

# Can dams increase the risk of malaria?

## Story highlights

- New study finds a link between malaria infections and dams in Africa
- Stagnant waters created by dams could cause 1.1 million additional cases a year

(CNN) Living close to a dam could increase the risk of contracting malaria, a new study conducted in sub-Saharan Africa has found.

The research looked at infection rates among people living close to 1,268 dam reservoirs, and found that about 15 million people reside in "risk areas" -- fewer than 5 kilometers away from a dam.

By comparing the difference in the number of cases for communities further away, the researchers from the [CGIAR program on Water, Land and Ecosystems](#) and the [International Water Management Institute](#) stipulate that at least 1.1 million cases of malaria annually can be directly linked to the presence of dams.

## Stagnant waters

Malaria is transmitted by the *Anopheles* mosquito, which breeds in stagnant or slow-moving waters.

An *Anopheles Freeborni* mosquito.

Reservoirs -- the artificial lakes created by dams -- offer conditions similar to those found by the insect in its habitats, consisting of natural lakes, ponds, wetlands and other water bodies, and thus increasing its chances of breeding.

While the number of infections attributed to dams in the study is a small fraction of the estimated annual 174 million cases in sub-Saharan Africa, the researchers believe that is "unethical" that people living close to dams pay the price of that development through increased suffering and, in extreme cases, loss of life.



Over half a million people die from malaria each year, with up to 90% of these deaths occurring in the sub-Saharan region.

"Although dams are key to promoting economic development and help to ensure food security and alleviate poverty, previous studies indicated that dams can enhance malaria," Solomon Kibret of the University of New England in Australia, lead author of the paper, told CNN.

"However, to date there was no study that attempted to look at the aggregated impact of all large dams across sub-Saharan Africa. We thought that if we conducted such a study it would increase understanding of the impact of large dams on malaria and highlight the need for improved mitigation during planning, designing and operating of large dams."

## Helping Africa's growth

Dams are important drivers of economic growth in Africa, but their construction has not been free of controversy.

A big push toward hydropower has seen them rise all over the continent starting in the 1950s, with the goal of supplying cheap electricity and increase water security.

But their production rates have been lower than expected, a [study from the Independent World Commission on Dams](#) has found.

The Grand Renaissance Dam under construction.

Other grievances include lack of compensation for displaced communities, negative environmental impact and a lopsided distribution of the energy in favor of large operations rather than local communities.

Nevertheless, massive developments are currently underway, such as multi-billion dollar [Inga 3 dam](#) in the Democratic Republic of Congo, or the [Grand Renaissance Dam](#) near the Sudanese-Ethiopia border, which will be Africa's largest when completed in 2017.



## Planning ahead

The study includes data from 78 dams that are under construction or planned, which could create 56,000 additional cases of malaria annually.

The authors offer suggestions on how to manage the risk, such as a technique called *reservoir management*: "This modifies dam operating schedules so that, at critical times, the shore where mosquitoes breed is dried out and the larvae die," said Kibret.

*Dam proponents have a moral duty to combat the likely increased malaria*

*Solomon Kibret, Lead Author*

But with no single practical intervention guaranteed to slash risks, the first step is to create awareness around the problem: "The main thing is that dam operators and public health authorities acknowledge the likelihood of increased malaria in the vicinity of large dam reservoirs and work closely together to implement mitigation measures," said Kibret.

"Dam proponents have a moral duty to combat the likely increased malaria and must work closely with appropriate health and water authorities. They must also finance appropriate interventions not just in the immediate aftermath of dam construction but also for many years into the future."

## Builders should 'share the burden'

Other proposed measures include the introduction of fish that eat mosquito larvae, and an increased investment in integrated malaria intervention around the affected areas, to provide bed nets and antimalarial drugs.

But these measures are costly, particularly for developing countries in Africa: "Too often dam builders and operators may acknowledge the potential for increased malaria but leave the responsibility and costs to overstretched public health authorities," said Kibret.

"I believe they should be required to cover the cost of malaria control, which may be best framed as a long-term effort that goes hand-in-hand with dam management rather than a one-off intervention."

While these costs may vary dramatically from site to site, the authors of the study believe that the financial viability of the dams would not be threatened.

## Seasonal areas hit the strongest

The study found a stronger link between malaria infections and dams in areas where transmission is seasonal, or unstable, rather than continuous throughout the year, contributing about 900,000 of the projected 1,1 million additional cases each year.

A possible reason for this is that dam reservoirs offer a breeding habitat for mosquitoes during the dry season, when they would otherwise miss their chance.

However, in areas of perennial transmission, the link between dams and increased infection rates was not statistically significant, meaning that water reservoirs simply add to an already wide array of breeding habitats available to the insects.

Commenting to CNN on the validity of the study, Lucy Tusting, a malaria expert from the [London School of Hygiene & Tropical Medicine](#) who is not associated with the research, told CNN: "Malaria risk may be higher among people living close to dams in areas of unstable transmission, where immunity is relatively lower. While these people represent a small proportion of the overall population at risk of malaria, the study highlights the importance of health impact assessments and adequate protection for people living near planned new dams."

Furthermore, no data could be gathered from an additional 800 existing dams and 50 planned ones: "This means that our estimates are certainly conservative. Big dams are just one of many factors that influence malaria transmission, but 1.1 million cases is still a large absolute number," said Kilbert.

The research continues for the team behind the study, who are looking to assess the potential impact of climate change on malaria around dams in sub-Saharan Africa.

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