

Zoonotic Disease

A Zoonotic Disease Summary for Public Health Personnel in the United States Army

INSIDE

In this issue: Focus on Heartland virus, a tick-borne virus discovered in the United States in 2009. Find summaries of Army tick and mosquito testing, animal disease cases, rabies animal testing, and human zoonotic disease cases diagnosed at Army and Joint Base (JB) military treatment facilities (MTFs) or their designated catchment areas.



Amblyomma americanum adult. Photo courtesy of Graham Snodgrass, USAPHC.

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Executive Summary

Human Disease

The most frequently identified zoonotic diseases among both Army Active Duty (AD) and beneficiaries are tick-borne (Lyme disease and Rocky Mountain Spotted Fever), indicating a need for continued emphasis on insect-bite prevention.

- **Zoonotic Diseases as a Proportion of Reportable Medical Events:** In 2014, zoonotic diseases comprised **7.4% (155/2,158)** of all Reportable Medical Events (RMEs), excluding sexually transmitted infections (STI). Zoonotic disease reports among Army AD Service Members (SMs) comprised **4.3% (46/1,064)** of all non-STI RMEs; among non-AD beneficiaries, zoonotic RMEs comprised **7.7% (60/782)**.
- **Most Common Zoonosis:** Borreliosis, which includes Lyme disease, continued to be the most frequently reported zoonotic RME, comprising **86.5%** of all reported zoonotic events. Borreliosis was also the most commonly coded zoonotic diagnosis in medical records, making up **59.7% (334/559)** of zoonotic diseases identified.

Animal Disease

The top 4 zoonotic diseases captured in veterinary records are tick-borne; use of animal preventives should be emphasized.

- A total of **1,031** records of zoonotic disease were captured in ROVR (Remote Online Veterinary Record) in 2014. Of diseases monitored in this report, borreliosis (**39.2%**) and ehrlichiosis (**37.9%**) were the most commonly identified, followed by anaplasmosis (**13.3%**), babesiosis (**4.1%**), leishmaniasis (**3.2%**), Rocky Mountain Spotted Fever (RMSF) (**2.0%**), and leptospirosis (**0.7%**). All records were for canines: **79%** pets, **21%** working dogs. No cases of Yersinia, Q fever, or West Nile virus disease were identified. There was **1** case of rabies diagnosed in a stray cat in Fort Hood, Texas.

Rabies among feral and domestic animals remains problematic in many countries. The United States continues to see rabid animals despite prevention efforts. Rabies testing of animal specimens by Army labs indicates some Army personnel may encounter rabies-positive animals. Veterinarians should continue to emphasize rabies vaccination for domestic animals.

- **Rabies:** In 2014, **267** international rabies events were reported. **4,648** rabies positive animal samples were reported from 34 US states, the majority from wild animals (**91.3%**). Bats were the most frequently identified infected species (**29.5%**), followed by raccoons (**26.0%**) and skunks (**26.9%**). **189** animal specimens associated with **147** human exposures were tested for rabies by Army labs; **3.7% (7/189)** of specimens were positive, **6.3% (12/189)** were indeterminate. PHCR-Europe tested 29 of the animal samples, mostly from Central Command (**86.2%**). **8** specimens from Afghanistan tested indeterminate; no other samples from Europe or Central Command were indeterminate or positive. Installations from PHCR-North, South, West, and Pacific submitted **160** samples associated with **126** human exposures to the DoD Food Analysis and Diagnostic Laboratory. **7** samples were positive (**6** from Texas, **1** from Colorado) and **4** were indeterminate.

Vector Surveillance

Mosquito pool testing indicates West Nile virus remains a potential threat to human health in all CONUS regions and Africa; Soldiers in Africa also need to be aware of the ongoing threat posed by dengue virus and malarial parasites. Tick testing indicates established and emerging tick-borne diseases remain a threat. Leaders at all levels should continue to emphasize the use of permethrin-treated uniforms, insect repellent, and tick-checks.

