

Climate Change and Public Health The Environment's Impact on Infectious Diseases

EVENT REPORT

12 November 2025, Singapore



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Abbreviations

AMR	Antimicrobial Resistance
ASEF	Asia-Europe Foundation
CCRS	Centre for Climate Research Singapore
EEA	European Environment Agency
EU	European Union
IPCC	Intergovernmental Panel on Climate Change
NEA	National Environmental Agency
NUS	National University of Singapore
SSHSPH	Saw Swee Hock School of Public Health
WHO	World Health Organization

Acknowledgements

This event was jointly organised by the Asia-Europe Foundation (ASEF) and the Saw Swee Hock School of Public Health, National University of Singapore (NUS SSHSPH). The organisers wish to thank Mr Hotta Toru, Minister, Embassy of Japan in Singapore, for his support and opening remarks. Sincere thanks are also extended to the panellists — Prof. Fredolin Tangang (Universiti Brunei Darussalam), Ms Sasha Mosky (European Environment Agency), Dr Chang Chia-Chen (National Environmental Agency & National University of Singapore), and Dr Thilaka Chinnayah (WHO Regional Office for the Western Pacific) — for their valuable insights and contributions. The organisers are also grateful to all attendees for their engagement and participation, which made for a meaningful and productive discussion.

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**From
the People of Japan**

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Introduction

The panel discussion on Climate Change and Public Health – The Environment’s Impact on Infectious Diseases was jointly organised by the Asia-Europe Foundation (ASEF) and the Saw Swee Hock School of Public Health (SSHSPH), National University of Singapore (NUS) on 12 November 2025. The session aimed to foster dialogue between academia and policymakers on how environmental changes influence the burden and distribution of infectious diseases.

Climate change poses growing risks to human health, yet its impact on infectious diseases remains underexplored despite increasing evidence of its global reach. From Asia to Europe, rising temperatures, shifting rainfall patterns, and ecological disruptions are altering the transmission dynamics of diseases such as dengue fever. These developments highlight the urgent need to translate scientific research into public awareness and policy action.

This event marked ASEF Public Health Network’s first engagement at the intersection of climate and health. Bringing together experts, researchers, and public health professionals, the panel sought to deepen understanding of the climate-health nexus and encourage intersectoral collaboration. The discussion explored shared vulnerabilities, adaptation strategies, and policy responses to climate-driven health challenges while identifying opportunities for sustained knowledge exchange across Asia and Europe.

The session aimed to raise awareness of how climate change is driving infectious disease risks, foster cross-regional dialogue between Asian and European experts, and bridge science with policy through evidence-based discussions. It also sought to examine strategic responses to climate-related health threats and strengthen networks among stakeholders committed to advancing climate-resilient public health systems.

Welcome & Opening Remarks



Ambassador Beata Stoczyńska,
Executive Director, Asia-Europe Foundation (ASEF)

Ambassador Beata Stoczyńska opened the session by highlighting the universal impact of climate change on ecosystems, human health, and overall public well-being. She noted that environmental degradation contributes to a range of health challenges, including vector-borne and respiratory diseases, emphasising that no region is immune to these effects — whether in Asia or Europe.

She underscored the importance of cross-regional dialogue and policy collaboration, reflecting ASEF's mission to build bridges between its 53 partner countries, 30 from Europe and 21 from Asia with two regional organisations: the European Union (EU) and the ASEAN Secretariat. Ambassador Stoczyńska acknowledged the support of the Government of Japan in facilitating such initiatives and reaffirmed ASEF's commitment to strengthening mutual understanding and cooperation.

In her remarks, she called for enhanced risk communication and the exchange of good practices to improve collective preparedness and response to climate-related health risks. She emphasised ASEF's intent to translate dialogue into practice, fostering effective strategies that can inform evidence-based policies and safeguard the health of future generations.

Ambassador Stoczyńska concluded by expressing gratitude to the organising teams from ASEF and SSHSPH, for their efforts in coordinating this important discussion.



