

Leveraging Partnerships: An Evaluation of the NACCHO Vector Control Collaborative Mentorship Program



The Growing Need for Capable Vector Control Agencies

Local health departments and local vector control programs are the front line of defense against the spread of vector-borne diseases in the United States. These agencies fulfill the critical public health function of monitoring mosquito and tick populations; educating the public on personal protective measures; and using chemical, physical, and biological interventions to reduce vector populations. Incidents such as the 2015 Zika virus epidemic and the 2019 spike in Eastern equine encephalitis cases in the United States show the growing importance of this work to keep communities safe and healthy.

According to the Centers for Disease Control and Prevention (CDC), disease cases from mosquito, tick, and flea bites in the United States have tripled from 2004 to 2016. Many vector control organizations are not adequately equipped to address these threats. A 2017 assessment conducted by the National Association of County and City Health Officials (NACCHO) found that 84% of vector control organizations in the U.S. need improvement in one or more of the 10 core capability areas (see Figure 1) for mosquito surveillance and control.



Building Local Vector Control Capacity

Since this assessment, NACCHO and CDC have offered numerous technical assistance opportunities that build knowledge and skills in vector control and surveillance. One such opportunity is the Vector Control Collaborative (VCC), a peer-to-peer

mentorship program for local vector control organizations that provides funding for capacity-building in one or more of the capabilities. Vector control organizations that are proficient in the 10 capabilities serve as mentors and advise developing mentee programs on improvements over the course of the grant.

“Even though it’s Gainesville, it’s Anastasia, we’re a team. We’re partners. We work together. Knowing their program is a little better and what their needs are, we’re more able to help them the same as they are with us.” — Anastasia Mosquito Control District (Mentor)

The VCC is designed to be flexible enough for participants to tailor the experience according to their jurisdictional and programmatic needs. NACCHO requires that mentees prioritize at least one of the 10 capabilities for capacity-building and complete at least one in-person site visit with their mentor. Mentorship pairs also submit an action plan based on the mentee’s needs that outlines the approach for collaboration and program development. Subject matter experts from NACCHO and CDC host routine cohort calls to discuss how participants are progressing, provide supplemental resources, and advise on challenges. During these calls, participants are also encouraged to share lessons learned to further encourage the exchange of best practices among members of the cohort.

Through the VCC, NACCHO aims to establish a growing network of local vector control organizations that can share resources, experiences, and lessons learned with other local vector control programs. Since launching the VCC in 2018, NACCHO has awarded over \$172,000 to 28 programs across eleven states.

Figure 1. CAPABILITIES-BASED FRAMEWORK FOR MOSQUITO CONTROL

NACCHO, in partnership with the 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.

Core Capabilities

1. Routine mosquito surveillance through standardized trapping and species identification
2. Treatment decisions using surveillance data
3. Larviciding, adulticiding, or both
4. Routine vector control activities (e.g., chemical, biological, source reduction, or environmental management)
5. Pesticide resistance testing

Supplemental Capabilities

6. Licensed pesticide application
7. Vector control activities other than chemical control (e.g., biological, source reduction, or water management)
8. Community outreach and education campaigns regarding mosquito-borne diseases, how they spread, and how to prevent infection
9. Regular communication with local health departments regarding surveillance and epidemiology
10. Outreach (e.g., communication and/or cooperation) with nearby vector control programs



Evaluation of the Vector Control Collaborative

The first cohort of the VCC ran from February through June 2019 and included six vector control programs, making three mentorship pairs:

Florida: City of Gainesville Mosquito Control, Mentee
Anastasia Mosquito Control, Mentor

Ohio: Hancock Public Health, Mentee
Toledo Area Sanitary District, Mentor

Texas: Brazos County Health District, Mentee
Harris County Public Health, Mentor

At the conclusion of the first cohort, NACCHO conducted a post-program evaluation to assess how well the VCC increases the capacity of local organizations to detect, monitor, and respond to vector-borne disease threats.

METHODS

NACCHO administered a two-part evaluation at the end of the funding period to achieve the following:

- Identify the vector surveillance and control capabilities prioritized by participants;
- Document how vector control program capacity can be built through an intensive mentorship program; and
- Capture accomplishments, challenges, and lessons learned.

All programs that applied to the VCC were required to complete a pre-assessment to document their initial proficiency in the 10 capabilities. At the conclusion of the program, NACCHO administered a post-assessment to mentees to capture how they felt their program capacity had changed. Mentorship pairs also participated in an interview to discuss lessons learned, identify best practices, and provide recommendations on program design and implementation.

“This [program] has opened the door for us to pay it forward... We’d be willing to [mentor other programs]. You don’t have to be Michael Jordan to teach someone to play basketball. You just have to be a little further down the road than they are.” — Brazos County Health District (Mentee)

“Having this type of framework in place regionally and being able to share experience is extremely important. When you use money as an incentive to upgrade a program or perform a service and it’s attached to mentorship that’s extremely important. [Otherwise,] You can get money and not know what you’re doing with it.” — Toledo Area Sanitary District (Mentor)

RESULTS AND LESSONS LEARNED

Accomplishments of VCC Participants

All mentees reported that participation in the VCC was “very beneficial” or “beneficial” in increasing their programs’ vector surveillance and control capacity. On average, mentees dedicated 15 hours each week to completing VCC-related activities. By the end of the cohort, two mentees reported increased capacity in eight of the 10 capabilities. These mentees had already reported full capacity in the remaining two capabilities during the pre-assessment. The third mentee reported increase capacity in capabilities 1 (Routine Surveillance), 5 (Pesticide Resistance Testing), and 10 (Outreach).

