

Discovery of how malaria kills children will lead to life-saving treatments

March 18 2015



Dr. Terrie Taylor, Michigan State University, takes vitals on a child in the pediatric malaria ward at the Queen Elizabeth Hospital in Blantyre, Malawi, Africa. Credit: Photo by Jim Peck, MSU

Malaria kills a child every minute. While medical researchers have successfully developed effective drugs to kill the malaria parasite, efforts to treat the effects of the disease have not been as successful. But that soon may change.

In a groundbreaking study published in the *New England Journal of Medicine*, Michigan State University's Dr. Terrie Taylor and her team discovered what causes death in children with cerebral [malaria](#), the deadliest form of the disease.

"We discovered that some children with cerebral malaria develop massively swollen brains and those are the children who die," Taylor said.

Taylor and her research team found that the brain becomes so swollen it is forced out through the bottom of the skull and compresses the brain stem. This pressure causes the children to stop breathing and die.

"Because we know now that the [brain swelling](#) is what causes death, we can work to find new treatments," Taylor said. "The next step is to identify what's causing the swelling and then develop treatments targeting those causes. It's also possible that using ventilators to keep the children breathing until the swelling subsides might save lives, but ventilators are few and far between in Africa at the moment."

While increased efforts targeting [malaria elimination](#) and eradication have had some effect on [malaria infection](#) and illness, death rates from malaria are still too high, Taylor said.

"It's gut-wrenching when children die, but what keeps us going is that we are making progress against this Voldemort of parasites," Taylor said.

"It's been an elusive quarry, but I think we have it cornered."

How Taylor found the brain swelling

In 2008, GE Healthcare provided a \$1-million MRI to the Queen Elizabeth Hospital in Blantyre, Malawi, where Taylor spends six months of every year treating and studying children with malaria.



Dr. Terrie Taylor (left) and Dr. Karl Seydel (center) take a child's vitals in the pediatric malaria ward at Queen Elizabeth Hospital in Blantyre, Malawi, Africa. Credit: Photo by Jim Peck, MSU

MRI is an important diagnostic tool that is so common in developed countries it's even used on family pets. But in 2008, the closest MRI was a thousand miles away.

With the help of other researchers from MSU including Colleen Hammond and Matt Latourette in the Department of Radiology, Taylor and her team used the MRI to view brain images from hundreds of [children](#) with [cerebral malaria](#), comparing findings in those who died and to those who survived. That's when they made the groundbreaking discovery.

"We found that survivors' brains were either never swollen or decreased

in size after 2-3 days. This was a triumphant moment," Taylor said. "I wanted to say to the parasite 'Ha! You never thought we'd get an MRI, did you?'"

More information: The study appears in the March 19 issue of the *New England Journal of Medicine*.

Provided by Michigan State University

Citation: Discovery of how malaria kills children will lead to life-saving treatments (2015, March 18) retrieved 27 April 2024 from <https://medicalxpress.com/news/2015-03-discovery-malaria-children-life-saving-treatments.html>

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