

Milken Institute School of Public Health

THE GEORGE WASHINGTON UNIVERSITY

BACKGROUNDER

Unmet needs in tuberculosis diagnosis and case management in LMICs

Thursday, September 28, 2023 – 11:00-12:30 (EDT)

Contents

Event Overview	1
Symposium Program	1
Symposium Speaker Biographies	2
Event Background	7
Overview of Featured Organizations	7
Milken Institute School of Public Health at the George Washington University	9
Mérieux Foundation	9

Event Overview

A week after the UN High-Level Meeting on the fight against tuberculosis, listen to the perspective of experts from the front lines in TB high-burden countries and partnerships at work to address the unique challenges they face. The symposium will showcase innovative strategies that could potentially be expanded to other high-burden countries, including successful models for community-based interventions and novel approaches for TB prevention and childhood TB in the most vulnerable, hardest to reach populations. It will also look at the challenges facing national TB programs to address unmet needs and factors impeding their resolution.

Symposium Program

- Introduction by Dr. Jon Andrus, Adjunct Professor, Milken Institute School of Public Health
- Keynote presentation on today's TB landscape by Dr. C. Robert Horsburgh, Jr., Professor of Epidemiology, Biostatistics, Global Health and Medicine, Boston University and Vice-President of the International Union Against Tuberculosis and Lung Disease (IUATLD)
- Presentation on successes and challenges in two high-burden countries by Dr.
 Vanessa Rouzier, Director of Research at GHESKIO, Haiti & Dr. Sayera Banu, Senior Scientist & Head, Emerging Infections, Infectious Diseases Division at the International Centre for Diarrhoeal Disease Research (icddr,b), Bangladesh
- Roundtable discussion moderated by Dr. Kevin De Cock, Former Director of the U.S. Center for Disease Control (CDC) Center for Global Health and CDC program in Kenya: 'Improving TB prevention, detection and treatment in high-burden countries: successful models, innovative interventions and their implications for the future' with panelists Dr. Vanessa Rouzier, Dr. Sayera Banu & Dr. Jacob Creswell, Head, Innovations and Grants, Stop TB Partnership
- Comments by Dr. Charlotte Colvin, Senior TB Technical Advisor, USAID
- Symposium conclusion by **Dr. Lynn Goldman**, Dean of the Milken Institute School of Public Health

Symposium Speaker Biographies

Dr. Jon Andrus, MD

Dr. Jon Andrus is Adjoint Professor and Director of the Division of Vaccines and Immunization of the University of Colorado's Center for Global Health. He is also Adjunct Professor for Global Health at George Washington University. Dr. Andrus leads efforts to advocate for the evidence-based use of vaccines in developing countries. Over his >35-year global health career Dr. Andrus has served as Deputy Director of the Pan American Health Organization (PAHO); Director and Lead Senior Technical Advisor for PAHO's immunization program providing oversight for PAHO's measles-rubella elimination and other immunization initiatives; and the Regional Advisor for polio eradication in WHO's Southeast Asia Region from 1993-2000. He has also held positions as Head of

the Vaccinology and Immunization Program at the Institute for Global Health at the Universities of California at San Francisco and Berkeley; and Professor and Director of the Global Health MPH Program at George Washington University.

Dr. Andrus began his global health career as a Peace Corps volunteer, serving as the District Medical Officer in Mchinji, Malawi. Currently, Dr. Andrus serves on several global health advisory groups, including: Chair of PAHO's Regional Commission for Re-Verification and Monitoring Measles Rubella Elimination in the Americas, Member of PAHO's Technical Advisory Group for Vaccine Preventable Diseases, Member of WHO's Southeast Asia's Regional Verification Commission for Measles and Rubella Elimination. Dr. Andrus has published more than 120 scientific peer-reviewed papers. He has received numerous awards for his leadership in the eradication of polio, measles, rubella and congenital rubella syndrome, as well as for the introduction of new vaccines in developing countries.