Prof. Alex Cook,
Vice Dean (Global Health), Saw Swee Hock School of Public Health

Prof. Alex Cook emphasised the unprecedented scale of climate change and its far-reaching consequences on human health, noting that the challenges faced today are beyond what previous generations could have imagined. He cited recent extreme weather events, including super typhoons in the Philippines, as tangible examples of the immediate risks posed by environmental change.

He highlighted that climate change and infectious diseases are often treated as separate domains but stressed the importance of integrating these areas to improve public health preparedness and response. By considering the interconnectedness of environmental and disease dynamics, public health systems can better anticipate emerging risks and develop more effective mitigation strategies.

Welcome & Opening Remarks



**Mr Hotta Toru,
Minister, Embassy of Japan in Singapore**

Mr Hotta Toru highlighted ongoing collaborations between Asia and Europe in addressing the intersection of climate change and public health, noting that no region is exempt from the impacts of climate-related health challenges. He referenced a memorandum of understanding signed in June 2024¹ and Japan's subsequent engagement in November 2024² to advance risk communication in public health.

He acknowledged the complex challenges posed by climate change on infectious disease management and shared examples of initiatives in Japan aimed at strengthening infectious disease preparedness. Mr Hotta also outlined broader ASEF Public Health Network projects, including antimicrobial resistance studies conducted in four countries, emphasising efforts to promote mutual understanding and collaboration between Asia and Europe.

¹ Read more about the MoU [here](#).

² Read more about the event [here](#).

Expert Panel Presentations

From Science to Action: Addressing Climate-Driven Disease Threats Across Asia & Europe

Panellist 1: Prof. Fredolin Tangang, Universiti Brunei Darussalam

Prof. Fredolin Tangang presented insights from the Intergovernmental Panel on Climate Change (IPCC), emphasising that recent changes in the climate are widespread, rapid, intensifying, and unprecedented in thousands of years. He noted that the global mean temperature is rising, with WMO's recent estimate that global mean temperature in 2024 reached about +1.55 °C above the 1850-1900 baseline.

He discussed observed trends in extreme heat, cold, and precipitation events, attributing these patterns to climate change, and highlighted the impacts on societies and human systems, which will intensify if global greenhouse gas emissions are not significantly reduced. Under current trajectories, global temperatures could rise by more than 3 °C by 2100, with Europe potentially experiencing temperature increases of 4–5 °C in worst-case scenarios, alongside more frequent heatwaves and altered rainfall patterns.

Prof. Tangang also linked climate change to infectious disease dynamics, explaining that shifts in temperature and precipitation can affect disease transmission routes. He compared Asia and Europe, noting differences in average annual weather-related displacement, exposure, vulnerability, and adaptive capacity, and cited projections of additional annual deaths attributable to climate change in 2030 and 2050 relative to 1961–1990, underscoring the urgent need for mitigation and adaptation strategies.



Expert Panel Presentations

Panellist 2: Ms Sasha Mosky, European Environment Agency

Ms Sasha Mosky highlighted that Europe is currently the fastest-warming continent, experiencing rising temperatures, changing precipitation patterns, and increasingly frequent extreme weather events. She noted that beyond these climate-related factors, non-climate factors such as human mobility and public health capacities also influence the emergence and spread of infectious diseases.

She described how the EU monitors infectious diseases, including climate-sensitive diseases, through the EU epidemiological surveillance network. Ms Mosky noted that in Europe, institutions such as the Early Warning and Response System of the European Union (EWRS) support rapid detection and response to cross-border health threats, while the European Climate and Health Observatory (hosted by the EEA) is developing evidence-tools on climate-sensitive infectious diseases. According to a review of national health strategies, the most frequently planned responses to climate-related health risks include monitoring and surveillance, early-warning systems and public awareness-raising campaigns.