- A total of **2,535** mosquito pools from military installations in the United States were tested for West Nile virus (WNV) in 2014; all positive pools were *Culex* spp. Overall, **4.6% (99/2,174)** of *Culex* spp. pools were WNV positive. In PHCR-North, **85 of 930 (9.1%)** pools tested positive, **2 of 1,020 (0.2%)** pools in PHCR-South tested positive, and **12 of 224 (5.4%)** of *Culex* spp. mosquito pools in PHCR-West were positive.
- In 2014, PHCR-Europe tested **1,460** mosquito pools from Africa and Afghanistan for a variety of pathogens. **0.2% (2/1,248)** of *Culex* spp. pools tested positive for WNV, **195** *Aedes* spp. pools were tested for chikungunya virus (**0** positives) and dengue virus (**0.5%** positive), and **17** *Anopheles* spp. pools were tested for *Plasmodium* spp. (**5.9%** positive).
- In 2014, **2,934** ticks were removed from humans and submitted to the DoD Tick Test Kit Program at the Army Institute of Public Health from installations in the U.S. **265** *I. scapularis* were tested, **77 (29.1%)** tested positive for *Borrelia burgdorferi*, the Lyme disease pathogen. Of **2,208** *A. americanum* ticks, **41 (1.9%)** were positive for *Ehrlichia ewingii* and **24 (1.1%)** for *E. chaffeensis*.

Human Disease Summary: U.S. Army Reportable Medical Events

Zoonotic Diseases in DoD Beneficiaries from Army & Joint Army Installations in DRSi, 2014

- Excluding STIs, 2,158 RME records with date of diagnosis in calendar year 2014 were entered into DRSi. Of these, 155 (7.2%) were for zoonotic diseases: 61 AD SMs (46 Army, 7 Air Force, 6 Navy, and 1 Marine Corps and US Public Health Service) and 94 non-AD beneficiaries (family members, retirees, civilians).
- In addition, 10 Army cases were reported from non-Army locations (data not shown): 8 borreliosis (7-NRMC, 1-WRMC), 1 West Nile virus (IgM positive) from SRMC, and 1 ehrlichiosis/anaplasmosis from WRMC.

Region and Location		Borreliosis (Lyme Disease)		Brucellosis		Hantavirus Disease		Q Fever		Rocky Mountain Spotted Fever	
		AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN
ERMC	USAG§ Stuttgart, GM	3	1			2					
	USAG Bavaria, GM	5	3								
	USAG Rheinland-Pfalz, GM	2	3								
	USAG Wiesbaden, GM	1									
	EUROPE TOTAL	11	7			2					
PRMC	USA Hawaii, HI	1									
	USAG Red Cloud, KO					1					
	PACIFIC TOTAL	1				1					
NRMC	Aberdeen Proving Ground, MD		1								
	Carlisle Barracks, PA	1	5								
	Fort Belvoir, VA	1	4					1	1		
	Fort Bragg, NC	1	2							1	
	Fort Detrick, MD		1								
	Fort Drum, NY	3	6								
	Fort Knox, KY										2
	Fort Lee, VA	4	1							2	2
	Fort Meade, MD	5	4								
	JB Andrews, MD	1									
	JB Langley-Eustis, VA		1								
	JB Myer-Henderson Hall, VA	2	2							1	
	National Capital Region, VA		5								
	New Cumberland Army Depot, PA	1	2								
	Walter Reed NMMC, MD	6	19							1	2
West Point USMA, NY	1	13									
NORTH TOTAL	26	66						1	6	6	
SRMC	Fort Campbell, KY	4	4	1							
	Fort Hood, TX	1	1								
	Fort Rucker, AL	1									2
	Fort Stewart, GA	2	1								
	SOUTH TOTAL	8	6	1							2
WRMC	Fort Huachuca, AZ	1	1								
	Fort Leavenworth, KS		1								
	Fort Riley, KS	2	2								2
	Fort Wainwright, AK	1									
	JB Lewis-McChord, WA	1									
WEST TOTAL	5	4								2	
Total		51	83	1		3			1	6	10

§ Locations listed as garrisons (e.g., USAG -U.S. Army Garrison) include all human cases from any clinics within the garrison (cases from multiple clinics are rolled up into garrison totals).

