

# **Injuries Due to Venomous Insects and Plants among Arizona Residents, 2010**

Resources for the development of this report were provided through funding to the Arizona Department of Health Services from the Centers for Disease and Control and Prevention, Cooperative Agreement 1U17CE002023-01, Core Violence and Injury Prevention Program

Permission to quote from or reproduce materials from this publication is granted when acknowledgment is made.



Prepared by: Alana Shacter, MPH  
150 North 18<sup>th</sup> Avenue, Suite 320  
Phoenix, AZ 85007  
Injury Prevention Program  
Bureau of Women's and Children's Health  
Arizona Department of Health Services  
September 2011

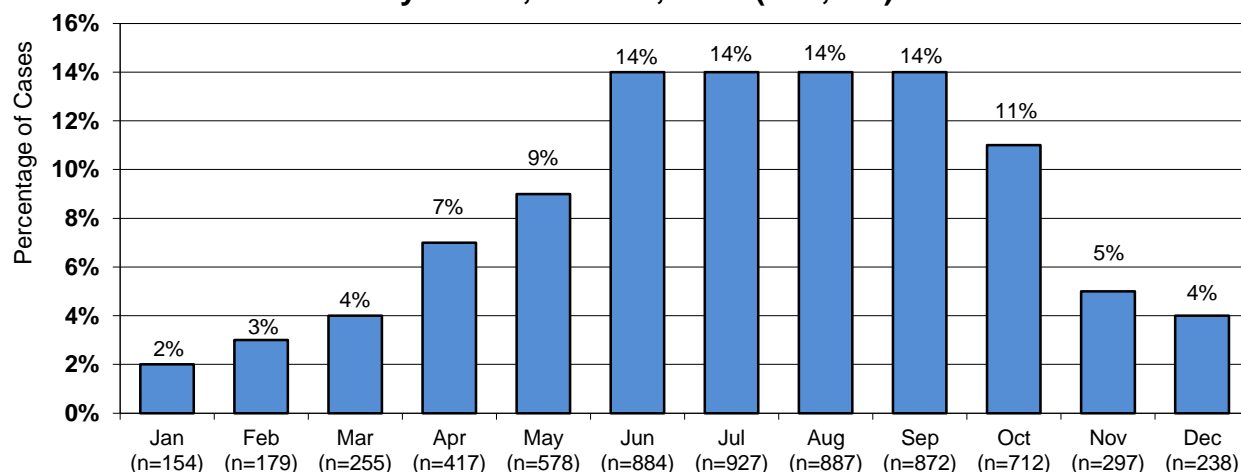
This brief includes mortality data with an underlying cause of death coded to ICD-10 codes X20-X29, and hospital discharge data coded to ICD-9 codes 905.0-905.9. The hospital discharge data only include information from private, acute-care facilities. Data from urgent care centers or federal facilities, including Indian Health Services or Veteran's Administration facilities, are not available.

In 2010, there were 2 fatalities among Arizona residents due to envenomations by insects or reptiles. In the five year period from 2006 through 2010, 11 Arizona residents died from envenomations by insects or reptiles; 45 percent of deaths resulted from bee stings (n=5).

Six thousand four hundred Arizona residents were hospitalized or treated in emergency departments in 2010 for non-fatal insect or reptile envenomations. While males have higher rates of injury than females for most types of injury, males and females had nearly identical age-adjusted rates of non-fatal insect or reptile envenomations. In 2010, there were 100.5 injuries per 100,000 males (n=3,201) and 100.9 injuries per 100,000 females (n=3,198). There was one injury to an individual of unknown sex.

