A Survey of Tick-Related Services Offered by MVCAC Member Agencies

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ABSTRACT: MVCAC member districts were surveyed regarding their activities pertaining to ticks and tick-borne diseases in 2011. Survey results were compared to those obtained in a similar survey conducted in 2005. All 56 agencies contacted during a telephone survey provided information on the extent to which they engaged in control, surveillance and public education.

The Mosquito and Vector Control Association of California (MVCAC) is comprised of 61 member agencies. Many of these agencies were formed for the purpose of controlling mosquitoes and protecting residents from mosquito-borne pathogens such as malaria parasites and encephalitis viruses. Following the recognition of Lyme disease in ticks in California in 1985, several districts began incorporating information about Lyme and other tick-borne diseases in their public-education programs and some began conducting tick-surveillance activities. By the early 2000's, a number of MVCAC member agencies offered some type of service related to ticks. These services ranged from educating the public and identification of ticks, to field surveys assessing tick density and to testing ticks for the presence of pathogens. In 2005, a survey of districts was conducted by one of us (RSL) to determine the extent to which they engaged in control of ticks and asked what other services were being offered with regard to ticks. These findings were presented at the 4th International Congress of Vector Ecology that year. Since 2005, the number of vector control agencies listed as members of the MVCAC has increased, and several districts have expanded their scope of services beyond mosquito control to include other vectors.

In 2008, the question as to how many local agencies provide education to the public about ticks and Lyme disease arose at a meeting of the California State Lyme Disease Advisory Committee (LDAC). The LDAC was formed in 1999 by passage of SB 1115 by the state legislature. SB 1115 added a chapter to the Health and Safety Code requiring the State Health Department to establish a Lyme disease information program. The purpose of the LDAC is to "make recommendations to the Department of Health Services (now the California Department of Public Health, or CDPH), Vector-Borne Disease Section on how best to provide education and information to the public" (http://www.lymedisease.org/california/ca_legislation_ldac.html). The LDAC meets annually to review progress made by the CDPH in educating physicians and the public.

The committee added a member to represent local vector control districts in 2008. This was done largely to raise awareness about the role of local vector control districts in educating the public about ticks and tick-borne diseases. In 2011, in furtherance of this goal, we undertook a survey of MVCAC member agencies to assess the range of tick services currently offered by vector control agencies. The results of the 2005 and 2011 surveys were compared to ascertain whether there had been a change in the number of districts offering services to the public related to ticks or tick-borne diseases (Table 1). Results of the 2011 survey also will be used to build a statewide database of districts that offer tick-related services.

Year	Total agencies responding	Control ticks	Survey ticks for disease agents	Identify ticks for public	Test individual ticks for public	Public education on ticks
2005	10	0	3 (30%)	7 (70%)	1 (10%)	6 (60%)
2011	56	3 (5%)	8 (32%)	30 (54%)	4 (7%)	23 (41%)

Table 1. Comparison of the responses to questionnaires regarding tick-related services offered by MVCAC member agencies

The 2005 survey was conducted by R. S. Lane. Surveys were sent by e-mail to every member district in the MVCAC. The primary question asked was whether or not the district was conducting any control activities for ticks. Additional questions were intended to discover if any other tick-related activities were being conducted by the district. Ten districts responded to the survey. Three of these agencies did not offer any services for ticks because their mandates covered only mosquitoes. Three districts had active surveillance programs in which they collected

ticks along recreational trails and tested them for the presence of Lyme disease spirochetes. Seven of the ten included ticks and tick-borne disease in their public outreach programs. None was actively involved in tick control.

The 2011 survey was conducted by telephone and included questions about control, field surveys, testing for pathogens and public outreach. Calls were made to all 61 MVCAC member districts. Fifty-six of them provided information about their programs. Thirty (54%) of these agencies only engage in mosquito control, either because of the agency's limited mandate or because ticks are rare or absent within their boundaries. Thirty (54%) will identify ticks submitted by the public. Twenty-five districts (45%) include information about ticks in their public-outreach programs. Eighteen (32%) conduct surveys for ticks and tick-borne disease agents. Most such surveys are aimed at assessing the abundance of Western Black-legged Tick (*Ixodes pacificus*) populations or testing this vector tick for the presence of Lyme disease spirochetes (*Borrelia burgdorferi*). Other tick-borne diseases sometimes are investigated if a human case is reported within the district's boundaries. For example, San Bernardino County has conducted surveillance for tularemia and Rocky Mountain Spotted Fever group rickettsiae, as has San Mateo County MVCD and Napa County MVCD. Two districts, Imperial County and West Side MVCD, carried out surveys for tick-borne pathogens in the past, but are no longer doing so. Most districts will assist public health biologists with the California Department of Public Health in their follow-up investigations of human cases of tick-borne diseases such as tularemia. Several districts currently have the capability to test ticks in their facilities either by Polymerase Chain Reaction (PCR) or Direct or Indirect Fluorescent Antibody (DFA or IFA) assays. These tests generally are used for assessing pathogen presence in ticks collected in public parks. Only three member agencies currently test ticks for the public. Some agencies that do not test individual ticks for the public will refer people to commercial laboratories if they are insistent about having a tick tested.