Note: US Army Medical Command is divided into Region Medical Commands that oversee MTFs in their area:

ERMC: Europe
PRMC: Pacific
NRMC: North
SRMC: South
WRMC: West

- Two tick-borne diseases (borreliosis and Rocky Mountain Spotted Fever [RMSF]) comprised the majority (96.8%, 150/155) of all zoonotic disease records in DRSi in 2014; borreliosis (including Lyme disease) alone makes up 86.5% (134/155) of records. Of 134 borreliosis cases, 38 Army AD, 52 Army beneficiaries, and 44 non-Army were reported: 92 cases from NRMC (68.7%, 92/134), 18 from ERMC (13.4%), 14 from SRMC (10.4%), 9 from WRMC (7.8%), and 1 from PRMC. The 1 borreliosis case from PRMC had chronic symptoms. The majority of RMSF cases were reported from NRMC (75.0%, 12/16); SRMC and WRMC each reported 12.5% (2/16) of cases.
- All 3 hantavirus disease cases were in Army SMs: 1 had leisure travel, 1 had duty-related exposure, and the third had an unknown source. The brucellosis case occurred in an Army SM reporting wild animal hunting. The Q fever case occurred in a non-US military SM reporting travel in both Europe and the U.S. with source unknown.

Human Disease Summary: U.S. Army Location Medical Data

Zoonotic Disease Cases in DoD Beneficiaries Identified from Medical Visit Data in M2, 2014

- M2 in- and outpatient records from Army and JB MTFs as well as purchased care records from beneficiaries residing within these catchment areas were reviewed for zoonotic disease diagnoses codes; modified AFHSC case definitions and incident rules were applied to identify new cases. Verification of diagnoses via chart review was not possible. Cases listed in this section may not meet RME reporting guidelines, leading to higher case counts than reported elsewhere.
- During 2014, 559 newly diagnosed zoonotic diseases were identified in M2. Most cases were identified from Army or JB MTFs (63.7%), with the remainder identified from medical claims submitted from beneficiaries residing in these catchment areas (data not shown). 169 (30.2%) zoonotic diseases were diagnosed among AD SMs.
- Borreliosis (including Lyme disease) was the most common zoonosis diagnosed in 2014 (59.7%, 334/559). RMSF was the second most common zoonosis identified (18.6%, 104/559), followed by leptospirosis (9.7%, 54/559).
- The majority of diseases (63.1%) were diagnosed in NRMCM, followed by SRMCM (27.2%), and WRMCM (14.5%).

Region and Location		Borreliosis (Lyme Disease)		Babesiosis		Ehrlichiosis [¶]		Spotted Fever Rickettsiosis [§]		Q Fever		Tick-borne Encephalitis		Leptospirosis		Leishmaniasis [#]	
		AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN
ERMCM	USAG Rheinland-Pfalz, GM	5	11														
	USAG Stuttgart, GM	2	5									2	11				
	USAG Vicenza, IT													2			
	USAG Bavaria, GM		1										1				
	USAG Wiesbaden, GM		2														
EUROPE TOTAL		7	19	0	0	0	0	0	0	0	0	2	12	2	0	0	0
PRMCM	Camp Humphreys, KO		1														
	USAG Yongsan, KO	1															
	USA Hawaii, HI	3	2					1	1	1			1	39	5		
PACIFIC TOTAL		4	3	0	0	0	0	1	1	1	0	0	1	39	5	0	0
NRMCM	Aberdeen Proving Ground, MD		1														
	Carlisle Barracks, PA	2	6				1										
	Fort Belvoir, VA	2	20		2	1	1	4	4		1				1		
	Fort Bragg, NC	9	19				1	6	28			1			2	1	1
	Fort Detrick, MD		2								1						
	Fort Drum, NY	4	4														
	Fort Knox, KY		5				1	3	6								1
	Fort Lee, VA	2	3						1								
	Fort Meade, MD		4														
	JB Langley-Eustis, VA		2														
	JB Myer-Henderson Hall, VA		2														
	New Cumberland Army Depot, PA		3														
	Walter Reed NMMC/Pentagon, NCR	10	57		4		1	2	5							1	
	West Point USMA, NY	4	32		1		4										
NORTH TOTAL		33	160	0	7	2	8	15	45	0	2	1	1	2	3	1	1
SRMCM	Fort Benning, GA	1	1					2	3								1
	Fort Campbell, KY	5	13				3	5	8								
	Fort Gordon, GA	1	3														
	Fort Hood, TX	1	3							3	3	1			1	1	
	Fort Jackson, SC		1				1		3			1			1		
	Fort Polk, LA	5	3														
	Fort Rucker, AL							1	2								
	Fort Sill, OK	6	4					2	1				1				
	Fort Stewart, GA		1														
	Fort Gordon, GA	1															
	JB San Antonio, TX	3	6					1			1						1
	Redstone Arsenal, AL		1					1	1								
	SOUTHCOM MMH, FL		2														
	SOUTH TOTAL		23	38	0	0	0	6	10	21	3	2	1	1	0	2	1
WRMCM	Fort Bliss, TX	1	4		1			1							1		
	Fort Carson, CO		4					1			1						
	Fort Huachuca, AZ		2														
	Fort Irwin, CA								1								
	Fort Leavenworth, KS	1	2			1		2	1								
	Fort Leonard Wood, MO	3	8				2	1	1								
	Fort Riley, KS	3	13						2								
	Fort Wainwright, AK	1	1														
JB Lewis-McChord, WA	2	2					1			1							
WEST TOTAL		11	36	0	1	1	2	6	5	0	2	0	0	0	1	0	0
TOTAL		78	256	0	8	3	16	32	72	4	6	4	15	43	11	2	3