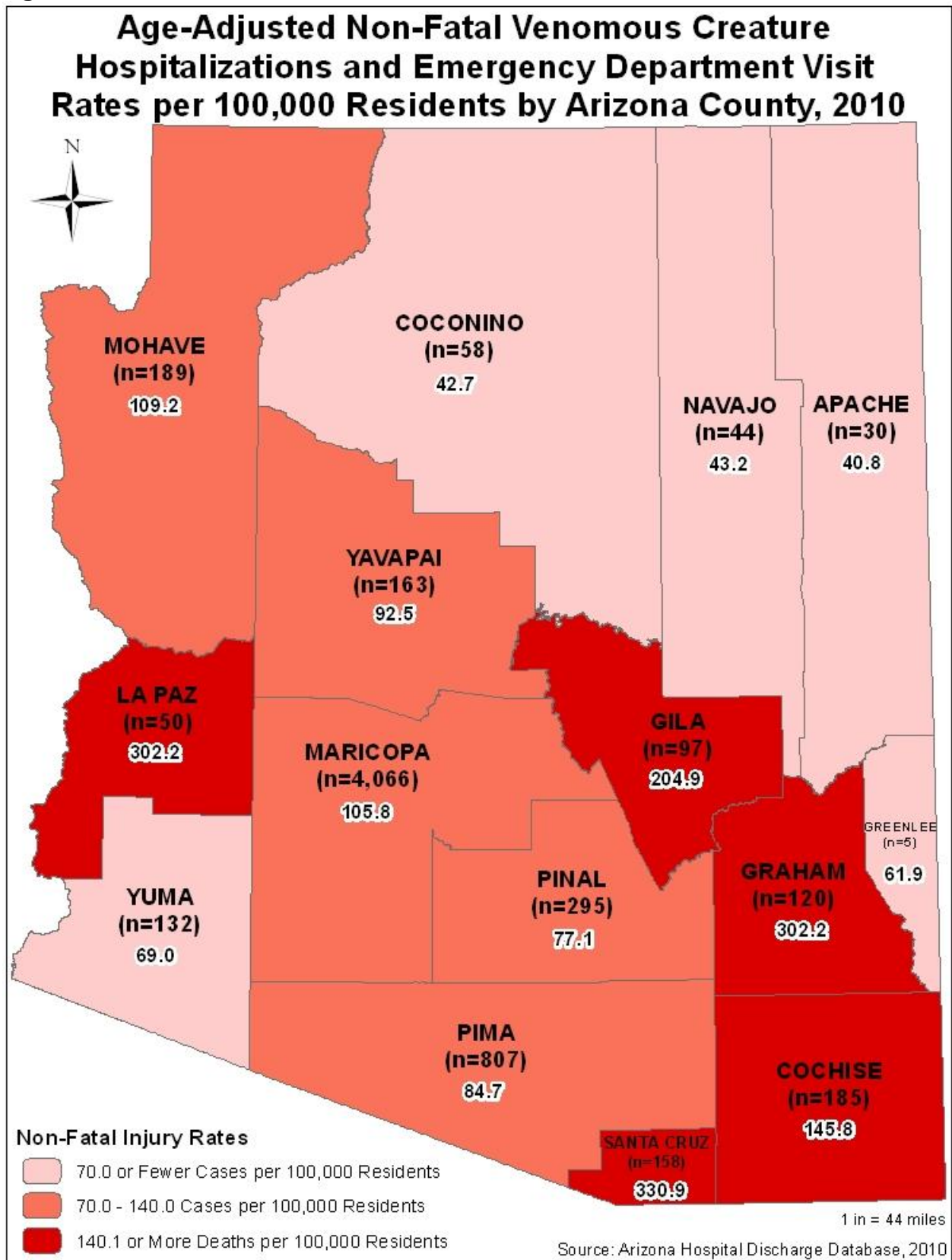
The highest number of hospitalizations and emergency department visits due to envenomations by insects or reptiles occurred during the hot summer months. There were not significant differences in the distribution of cases by type of envenomation. Figure 1 shows the distribution of cases by month.

**Figure 1. Percentage of Non-Fatal Venomous Creature Hospitalizations and Emergency Department Visits by Month, Arizona, 2010 (n=6,400)**



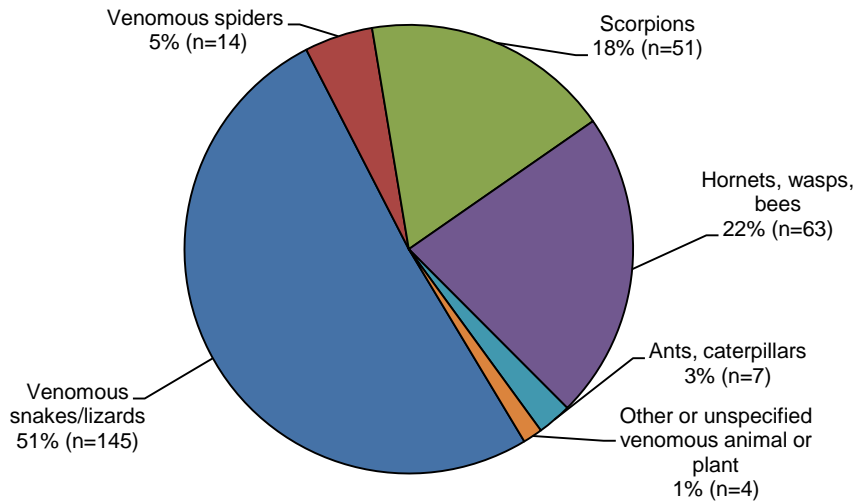
Rural counties had the highest age-adjusted rates of hospitalizations and emergency department visits for non-fatal injuries due to insect or reptile envenomations in 2010. While there were 100.7 cases per 100,000 residents across Arizona, La Paz and Graham Counties had rates three times that high (302.2 cases per 100,000 residents). Counties located at higher elevations had lower rates of injuries related to venomous creatures; this is most likely attributable to the fact that venomous invertebrates cannot survive in colder climates. There is not a definitive reason regarding why Yuma County residents sought medical care at such a low rate. It is possible that residents sought care on the local military base, resulting in an artificially low rate. Figure 2 shows the age-adjusted rates of hospitalizations and emergency department visits due to venomous creature injuries by county of residence.

