

## Policy recommendations: Addressing Climate Change-Related Disease Outbreaks

*This document is a collaborative effort between Valneva, Takeda, Deutsche Stiftung Weltbevölkerung (DSW), and International Society for Neglected Tropical Diseases (ISNTD), aimed at raising awareness among European policymakers about the disease-related risks from mosquito-borne disease associated with climate change. Tick borne diseases are also emerging in Europe (e.g. Lyme Disease, Tick Borne Encephalitis, Crimean Congo haemorrhagic fever) but this document is focusing on mosquito-borne diseases in Europe. While all reasonable steps have been taken to ensure the accuracy of the information provided here as of the date of this document, the drafters of this document cannot certify the accuracy and completeness of any of the information provided. No drafters shall be responsible or in any way liable for any errors or omissions or any action taken or non-action in reliance upon this document.*

### Executive Summary

Climate change is increasingly recognised as a significant threat to global public health, with WHO identifying it as a defining issue of our century. One of its most concerning impacts is the rise in disease outbreaks, which could lead to epidemics and the re-emergence of diseases with pandemic potential. Higher temperatures and increasing precipitation create favourable conditions for vectors like mosquitoes or ticks to thrive. These vectors are spreading through Europe, where they can lead to outbreaks of diseases such as Lyme disease, Tick Borne Encephalitis, dengue fever, chikungunya, or Zika. This document will focus on mosquito borne diseases in Europe.

This paper "Policy Recommendations: Addressing Climate Change-Related Disease Outbreaks" proposes concrete actions and strategies to combat the growing threat of mosquito borne disease outbreaks in Europe due to climate change. Key recommendations include enhancing surveillance, developing countermeasures, increasing research investment, and building resilience within the **EU Preparedness Union Strategy**. It advocates for recognising mosquito borne climate-related diseases as priority threats by the EU's Health Emergency Preparedness and Response Authority (**HERA**) and the European Centre for Disease Control (**ECDC**), emphasising global cooperation and strategic planning to protect public health. The document calls for the European Union (EU) to strengthen preparedness and response capabilities, utilising existing infrastructure and expertise effectively.

Enhancing health, security and preparedness against the risk of mosquito-borne climate-related disease outbreaks requires the EU and its Member States to urgently:

- Enhance surveillance and epidemiological capabilities, within the EU and globally, to provide early identification of local outbreaks.
- Adequately prepare for outbreaks by stockpiling essential countermeasures, such as vaccines, and establishing efficient distribution mechanisms to ensure rapid access.
- Urging national immunization advisory groups (NITAGs) to issue recommendations for vaccination, in advance of outbreaks.
- Increase investments in research, preparedness, and collaborative initiatives to mitigate risks and protect public health, in line with the EU's competitiveness agenda.
- Build cross-border resilience as part of the EU Preparedness Union Strategy.
- Encourage DG HERA and ECDC to include climate change-related diseases among their priority health threats

## Climate change is leading to increasing disease outbreaks.

Climate change, according to the World Health Organization (WHO), may be the defining global public health threat of the 21<sup>st</sup> century<sup>1</sup>. Among its other significant potential public health consequences, one of its most worrying is the increased incidence of infectious disease outbreaks that could lead to epidemics and the emergence of new diseases with pandemic potential. Increased temperatures and precipitation will provide the necessary conditions for arthropod disease vectors, e.g., mosquitoes, ticks, and other insects such as midges to flourish and expand their geographical distribution, which increases risks of viral and parasitic diseases<sup>2</sup>. In Europe, there is growing concern about the further spreading of e.g., Crimean Congo haemorrhagic fever (CCHV), Lyme disease, West Nile fever, leishmaniasis, dengue fever, Zika, and chikungunya. Extreme climate change-related events, such as heatwaves and flooding, are also leading to increased outbreaks of food and water borne diseases, e.g., leptospirosis and cholera. A new study published in *The Lancet Planetary Health*<sup>14</sup> reinforces growing concerns within the scientific community about the impact of climate change on the spread of mosquito-borne diseases in Europe. It confirms that *Aedes albopictus* mosquitoes are increasingly present across the continent, which eventually could lead to a shift from sporadic outbreaks of chikungunya and dengue towards endemic transmission.

Looking ahead, climate change-related mosquito-borne disease outbreaks have the potential to significantly impact public health, particularly in terms of increased morbidity and mortality rates associated with these diseases. Climate change has been shown to increase the frequency, reach, and severity of mosquito-borne disease outbreaks both in non-endemic subtropical areas and in endemic, tropical and equatorial regions<sup>3 4 5 6</sup>.