[¶] Cases due to *E. ewingii* or *E. chaffeensis*.

[§] Cases due to *Rickettsia rickettsii* or *R. parkeri*.

[#] Cases of cutaneous Leishmaniasis.

Diseases with <5 cases excluded: Brucellosis (n=3; 1 AD, 2 BEN), Hantavirus (2 AD), WNV (1 BEN). No CCHF or Equine arbovirus cases were identified.

Human Disease Summary: *Notable Disease Events*

Middle East Respiratory Syndrome-Coronavirus (MERS-CoV), as of 1 January 2015

- From April 2012 through 1 January 2015, 962 cases of Middle East Respiratory Syndrome-Coronavirus (MERS-CoV) and 391 deaths have been reported.¹
- Numbers of cases and deaths more than quadrupled in 2014 compared to 2012-2013; the reasons for this increase are unknown.²
- Almost all cases since 2012 (98%, 939/962) are reported from countries in or near the Middle East. Saudi Arabia continues to report the most cases, accounting for 86% (825/962) of all cases and 91% (356/391) of all deaths.
- Limited person-to-person transmission has been observed. While the definitive source and mode of transmission have not been identified, both bats and camels have been implicated as reservoirs.

Region	2012-2013*		2014	
	Cases	Deaths	Cases	Deaths
Middle East	166	69	773	312
Europe	9	5	5	2
Africa	3	1	2	1
Asia	0	0	2	1
Americas	0	0	2	0
Total	178	75	784	316

* 2012-2013: April 2012 through 9 January 2014.
2014: 9 January 2014 through 1 January 2015.

Avian-Associated Human Influenza Cases, 2014

Human Influenza A(H5N1)		
Country	2014	
	Cases	Deaths
Cambodia	9	4
China	2	0
Egypt	31	9
Indonesia	2	2
Viet Nam	2	2
Total	46	17

- From 2003 through 2014, WHO reports a total of 695 cases of human influenza A(H5N1). Since 2003, 16 countries have reported cases, including 402 deaths (58% case fatality).³
- More H5N1 cases but fewer deaths were reported in 2014 than in the previous 2 years. From 2003 - 2014, Egypt (204/695, 29.4%) and Indonesia (197/695, 28.3%) reported the most cases; together they reported more than half (57.7%) of all cases.
- Since influenza A(H7N9) was identified in China in March 2013 nearly 500 cases have been confirmed.⁴ Two epidemic waves have occurred with 134 cases detected in the 1st (January - September 2013), and 306 cases in the 2nd (October 2013 - October 2014).⁵
- Control of H7N9 is difficult because infected birds are asymptomatic. In humans, the virus continues to display limited transmissibility.

Human Ebola Virus Disease (EVD) Outbreak Cases and Fatalities, 2014

Transmission	Country	2014	
		Cases	Deaths
Widespread	Guinea	2,707	1,709
	Liberia	8,018	3,423
	Sierra Leone	9,446	2,758
Travel-associated/ Localized	Nigeria	20	8
	Mali	8	6
	United States	4	1
	United Kingdom	1	0
	Spain	1	0
	Senegal	1	0
Total		20,206	7,905

Note: Cases include all case statuses. Numbers of cases and deaths are preliminary and subject to revision.

