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Zoonotic Disease Section

Tickborne Disease Activity Summary

2013 End of Year Summary

Provisional Information

Public Release

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Executive Summary

The Arkansas Department of Health (ADH) received 1561 reports of tickborne disease (TBD) in 2013, with 689 cases (i.e., disease cases, confirmed or probable). Cases represented four disease classes, including seven cases of Anaplasmosis, 165 cases of Ehrlichiosis, 479 cases of Spotted Fever Rickettsiosis, and 38 cases of Tularemia. There were four deaths associated with Tickborne Disease in 2013, including, two Spotted Fever Rickettsiosis, one Ehrlichiosis, and one Tularemia. TBD cases were investigated in 71 counties, with disease occurrence in 65 counties, which represent all five public health regions. Onset of illness was from January through December, peaking in June.

Provisional data

This update includes provisional data reported to the ADH, and subsequently to the Centers for Disease Control and Prevention's (CDC) National Notifiable Diseases Surveillance System (NNDSS). This summary of TBD includes:

- *Anaplasmosis*
- *Ehrlichiosis*
- *Spotted Fever Rickettsiosis*
- *Tularemia*

National Notifiable Diseases Surveillance System

The CDC NNDSS is a multifaceted public health disease surveillance system that allows public health officials to monitor the occurrence and spread of diseases. (CDC, 2014)

Data limitations

The data collected on TBD, is from a passive surveillance system. The data is dependent on clinicians considering the diagnosis of a TBD, obtaining the appropriate diagnostic test, and reporting of laboratory confirmed cases to ADH. Diagnosis and reporting are incomplete, and the incidence of TBD is underestimated. Provisional TBD data are provided to help track recent TBD disease activity. However, these data may change substantially before they are finalized.

National Information

Anaplasmosis - The number of anaplasmosis cases reported to CDC has increased steadily since the disease became reportable, from 348 cases in 2000, to 1761 cases in 2010. The incidence of anaplasmosis has also increased, from 1.4 cases per million persons in 2000 to 6.1 cases per million persons in 2010. The case fatality rate has remained low, at less than 1%. The blacklegged tick (*Ixodes scapularis*) is a potential vector for Anaplasmosis in Arkansas, and is also suspected in the transmission of Lyme disease, babesiosis, and Powassan disease nationally. (US HHS CDC, 2014) Cases of anaplasmosis have generally increased from 350 cases in 2000, when the disease became nationally notifiable, to 1163 cases in 2009. The number of reported cases increased 52% between 2009 and 2010 (DVBD, 2014). [Figure 1](#) shows the reported cases nationally from 2008-2012. [Figure 2](#) displays the distribution of Anaplasmosis nationally. (Dahlgren, 2014)

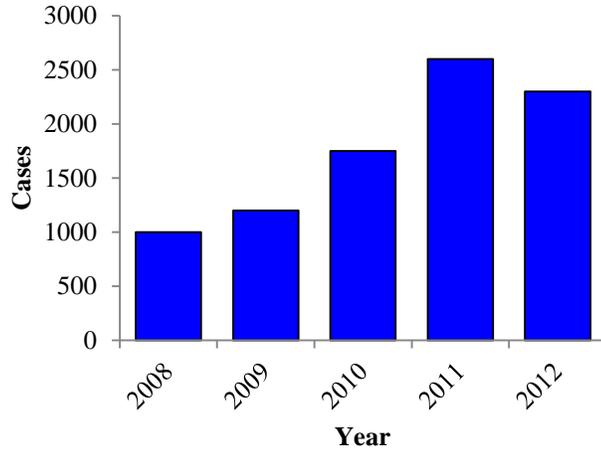
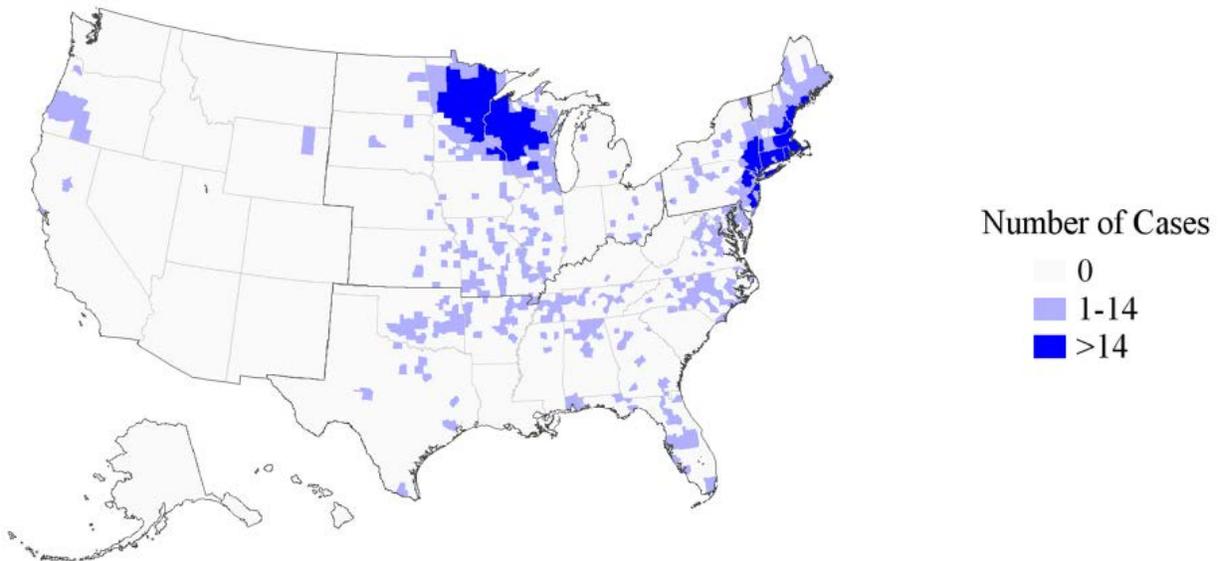


Figure 2. Map of reported cases of Anaplasmosis, United States, by county, 2008-2012



National Information

Ehrlichiosis - Ehrlichia chaffeensis and E. ewingii are both causes of human illness in the United States, although the majority of reported cases are due to E. chaffeensis. The Lone Star tick (*Amblyomma americanum*) is a potential vector for Ehrlichiosis in Arkansas, and is also capable of transmitting Tularemia, and Southern Tick Associated Rash Illness (STARI). (US HHS CDC, 2014) The number of ehrlichiosis cases due to E. chaffeensis that have been reported to CDC has increased steadily since the disease became reportable, from 200 cases in 2000, to 961 cases in 2008. A

decrease in the number of cases of ehrlichiosis was noted in 2010. The incidence of ehrlichiosis increased similarly, from less than 1 case per million persons in 2000 to 3.4 cases per million persons 2008, and decreased to 2.5 cases per million persons in 2010, but has increased to levels higher than 2008 in 2012. Since becoming a reportable disease, the annual case fatality rate has declined. (DVBD, 2014) [Figure 3](#) shows the reported cases nationally from 2008-2012. [Figure 4](#) displays the distribution of Ehrlichiosis nationally. (Dahlgren, 2014)

Figure 3. Ehrlichiosis cases, United States 2008–2012

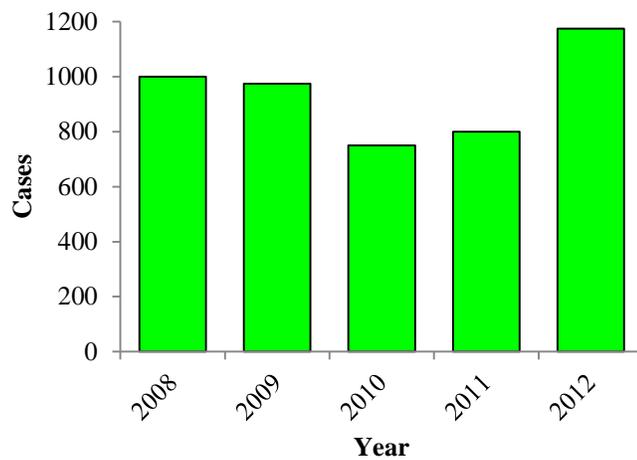


Figure 4. Map of reported cases of Ehrlichiosis, United States, by county, 2008-2012



National Information

Spotted Fever Rickettsiosis - In addition to *Rickettsia rickettsii*, the agent of Rocky Mountain spotted fever (RMSF), several other tick-borne species of *Rickettsia*, broadly grouped under the heading "Spotted Fever group

Rickettsia (SFGR)" has been shown to cause human infections.

