 7 OCTOBER 2026

# Programme

| TIME | SESSION | CHAIR / MODERATOR |
|---|---|---|
| 08:00 – 09:00 | **Registration** | All |
| 09:00 – 10:15 | **Opening Ceremony**<br>**Welcome remarks** President of APEHOG – Sarja Jarjusey<br>**Opening remarks** Chair, NPHC 2.0 / Director, Public Health Services – Dr Alieu Sowe<br>**Distinguished addresses**<br>**Public Health Expert** One Health Concept & Antimicrobial Resistance: Bridging Human, Animal, and Environmental Health **— Mr Sana Sambou**<br>**Program Analyst** Data-Driven Health Governance – Digital Tools, AI, and Real-Time Surveillance **— Dr Metta Kongira Manneh**<br>**GRA** Non-Communicable Diseases and Tobacco Taxation: Aligning Fiscal Policy with Public Health **— Commissioner General Mr Yankuba Darboe**<br>**MRC** New Vaccines & Innovation **— Prof. Ed Clarke**<br>**Guest Speaker · Africa CDC** **— Mr Modou Njai**<br>**Keynote Address · WHO Representative** Data-Driven Governance for Health System Strengthening: Transforming Health Outcomes Through Evidence, Leadership and Accountability **— Dr Nathan Nsubuga Bakyaita**<br>**Special Guest of Honour · Official Opening** **— Hon. Minister of Health, Dr Ahmadou Lamin Samateh, or Delegate** | *Sona Darboe* |
| 10:15 – 10:45 | **Coffee Break** | |
| 10:45 – 11:30 | **Plenary Session Part A \| Climate Change & Environmental Health; Water, Sanitation and Hygiene**<br>**Panel** MoH, DPHS – Ibrahim Touray · NEA – Director Dawda Badgie · MoH, WASH – Lamin M. Fadera · DWR – Mr Foday Conteh · HePDO – Alhagie Tambajang | *Dr Buba Manjang*<br>*Musa Njie* |

| TIME | SESSION | CHAIR / MODERATOR |
|---|---|---|
| 11:30 – 12:40 | **Oral Presentations – Session 1**<br>**OP-01** Is Nasopharyngeal Carriage of Staphylococcus aureus Associated With Invasive Disease in the Same Patient? A Genomic Approach — **Sulayman Sowe**<br>**OP-02** Ambient Particulate Matter, Humidity and Hospital Admissions in The Gambia: An Ecological Panel Study — **Saikou Camara**<br>**OP-03** Utilization of Routine Service Delivery Data in Hospital Management and Quality of Care Improvement: Bundung Maternal & Child Hospital (BMCH) as a Case Study — **Dr Mamady Cham**<br>**OP-04** Does Health Worker Behaviour and Equipment Configuration Threaten Vaccine Potency in Solar Direct Drive Refrigerators in The Gambia? A Retrospective Cohort Study — **Amadou Barry**<br>**OP-05** Spatio-Temporal Machine Learning for Malaria Prediction in The Gambia: Using Climate and Environmental Factors to Predict District-Level Incidence, 2015–2024 — **Muhammed L. Daffeh**<br>**OP-06** Quantitative Microbial Risk Assessment of Groundwater Contamination in Peri-Urban Gambia: Monte Carlo Modelling of Rotavirus, Cryptosporidium, and Pathogenic Escherichia coli Risks From Faecal Indicator Data — **Samba Camara**<br>**OP-07** The Evolutionary Trade-Offs of Bacterial Immunity: Balancing Genome Protection and Adaptive Opportunity in Antimicrobial Resistance — **Lamarana Jallow** | *Nuha Fofana* |
| 12:40 – 12:45 | **Interlude** | |
| 12:45 – 13:30 | **Plenary Session Part B \| One Health & Antimicrobial Resistance; Data-Driven Health Governance**<br>*Bridging human, animal and environmental health*<br>**Panel** MoH – Sheriffo MK Darboe · DLS – Dr Mustapha Manneh · UTG – Dr Haddy Bah · EDC – Amadou Woury Jallow · WHO – Bakary T Barrow · MRC – Dr Babucarr Bah<br>*Questions and answers* | *Prof. Thomas Senghore*<br>*Famata Colley* |
| 13:30 – 14:00 | **Workshop / Seminar**<br>*Africa's Health Security and Sovereignty Agenda* | *Mary Bobb* |
| 14:00 – 14:45 | **Lunch & Prayers** | All |

| TIME | SESSION | CHAIR / MODERATOR |
|---|---|---|
| 14:45 – 15:15 | **Oral Presentations – Session 2 \| Regional Health Research**<br>**OP-08** Perceived Barriers to Accurate Maternal Death Reporting Among Healthcare Workers in the Lower River Region, The Gambia — **LRR Team**<br>**OP-09** Geospatial Distribution and Associated Factors of Hepatitis B Birth-Dose Vaccination Timeliness Among Children Aged 0–11 Months in the Upper River Region, The Gambia, January to December, 2025 — **URR Team**<br>**OP-10** Home Delivery in Central River Region, The Gambia: Prevalence, Barriers, and Newborn Care Outcomes, a Mixed Method Study — **CRR Team** | *MRC* |
| 15:15 – 15:45 | **Poster Presentations**<br>**PP-01** Household Decision-Making, Insecticide-Treated Net Ownership, Utilisation, and Their Associations With Malaria Outcomes Among Children Under Five Years in Rural Gambia: A Cross-Sectional Study — **Momodou Alieu Jallow**<br>**PP-02** Building Resilience to Extreme Heat in Maternal and Neonatal Health Systems: An Urgent, Evidence-Based Multi-Sectoral Policy Framework for The Gambia — **Layin Surr**<br>**PP-03** Digital Health Readiness for Respiratory Infection Care at Edward Francis Small Teaching Hospital, The Gambia: A Cross-Sectional Quality Improvement Survey — **Ousman Bajinka**<br>**PP-04** Occupational Exposure to Fine Particulate Matter and Volatile Organic Compounds Among Artisanal Fish Smokers in Coastal Gambia: A Pilot Cross-Sectional Study — **Saikou Camara**<br>**PP-05** Determinants of Safe Child Stool Disposal Practices Among Mothers in The Gambia: Evidence From the 2019/20 Demographic and Health Survey — **Lamin N.S. Fofana**<br>**PP-06** Healthcare Waste Generation and Management in a District Hospital in The Gambia: A Cross-Sectional Study at Brikama District Hospital — **Alieu Jadama**<br>**PP-07** Impact of Field Epidemiology Training on Disease Surveillance Competencies Among Public Health Officers in The Gambia: Evidence for Data-Driven Health Governance — **Sambou Mbye**<br>**PP-08** Longitudinal Genomic Diversity, Antimicrobial Resistance and Virulence-Associated Determinants of Staphylococcus aureus in The Gambia, 2005–2023 — **Morrow Minteh**<br>**PP-09** Hepatitis B Vaccination Status of Health Care Workers in the Lower River Region, The Gambia — **Yankuba Jarjusey**<br>**PP-10** Knowledge and Practices of Food Safety and Hygiene Among Food Vendors in Public Primary Schools: Implications for Public Health in the Serekunda Health Centre Catchment Area — **Ousman Y. Jallow**<br>**PP-11** Longitudinal Personal Environmental Exposure and | *Bakalilu Kijera* |

| TIME | SESSION | CHAIR / MODERATOR |
|---|---|---|
| | Streptococcus pneumoniae Colonisation in a Cohort of Children 5-14 Years Old in Rural Gambia — **Dam Khan**<br>**PP-12** Prevalence of Environmental Risk Factor Exposures Among Under-Five Children Diagnosed With Pneumonia in Kerr Cherno Health Center Catchment Area — **Ousman Jallow**<br>**PP-13** Pesticide Use Practices Among Farmers and Screening for Organophosphate and Carbamate Residues in Vegetables Sold at Brikama Market, The Gambia: A Cross-Sectional Study — **Western II Team**<br>**PP-14** Production and Application of a Murine Monoclonal Antibody Targeting Toxoplasma gondii Inner Membrane Complex 1 (TgIMC1) — **Yusupha Jallow**<br>**PP-15** Assessment of Core Capacities, Challenges and Strategies in Mpox Preparedness and Response at Ground Border Crossings in the Western II Health Region, The Gambia — **Momodou Alieu Jallow**<br>**PP-16** Determinants of Immunization Defaulters Among Children Aged 24-59 Months in the Western One Health Region, The Gambia. A Community-Based Case-Control Study — **WOPHOA Research Team**<br>**PP-17** Risk Factors Associated With Diarrhoea With Blood Among Children Under Five Years in North Bank West Health Region, The Gambia — **NBWR Team** | |
| **15:45 – 16:30** | **Plenary Session Part C \| Reproductive, Maternal, Adolescent & Child Health; NCDs**<br>**Panel** RMNCAH – Dr Marena · UNFPA – Alagie Kolley · MGCSW – Bintou Fatty · MDAG – Dr Fatoumatta Jarjusey · FSQA – Lamin Jaiteh · NaNA – Haddy Crookes · UTG – Dr Evelyn · UNICEF – Yankuba Sawo · Health Promotion Expert – Momodou Gassama | *Dr Hassan Njie*<br>*SG Sillah* |
| **16:30 – 17:10** | **Oral Presentations – Session 3**<br>**OP-11** Menstrual Hygiene Management Practices and Menstruation-Related School Absenteeism Among Adolescent Girls Attending Urban Basic Schools in The Gambia: A Cross-Sectional Study — **Momodou Alieu Jallow**<br>**OP-12** Prevalence and Factors Associated With Workplace Violence Against Healthcare Workers at Brikama District Hospital, The Gambia — **Isatou Dem**<br>**OP-13** Ethical Community Engagement in Health Research: A Case Analysis Using the Socio-Cultural Research Ethics Conceptual Model (SCREM) in The Gambia — **Omar Jaiteh**<br>**OP-14** Overview of Cardiovascular Disease and the Cost of Care in The Gambia — **Olubunmi Abiola Olubiyi** | *Baba Ceesay* |
| **17:10 – 18:00** | **Presentation of Certificates and Closing Remarks** | *Vice Chair, NPHC 2.0 – Fatou A. Darboe* |

*OP = oral presentation; PP = poster presentation. Codes match the abstracts in this book.*

NATIONAL PUBLIC HEALTH CONVERGENCE 2.0

# Speaker Profiles



## Sarja Jarjusey

**President, Association of Public and Environmental Health Officers The Gambia (APEHOG)**

*Field Epidemiologist · MPhil Applied Epidemiology and Disease Control (University of Ghana)*

Sarja Jarjusey is President of the Association of Public and Environmental Health Officers of The Gambia (APEHOG), the professional body representing more than 600 public and environmental health officers across the country. Under his leadership, the Association established its Scientific Conference as a national platform for public health research and practice, launched a mentorship program for public health students, and built international partnerships with the South African Public Health Association and Southern Medical University, China. He previously served the Association as Public Relations Officer and Social Secretary.

A field epidemiologist with more than nine years of experience in disease surveillance, immunization, and health information systems, Sarja is a Data Manager and Statistics Associate at PATH (MACEPA). As a Subnational Tailoring Data Fellow, he supports the National Malaria Control Program and the Expanded Program on Immunization, leading malaria data analytics, cross-border data sharing with Senegal, and technical support for the hepatitis B birth dose study and the HPV vaccination campaign.

His career spans senior roles at the national and international level, including Vaccine Safety Training Coordinator with the African Field Epidemiology Network (AFENET), Senior Health Information Systems Officer and Head of Unit at the Ministry of Health, and Head of Contact Tracing during The Gambia's COVID-19 response, where he trained public health officers and Red Cross volunteers.

Sarja holds an MPhil in Applied Epidemiology and Disease Control from the University of Ghana, a BSc in Public and Environmental Health (magna cum laude) from the University of The Gambia, and a Higher National Diploma in Public and Environmental Health (with distinction) from Gambia College. He has authored peer-reviewed publications in journals including BMC Public Health and PLOS ONE and has taught epidemiology at the American International University West Africa.

A long-standing advocate for the public health profession, he is Co-founder and former Secretary General of Focus on Health – The Gambia. His contributions have earned him the Public Health Champion Award and the Best Public Health Officer of the Year award.



## Dr Ahmadou Lamin Samateh

**Minister of Health, The Gambia**

Until his appointment as the Honourable Minister of Health in 2019, Dr Ahmadou Lamin Samateh served as Chief Medical Director of the country's only teaching hospital: the Edward Francis Small Teaching Hospital in Banjul, where he had worked since 2002. In his former role, Dr Ahmadou Lamin Samateh championed the postgraduate specialisation in various fields of Medicine. Hitherto, medical doctors from The Gambia are able to receive specialisation training abroad. He additionally served as Senior Consultant General Surgeon and Head of Department of Surgery at the same hospital. Dr Samateh served as Senior Lecturer in Surgery at the School of Medicine and Allied Health Sciences—at the University of The Gambia—and spearheaded specialisation training for surgeons in the country.

In his tenure as Honourable Minister of Health, Dr Ahmadou Lamin Samateh together with his team, have made tremendous strides in improving the nation's health sector. Postgraduate training for specialisation in various specialities have been established in the country; there are more highly equipped health facilities to improve access to health care; National Health Insurance scheme has started for the first time in the country; digitalization processes such as electronic Civil Registration and Vital Statistics System (e-CRVS) and other digital health solutions have also started in the health sector and an ultramodern clinical waste management systems using microwave technology has been established. These are just few of the numerous achievements he has spearheaded in the health sector.

The Honourable Minister served as a member of various professional bodies such as The Medical and Dental Council of The Gambia as well as The Gambia Government and Medical Research Council Joint Ethics Committee, amongst many others. He has collaborated with scientists globally and has produced numerous scientific literatures.

Dr. Ahmadou Lamin Samateh holds a Master's degree in Health Planning and Management (MHPM) and a combined degree in Medicine and Surgery (MBBS). He is also a Fellow of the West African College of Surgeons (FWACS).



## Dr Alieu Sowe

**Director of Public Health Services, Ministry of Health**

*Chair, National Public Health Convergence 2.0*

Dr. Sowe is a public health practitioner and researcher working with the Ministry of Health as Director of Public Health Services. He holds doctoral in medical science concentrating in Epidemiology and Public Health from Umeå University. From the same university, he also obtained an MSc in Public Health focusing on methods and monitoring and evaluation. He has received advanced training in vaccinology, and survey methods, machine learning.