Three of the districts contacted actively control ticks. San Bernardino County will spray pyrethroid insecticides along trails in public parks if tick populations are found to be high. Placer County MVCD and Butte County MVCD conduct vegetation control along trails to reduce the exposure of hikers to ticks. San Mateo County occasionally has carried out tick-control trials along recreational trails (Rory and Peavey 2007) and assessed the impact of vegetation control (mowing) on the density of *Dermacentor* ticks along trails (Nakano 2009).

The geographic distribution of districts with tick programs mirrors the distribution of the ticks themselves. Most districts having tick programs are located in the San Francisco Bay Area or Southern California. Seven of the ten districts (70%) in the Coastal Region have tick programs. The three that do not engage in tick-related activities only have mosquito control in their mandates (i.e., Alameda County MAD, Solano County MAD and Northern Salinas Valley MAD). In southern California, 11 (65%) of the 17 districts offer services related to ticks. Fewer districts in the Central Valley have tick programs; those that do tend to be districts in which the service area includes portions of the Sierra Nevada or Coast Ranges. Seven of 15 (46%) districts in the Sacramento Valley Region have tick programs. Only one of five districts (20%) in the northern San Joaquin Valley does any work related to ticks. San Joaquin County MVCD in this region has an extensive public education program that provides information about ticks. The remaining districts reported receiving very few requests for information from the public about ticks and have few or no ticks in their territories. In the southern San Joaquin Valley region, four of nine districts (44%) offer tick services. Some agencies reported either a lack of significant tick habitat in their jurisdiction, limited staff and resources such that staff time must be devoted solely to mosquito control, or a mandate in their founding documents for mosquito control only.

We conclude that most mosquito and vector control districts in California offer some type of service related to ticks and the disease agents they transmit. These agencies are a significant local resource to residents seeking information about these vectors and an important source of educational materials to the public. In the current (2011) study, many more districts reported conducting tick education and surveillance than in the 2005 survey. However, due to a low response rate in the original survey, it is difficult to determine exactly how much has changed. It may be that many districts with existing programs in 2005 did not return the survey. The high response rate in the 2011 survey was the result of telephoning every district and following up with many of them in a second phone call. This was not feasible when the first survey was conducted. Overall, there appears to be a heightened awareness of tick issues among MVCAC member agencies. In 2011, three districts performed some measure of tick control; no district reported these activities in the 2005 survey. Eighteen districts reported that they have conducted surveys for disease agents in local tick populations, while only 3 reported such programs in 2005. Several districts in the current survey have also conducted surveillance for tick-borne disease pathogens other than the Lyme disease bacterium (i.e., tularemia or rocky mountain spotted fever group rickettsia). In areas of California where residents regularly encounter ticks (i.e., the Sierra Nevada, the coastal region and Southern California), districts now typically offer a very broad range of tick services, unless limited by their mandate. Even in areas of the state in which ticks are rare, many districts include tick information in their public outreach materials or would identify a tick specimen submitted by a resident.

REFERENCES CITED

Nakano, A.T. 2009. An evaluation of trailside mowing as a control method for *Dermacentor* ticks in San Mateo County, California. Proc. & Papers Mosq. Vector Contr. Assoc. Calif. 77: 193-200.

Rory, A.M. and C.A. Peavey. 2007. Efficacy of Deltamethrin (Suspend) on density of *Dermacentor* ticks along a recreational trail in coastal California. Proc. & Papers Mosq. Vector Contr. Assoc. Calif. 75: 102-104.

Text of the legislation setting up the Lyme Disease Advisory Committee. http://www.lymedisease.org/california/ca_legislation_ldac.html

Website for the Lyme disease advisory committee, http://www.cdph.ca.gov/SERVICES/BOARDS/LDAC/Pages/default.aspx