

## HUMAN FATALITIES CAUSED BY VENOMOUS ANIMALS IN UTAH, 1900–90

Richard C. Straight<sup>1</sup> and James L. Glenn<sup>1</sup>

**ABSTRACT.**—An examination of death certificates at the Utah Bureau of Health Statistics from 1900 through 1990 indicates that Utah has a very low incidence of human fatalities due to venomous bites and stings. During this 91-year period, 20 fatalities were recorded from bee (10) or hornet (1) stings, spider bites (4), and rattlesnake bites (5). There were eight additional fatalities during the early part of this century recorded from “insect bite,” “apparently insect bite,” or “unknown agent poisoning,” some of which may have included spiders. No deaths were recorded from Gila monster or scorpion envenomizations, although in 1962 one death in San Juan County was recorded as “venom poisoning, unknown agent, possible scorpion.” Utah statistics follow the national pattern, indicating that bee stings cause more fatalities than spider bites or rattlesnake bites. Rapid deaths (within minutes) occurred in the majority of bee sting fatalities, resulting from allergic reactions (anaphylaxis), whereas protracted death times of days or months, resulting from infection, followed most spider and unknown insect bites. Only two spider bite fatalities occurred within 1–3 days, suggesting black widow envenomization. Two of the five fatalities from rattlesnake bite resulted from handling the offending snake, one fatality was recorded as a homicide, and one other envenomization occurred in Arizona, with subsequent death in Utah.

**Key words:** fatalities, envenomization, venomous animals, rattlesnakes, spiders, hymenopterids, scorpions, Gila monsters, tick bite, Utah.

Venomous animals native to Utah and considered dangerous to humans include hymenopterid insects (bees, hornets, wasps), spiders, scorpions, and reptiles (rattlesnakes and Gila monster). Three species of mildly venomous snakes (Colubridae) are considered to be medically unimportant. The only national study of the incidence of fatalities from all venomous animal bites or stings is the 1950–59 survey by Parrish (1963). He obtained his data through the National Office of Vital Statistics and subsequently reviewed death certificates from each state in which deaths occurred. His survey indicated that Hymenoptera stings cause more human fatalities than all other venomous animals combined. Only one fatality from Hymenoptera sting occurred in Utah during this 10-year period, and no Utah fatalities from rattlesnake bite were recorded (also see Parrish 1966, 1980). In the present investigation we examined death certificate records at the Utah Bureau of Health Statistics for fatalities recorded as caused by all venomous animals from 1900 through 1990. The results of the 91-year survey are presented in this report.

### METHODS

Death certificates were surveyed at the Utah Bureau of Health Statistics for the cause of death due to animal bites and stings. Therefore, even deaths from diseases transmitted by tick bite were gathered and are briefly discussed in this report. At the time of this survey, death certificates prior to 1956 were not coded as to cause of death, necessitating that every certificate be examined. Death certificates filed since 1956 are coded as to cause of death by the International Cause of Death Code (ICD) and were screened using these codes.

### RESULTS

#### Fatalities from Hymenopterid Stings

Eleven fatalities from hymenopterid stings were recorded in Utah during the 91-year period 1900–90 (Table 1). The first recorded fatality during this period was in 1904 (from infection) and the most recent in 1984, the latter being the only year with more than one fatality. The majority were recorded as “bee”

<sup>1</sup>Venom Research Laboratory, Veterans Affairs Medical Center, Salt Lake City, Utah 84148.



sting. One fatality was ascribed to a “hornet” sting (1922), and one was the result of multiple bee stings while the victim was gathering firewood at the Strawberry Reservoir area (1980). One victim (1984) was stung in Nevada but died in Utah 36 h later. Most deaths occurred rapidly by anaphylaxis, but two deaths (1984) were due to cardiovascular or myocardial injury induced by the anaphylactic reaction. The delayed death times of the latter victims likely reflect patients kept alive with various modern medical techniques. Deaths occurred in the summer months, the majority in July and August. All age groups (7–71) are represented. Notably, after the 1954 fatality, 26 years passed without a bee sting fatality and then four deaths occurred in the 5-year period 1980–84 (Table 1). The 1980s was the only decade to contain four fatalities from hymenopterid sting.

Spider Bite Fatalities

Only four deaths were recorded from “spider bite,” and two of these were recorded as “probable” spider bites (Table 2). Three of these four cases were children less than 6 years of age, with deaths resulting in 3–25 days from “blood poisoning,” “infection,” or “septicemia” (before antibiotics, 1915–36).

One death (1968), listed as “acute circulatory failure—probable poisonous spider bite on leg,” occurred in 24 h to a 41-year-old “mentally retarded” male (American Fork, Utah). Eight additional fatalities recorded in the earlier part of this century were caused by chronic infection from “insect bite” or “unknown agent” poisonings. These may have been from spider bite but are not included herein. The time of death in these cases was quite delayed, about 2–5 months. The “suspected” spider bite deaths and other “insect” bite deaths occurred in all seasons of the year.