He has over ten years of experience in planning, implementing, monitoring, and evaluating public health activities at the service delivery, sub-national, national, and international levels. His roles have included as a Public Health Officer at the service delivery level, Regional Operations Officer for Expanded Program on Immunization, national Data Manager and Monitoring and Evaluation Focal Point of The Expanded Program on Immunization, Data Analysis Consultant for the Swiss TPH, and as a Field Epidemiologist supporting Global Polio Eradication Initiative activities at the international level. He has also led evaluation projects in several countries.

Dr Sowe's research mainly lies within Social Epidemiology, vaccination, disease surveillance, and data quality improvement, including field surveys and accountability of field workers. He is involved in teaching and supervision of masters students in and outside The Gambia.

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## Mr Modou Njai

**Senior Technical Officer, Africa CDC Western Africa Regional Coordinating Centre (Abuja, Nigeria)**

*Guest Speaker*

Mr. Modou Njai is a Senior Technical Officer at the Africa CDC Western Africa Regional Coordination Centre in Abuja, Nigeria. In this role, he strengthens the interface between Africa CDC's Regional Coordinating Centres, Member States, and Headquarters to ensure effective implementation of continental priorities at country level and systematic feedback of Member State priorities into continental policy and programme development. He also serves as the Acting Regional Programme Lead (October 2025 to present) and as the Primary Health Care (PHC) and Health Promotion Coordinator at the regional level, overseeing the PHC transformation agenda, including PHC digitalization and the operationalization of the Primary Health Care – Continental Coordination Mechanism (PHC-CCM).

Mr. Njai holds an MSc in Public Health (Health Promotion) from Leeds Beckett University, a Postgraduate Diploma in Food and Nutrition Security, a Diploma in Public and Environmental Health, and certificates in Social Policy for Development Planners and Project Planning and Proposal Writing. He is a Fellow of the West African Post-Graduate College of Public and Environmental Health (WAPCEH).

Prior to joining Africa CDC, Mr. Njai served the Ministry of Health, The Gambia, for over 30 years, including as Director of Health Promotion and Education (2012–2022). He led the establishment of The Gambia's first Directorate of Health Promotion and Education, created a National Multi-sectoral Coordination Mechanism for health promotion, and established the NCDs Unit, which earned several WHO NCD and Tobacco Control awards. In 2001, he led the capacity-building workshop for journalists that resulted in the establishment of The Gambia's first Association of Health Journalists, a model since replicated across West Africa.

At Africa CDC, Mr. Njai has coordinated major continental initiatives, including the Saving Lives and Livelihoods Programme, the Continental Immunization Strategy (CIS) implementation in West Africa, and the establishment of the Continental Technical Working Group on Sickle Cell Disease. He has supported NCD, Injuries and Mental Health programmes across multiple Member States and facilitated the development of the Africa CDC Governance Structure for the Continental Multi-sectoral Taskforce on NCDs, Injuries and Mental Health.

Mr. Njai is a member of numerous professional bodies, including the International Union for Health Promotion and Education, the West African Post-Graduate College of Environmental Health, and the Africa CDC Continental Multi-sectoral Taskforce on NCDs, Injuries and Mental Health. He has authored and co-authored several peer-reviewed publications on public health, immunization, NCDs, and health promotion.

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## Dr Nathan Nsubuga Bakyaita

**WHO Representative, The Gambia**

*Keynote Address*

Dr. Nathan Nsubuga Bakyaita is a physician, public health specialist, and global health leader with more than three decades of experience in communicable disease control, epidemiology, malaria prevention, disease surveillance, and health systems strengthening across Africa. He currently serves as the World Health Organization (WHO) Representative to The Gambia, where he leads WHO's collaboration with the Government and partners in support of national health priorities.

A graduate of Makerere University, Uganda, with a Master of Public Health from the University of Leeds, United Kingdom, Dr. Bakyaita has built an accomplished career spanning national health services, international public health programmes, and senior leadership positions within WHO. Since joining the Organization in 2005, he has provided technical and strategic leadership in malaria control, epidemic preparedness, disease surveillance, immunization, and health policy across the African Region.

Dr. Bakyaita has served in several key WHO positions, including roles within the WHO Regional Office for Africa as Malaria M & E Officer (2005-2011) and Medical Officer Integrated Disease Surveillance and Response (IDSR) 2011-2013. He also served as WHO Malaria Adviser in Kenya 2013-2017 and WHO Representative to Zambia, 2017-2025. During the 2014–2015 Ebola outbreak in West Africa, he was deployed to Sierra Leone, where he supported efforts to strengthen disease surveillance and outbreak response systems during one of the region's most significant public health emergencies. Prior to joining WHO, he worked with the Ministry of Health, Uganda from 1990 to 2005 as a Clinician, in HIV/AIDS and malaria control as well as IDSR.

Widely respected for his expertise in public health programme management and health systems development, Dr. Bakyaita has worked closely with governments, development partners, researchers, and communities to advance health security and improve population health outcomes. His extensive experience in public health leadership, disease prevention, and programme implementation offers valuable perspectives on translating policy into practice and sustaining gains in child survival across Africa.



## Ms Nafisa Binte Shafique

**UNICEF Representative in The Gambia**

Nafisa Binte Shafique is the UNICEF Representative in The Gambia, a position she has held since November 2023. In this role, she provides strategic leadership and oversight of UNICEF's Country Programme and represents the organization in its engagement with the Government, civil society, the United Nations system, and international development partners. She leads efforts to advance children's rights, strengthen partnerships, and mobilize resources for the delivery of sustainable results for children.

Ms. Shafique has more than two decades of experience in international development and humanitarian action. Before joining UNICEF The Gambia, she served as UNICEF Chief of Field Office in Bihar, India, where she provided strategic direction for programme implementation, partnership development, emergency response and the management of human and financial resources. She previously served as UNICEF Deputy Representative in Sudan and Azerbaijan and as Chief of Field Office for Homs and Hama in Syria. These assignments provided extensive leadership experience across complex humanitarian and development contexts.

Earlier in her UNICEF career, Ms. Shafique held senior programme leadership positions in Nepal, Lesotho and Bangladesh. Her work included adolescent development and participation, HIV and AIDS programming, adolescent girls' empowerment, gender equality, social inclusion, child protection, and social and behaviour change. In Nepal, she led the development of the country's first costed national plan of action on adolescent development and participation. She also contributed to the expansion of services and national initiatives supporting adolescents, children affected by HIV and AIDS, and vulnerable communities.

Ms. Shafique is a citizen of Bangladesh. She holds a Master of Arts in Development Studies from the Institute of Social Studies in The Hague, the Netherlands, and a Master of Social Sciences, majoring in Social Welfare, from the University of Dhaka, Bangladesh.

**Areas of experience:** Strategic leadership • Humanitarian and development programming • Adolescent development and participation • Gender equality and social inclusion • Child protection • Social and behaviour change • Partnerships and resource mobilization



## Professor Ed Clarke

**Unit Director, MRC Unit The Gambia at the London School of Hygiene & Tropical Medicine**

*Theme Lead, Vaccines & Immunity*

Professor Clarke is the Unit Director and Theme Lead for Vaccines & Immunity at MRC Unit The Gambia, where he has been a Principal Investigator since 2012. He brings exceptional experience in vaccine research and paediatric infectious diseases, with notable contributions in clinical trials, B-cell immunology, and epidemiology. His work has consistently advanced regional health priorities and he has played a pivotal role in securing funding to support the Unit's growth and long-term impact.

Professor Clarke has a PhD in Immunology from the University of Bristol and an MSc in Molecular Medicine from Imperial. As a lifelong learner, he obtained a postgraduate diploma in Paediatric Infectious Diseases from the University of Oxford, an MSc in Epidemiology from LSHTM, and a graduate certificate in statistics from the University of Sheffield.

He is a Fellow of the West African College of Physicians, and the Royal College of Paediatrics and Child Health (UK). In addition to his clinical paediatrics cover in the Unit, he is an Honorary Consultant in Paediatric Infectious Diseases and Immunology at the Royal Hospital for Sick Children in Bristol, having previously been a lecturer and clinical research fellow at the University of Bristol.

He continues to lecture at LSHTM and sits on The Gambia Government/MRC Joint Ethics Committee, Research Governance Committee at LSHTM, and the Unit's Scientific Coordinating and Leadership Board.



## Mr Gibril Jarjue

**Principal Technical Officer, Public Financial Management and the Lusaka Agenda, Africa CDC Western Regional Coordinating Centre**

*Former President, Gambia Association of Public and Environmental Health Officers*

Gibril Jarjue is a public health professional with 21 years of experience in health policy, planning, health financing, public financial management, digital transformation and institutional leadership. He serves as Principal Technical Officer for Public Financial Management and the Lusaka Agenda at the Africa Centres for Disease Control and Prevention, Western Regional Coordinating Centre, Abuja, Nigeria.

In this role, he supports African Union Member States in strengthening public financial management for health, domestic resource mobilisation, expenditure efficiency, accountability, and country ownership. He promotes alignment with the Lusaka Agenda principles of One Plan, One Budget and One Report.

Before joining Africa CDC, Mr Jarjue served as Director of Planning and Information at The Gambia's Ministry of Health. He led policy and planning, health financing, monitoring and evaluation, health information systems, digital health, quality assurance, civil registration, and health infrastructure. He

contributed to the National Health Policy 2021–2030, Health Sector Strategic Plan 2021–2025, National Health Financing Policy 2017–2030 and National Health Insurance Act 2021.

He holds master's degrees in Health Economics, Economics, and Public Management in International Cooperation, alongside qualifications in Public and Environmental Health. His interests include universal health coverage, results-based financing, health-system efficiency, institutional development and digital health. He is committed to sustainable, country-led reforms, mentorship and resilient health systems across Africa. He is a PhD scholar at the Royal Institute of Technology in Sweden and a former President of the Gambia Association of Public and Environmental Health Officers.

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## Mr Sana Sambou

**Public Health Veteran**

*Distinguished Address · Opening Ceremony*

Mr. Sana Sambou is a distinguished Public Health Veteran with over three decades of service to The Gambia's health sector, beginning in 1986. His extensive field experience in disease surveillance and response across Western Region 1, Upper River Region, and Lower River Region gave him a deep understanding of the health landscape at the grassroots level, a perspective that would guide his entire career.

In 2004, he assumed leadership of the then five-member Epidemiology and Statistics Unit, which he transformed into the Epidemiology and Disease Control (EDC) unit—now a cornerstone of the Ministry of Health. He orchestrated its evolution through institutional disruptions and relocations, building the strategic plans, operational protocols, and robust surveillance systems that underpin our national health security today.

Mr. Sambou's legacy is woven into the fabric of The Gambia's public health infrastructure. He was instrumental in institutionalizing the Integrated Disease Surveillance and Response (IDSR) system; forging critical partnerships with the CDC and WHO that facilitated The Gambia's participation in the Global Health Security Agenda (GHSA) and the Field Epidemiology Training Program (FETP); establishing national emergency coordination systems, including the Public Health Emergency Operations Center (PHEOC); and leading resource mobilization to ensure that surveillance and outbreak response activities were funded realities.

The strength of the systems he built was tested and proven during the COVID-19 pandemic. Following his civil service, his expertise was called upon at the global level, where he served as a WHO Local Surge Officer, continuing to strengthen the very systems he had spent a lifetime developing.

Beyond his structural achievements, Mr. Sambou's greatest investment has been in people. He is a mentor and teacher who actively supported nine personnel to pursue higher academic training, expanding the cadre of technical expertise within The Gambia. He built a team, fostered collaboration, and created a family of public health professionals whose impact continues to be felt across the nation.



## Dr Metta Kongira

**Program Analyst, Oregon Health Authority**

*Distinguished Address · Opening Ceremony*

Metta Kongira is a mom, wife, and public health professional with more than a decade of experience across public health practice, academia, community engagement, leadership, and research.

Her journey began at the Gambia College, School of Public Health, where she earned a Higher National Diploma in Environmental Health. She earned an undergraduate degree in Biology and Public Health at the University of The Gambia before moving to the United States, where she earned a Joint master's in public health and human services from the University of Illinois in Springfield. Metta earned another master's degree and a Doctor of Philosophy in Prevention Science from Washington State University.

In The Gambia, she served at various health facilities, including the Polyclinic, Leman Clinic, and Fajikunda Health Center, under the Ministry of Health. She also served as project coordinator with the Nova Scotia Gambia Association, where she led implementation of health programs in schools and communities across The Gambia.

Metta currently serves as a Program Analyst with the Oregon Health Authority, overseeing statewide HIV and STI prevention services. She continues to draw on her public health experience and expertise to advance disease prevention and health promotion.

Metta's journey reflects her commitment to learning, service, and improving the health and well-being of individuals and communities.

SUB-THEME 1

# One Health Concept & Antimicrobial Resistance

Bridging human, animal and environmental health

## IN THIS SECTION

**OP-01** Is Nasopharyngeal Carriage of *Staphylococcus aureus* Associated With Invasive Disease in the Same Patient? A Genomic Approach — *Sulayman Sowe*

**PP-08** Longitudinal Genomic Diversity, Antimicrobial Resistance and Virulence-Associated Determinants of *Staphylococcus aureus* in The Gambia, 2005–2023 — *Morrow Minteh*

**PP-11** Longitudinal Personal Environmental Exposure and *Streptococcus pneumoniae* Colonisation in a Cohort of Children 5-14 Years Old in Rural Gambia — *Dam Khan*

**PP-14** Production and Application of a Murine Monoclonal Antibody Targeting *Toxoplasma gondii* Inner Membrane Complex 1 *(TgIMC1)* — *Yusupha Jallow*

**OP-07** The Evolutionary Trade-Offs of Bacterial Immunity: Balancing Genome Protection and Adaptive Opportunity in Antimicrobial Resistance — *Lamarana Jallow*

OP-01 ORAL PRESENTATION · SESSION 1

# Is Nasopharyngeal Carriage of *Staphylococcus aureus* Associated With Invasive Disease in the Same Patient? A Genomic Approach

**Sulayman Sowe et al.**

*MRC Unit The Gambia at the London School of Hygiene and Tropical Medicine, Fajara, The Gambia.*

**BACKGROUND** *Staphylococcus aureus* nasopharyngeal colonization is a major risk factor for invasive disease and has traditionally been regarded as the principal endogenous reservoir from which bloodstream infections arise. However, the genomic relationship between contemporaneously sampled carriage and invasive isolates remains incompletely understood, particularly in sub-Saharan Africa, where paired genomic studies are scarce.

