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A Web-Based Review of Environmental Health Vector Control Services in the United States

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Editor's Note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature a column from the Environmental Health Services Branch (EHSB) of the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, EHSB and guest authors share insights and information about environmental health programs, trends, issues, and resources. The conclusions in this column are those of the author(s) and do not necessarily represent the official position of CDC.

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By October 25, 2017, the U.S. and its territories documented 42,629 cases of Zika virus disease (Centers for Disease Control and Prevention, 2018). Zika renewed the need and importance for mosquito control in local jurisdictions. The National Association of County and City Health Officials (NACCHO) estimates that approximately half of local health departments in the U.S. provide vector control services (NACCHO, 2017a). While vector (i.e., mosquito, tick, and rodent) control is widely viewed as an environmental health responsibility, little is known about the services performed by environmental health vector control (EHVC) programs.

To learn more, we began with a list of mosquito control programs across the U.S. and

used a structured web-based review process to identify the types of services EHVC programs offer. We used our findings to provide recommendations about how environmental health programs and professionals can strengthen their role in vector control with environmental health practices.

We reviewed 1,210 mosquito control programs from a preliminary list of programs identified by the Centers for Disease Control and Prevention's (CDC) Division of Vector-Borne Disease in spring 2017. We examined each mosquito control program's website, social media pages, and related news articles for information about agency and program characteristics (Table 1). We also noted whether programs addressed

vectors other than mosquitoes (i.e., rodents and ticks). Out of the 1,210 programs reviewed, only 964 had information about vector control services online. Local health departments operated the majority of the 964 programs ($n = 408$, 42%), followed by mosquito control districts ($n = 266$, 28%), public works departments ($n = 189$, 20%), and other local government agencies ($n = 101$, 10%). Of the 408 local health departments providing vector control services, 360 local health departments had environmental health programs providing those services (Figure 1). This result emphasizes the important role that environmental health professionals could have in influencing the direction and scope of vector control services in the country.

Environmental Health Vector Control Program Services and Activities

A large number of local health departments provide vector control services. Our study suggested that the majority of this activity was the responsibility of environmental health. This investigation gave better insight into the types of services EHVC programs offer. On average, EHVC programs performed 2.3 of the 9 services and activities (Table 1) considered in this study. While this number was lower than the 3.6 performed by all other program types, EHVC programs stood out in a few key ways.

- More EHVC programs performed rodent and tick services than other program types. EHVC represented 62% of the programs performing rodent services and 39% of the programs offering tick services.

TABLE 1

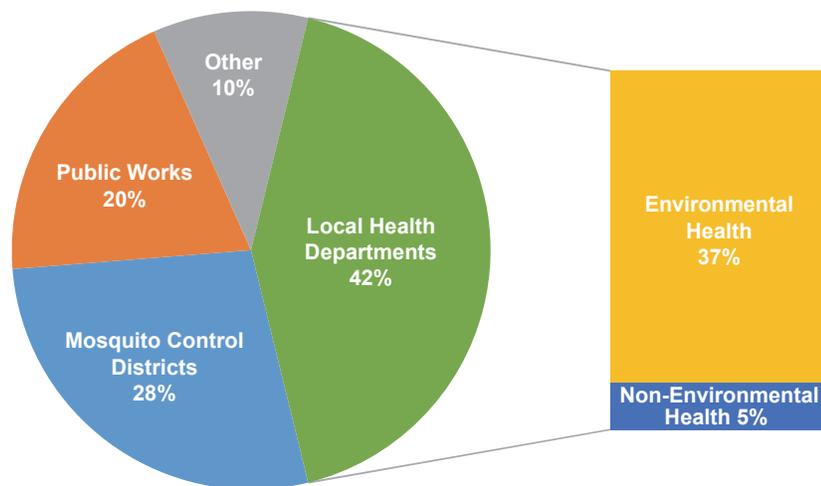
Number of Programs Performing Vector Control Services

Program	Mosquito Control Program Services									Other Vector Services	
	Public Outreach and Education	Service Calls and Site Inspection	Source Reduction	Mosquito Surveillance and Trapping	Larval Control	Adult Control	Pesticide Resistance Testing	Existing Outbreak Response Plan	Follows Integrated Pest Management	Rodent Program	Tick Program
Mosquito control district	153	155	124	204	194	208	46	33	128	36	30
Local health department (environmental health)*	108 (85)	162 (130)	52 (37)	318 (271)	167 (122)	125 (82)	7 (4)	39 (37)	32 (21)	103 (81)	48 (31)
Public works	76	56	36	57	73	180	9	5	31	1	2
Other	27	21	17	53	36	63	10	11	14	5	18

*Environmental health programs are included in the local health department totals.

FIGURE 1

Vector Control Services by Program Type



- EHVC programs prioritized mosquito monitoring. Nearly 79% of EHVC programs mentioned performing mosquito surveillance.
- EHVC programs performed more mosquito larval control than adult control when compared with other program types. Thirty-four percent mentioned larval control while only 23% mentioned performing adult control.

In addition, a small fraction (8%) of mosquito control programs, regardless of type, mentioned conducting any form of pesticide resistance testing. This finding is consistent with NACCHO's 2017 assessment of mosquito control services and is an opportunity for improvement across all vector control agencies (NACCHO, 2017b).

Environmental health programs and professionals are responsible for delivering a wide range of services, and vector control might be one of the most important. Developing a strong understanding of EHVC program structure, capacity, and service delivery is essential to identify strengths and opportunities for improvement. This web-based review gave a snapshot of vector control programs and their activities by using a convenience sample of programs and relying upon the information available online, which varied significantly among the programs. A more in-depth study of U.S. EHVC services and program capacity is needed, but the results of this review shed light on the role of environmental health in vector control and the services they provide.

Environmental Health Vector Control Opportunities

EHVC programs might make up the largest proportion of all U.S. vector control program types, placing them in a position to influence and strengthen vector control capacity. Environmental health professionals should consider active participation in vector control associations and seek opportunities to build their technical skills, improve EHVC programs, and encourage integration of environmental health practices in vector control programs across the country. EHVC pro-

grams might also consider describing all of their services online to increase transparency and make web-based reviews more reliable. Increasing transparency could help EHVC programs link communities to available services and help provide a greater understanding of their activities.

CDC's Water, Food, and Environmental Health Services Branch continues to support environmental health programs and professionals by creating vector control tools and resources that can be accessed at www.cdc.gov/nceh/ehs/topics/vectorcontrol.htm. 🐞

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