

Utah Arboviral Surveillance weekly report

MMWR Week 40, October 1–October 7 2023



This report contains preliminary data through the week ending **October 7, 2023**.

Background:

Utah public health conducts surveillance for [reportable arboviral diseases](#)¹ year-round. The focus of these surveillance efforts is to primarily monitor endemic mosquito-borne diseases such as West Nile virus (WNV), Saint Louis encephalitis (SLE), and Western Equine encephalitis (WEE) which includes routine testing of the mosquito vector that causes these endemic diseases along with tracking human and horse cases. WNV is the leading cause of mosquito-borne disease in the continental United States,² as well as Utah. Due to the abundance of this virus, this report will primarily contain information regarding WNV human, mosquito, and animal detections.

West Nile virus (WNV) is carried by mosquitoes and commonly found in Africa, West Asia, and the Middle East. The virus first appeared in the U.S. in 1999 and in Utah in August 2003. WNV can cause disease in humans, birds, horses, and some other mammals. WNV is most commonly spread through the bite of an infected *Culex* mosquito. Most people (70–80%) who become infected with WNV do not develop any symptoms. Those people who do become ill may experience headache, body aches, joint pain, vomiting, diarrhea, or rash. Fewer than 1% of people infected with WNV will develop a serious neurologic illness, such as encephalitis (inflammation of the brain) or meningitis (inflammation of the membranes that surround the brain and spinal cord).² There are no vaccines to prevent or medicines to treat WNV in humans. However, there is a WNV vaccine for horses that is strongly recommended for all healthy horses.³

St. Louis encephalitis (SLE) virus is spread to people by the bite of an infected mosquito. Most people infected with SLE virus do not have symptoms. Those people who do become ill may experience fever, headache, nausea, vomiting, and tiredness. Some people may develop a more serious neuroinvasive disease. In rare cases, long-term disability or death can occur. There are no vaccines to prevent or medicines to treat SLE.⁴

Beginning in 2023, this report has been expanded to enhance awareness of other mosquito-borne diseases that have been historically travel-associated. These include chikungunya, dengue, yellow fever, zika, and malaria. These enhanced efforts resulted from recent [locally-acquired malaria \(2023\)](#)⁵ and [dengue \(2022\)](#)⁶ cases reported in other states. Utah has not seen locally-acquired transmission of these diseases. Utah does have the mosquito vectors that can transmit malaria (*Anopheles* species) and dengue (*Aedes aegypti*) across the state. We consider the risk of local transmission to be very low, because our vector numbers in the state are very small and the *Anopheles* vectors we have in the state are not the most efficient mosquito vector for the malaria parasite. However, it is important we remain vigilant in our surveillance efforts.

Anopheles (the vector for malaria) mosquito detection has been reported by every mosquito abatement district across the state and, in most cases, since the start of each district's inception. The two species of *Anopheles* found most commonly in Utah are *A. freeborni* and *A. franciscanus*; other *Anopheles* species are also found each year in Utah, but are usually found in small numbers.

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Aedes aegypti, the vector for dengue and zika, has been detected in multiple areas of the Southwest health jurisdiction, as well as in Moab, Utah. *A. aegypti* was first detected in 2013 in Southwest, and since then, has been found every year since 2020 in that jurisdiction. In 2023, Southwest detected *A. aegypti* in a new location. *A. aegypti* was first found in Moab in September 2019, and has since been found in 2021, 2022, and 2023. In 2023, *A. aegypti* was found at 3 sites and there have been 8 detections, totaling 13 mosquitoes.

Data presented in this report are based on currently available data and are subject to change. Mosquito abatement districts (MADs) report positive WNV, SLE, and WEE results to the Utah Department of Health and Human Services (DHSS) by end of day Friday during each MMWR week. However, testing varies by county and not all counties actively test for arboviruses in mosquitoes and animals. Additionally, mosquito-borne disease case reports done by local health districts (LHDs) might still be under investigation and may not be included in the report in a timely manner. Therefore, these data should not be used to assess the current risk of contracting arboviruses in any particular location.

WNV testing protocols:

Human cases

All arboviral and parasitic diseases included in this report are [reportable to the Utah Department of Health & Human Services](#).¹ Healthcare providers across the state submit human samples to both the Utah Public Health Laboratory (UPHL) and private laboratories. The 3 major blood banks serving Utah (American Red Cross, ARUP, and Mountain Star) coordinate screening of donated blood for identification of viremic donors. All LHDs in Utah are involved in dissemination, investigation, and response to surveillance data which indicates of local arboviral activity.