**METHODS** We performed whole-genome sequencing of paired bloodstream (BC) and contemporaneously collected nasopharyngeal (NPS) *S. aureus* isolates from 35 Gambian children with invasive disease. To improve representation of the carriage population, up to eight morphologically distinct colonies were analysed from each nasopharyngeal specimen. Paired isolates were compared for multilocus sequence type (MLST) concordance, clonal complex distribution, antimicrobial resistance determinants, and virulence-gene composition. Generalized Linear Mixed Models statistical test was used to calculate the Odds Ratios (OR) and 95% Confidence Intervals (CI) in R studio.

**RESULTS** Only 9 of 35 (25.7%) patients had at least one nasopharyngeal isolate sharing the same sequence type as the paired bloodstream isolate, indicating limited patient-level concordance. Despite this, bloodstream and nasopharyngeal isolates displayed remarkably similar genetic characteristics, with ST152/CC152 and ST15/CC15 dominating both compartments. Within the ST-matched cohort, most virulence determinants were shared between the matched isolates; however, certain genes, including *cap operon*, *cna*, and *hld*, were more frequently identified among bloodstream isolates, whereas *chp* gene was more prevalent among nasopharyngeal isolates: *cap operon* OR 8.27 (95% CI: 1.41-48.53), p = 0.019; *cna* OR 2.75 (95% CI: 2.72-2.77), p = <0.001; *hld* OR 5.21 (95% CI: 5.03-5.39), p = <0.001; *chp* OR 0.12 (95% CI: 0.01-0.96), p = 0.045. AMR-gene profiles were broadly similar, with no clear evidence of differential AMR-gene prevalence.

**CONCLUSIONS** Contemporaneously sampled nasopharyngeal carriage frequently failed to capture the *S. aureus* lineage recovered from blood, despite both compartments sharing the same dominant circulating lineages. These findings suggest that patient-level carriage–bloodstream concordance cannot be inferred from population-level lineage similarity and highlight the limitations of single-site carriage sampling for investigating the origins of invasive disease. Higher-resolution genomic analyses and longitudinal multi-site sampling will be important to determine the evolutionary and ecological relationships between colonising and invasive *S. aureus* populations.

PP-08 POSTER PRESENTATION

# Longitudinal Genomic Diversity, Antimicrobial Resistance and Virulence-Associated Determinants of *Staphylococcus aureus* in The Gambia, 2005–2023

**Morrow Minteh[1], Sulayman Sowe[1], Horeja A Drammeh[1], Matty Faal[1], Amie Jarjou[1], Paulina Mendy[1], Ebrima Faal[1], Grant Makenzie[1], Solomon Umukoro[1], Karen Forest[1], Lamarana Jallow[2], Benjamin P Howden[3,4,5], Elodie Ghedin[6], Anna Roca[1,7], Ousman Secka[1], Abdoulie Bojang[*1]**

**BACKGROUND** *Staphylococcus aureus* is an important cause of invasive and non-invasive disease. The diverse strains harbour a wide range of antimicrobial resistance and virulence-associated genetic determinants which contribute to increased morbidity and mortality. Longitudinal genomic data from The Gambia remain limited. We characterised the genomic diversity, antimicrobial resistance and virulence profiles of *S. aureus* isolates collected in The Gambia between 2005 and 2023.

**METHODS** Archived *S. aureus* isolates recovered from clinical and carriage-associated specimens were retrospectively analysed. Whole-genome sequencing was performed using Oxford Nanopore Technologies, and genomic data were analysed using EPI2ME to determine sequence types and detect antimicrobial resistance and virulence-associated genetic determinants. Temporal and specimen-associated patterns were assessed descriptively. All data and statistical analyses were performed using R.

**RESULTS** Of the 1,032 isolates considered, 765 generated high-quality whole-genome sequences. The population was genetically diverse, with CC15, CC152, CC1 and CC121 among the predominant lineages. CC15 was consistently detected throughout the study period and was distributed across multiple specimen types. Antimicrobial resistance genes coding for penicillin *(blaZ*) and trimethoprim *(dfrG*) resistance, respectively, were the most frequently detected, while *mecA* was uncommon. Virulence-associated determinants related to adhesion, immune evasion, exoenzyme production, iron acquisition and quorum sensing were widely distributed, whereas toxin- and biofilm-associated determinants showed greater variation across the population.

**CONCLUSION** *S. aureus* isolates collected in The Gambia over nearly two decades showed substantial genomic diversity, with persistent circulation of several major lineages and widespread antimicrobial resistance and virulence-associated determinants. Continued genomic surveillance integrated with phenotypic antimicrobial susceptibility testing and epidemiological data is warranted to better understand temporal changes in *S. aureus* population structure, antimicrobial resistance and clinical disease in The Gambia.

**KEYWORDS** *Staphylococcus aureus; Whole-genome sequencing; Antimicrobial resistance; Virulence factors; Molecular epidemiology; Genomic surveillance; The Gambia.*

PP-11 POSTER PRESENTATION

# Longitudinal Personal Environmental Exposure and *Streptococcus pneumoniae* Colonisation in a Cohort of Children 5-14 Years Old in Rural Gambia

**Dam Khan[1,2], Brenda Kwambana-Adams[3,4], Peggy-Estelle Tientcheu[1], Shola-Able Thomas[1], Peter Sylvanus Ndow[1], Ma-Ansu Kinteh[1], Archibald Worwui[1], Nuredin Ibrahim Mohammed[1], Mark P. Nicol[5] and Martin Antonio[1,2,6]**

*[1]MRC Unit The Gambia at LSHTM, Banjul, The Gambia; [2]Dept of Infection Biology, LSHTM, London, UK; [3]Malawi Liverpool Wellcome Programme, Blantyre, Malawi; [4]NIHR Global Health Group on Vaccines to Control Respiratory Pathogens and AMR, University College London, UK; [5]Marshall Centre, School of Biomedical Sciences, University of Western Australia, Perth, Australia; [6]Centre for Epidemic Preparedness and Response, LSHTM, London, UK*

**BACKGROUND** Air pollution drives morbidity and mortality in low-income countries where solid fuel reliance causes high household exposure. We investigated associations between Streptococcus pneumoniae pharyngeal colonisation, a prerequisite for pneumococcal disease and personal exposure to particulate matter (PM2.5), carbon monoxide (CO), temperature, and relative humidity in Gambian children.

**METHODS** The prospective study included 134 children aged 5–14 years across eight visits in Foni. Personal 24-hour PM2.5, CO, temperature, and relative humidity were measured using PATS+ monitors. Swabs were collected concurrently to determine colonisation via microbiological culture. Decomposed mixed-effects logistic regression models, adjusted for age, season, and income, examined associations between environmental exposures and colonisation.

**RESULTS** Analysis included 554 child-visits. Geometric means were 12.6 µg/m$^3$ (95% CI: 12.2–13.1) for PM2.5 and 0.13 ppm (95% CI: 0.11–0.16) for CO. PM2.5 levels exceeded the WHO 24-hour guideline (15 µg/m$^3$) in 30.7% of visits, which was over twice as high in the dry season compared to the wet season (44.2% vs 18.2%). The CO guideline (3.5 ppm) was exceeded in 7.8% of visits (dry season 11.6% vs 4.5%). Low-income households experienced the highest exposures PM2.5: 14.43 µg/m$^3$, CO: 1.01 ppm versus medium (13.03 µg/m$^3$, 0.85 ppm) and high-income groups (12.11 µg/m$^3$, 0.86 ppm). PM2.5 and CO were not associated with S. pneumoniae colonisation in our mixed-effects model. Higher between-child temperature exposure was associated with lower odds of colonisation (OR: 0.74, 95% CI: 0.56–0.98; p=0.034). Relative humidity showed an inverse within-child association in crude analysis (OR: 0.70, 95% CI: 0.52–0.93; p=0.013) but attenuated after seasonal adjustment.

**CONCLUSION** PM2.5 and CO exposure disparities exist across seasons and income groups. However, at the observed levels, neither pollutant was associated with S. pneumoniae colonisation. Longer-term ambient temperature conditions appear more relevant to pneumococcal colonisation dynamics than acute environmental variations in this setting.

PP-14 POSTER PRESENTATION

# Production and Application of a Murine Monoclonal Antibody Targeting *Toxoplasma gondii* Inner Membrane Complex 1 (Tg*IMC1)*

**Yusupha Jallow[1], [2]; Hong-Juan Peng[1]**

*Southern Medical University Guangzhou, China*

*Medical Research Council The Gambia at London School of Hygiene and Tropical Medicine (MRCG@LSHTM)*

**BACKGROUND** *Toxoplasma gondii* is a globally distributed protozoan parasite and a major public health concern, infecting approximately one-third of the world's population. It causes severe disease in immunocompromised individuals and in cases of congenital infection. The inner membrane complex 1 (*Tg*IMC1) protein is a key cytoskeletal component essential for parasite motility, host cell invasion, and replication. This study aimed to generate and characterize murine monoclonal antibodies (mAbs) against *Tg*IMC1 using hybridoma technology, with the goal of improving diagnostic accuracy and informing therapeutic strategies for toxoplasmosis.

**METHODS** The *Tg*IMC1 gene was amplified by PCR and cloned into the pET-28a(+) vector. The recombinant plasmid was transformed into *E. coli* BL21 (DE3) cells, and transformants were selected on kanamycin-supplemented LB agar. *Tg*IMC1 expression was induced with IPTG, and the recombinant protein was purified via nickel-chelate affinity chromatography. BALB/c mice were immunized three times with the purified *Tg*IMC1 protein, generating high-titre antibodies. Spleen cells from immunized mice were fused with myeloma cells to produce hybridomas, and ELISA was used to screen for antibody-secreting clones. Positive hybridoma cell lines secreting high-specificity mAbs against *Tg*IMC1 were established. The mAbs were characterized using ELISA, Western blot, and immunofluorescence assays to determine their specificity and the intracellular localization of *Tg*IMC1

**RESULTS** The *Tg*IMC1 protein was successfully expressed in *E. coli* and purified to a final concentration of 2.15 µg/µL, providing sufficient antigen for immunization. Immunized BALB/c mice mounted a strong immune response, with the highest antibody titter reaching 1:102,400 after the second immunization. From hybridoma screening, six positive hybridoma cell lines (C5, A3, B6, B9, C7, and D4) secreting high-specificity mAbs against *Tg*IMC1 were established. The purified mAbs achieved a concentration of 1.3 µg/µL and demonstrated high specificity, affinity, and immunoreactivity. All experiments were performed in triplicate, and no cross-reactivity with host cell proteins was observed. The mAbs were characterized and Immunofluorescence assays confirmed that the mAbs effectively detect *Tg*IMC1 at its native intracellular localization within the parasite.

**CONCLUSION** The newly developed monoclonal antibodies against *Tg*IMC1 enable specific detection of the protein at its native localization and provide a useful tool for future immunodiagnostic and functional studies of toxoplasmosis. This study highlights *Tg*IMC1 as a promising target for the diagnosis of *T. gondii* infections.

**KEYWORDS** *Toxoplasma gondii; Inner Membrane Complex 1; monoclonal antibodies; gene cloning; protein expression and purification.*

OP-07 ORAL PRESENTATION · SESSION 1

# The Evolutionary Trade-Offs of Bacterial Immunity: Balancing Genome Protection and Adaptive Opportunity in Antimicrobial Resistance

**Lamarana Jallow[1,2], Ousman Bajinka[3], Ismaila Mbenga[2,4], Daniel Oduro-Mensah[1], Abdoulie Bojang[5]***

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[4] *Department of Biology, College of Arts and Sciences, Georgia State University, Atlanta, GA,30303, USA*

[5]*MRC Unit The Gambia at the London School of Hygiene and Tropical Medicine, Fajara, Gambia*

**BACKGROUND** Antimicrobial resistance (AMR) is traditionally explained by antibiotic selection acting on genetic variation generated through mutation and horizontal gene transfer (HGT). However, an equally fundamental question is why some bacterial lineages readily acquire foreign DNA whereas others remain comparatively resistant to gene acquisition. Recent discoveries have revealed an extensive repertoire of bacterial immune systems including restriction-modification systems, CRISPR-Cas, BREX, DISARM, CBASS, retrons, and numerous newly identified defense mechanisms that protect bacteria from invading genetic elements and constrain the acquisition of potentially beneficial traits, including AMR genes and virulence factors.

**METHODS** A narrative synthesis of 95 peer-reviewed publications was undertaken, integrating evidence from microbial immunology, evolutionary biology, bacterial genomics, and antimicrobial resistance research. The review examined bacterial defense systems, counter-defense mechanisms, host-mobile genetic element interactions, and ecological influences on HGT to develop a unified evolutionary framework.

**RESULTS** The evidence indicates that bacterial immunity represents a fundamental evolutionary trade-off between genomic protection and adaptive opportunity. While defense systems preserve genome integrity by restricting HGT, they simultaneously limit access to the broader mobile gene pool from which adaptive traits arise. Conversely, counter-defense mechanisms and recursive host-mobile genetic element conflicts partially restore gene flow, creating dynamic evolutionary equilibria that differ among bacterial lineages and ecological settings. These interactions determine whether bacterial populations remain genetically restrictive or become permissive to the acquisition and dissemination of antimicrobial resistance. Collectively, the findings suggest that bacterial immunity functions as an upstream regulator of bacterial evolvability by governing access to mobile genetic diversity before antibiotic selection acts.

**CONCLUSIONS** Bacterial immunity represents an underappreciated determinant of antimicrobial resistance emergence and dissemination. Incorporating immune architecture into AMR surveillance and risk assessment could improve the prediction of bacterial lineages most likely to acquire and spread resistance genes, while identifying new opportunities to interrupt resistance transmission.

