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iDAlert

Infectious Disease decision-support
tools and Alert systems

**Tackling the spread of infectious
diseases in a changing climate.**



An overview in cartoons



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Tackling the spread of infectious diseases in a changing climate

February 2026

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Authors

The book was illustrated and written by artist Betje Ton. It is a joint effort by the IDAlert project coordinator along with its consortium partners, and led by partners Tilly Alcayna and Adwoa Amankona from the Red Cross Climate Centre.

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Consortium partners

The consortium involves 19 organisations from Sweden, Germany, France, Spain, Greece, The Netherlands, Italy, UK, and Bangladesh, with world leading experts in a wide range of disciplines including zoonoses, infectious disease epidemiology, social sciences, artificial intelligence, environmental economics, and environmental and climate sciences.



Why IDAlert is important

As the climate is changing, Europe is confronted with a higher risk that some infectious diseases will (re-)emerge and spread. A combination of the rise of temperatures, variable rainfall, changing humidity and other factors are making Europe increasingly suitable for certain mosquitoes, ticks, sand flies, and other 'vectors' that can carry diseases. The IDAlert project is working on methods to monitor and forecast the risk of climate-sensitive infectious diseases in Europe and beyond. The work that the IDAlert researchers are doing is helping governments, health care professionals and individuals tackle this challenge.



Good to know before we dive in

Pathogens are disease-causing agents such as viruses, bacteria, fungi, protozoa, or prions. A vector is a living organism that transmits a pathogen from an infected animal or human to another human or animal. Some vectors, like mosquitos, ticks and sandflies, need a minimum temperature to survive or reproduce as they rely on the surrounding temperature to regulate their body temperature.

Diseases transmitted by vectors are called vector-borne diseases. Examples of these are dengue, malaria and West Nile virus.

The vectors that IDAlert is focussing on are mosquitos, ticks, and sandflies, when we refer to vectors these are the vectors we mean.



How climate change affects our health

Higher temperatures

As average temperatures in Europe rise, more areas are becoming suitable for vectors that rely on a warmer climate. Additionally, vectors that would have previously died during winter may now be able to survive throughout the year, giving them more time to spread infectious diseases.

Changing rainfall patterns

Some areas may now have multiple rainy seasons due to the changing climate, while they used to have one. This is giving mosquitoes more opportunities to lay eggs.

Changing ecology

Ecosystem changes, whether driven by climate change or human activities, can increase the risk of attracting vectors.



What we can do to prevent outbreaks

It's important to know which areas are at risk and what types of interventions are most effective in reducing disease transmission. The IDALert project is creating tools to ensure that policymakers, health professionals, city planners and citizens can make well-informed decisions to protect their communities against these climate-sensitive infectious diseases.

In the following sections, we highlight some of the work the IDALert researchers are doing to improve resilience to these emerging health threats.