Scorpion Sting Fatalities

The only Utah fatality recorded as “venom poisoning, unknown agent, possibly scorpion” was a 24-year-old female Indian at Monument Valley Hospital, San Juan County, on 31 December 1962. The death certificate does not mention infection, but rather “venom poisoning,” as if from the direct effects of the venom. The place of injury was “unknown” and the victim died in 3 days. The victim was attended by a physician for about 14 h.

Fatalities from Gila Monster Bite

The Utah distribution of the Gila monster (*Heloderma suspectum*) is limited to Washington

TABLE 1. Utah fatalities recorded as caused by Hymenoptera stings during the period 1900–90.

Date	Sex	Age	Death	Comments
9/17/1904	F	71 yr	18 d	“Blood poisoning”
7/08/1922	M	39 yr	5–10 min	“Hornet” sting
8/17/1926	F	15 yr	30 min	“No doctor available”
7/28/1929	M	12 yr	2 d	“Was sensitized to bee sting”
8/13/1935	F	28 yr	30 min	“Idiosyncrasy to bee sting”
8/06/1936	M	46 yr	10 min	“Stung above rt eye, riding horse”
7/11/1954	F	53 yr	30 min	“Anaphylactic shock, bee sting”
9/13/1980	M	43 yr	minutes	“Anaphylaxis, bee stings”
8/08/1983	M	7 yr	2 d	“Anoxic encephalopathy”
6/26/1984	M	60 yr	36 h	“MI-rupture myocardium”
9/17/1984	F	63 yr	5 d	Victim stung in Nevada

TABLE 2. Human fatalities in Utah recorded as caused by spider bite during the period 1900–90<sup>a</sup>.

Date	Sex	Age	Death	Comments
12/18/1915	F	4 1/2 mo	25 d	“Septicemia, spider bite”
10/03/1923	F	5 1/2 yr	3 d	“Blood-poisoning, probably spider”
8/04/1926	M	15 mo	7 d	“Abscess of face caused by spider”
3/27/1968	M	41 yr	24 h	“Acute circulatory failure, probably spider bite”

<sup>a</sup>There are eight additional fatalities during the early part of this century recorded from “insect bite,” “apparently insect bite,” or “unknown agent poisoning,” some of which may have included spiders. Death times were 2–5 months from infection.



TABLE 3. Human fatalities in Utah recorded as caused by rattlesnake bite during the period 1900–90<sup>a</sup>.

Date	Sex	Age	Death	Comments
7/17/1931	M	12 1/2 yr	1 d	"Poisoning from rattlesnake venom"
6/19/1938	M	22 yr	4 h	"Rattlesnake bite, possible intracranial hemorrhage with hysteria"
8/22/1961	F	70 yr	24 h	"Rattlesnake bite in outdoor Hogan"
10/04/1963	F	10 yr	11 1/2 h	"Rattlesnake bite, Mexican Water, AZ"
5/07/1987	F	22 mo	5 h	"Venomous bite, snake held by another person" (resulting in homicide)

<sup>a</sup>Not included are a 1913 fetal death miscarriage and an exotic snakebite fatality in 1964. See text.

County in the extreme southwestern region of the state. No fatalities from envenomization by the Gila monster were reported in Utah during the 91-year period, according to our survey.

#### Rattlesnake Bite Fatalities

Extenuating and/or unusual circumstances were associated with three of the five rattlesnake bite fatalities in Utah (Table 3). In 1931 the death of a 12-year-old boy was recorded as "poisoning from rattlesnake venom"; however, the exact cause was questionable. The child had reportedly handled a dead rattlesnake (*Crotalus viridis lutosus*) "a day before he became ill" (*Beaver News*, page 1, 24 June 1931). Apparently, however, the child was not attended by a physician and no autopsy was performed. A second unusual death (19 June 1938) was attributed to "possible intracranial hemorrhage with hysteria," resulting from head injuries incurred during the victim's hysteria following envenomization by a rattlesnake (*C. v. lutosus*). The hiking victim was attempting to kill ("cut in half") the rattlesnake in South Willow Canyon, near Grantsville (*Salt Lake Tribune*, page A-20, 20 June 1938). As the victim was being transported by car down the canyon, he "flung himself around in apparent hysteria, striking his head several times on the back of the rear seat." This 22-year-old male died in approximately 4 h en route to Salt Lake City. A third unusual death was a tragic fatality (1987), recorded as a homicide, which resulted when a large rattlesnake (*C. v. lutosus*) bit a 22-month-old girl after the snake had been placed around her neck (Washington County). The child died in approximately 5 h.

In 1961 a 70-year-old female was bitten by *Crotalus v. viridis* and died within 24 h (Monument Valley, San Juan County). This is the only Utah fatality in which rattlesnake enven-

omization occurred within the state borders and the victim did not handle the snake. One 10-year-old girl was bitten (*C. v. viridis*) in northeastern Arizona but was hospitalized and died in Utah (San Juan County, 1963) 11 1/2 h after envenomization.