Dr. C. Robert Horsburgh, Jr., MD

Dr. C. Robert Horsburgh, Jr. is a Professor of Epidemiology, Biostatistics, Global Health and Medicine, at Boston University. He has been an infectious diseases epidemiologist and clinical trialist since 1983. He has participated in numerous studies of TB in India, South Africa, Brazil, Peru, Vietnam and the Philippines. He was the founding Steering Committee Co-Chairman of the U.S. TB Trials Consortium (TBTC) and Steering Committee Co-Chairman of the U.S. TB Epidemiologic Studies Consortium from 2008-2011. Dr. Horsburgh is a member of the Board of Directors of the International Union Against TB and Lung Disease (IUATLD), having previously served as Vice-President of IUATLD and President of the North American Region. He is currently Co-Chairman of



the Union's DR-TB Working group and Chairman of the Steering Committee of RESIST-TB, an international organization that advocates for global expansion of improved treatment for Drug-resistant TB. His ongoing research includes leading an NIAID-funded clinical trial to define the optimal duration of treatment of MDR-TB in Vietnam and the Philippines (U01 AI152980) and a prospective cohort study of risk factors for and mechanism of emergence of drug resistance during TB treatment in India and Brazil (R01 AI134430).

After a Bachelor of Art in Architecture and History from Princeton (cum laude) and a master's in urban studies from Yale, Dr. Horsburgh received a Doctorate in Medicine from Case Western Reserve

University. He continued his medical training at Massachusetts General Hospital in Boston and at the University of Colorado Medical Center and the National Jewish Center, both in Denver.

Prior to joining Boston University, Dr. Horsburgh was Professor of Medicine and Public Health at Emory University, Director of the Mycobacterial Clinical Center at Grady Memorial Hospital in Atlanta. He worked at the US Centers for Disease Control as an Epidemiologist in the Division of Tuberculosis elimination and in the Division of HIV/AIDS, Centers for Disease Control, Atlanta, GA. He began his career as Assistant Professor in the University of Colorado Department of Medicine.

Contributions to Science

- 1. Defining the clinical presentation, treatment and prevention of disseminated MAC infection. Dr. Horsburgh began his scientific career studying disseminated *Mycobacterium avium* complex (DMAC) infection and disease. At the time (1985), this condition was extremely rare and had not been well described. However, as the AIDS epidemic grew, it became quite common and there was a need for better epidemiologic and clinical characterization. One of his early publications was the first case series and review of this condition. He then defined the U.S. national epidemiology and natural history of the disease in persons with AIDS. This was followed by the first study of risk factors for the disease. He also wrote the first article demonstrating that antimycobacterial therapy was useful in treating DMAC, which led to several clinical trials of treatment regimens.
- 2. Defining the epidemiology and treatment of latent tuberculosis. By 2000, it had become clear that better understanding of and treatment for Latent Tuberculosis Infection (LTBI) was essential for elimination of tuberculosis in the United States. Dr. Horsburgh focused his research on LTBI, summarizing current knowledge and identifying risk factors for progression in 2004. He was co-senior author on a clinical trial that established a new, shorter treatment regimen for LTBI in the New England Journal in 2011. He then focused on defining the role of latent infection in modulating the effects of re-infection with *M. tuberculosis*. In addition, he and colleagues identified challenges in using non-inferiority designs to study LTBI treatment and proposed strategies to overcome these challenges.
- **3.** Defining risk factors and treatment for multidrug-resistant and extensively drug-resistant tuberculosis. Despite progress in reducing the global burden of tuberculosis by 2005, drug resistant tuberculosis (MDR-TB) remained unchecked. Dr. Horsburgh had examined treatment for MDR-TB in 1993 and demonstrated its limitations. He refocused his research agenda on this condition, beginning in 2007 with observational cohort studies of XDR-TB in South Africa, where he and his colleagues also identified substantial transmission of XDR-TB to health care workers. Dr. Horsburgh is currently performing an observational cohort study of MDR-TB in Brazil and India and co-authored a recent review on management of patients with MDR-TB. He has also been at the front of global efforts to expand compassionate use of new anti-tuberculosis medications. Dr. Horsburgh is the Steering Committee Chairman of RESIST-TB, which maintains a website and distributes a monthly newsletter focusing on drug resistant TB issues.
- 4. Advancing the science of clinical trials for TB disease. As a founding member of the TB Trials Consortium and its initial Steering Committee chairman, Dr. Horsburgh advocated for innovative designs of TB clinical trials. The first TBTC trial protocol, which he co-authored, was the first to isolate and study independently the continuation phase of TB treatment. He then developed a trial design to more efficiently identify the shortest TB treatment consistent with acceptable efficacy. Turning to the issue of identifying the contribution of an individual agent to a combination chemotherapeutic regimen, he and colleagues designed and performed a phase 2 trial to isolate and maximize the contribution of levofloxacin to TB treatment regimens. Most recently, his team performed a simulation of TB clinical trial results that revealed weaknesses in the non-inferiority design when applied to treatment-shortening regimens for TB and proposed alternative metrics.