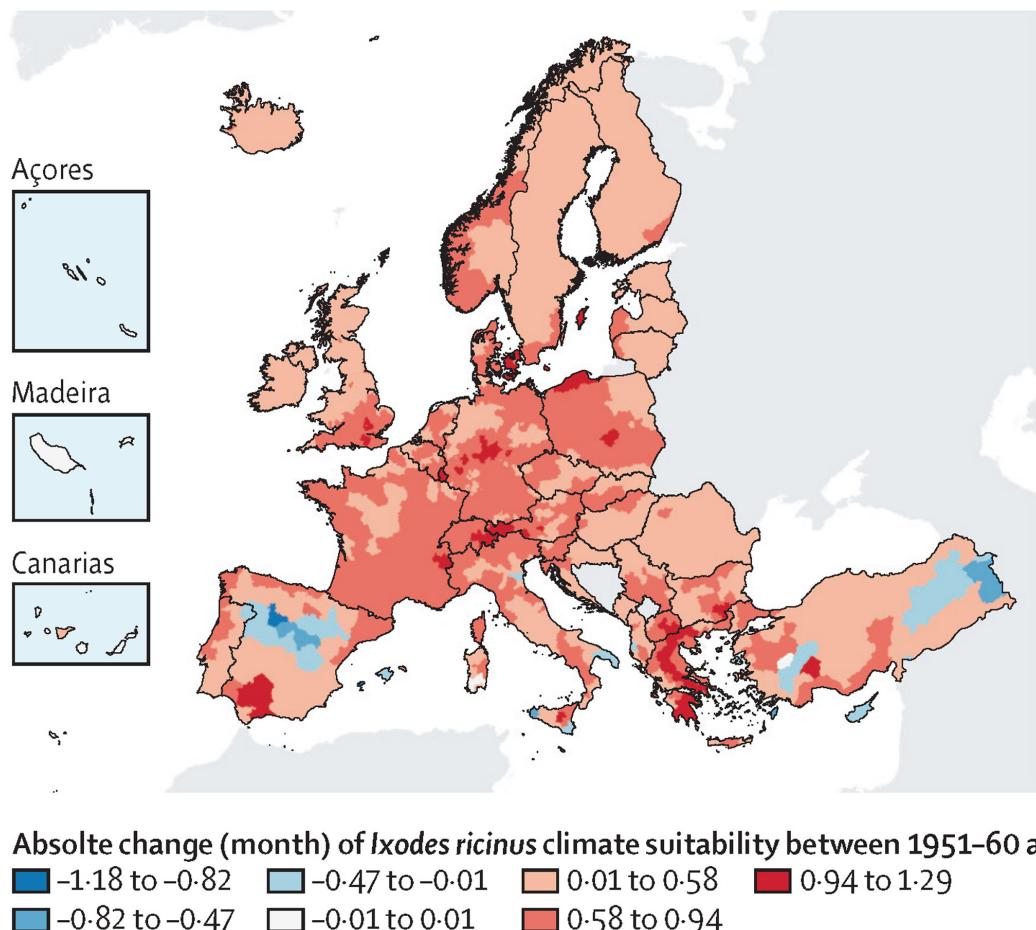
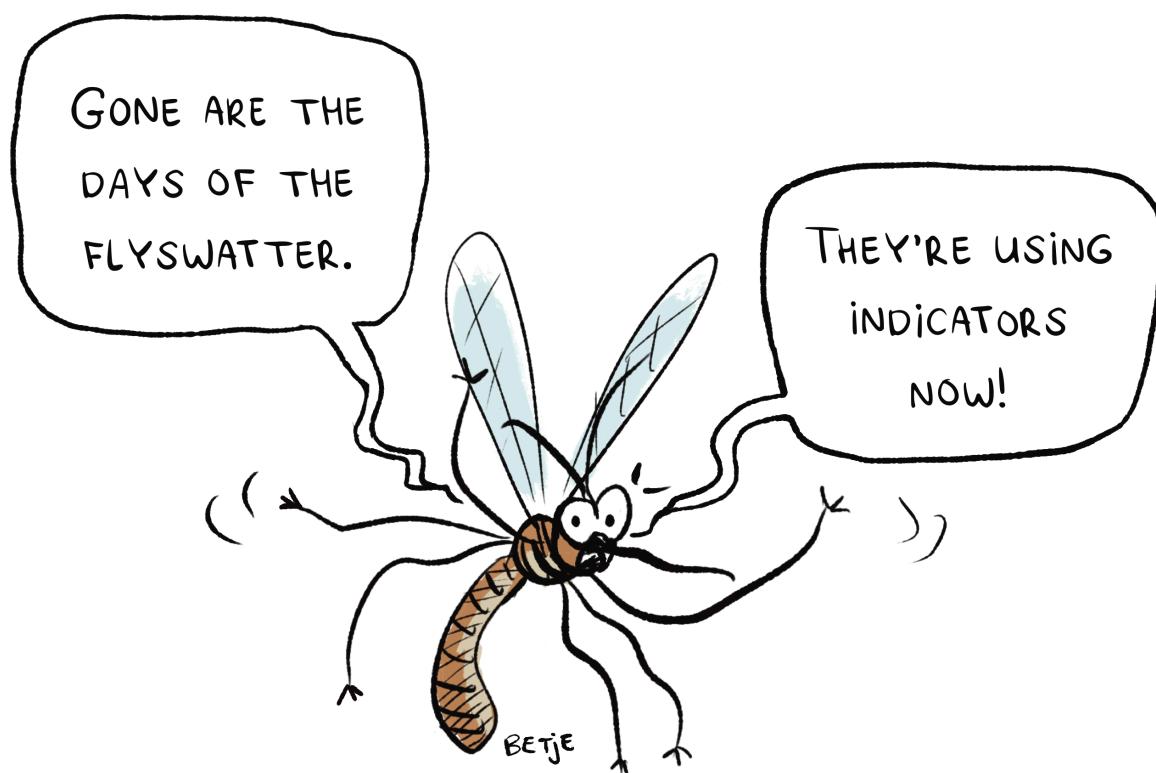


Figure source: The 2024 Europe report of the Lancet Countdown on health and climate change: unprecedented warming demands unprecedented action. Countdown Volume 9, Issue 7e495-e522 July 2024

The Lancet Countdown

Indicators are used to measure changes over time. IDAlert researchers are translating available data on vectors, the pathogens they may be carrying and their preferred environmental conditions, into indicators for the “Lancet Countdown Europe” report. [**The Lancet Countdown**](#) is a major international initiative that works to ensure policymakers know of the impact of climate change on our health and how to respond to reduce the impact.