Horse cases

West Nile virus in horses is also [reportable to the Utah Department of Agriculture and Food \(UDAF\)](#)⁷ in the state of Utah. All laboratory reports of positive cases are sent to the state veterinarian at UDAF, who shares the cases with DHHS to report out statewide WNV activity.

Bird cases

Even though routine sentinel chicken surveillance is no longer funded statewide, a few MADs continue to maintain this surveillance activity and report the positive chickens identified through this method to DHHS. In addition, while routine wild bird surveillance is no longer funded statewide, the Utah Department of Wildlife Resources (UDWR) reports any wild bird identified through passive surveillance that tests positive for WNV throughout the season.

Mosquito pools

Mosquito pooling is a collection and testing method where mosquitoes are grouped in numbers of up to 100 mosquitoes, and the grouped mosquitoes are then tested for mosquito-borne pathogens. Local MADs and tribal abatement districts, in conjunction with the Utah Mosquito Abatement Association, perform necessary trapping and identification for mosquito surveillance. Mosquito pool confirmatory testing is conducted at the UPHL.

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[Link to interactive WNV mosquito and animal activity map by county, Utah, 2023](#)

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New this week

Utah WNV updates

Humans

As of October 7, 2023, 6 WNV positive human cases have been reported in Davis County (2), Salt Lake County (1), TriCounty (2) and Weber-Morgan (1) Utah health districts. The first case was reported on 7/1/2023.

Horses

As of October 7, 2023, 16 WNV positive horses have been reported in Utah from Cache (1), Garfield (1), Duchesne (2), Emery (1), Grand (1), Tooele (2), Rich (1), Utah (3), Washington (1) and Weber (3) counties. The first horse was reported on 8/14/23 in Duchesne county.

Birds

As of October 7, 2023, 2 WNV positive bird has been reported in Utah in 2023. DWR reported a positive Sage Grouse on 8/15/2023 in Wasatch County, and Tooele County reported a positive chicken on 9/14/23.

Mosquito pools

As of October 7, 2023, 295 WNV positive mosquito pools have been reported in Utah by Box Elder (4), Cache (1), Davis (49), Duchesne (21), Millard (21), Grand (1), Salt Lake (102), Tooele (9), Washington (10), Uintah (60), Utah (7), and Weber (10) counties. Additionally, 1 SLE positive mosquito pool was reported in Washington county on 8/21/23. To date in 2023, the UPHL and mosquito abatement laboratories have tested a total of 11,922 mosquito pools. The first positive WNV pool was identified in Davis County on July 14, 2023.

West Nile virus comparisons, Utah, 2023, 2022, and 2021 YTD

	2021 YTD	2022 YTD	2023 YTD
Counties where WNV has been detected (human, animal, or mosquito cases)/Total Utah counties	9/29	9/29	15/29
Human WNV cases	20	5	6
Horse WNV cases	12	6	16
Positive mosquito pools/Number tested	654/9,248 (7.07%)	144/8,715 (1.65%)	295/11,922 (2.47%)

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WNV testing summaries

YTD West Nile positive samples by local health district, 2023

Health jurisdiction	WNV positive humans	WNV positive horses	WNV positive mosquito pools
Bear River	0	2	5
Central	0	0	21
Davis County	2	0	49
Salt Lake County	1	0	102
San Juan County	0	0	0
Southeast	0	2	1
Southwest	0	2	10
Summit County	0	0	0
Tooele County	0	2	9
TriCounty	2	2	81
Utah County	0	3	7
Wasatch County	0	0	0
Weber Morgan	1	3	10
Total	6	16	295

Mosquito pools positive/total tested, 2023

	WNV	SLEV	WEEV
Week	0/0 (0.0%)	0/0 (0.0%)	0/0 (0.0%)
YTD	295/11,922 (2.47%)	1/11,922 (0.01%)	0/11,922 (0.0%)

WNV = West Nile virus; SLEV = St. Louis encephalitis virus; WEEV = Western Equine encephalitis virus

Human cases of West Nile virus, 2023

Age group	Total	Deaths	Neuroinvasive
1-14	0	0	0
15-24	1	0	0
25-44	0	0	0
45-64	3	0	2
65-84	1	0	1
85+	1	0	0
State total	6	0	3

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Utah: other mosquito-borne disease updates

(including chikungunya, dengue, malaria, and zika)

This week, there was 1 new travel-associated malaria case. To date in 2023, there have been a total of 13 malaria cases, 6 dengue cases, 1 probable chikungunya case, and 1 zika case reported in Utah—all of these were acquired out of country and considered travel-associated cases.