A list of Dr. Horsburgh's published work (321 citations) can be found on PubMed.

Dr. Vanessa Rouzier, MD

Dr. Vanessa Rouzier is Assistant Professor of Medicine at Weill Cornell Medicine and Director of Research at GHESKIO, the largest HIV/AIDS and TB center in the Caribbean. Based in Haiti, Dr. Rouzier's research expertise is in HIV and hypertension (HTN) among adolescents. Dr. Rouzier is the recipient of the NHLBI Diversity Supplement to investigate early-onset HTN among adolescents and young adults in Haiti and the Haiti Principal Investigator of the NIAID-funded CCASAnet project to evaluate non-communicable diseases (NCD) among adolescents in the Caribbean and Latin American region. She has also led the scale up of maternalchild and adolescent clinical research at GHESKIO as the study coordinator and protocol chair for several NIAID International Maternal, Pediatric, and Adolescent

AIDS Clinical Trails Network (IMPAACT) trials. She currently supervises all research staff in the GHESKIO NCD Unit. Dr. Rouzier also serves as a mentor to trainees interested in early-onset chronic diseases, early-life exposures, and research on the intersection of chronic and communicable diseases.

Dr. Sayera Banu, MS, PhD

Dr. Sayera Banu is a Bangladeshi scientist whose research focuses on mycobacterial infections, epidemiology, diagnostics, and therapeutics, where she has fostered international and national collaborations. She currently holds the position of Senior Scientist and heads the Program for Emerging Infections under the Infectious Diseases Division at the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b). Dr. Banu is a medical doctor with an MS (Microbiology) from University of Tsukuba, Japan in 1997, and a PhD in Medical Microbiology, from the University of Dhaka, Bangladesh in 2003. She had postgraduate training in mycobacteriology at Pasteur Institute under the direct supervision of Professor Stewart Cole, a leading scientist in

mycobacteriology. She also worked as a Visiting Scientist with Professor William Jacobs at Albert Einstein College of Medicine, USA in 2007 on TB diagnostics. Her contribution towards TB research includes initiating the icddr,b TB laboratory – the best of its kind in the country; as well as some sophisticated work, microbiological and molecular biological techniques, which have been adopted at icddr,b and nationally. Dr. Banu serves as a member in several scientific/program committees, has won significant awards for her work, published extensively high impact peer reviewed journals, and has presented her work in many scientific conferences and symposiums. She has secured substantial research funds from high profile donors to work on diverse areas of TB and is considered an expert in the field, both nationally and internationally. Currently, many of the USAID funded icddr,b and government entities' COVID-19 response activities are ongoing under her leadership.

Dr. Kevin De Cock, MD, FRCP (UK), DTM&HF

Dr. Kevin De Cock was born in Belgium and graduated in medicine from the University of Bristol, United Kingdom, in 1974. He specialized in internal medicine and then undertook further training in infectious and tropical diseases and hepatology. He joined the US Centers for Disease Control and Prevention (CDC) as an Epidemic Intelligence Service (EIS) Officer in 1986. He has held faculty positions at the University of Nairobi, Kenya, the University of Southern California, and the University of London where he was Professor of Medicine and International Health. He was founding Director of CDC's Projet RETRO-CI in Cote d'Ivoire, CDC's Division of HIV/AIDS Prevention – Surveillance and Epidemiology,