Indicators typically use data from traditional disease surveillance techniques, but IDAlert researchers are also pioneering the use of novel data sources.

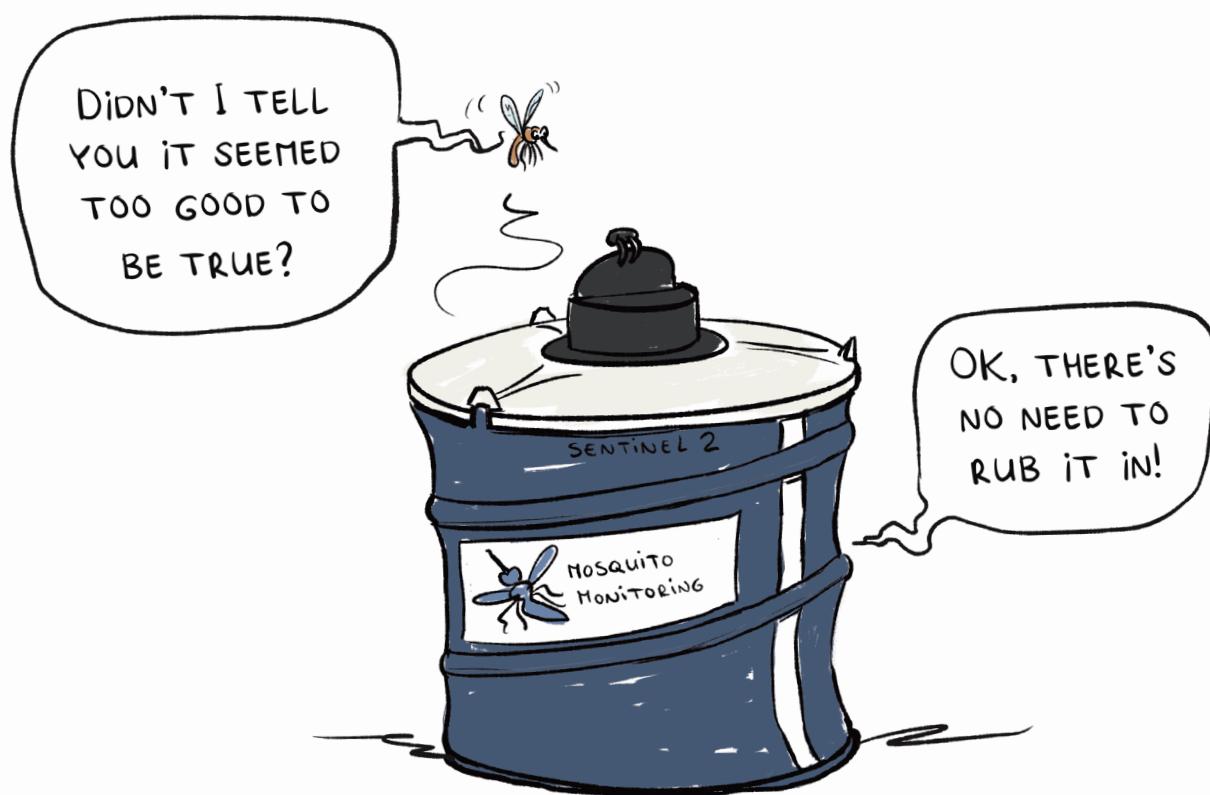


Traditional methods

An example of a traditional method is capturing mosquitoes to be studied in a lab. This doesn't mean that this method is old-fashioned, it can use advanced technology as well; traps can be equipped with an artificial human scent and the distribution of CO₂ to lure mosquitoes in.

