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## **Prevention and early treatment of RMSF in Arizona may save millions by preventing premature death and disability**

*Several Arizona American Indian communities severely impacted by outbreak, CDC/IHS study finds*

The mounting costs of an epidemic of Rocky Mountain spotted fever (RMSF) among several American Indian tribes in Arizona suggests that prevention and control efforts would be cost effective. A recent study released by experts at the Centers for Disease Control and Prevention (CDC) and the Indian Health Service (IHS), in partnership with Arizona tribes, describes an estimated \$13.2 million in losses linked to the epidemic of RMSF between 2002 and 2011, on two Indian reservations.

Cost estimates include medical costs, time off work, and loss of lifetime productivity due to early death. These values underestimate the actual cost of the epidemic because long-term losses from disability and expensive medical procedures are not included. Preventing tick bites is the most important step in preventing severe illness and death from RMSF. CDC, IHS, state, and tribal governments are working together to develop effective prevention programs to gain control of this devastating epidemic.

“Rocky Mountain Spotted Fever is completely preventable,” said Naomi Drexler, CDC epidemiologist and one of the study’s authors. “State, federal and tribal health authorities have been working together since the start of the epidemic to build effective community-based tick control programs, and these efforts have produced remarkable reductions in human cases. These programs are costly, but medical expenses and lives lost cost four times more than RMSF prevention efforts. Increasing access to these prevention efforts is critical to save lives and protect communities.”

Published in *The American Journal of Tropical Medicine and Hygiene*, the study reviewed 205 medical records from two American Indian communities at the center of the epidemic. Over 80 percent of RMSF cases required emergency room visits, 14 percent were admitted to the intensive care unit for severe illness, and 7 percent were fatal. The average cost per death from RMSF (\$775,467) is more than five times that of pneumococcal disease (\$140,862) in the United States. More than half of RMSF deaths were among children, raising the long-term social costs of the epidemic.

RMSF is a severe disease caused by the bacterium *Rickettsia rickettsii* and spread through the bite of an infected tick. RMSF begins with non-specific symptoms such as fever and headache, vomiting, diarrhea, and sometimes rash. Severely ill patients may require amputation of fingers, toes or limbs due to blood loss; heart and lung specialty care; and management in intensive care units. More than 20 percent of untreated cases are fatal; the average time from the beginning of symptoms to death is only eight days.

Treating RMSF early with the proper antibiotic, doxycycline, is the best way to prevent severe illness or a fatal outcome in patients of all ages. CDC recommends starting doxycycline treatment as soon as a doctor suspects RMSF or other rickettsial infection. Delaying treatment after the start of the infection increases the patient's risk of hospitalization and death.

RMSF occurs throughout the United States, but has only recently become an urgent issue for American Indians in Arizona. More than 300 cases of RMSF and 20 deaths have occurred on Arizona Indian reservations between 2002 and 2014, illustrating the severity of the epidemic. There is no vaccine available for RMSF, so prevention of disease must focus on preventing tick bites.

The tick known to transmit RMSF in Arizona—the brown dog tick—can be carried to home sites by untreated community dogs and pets. Tribally run tick control plans, including placing tick collars on dogs and treating homes and lawns, have been shown to work on reservations to prevent RMSF, but the cost of these programs has stood in the way of effective control. The long-term costs of leaving the epidemic unchecked, however, could be far greater.

To read the study, visit: <http://www.ajtmh.org/content/early/2015/05/28/ajtmh.15-0104.full.pdf>

For more information about RMSF and other rickettsia, visit: [www.cdc.gov/rmsf](http://www.cdc.gov/rmsf).

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[U.S. Department of Health and Human Services](http://www.cdc.gov/rmsf)

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*The IHS, an agency in the U.S. Department of Health and Human Services, provides a comprehensive health service delivery system for approximately 2.2 million American Indians and Alaska Natives.*