Figure 2.



In 2010, there were 284 non-fatal inpatient hospitalizations among Arizona residents for treatment of insect or reptile envenomations. Scorpion stings accounted for 18 percent of non-fatal inpatient hospitalizations (n=51). Bites by venomous snakes and lizards accounted for the highest percentage of non-fatal inpatient hospitalizations (51 percent, n=145). Figure 3 shows non-fatal inpatient hospitalizations by type of bite/sting.

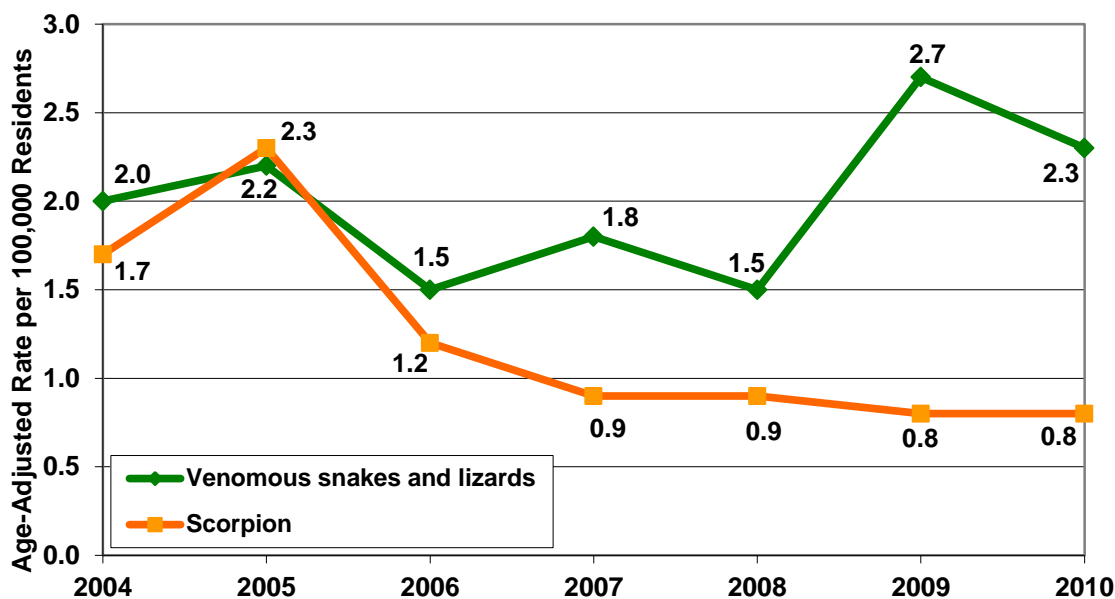
**Figure 3. Non-Fatal Inpatient Hospitalizations due to Venomous Animals or Plants, Arizona 2010 (n=284)**



Hospital charges for non-fatal inpatient hospitalizations due to venomous animals or plants totaled more than \$11.3 million, with an average hospital stay lasting 2 days and resulting in \$40,010 in hospital charges. The median hospital charge was \$16,515. Arizona residents spent a total of 503 days hospitalized, with the longest stay lasting 11 days. While scorpion stings resulted in 18 percent of inpatient hospitalizations, they only accounted for 12 percent of the hospital days, and 5 percent of the total charges.

