

Nutrient-rich water is heaven for disease-spreading mosquitoes

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Credit: Leiden University

When mosquito eggs hatch in nutrient-rich water, the mosquitoes are larger and they can also fly further. That is the first conclusion of a study from by the Netherlands Center for One Health (NCOH) by PhD-student Sam Boerlijst.

Boerlijst (Institute of Environmental Sciences) worked in a field lab with ponds full of mosquitoes on a study of how mosquitoes develop in different conditions. "There are not enough [natural predators](#) in nutrient-rich [water](#). And the mosquitoes also grow faster when the water warms up."

His study is part of a larger program looking at the spread of disease by vectors. Vectors here are animals that can transmit diseases. The West Nile virus was found in Utrecht in a type of warbler, a common whitethroat, in Utrecht, as well as in people in the Utrecht and Arnhem areas. Mosquitoes can transmit not only this virus but also others. In 1945-1955, for example, malaria, another disease transmitted by mosquitoes, was still prevalent in the Netherlands.

Boerlijst and his colleagues are looking at whether globalization and [climate change](#), but also changes made by humans in landscapes, make the transmission of diseases more probable. He is being supervised in his research by Eline Boelee, a water and health expert at research institute Deltares. Boelee: "We are an NCOH partner in the One Health PACT research program, which is looking at transmissible diseases of this kind in the Netherlands. Boerlijst's study is focusing on how mosquitoes develop in and around water. That is important knowledge for our institute, especially given our worldwide involvement in water and planning issues."

A higher water temperature does affect the growth rate, but not the size and flying capacity, of mosquitoes. When [water quality](#) is poor and there are no natural predators as a result, mosquitoes will be larger and able to fly further: the dirtier the water, the larger the mosquitoes. The ecologists working on the program are now also looking at how this works outside the field lab so that validated data can be used in a [prediction model](#). Ecologists, virologists and programmers are therefore working closely together on the One Health PACT program. "Our model will soon predict whether certain areas are more at risk of the transmission of diseases by [mosquitoes](#), probably making it possible to prevent or mitigate the risk," says Boerlijst.

It will take a while before we get to that stage. The mosquito model should be completed in four to five years. Boerlijst is now working on a

first publication about his study.

Provided by Leiden University

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