The American Dog Tick (*Dermacentor variabilis*) and the Brown Dog Tick (*Rhipicephalus sanguineus*) are potential vectors for Spotted Fever Rickettsiosis in Arkansas. (US HHS CDC, 2014)

RMSF has been a reportable disease in the United States since the 1920s. CDC compiles the number of cases reported by state health departments.

The incidence of RMSF has increased during the last decade, from less than 500 cases reported in 1993 to nearly 4,500 reported in 2012. [Figure 5](#) shows the reported cases nationally from 2008-2012. [Figure 6](#) displays the distribution of Spotted Fever cases nationally. (Dahlgren, 2014)

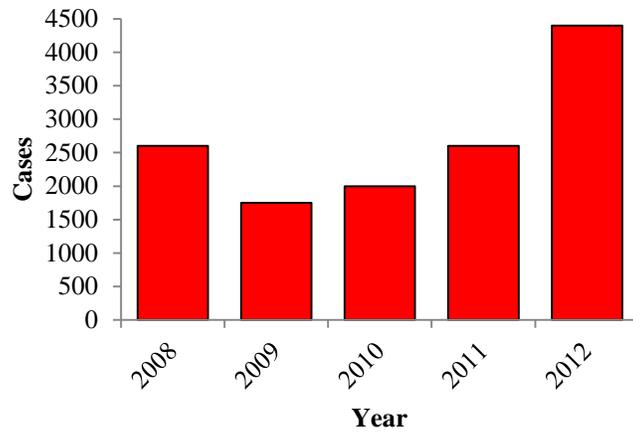
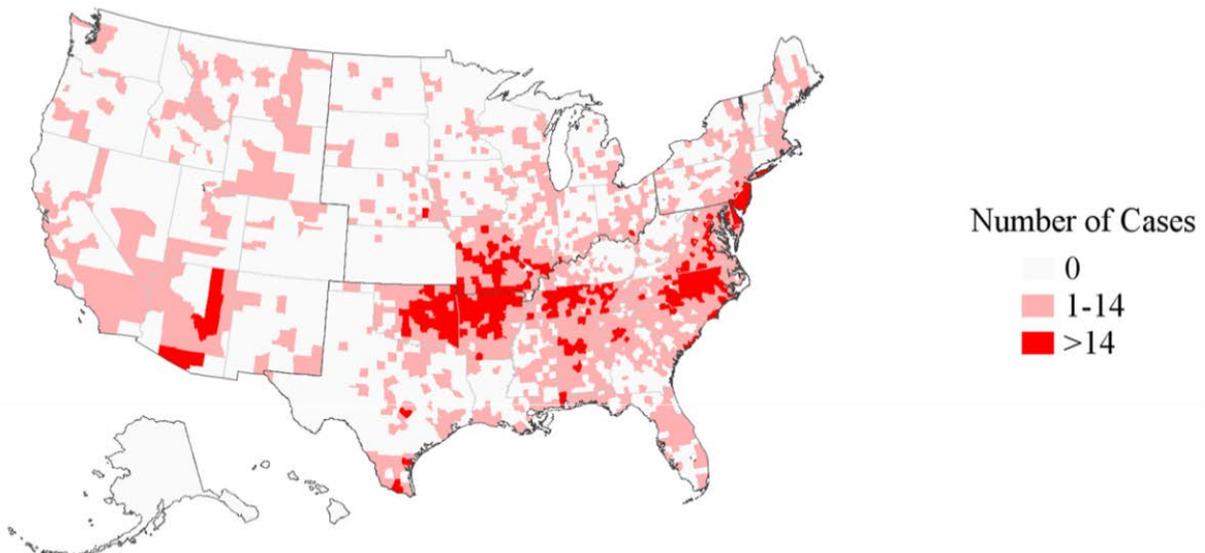


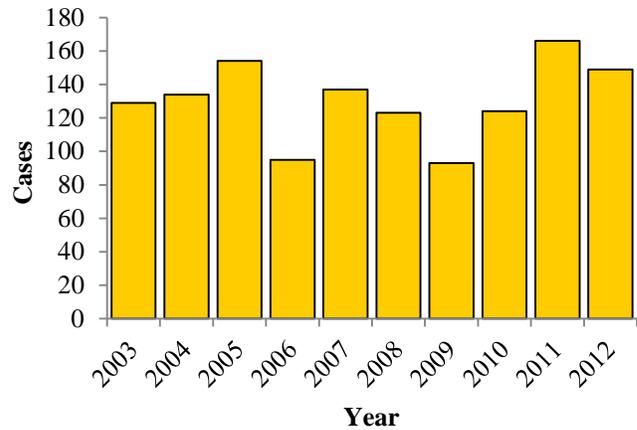
Figure 6. Map of reported cases of Spotted Fever Rickettsiosis, United States, by county, 2008–2012



National Information

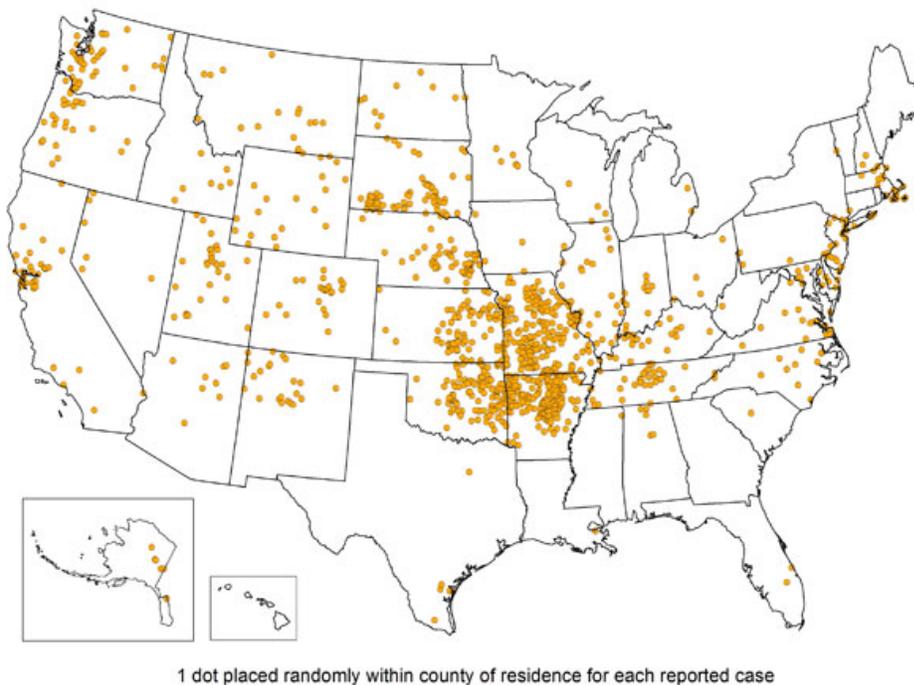
Tularemia – Tularemia is a rare but potentially serious bacterial zoonosis that has been reported from all U.S. states except Hawaii. The etiologic agent, *Francisella tularensis*, is highly infectious and can be transmitted through arthropod bites, direct contact with infected animal tissue, inhalation of contaminated aerosols, and ingestion of contaminated food or water. *F. tularensis* has been designated a Tier 1 select agent because it meets several criteria, including low infectious dose, ability to infect via aerosol, and a history of being developed as a bioweapon. (Nelson, Kugeler, Peterson, & Mead, 2013) During 2003–2012, more than 1,300 cases were reported to CDC. Cases submitted from Arkansas accounted for 15 percent of all cases submitted during this timeframe.