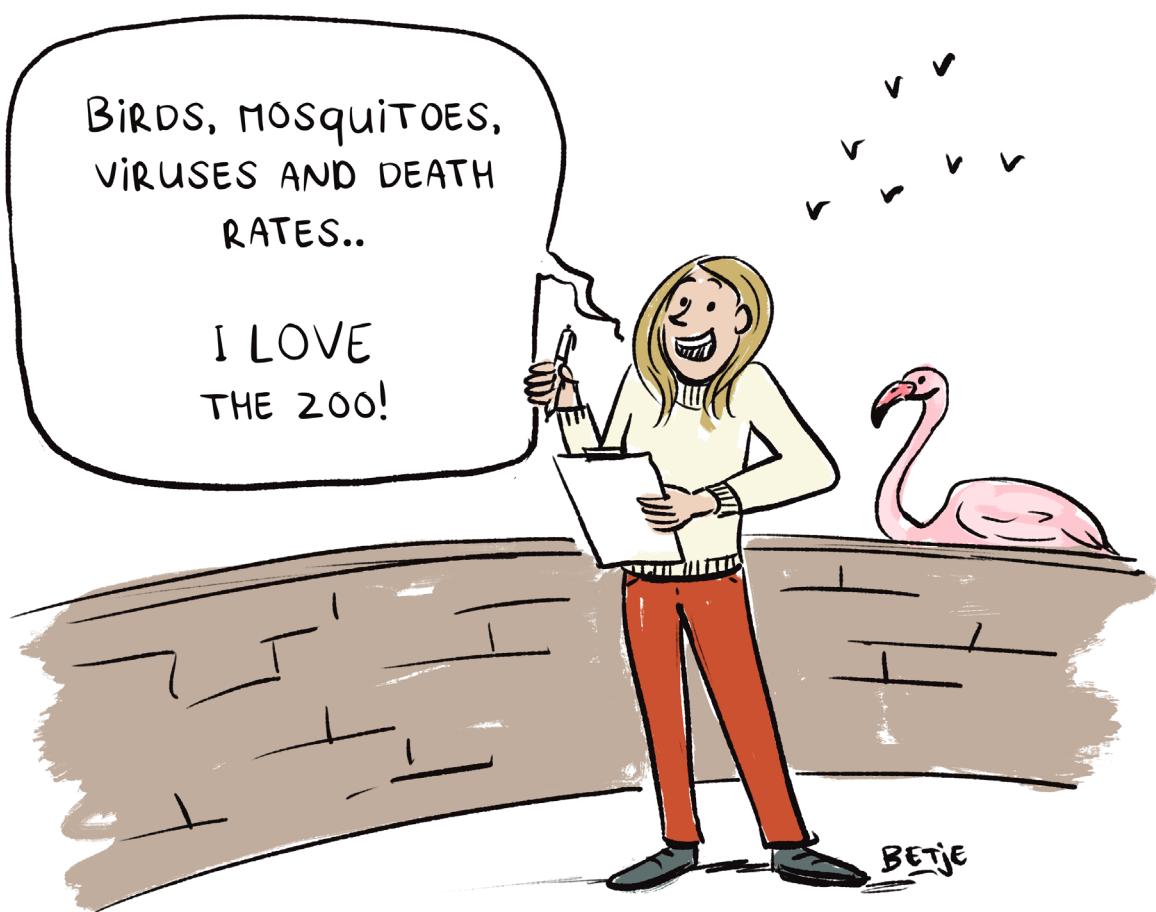
Smart Traps are similar traps but with infrared sensors. The infrared light captures characteristics of anything that passes, such as colour, size, wing beat and speed. The traps use machine learning to determine whether it has captured a mosquito and, if so, what genus* and what sex it is, as it is only the female mosquito that bites for a blood-meal and transmits pathogens.