Continental Europe already witnessed several instances of mosquito-borne arboviral diseases, such as autochthonous cases of dengue and chikungunya in France and two outbreaks of chikungunya in Italy. The increased burden on healthcare systems and the disruption to our societies and infrastructure projects another layer of concern. Moreover, most of these diseases are particularly severe in vulnerable populations (e.g., patients with chronic diseases, children, the elderly, pregnant individuals), and this burden threatens to aggravate existing global inequalities, including gender inequality, as well as those specific to low- and middle-income countries (LMICs), while also threatening to create new inequalities in Europe (e.g., Southern countries, rural areas).

The significance of the public health burden of arboviruses led to the 2022 launch of the Global Arbovirus Initiative by WHO. Arboviral diseases are major public health threats in tropical and subtropical regions, where almost 4 billion people live, and they are often difficult to control. A major challenge in public health management of arboviral-associated diseases is the lack of specific antiviral drugs, so current treatment is mainly based on the management of symptoms. Preserving non endemic territories from becoming endemic should be a priority. As we have seen in the past, once the vector is established and the conditions are favourable, controlling those diseases becomes extremely difficult. The introduction and expansion of *Aedes albopictus* in Europe is a perfect example of how fast and far vectors can spread, aided by rising temperatures across the continent.

It is very encouraging that at the 77<sup>th</sup> World Health Assembly in May 2024<sup>7</sup>, WHO member states adopted a resolution on Climate Change and Health. The Resolution clearly identifies climate change as a major threat to public health and sets out a framework to build climate-resilient and sustainable health systems. Proposed measures include multi-sectoral cooperation, raising awareness on the interdependence between climate change and health, and decarbonization to tackle the root cause of climate change. At the 78<sup>th</sup> World Health Assembly in May 2025, Member States adopted the first-ever draft Global action plan on climate change and health, linked to the Resolution<sup>8</sup>. The adoption demonstrates a political

commitment by governments and WHO to scale up climate action as a public health priority to protect people from the growing health impacts of climate change. It is critical that EU political stakeholders act on this important resolution. In that regard, it is timely that the Council adopted conclusions on the future of the European Health Union, which includes important considerations on the impact of climate change on health<sup>9</sup>.

## **Policy recommendations to enhance health security and preparedness**

The potentially severe health risks linked to climate change-related mosquito-borne diseases call for aligned global efforts to ensure better preparedness and response to prevent future outbreaks. The new mandate of the European Commission and Parliament provides momentum for policy development in this area, ensuring the EU can protect its citizens against climate change-related mosquito-borne diseases, while contributing to greater health equity and improved responses to those diseases globally, including in LMICs. This in turn will enhance the EU's position of global leadership on this issue. With health security a high priority on the EU's agenda, as evidenced in the recently published Health Preparedness Union Strategy, it is crucial that climate-change related threats are specifically considered in the policies shaping the EU's preparedness response. In this context, the following concrete actions from policy makers are needed:

### **1. Enhance surveillance and epidemiological capabilities, within the EU and globally, to provide early identification of local outbreaks.**

Policymakers must prioritise addressing climate change-related mosquito-borne diseases: they have the potential to spread quickly to Europe through global trade and travel which enable migration of disease vectors or the diseases themselves. The success of the **EU's Preparedness, Medical Countermeasures, and Stockpiling Strategies** is closely linked with comprehensive early detection. At EU level, ECDC is responsible for surveillance of diseases associated with climate change. ECDC has already established networks and tools such as the European Environment and Epidemiology Network and Vector Net, which provide data on geographical distribution of data on water and vector borne diseases within the EU. These networks should be further expanded and strengthened, providing international reach to enhance EU and global capabilities to protect citizens. Furthermore, within Europe, reporting guidelines should be consolidated, ensuring that arboviral diseases such as dengue, chikungunya or Zika are consistently reported nationally and Europe-wide. Furthermore, regular scientific exchange between ECDC, and industry will help to secure a strong data basis and ensure all sides can effectively contribute to reacting rapidly to new threats.

Beyond specific measures targeting mosquito-borne diseases, it is imperative for the EU and Member States to actively facilitate and fund comprehensive capacity-building initiatives worldwide. For example, ECDC should increase co-operation and collaboration with other global Centres for Disease Control (CDCs), particularly in aligning practices and controls. The EU and Member States should prioritise the development of instruments for detection and surveillance of such diseases, as well as the cooperation with authorities from Third Countries. These efforts should focus on enhancing diagnostic capabilities and establishing robust reporting mechanisms to promptly identify and address events with epidemic potential, bolstering global preparedness and response to mosquito-borne diseases.