Figure 7. Tularemia cases, United States 2003-2012



[Figure 7](#) shows the reported cases nationally from 2003-2012. [Figure 8](#) displays the distribution of tularemia nationally by year. (CDC, 2013)

Figure 8. Map of reported cases of tularemia by year, United States, 2003 2012



Arkansas Information

Tickborne Disease (TBD) Activity in Arkansas (2013)

ADH conducted a total of 1561 investigations for TBD, of which, 689 were determined to be cases (i.e., disease cases, confirmed or probable). Cases were investigated in 71 of 75 counties, with disease occurrence in 65 counties, which represent all five public health regions.

Anaplasmosis was present in five counties; Ehrlichiosis was present in 45 counties (including the first case of *E. ewingii* in Arkansas), Spotted Fever Rickettsiosis was present in 63 counties; and Tularemia was present in 23 counties.

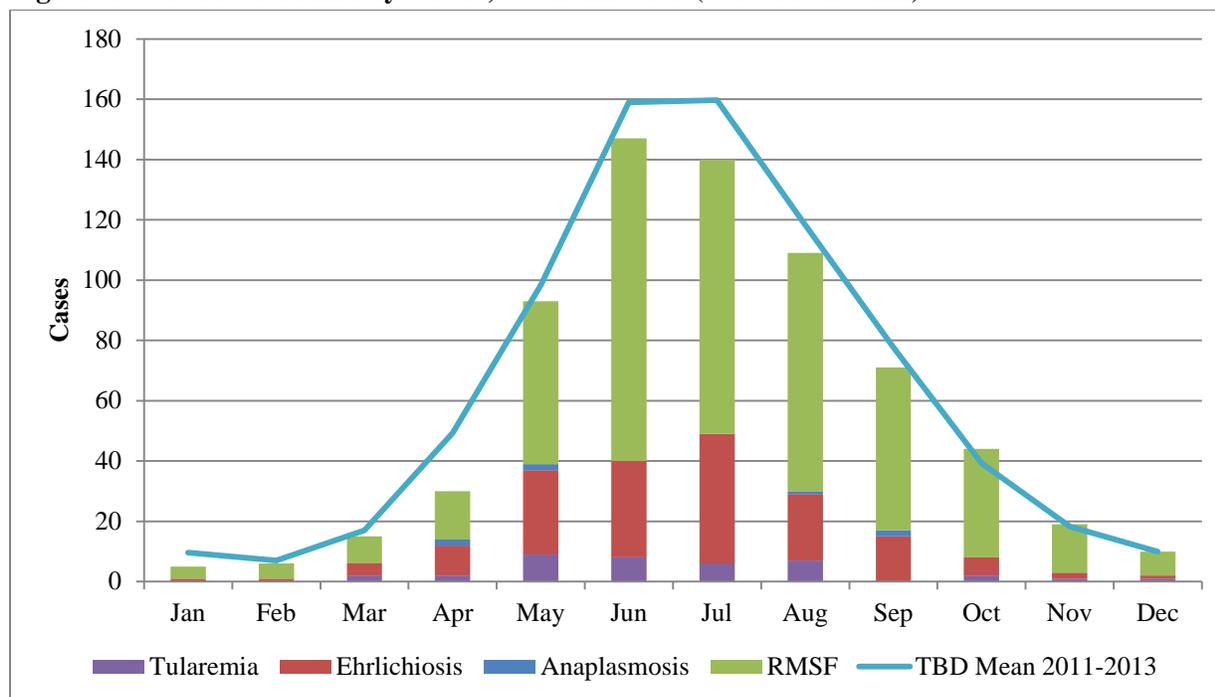
Tickborne Disease (TBD) Related Deaths in Arkansas (2013)

As of December 31, 2013, 4 deaths have been associated with TBD. The median age for all deaths was 71 (range 53, 87).

Comparison to Previous Years

From 2011–2013, a total of 2,295 cases of tickborne disease were reported to the Arkansas Department of Health (ADH). The mean number of cases in this timeframe was 765 (range 656, 950). Prior to 2011, ADH relied heavily on surveillance information completed by the reporting physician. Since the beginning of 2011, ADH has conducted case investigations utilizing communicable disease staff both in the ADH central office, and local level communicable disease nurses. TBD onset of illness started in January and continued through December, peaking in June ([Figure 9](#)).

Figure 9. Tickborne disease by month, Arkansas 2013 (Provisional Data)



Geographic Distribution of Tickborne Disease

Tickborne Disease occurrence is not equally distributed across Arkansas. Seventy two percent of reported TBD occurred in the Northwest and Northeast Public Health Regions, with the Northwest Region accounting for 49% of all TBD cases ([Figure 10](#)). Benton and Washington Counties in the Northwest corner of the state accounted for 14% of all reported TBD cases in the state. [Figure 11](#) geographically displays TBD case density, by county in 2013.