* for example, *Aedes*, *Anopholes*, or *Culex*



Sentinel sites

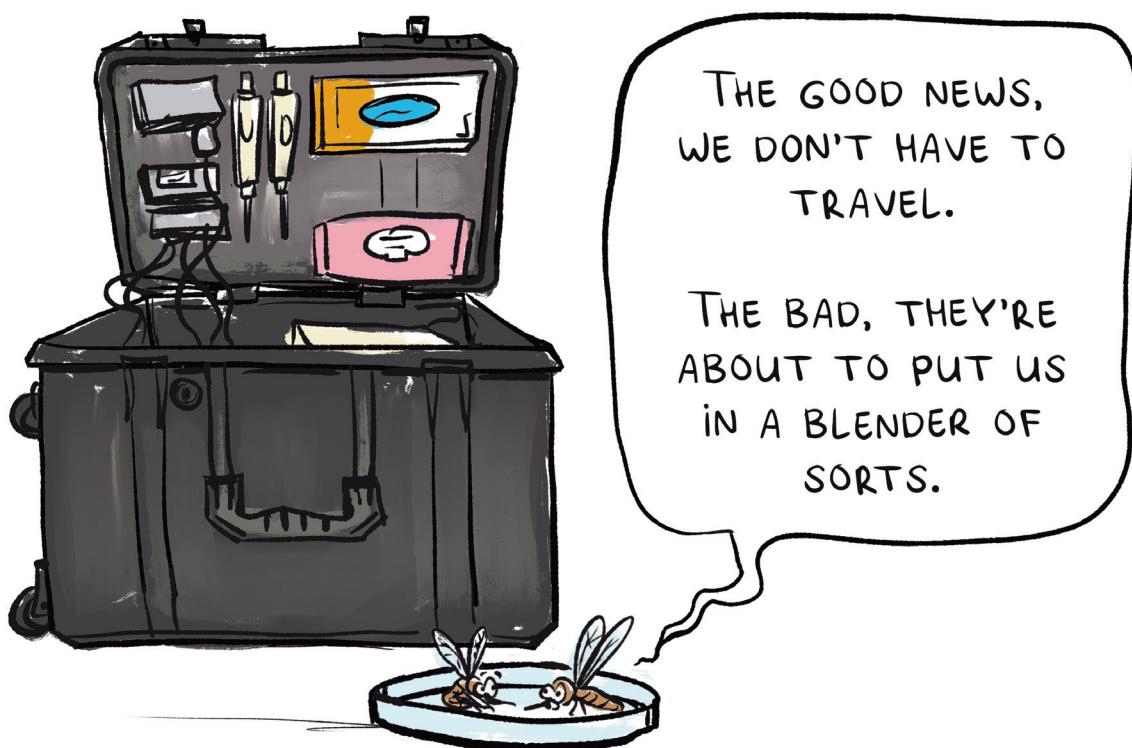
A sentinel site is a location in which scientists gather data that can be used to monitor trends. IDAlert researchers focus on water-rich areas that are home to large numbers of migratory and resident bird species that may carry diseases such as West Nile virus (WNV), Usutu virus (USUV) and Sindbis virus (SINV). IDAlert is also looking at whether samples from zoo animals can help identify diseases spread by birds, meaning that zoos could be used as sentinel sites.



Novel data

Novel data is data collected in a new way. An example of this is the Mobile Lab. It's a big sturdy suitcase on wheels that can be taken anywhere to do DNA analysis on the field. Through nanopore sequencing, it can identify species as well as pathogens. A big advantage of the Mobile Lab is that there's no need to send samples to a lab with a risk of deterioration of the sample. By doing the testing on the field, the results are available much faster. Additionally, there's no risk of contaminating the sample with other pathogens or infecting others outside the contaminated area.

Another example of novel data collection is **citizen science**.



Citizen science

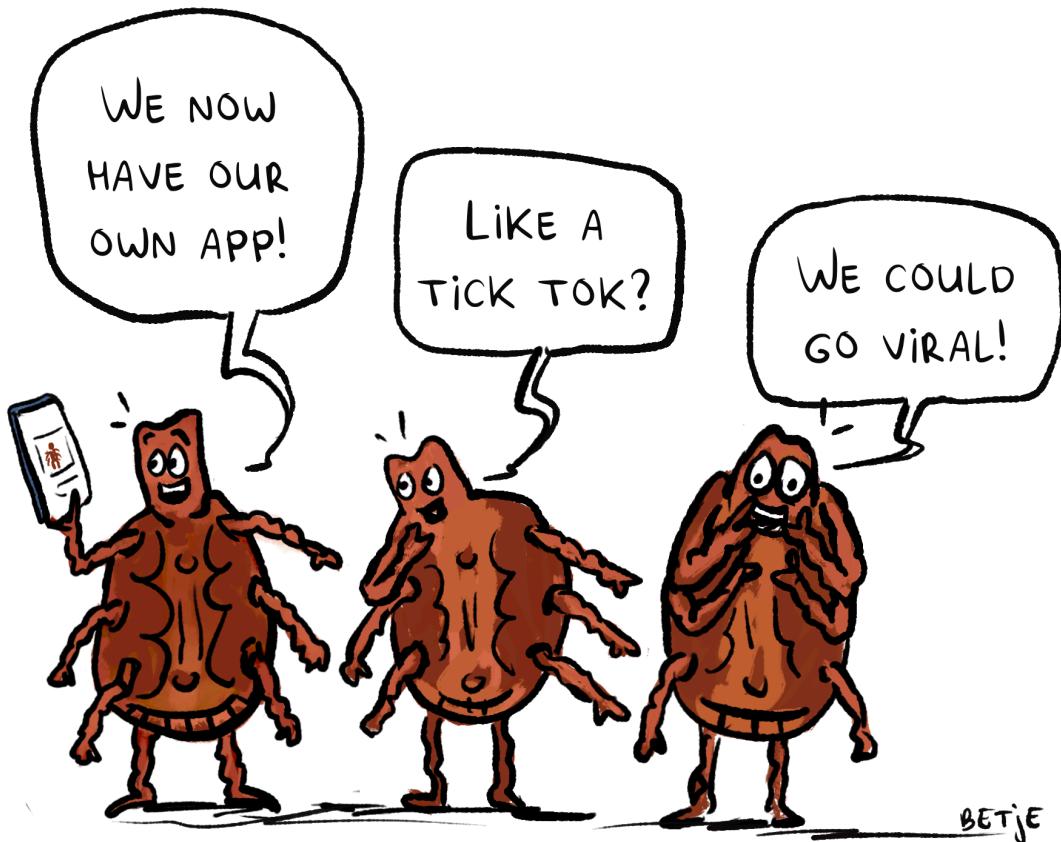
When data is collected by people who are not professional scientists running an experiment, we call it citizen science. It's an easy and inexpensive way to collect a lot of data whilst actively involving members of the public. Through online surveys or apps, people are asked about their knowledge, behaviour, and/or observations of their local environment and experience with vectors of concern. Two of these apps supported by IDAlert are TickRapporteur and Mosquito Alert.