On June 11<sup>th</sup>, 2024 ECDC issued a warning<sup>16</sup> about the increasing number of cases of locally transmitted dengue in Europe, due to climate change and the spread of competent mosquito vectors. ECDC reported 130 locally acquired dengue cases in the EU/EEA last year, a significant rise from the 71 cases recorded over the previous decade from 2010 to 2021. Imported cases are also increasing, with 1.572 reported in 2022 and over 4.900 cases in 2023.

This marks the highest number of imported dengue cases recorded since EU-level surveillance began in 2008. Additionally, there were 713 locally acquired human cases of West Nile virus (WNV) and 67 deaths in nine EU countries in 2023, with infections appearing in many new regions. Although this was a decrease from the 1.133 cases the previous year, ECDC is alarmed by the widespread geographical presence of WNV.

## **2. Encourage EU Member States to adequately prepare for outbreaks by stockpiling essential countermeasures, such as vaccines, and establishing efficient distribution mechanisms to ensure rapid access**

During the COVID-19 pandemic, our ability to quickly develop and deploy vaccines for prophylactic use to immunise populations and control or mitigate an ongoing outbreak has allowed us to counter threats and restore societal norms. For mosquito-borne diseases, a combination of vaccination programs and community-based interventions is crucial to mitigate their impact.

To realistically control infectious diseases, human, animal, and environmental factors need to be considered together, based on the One Health approach<sup>10</sup>. For vaccination to be part of an effective response in a crisis, the necessary doses must be available at short notice. Given typical production cycles of 12 months or more, and the limited availability of travellers' vaccines in the private market, stockpiling must be considered. Also, procurement and deployment of vaccines are often conditional to existing national recommendations. National immunization technical advisory groups (NITAGs) should therefore take the lead on discussing, proposing and publishing recommendations for available vaccines. This should be done pre-emptively of any local outbreak, and coherently across the EU.

The **EU Preparedness Union, Stockpiling, and Medical Countermeasures Strategies** must consider the particularities of climate-change related mosquito-borne diseases countermeasures. In this case, limited licensed vaccines exist for most of the known threats (though many are in early development stages); those which are available still need to be more consistently recommended and implemented. Policymakers must therefore encourage the development and recommendation of these products, as well as the generation of supportive real-world evidence, through increased funding opportunities and a robust incentives framework. The objective should be to achieve proven clinical efficacy and validated manufacturing processes, so that vaccines can be stockpiled or manufactured quickly at large volume in case of a new emergency. For example, in Italy a recommendation issued from the national traveller medicine and immigration society (SIMVIM) on dengue prevention was replicated in three Italian regions, with vaccine instructions for travelers and residents (Lazio, Lombardy and Romagna)<sup>11</sup>.

Notably, the **Climate Adaptation Plan**, proposed under the EU Preparedness Union Strategy, should become a priority and consider the risk to Europe from the increasing presence of vectors and local cases of emerging mosquito-borne diseases.

## **3. Increase investment in research, preparedness, and collaborative initiatives to mitigate risks and protect public health, in line with the EU's competitiveness agenda.**

COVID-19 was a wake-up call, demonstrating that infectious diseases pose a cross-border security threat, capable of causing elevated levels of mortality, damaging economies and disrupting social infrastructure. Investment in preparedness and response against such mosquito-borne threats, which will be magnified by climate change, should be treated by the EU on the same priority level as defense.

Increased public investment is essential to develop, procure and stockpile existing countermeasures for climate change-related mosquito-borne diseases. This should leverage different platform technologies that were validated and licensed during the COVID-19 pandemic, including viral vectors, RNA, and inactivated or attenuated virus technologies. These technologies now have scalable manufacturing processes available which can be expanded once the candidate vaccines are available. It is also essential to fund research into innovative platform technologies so that a “toolbox” is available to develop vaccines against new threats. Research and development of vaccine formulations that provide thermostable vaccines (not requiring fridge or freezer storage), or which can be delivered without the use of needles, are other areas to focus on. This could accelerate deployment of vaccines and potentially allow for self-administration, reducing the need for large numbers of medical staff during the vaccination campaigns. It would also facilitate global access to vaccines, particularly in countries unable to maintain a cold chain. Ensuring representative clinical trials in the research and development of such medical countermeasures is vital to ensure an equitable response, with the inclusion of pregnant and lactating populations in the clinical trials an imperative, as per WHO Guidance for Best Practices in Clinical Trials published in 2024<sup>12</sup>, especially given the unique and heightened risk that many climate-related diseases pose to this population.

The pharmaceutical and biotech industry has demonstrated a capacity to develop, manufacture and deliver vaccines at large scale and volumes. However, since industry cannot define threats alone, close co-operation with EU agencies, institutions and governments is necessary to ensure a timely response. HERA should be encouraged to foster strong collaborative relationships with the global vaccines industry while supporting vaccine equity globally.