Figure 10. Total Tickborne Disease Cases by Public Health Region, Arkansas 2013

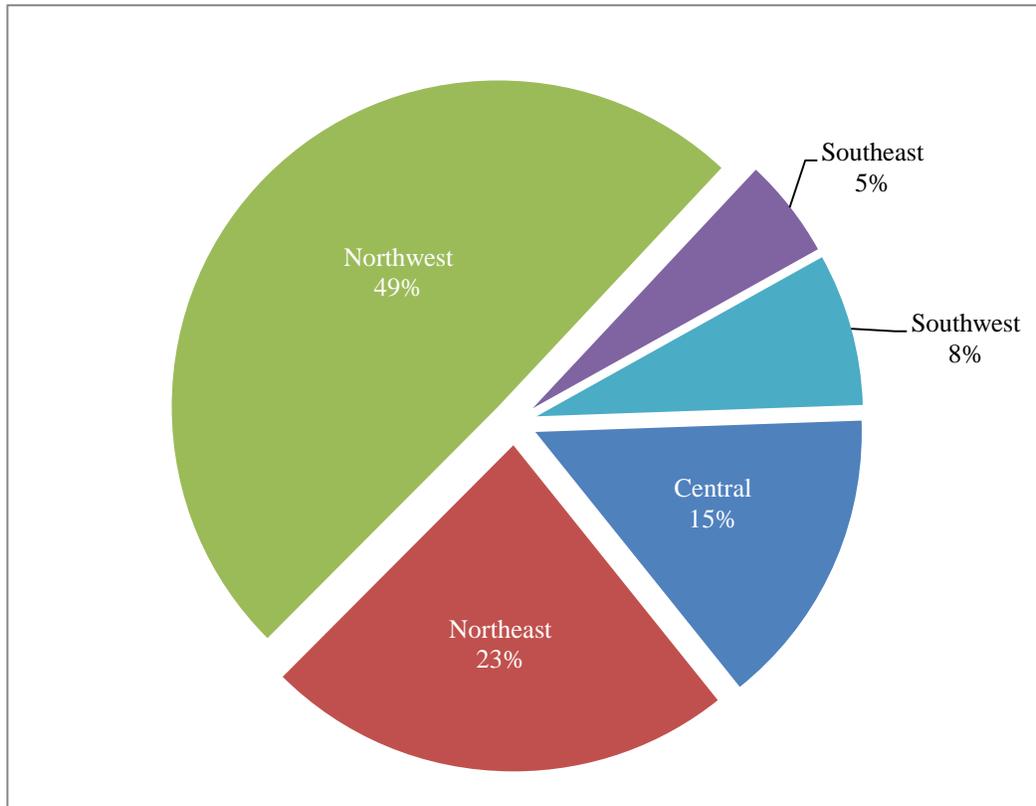
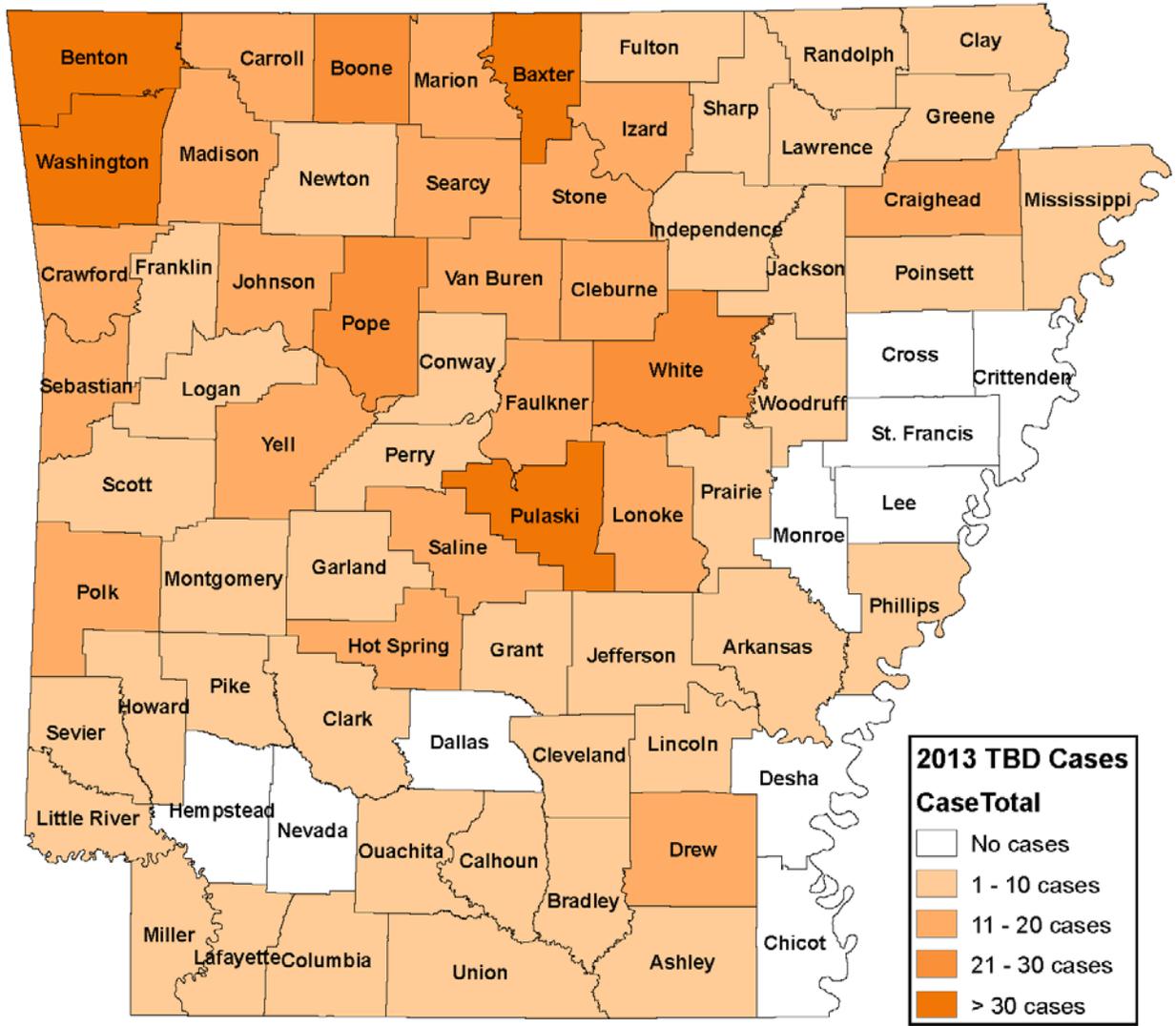


Figure 11. Map of Tickborne Disease Case Density by County, Arkansas 2013



* Cases are defined as Confirmed or Probable



Date: June 5, 2014
 Source: Arkansas Department of Health
 Map created by: Richard Talfner

Anaplasmosis in Arkansas– the ADH investigated 15 suspect reports of Anaplasmosis in 2013, resulting in seven probable cases in five counties in three public health regions. The number of Anaplasmosis cases reported to the ADH in 2013 was above the mean number of cases, by month, from 2011 to 2013 (Figure 12). There were no reported deaths associated with Anaplasmosis in 2013. Of the seven cases, all reported ethnicity as not Hispanic or Latino with 86 percent reporting race as White, with 4 males and two females (Table 1). Of the cases reported, over half were located in the Northwest Public Health Region (Figure 13), with onset of illness from April through September (Figure 12). The mean age of reported cases was 40 (range 5, 66). There were no reported cases in children under age 5, and two of the seven cases were over age 60 (Figure 14).