and CDC's Center for Global Health. He served as Director of the World Health Organization's Department of HIV/AIDS; Director of CDC programs in Kenya; and CDC Ebola Response Team Lead in Liberia and the Democratic Republic of Congo. He has received various awards including CDC's William C. Watson Jr. Medal of Excellence; the Chalmers Medal, Royal Society of Tropical Medicine and Hygiene; Commandeur de l'Ordre de la Santé Publique (Commander of the Order of Public Health), Côte d'Ivoire; the CDC and ATSDR honor Award for International Health; and the CDC Mackel Award. He has over 380 publications, chapters, and articles, and is fluent in English, French, and Dutch. Since retirement from CDC end-2020, he has worked as an independent consultant (UNAIDS, FHI 360) and has taught at the University of Oxford, UK, and the Institute of Tropical Medicine, Antwerp, Belgium.

Dr. Jacob Creswell, MPH, PhD

Dr. Jacob Creswell is Head of Innovations & Grants at the Stop TB Partnership in Geneva. He previously worked at WHO and started his career at US CDC on TB and HIV more than 20 years ago. Currently, he coordinates Stop TB's TB REACH initiative which is focused on improving programmatic aspects of tuberculosis case detection and treatment outcomes. TB REACH has provided more than USD 180 million to partners in 56 countries. Jacob also leads Stop TB's work in the Unitaid-funded START4ALL initiative aiming to deliver novel point of care diagnostics in seven countries. He serves as a global expert on different aspects of improving tuberculosis detection including private sector



engagement and active case finding. Jacob is currently working on the evaluation of new diagnostic and screening tools for TB including artificial intelligence and how they can fit into more efficient and effective diagnostic algorithms. Jacob has more than 100 scientific publications and his work has supported the development of several WHO Guidelines on TB including TB screening, private sector engagement TB in children, and artificial intelligence for chest X-ray.

Dr. Charlotte Colvin, PhD

Dr. Charlotte Colvin, Senior TB Advisor at the U.S. Agency for International Development (USAID), is a global health professional with more than 20 years' experience in the design, implementation and monitoring and evaluation of health programs. Her efforts are focused on tuberculosis services, with the last 10 years at USAID in the Office of Infectious Disease in the Bureau of Global Health. She has a range of field experience, including working with USAID missions, Ministries of Health and implementing partners across the world. Currently, she is leading USAID's work to improve TB services for children, including the introduction of innovative methods to diagnose pediatric TB. She also supports USAID



missions in Mozambique and Zambia as a virtual member of their infectious disease teams, providing virtual and in-person technical assistance to their TB portfolios.

Dr. Lynn R. Goldman, MD, MS, MPH

Dr. Lynn R. Goldman, a pediatrician and an epidemiologist, is the Michael and Lori Milken Dean and Professor of Environmental and Occupational Health at the Milken Institute School of Public Health at the George Washington University. Formerly the Assistant Administrator for Toxic Substances at the U.S. Environmental Protection Agency (EPA), where she oversaw the Office of Chemical Safety and Pollution Prevention, she is a renowned expert in pediatric environmental health and chemicals and pesticides policy. She has engaged in translating research to policy through writing policy analyses and via Congressional testimony in service of successful efforts by Congress to achieve passage of reforms both to federal



pesticide law (the 1996 Food Quality Protection Act) and federal chemicals law (the 2016 Lautenberg Chemical Safety Act for the 21st Century) as well as legislation to establish California's Childhood Lead Poisoning Prevention Program.

She was previously Professor of Environmental Health Sciences at the Johns Hopkins University Bloomberg School of Public Health; and Chief of the Division of Environmental and Occupational Disease Control (as well as other positions) at the California Department of Public Health.

She is a member of the National Academy of Medicine (NAM) and has received the NAM Walsh McDermott Award for service to the academy. She is a recipient of the Heinz Award for Global Environmental Change and the American Public Health Association Environment Section's Homer M. Calver Award. Currently, she serves on the National Research Council (NRC) Environmental Health Matters Initiative; is a Trustee of the Environmental Defense Fund; and is a member of the CDC Advisory Committee to the Director.