A good example of public-private cooperation was the COVID-19 vaccines Advance Purchase Agreements (APAs), led by the Commission. Under these agreements, the EU provided purchase guarantees to the industry during development and before authorisation of countermeasures, thus ensuring their development. This approach could be replicated to encourage the development of new vaccines for climate change-related mosquito-borne diseases. In addition, the EU should explore other pull incentives suitable to spur the development of key medicinal products, complementing existing EU push funding such as the European and Developing Countries Clinical Trials Partnership and Horizon Europe funding.

Timely manufacturing of vaccines is further compounded by the shortage of flexible manufacturing capabilities in Europe. Vaccines industry facilities are typically dedicated to single products, and do not have the flexibility to quickly provide surge capacity for new countermeasures in an emergency. To address this, governments should collaborate with industrial partners that have more flexible manufacturing capability. Such public-private partnerships can provide the capacity to produce products for stockpiling and offer surge capacity during emergencies. With the concept of strategic autonomy in mind, the **EU Biotech Act** and **Life Sciences Strategy** should foster its pharmaceutical and biotechnology industry to ensure adequate production capacity is available in Europe. These frameworks can provide political and legal support needed to strengthen R&D capabilities and ensure resilient supply chains in Europe.

#### **4. Call for initiative-taking measures and strategic planning to build cross-border resilience as part of the EU Preparedness Union Strategy.**

The EU is urged to develop comprehensive “end to end” preparedness and response capabilities. This includes ensuring that health threats are thoroughly assessed, medical countermeasures are developed and stockpiled and readily made available in response to

these threats. Also, autonomous manufacturing and supply chains must be in place, alongside robust distribution and deployment mechanisms, to ensure equitable availability across all Member States. The COVID-19 pandemic revealed how difficult it is to provide these capabilities solely within the EU, particularly when it comes to the sourcing of components for manufacturing medical countermeasures. Consequently, increased global co-operation is essential. The recent **Preparedness Union Strategy** provides a solid framework, but some of the actions are delayed to 2027 – while the threat to health from climate change-related mosquito-borne diseases is imminent.

Within the EU, regulatory approvals for medical countermeasures must be streamlined to improve equitable access for its citizens. The European Medicines Agency (EMA) plays a key role in ensuring that efficient regulatory processes are in place for the approval of medical countermeasures intended for use in health emergencies or stockpiling. However, one of the lessons learnt from the pandemic is that even when a vaccine is approved at EU level, Member States may still impose their own requirements for market access and limit recommendation for the vaccine, e.g. for certain age groups.

Additionally, HERA and the EMA should thoroughly explore the global market for approved medical products while evaluating the availability of countermeasures for prioritised threats. Some of these products may already meet the standards for approval and procurement within the EU, potentially eliminating the need for substantial investment in their domestic development and manufacturing.

## **5. Encourage DG HERA and ECDC to include climate change-related mosquito-borne diseases among their priority health threats.**

There can be no doubt that the EU possesses considerable infrastructure and organisational expertise that could be leveraged to develop a robust preparedness and response capability to combat climate change-related mosquito-borne diseases<sup>13</sup>.

As the former ECDC Director stated, “Europe is already seeing how climate change is creating more favourable conditions for invasive mosquitos to spread into previously unaffected areas and infect more people with diseases such as dengue. Increased international travel from dengue-endemic countries will also increase the risk of imported cases, and inevitably also the risk of local outbreaks<sup>4</sup>.

A large coalition (Lancet Countdown in Europe, Health and Environment Alliance (HEAL), the Standing Committee of European Doctors (CPME), and the Association of Schools of Public Health in the European Region (ASPHER)) recently published in Lancet Countdown 2024 key priorities for Europe: 1. Prevent heat-related health impacts; 2. Prioritize reducing climate change-related health inequalities and 3. Take urgent action on climate and health<sup>15</sup>.

The establishment of HERA by the Commission is a significant step towards enhancing the EU's ability to prepare and respond to emerging disease threats driven by climate change. There is an urgent need for HERA to take the lead in building and synergizing the enormous expertise, resources and capabilities available within the EU's public and private sectors to meet the challenges posed by climate change.

Beyond its current capacities, HERA could also serve as the EU “voice” in leading the global effort against climate change-related diseases. To fulfil this role effectively, HERA must operate with a more independent structure, enabling accelerated technical decisions, particularly in case of emergencies. Additionally, HERA would benefit from an increased budget to better support the EU's response to climate change-related diseases. This combination of autonomy

and financial stability is essential for HERA to become a leading force in combating global threats as climate change-related diseases.

This document was drafted in May 2025 and is subject to change. It is intended for informational purposes only.

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