

# Public Perceptions of Mosquitoes and Mosquito Control<sup>1</sup>

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## Prevent & Protect Series Overview

The *Prevent & Protect* publication series focuses on the creation of different material formats to resonate with various audiences and ways to maximize efficacy in communicating with the public about mosquito-related risks and mosquito control topics. This publication provides a background of public opinion on various aspects of mosquito control covered in the *Prevent & Protect* campaign. Understanding preexisting public knowledge and perceptions is key to the development of effective risk communication campaigns on public health topics, such as mosquito control (Association of State and Territorial Health Officials [ASTHO], 2018). This publication and the other publications in this series will be of interest to Extension faculty, public health communicators, and mosquito control educators to provide them with information on how to educate and engage the public about mosquito control or other issues related to public health.

## Overview of the *Prevent & Protect* Project

The *Prevent & Protect* project consists of materials designed 1) to educate local elected and appointed officials and targeted audiences about mosquito control in a simplified, understandable format and 2) to increase public understanding of scientific information on the topic without potentially causing members of the public to dismiss such information. The UF/IFAS Center for Public Issues Education in Agriculture and Natural Resources (PIE Center), as part of a Florida Department of Health grant, created the initial *Prevent & Protect* web page and related materials to help local officials communicate to residents of Florida's cities and counties about the importance of mosquito control efforts and how residents can help reduce mosquito populations. A second grant, from the US Department of Agriculture, provided funds to expand *Prevent & Protect* to a full website; add more detailed information about mosquito-borne illnesses, particularly the Zika virus; and translate materials into Spanish and Haitian Creole. The website (<https://preventmosquitoes.org/>) houses two toolkits: the Mosquito Control Toolkit and the Emergency Response Toolkit. The Mosquito Control Toolkit educates the public on mosquito control and the negative impact mosquitoes

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can have in local communities. This toolkit consists of four components: personal responsibility, mosquito-borne illness, nuisance and economy, and application method. The Emergency Response Toolkit educates the public about mosquito control emergency response actions, primarily after a hurricane or flood and during a disease outbreak. Both toolkits include social media content with suggestions on when to publish each post as well as instructions for how to download the components and customize each item to best fit mosquito control educational efforts. The website also includes videos and lesson plans for middle schools and high schools.

Several studies were conducted to guide the design and development of the website and its components. Data collection for *Prevent & Protect* began in early 2018 and ran through June 2019. Results highlighted in the *Prevent & Protect* document series come from research conducted by the PIE Center from March to June 2019 using the following research methods: a survey of 500 Floridians, a survey of mosquito control districts professionals, a survey of communication and education professionals of local Departments of Health and mosquito control program locations, and eight focus groups conducted in four locations in Florida. The goals of the research conducted, as part of *Prevent & Protect*, were to (1) identify what different audiences know and believe about mosquitoes and mosquito control methods and (2) evaluate the *Prevent & Protect* materials so they can be utilized with various audiences to promote communication and education regarding mosquito control topics.

## Mosquito Control

Various insect collections in Florida have identified approximately 80 species of mosquitoes in the state (Florida Coordinating Council on Mosquito Control, 2018). Mosquitoes can be an irritant to those they bite, but of greater concern is their potential to spread diseases. As a result, mosquito control is critical. A central component of integrated mosquito management and control in Florida is public education and engagement (Healy et al., 2014; Lloyd, Connelly, & Carlson, 2018). The Association of State and Territorial Health Officials (2018) recommend learning as much as possible about the public's preexisting knowledge and perceptions on a topic to develop effective risk communication campaigns on public health. As a result, it is necessary to understand Florida residents' knowledge and perceptions of mosquitoes, mosquito-related risks, and mosquito control methods to identify best practices for maximizing public communication and education outreach efforts. The remainder of this document details specific

findings from the *Prevent & Protect* surveys and focus groups with Florida residents to identify their knowledge, attitudes, and perceptions about mosquitoes and mosquito control.