Figure 12. Anaplasmosis Cases by Month, Arkansas 2013

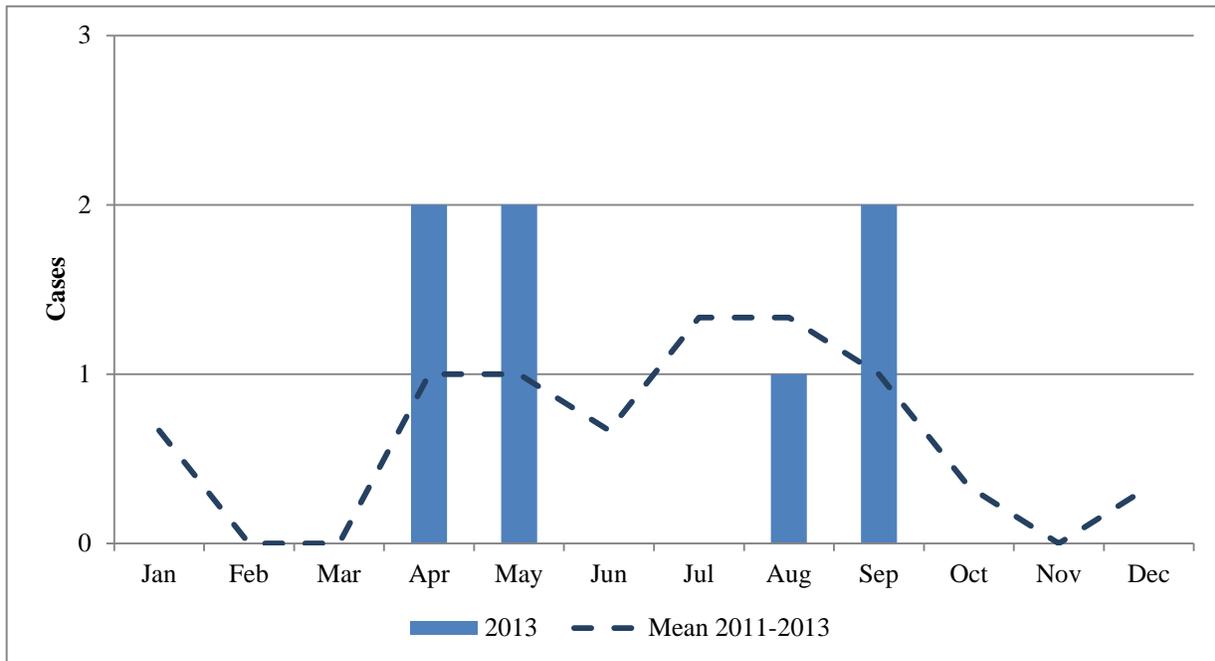


Figure 13. Anaplasmosis Cases by ADH Public Health Region, Arkansas 2013

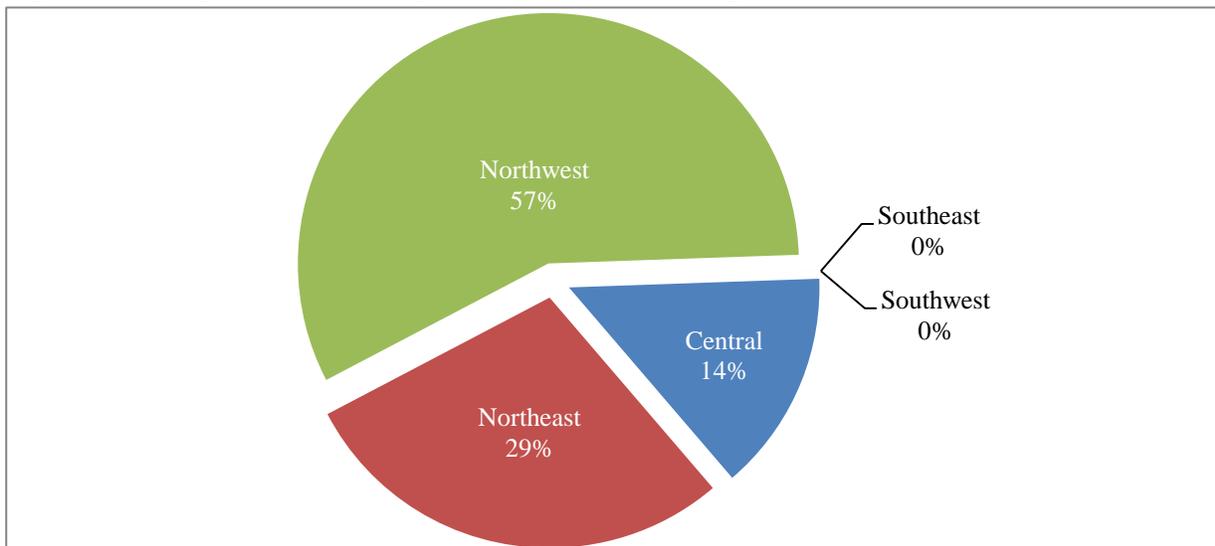


Table 1. Anaplasmosis Demographics, Arkansas 2013

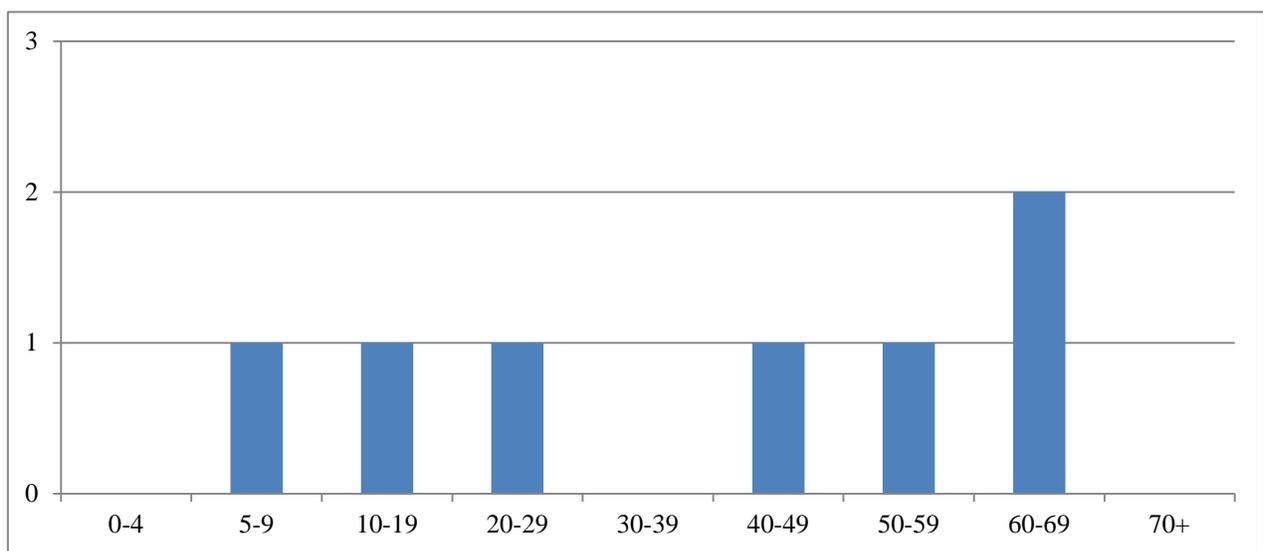
Case Status	Frequency	Percent
Confirmed	0	0
Probable	7	47
TOTAL	7	100

Age	Frequency	Percent	Male	Female	Deceased
0-4	0	0	0	0	0
5-9	1	14	1	0	0
10-19	1	14	0	1	0
20-29	1	14	1	0	0
30-39	0	0	0	0	0
40-49	1	14	1	0	0
50-59	1	14	0	1	0
60-69	2	29	1	1	0
70+	0	0	0	0	0
TOTAL	7	100	4	3	0

Race	Frequency	Percent
White	6	86
Unknown / Missing	1	14
TOTAL	7	100

Ethnicity	Frequency	Percent
Hispanic or Latino	0	0
Not Hispanic or Latino	7	100
Unknown or Missing	0	0
TOTAL	7	100

Figure 14. Anaplasmosis Cases by Age Group, Arkansas 2013



Ehrlichiosis in Arkansas - the ADH investigated 364 suspect reports of Ehrlichiosis in 2013, resulting in 29 confirmed cases, including one case of *Ehrlichia ewingii*, and 136 probable cases, in 45 counties. The number of Ehrlichiosis cases reported to the ADH in 2013 was above the mean number of cases, by month, from 2011 to 2013 (Figure 15). There was one reported death associated with Ehrlichiosis in 2013. Of the 165 cases, 83 percent reported race as White, 15 percent were reported as Unknown or missing, and two percent as Black/African American or American Indian/Alaska Native. Ethnicity was reported as 89 percent Not Hispanic or Latino, ten percent Unknown or missing, and less than one percent as Hispanic or Latino (Table 2). Of the cases reported, over half were located in the Northwest Public Health Region (Figure 16), with onset of illness from January through December, peaking in July (Figure 15). The mean age of reported cases was 54 (range 3, 87). There were three reported cases in children under age 5, and 77 of the 165 reported cases were over age 60 (Figure 17).

