

Notes from the Field

Community-Based Prevention of Rocky Mountain Spotted Fever — Sonora, Mexico, 2016

Anne Straily, DVM^{1,2}; Naomi Drexler, MPH²;
Denica Cruz-Loustaunau, MD³; Christopher D. Paddock, MD²;
Gerardo Alvarez-Hernandez, MD, PhD⁴

Rocky Mountain spotted fever (RMSF), a life-threatening tickborne zoonosis caused by *Rickettsia rickettsii*, is a reemerging disease in Mexico (1,2). *R. rickettsii* is an intracellular bacterium that infects vascular endothelium and can cause multisystem organ failure and death in the absence of timely administration of a tetracycline-class antibiotic, typically doxycycline. Epidemic RMSF, as described in parts of Arizona and Mexico, is associated with massive local infestations of the brown dog tick (*Rhipicephalus sanguineus sensu lato*) on domestic dogs and in peridomestic settings that result in high rates of human exposure; for example, during 2003–2012, in Arizona the incidence of RMSF in the three most highly affected communities was 150 times the U.S. national average (3,4). In 2015, the Mexico Ministry of Health (MOH) declared an epidemiologic emergency because of high and sustained rates of RMSF in several states in northern Mexico, including the state of Sonora. During 2004–2015, a total of 1,129 cases and 188 RMSF deaths were reported from Sonora (Sonora MOH, unpublished data, 2016). During 2009–2015, one impoverished community (community A) in Sonora reported 56 cases of RMSF involving children and adolescents, with a case-fatality rate of 40% (Sonora MOH, unpublished data, 2016). Poverty and lack of timely access to health services are risk factors for severe RMSF. Children are especially vulnerable to infection, because they might have increased contact with dogs and spend more time playing around spaces where ticks survive (5). In Sonora, case fatality rates for children aged <10 years can be as high as 30%, which is almost four times the aggregate case-fatality rate reported for the general population of the state (8%) (2), and 10–13 times higher than the case-fatality rate described for this age group in the United States (2.4%) (6).

Domestic dogs serve as primary hosts for *Rh. sanguineus* ticks and present a unique target for control. Community-based programs for the control of *Rhipicephalus*-associated RMSF using long-acting tick collars on dogs and environmental acaricides (pesticides targeting ticks) have been found to be effective in reducing tick populations in homes and on dogs and in human disease cases (4). After the successful control of

Rhipicephalus-associated RMSF in Arizona during 2012–2013, a collaborative endeavor was initiated in February 2016 among the University of Sonora School of Medicine, the Sonora MOH, and CDC to reduce the number of human RMSF cases in community A.

Over a period of 5 days in March 2016, six teams comprising local health care workers and community leaders, medical students from the University of Sonora School of Medicine, and public health veterinarians and epidemiologists from the Sonora MOH and CDC registered 530 households, provided education on RMSF, and placed tick collars on approximately 750 dogs. A knowledge, attitudes, and practices survey, which focused on understanding of RMSF and awareness and use of preventive practices, also was conducted among 230 households in community A and among 200 households in a similarly affected control community (community B). Community B was geographically removed (>50 km [31 miles]) from community A, and the socioeconomic status of most inhabitants was similar between the communities. In community A, 60% of dogs that were registered had visible tick infestations, and almost half of the participants reported seeing ticks inside their homes. Sonora MOH vector-control operators applied deltamethrin, an environmental acaricide, to the exterior walls and adjacent yard areas of participating homes. Bimonthly follow up visits were made to monitor tick populations on dogs, replace tick collars as necessary, deliver health messages, and provide timely pesticide application. The intervention will end in November 2016.

Since the beginning of the intervention in March through November 14, 2016, no new cases of RMSF have been reported from the intervention area in community A, and three RMSF cases (one fatal) have been reported in community B. In addition, 109 cases, 35 (32%) of which were fatal, have been reported from the remaining areas of Sonora, including two cases (one fatal) in community A outside of the intervention area, indicating that RMSF transmission is continuing in this region of Mexico. Data analyses are ongoing, including analysis of the pre- and postintervention knowledge, attitudes, and practices surveys.

¹Epidemic Intelligence Service, CDC; ²Rickettsial Zoonoses Branch, Division of Vector-Borne Diseases, National Center for Emerging and Zoonotic Infectious Diseases, CDC; ³Secretariat of Public Health, Sonora, Mexico; ⁴Department of Medicine and Health Sciences, University of Sonora, Sonora, Mexico.

Corresponding author: Gerardo Alvarez-Hernandez, galvarez@guayacan.uson.mx, 52-662-259-2121.

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