

A Capabilities-Based Framework for Mosquito Control Programs in the United States



Introduction

The National Association of County and City Health Officials (NACCHO) supports local health departments in protecting their communities from the bacterial and viral diseases transmitted by mosquitoes, ticks, rodents, and other emerging vectors. Through development of new tools and resources, policy statements, stories from the field, and more, NACCHO helps local health departments increase their capacity to address existing and emerging issues related to vector control and integrated pest management.

Past experiences with West Nile virus and Zika virus have highlighted the need for further investments in vector control programs across the country. Municipalities and states make investments in response to pandemics and epidemics – hiring staff, expanding training, improving diagnostic testing, pursuing vaccine therapies, and establishing partnerships. However, once the urgency around the threat fades, funding and resources are reduced, ultimately leaving vector control programs understaffed, under-trained, and underfunded, which leaves communities vulnerable to future vector borne-threats.

In response to this issue, NACCHO, in partnership with the Centers for Disease Control and Prevention (CDC) and referencing the American Mosquito Control Association (AMCA), established 10 vector control capabilities that describe the key activities needed to adequately assess, prepare for, prevent, and respond to vector-borne threats. The vector control capabilities were developed using the following standards:

- **CDC's framework for vector control competency**¹
- **Integrated pest management (IPM) principles**, which (a) combine effective and environmentally sensitive practices to manage pests and (b) consider pest biology (e.g., life cycles of pests) and the extent to which they interact with the surrounding environment.²
- **Integrated mosquito management (IMM)**, which uses a combination of methods to control mosquitoes based on an understanding of mosquito biology, lifestyle, and spread.³

IPM and IMM set forth the following basic principles: (1) set action thresholds; (2) monitor and identify pests; (3) take measures to prevent pests from becoming a threat; and (4) employ control measures.



Vector Control Capabilities

There are five core capabilities and five supplemental capabilities:

Core Capabilities

Capability 1: Routine vector surveillance through standardized trapping and species identification

Establish capacity and routines for surveillance and identification, including maintaining current surveillance data and determining the specific vector, its abundance, and the areas vulnerable to pests.

Capability 2: Treatment decisions using surveillance data

Develop and implement a treatment decision-making strategy or decision tree.

Capability 3: Larviciding and/or adulticiding

Conduct chemical abatement activities to the extent needed by the jurisdiction.

Capability 4: Routine vector control activities (e.g., chemical, biological, source reduction, or environmental management)

Conduct vector control activities to the extent needed by the jurisdiction, using the most effective, lowest risk options and considering risks to applicators, building occupants, environment, etc.

Capability 5: Pesticide resistance testing

Conduct resistance testing before product's first use and on a routine basis, following published protocols for standardized results.

Supplemental Capabilities

Capability 6: Licensed pesticide application

Meet jurisdictional licensing requirements necessary to access applicators.

Capability 7: Vector control activities other than chemical control (e.g., biological, source reduction, or water management)

Consider and implement non-chemical control as needed by the jurisdiction.

Capability 8: Community outreach and education campaigns regarding the spread of vector-borne diseases and how to prevent infection

Perform outreach and education to meet jurisdictional needs, issuing accurate, clear, and timely information to provide practical and concrete steps for individuals to protect themselves.

Capability 9: Regular communication with local health departments regarding surveillance and epidemiology

Maintain frequent communication with the local health department on epidemiology and surveillance, collaborating to facilitate situational awareness of vectors and vector-borne threats.

Capability 10: Outreach (e.g., communication and/or cooperation) with nearby vector control programs

Maintain awareness of nearby vector control programs and engage with them on a frequent basis.

A “fully capable” vector control program performs all core and supplemental capabilities. A “competent” vector control program performs all core capabilities. A “needs improvement” vector control program fails to perform one or more core capabilities.

In addition to the ten capabilities, vector control programs should also work to build their capacity in mapping and record-keeping. GIS mapping enhances surveillance and field operations and serves as a useful resource in program decision-making and stakeholder education.³ Proper documentation of vector control actions through record-keeping allows programs to evaluate the success of program activities and develop recommendations for preventing future pest problems.² Although these activities are not individual capabilities in the NACCHO framework, they are recommended program practices as established by IPM and IMM, and they further contribute to development of a more robust vector control program.

Next Steps

The vector control capabilities serve as a resource to inform program planning and development and build on existing vector control guidance issued through IPM, IMM and the CDC. A 2017 NACCHO report on the mosquito capabilities of 1,906 vector control organizations in the United States identified that 84% of responding programs were ranked as needs improvement, and all lacked the capacity to perform pesticide residue testing.⁴ NACCHO recommends several measures to increase mosquito surveillance and control capacity, including forming mosquito control districts; providing quality and ongoing staff training in standard mosquito surveillance and control techniques; and ensuring sustainable funding and resources are dedicated to local vector control programs and mosquito control districts.

NACCHO further supports vector control programs in the attainment of these capabilities through the annual NACCHO Vector Control Summit and the Vector Control Collaborative, a mentorship program that matches local vector control programs that have demonstrated expertise in core capabilities with vector control programs looking for guidance.



[FACT SHEET]

January 2019



References

1. Centers for Disease Control and Prevention. (2018) Integrated Mosquito Management. Retrieved December 31, 2018 from https://www.cdc.gov/westnile/vectorcontrol/integrated_mosquito_management.html.
2. Environmental Protection Agency. (n.d). Introduction to Integrated Pest Management. Retrieved December 28, 2018 from <https://www.epa.gov/managing-pests-schools/introduction-integrated-pest-management>.
3. American Mosquito Control Association. (2017). Best Practices for Integrated Mosquito Management: A Focused Update. Retrieved December 28, 2018 from https://www.mosquito.org/resource/resmgr/docs/Resource_Center/Training_Certification/12.21_amca_guidelines_final_.pdf.
4. National Association of County and City Health Officials. Mosquito Control Capabilities in the U.S. Retrieved December 28, 2018 from <https://www.naccho.org/uploads/downloadable-resources/Mosquito-control-in-the-U.S.-Report.pdf>.

Acknowledgments

This fact sheet was supported by Award Number OT18-18020101SUPP18 from the Centers for Disease Control and Prevention. NACCHO is grateful for this support. The contents do not necessarily represent the official views of the sponsor.

FOR MORE INFORMATION, PLEASE CONTACT:

Chelsea Gridley-Smith, PhD

Senior Program Analyst, Environmental Health
cgridley-smith@naccho.org



For more information on NACCHO's vector control programs and services, visit www.naccho.org/vector-control.

NACCHO

National Association of County & City Health Officials

The National Connection for Local Public Health

www.naccho.org



The mission of the National Association of County and City Health Officials (NACCHO) is to improve the health of communities by strengthening and advocating for local health departments.

1201 Eye Street, NW, Fourth Floor • Washington, DC 20005

Phone: 202-783-5550 • Fax: 202-783-1583

© 2019. National Association of County and City Health Officials.