Figure 15. Ehrlichiosis Cases by Month, Arkansas 2013

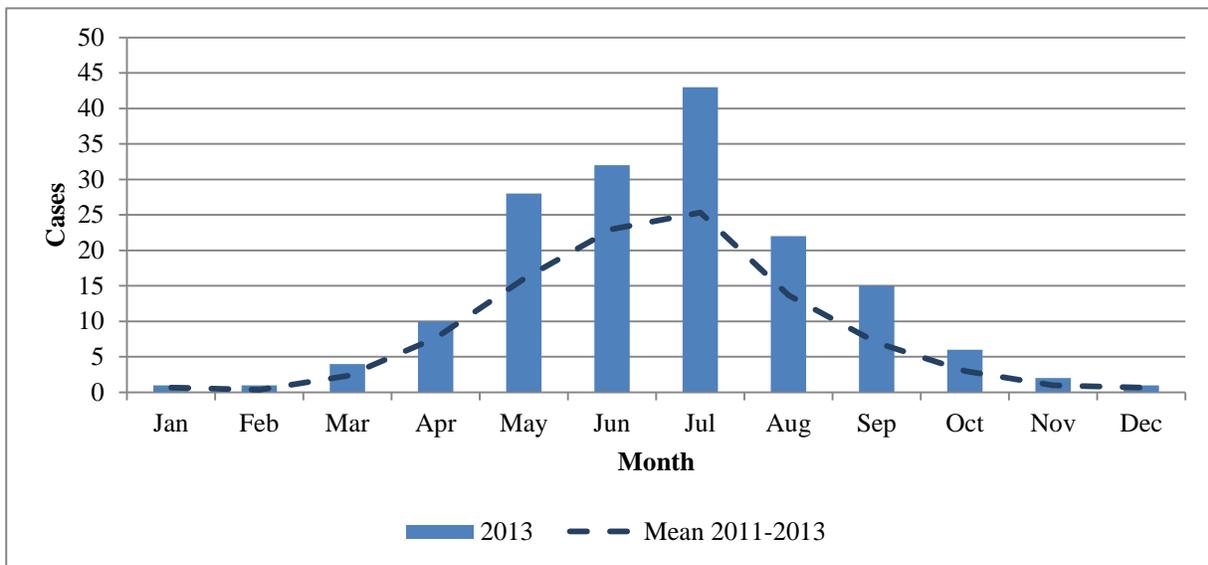


Figure 16. Ehrlichiosis Cases by ADH Public Health Region, Arkansas 2013

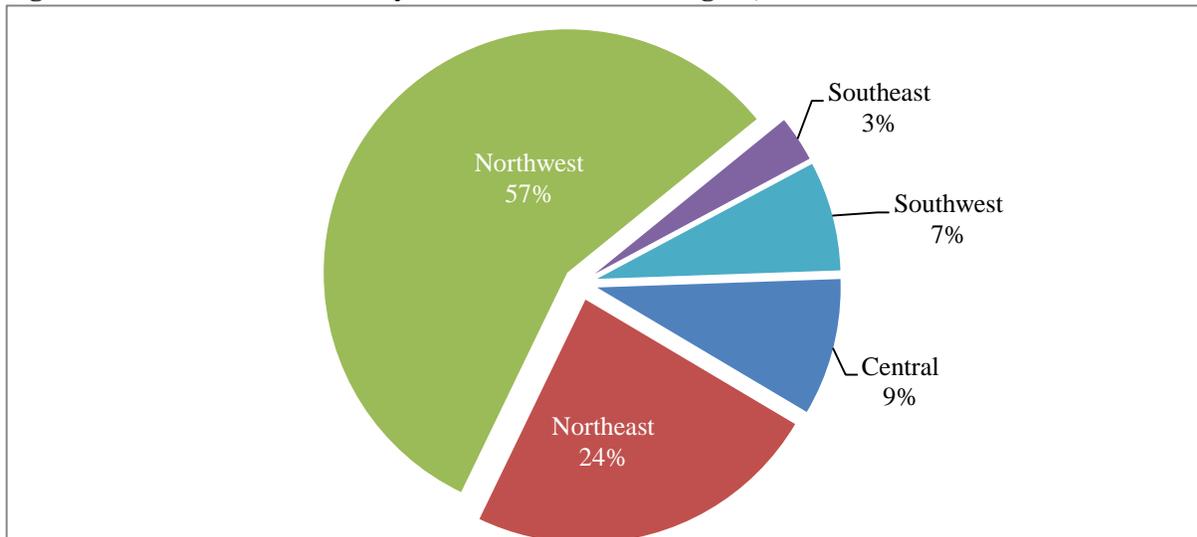


Table 2. Ehrlichiosis Demographics, Arkansas 2013

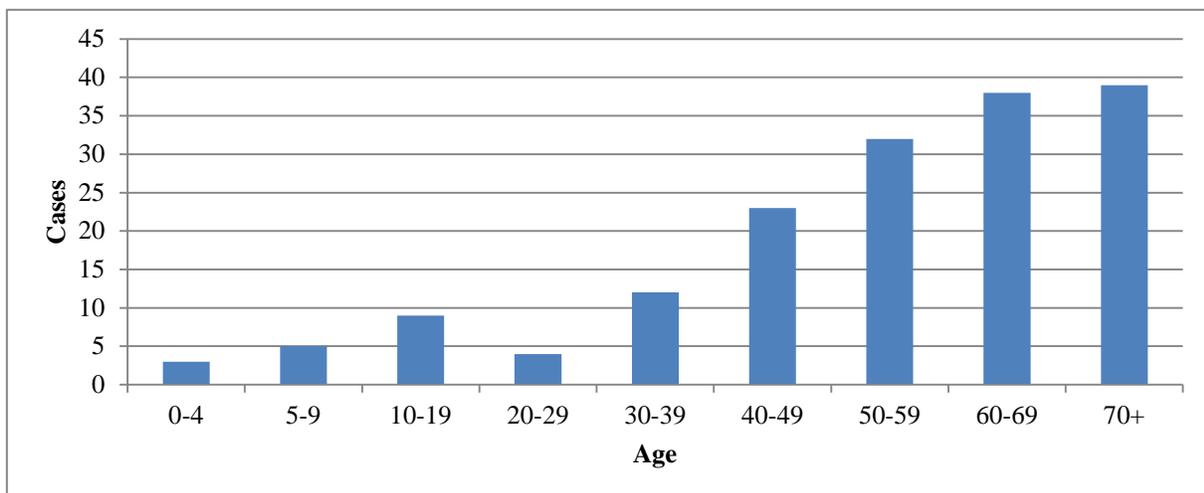
Case Status	Frequency	Percent
Confirmed	29	18
Probable	136	82
TOTAL	165	100

Age	Frequency	Percent	Male	Female	Deceased
0-4	3	2	2	1	0
5-9	5	3	3	2	0
10-19	9	5	7	2	0
20-29	4	2	3	1	0
30-39	12	7	4	8	0
40-49	23	14	15	8	0
50-59	32	19	19	13	1
60-69	38	23	21	17	0
70+	39	24	27	12	0
TOTAL	165	100	101	64	1

Race	Frequency	Percent
American Indian or Alaska Native	1	1
Black or African American	2	1
White	137	83
Unknown	25	15
TOTAL	165	100

Ethnicity	Frequency	Percent
Hispanic or Latino	2	1
Not Hispanic or Latino	147	89
Unknown or Missing	16	10
TOTAL	165	100

Figure 17. Ehrlichiosis Cases by Age Group, Arkansas 2013



Spotted Fever Rickettsiosis in Arkansas - the ADH investigated 1,107 suspect reports of Spotted Fever Rickettsiosis (SFR) in 2013, resulting in four confirmed cases and 475 probable cases in 63 counties ([Table 3](#)). The number of SFR cases reported to the ADH in 2013 was below the mean number of cases, by month, from 2011 to 2013 ([Figure 18](#)). There were two reported deaths associated with SFR in 2013. Of the 479 cases, 89 percent reported race as White, nine percent were reported as Unknown or missing, and two percent as Black/African American or American Indian/Alaska Native. Ethnicity was reported as 100 percent Not Hispanic or Latino ([Table 3](#)). Of the cases reported, nearly half were located in the Northwest Public Health Region ([Figure 19](#)), with onset of illness from January through December, peaking in June ([Figure 18](#)). The mean age of reported cases was 51 (range 1, 92). There were four reported cases in children under age 5, and 172 of the 479 reported cases were over age 60 ([Figure 20](#)).