Two additional human fatalities in Utah have involved snakes. In 1913 a fetal death (aborted stillbirth—5 months) was ascribed to "shock" caused by the mother "almost stepping on a snake" (Cedar City). Also, Utah has one recorded fatality (1964) that was caused by the bite of a captive exotic snake (African puff adder, *Bitis arietans*). The 37-year-old male, director of Hogle Zoological Gardens, Salt Lake City, died in 31 h. This incident is one of only two venomous snake-induced fatalities this century in American zoological institutions.

#### Fatalities Resulting from Tick Bite Diseases

Although tick bites may not be considered envenomizations per se, it is appropriate to include them in this review of deaths resulting from bites and stings of dangerous animals. Two different febrile diseases can be transmitted by tick bite in Utah and other Rocky Mountain states, i.e., Colorado tick fever and Rocky Mountain spotted fever (see Dyer 1963, Eklund 1963). Forty-six fatalities were attributed to tick bite and recorded as "tick fever" (7), "spotted fever" (15), or "Rocky Mountain spotted fever" (24). All but one of the deaths occurred during the period 1900–42 (Table 4). The victims were typically middle-aged male farmers or sheepmen in mountainous terrain. Most victims were bitten from early spring through midsummer. Consequently, before the advent of antibiotics, fatalities from disease-bearing ticks greatly outnumbered all venomous animal-induced fatalities in Utah. However, venomous



TABLE 4. Human fatalities recorded as due to Rocky Mountain spotted fever or tick bite fever, 1900–90.

Years	1900–09	1910–19	1920–29	1930–38	1942	1955
Deaths	8	15	10	12	1	1 <sup>a</sup>

<sup>a</sup>Death resulting from “gas gangrene.”

animal-induced fatalities, mainly rapid death by anaphylaxis from Hymenoptera sting, now overshadow tick bite fatalities, as the last tick bite fatality (from “gas gangrene”) occurred in 1955.

DISCUSSION

Spider bites often occur while the person is asleep and may produce little or no immediate pain, symptoms are slow to develop, and the offending spider is seldom seen or identified. Conversely, bee or hornet stings cause immediate pain and the envenomer is usually seen by the victim. Also, the vast majority of deaths from spider or “insect” bite are protracted over days (from infection), whereas bee sting causes rapid death within minutes from anaphylaxis or within a matter of hours due to cardiovascular injury induced by the anaphylactic reaction. Only one death (1968) from “probable spider bite” has occurred in Utah since the discovery and widespread use of antibiotics. This case is suspected to be the result of black widow (*Laterodectus*) envenomization. Although the black widow is relatively common around human habitations throughout Utah and is capable of causing death (rare) to humans, no fatalities in which this spider was specifically identified have been recorded in Utah.

Only one species of scorpion in the USA is considered capable of killing humans with a single sting, i.e., *Exilicauda sculpturatus* (formerly *Centruroides* genus). This species is abundant in the deserts of Arizona and has been collected in southeastern Utah at Hole-in-the-Rock (Kane County, Utah) in 1953 (Johnson and Allred 1972). There have been a few scorpion stings in the southeastern region of Utah resulting in severe pain and neurological signs similar to *E. sculpturatus* stings (personal communication with personnel at Moab Hospital and Canyonlands National Park). The distribution of this scorpion in Utah is presently unknown but is likely limited to the Colorado River drainage areas in the southeastern region of the state.

Snakebite envenomizations are often divided into two categories, legitimate and illegitimate. Envenomizations in which the victim is unaware of the offending snake are considered legitimate; e.g., the victim accidentally steps, sits, or places hand on or near the snake in the wild (or yard). Illegitimate snakebites include envenomizations by captive specimens or by specimens whom the victim attempts to handle, kill, or manipulate. Only two of the snakebite fatality victims discussed above would be classified as legitimate category envenomizations (1961, 1963), but one of these was not bitten in Utah (Arizona—1963). One death involved homicide (1987). Two involved psychological effects of fear or hysteria (1913, 1938), and one of these may even have involved a harmless snake (1913). One death involved an exotic species in captivity (1964), and one mysterious death possibly involved handling a dead rattlesnake (1931). According to state localities of the snakebites in Utah, only two subspecies of rattlesnakes (*C. v. viridis* and *C. v. lutosus*) have been involved. No deaths have been recorded from areas of *C. v. concolor* distribution in eastern Utah, and no fatalities are indicated from *C. cerastes*, *C. scutulatus*, or *C. mitchelli*, which are limited to Washington County in southwestern Utah. Only three Utah fatalities from envenomizations by the Great Basin rattlesnake (*C. v. lutosus*) occurred during the 91-year period, and all three involved handling of the snake (illegitimate envenomization category).

Utah has a very low incidence of human fatalities from venomous bites and stings. Hymenoptera are responsible for more human deaths than all other venomous animals combined, which follows the national statistical pattern (Parrish 1963). Fatalities due to rattlesnake envenomization represent an extremely low environmental hazard and would be further reduced if rattlesnakes were not handled. Hymenopterid sting fatalities could be reduced if emergency self-treatment kits (epinephrine in dose syringes) were carried by persons suspected of allergy to bee venom.

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