TickRapporteur

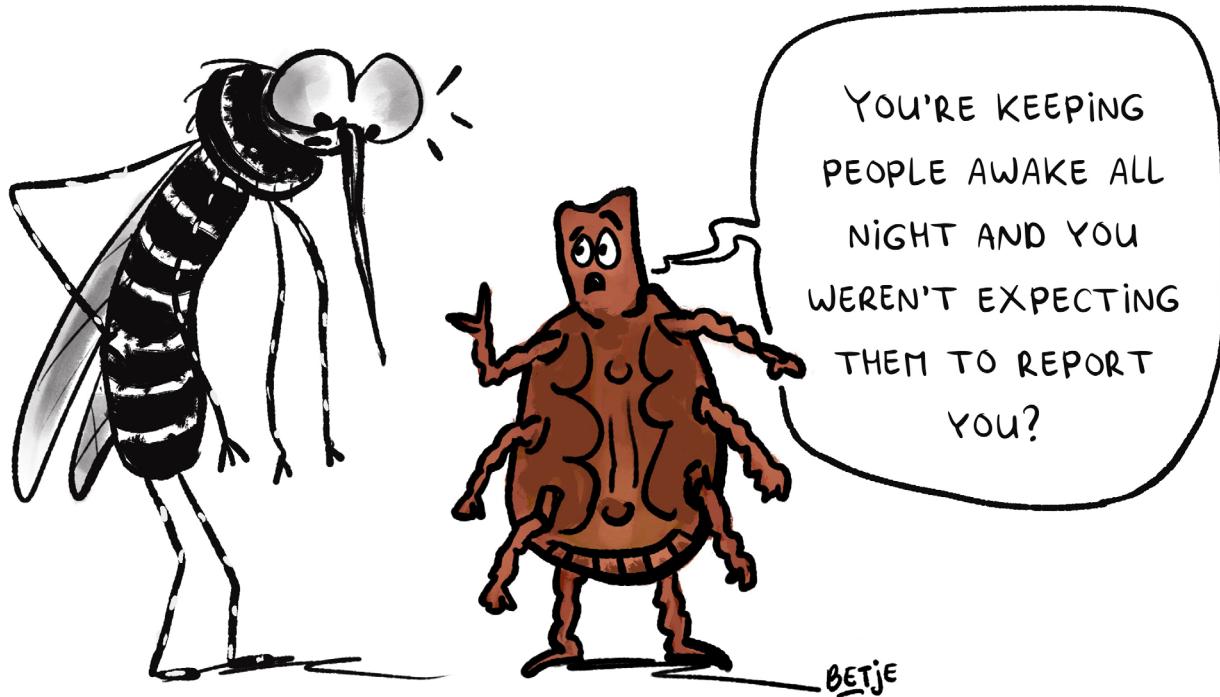
In Sweden, citizens can use the app TickRapporteur to send photos of ticks they find on themselves, their pets, or other domesticated animals. The tick species are identified with AI. By doing this, we are gaining valuable insights into how changing environmental conditions are influencing the whereabouts of ticks.