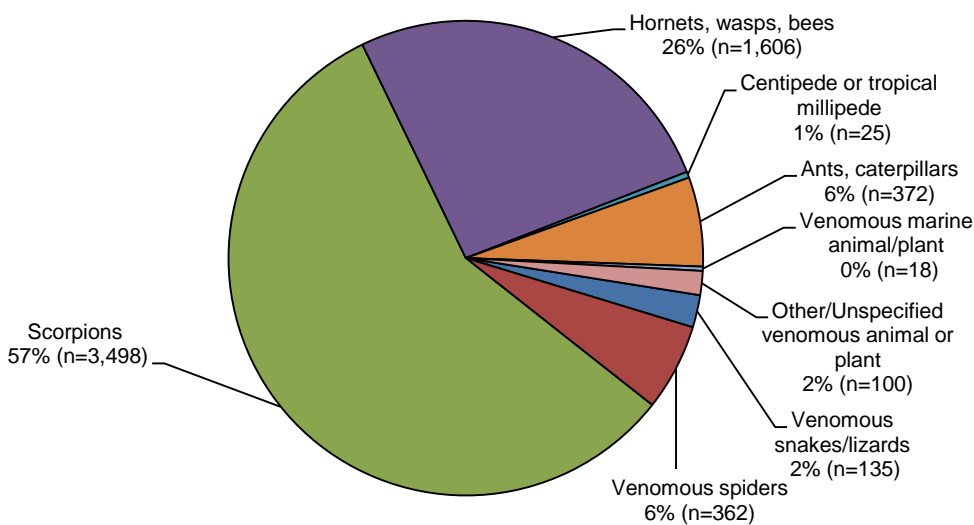
Between 2004 and 2010, the age-adjusted rates of non-fatal inpatient hospitalizations increased 15 percent from 2.0 to 2.3 hospitalizations per 100,000 residents for injuries from venomous snakes and lizards, though the rate declined between 2004 and 2008, with a sharp increase in 2009. The rate of hospitalizations due to scorpions decreased 53 percent from 1.7 to 0.8 hospitalizations per 100,000 residents. Figure 4 shows the age-adjusted rates of non-fatal inpatient hospitalizations due to venomous reptiles and scorpions between 2004 and 2010.

**Figure 4. Age-Adjusted Rate of Non-Fatal Inpatient Hospitalizations Due to Selected Venomous Creatures by Year, Arizona, 2004-2010**



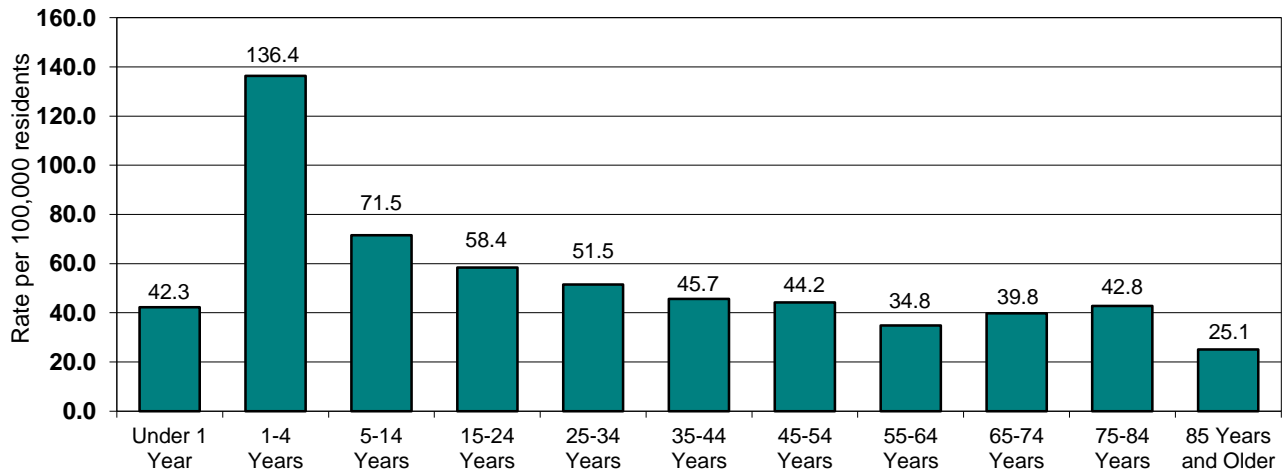
In 2010, there were 6,116 non-fatal emergency department visits by Arizona residents for treatment of insect or reptile envenomations. Scorpion stings accounted for a majority of these visits (57 percent, n=3,498). The second highest number of visits resulted from stings by hornets, bees, and wasps (26 percent, n=1,606). Figure 5 shows non-fatal emergency department visits by type of bite/sting.