Mentor and mentee vector control programs reported that as a result of their participation in the VCC, they were able to:

- Attend trainings and conferences using award funding.
- Gain opportunities to shadow and learn from more advanced programs.
- Adopt best practices and gained practical knowledge that increased program’s operational efficiency.
- Expand partnerships with mentorship partner, academia, and other jurisdictional organizations.
- Establish physical upgrades to program space and equipment to support resistance testing, education, and control efforts.

When asked how they expanded vector program services over the course of the VCC program, mentees reported that they:

- Established insecticide resistance testing programs and research capabilities.
- Built community education spaces.
- Trained staff to use equipment and apply pesticides.
- Purchased chemical control supplies, resistance testing equipment, mosquito rearing tools, mosquito collection and identification equipment.
- Developed public educational materials for public.

Benefits of the Mentorship Model

Although the provision of flexible funding to support these efforts is a large factor in vector program growth, many VCC program participants reported that access to a subject matter expert in the form of a mentor was a critical component to their success. The VCC provides an avenue for nearby programs to build and sustain substantive relationships with one another. All participating programs reported plans to collaborate with their mentorship partner even after the end of the program and expressed that the VCC was only the start of a longer partnership. Two mentors indicated that they would continue to offer consultation and program evaluation support to their mentee. One program also indicated that they would be working with their mentor to complete an applied research project and their mentor would provide training for program staff following the VCC.

“Now we’ve become partners. If we need help with something...I don’t have any hesitation to call [our mentor]. [The VCC] helped us to build a good working relationship that we can maintain and continue to share resources. I think it will be a lifetime partnership.” — City of Gainesville Mosquito Control (Mentee)



Incentives to Be a Mentor

Another notable feature of the VCC is the program's mutual benefit for both mentors and mentees. Mentors are also granted an award to fund their own capacity-building efforts, and they used these funds to attend conferences, send program staff to trainings, purchase field equipment and supplies, and create educational material for staff and the public. Adding program services and increasing public outreach were the two most common outcomes achieved by VCC mentors. One mentee was able to directly enhance their mentor's operations by rearing and supplying mosquitofish (*Gambusia affinis*) to their program over the course of the VCC. The pair reported that this arrangement is planned to continue. Two mentors also reported that the VCC provided a framework and experience they could use to train other nearby developing programs, further supporting jurisdictional readiness to vector-borne disease threats.

"We had been talking about a vector control network and how to work with other vector control programs within our jurisdiction and surrounding jurisdictions. Going through this program really enhanced our need for that, facilitated us starting it, and provided a framework." — Harris County Public Health (Mentor)



Next Steps and Recommendations

According to the evaluation of the first VCC cohort, participation in the VCC can lead to substantive program development for both mentors and mentees. NACCHO will continue to support peer-to-peer mentorship as a model by which local organizations

can enhance their program capabilities in vector surveillance and control. Through this continued investment, the VCC will create a growing roster of capable programs that can educate other neighboring vector organizations.

NACCHO recommends that local vector programs identify priorities for capacity-building and establish relationships with other vector control organizations to share best practices and solutions to challenges. State departments of health, mosquito and vector control associations, and national organizations such as the [AMCA](#), [CDC](#), and [NACCHO](#) may be able to assist with identifying appropriate program contacts. These organizations and academic entities such as the [Regional Centers of Excellence](#) can also offer training opportunities for vector control professionals. To further strengthen local public health infrastructure and maintain the improvements made by vector control organizations, local programs must also be adequately resourced to build and maintain vector control and surveillance activities that meet jurisdictional needs. Some ways to encourage program sustainability include developing or promoting a financing structure to support program activities, working with local government to prioritize vector control, and establishing training materials and standard operating procedures for staff and temporary employees.

NACCHO is continuing to partner with the CDC to administer the VCC program. Local vector control programs interested in learning more about the VCC and other technical assistance opportunities should visit NACCHO's vector control webpage at www.naccho.org/vector-control, or send an email to vectorcontrol@naccho.org.

Further Reading

NACCHO Vector Control Collaborative: A Cinderella Story. <https://nacchovoice.naccho.org/2019/07/25/naccho-vector-control-collaborative-a-cinderella-story/>

Mosquito Invasion Leads to Innovation. <https://essentialelements.naccho.org/archives/16580>

“Losing funding from grants is the story of our lives. We are nimble and flexible enough now to sustain. We know that [VCC funds] were seed money to start the [insecticide resistance] lab and testing and we are now going to take advantage of our relationships with [our mentor], the university, or local people that are interested in the subject to keep it going for years to come.” — Hancock Public Health (Mentee)

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