Event Background

TB Facts & Figures

According to the <u>World Health Organization Tuberculosis Fact Sheet</u>, Tuberculosis (TB) is the second leading infectious killer after COVID-19 (above HIV and AIDS). Ending the TB epidemic is one of the health targets of the United Nations Sustainable Development Goals for 2030. Additional key facts from the WHO TB Fact Sheet include:

- About a quarter of the global population is estimated to have been infected with TB bacteria. About 5–10% of people infected with TB will eventually get symptoms and develop TB disease. Those who are infected but not (yet) ill with the disease cannot transmit it. TB disease is usually treated with antibiotics and can be fatal without treatment.
- In 2021, the largest number of new TB cases occurred in WHO's South-East Asian Region (46%), followed by the African Region (23%) and the Western Pacific (18%). Around 87% of new TB cases occurred in the 30 high TB burden countries, with more than two thirds of the global total in Bangladesh, China, the Democratic Republic of the Congo, India, Indonesia, Nigeria, Pakistan, and the Philippines.
- Those with compromised immune systems, such as people living with HIV, undernutrition or diabetes, or people who use tobacco, have a higher risk of falling ill. Globally in 2021, there were 2.2 million new TB cases that were attributable to undernutrition, 740 000 new TB cases worldwide were attributable to alcohol use disorder and 690 000 were attributable to smoking.
- A total of 1.6 million people died from TB in 2021 (including 187 000 people with HIV).
- An estimated 74 million lives were saved through TB diagnosis and treatment between 2000 and 2021.

Overview of Featured Organizations

GHESKIO

Based in Port-au-Prince, Haiti, GHESKIO was founded in 1982 and is widely recognized as the world's first institution dedicated to the fight against HIV/AIDS. Under the leadership of Dr. Jean William Pape, a professor at Weill Cornell Medicine, GHESKIO works with the Haitian Government to provide health care and humanitarian support to Haiti's most vulnerable populations. As an international research center of excellence, it seeks to improve treatment and prevention strategies in resource-poor settings, and it is building Haiti's public health system by training the next generation of healthcare workers.

GHESKIO's three-part mission includes clinical service, research, and training in HIV/AIDS and related diseases, including tuberculosis. Working in partnership with the Haitian Government, GHESKIO provides integrated primary care services, including HIV counseling, AIDS care, prenatal care, and management of tuberculosis and sexually transmitted infections. Through the conduct of research, GHESKIO defines HIV/AIDS treatment and prevention models for Haiti. Through training, GHESKIO expands these models to the national level. GHESKIO doctors and nurses support more than 100,000 patient visits every year, and deliver holistic, coordinated care including testing, counseling, treatment, medications and reproductive health services for free.

https://www.gheskio.org/

icddr,b

Based in Dhaka, Bangladesh, the International Centre for Diarrheal Disease Research, Bangladesh (icddr,b) is an international health research institute committed to solving public health problems facing low- and middle-income countries through innovative scientific research – including laboratory-based, clinical, epidemiological and health systems research. By developing, testing and assessing the implementation of interventions specifically designed for resource-poor settings, icddr,b aims to improve the health and wellbeing of people living in the world's poorest nations. For more than 50 years, the teams have been carrying out high-quality research and promoting the uptake of evidence-based interventions. https://www.icddrb.org/

Stop TB Partnership

The Stop TB Initiative was established following a meeting of the First Ad hoc Committee on the Tuberculosis Epidemic, held in London in March 1998. The meeting addressed rising global concern about a dramatic upsurge in the TB pandemic.

In March 2000, the Stop TB Initiative produced the Amsterdam Declaration to Stop TB, which called for action from ministerial delegations of 20 countries with the highest burden of TB. In the same year, the World Health Assembly of the World Health Organization endorsed the establishment of a Global Partnership to Stop TB, and set two targets to be achieved by 2005: to diagnose 70% of all people with infectious TB, and to cure 85% of those diagnosed.

The Stop TB Partnership, as it is now known, has evolved into a broad global partnership of over 2,000 partners drawn from TB communities, international and technical organizations, government programmes, research and funding agencies, foundations, NGOs, society and community groups, and private sector companies, all committed to eliminating TB as a public health problem by 2030.