**KEYWORDS** *antimicrobial resistance; bacterial immunity; horizontal gene transfer; microbial evolution; genomic epidemiology; mobile genetic elements.*

SUB-THEME 2

# Reproductive, Maternal, Adolescent & Child Health

2 abstracts

## IN THIS SECTION

**PP-01** Household Decision-Making, Insecticide-Treated Net Ownership, Utilisation, and Their Associations With Malaria Outcomes Among Children Under Five Years in Rural Gambia: A Cross-Sectional Study — *Momodou Alieu Jallow*

**PP-09** Hepatitis B Vaccination Status of Health Care Workers in the Lower River Region, The Gambia — *Yankuba Jarjusey*

PP-01 POSTER PRESENTATION

# Household Decision-Making, Insecticide-Treated Net Ownership, Utilisation, and Their Associations With Malaria Outcomes Among Children Under Five Years in Rural Gambia: A Cross-Sectional Study

**Momodou Alieu Jallow, Mamadou Korka Jallow, Abdul-Aziz Hussein, Samba Camara**

**BACKGROUND** Malaria disproportionately affects children under five in sub-Saharan Africa. Although insecticide-treated nets (ITNs) are an effective prevention tool, household and caregiver factors may influence malaria outcomes. This study aimed to determine malaria prevalence and identify household, caregiver, and ITN-related factors associated with malaria among children under five in rural communities of the Upper River Region, The Gambia.

**METHODS** A community-based cross-sectional study was conducted among 402 purposively and randomly selected households with children under five years in the Upper River Region (URR), The Gambia. Data were collected using a validated, interviewer-administered, semi-structured questionnaire across seven districts, employing multi-stage cluster sampling with probability proportional to size allocation. Forward stepwise binary logistic regression was applied to identify independent predictors of malaria outcomes, adjusting for potential confounders. Statistical significance was set at $p < 0.05$.

**RESULTS** The prevalence of at least one malaria episode in the six months preceding the survey was 28.6% (n = 115/402). The majority of households (84.3%) owned between one and ten ITNs, and 71.1% reported that all children under five slept under an ITN the previous night. Forward stepwise logistic regression identified eight independent predictors of malaria outcomes. Caregiver age was inversely associated with malaria risk: compared with caregivers aged ≥48 years, those aged 18–27 years (AOR= 0.105; 95% CI: 0.035–0.320; $p < 0.001$), 28–37 years (AOR = 0.117; 95% CI: 0.042–0.328; $p < 0.001$), and 38–47 years (AOR = 0.209; 95% CI: 0.076–0.574; $p = 0.002$) had significantly lower odds of child malaria. Households in which no child slept under an ITN had nearly fourfold higher odds of malaria (AOR = 3.821; 95% CI:1.647–8.863; $p = 0.002$), and those with fewer ITNs (1–10 nets) had over sixfold higher odds compared with households owning 11–20 nets (AOR = 6.657; 95% CI: 1.548–28.622; $p = 0.011$). Caregivers who consistently encouraged community members to use ITNs (AOR = 0.199; 95% CI: 0.085–0.466; $p < 0.001$), sought malaria treatment (AOR = 0.030; 95% CI: 0.014–0.065; $p < 0.001$), and resided in households with 1–6 children under five (AOR = 0.089; 95% CI: 0.022–0.368; $p = 0.001$) had substantially reduced odds of child malaria.

**CONCLUSIONS** Malaria outcomes among children under five in rural Gambia are significantly associated with ITN utilisation patterns, household ITN adequacy, caregiver community engagement, and treatment- seeking behaviour. Strategies to reduce malaria burden should prioritise ensuring adequate household ITN coverage, empowering caregivers through targeted health education, and strengthening community-level promotion of preventive practices.

PP-09 POSTER PRESENTATION

# Hepatitis B Vaccination Status of Health Care Workers in the Lower River Region, The Gambia

**Yankuba Jarjusey**

**BACKGROUND** Although nosocomial hepatitis B is highly vaccine-preventable, vaccination rates among healthcare workers (HCWs) remain low, posing significant health risks to HCWs, patients and communities. The study assessed full-dose HBV vaccination among HCWs and identified factors associated with HBV vaccination in the Lower River Region of The Gambia.

**METHODS** This was a cross-sectional design that involved 182 HCWs selected through stratified multi-stage sampling and interviewed using a structured questionnaire administered via face-to-face interviews or self-administration. STATA 18 was used for analysis, and Chi-square or Fisher's exact tests were used to identify statistically significant variables worth advancing to the multivariable logistic regression model. The model identified the factors associated with HBV vaccination, and statistical significance was declared at $p < 0.05$.

**RESULTS** The proportion of HCWs vaccinated against HBV was 52.2%, but only 23.1% of the HCWs received the recommended 3 doses, becoming fully vaccinated as prophylaxis against occupationally acquired hepatitis B infection. Among the high-risk cadres of HCWs, vaccination rates were highest among laboratory staff (83.3%), followed by pharmacy staff (75.0%), LTI staff (60.0%), ophthalmology staff (60%), auxiliary staff (54.1%), public health officers (52.9%), medical doctors (50%), and nursing staff (42.9%). Having good knowledge of HBV (AOR = 2.363; 95% CI: 1.078-5.179), screened for HBV (AOR = 7.059; 95% CI: 3.597-13.854), accidental needle sticks (AOR = 2.697; 95% CI: 1.278-5.688) and working at a community health clinic (AOR = 0.229; 95% CI: 0.065-0.800) were significantly associated with HBV vaccination.

**CONCLUSIONS** Full-dose HBV vaccination coverage among HCWs in LRR was low even though the majority had received at least one dose of the vaccine. Strengthening occupational health policies, HBV education, screening, vaccination access and infection prevention practices is necessary to protect HCWs against occupationally acquired HBV infection.

SUB-THEME 3

# Data-Driven Health Governance

7 abstracts

## IN THIS SECTION

**OP-13** Ethical Community Engagement in Health Research: A Case Analysis Using the Socio-Cultural Research Ethics Conceptual Model (SCREM) in The Gambia — *Omar Jaiteh*

**OP-04** Does Health Worker Behaviour and Equipment Configuration Threaten Vaccine Potency in Solar Direct Drive Refrigerators in The Gambia? A Retrospective Cohort Study — *Amadou Barry*

**OP-12** Prevalence and Factors Associated With Workplace Violence Against Healthcare Workers at Brikama District Hospital, The Gambia — *Isatou Dem*

**OP-03** Utilization of Routine Service Delivery Data in Hospital Management and Quality of Care Improvement: Bundung Maternal & Child Hospital (BMCH) as a Case Study — *Dr Mamady Cham*

**PP-15** Assessment of Core Capacities, Challenges and Strategies in Mpox Preparedness and Response at Ground Border Crossings in the Western II Health Region, The Gambia — *Momodou Alieu Jallow*

**PP-07** Impact of Field Epidemiology Training on Disease Surveillance Competencies Among Public Health Officers in The Gambia: Evidence for Data-Driven Health Governance — *Sambou Mbye*

**PP-03** Digital Health Readiness for Respiratory Infection Care at Edward Francis Small Teaching Hospital, The Gambia: A Cross-Sectional Quality Improvement Survey — *Ousman Bajinka*

OP-13 ORAL PRESENTATION · SESSION 3

# Ethical Community Engagement in Health Research: A Case Analysis Using the Socio-Cultural Research Ethics Conceptual Model (SCREM) in The Gambia

**Omar Jaiteh**

[1] *Department of Nursing and Reproductive Health, School of Medicine & Allied Health Sciences, University of The Gambia, Banjul Campus, The Gambia.*

**BACKGROUND** Community engagement is essential for ethical health research in sub-Saharan Africa, yet evidence on implementing culturally adapted strategies remains limited. In sub-Saharan Africa, research is often conducted with Global North partners, and engagement can become tokenistic. The Socio-Cultural Research Ethics Model (SCREM) offers a framework for contextualizing Western bioethical principles in African communal settings but its application in The Gambia remains unexplored. This paper analyses ethical community engagement practices in The Gambia using SCREM to provide practical guidance for researchers.

**METHODS** A case study analysis of existing literature on community engagement in health research. SCREM served as the analytical framework to examine how autonomy, beneficence, and justice can be adapted within Gambian socio-cultural contexts. Sources included peer-reviewed studies on community engagement, informed consent, and trial participation in The Gambia

**RESULTS** Applying SCREM revealed three key themes. To start, trust-building through dialogue with village heads and iterative community feedback operationalizes relational autonomy. Moreover, village leaders and male household heads strongly influence participation decisions, creating tension between communal authority and individual consent. Third, socioeconomic vulnerability and limited healthcare access can turn beneficial research offers into coercion, raising justice concerns. Culturally appropriate strategies include co-developed consent processes, inclusive forums, separate discussion spaces for marginalized groups, ongoing consent throughout the research lifetime, and result dissemination through bantaba meetings and traditional communicators.

**CONCLUSION** SCREM effectively bridges Western bioethics and Gambian communal realities, demonstrating that universal principles can be delivered at the community level when contextualized. This analysis provides actionable guidance for researchers, ethics committees, and policymakers in The Gambia and similar West African settings. Future research should empirically validate these strategies across diverse Gambian communities.

OP-04 ORAL PRESENTATION · SESSION 1

# Does Health Worker Behaviour and Equipment Configuration Threaten Vaccine Potency in Solar Direct Drive Refrigerators in The Gambia? A Retrospective Cohort Study

**Amadou Barry**

**BACKGROUND** Gambia as a tropical developing country benefitted from the global Cold Chain Equipment Optimization Platform (CCEOP) to replace its old generation of CCE to ensure vaccine potency and strengthen last-mile immunization equity. This study evaluates how remaining vulnerabilities such as healthcare worker behaviours, equipment thermodynamics and equipment alarm configuration interactions influence vaccine thermal integrity.

**METHODS** A country-wide retrospective cohort study was conducted using continuous cellular telemetry data from TOLOGG-4.0-GL electronic loggers deployed in 134 B Medical SDDs. Physical door open-close event pairings between April 2025 and June 2026 were reconstructed and resampled into hourly panel with linear gap interpolation up to 4 hours. Statistical analyses included Haynes Mean Kinetic Temperature equation, distributed lag regression modelling with Cluster-Robust variance estimation, multivariable logistic regression, one-way ANOVA across SDD types. Unsupervised K-Means clustering (k = 3) was utilized to categorize SDD units into 3 risk levels (high, medium and low) and an out-of-sample sensitivity testing on SDDs with pre-April 2025 telemetry data was conducted to confirm selection bias and model stability.

**RESULTS** Overall national WHO temperature compliance (+2.0°C to 8.0°C) was 97.85% (mean = 4.26°C; SD: 1.40°C; median = 4.07°C) and MKT of 4.43°C. Heat excursions account for 2.13% while freeze excursions account for 0.02%. However, all these freeze excursions occurred silently between −0.5°C and +2.0°C. Additionally, the size and design of an SDD strongly determines its thermal stability ($F(4,80) = 18.42$, $p < 0.001$). Door open duration adds ~1.26 minutes of heat exposure per minute of opening ($\beta = +0.021$ h/min, CI: 0.005–0.037, $p = 0.011$).

**CONCLUSION** While national SDD compliance is high, vaccine potency continues to be threatened by door opening duration and low alarm configuration. Adjusting low alarm configuration, enforcing WHO two-touch rule and deploying large-capacity SDD units will strengthen CCE thermal stability and promote last mile efforts

OP-12 ORAL PRESENTATION · SESSION 3

# Prevalence and Factors Associated With Workplace Violence Against Healthcare Workers at Brikama District Hospital, The Gambia

**Isatou Dem**

*Baja Kunda Major Health Centre, Upper River Region, The Gambia*

**BACKGROUND** Globally, in healthcare facilities, workplace violence encompasses both victimization of healthcare workers and perpetration by patients, relatives, visitors, and colleagues. In sub-Saharan Africa, it is a recognized occupational health problem with documented consequences for staff wellbeing, retention, and quality of care. In The Gambia, facility-level evidence remains scarce, with the only prior study by Sisawo et al. (2017) reporting that about three-fifths (62.1%) of nurses in 14 public secondary facilities had experienced workplace violence in the preceding 12 months. This study estimated the 12-month prevalence and identified factors associated with exposure among healthcare workers at Brikama District Hospital.

**METHODS** A cross-sectional study was conducted among general nurses, midwives, public health officers, and medical officers. A sample of 133 was calculated using the Yamane formula from a workforce of 173, with participants recruited through multi-stage sampling combining simple random selection of cadres and systematic sampling from departments. Data were collected using a self-administered questionnaire adapted from the joint ILO, WHO, ICN, and PSI instrument, which demonstrated good internal consistency (Cronbach's alpha 0.82). Analyses in SPSS version 26 comprised descriptive statistics, chi-square tests, and binary logistic regression, with significance set at $p<0.05$.

**RESULTS** Of 133 questionnaires distributed, 125 were completed (response rate 94.0%). Fifty-six (44.8%) reported at least one episode of workplace violence in the preceding 12 months. Among those who experienced violence (n=56), verbal abuse was most frequent [26 (47%)], followed by physical violence [20 (36%)] and sexual violence [10 (17%)]. Patients and their escorts were the most commonly reported perpetrators, with most incidents occurring in the outpatient department. In adjusted analyses, exposure was associated with age 21-30 years (aOR 3.5; 95% CI 1.2-10.2), 1-5 years work experience (aOR 4.2; 95% CI 1.5-11.8), working rotating shifts including night shifts compared to day-only shifts (aOR 3.2; 95% CI 1.2-8.4), and perceived understaffing (p=0.004).

**CONCLUSION** Workplace violence, particularly verbal abuse, was common at 44.8% at Brikama District Hospital, consistent with Sisawo et al.'s over 60% regionally, and was concentrated among younger, less experienced and shift-working staff. Findings support adequate staffing, security measures, de-escalation training, public sensitization, and confidential incident reporting systems, alongside longitudinal studies to characterize these associations further.

**KEYWORDS** *workplace violence, healthcare workers, prevalence, associated factors, The Gambia*

OP-03 ORAL PRESENTATION · SESSION 1

# Utilization of Routine Service Delivery Data in Hospital Management and Quality of Care Improvement: Bundung Maternal & Child Hospital (BMCH) as a Case Study

**Dr. Mamady Cham**[1]

[1]*Retired Chief Executive Officer, Bundung Maternal & Child Hospital, Ministry of Health*

**BACKGROUND** Routine health service delivery data provides important set of information that has the potential to inform decisions relating to health management and quality of care improvement. However, often they are not used optimally. The objectives of the review conducted in BMCH were to illustrate the trend in patient load, quality of care indicators and enumerate how the information were used in the management and administration of the hospital.

**METHODS** Case abstraction of hospital kept patients' records was introduced following three steps. First, patients' records were abstracted using an internally designed unit specific template. Second, it was mandatory for Heads of Units/Wards submit to the CEO not later than 5$^{th}$ of the following month their monthly statistics. Third, monthly and quarterly analysis of the submitted service delivery data to generate descriptive statistics and pictographs and shared.