During a TickRapporteur campaign, a dozen ticks that are not typically found in Sweden were reported, including *Dermacentor marginatus*, a tick that can carry various pathogens, including the Crimean-Congo hemorrhagic fever virus and *Coxiella burnetii*, which causes Q fever.



Mosquito Alert

[**The Mosquito Alert app**](#) can be used to report mosquitoes, bites and breeding sites. When users send their photos, they will be looked at by entomologists (scientists who focus on insects). In case they identify a mosquito that can carry a pathogen, such as the 'Tiger mosquito', they will inform the local public health authorities so that they can take appropriate action.



Decision making tools

IDAlert researchers are sharing their findings through scientific publications, reports, blogs, videos, training sessions, webinars, and workshops with policy-makers. They are also building two key open-access resources: the Decision Support Library and the EpiOutlook dashboard.



Decision Support Library

IDAAlert researchers are working on a digital library that is filled with evidence to help policymakers understand how their plans to tackle climate change may affect the risk of introducing or spreading infectious diseases. Users can ask an AI bot to scrape this library and create a summary of case studies that are relevant to their own situation and plans in order to make well-informed decisions.



EpiOutlook

EpiOutlook is an online platform that shows which places in Europe are climatically and environmentally suitable for vectors. It uses climate forecasts as well as longer-term climate projections to estimate the future risk of climate-sensitive disease outbreaks. In addition, it can help public health and environmental authorities understand changing timings of mosquito or tick seasons so that they can communicate this information to the public.



Interventions

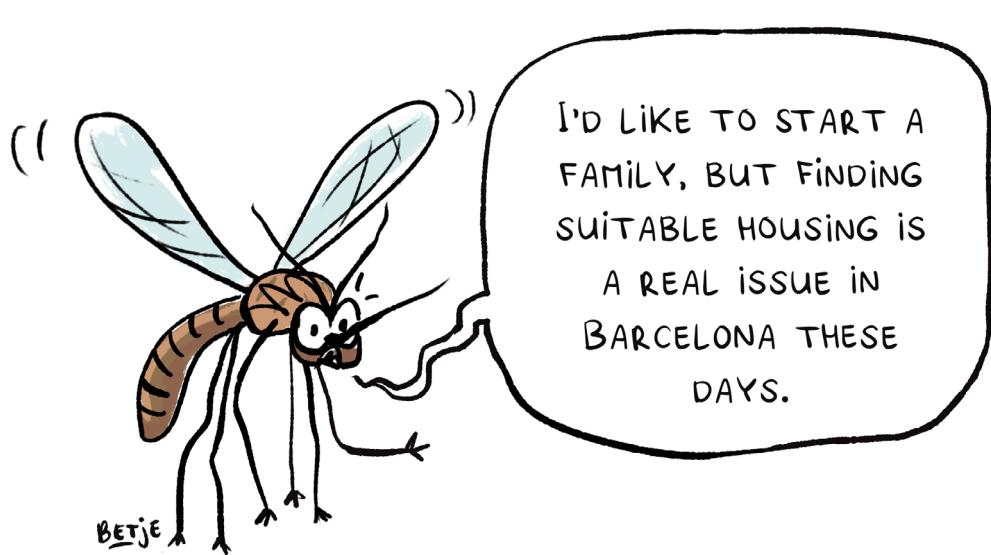
IDAlert researchers are testing interventions that aim to reduce the abundance of vector populations.

Larvicides

A larvicide is a pesticide that is targeted against the larval life stage of an insect. IDAlert researchers are using the larvicide *Bacillus thuringiensis israelensis* (BTI) for mosquito control in wetlands. They are identifying the best timing of spraying BTI, as it is most effective during specific mosquito larval stages. The researchers are also considering how this intervention affects the wetland ecosystem.

Storm drains

Typically, storm drains are ideal breeding sites for mosquitoes, because of the layer of water they contain. In Barcelona, IDAlert researchers have been testing storm drains that were altered to drain completely. This intervention has resulted in a 94% reduction in adult mosquito population around these altered drains. This is evidence we need to invest in these modified storm drains in many other places around Europe.



Exchanging knowledge

While temperatures are rising twice as fast in Europe than in the rest of the world, making an outbreak of infectious disease more and more likely, the continent is not well prepared for this. Countries in sub-Saharan Africa, Asia and the Americas have for a long time been affected by vector-born diseases. The management of these diseases has led to extensive experience, creating a wealth of information that can help Europe prepare for outbreaks or even prevent them from happening. The altered storm drains for example, were introduced in Brazil before IDAlert started their research in Barcelona. Conversely, Bangladesh is starting to introduce Mosquito Alert.