Disease/infection	Number of new cases this week	Total number of cases in 2023	Locally acquired	Travel associated
Chikungunya	0	1	0	1
Dengue	0	6	0	6
Malaria	0	13	0	13
Zika	0	1	0	1

New this week

National updates

Travel advisories

Dengue			Chikungunya	Yellow fever
Africa/Middle East	Americas	Asia/Pacific Islands	Americas	Africa/Middle East
Chad Côte d'Ivoire Egypt Mauritius Sudan	Argentina Colombia Cuba Guadeloupe Guatemala Jamaica Martinique Nicaragua Panama Peru	Bangladesh Cambodia Laos Malaysia Maldives Myanmar (Burma) Pakistan Philippines Sri Lanka Taiwan Thailand Vietnam	Paraguay	Nigeria

Level 1 Travel Health Notice, **Level 2 Travel Health Alert**: wwwnc.cdc.gov/travel/notices.

For a map of arboviral disease activity in the United States visit: <https://www.cdc.gov/fight-the-bite/at-risk/index.html>.

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Table 1. West Nile virus disease cases and infections reported to ArboNET, 2023
Provisional data as of October 3, 2023

Jurisdiction	Human disease cases				Presumptive viremic blood donors
	Neuroinvasive cases	Non-neuroinvasive cases	Total	Deaths	
Alabama	17	0	17	0	3
Arkansas	5	1	6	0	0
Arizona	62	14	76	8	8
California	120	49	169	5	21
Colorado	279	263	542	37	103
Connecticut	1	3	4	0	0
District of Columbia	1	0	1	0	0
Delaware	4	0	4	0	0
Florida	3	2	5	0	4
Georgia	12	2	14	0	5
Iowa	4	2	6	0	5
Idaho	22	7	29	0	4
Illinois	77	12	89	5	19
Indiana	5	1	6	0	2
Kansas	25	9	34	3	22
Kentucky	2	0	2	1	0
Louisiana	28	5	33	2	10
Massachusetts	2	0	2	0	0
Maryland	3	3	6	1	0
Michigan	10	1	11	1	1
Minnesota	5	8	13	1	28
Missouri	19	1	20	2	9
Mississippi	13	4	17	0	4
Montana	20	17	37	0	8
North Carolina	6	0	6	0	6
North Dakota	25	22	47	0	14
Nebraska	72	48	120	5	34
New Jersey	4	1	5	1	2
New Mexico	36	18	54	3	11
New York	27	1	28	2	1
Ohio	10	0	10	1	2
Oklahoma	22	7	29	2	10
Oregon	2	11	13	0	3
Pennsylvania	0	5	5	0	1
South Carolina	2	1	3	0	3
South Dakota	38	42	80	2	3
Tennessee	8	2	10	3	2
Texas	39	11	50	6	27
Utah	2	3	5	0	1
Virginia	6	1	7	0	0
Washington	2	1	3	0	0
Wisconsin	3	1	4	0	5
West Virginia	1	0	1	0	0

Table 1. West Nile virus disease cases and infections reported to ArboNET, 2023
Provisional data as of October 3, 2023

Jurisdiction	Human disease cases				Presumptive viremic blood donors
	Neuroinvasive cases	Non-neuroinvasive cases	Total	Deaths	
Wyoming	12	10	22	2	13
Totals	1056	589	1645	93	394

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Table 6. St. Louis encephalitis virus disease cases reported to ArboNET, 2023
Provisional data as of October 3, 2023

Jurisdiction	Neuroinvasive disease cases	Non-neuroinvasive disease cases	Total cases	Deaths
California	1	2	3	0
South Carolina	1	0	1	0
Totals	2	2	4	0

Table 7. Chikungunya virus disease cases reported to ArboNET, 2023
Provisional data as of October 3, 2023