**RESULTS** Service utilization increased substantially, as Inpatient admissions increased by 256.6% between 2019 (1,965) and 2025 (5,631); Institutional deliveries, new Antenatal registrations and Surgeries increased by 133%, 124% and 309% respectively in the same reference period. First trimester registrations of pregnant women increased from 13.8% in 2019 to 48% in 2024. Quality of care indicators, indicated that Cesarean Section rate increased by 296% between 2019 (370) and 2025 (1,096) with access to emergency obstetric care services improved from 8.8% to 20%. Live birth and stillbirth birth rates were maintained in excess of 98% and below 2% respectively. The institutional maternal mortality ratio reduced to 18 per 100,000 live births. Residence of parturient women, indicated that non-resident within BMCH catchment area accounted for 76% (2019) and 83.9% (2025). Revenue generation through user-fees increased by 517% between 2019 to 2025.

**CONCLUSION** Analysed routine health services delivery data has been used over the years to inform management decisions and in improving quality of care for better health outcomes for our patients over the past years.

PP-15 POSTER PRESENTATION

# Assessment of Core Capacities, Challenges and Strategies in Mpox Preparedness and Response at Ground Border Crossings in the Western II Health Region, The Gambia

**Momodou Alieu Jallow**

*1. Department of Public and Environmental Health, School of Medicine and Allied Health Sciences, University of The Gambia, Banjul, The Gambia.*

**BACKGROUND** Mpox is a re-emerging zoonotic disease of global public health concern, particularly in regions with porous borders and weak surveillance systems. The 2024 PHEIC declaration highlighted gaps in cross-border preparedness, especially in low-resource settings, where limited surveillance, coordination, and infrastructure increase the risk of disease transmission. The study assessed the core capacities, challenges and strategies for Mpox preparedness and response at the ground crossing sites in Western II Health Region.

**METHODS** A mixed-method study was conducted across four ground crossing sites. Quantitative data were collected using the WHO core capacity assessment tool, while qualitative data were gathered through Key Informant Interviews and focus group discussions with 12 participants. Descriptive statistics (frequencies and percentages) were presented for quantitative data while thematic method was used for qualitative data.

**RESULTS** The core capacity score was 46.25%, reflecting significant gaps in compliance with International Health Regulations (IHR). Preparedness levels were moderate but varied, with scores ranging from 39% to 54%. Coordination and communication were relatively stronger (44%-64%), yet international communication systems were largely non-functional. Routine capacities were weak to moderate (36%- 50%), showing deficiencies in vector control, staffing, and infrastructure. PHEIC response capacities were generally low (38%-48%). Qualitative assessments identified critical barriers to Mpox preparedness and response, including staffing shortages during peak periods, inadequate infrastructure, shortages of personal protective equipment (PPE), weak inter-agency coordination, and community underreporting of suspected Mpox cases among visitors from neighboring regions. Community Signal Detectors were identified as essential components of the early warning system, particularly at informal border crossings.

**CONCLUSION** Mpox preparedness and response capacity in the Western II Health Region remains inadequate, with notable gaps in human resources, infrastructure, surveillance, and emergency preparedness. However, community-based surveillance plays a vital role in early detection. Strengthening coordination, workforce capacity, infrastructure, and emergency response systems is essential to enhance outbreak preparedness and health security in The Gambia.

PP-07 POSTER PRESENTATION

# Impact of Field Epidemiology Training on Disease Surveillance Competencies Among Public Health Officers in The Gambia: Evidence for Data-Driven Health Governance

**Sambou Mbye**

[1] *School of Public Health, University of Education, The Gambia* | [2] *Gambia Field Epidemiology Training Program, Ministry of Health, The Gambia*

**BACKGROUND** Effective disease surveillance is essential for data-driven health governance, enabling timely detection, response, and evidence-based decision-making during public health events. The Field Epidemiology Training Program (FETP) was introduced in The Gambia to strengthen surveillance capacity, yet evidence of its effectiveness remains limited. This study assessed the impact of FETP on the knowledge, attitudes, and practices (KAP) of Public Health Officers involved in disease surveillance.

**METHODS** A cross-sectional analytical study was conducted among 129 Public Health Officers from four health regions in The Gambia between June and August 2025. Data were collected using a structured electronic questionnaire. Composite KAP scores were generated, and descriptive statistics, bivariate analyses, and multivariable linear regression were used to compare FETP-trained and non-trained officers and identify factors associated with surveillance competencies. Statistical significance was set at $p < 0.05$.

**RESULTS** The mean knowledge, attitude, and practice scores were 83.5%, 91.6%, and 59.2%, respectively. FETP-trained officers demonstrated significantly higher KAP scores than non-trained officers. After adjustment for potential confounders, FETP training remained independently associated with improved knowledge, attitudes, and practices. Higher educational attainment and longer work experience were associated with better knowledge, while routine data analysis and availability of surveillance tools predicted improved surveillance practices. Despite high knowledge and positive attitudes, comparatively lower practice scores highlighted persistent operational challenges.

**CONCLUSION** FETP significantly improves disease surveillance competencies among Public Health Officers in The Gambia and provides evidence to support data-driven health governance. Expanding FETP coverage, strengthening supportive supervision, and improving access to surveillance resources could enhance evidence-based decision-making, strengthen surveillance performance, and improve national health security.

PP-03 POSTER PRESENTATION

# Digital Health Readiness for Respiratory Infection Care at Edward Francis Small Teaching Hospital, The Gambia: A Cross-Sectional Quality Improvement Survey

**Ousman Bajinka**

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**BACKGROUND** Predictive, preventive, personalized (3PM) respiratory care depends on digital infrastructure, yet readiness in low-resource settings is poorly quantified. We assessed digital health maturity and staff readiness at Edward Francis Small Teaching Hospital (EFSTH), a tertiary referral hospital serving over 2.5 million people.

**METHODS** Cross-sectional quality improvement survey (DHRQ-EFSTH-350). Sampling frame: all 350 clinical and non-clinical staff on duty rosters across nine departments. Of 350 invited, 350 completed surveys (100% response). A composite Digital Health Maturity Score (0–10) was constructed from three equally weighted domains: infrastructure, interoperability, and 3PM functionality. Domain items were normalized to 0–10 and averaged. Content validity was established by expert review; the tool was pilot-tested and triangulated with 64 focus-group participants.

**RESULTS** Only 27.4% (96/350) had functional computers; 74.0% (259/350) lacked reliable internet; 80.9% (283/350) experienced power outages; 89.7% (314/350) used paper records exclusively. No automated early warning scores, digital preventive reminders, or personalized care planning were operational. Overall maturity was 1.6/10 (Level 1: Initial/ad-hoc). Despite deficits, 91.4% (320/350) agreed digital tools would improve clinical speed, 92.6% (324/350) were confident learning new systems, and 74.6% (261/350) volunteered as digital champions.

**CONCLUSION** EFSTH has severe digital infrastructure gaps but strong staff readiness. Targeted, low-cost investments in offline-capable tablets, solar backup power, basic electronic medical records, and peer-training programs using volunteer champions could advance maturity. Addressing these foundational gaps is necessary for equitable 3PM respiratory care. This study provides an implementation readiness assessment to guide phased digital health strengthening in resource-constrained settings.

SUB-THEME 4

# Regional Scientific Research Competition 2026

Research from the Regional Associations of Public Health Officers

## IN THIS SECTION

**OP-08** Perceived Barriers to Accurate Maternal Death Reporting Among Healthcare Workers in the Lower River Region, The Gambia — *LRR Team*

**OP-09** Geospatial Distribution and Associated Factors of Hepatitis B Birth-Dose Vaccination Timeliness Among Children Aged 0–11 Months in the Upper River Region, The Gambia, January to December, 2025 — *URR Team*

**OP-10** Home Delivery in Central River Region, The Gambia: Prevalence, Barriers, and Newborn Care Outcomes, a Mixed Method Study — *CRR Team*

**PP-16** Determinants of Immunization Defaulters Among Children Aged 24-59 Months in the Western One Health Region, The Gambia. A Community-Based Case-Control Study — *WOPHOA Research Team*

**PP-13** Pesticide Use Practices Among Farmers and Screening for Organophosphate and Carbamate Residues in Vegetables Sold at Brikama Market, The Gambia: A Cross-Sectional Study — *Western II Team*

**PP-17** Risk Factors Associated With Diarrhoea With Blood Among Children Under Five Years in North Bank West Health Region, The Gambia — *NBWR Team*

OP-08 ORAL PRESENTATION · SESSION 2 · REGIONAL HEALTH RESEARCH

# Perceived Barriers to Accurate Maternal Death Reporting Among Healthcare Workers in the Lower River Region, The Gambia

**Lower River Region Public Health Officers Association**

**BACKGROUND** Accurate maternal death reporting is essential for effective Maternal Death Surveillance and Response (MDSR) and for preventing future maternal deaths. However, deaths occurring in communities, during transit, or within health facilities may be missed or incompletely reported. This study explored healthcare workers' perceived barriers to accurate maternal death reporting and proposed strategies for improvement in the Lower River Region (LRR) of The Gambia.

**METHODS** A qualitative descriptive study informed by the Socio-Technical Ecology Framework was conducted in the LRR. Maximum-variation purposive sampling recruited healthcare workers and health-system administrators involved in maternal healthcare or MDSR activities. Data were collected through 21 semi-structured interviews involving 16 frontline healthcare workers and 5 regional or facility administrators between 28 June and 16 July 2026. Interviews were conducted in English or participants' preferred local language, audio-recorded, transcribed, translated where necessary, and analysed using Braun and Clarke's reflexive thematic analysis. NVivo 14 supported data management.

**RESULTS** Six interconnected themes emerged: fear and punitive culture; cultural and religious beliefs perceived to discourage disclosure; health workforce capacity and training gaps; organisational and systemic weaknesses; weak detection and underreporting; and resource and logistical constraints. Participants described fear of blame, scrutiny, and disciplinary action as factors that could discourage reporting. Other barriers included inadequate MDSR training and mentorship, staff shortages, inaccessible reporting guidelines, unclear reporting responsibilities, limited supervision, community-level non-disclosure of maternal deaths, underreporting of facility deaths, and inadequate transport, mobile phones, communication credit, electricity, and network access. Proposed strategies included learning-oriented and non-punitive maternal death reviews, continuous training and mentorship, supportive supervision, standardised reporting tools, designated reporting focal persons, stronger community facility surveillance linkages, community engagement, and improved communication and logistical support.

**CONCLUSION** Maternal death reporting in LRR is constrained by interacting individual, community, organisational, and health-system barriers. A coordinated approach that promotes a trusted learning environment, strengthens workforce capacity and reporting systems, improves community-based detection, and provides adequate logistical support is needed to improve the completeness, timeliness, and usefulness of maternal death reporting.

**KEYWORDS** *Maternal death reporting; Maternal Death Surveillance and Response; Healthcare workers; Perceived barriers; Maternal mortality; Lower River Region; The Gambia.*

OP-09 ORAL PRESENTATION · SESSION 2 · REGIONAL HEALTH RESEARCH

# Geospatial Distribution and Associated Factors of Hepatitis B Birth-Dose Vaccination Timeliness Among Children Aged 0–11 Months in the Upper River Region, The Gambia, January to December, 2025

**Ansumana Darboe, Alassana Kanteh, Hawa Ndow, Ebrima Nyimanta, Modi A. Jawo, Muhammed A. Camara**

**BACKGROUND** Hepatitis B virus infection remains a major public health threat in The Gambia, with mother-to-child transmission being a key driver. Timely administration of the Hepatitis B birth dose is critical for prevention, yet timeliness in the Upper River Region remain suboptimal. This study assessed the geospatial distribution and associated factors of Hepatitis B birth-dose vaccination among children aged 0–11 months in Upper River Region.

**METHODS** A community-based, analytical cross-sectional study was conducted from January to December, 2025. Data were collected from 795 caregivers using structured questionnaires. Timeliness was defined as vaccinated within 24 hours of birth and delayed if after 24 hours. Geospatial analysis was performed using QGIS version 4.2.0 to map district-level delays and kernel density concentrations. Bivariable analysis used chi-square or Fisher's exact test, with variables at $p<0.2$ entered into multivariable logistic regression to identify associated factors. Significance was set at $p<0.05$.

**RESULTS** Overall, 65.3% of children were vaccinated on time. Spatial analysis revealed significant heterogeneity, with the highest delays in Jimara and Tumana districts. Multivariable analysis showed children from Tumana had 6.5 times higher odds of delayed vaccination compared to Wuli West.

**CONCLUSION** Delayed Hepatitis B birth-dose vaccination is a substantial public health risk in Upper River Region, with clear geographic clustering and links to district of residence, time of delivery and facility type. Integrating Hepatitis B birth-dose into delivery room protocols, ensuring vaccine availability in community clinics and targeting interventions to high-burden districts like Jimara and Tumana are urgently needed to improve timeliness and advance hepatitis B elimination goals.

OP-10 ORAL PRESENTATION · SESSION 2 · REGIONAL HEALTH RESEARCH

# Home Delivery in Central River Region, The Gambia: Prevalence, Barriers, and Newborn Care Outcomes, a Mixed Method Study

**Presenters: Kumba S Susso and Abass Saidy**

**BACKGROUND** In 2023 globally, 86% of births were attended by skill health workers and as of 2022, HepB birth dose coverage stood at just 45% globally. Home delivery remains a problem in CRR ranging from 23.9 to 34.3% (Demographic and Health Survey, 2020).

**AIM** To assess the prevalence of home delivery and its association with Newborn care outcomes and to explore perceived barriers to facility delivery from the perspective of mothers, community birth companions and health workers in CRR, The Gambia.

**METHODS** OLOGY: A mixed method study design was used including an analytical community cross-sectional study and qualitative study through focus group discussions. A two-stage cluster sampling design with proportionate allocation was used to get study participants and qualitative data was analyzed with MAXQDA whereas quantitative data was analyzed through SPSS version 27 where APR were obtained.

**RESULTS** The Prevalence of Home Delivery in CRR was 19.6% (95% CI: 15.5-23.7). Hepatitis B timeliness was 82% (APR = 0.180) less likely, PNC within 48hrs was 59.2% (APR = 0.408) less likely, Birth registration was 37.1% (APR = 0.629) less likely and there was 60.7% (APR = 0.393) reduction with accuracy of Date of birth among home delivered babies. The qualitative data from the triangulated information from mothers, health workers and CBCs revealed that cost of transport, fear of C-section, household decision making patterns, and privacy concerns were the barriers to home facility delivery, which indicates that access is the main issue compared to lack of awareness.