The Stop TB Partnership advocates to #ENDTB, accelerate TB innovations, facilitate greater access to TB drugs and diagnostics, and provides technical support and capacity building while prioritizing people, human rights, and gender.

https://www.stoptb.org/

U.S. Agency for International Development (USAID)

The U.S. Agency for International Development (USAID) leads the U.S. Government's global TB efforts by working with agencies and partners around the world on the shared goals of reaching every person with the disease, curing those in need of treatment, and preventing the spread of new infections and the progression to active TB disease. In cooperation with Ministries of Health, USAID provides bilateral assistance in 24 countries with high burdens of TB. Leveraging the U.S. Government's investment in the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), USAID provides targeted technical assistance to an additional 31 countries.

Overall, since 2000, in USAID's TB priority countries, TB incidence decreased by 25 percent, TB mortality decreased by 41 percent, and TB notifications increased by 106 percent.

Access the webpage here for more information, including USAID TB Strategy, FY 2022 Tuberculosis Report to Congress, and USAID TB Fact Sheet.

Milken Institute School of Public Health at the George Washington University

Established in July 1997 as the School of Public Health and Health Services, <u>Milken Institute School of</u> <u>Public Health</u> is the only school of public health in the nation's capital. Today, students from all over the United States and the world pursue undergraduate, graduate and doctoral-level degrees in public health. The school also offers an online Master of Public Health, <u>MPH@GW</u>, and an online Executive Master of Health Administration, <u>MHA@GW</u>.

Mérieux Foundation

The Mérieux Foundation, a state-approved charity created in France in 1967, is a family non-profit, working in limited-resource settings to improve health and living conditions for the most vulnerable. The Foundation uses locally driven solutions to build health system capacity and prevent epidemics from spreading. A U.S. 501(c)(3) organization founded in 2012 in Washington, DC, the <u>Mérieux Foundation</u> <u>USA</u> engages North American partners with Mérieux Foundation teams and networks in initiatives to foster sustainable health systems around the world. The foundation has teams working in over 25 countries across West, Central, and North Africa, the Indian Ocean, the Caribbean, Latin America, Southeast Asia, and the Middle East, focusing on enhancing local applied research capabilities and improving access to diagnostics, an essential part of patient care and an indispensable tool for disease surveillance and control.

https://www.fondation-merieux.org/en/

Mérieux Foundation Actions in the Field of TB

The Mérieux Foundation's objective is to support the WHO END TB strategy and improve the diagnosis and management of TB for the most vulnerable populations in low- and middle-income countries. It focuses on addressing unmet needs to overcome barriers to case finding and treatment.

For its work in TB, the foundation leverages the international <u>GABRIEL¹ research network</u>, which it launched in 2008. This non-profit network brings together 22 research laboratories in academic, public and private institutions in 17 low- and middle-income countries (LMICs). The network aims to improve laboratory- and hospital-based surveillance and research capacity on infectious diseases that have a major impact on public health through collaborative research, technology transfer of diagnostic tools, training and knowledge-sharing. The GABRIEL network also supports member laboratories to meet the international accreditation requirements for the ISO 15189 standard.

Located in high-burden countries, several GABRIEL members are the National Reference Laboratory for TB in their country. Working with this unique platform for locally driven applied research and surveillance, the Mérieux Foundation is:

- 1- Strengthening TB diagnosis and surveillance capacities in low- and middle-income countries by **building high biosafety level-3 (BSL3) laboratories and training their staff** in partnership with the National TB Program (NTP).
- 2- Advancing science and innovation by coordinating operational research projects to support NTPs in defining cost-effective strategies for the detection and management of TB infection, and through transferring technology and coordinating multi-country evaluations of innovative TB diagnostic/prognostic tools for childhood TB and tuberculosis infection.

Infectious Disease Detection and Surveillance (IDDS) Project

The Mérieux Foundation also contributes to TB activities under USAID's Infectious Disease Detection and Surveillance (IDDS) project, which aims to improve diagnostic tools and scale up TB detection and notification in countries, while strengthening the underlying health systems and supporting improvements in quality-based services.

¹ "Global Approach to Biological Research, Infectious diseases and Epidemics in Low-income countries"