Ms Mosky provided country-specific examples illustrating best practices:

- Belgium monitors both endemic and invasive mosquito species, monitoring points of entry and conducting active/passive surveillance of exotic *Aedes* species.
- France has implemented a national strategy since 2006 for chikungunya and dengue and expanded to include Zika in 2016. Measures include enhanced surveillance during peak periods (May–November), training, awareness campaigns, and door-to-door outreach.
- Germany runs the “Mückenatlas,” a citizen science project in which residents capture and mail mosquitoes to laboratories, generating valuable scientific data.
- Czechia conducts tick-borne encephalitis surveillance, using forecasting models to anticipate tick activity, communicate risk levels via early warning systems, and implement prevention and awareness measures.

Overall, she emphasised that coordinated monitoring, surveillance, and early warning systems at both national and EU levels are essential to respond effectively to the growing threat of climate-sensitive infectious diseases.



Expert Panel Presentations

Panellist 3: Dr Chang Chia-Chen, National Environmental Agency (NEA) & National University of Singapore (NUS)

Dr Chang Chia-Chen focused on the relationship between climate change and dengue risk in Singapore, noting that the country's warm and wet climate provides an ideal habitat for the *Aedes* mosquito, the primary vector for dengue. She highlighted environmental risk factors, including the efficiency of the vector and urban infrastructure, which contribute to dengue transmission.

She presented findings from Singapore's third national climate change study and research by the Centre for Climate Research, showing that annual average daily mean temperatures are projected to increase by 0.6–5 °C by 2100, alongside increases in extreme daily rainfall. Dr Chang explained that rising temperatures influence mosquito-borne virus transmission, and that climate change is expected to increase dengue burden in the region.

As part of adaptation strategies, she discussed a novel vector control tool using Wolbachia-infected male *Aedes aegypti* mosquitoes, which mate with wild-type females to reduce populations and reduce the risk of dengue in Singapore. By the end of 2025, the programme is projected to cover approximately 580,000 households. Results from a randomized controlled trial indicate about a 90% reduction in *Aedes aegypti* populations. Modelling studies suggest that the Wolbachia approach remains effective even under projected climate change scenarios, demonstrating its potential as a climate-adaptive public health intervention.



Expert Panel Presentations

Panellist 4: Dr Thilaka Chinnayah, WHO Regional Office for the Western Pacific

Dr Thilaka Chinnayah provided a WHO regional perspective on climate change and infectious disease risks in the Western Pacific, a region home to nearly 2.2 billion people across 38 diverse countries and areas. She described climate change as a wake-up call for global health, noting the rising frequency of cyclones, such as Typhoon Tino and Typhoon Uwan in the Philippines, along with floods, heatwaves, droughts, and wildfires, all of which contribute to the spread of infectious diseases.

She highlighted key insights from regional risk profiling, emphasising diseases such as dengue, antimicrobial resistance (AMR), and measles. Climate-related hazards affect health directly and indirectly, with approximately 3.6 billion people living in areas highly susceptible to climate change. She also discussed projections of additional deaths between 2030 and 2050 linked to climate-related health risks, including water contamination.

Dr Chinnayah outlined the WHO's role in responding to climate-related health emergencies, including risk profiling, joint evaluations, threat detection, rapid response coordination under the One Health approach, workforce deployment, specialist supply delivery, and global leadership aligned with International Health Regulations (IHR). She noted that 1,797 signals were detected and 72 events managed in the region, including flooding, typhoons, heatwaves, and earthquakes. Additional WHO initiatives mentioned included the Arbovirus Community of Practice, GOARN partnerships, the regional emergency stockpile, and simulation exercises to support country preparedness.

In summary, Dr Chinnayah emphasised that regional climate and health risks are evolving, with gaps in capacities continuing to challenge effective preparedness and response.



Expert Panel Discussion & Q&A

During the expert panel discussion and audience Q&A, moderated by Associate Professor Yann Boucher, Saw Swee Hock School of Public Health, National University of Singapore, panellists addressed key challenges, strategies, and regional differences in managing the health impacts of climate change, with a particular focus on infectious diseases.