**CONCLUSION** Home delivery remained to negatively affect vaccination outcomes, timely postnatal care services, birth registrations and causes children to live with wrong date of birth written on their national documents. Notably, the study revealed that most of the home deliveries were unplanned ranging from transport issues to fast labor as barriers, which centers implications for intervention design, considering that the study confirmed the problem to be structural, rather than attitudinal.

PP-16 POSTER PRESENTATION

# Determinants of Immunization Defaulters Among Children Aged 24-59 Months in the Western One Health Region, The Gambia. A Community-Based Case-Control Study

**WOPHOA Research Team: Gibril Jallow, Basaikou Saidy, Ebrima S Juwara, Ebrima Manneh, Hawa Danso**

*Western One Public Health Officers Association*

**BACKGROUND** Immunization defaulting remains an important barrier to achieving optimal childhood vaccination coverage and sustained protection against vaccine-preventable diseases. Identifying modifiable caregiver, community, and health service factors associated with immunization defaulting is essential for designing context-specific interventions. This study assessed factors associated with immunization defaulting among children aged 24–59 months in the Western One Health Region of The Gambia.

**METHODS** A Community Base Case-Control Study involving 855 caregiver–child pairs assessed caregivers' knowledge of childhood immunization. Data were collected using a structured interviewer-administered questionnaire, while children's immunization status was verified through vaccination cards. Caregiver knowledge was measured using 10 questions, with correct answers scored 1 and incorrect or unclear answers scored 0. Scores ranged from 0–10, with scores ≥6 considered good knowledge and scores <6 considered poor knowledge. Descriptive statistics were used to summarize the characteristics of the participants. Associations between categorical variables and immunization status were assessed using Pearson's chi-square, Fisher's exact, or Fisher–Freeman–Halton exact tests, as appropriate. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported.

**RESULTS** Among the 855 children, 570 (66.7%) were fully immunized and 285 (33.3%) were immunization defaulters. Overall, 608 (71.1%) caregivers had poor knowledge of childhood immunization, while 247 (28.9%) had good knowledge. In bivariate analysis, caregiver educational attainment, household size, ethnicity, selected knowledge indicators, attendance at community sensitization activities, health worker attitudes, fear of vaccine side effects, and reported vaccine availability were associated with immunization status. In the multivariable analysis, caregivers with no formal education had higher odds of immunization defaulting compared with those with tertiary education (AOR = 2.262, 95% CI: 1.297–3.947, p = 0.004). Secondary education was also associated with higher odds of defaulting (AOR = 1.797, 95% CI: 1.014–3.187, p = 0.045). Negative perceptions of health workers' attitudes were associated with higher odds of defaulting (AOR = 2.334, 95% CI: 1.502–3.626, p < 0.001). Caregivers who did not stay home because of fear of vaccine side effects had lower odds of defaulting (AOR = 0.493, 95% CI: 0.344–0.707, p < 0.001). Caregivers who reported no vaccine unavailability during previous RCH visits had higher odds of defaulting (AOR = 2.021, 95% CI: 1.349–3.028, p = 0.001). Failure to correctly identify all three vaccine-preventable diseases was also associated with higher odds of defaulting (AOR = 1.565, 95% CI: 1.105–2.216, p = 0.012).

**CONCLUSIONS** Immunization defaulting was linked to caregiver education, perceptions of health workers, fear of vaccine side effects, and knowledge of vaccine-preventable diseases. Improving caregiver education, communication, and immunization services may help reduce missed vaccinations.

**KEYWORDS** *Immunization defaulting; childhood vaccination; vaccine knowledge; caregivers; health services; The Gambia.*

PP-13 POSTER PRESENTATION

# Pesticide Use Practices Among Farmers and Screening for Organophosphate and Carbamate Residues in Vegetables Sold at Brikama Market, The Gambia: A Cross-Sectional Study

**Modou Lamin Suwaneh, Ensa Jammeh, Alieu Sey, Jarrie Jawla, Karamba Fatajo**

*Western II Health Region*

**BACKGROUND** Pesticides are important for vegetable production but may leave residues in food that pose risks to human health. In The Gambia, little is known about pesticide-use practices among vegetable farmers or residues in vegetables sold at local markets. This study assessed pesticide-use knowledge, attitudes, and practices (KAP) among farmers supplying Brikama Market and screened vegetables for organophosphate and carbamate residues.

**METHODS** A cross-sectional study was conducted among 152 vegetable farmers recruited through market-vendor referrals and snowball sampling. A structured, pre-tested questionnaire assessed KAP using predefined cut-offs. Associations were tested using Pearson's Chi-square, Fisher-Freeman-Halton exact, and likelihood-ratio tests, with significance set at $p \leq 0.05$. Six composite vegetable samples (lettuce, cabbage, tomato, green pepper, bitter tomato, and cucumber) were screened using an enzyme-inhibition rapid test card and portable pesticide residue tester. The method is class-specific and screening-level and does not provide residue concentrations, LOD/LOQ values, or MRL exceedance data.

**RESULTS** Among 152 farmers, 77.0% were female, 84.9% married, and 38.2% had Qur'anic-Arabic education. Mean age was 41.6 years (SD 12.358) and mean farming experience 13.12 years (SD 10.234). Good knowledge, attitude, and practice were reported by 63.2%, 55.9%, and 32.9%, respectively. Knowledge was significantly associated with attitude ($\chi^2$=12.229, df=4, p=.016; Fisher-Freeman-Halton p=.023), and attitude with practice ($\chi^2$=11.214, df=4, p=.024; Fisher-Freeman-Halton p=.023). Knowledge was not significantly associated with practice ($\chi^2$=8.201, df=4, p=.085). Of six samples, three (50.0%) were negative, two (33.3%) weak positive, and one (16.7%) positive; tomato showed the strongest signal, while lettuce and green pepper were weak positive. Screening was qualitative, so MRL exceedance could not be determined

**CONCLUSION** Despite good knowledge and attitudes, only one-third of farmers demonstrated good practices. Screening detected organophosphate or carbamate residues in half of the samples. However, findings cannot establish MRL exceedance or dietary health risk. Chromatographic quantification using GC-MS/LC-MS and comparison with Codex/EU MRLs are recommended to inform food safety policy.

**KEYWORDS** *Pesticide residues, knowledge attitudes and practices, vegetable farmers, enzyme-inhibition rapid test, organophosphates, carbamates, food safety, Brikama Market, The Gambia*

PP-17 POSTER PRESENTATION

# Risk Factors Associated With Diarrhoea With Blood Among Children Under Five Years in North Bank West Health Region, The Gambia

North Bank West Region (NBWR) Research Team

**BACKGROUND** Bloody diarrhoea is a major contributor to childhood morbidity and mortality in low-resource settings. In North Bank West Health Region (NBWHR), recent surveillance has indicated rising cases, but facility-based evidence remains limited.

**OBJECTIVE** To investigate the risk factors associated with bloody diarrhoea among children under five years attending selected public health facilities in NBWHR, The Gambia.

**METHODS** A facility-based analytical cross-sectional study was conducted in nine public health facilities across NBWHR between January and June 2026. Children aged 0–59 months presenting with diarrhoea were consecutively recruited. Data were collected through structured questionnaires, observation, and register review. Descriptive statistics and crude associations were analyzed.

**RESULTS** Of 218 recruited children, 205 completed the study (completion rate 94%). Among them, 62 (30.2%) presented with bloody diarrhoea. Crude associations showed higher occurrence among children aged 12–23 months, those from farming households, households with longer water collection times, and those using unimproved toilet facilities. Nutritional status (MUAC) and recent antibiotic use also showed crude associations.

**CONCLUSION** Nearly one-third of diarrhoeal cases among under-five children in NBWHR presented with blood. Findings highlight the importance of WASH conditions, household livelihood, nutrition, and healthcare practices in reducing the burden.

**PUBLIC HEALTH IMPLICATIONS** Nearly one-third of diarrhoeal cases among under-five children in NBWHR presented with blood. These findings underscore the urgent need to strengthen WASH services, improve nutrition screening and support, promote rational antibiotic use, and expand caregiver education. Integrated interventions across health, water, agriculture, and education sectors are essential to reduce morbidity and mortality from bloody diarrhoea in The Gambia.

**KEYWORDS** *Bloody diarrhoea, under-five children, WASH, malnutrition, North Bank West, The Gambia.*

SUB-THEME 5

# Climate Change & Environmental Health

6 abstracts

## IN THIS SECTION

**OP-05** Spatio-Temporal Machine Learning for Malaria Prediction in The Gambia: Using Climate and Environmental Factors to Predict District-Level Incidence, 2015–2024 — *Muhammed L. Daffeh*

**OP-02** Ambient Particulate Matter, Humidity and Hospital Admissions in The Gambia: An Ecological Panel Study — *Saikou Camara*

**PP-06** Healthcare Waste Generation and Management in a District Hospital in The Gambia: A Cross-Sectional Study at Brikama District Hospital — *Alieu Jadama*

**PP-02** Building Resilience to Extreme Heat in Maternal and Neonatal Health Systems: An Urgent, Evidence-Based Multi-Sectoral Policy Framework for The Gambia — *Layin Surr*

**PP-04** Occupational Exposure to Fine Particulate Matter and Volatile Organic Compounds Among Artisanal Fish Smokers in Coastal Gambia: A Pilot Cross-Sectional Study — *Saikou Camara*

**PP-12** Prevalence of Environmental Risk Factor Exposures Among Under-Five Children Diagnosed With Pneumonia in Kerr Cherno Health Center Catchment Area — *Ousman Jallow*

OP-05 ORAL PRESENTATION · SESSION 1

# Spatio-Temporal Machine Learning for Malaria Prediction in The Gambia: Using Climate and Environmental Factors to Predict District-Level Incidence, 2015–2024

**Muhammed L Daffeh**

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**INTRODUCTION** Malaria remains a persistent public health threat in The Gambia despite substantial gains from insecticide-treated nets, indoor residual spraying, seasonal malaria chemoprevention, and improved case management. National incidence has declined since 2015 but re-surges periodically, indicating that transmission remains unstable rather than resolved. Routine DHIS2/HMIS surveillance generates rich district-month data, yet this is rarely paired with climate information for predictive purposes. Existing malaria-climate models are seldom calibrated to The Gambia's own districts and climate history, and most are validated using random train/test splits, a design that can overstate real forecasting skill by allowing models to see other months from the same district during training.

**OBJECTIVE** This study aimed to characterize seasonal and spatial patterns of malaria across all 42 districts (2015–2024), quantify lagged relationships between incidence and climate variables, develop and rigorously validate machine learning prediction models, compare interpolation-style validation against genuine temporal forecasting, and produce a 2025 district-level outlook for early warning and resource allocation.

**METHODS** A district-month panel of approximately 4,828 observations combined DHIS2/HMIS clinical malaria incidence with climate and environmental data from Google Earth Engine (CHIRPS rainfall, ERA5-Land temperature and humidity, MODIS NDVI, SRTM elevation, ESA WorldCover). Analysis included seasonal trend and spatial clustering analysis (Moran's I, LISA), lagged cross-correlation and regression, machine learning prediction (CatBoost, XGBoost, Random Forest, LightGBM, Gradient Boosting) with SHAP interpretability, and comparison of random-split versus temporal holdout validation alongside time-series forecasting (SARIMA, Prophet, LSTM).

**RESULTS** Incidence peaked every September–November at 15–25 times the March–June low, lagging rainfall by about two months and NDVI by one month. CatBoost led under random-split validation ($R^2$=0.818), but temporal validation showed more modest real-world skill. An east–west burden gradient emerged, with eastern districts disproportionately affected despite similar climate. LSTM and SARIMA forecasts projected the seasonal peak to continue into November 2025.

**CONCLUSION** Malaria in The Gambia is strongly seasonal and climate-lagged, but climate alone does not explain spatial variation. Validation method matters as much as model choice, and temporal holdout should be standard for operational forecasting claims.

OP-02 ORAL PRESENTATION · SESSION 1

# Ambient Particulate Matter, Humidity and Hospital Admissions in The Gambia: An Ecological Panel Study

**Saikou Camara, Sunkaru Touray, MD, FACP, FCCP, Buba Manjang, PhD, Lamin Bojang, Julius O. David, Abdou Samadou Hydara, Awa Sabally-Touray, MD, Omar Sey, Dawda Badgie, PhD**

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**BACKGROUND** Ambient fine particulate matter (PM2.5) causes millions of deaths annually, yet evidence linking air pollution to hospital admissions in sub-Saharan Africa remains scarce due to the historical absence of ground-based monitoring.

**METHODS** We conducted an ecological panel study linking monthly ambient PM2.5 concentrations from 22 low-cost IQAir sensors to monthly acute hospital admissions in the national DHIS2 database across 24 months (January 2024–December 2025). Negative binomial regression estimated the independent associations of PM2.5 (per 10 µg/m$^3$), temperature, relative humidity, season, and year with monthly admissions. The strong correlation between $PM_{2.5}$ and relative humidity (r = −0.87) may have introduced mutual suppression in the models; therefore, sensitivity analyses were conducted with each predictor entered separately.

**RESULTS** Annual mean PM2.5 was 36.9 µg/m$^3$ — 7.4-fold above the WHO annual guideline with marked seasonal variation (dry season 45.7 ± 14.0 µg/m$^3$ vs. rainy season 18.5 ± 5.1 µg/m$^3$; p = 0.002). In the primary model, PM2.5 (IRR = 1.087 per 10 µg/m$^3$; 95% CI: 1.007–1.173; p =0.033) and relative humidity (IRR = 1.014 per percentage point; 95% CI: 1.003–1.025; p = 0.010) independently predicted monthly admissions. Sensitivity analyses revealed mutual confounding: neither predictor reached significance without the other as a covariate, confirming that the joint model is the correctly specified primary analysis.

**CONCLUSIONS** This study provides preliminary evidence — the first from a national ground-based monitoring network in West Africa — that ambient PM2.5 and relative humidity are independent predictors of monthly hospital admissions in The Gambia. These findings support integration of environmental monitoring into health system planning and the urgent need for expanded air pollution epidemiology in sub-Saharan Africa.