**Figure 5. Non-Fatal Emergency Department Visits due to Venomous Animals or Plants, Arizona 2010 (n=6,116)**

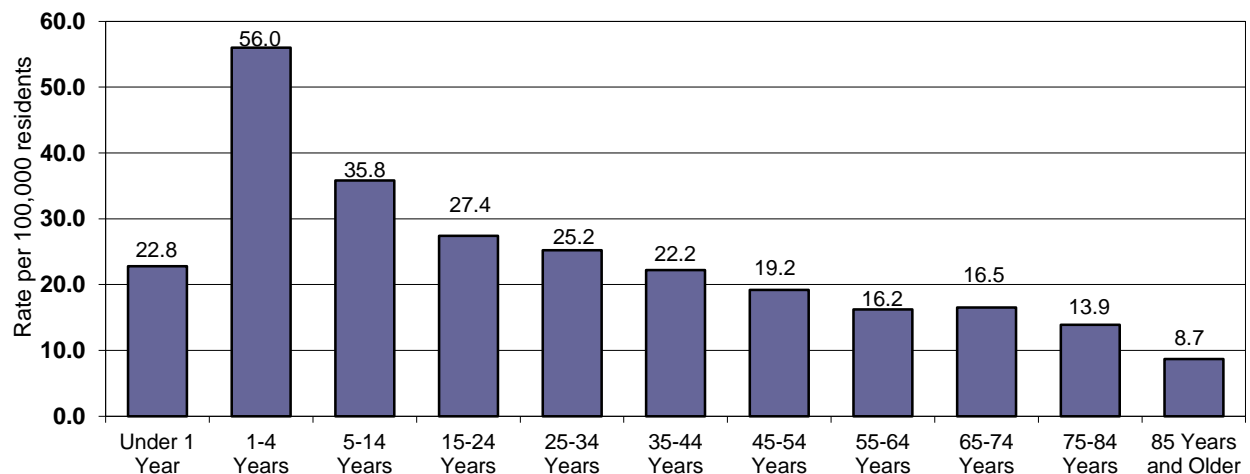


Among the 3,498 non-fatal emergency department visits due to scorpion stings in 2010, the highest rate of events was among children ages 1 to 4 (136.4 ED visits per 100,000 residents). Children ages 1 to 4 also had the highest age-specific rate of emergency department visits due to hornet, wasp, and bee stings, the second leading cause of emergency department visits due to venomous creatures (56.0 ED visits per 100,000 residents). Figure 6 shows the rate of non-fatal emergency department visits due to scorpion stings by age group, and Figure 7 shows the rate of non-fatal emergency department visits due to hornets, wasps, and bee stings by age group.

**Figure 6. Rate of Non-Fatal Emergency Department Visits due to Scorpion Stings per 100,000 Residents, Arizona 2010 (n=3,498)**



**Figure 7. Rate of Non-Fatal Emergency Department Visits due to Hornet, Wasp, or Bee Stings per 100,000 Residents, Arizona 2010 (n=1,606)**