1. Regional Differences and Priorities

Panellists noted that data availability and research focus differ between regions. Prof. Boucher highlighted that Asia has less research compared to Europe, and that priorities for infectious disease control may differ. Prof. Tangang emphasised the role of monsoon patterns in Asia versus seasonal variation in Europe, leading to different disease patterns and risks. Dr Chang noted that knowledge and modelling approaches developed in Singapore could inform strategies in other countries, particularly dengue.

2. Public Health Preparedness and Surveillance

The discussion stressed the importance of coordinated surveillance and early warning systems. Ms Mosky described the EU's approach: collecting data on climate-sensitive diseases, rapidly identifying sources, and coordinating responses. Dr Chinnayah explained WHO's role in outbreak and disaster response, including risk profiling, early warning, workforce deployment, and provision of specialist supplies. Post-disaster surveillance and mobile clinics were highlighted as crucial for identifying both communicable and non-communicable health impacts.

3. Community Engagement and Youth Involvement

Panellists agreed that community participation and youth engagement are essential. Dr Chinnayah and Ms Mosky emphasised including young voices in decision-making, clinical management, and outbreak preparedness. Dr Chang described public engagement in Singapore's Wolbachia programme, including door-to-door communication and citizen science initiatives, as a model for building trust and improving uptake of interventions. Prof. Boucher and Ms Mosky emphasised the need to demystify risks and enhance public awareness of climate change-related diseases and adaptation measures.



Expert Panel Discussion & Q&A

4. Vector Control and Modelling Approaches

Mosquito-borne diseases were a central theme. Dr Chang highlighted the Wolbachia-based vector control programme, noting its sustained effectiveness (30–50 years) and potential for replication in other regions. Panellists also discussed potential ecological shifts, such as *Aedes albopictus* filling ecological niches if *Aedes aegypti* populations decline and emphasised the use of modelling approaches to anticipate emerging risks and guide intervention strategies.

5. Data Integration and Early Warning Systems

The panel addressed integrating health and environmental data for better pandemic preparedness. Dr Chang described combining notifiable disease data with vector surveillance in Singapore, while Dr Chinnayah outlined WHO's use of early warning and reporting systems (EWRS) and rapid signal detection for disaster-related outbreaks. Panellists noted challenges such as limited time for post-disaster surveillance and resource constraints but stressed the importance of multi-sectoral collaboration.

6. Climate Adaptation and Policy

There was discussion on adaptation measures, highlighting examples such as heat-related illness mitigation (Arizona), renewable energy adoption (China), and multisectoral disaster response. Ms Mosky and Prof. Tangang emphasised the need for long-term government investment in climate adaptation, research, and informed decision-making.

7. International Collaboration and Data Sharing

Panellists underscored the critical role of cross-country collaboration to tackle climate-sensitive health risks. All panellists agreed that sharing data, modelling approaches, and public health strategies across countries helps improve preparedness and response. Integrated projects, joint research, and collaborative meetings were highlighted as essential for building resilient health systems and for ensuring lessons learned in one region can benefit others globally. The importance of collaboration between countries, data sharing, and integrated projects was underscored to address both current and future risks.

8. One Health and Multi-Hazard Approaches

Panellists highlighted the importance of a One Health approach to integrate human, animal, and environmental health in climate and infectious disease planning. Dr Chinnayah described WHO training programmes for rapid response, field epidemiology, and multi-sectoral exercises, noting that communication frameworks like International Health Regulations (IHR) crystal exercises help evaluate and improve country-level preparedness.



Looking Ahead

In closing, Prof. Boucher asked the panel to reflect on the next 10–20 years, focusing on climate change and its interconnectedness with infectious diseases. Panellists emphasised that all countries must invest in adaptation, intersectoral collaboration, and capacity building. Prof. Tangang and Dr Chang highlighted the importance of ongoing research and cross-country collaboration, while Ms Mosky and Dr Chinnayah underscored the sustained impacts of climate change on public health and the need for continued investment in adaptive measures and resilient health systems.