Figure 18. Spotted Fever Rickettsiosis Cases by Month, Arkansas 2013

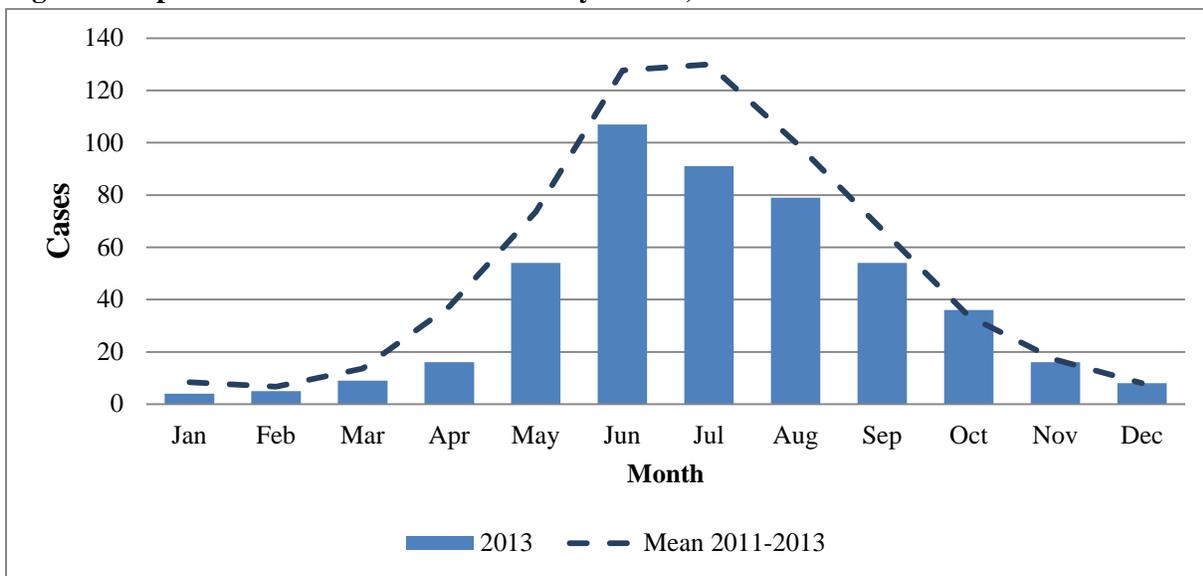


Figure 19. Spotted Fever Rickettsiosis Cases by ADH Public Health Region, Arkansas 2013

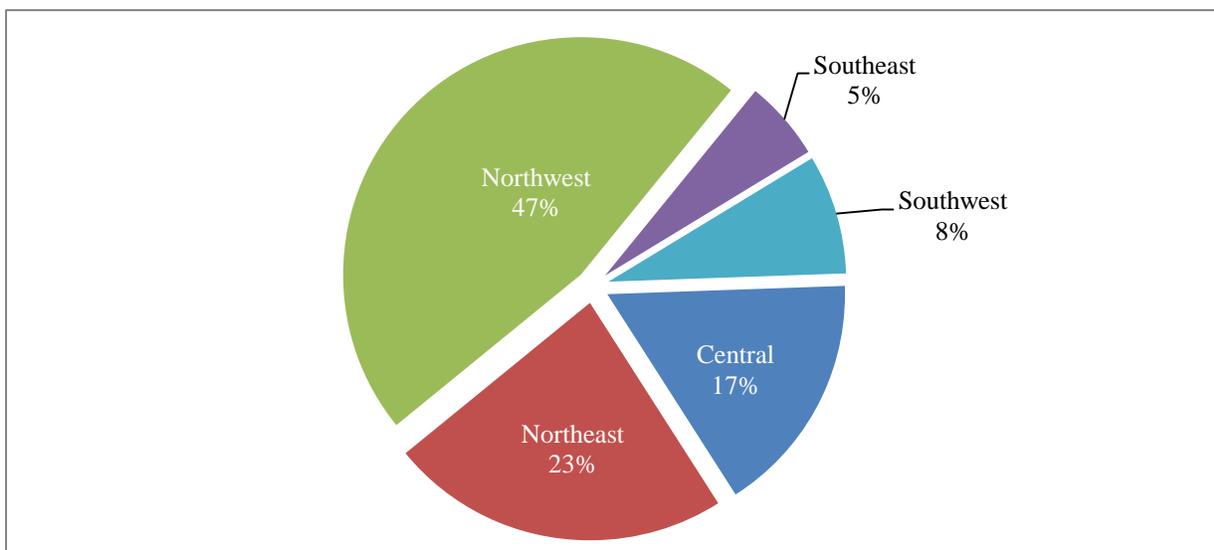


Table 3. Spotted Fever Rickettsiosis Demographics, Arkansas 2013

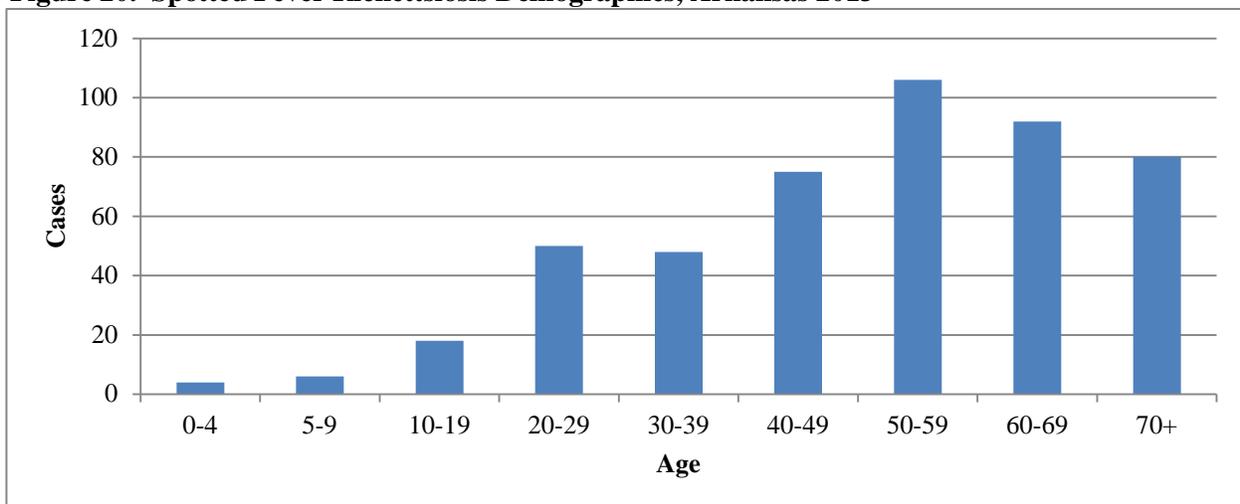
Case Status	Frequency	Percent
Confirmed	4	1
Probable	475	99
TOTAL	479	100

Age	Frequency	Percent	Male	Female	Deceased
0-4	4	1	0	4	0
5-9	6	1	3	3	0
10-19	18	4	11	7	0
20-29	50	10	38	12	0
30-39	48	10	36	12	0
40-49	75	16	49	26	0
50-59	106	22	70	36	0
60-69	92	19	70	22	0
70+	80	17	54	26	2
TOTAL	479	100	331	148	2

Race	Frequency	Percent
American Indian or Alaska Native	3	1
Asian	2	0
Black or African American	5	1
White	426	89
Unknown	43	9
TOTAL	479	100

Ethnicity	Frequency	Percent
Hispanic or Latino	8	2
Not Hispanic or Latino	423	88
Unknown or Missing	48	10
TOTAL	479	100

Figure 20. Spotted Fever Rickettsiosis Demographics, Arkansas 2013



Tularemia in Arkansas - the ADH investigated 75 suspect reports of Tularemia in 2013, resulting in 14 confirmed cases and 24 probable cases in 23 counties. The number of Tularemia cases reported to the ADH in 2013 was above the mean number of cases, by month, from 2011 to 2013 ([Figure 21](#)). There was one reported death associated with Tularemia in 2013 ([Table 4](#)). Of the 38 cases, 76 percent reported race as White, eight percent were reported as Unknown, and three percent as Native Hawaiian or Other Pacific Islander. Ethnicity was reported as 92 percent Not Hispanic or Latino and eight percent were reported as Unknown or missing ([Table 4](#)). Of the cases reported, half were located in the Northwest Public Health Region ([Figure 22](#)), with onset of illness from March through December, peaking in May ([Figure 18](#)). The mean age of reported cases was 49 (range 2, 80). There were two reported cases in children under age 5 and 13 of the 38 reported cases were over age 60 ([Figure 23](#)).