PP-06 POSTER PRESENTATION

# Healthcare Waste Generation and Management in a District Hospital in The Gambia: A Cross-Sectional Study at Brikama District Hospital

**Alieu Jadama & Samba Camara**

**BACKGROUND** Healthcare waste (HCW) poses significant risks of infection, toxic injury, and environmental contamination when improperly managed. Globally, HCW generation is increasing in parallel with the expansion of healthcare services and population growth, yet evidence from sub-Saharan African district hospitals, particularly in The Gambia, remains scarce. This study assessed HCW generation, waste composition, and management practices at Brikama District Hospital.

**METHODS** An institutional cross-sectional study was conducted in December 2024 at BDH. Purposive sampling using a key-informant approach was employed to select 17 participants directly involved in waste management. Data were collected through structured and semi-structured questionnaires, a validated WHO observational checklist, and a calibrated weighing scale for three consecutive days. Data were analyzed using STATA and results are presented in descriptive statistics.

**RESULTS** The mean total daily HCW generation was 87.6 kg/day (SD ±12.8; range 75.0–112.5 kg). General (non-hazardous) waste comprised 74% (65.6 kg/day), hazardous waste 18% (15.6 kg/day), pathological waste 5% (4.1 kg/day), sharps 2% (2.0 kg/day), and food waste 1% (1.1 kg/day). The Maternity unit generated the highest proportion of hazardous waste (37%), followed by Theatre (23%) and Immunization (14%). Waste management performance was critically deficient: PPE use among waste handlers was 0%, colour-coded segregation was absent; waste storage exceeded 48 hours; no internal standard operating procedures (SOPs) and no on-site hazardous waste treatment.

**CONCLUSIONS** BDH generates approximately 88 kg of HCW per day, of which 25% are infectious. Waste management practices are substantially non-compliant with WHO and national standards, particularly regarding segregation, PPE use, storage duration, and treatment. Urgent interventions were required by the authority. The study provides the first published quantitative evidence on HCW generation and management at a Gambian district hospital and establishes a baseline for national policy development.

PP-02 POSTER PRESENTATION

# Building Resilience to Extreme Heat in Maternal and Neonatal Health Systems: An Urgent, Evidence-Based Multi-Sectoral Policy Framework for The Gambia

**Layin Surr**

*Master's Candidate, Climate Change Policy; Pan African University of Water and Energy Sciences*

**BACKGROUND** The Gambia's maternal, neonatal, and stillbirth burden remain high. Heat exposure among subsistence farmers increases risk of stillbirth, preterm birth, low birth weight, and fetal strain affecting an estimated 28,700 pregnant women annually in the three highest-risk farming regions. Yet, national policy lacks an explicit heat-adaptation strategy, and the geographic distribution of heat-related outcomes remains poorly characterized. The aim of this policy brief is to provide policy options for MoH and government in The Gambia.

**METHODS** The researcher relied-on evidence from DHIS2 stillbirth data (2017-2025) extracted by region and converted to rates using MoH population denominators (2014-2025). Secondary data obtained from Journal review identified two cohort studies on 92 pregnant subsistence farmers on heat exposure and maternal/fetal health. World Bank/CMIP temperature projections (2015–2050) were extracted, and the National Health Policy (2021–2030) content-analyzed for RMNCAH-climate linkage. Policy options were costed against MoH-projected regional populations (2026–2029) using analogy-based unit costs, and triangulated narratively.

**RESULTS** Neonatal mortality (29/1,000) and national stillbirths (32/1,000) are high (GDHS 2019-20; HMIS 2020). DHIS2 facility rates (MoH 2014-2025 denominator) are consistently higher in CRR, NBRE, and URR (3-5%) than coastal regions (2-5%). Each 1℃ rise in heat exposure raised the odds of fetal strain (abnormal fetal heart rate) by 17% (OR 1.17, 95% CI 1.09-1.29, $p<0.0001$ adjusted OR 1.12, 95% CI 1.03-1.21, maternal heat strain and third-trimester exposure above 50% humidity independently raised risk. Surface temperatures are projected to rise through 2050 (TAS 28.65℃-30.49℃). We propose three phased, costed options (2026-2029; USD 1.25-5.6 million): heat-awareness education (~11% $50K-200K); climate-resilient MNH services in high-risk regions ($500K-2M); and climate-smart livelihoods for women in four farming regions ($1M-5M / 5 yrs).

**CONCLUSION** This evidence links occupational heat exposure to fetal strain, with risk persisting absent intervention as warming continues through 2050. Cross-ministry action led by Health, Agriculture, Environment, and Women's Affairs is recommended, prioritizing resources to CRR, NBRE, and URR. A cost-effectiveness analysis and monitoring framework tracking regional stillbirth and heat-counselling indicators are recommended pre-implementation; delayed action risks increase stillbirth's rate.

**KEYWORDS** *Climate Change, Maternal Health, Extreme Heat, Neonatal Health, and The Gambia*

PP-04 POSTER PRESENTATION

# Occupational Exposure to Fine Particulate Matter and Volatile Organic Compounds Among Artisanal Fish Smokers in Coastal Gambia: A Pilot Cross-Sectional Study

**Saikou Camara**

**BACKGROUND** Artisanal fish smoking using biomass fuel is the primary post-harvest preservation method in coastal Gambia, creating sustained occupational exposure to combustion products. No indoor air quality data from Gambian fish smokehouses have previously been published.

**METHODS** A cross-sectional pilot study was conducted among 31 artisanal fish smokers in Tanji, Gunjur, and Kartong (24–29 November 2025). An interviewer-administered structured questionnaire captured smokehouse characteristics, work practices, PPE use, and self-reported symptoms. Seven Atmocube sensors continuously measured indoor $PM_{2.5}$, TVOCs, temperature, and relative humidity at 1-minute intervals over the 7-day observation period. Cigarette-equivalent $PM_{2.5}$ exposures were estimated using the Berkeley Earth framework.

**RESULTS** Traditional kilns fueled predominantly by firewood were used by 96.8% of participants. Batch durations exceeded 8 hours in 90.9% of Tanji and 60.0% of Gunjur respondents. Only 48.4% used any PPE; of these, 73.3% used protective clothing only, with no respiratory protection in Gunjur. Cough was reported by 35.5% and headache by 25.8%. Indoor $PM_{2.5}$ exceeded the WHO 24-hour guideline (15 µg/m$^3$) on all 49-monitoring site-days (100% exceedance rate). Mean daily $PM_{2.5}$ ranged from 69.7 µg/m$^3$ (Gunjur B; 4.6× WHO) to 146.8µg/m$^3$ (Tanji A; 9.8× WHO). Afternoon peaks reached 290.0, 269.3, and 187.4 µg/m$^3$ in Gunjur, Kartong, and Tanji. Night-time $PM_{2.5}$ remained above the WHO guideline at all sites (23.5–52.0 µg/m$^3$). These concentrations correspond to 3.2–6.7 involuntary cigarette-equivalents per working day, accumulating an estimated 0.9–2.9 pack-year equivalents per decade of occupational exposure.

**CONCLUSIONS** Indoor $PM_{2.5}$ in Gambian artisanal fish smokehouses exceeds the WHO 24-hour guideline by 4.6– to 9.8-fold—equivalent to passively inhaling 3–7 cigarettes daily—in a on biomarkers.

PP-12 POSTER PRESENTATION

# Prevalence of Environmental Risk Factor Exposures Among Under-Five Children Diagnosed With Pneumonia in Kerr Cherno Health Center Catchment Area

**Ousman Jallow**

**BACKGROUND** Pneumonia remains one of the leading causes of mortality and morbidity among children under-fives years of age in low- and middle-income countries including the Gambia. More than 90% of pneumonia cases from the catchment area in the year 2024 are under-five children. This study aims to identify the environmental risk factors associated with pneumonia among under-five children in the catchment area, and to determine the prevalence of these exposures.

**METHODS** A retrospective health facility-base and cross-sectional descriptive study design was adopted to measure trends of pneumonia cases and assess environmental related risk factor exposures respectively. Previously diagnosed children with pneumonia were traced to their households where a structured questionnaire was administered to obtained data on the above exposures and socio-demographic information. Children between 0-59 months were the study population and their caregivers served as respondents. Facility registers and records was used to traced 140 selected cases. IBM SPSS statistics 27 was used to analyzed the data into descriptive tables and figures.

**RESULTS** Over three quarter of pneumonia cases registered from the catchment between 2014 to 2024 were children under-fives years of age (77%). Cases were generally higher during the rainy season, with September recording the highest cumulative, thus 1988 cases. Pneumonia is dominant in children in their first year of life, (between 0 to 24 months). The following were identified as environmental risk factor exposures; overcrowds, indoor and outdoor air pollutants (smoke from solid fuel, poor ventilation, backyard burning of waste), and Unimproved sanitary facilities. Smokes from firewood, backyard waste burning, and outdoor pollutants appeared the most prevalent exposures. Likewise poor ventilation and unimproved sanitary facilities.

**CONCLUSION** This study has not only recognized existing environmental related risk factor children are exposed to, rather it has also enhanced directives for community interventions in reducing childhood pneumonia and open doors to other scholars to established association between risk factors and pneumonia outcomes.

SUB-THEME 6

# Non-Communicable Diseases, Nutrition & the Changing Disease Landscape

2 abstracts

## IN THIS SECTION

**PP-10** Knowledge and Practices of Food Safety and Hygiene Among Food Vendors in Public Primary Schools: Implications for Public Health in the Serekunda Health Centre Catchment Area — *Ousman Y. Jallow*

**OP-14** Overview of Cardiovascular Disease and the Cost of Care in The Gambia — *Olubunmi Abiola Olubiyi*

PP-10 POSTER PRESENTATION

# Knowledge and Practices of Food Safety and Hygiene Among Food Vendors in Public Primary Schools: Implications for Public Health in the Serekunda Health Centre Catchment Area

**Ousman Y Jallow**

**INTRODUCTION** Food safety and hygiene are critical public health concerns, particularly among schoolchildren in low- and middle-income countries. Globally, the World Health Organization estimates 600 million foodborne illnesses and 420,000 deaths annually, with 40% of cases affecting children under five. In The Gambia, surveillance data from the Serekunda Health Centre recorded over 60 food poisoning cases between January and September 2025, most among children aged 7–15 years. This study assesses food safety knowledge and hygiene practices among food vendors in public primary schools within the Serekunda Health Centre catchment area.

**METHODS** A cross-sectional study assessed food safety knowledge and hygiene practices among 128 food vendors, proportionately selected from 164 vendors in public primary schools. Data were collected using structured questionnaires and an observation checklist and analyzed using descriptive statistics and bivariate chi-square tests. We scored knowledge and hygiene practices using a method adapted from Njim et al. (2024), with positive responses scored 1 and negative responses 0. Scores were categorized as poor (<50%), average (50–<75%), or good (≥75%).

**RESULTS** The study included 128 female food vendors, with 47.7% aged 31–40 years and 32.8% having no formal education. Although 91.4% had good food safety knowledge, hygiene gaps remained: 37.5% always washed their hands, 57.8% lacked handwashing facilities, and 93.8% used the same hand for money and food. Overall, 71.1% reported good practices, compared with 22.7% observed as good. Practice levels were significantly associated with age (p=0.012), family size (p=0.011), vending duration (p=0.001), handwashing facilities (p=0.001), inspections (p=0.001), food safety policy (p=0.001), organized vending structure (p=0.010), and knowledge level (p=0.033).

**CONCLUSION** The study revealed that while food vendors demonstrated good knowledge of food safety, their practices were inconsistent, highlighting a clear knowledge-practice gap. Addressing this gap requires targeted interventions that combine education, infrastructure, and enforcement.

OP-14 ORAL PRESENTATION · SESSION 3

# Overview of Cardiovascular Disease and the Cost of Care in The Gambia

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**INTRODUCTION** Cardiovascular disease (CVD) is a major public health challenge globally including The Gambia and other countries in sub-Saharan Africa. Though it was thought to be less common in Africa, the burden in LMIC has changed due to epidemiological transition and urbanisation. This has created a double disease burden in LMICs such as The Gambia and other sub-Saharan countries in Africa because of the persistence of communicable diseases. This review examines the burden, mechanisms, patterns and cost implications of CVD, with particular attention to stroke and coronary heart disease globally and in The Gambia.

**METHODS** Review of existing literature using Google Scholar, PubMed, Google and Research Rabbit.

**RESULTS** In the United States of America, the cost of stroke was estimated to be as high as $ 59,900 per patient with haemorrhagic stroke costing more and is similar to Europe at $52,725 in Sweden and $41,950 in Spain. Grossly it is very clear the amount of damage that these costs can cause to the economy of LMICs especially in Africa. There are very few studies on the cost of stroke care in Africa but in Nigeria, it was reported by Iseko et al that the direct cost of acute stroke management cost about ₦195,672.20 ±170,661.30 ($139.77± 121.90). In Senegal, Nyassinde et al reported the direct cost of acute stroke management as 450,717 XOF ± 405,214 ($825 ± 742). While no literature was found on cost of stroke in The Gambia, it can be comparable to that of Nigeria and Senegal and other West African countries.

**CONCLUSION** The direct and indirect economic consequences of CVD are substantial. These costs are grave in LMICs where there is low health insurance coverage and patients bear the cost of treatments. Reducing the burden of CVD in The Gambia and other LMICs will require policies and control strategies across all levels of care.

**KEYWORDS** *Cardiovascular disease; cardiovascular risk factors; atherosclerosis; stroke; coronary heart disease; The Gambia; sub-Saharan Africa.*

SUB-THEME 7

# Water, Sanitation and Hygiene (WASH)

3 abstracts

## IN THIS SECTION

**OP-11** Menstrual Hygiene Management Practices and Menstruation-Related School Absenteeism Among Adolescent Girls Attending Urban Basic Schools in The Gambia: A Cross-Sectional Study — *Momodou Alieu Jallow*

**OP-06** Quantitative Microbial Risk Assessment of Groundwater Contamination in Peri-Urban Gambia: Monte Carlo Modelling of Rotavirus, Cryptosporidium, and Pathogenic *Escherichia coli* Risks From Faecal Indicator Data — *Samba Camara*

**PP-05** Determinants of Safe Child Stool Disposal Practices Among Mothers in The Gambia: Evidence From the 2019/20 Demographic and Health Survey — *Lamin N.S. Fofana*

OP-11 ORAL PRESENTATION · SESSION 3

# Menstrual Hygiene Management Practices and Menstruation-Related School Absenteeism Among Adolescent Girls Attending Urban Basic Schools in The Gambia: A Cross-Sectional Study

**Momodou Alieu Jallow, Yassin Dem, Sumaila Abdul, Modou Badjan, Samba Camara,**

*Correspondence: moalieujallow@ueg.edu.gm · University of The Gambia & University of Education*

**BACKGROUND** Menstruation-related school absenteeism significantly impacts adolescent girls' education in The Gambia, highlighting a public health opportunity. This study aims to identify menstrual hygiene management practices and determine the prevalence and factors associated with menstruation-related school absenteeism among adolescent girls attending urban upper basic schools in The Gambia.