- **Lack of risk concern.** Overall, participants were not very concerned about mosquito control, had not really thought about mosquito control, and had not actively researched information regarding mosquito control in their communities.
- **Lack of method awareness.** Overall knowledge of mosquito control topics was low. Many participants in all eight focus groups spoke of seeing trucks spraying to control mosquitoes when they were growing up in Florida, but quickly stated they did not remember seeing trucks spraying in recent years. They also discussed the lack of notifications about when spraying for mosquitoes would occur in their communities.
- **Concern for chemicals.** Respondents in the public survey reported fairly favorable attitudes toward both aerial and truck-mounted spraying to control mosquito populations. However, participants in all eight focus groups expressed concerns about the chemicals used to control mosquitoes and the potential impact those chemicals may have on humans, animals, the environment, and beneficial insects (e.g., honeybees).
- **Disease knowledge.** On average, survey respondents were able to correctly identify most diseases as either those that are or are not transmitted by mosquitoes. The vector-borne diseases respondents were most aware of were Zika, West Nile virus, and yellow fever, whereas fewer than half of the respondents knew that chikungunya fever and St. Louis encephalitis are transmitted by mosquitoes. Focus group participants were aware mosquitoes carried diseases and were able to name some of the diseases they carried, including West Nile virus, yellow fever, malaria, chikungunya, encephalitis, dengue, and heartworms. Interestingly, groups in central and south Florida were quick to mention Zika virus without being prompted, but groups in north and northwest Florida did not mention Zika immediately, and one group did not mention it at all until prompted. The majority of groups did not know that one could have the Zika virus and not show symptoms (south Florida groups were aware), and their concern over Zika was low unless they were starting a family or knew a pregnant woman.
- **Personal responsibility.** Florida residents who participated in the public survey reported having used most of the recommended at-home methods of mosquito control during peak mosquito seasons, such as keeping doors and

windows shut and eliminating places of standing water. The majority of the focus group participants expressed that a combination of personal mosquito control efforts and local government-led mosquito control programs would be the most effective way to control the mosquito population in Florida.

- **Understanding of risks/costs.** The majority of the focus group participants agreed that mosquito control was needed because mosquitoes carry diseases. They also expressed a general concern over the economic costs of not having mosquito control, chiefly its potential effects on tourism and property values.
- **Belief/support in system.** The majority of focus group participants agreed that they support mosquito control in their communities to protect themselves and their pets. These results were consistent with findings from the general public survey where Florida residents agreed that controlling the mosquito population in Florida is important because it protects them and their pets from mosquito-borne illnesses.
- **Desire to learn.** While most participants reported that they had not actively sought out information on mosquito control in the past, most said they would like to know more. Specifically, a desire was expressed for more information about both truck and aerial spraying efforts. All groups stated they would like to know a schedule of spraying and when it would occur in their area. All groups agreed that education regarding mosquitoes, mosquito control efforts, and the impact of efforts was needed and would increase their confidence.

## Summary

When communicating with the public about mosquitoes and mosquito control, it is important to first understand the average baseline level of knowledge and general perceptions held. By understanding the current perceptions of the public, organizations involved in mosquito control efforts can better position themselves to provide useful information that the public sees as necessary to enhancing their understanding and overall comfort levels in regard to mosquito control practices. By doing so, organizations also are able to better position themselves as trustworthy and relevant sources that audiences will continue to seek in the future if and when they require more information. Other publications in this series build on the information presented in this publication; other publications will discuss how to adapt research findings about mosquito control messages for industry professionals, how to integrate social media in emergency situations, specifically related

to mosquito control, and how to organize and carry out a clean-up program to remove mosquito habitats.

## Additional Information

*Prevent & Protect*—<https://preventmosquitoes.org>

UF/IFAS Florida Medical Entomology Laboratory—<https://fmel.ifas.ufl.edu>

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