Figure 21. Tularemia Cases by Month, Arkansas 2013

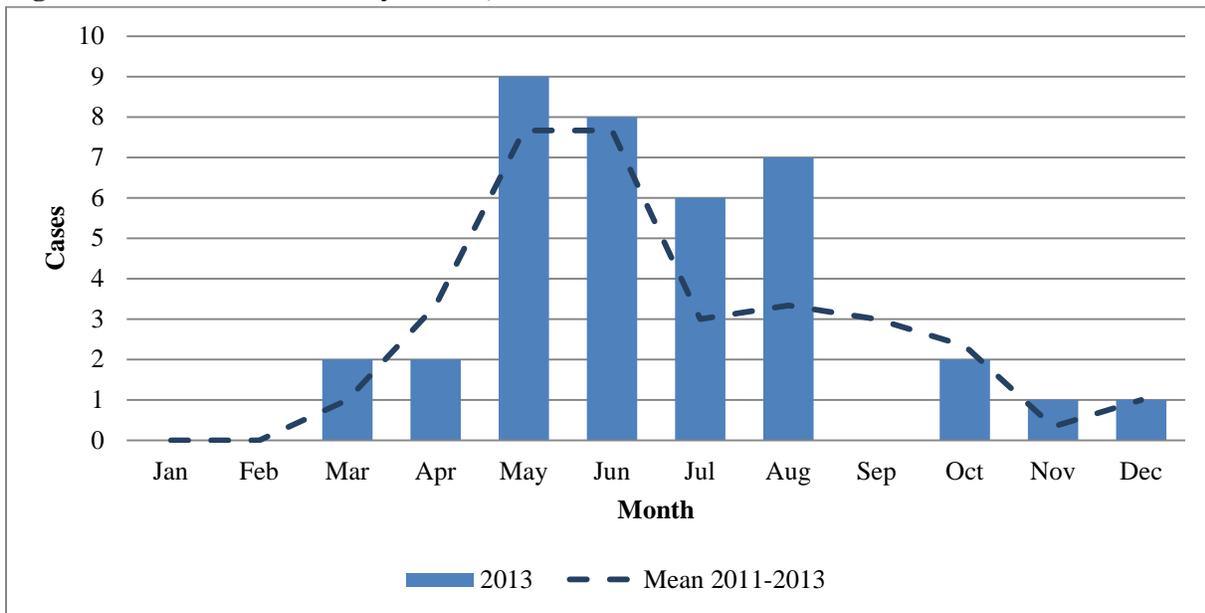


Figure 22. Tularemia Cases by ADH Public Health Region, Arkansas 2013

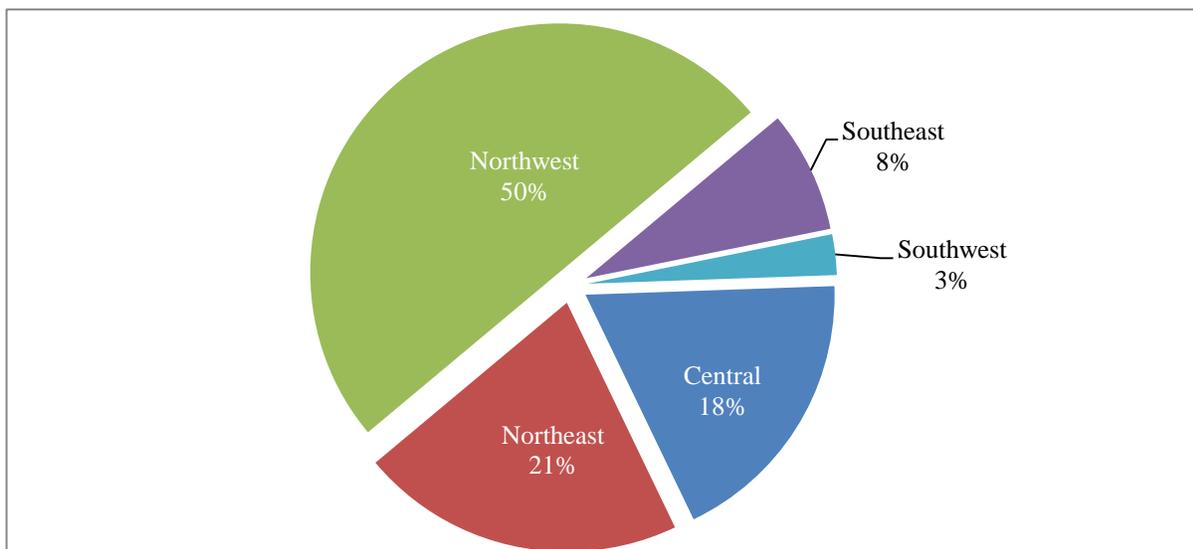


Table 4. Tularemia Demographics, Arkansas 2013

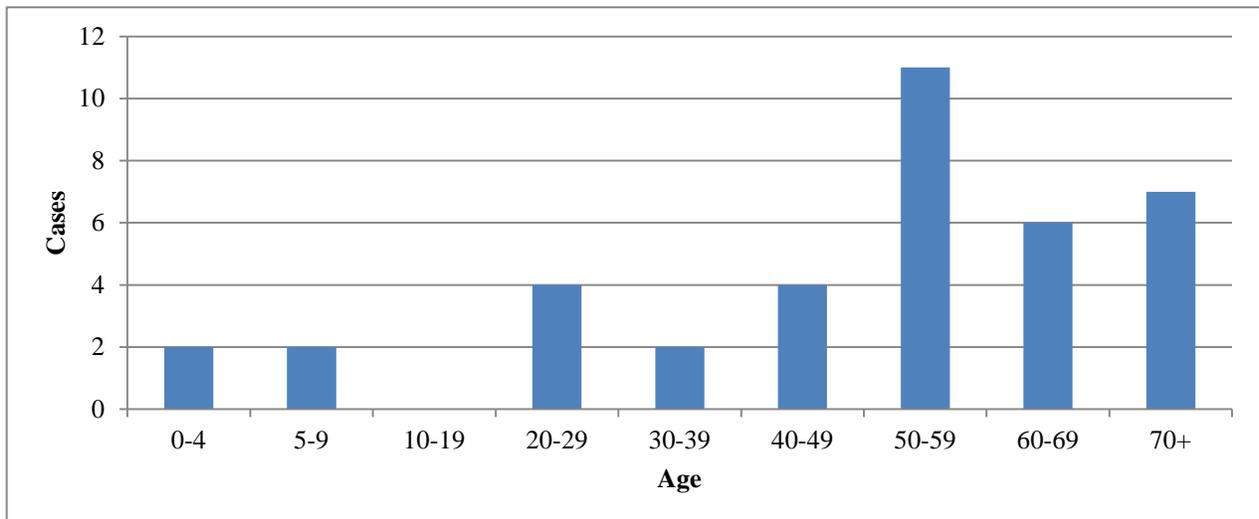
Case Status	Frequency	Percent
Confirmed	14	37
Probable	24	63
TOTAL	38	100

Age	Frequency	Percent	Male	Female	Deceased
0-4	2	5	2	0	0
5-9	2	5	1	1	0
10-19	0	0	0	0	0
20-29	4	11	4	0	0
30-39	2	5	2	0	0
40-49	4	11	2	2	0
50-59	11	29	8	3	0
60-69	6	16	4	2	1
70+	7	18	4	3	0
TOTAL	38	100	27	11	1

Race	Frequency	Percent
Native Hawaiian or Other Pacific Islander	1	3
White	29	76
Unknown / Missing	8	21
TOTAL	38	100

Ethnicity	Frequency	Percent
Hispanic or Latino	0	0
Not Hispanic or Latino	35	92
Unknown or Missing	3	8
TOTAL	38	100

Figure 23. Tularemia Cases by Age Group, Arkansas 2013



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