**METHODS** A cross-sectional study involving 423 female students from four selected upper basic schools in Brikama Area Council, The Gambia, utilized multi-stage probability proportional to size (PPS) sampling and structured questionnaires for data collection. Descriptive statistics were used to characterize the population, and a forward stepwise logistic regression model, adjusted for confounders identified by a directed acyclic graph (DAG), was applied to estimate adjusted odds ratios (AORs) with 95% confidence intervals (CIs) regarding menstruation-related absenteeism. Statistical significance was set at $p = 0.05$. Model diagnostics included the Hosmer-Lemeshow test, Nagelkerke $R^2$, and assessment of multicollinearity.

**RESULTS** The prevalence of menstruation-related school absenteeism was 29.8% (95% CI: 25.6–34.3%). Severe menstrual pain was the dominant causal exposure, with affected students being 24.7 times more likely to be absent than those with mild pain (AOR = 24.74, 95% CI: 13.17–46.47, $p < 0.001$; population attributable fraction [PAF] = 90.7%). Learning about menstruation after menarche doubled the odds of absenteeism (AOR = 2.27, 95% CI: 1.26–4.08, $p = 0.006$). Two MHM practices emerged as protective: changing absorbents <3 times per day (AOR = 0.14, 95% CI: 0.07–0.32, $p < 0.001$) and washing reusable pads with soap and water (AOR = 0.23, 95% CI: 0.12–0.43, $p < 0.001$). Household toilet facility type was not a significant predictor ($p = 0.105$). The model explained 52.8% of outcome variance (Nagelkerke $R^2 = 0.528$) with 83.2% correct classification.

**CONCLUSIONS** Menstruation-related absenteeism in urban Gambian schools is primarily associated by severe dysmenorrhea and inadequate menstrual hygiene management (MHM) practices. Key interventions include pre-menarche education, targeted pain management protocols, tailored MHM curricula, and evidence-based policies for pad provision, all aimed at enhancing educational equity for adolescent girls in The Gambia.

OP-06 ORAL PRESENTATION · SESSION 1

# Quantitative Microbial Risk Assessment of Groundwater Contamination in Peri-Urban Gambia: Monte Carlo Modelling of Rotavirus, Cryptosporidium, and Pathogenic *Escherichia coli* Risks From Faecal Indicator Data

**Samba Camara**

**BACKGROUND** Fecal coliforms were detected in 63.2% of groundwater samples (range: 0-21 CFU/100 ml) in six peri-urban communities of Brikama,The Gambia.

**OBJECTIVE** This study aimed to use the fecal coliform data in Brikama across the six communities to estimate the annual infection risk and the attributable DALY burden.

**METHODS** FC Data from a single sampling round (June 2021) of 57 groundwater sources (23 boreholes, and 34 hand-dug wells) was used to model dose-response by using exponential function for E. coli, and Cryptosporidium; and Beta-Poisson function for Rotavirus with probabilistic daily water ingestion of 2.0 L for adults; and 1.0 L for children. Pathogen concentrations were derived from FC data using published FC-to-pathogen ratio. Annual infection probabilities from 10,000 Monte Carlo simulations per scenario (with 95% credible intervals) were converted to DALYs using WHO disease-weight values and benchmarked against the WHO tolerable risk level of $10^{-6}$ DALYs/person/year. One-way sensitivity analysis was run across their plausible published range to test the robustness of the risk estimates. Sampling proceeded with the permission of community leaders and water-point users in each community, with support from relevant stakeholders.

**RESULTS** All six communities exceeded WHO risk benchmarks for Rotavirus (P[infection]: 0.478-0.989 adults, 0.366-0.959 children; 95% CrI: 0.102-1.000; 100% benchmark exceedance of $8.0\times10^{-5}$ Implied annual P[infection] threshold) and Cryptosporidium (0.023-0.299; 95% CrI: 0.002-0.639 against $6.7\times10^{-4}$), while E. coli O157:H7 stayed below $1.8\times10^{-5}$ threshold everywhere. Combined Rotavirus and Cryptosporidium DALY burden ranged from $0.358\times10^{-3}$ (Jamisa) to $1.005\times10^{-3}$ (Sanchaba) person$^{-1}$ year$^{-1}$ (95% CrI: $1.01\times10^{-4}$–$1.01\times10^{-3}$), with well users facing 1.1× higher Rotavirus and 2.3× higher Cryptosporidium risk than borehole users, and Kembujeh and Sanchaba as the highest-risk communities. A one-way sensitivity analysis (the FC-to-pathogen ratio varied across its published plausible range, with other parameters held fixed) identified this ratio as the dominant source of uncertainty in the infection-probability and DALY

**CONCLUSIONS** Groundwater contamination in Brikama poses very high infection risk from viral and protozoan pathogens across all six communities, far exceeding WHO thresholds, underscoring the need for immediate point-of-use treatment, well upgrading, and community WASH interventions, with this QMRA framework replicable across comparable sub-Saharan African contexts.

**KEYWORDS** *QMRA; Groundwater; Faecal Coliform; Rotavirus; Cryptosporidium; E. Coli; Monte Carlo Simulation; Waterborne Disease; DALY; The Gambia*

PP-05 POSTER PRESENTATION

# Determinants of Safe Child Stool Disposal Practices Among Mothers in The Gambia: Evidence From the 2019/20 Demographic and Health Survey

**Lamin N.S Fofana**

**BACKGROUND** Unsafe disposal of young children's stools is an important but often neglected sanitation and child health concern in low- and middle-income countries. In The Gambia, evidence on the prevalence and determinants of safe child stool disposal is limited. This study assessed the prevalence and factors associated with safe disposal among children aged 0–23 months.

**METHODS** A cross-sectional analytical study was conducted using data from the 2019–2020 Gambia Demographic and Health Survey (GDHS) Children's Recode file. Safe disposal was defined as the child using a toilet/latrine or the caregiver putting/rinsing the stool into a toilet/latrine; all other methods were considered unsafe. Weighted descriptive analyses estimated prevalence, while design-adjusted bivariate and multivariable logistic regression identified associated factors. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported.

**RESULTS** The weighted prevalence of safe disposal of child stool was 57.0% (95% CI: 54.0%–60.0%). Safe disposal was associated with child age, household wealth, and Local Government Area. The likelihood of safe disposal increased with age, with children aged 18–23 months having more than three times the odds of safe disposal compared with those aged 0–5 months (AOR = 3.5, 95% CI: 2.5–4.9). A notable finding was an inverse wealth pattern, whereby children from richer (AOR = 0.5, 95% CI: 0.3–0.9) and richest households (AOR = 0.3, 95% CI: 0.2–0.5) had lower odds of safe disposal than those from the poorest households. Significant geographic variation was observed, while maternal education, residence, drinking water source, and toilet facility type were not associated with safe disposal.

**CONCLUSION** Safe disposal of child stool remains suboptimal in The Gambia. Interventions should explicitly promote safe child stool disposal within sanitation and hygiene programmes, with particular focus on younger children, geographic disparities, and the unexpected wealth-related pattern identified in this study

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NATIONAL PUBLIC HEALTH CONVERGENCE 2.0

# Scientific and Organising Committee Leads



## Mrs Mary Bobb

**Senior Epidemiology and Disease Surveillance Officer, Epidemiology and Disease Control Programme, Ministry of Health**

*Head, Scientific Committee, NPHC 2.0*

Mrs Mary Bobb is a Senior Epidemiology and Disease Surveillance Officer with the Epidemiology and Disease Control (EDC) Program of the Ministry of Health, The Gambia. She holds a Master of Philosophy in Applied Epidemiology and Disease Control and an Advanced Certificate in Field Epidemiology Training Program (FETP).

She has over 13 years of experience in public health, disease surveillance, outbreak investigation and response, and public health emergency management. She serves as the National Event-Based Surveillance Focal Person and as a member of the West Africa Event-Based Surveillance Regional Community of Practice Steering Committee, contributing to regional coordination and knowledge exchange on event-based surveillance, focusing on strengthening early warning systems, epidemic intelligence, outbreak preparedness, and evidence-based public health decision-making across West Africa. She has co-authored several peer-reviewed publications and presented her work at international conferences. Her work also includes capacity building and mentorship of field epidemiology trainees.

Beyond routine public health responsibilities, she serves as Head of the Scientific Committee for both the inaugural and second editions of the National Public Health Convergence (NPHC), providing leadership in the scientific review and coordination of abstracts, development of scientific programmes and promotion of evidence-based knowledge exchange among public health professionals, researchers, policymakers, academia, and development partners.



## Fatou A. Darboe

**Programme Coordinator, Nutrition and School Health, Directorate of Health Promotion and Education, Ministry of Health**

*Vice Chair, NPHC 2.0*

Fatou A. Darboe is a Gambian public health professional and Public Health Nutritionist with 19 years of experience in public health, nutrition, health promotion, school health, surveillance, research, programme management and community engagement. She currently serves as Programme Coordinator for Nutrition and School Health within the Directorate of Health Promotion and Education, Ministry of Health, The Gambia, where she provides technical and programme leadership for national nutrition and school health interventions.

Fatou holds a Master of Public Health in Health Promotion and Development and a BSc in Public and Environmental Health from the University of The Gambia, as well as an HND in Public Health from Gambia College. She is also a graduate of Field Epidemiology Training Programme (FETP) Cohort 11.

Throughout her career, she has contributed to the design, implementation, monitoring and coordination of major public health programmes, including nutrition, infant and young child feeding, maternal and community nutrition, WASH, school health, immunization and health promotion. She played a key role in re-establishing and strengthening the Nutrition Unit within DHPE and has contributed to improvements in national nutrition outcomes, including the decline in childhood stunting from 25% in 2013 to 18% in 2019/20.

She initiated and helped mobilize support for the development of The Gambia Food-Based Dietary Guidelines, working with WHO, FAO and national stakeholders through development, validation and launch. She has also championed community-based approaches such as Mother-Led MUAC and Positive Deviance/Hearth, and contributed to evidence generation and research on childhood undernutrition.

Fatou has represented The Gambia in international public health forums and served as the Ministry of Health Child Protection Focal Person, advocating for stronger integration of child protection into health policies and programmes.

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## Dr Amadou Barrow

**Lecturer in Public Health, University of The Gambia · Founder, Nexera Global Health Intelligence**

*Second Vice Chair, Organising Committee · Chair, Scientific Review Panel, Regional Scientific Research Competition 2026*

Dr Amadou Barrow is an epidemiologist, data scientist and Lecturer in Public Health at the University of The Gambia and the founder of Nexera Global Health Intelligence, a Gambian research, training, and technology consultancy. He holds a PhD in Epidemiology from the University of Florida (2026), where he remains affiliated with the Department of Epidemiology, as well as master's degrees in International Health (Heidelberg University, Germany), Reproductive and Family Health (University of Benin, Nigeria), and Occupational and Environmental Health (University of The Gambia). He began his career in 2009 as a Public Health Officer in the Ministry of Health, and later served as Risk Communications Supervisor at the Public Health Emergency Operations Centre during the COVID-19 response. His research focuses on HIV epidemiology, maternal and child health, causal inference & machine learning, and the burden of disease in The Gambia and the wider sub-Saharan African region, with findings that inform global health estimates. He is a Senior Collaborator of the Global Burden of Disease Study and a Lead Author of the IPCC Seventh Assessment Report, and he has been listed among Stanford University's top 2% of scientists worldwide, UF global health case Competition champions, UF outstanding merit certification recipient, and people’s choice award for best research at Florida HIV Community, Practitioners & Researchers Conference, USA. He chairs the Scientific Review Panel of APEHOG's 2026 Regional Scientific Research Competition and serves as Second Vice Chair of the organizing committee and as an abstract reviewer for the National Public Health Convergence 2.0.



## Sona Darboe

**Health Communication and Media Officer, Ministry of Health**

*Head, Communication Committee, NPHC 2.0 · Information and Public Relations Officer, APEHOG*

Sona Darboe is a dedicated public health officer and communications specialist from The Gambia, with over five years of experience at the intersection of public health practice, health communication, and community development.

She holds a Higher National Diploma in Public and Environmental Health from Gambia College and Bachelor of Science in Journalism and Digital Media at the University of The Gambia. This dual training in public health and communications has shaped her career around one core belief: that effective health outcomes depend not only on sound science but also on clear, accessible communication.

Sona currently serves as Health Communication and Media Officer at the Ministry of Health, The Gambia, where she manages national social media platforms and media relations.

She is also the Project Manager and Country Lead at Social Change Factory, an international organization headquartered in Dakar, Senegal. In this role, she heads all programs in The Gambia, including the Voice of the Youth initiative, the Voice of the Youth Lab, and the Climate Inclusion Program, which empowers differently abled girls to participate in climate advocacy through arts and media. Her work spans climate change, disability inclusion, youth leadership, and maternal health.

Beyond her professional roles, Sona is the Information and Public Relations Officer for the Association of Public and Environmental Health Officers of The Gambia (APEHOG). She has served as Head of the Communications Committee for the National Public Health Convergence since its first edition and continues in this role for the second edition. She co-founded the MBAMA Care project, a community-led maternal mortality initiative that led to the formation of the Maternity Hub Foundation. She is a certified trainer in Emergency Risk Communication, Grievance Redress Mechanisms, and Gender-Based Violence response, and has completed the Africa CDC MhLAP Program with the University of Ibadan.

A recognized youth leader, Sona has represented The Gambia at continental forums including the Youth Democracy Network Regional Meeting for Africa in Nairobi and the Africa Caucus for CSW57 in Malawi, where she served as Rapporteur. She is fluent in English and committed to advancing health equity, risk communication, and youth leadership across Africa.

NATIONAL PUBLIC HEALTH CONVERGENCE 2.0

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# Notes

# Notes

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Founded in 1979 as the Gambia Association of Public Health Officers, APEHOG is the professional body for public and environmental health officers in The Gambia. It unites the profession to protect and promote the health of the public through capacity building, advocacy, evidence-based research and partnership, working through regional associations in every health region and a diaspora chapter.

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**WITH THANKS TO OUR PARTNERS**