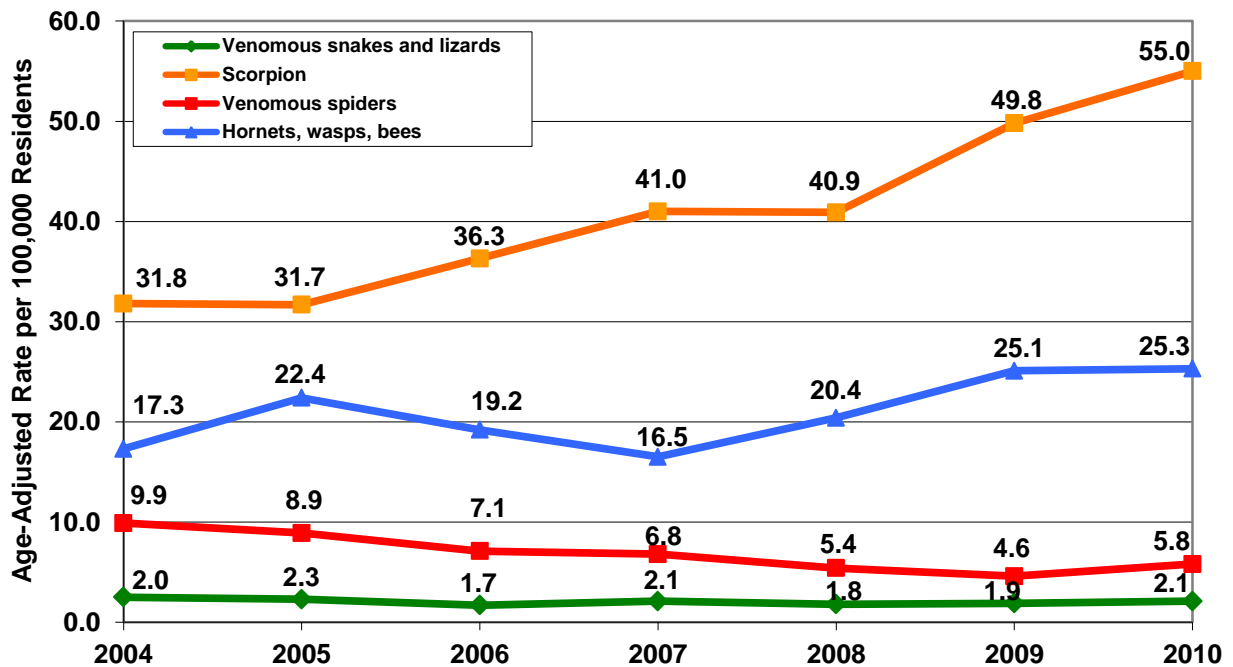


Hospital charges for non-fatal emergency department visits due to venomous animals or plants totaled more than \$8.5 million. Visits to treat scorpion stings totaled more than \$3.8 million in

hospital charges. While scorpion stings resulted in 57 percent of the total non-fatal emergency department visits for venomous animals or plants, they only accounted for 45 percent of the total hospital charges. While the 2010 hospital charges are relatively low, charges for visits related to scorpion envenomations are likely to increase in the future, due to the introduction of a new antivenin to treat serious reactions, such as those occurring in young children and older adults.

While the age-adjusted rate of non-fatal emergency department visits declined 41 percent between 2004 and 2010 for bites from venomous spiders, the age-adjusted rates increased for stings from scorpions and flying insects (73 percent and 46 percent, respectively). Figure 8 shows the age-adjusted rates of non-fatal emergency department visits due to selected venomous creatures between 2004 and 2010 by year.

**Figure 8. Age-Adjusted Rate of Non-Fatal Emergency Department Visits Due to Selected Venomous Creatures by Year, Arizona, 2004-2010**



**Figure 9. An Arizona Bark Scorpion**



**Figure 10. A Striped Scorpion**



Source: <http://phoenix.about.com/od/arizonapicturesandphotos/ig/Arizona-Bark-Scorpions/Scorpion-01.htm>;  
<http://phoenix.about.com/od/arizonapicturesandphotos/ig/Arizona-Bark-Scorpions/Scorpion-06.htm>

Hospital discharge data do not specify the species of scorpion, so it is not possible to further classify injuries. Bark scorpions, as shown in Figure 9, are the most venomous scorpions in North America, and extreme reactions to their stings can cause paralysis and convulsions, though fatalities are rare. Medical attention is recommended for stings to pets, young children, older adults, and people with compromised immune systems.

**Visit the following websites for more information on Arizona's venomous creatures:**

- The University of Arizona's Cooperative Extension:
  - Venomous Wildlife: <http://cals.arizona.edu/pubs/natresources/az1481g>
  - Scorpions: <http://ag.arizona.edu/pubs/insects/az1223.pdf>
- The Arizona Game and Fish Department:  
[http://www.azgfd.gov/w\\_c/nongameandendangeredwildlifeprogram/reptiles.shtml](http://www.azgfd.gov/w_c/nongameandendangeredwildlifeprogram/reptiles.shtml)
- Arizona's Poison Control Centers:
  - Banner Good Samaritan Poison & Drug Information Center:  
[http://www.bannerhealth.com/Locations/Arizona/Banner+Good+Samaritan+Poison+and+Drug+Information+Center/\\_Banner+Poison+Control+Center.htm](http://www.bannerhealth.com/Locations/Arizona/Banner+Good+Samaritan+Poison+and+Drug+Information+Center/_Banner+Poison+Control+Center.htm)
  - The University of Arizona College of Pharmacy Poison and Drug Information Center: <http://www.pharmacy.arizona.edu/outreach/poison/scorpions.php>
- The Arizona-Sonora Desert Museum:  
[http://www.desertmuseum.org/books/nhsd\\_inverts.php](http://www.desertmuseum.org/books/nhsd_inverts.php)