Jurisdiction	Travel-associated disease cases	Locally acquired disease cases	Total cases
Alabama	1	0	1
California	3	0	3
Colorado	5	0	5
District of Columbia	1	0	1
Florida	1	0	1
Illinois	5	0	5
Louisiana	1	0	1
Maryland	3	0	3
Michigan	1	0	1
Missouri	1	0	1
North Carolina	4	0	4
New Jersey	8	0	8
New York	20	0	20
Oregon	2	0	2
Pennsylvania	4	0	4
Rhode Island	1	0	1
South Carolina	1	0	1
Utah	1	0	1
Virginia	2	0	2
Washington	2	0	2
Totals	67	0	67

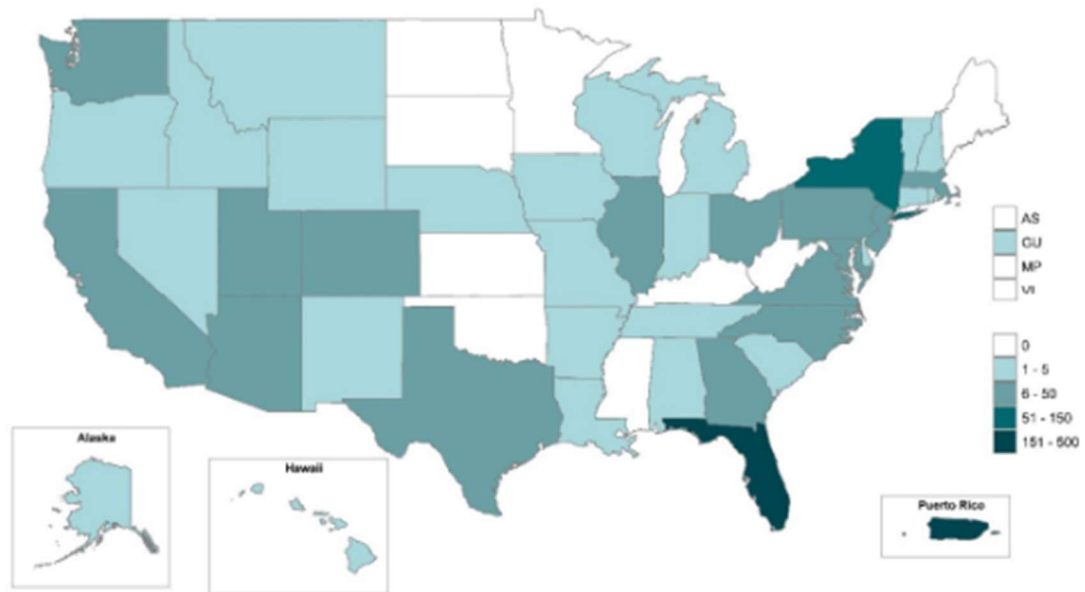
Table 8. Zika virus non-congenital disease cases reported to ArboNET, 2023
Provisional data as of October 3, 2023

Jurisdiction	Travel-associated disease cases	Locally acquired disease cases	Total cases
Idaho	1	0	1
Illinois	1	0	1
Puerto Rico	0	22	22
Utah	1	0	1
Totals	3	22	25

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Figure 1. Dengue cases reported to ArboNET — United States, 2023 (as of October 4, 2023).



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References:

1. Utah reportable diseases: https://epi.utah.gov/wp-content/uploads/Rpt_Disease_List.pdf
2. WNV: <https://www.cdc.gov/westnile/index.html>
3. WNV vaccine for horses: <https://aaep.org/guidelines/vaccination-guidelines/core-vaccination-guidelines/west-nile-virus>
4. St. Louis Encephalitis: <https://www.cdc.gov/sle/index.html>
5. Locally acquired malaria: <https://emergency.cdc.gov/han/2023/han00494.asp>
6. Locally acquired Dengue: <https://www.cdc.gov/mmwr/volumes/72/wr/mm7211a5.htm>
7. UDAF reportable diseases: <https://ag.utah.gov/wp-content/uploads/2021/07/Utah-Reportable-Animal-Disease-List-July-2021.pdf>

Special thanks to the California Department of Health for their [report format inspiration](#).

The Utah Department of Health and Human Services monitors [reportable arboviruses](#) year-round. If you have any questions about arboviruses, call 1-888-EPI-UTAH or send an email to vbzd@utah.gov.