

August 15, 2017 | By Samantha Jones and Tiffany Fox

## New Study Reveals Public Resistance to Use of Genetically Engineered Mosquitoes for Disease Control



*QI affiliate Cinnamon Bloss is the lead author on a new study, published today in JAMA, that found the use of genetically engineered mosquitoes is viewed negatively by those with strong opinions on the subject, with those opposed citing reasons of government and industry mistrust. Photo by Charlie Neuman/UT San Diego/Copyright 2013 San Diego Union-Tribune, LLC. © U-T San Diego/ZUMAPRESS.com/Alamy Live News*

A recent study has shown that among people with strong opinions on the use of genetically engineered mosquitoes, most view the technology negatively and overwhelmingly cite reasons of government and industry mistrust.

The study, which appears in today's edition of the *Journal of the American Medical Association (JAMA)*, analyzed public comments from a proposed field trial in Florida that seeks to control disease with genetically engineered mosquitoes. The research was led by Cinnamon Bloss, an associate professor of Psychiatry at the University of California San Diego School of

Medicine, along with colleagues Justin Stoler of the University of Miami, Matthew Bietz of UC Irvine, and Kimberley Brouwer and Cynthia Cheung, also of UC San Diego.

“Most studies investigating public attitudes toward genetically engineered mosquitoes for control of infectious disease have focused on other countries where mosquito-borne disease is more common,” said Bloss, who is also affiliated with the Center for Wireless and Population Health Systems at the UC San Diego Qualcomm Institute. “Unfortunately, due to climate change and other factors, the risks of such diseases here in the U.S. are increasing, and therefore we were interested in gauging U.S. public response in a more systematic way than has been done previously.”

Using records obtained from a Freedom of Information Act (FOIA) request, Bloss and her colleagues assessed public comments from a trial proposed for the town of Key Haven, Florida, which – despite robust mosquito control – had experienced a dengue fever outbreak in 2009 that infected more than 80 people in the region. The Florida Keys Mosquito Control District (FKMCD) then began exploring the use of new ways of controlling *Aedes aegypti*, the mosquitoes that spread dengue and other diseases.

FKMCD partnered with British-based biotech company Oxitec to propose the introduction of a genetically engineered version of the *Aedes aegypti* mosquito designed to be sterile and thereby suppress the mosquito population. The FKMCD tentatively agreed for the area to serve as a test site for a field trial of these mosquitoes, and in 2014 a formal proposal for the trial was submitted to the US Food and Drug Administration (FDA).

The plan was met with substantial resistance from some vocal community members concerned about potential risks to human health and the environment, with some holding up protest signs that read “No consent!”. “People are understandably concerned about a technology with respect to which the risks and benefits are difficult to establish prior to actual deployment,” said Bloss.

In March of 2016, following a two-year review of the proposed trial, the FDA reported that the trial had a “Preliminary Finding of No Significant Impact” – in other words, the release of these genetically engineered mosquitoes likely would *not* have a negative effect on humans or the region’s ecosystem.

This report was posted publicly, and between March and May of 2016, the public was invited to comment. It was these comments that Bloss and her group requested via the FOIA request. Because individual informed consent isn’t possible in this type of public health intervention, the researchers were motivated to better understand public attitudes and concerns related to the use of the technology. The comments – which came from nearly every state in the country – also represented a chance to inform understanding of U.S. public response to the use of genetically modified mosquitoes.

The researchers’ assessment of the community response revealed that despite the FDA’s conclusion that the proposed trial was unlikely to be harmful, roughly 75% of the 2,624 comments were in opposition to the release of genetically engineered mosquitoes, 22% were supportive and 3% were neutral.

“This work suggests that public understanding of science is driven not just by knowledge of facts but also by individuals’ trust in scientific authorities,” said Bietz.

The researchers also extracted the major themes from the comments and found that common topics raised were concerns about ecological safety, human health implications, concerns about genetically modified organisms generally, and mistrust of government or industry. Most notably, the team found that views on human health and government/industry mistrust differed greatly between those opposing versus those supporting the trial. Those opposed were much more likely to raise issues of mistrust, and those supportive were more likely to comment on benefits for human health.

The researchers were also able to link the comments to census data and found that opposition to the trial was more common in rural communities, communities with lower average household incomes, and lower average house values.

In November of 2016, a measure to move forward with the proposed trial was added to Florida's general election ballot in the form of two nonbinding referendums, one for Key Haven and one for all of Monroe County, where Key Haven is located. The vote unsurprisingly did not pass in Key Haven, but Monroe County as a whole voted in favor of the mosquito trial. The trial was subsequently moved to another town within the county. At this point, the FKMCD is considering alternative sites for the trial.

"It's important to note that this study does not reflect a representative sample of the entire population," said Bloss. "However, the fact that the vocal minority who have expressed views on this topic have influenced whether and where field trials may go forward, suggests it is really critical to understand those views and respond to the concerns raised."

Bloss also emphasized the foundational role of public trust in the success of public health interventions. "When public trust is diminished, it becomes difficult to move forward." In order to build that essential trust, Bloss and her colleagues recommend that studies continue to focus on local population, and that researchers should not only investigate public perception of the technology that governments or industry are proposing but also take the time to delve deeper into why communities may have these concerns.

---

## MEDIA CONTACT

**Tiffany Fox**, 858-246-0353, [tfox@ucsd.edu](mailto:tfox@ucsd.edu)

UC San Diego's [Studio Ten 300](#) offers radio and television connections for media interviews with our faculty, which can be coordinated via [studio@ucsd.edu](mailto:studio@ucsd.edu). To connect with a UC San Diego faculty expert on relevant issues and trending news stories, visit <https://ucsdnews.ucsd.edu/media-resources/faculty-experts>.