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Climate-Health Cluster

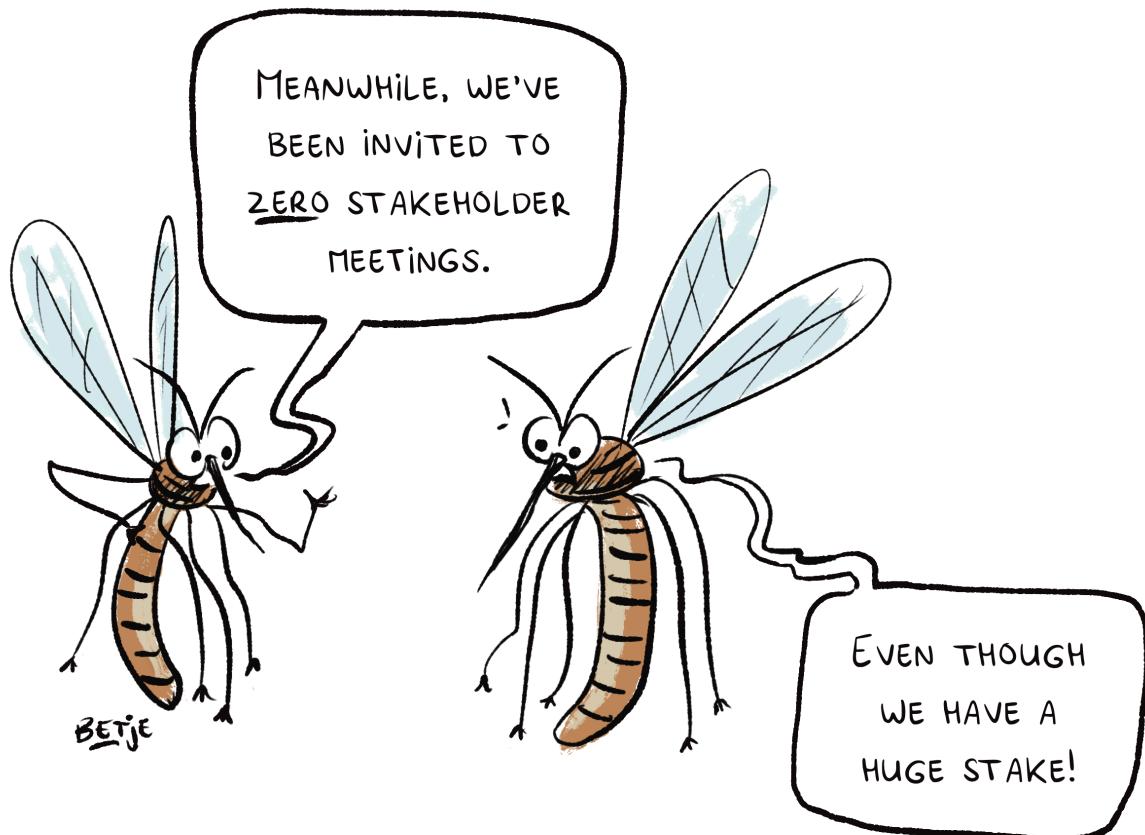
IDAlert, as part of the The Climate-Health Cluster, connects to significant initiatives in climate change and health. The goal is to provide scientific evidence and advice to contribute to a more resilient Europe and beyond. The Cluster collaborates with researchers and academia, climate and environment professionals, policymakers, policy experts, funding agencies, NGOs, healthcare providers, patient organisations, the healthcare industry, civil society and citizens.

The six Horizon Europe projects, BlueAdapt, CATALYSE, CLIMOS, HIGH Horizons, IDAlert, and TRIGGER, form the climate change and health cluster.



Conclusion

As Europe's climate becomes increasingly suitable for certain disease-carrying vectors, there is still much we can do to prevent their spread. IDAlert is helping policymakers understand the importance of investing in effective prevention measures. The evidence and forecasts IDAlert generates provide essential insights for policymakers and health professionals to prepare for potential outbreaks of vector-borne diseases. Urban planners can use IDAlert's research to design cities that minimise the creation of vector breeding sites. Citizens can also contribute to this research—while staying well informed about the risks they face and taking steps to protect themselves from mosquito and tick bites.





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