- In March 2014, over 50 deaths in February in Guinea were confirmed due to Ebola virus disease. Since then, the outbreak has affected 9 countries, 3 significantly.⁶
- In 2014, EVD infected 20,206 people, killing at least 7,905 (a known underestimation). 24 individuals were evacuated or repatriated from Ebola-affected countries to countries with higher levels of care.⁷
- The case-fatality rate for this outbreak is estimated between 60-71% in areas of widespread transmission.
- Ebolavirus spills into humans from handling infected animals (e.g., bats, chimpanzees, gorillas) and then spreads from human to human through close contact with infected blood and/or body fluids.

Animal Disease Summary: *International Rabies*

International Rabies Reporting through FAO's EMPRES-i, 2014

Region	Country	Type	Species	No. of Events (w/only one species)	No. of Events* (in which the species is involved)	Total Events
Africa	DR Congo	Domestic	Dog	1	1	1
Americas	Peru	Domestic	Cattle	90	135	140
			Equidae	2	28	
			Swine	8	24	
			Sheep	1	11	
			Goats	1	4	
			Unsp. Bird	1	2	
	Uruguay	Domestic	Cattle	1	3	3
			Sheep	0	2	
Cat, Dog, Horse, Swine			n/a	1		
Asia	China	Wild	Civet	1	1	112
			Ferret-badger	97	97	
			Unsp. Mammal	14	14	
			Dog	2	2	
Europe	Greece	Domestic	Dog	2	2	11
		Wild	Fox	11	11	

- In 2014, five countries reported 267 rabies-associated events to the FAO EMPRES-i database.
- Cattle are involved in 96% of Peru's reported rabies events; 64% of Peru's reported rabies events involve only cattle. Vampire bats continue to be associated with rabies livestock outbreaks in South America.
- All reported rabies events from China are from wild animals, mostly the ferret-badger, which comprises 87% of 112 reported rabies events.

*No. of Events includes any event in which the species is listed, regardless of other species.

- Greece was rabies-free for 25 years; in 2012 rabies virus reappeared and seems to be maintained in foxes. Since 2012, Greece has reported 47 rabies events. Countries bordering Greece to the north and east are rabies-endemic.

Animal Disease Summary: *Army Rabies Testing Snapshot*

Laboratory Services Rabies Specimen Testing, 2014

Testing Agent	Region*	No. Tested	No. Human Exposures	DFA** Indeterminate		DFA Positive	
				No.	%	No.	%
PHCR-Europe	Central Command	25	16	8	32%	0	0
	Europe	4	5	0	0	0	0
FADL	Cuba§	41	0	0	0%	0	0%
	South§	72	55	2	3%	6	8%
	North	12	11	0	0	0	0
	West	33	49	2	6%	1	3%
	Pacific	2	11	0	0	0	0

*Central Command: Afghanistan, Kuwait, Saudi Arabia.
Europe: Germany, Spain.
South: AR, FL, GA, LA, OK, SC, TN, TX.
North: KY, MD, NC, NY.
West: AK, AZ, CA, CO, KS, MO, NE, ND, WA.
Pacific: Japan.

**DFA: Direct Fluorescent Antibody

§ Rabies testing numbers from a feline surveillance program at Guantanamo Bay, Cuba not included in PHCR-South's data.

Note: No samples were tested using Mouse Neuroblastoma Cells (MNA).

- In 2014, overall 189 animal specimens associated with 147 human exposures were tested for rabies; 3.7% (7/189) were DFA positive, and 6.3% (12/189) of samples were Direct Fluorescent Antibody (DFA) indeterminate.
- Indeterminate test results should be treated as positives, and persons sustaining risk exposures should be evaluated for rabies prophylaxis.
- 41 feline specimens, part of a surveillance effort and not associated with any human exposures, were submitted from NS Guantanamo Bay; all samples were negative.
- For detailed location information on PHCR-Europe rabies testing, see Appendix B on page 17.
- For detailed location, state, and country information on DoD Food Analysis and Diagnostics Laboratory (FADL) rabies testing, see Appendix C on pages 18-19.

Note: To view Public Health Command Regions (PHCR) referenced throughout this report, see Appendix A on page 16.

Animal Disease Summary: *Army Rabies Testing*

Laboratory Services Rabies Specimen Testing by Species, 2014

Testing Agent	Region of Submitting Location*	Species	No. Tested	No. Human Exposures	DFA** Indeterminate		DFA Positive	
					No.	%	No.	%
PHCR-Europe	Central Command	Canine	11	2	8	73%	0	0
		Feline	11	14	0	0	0	0
		Fox	2	0	0	0	0	0
		Jackal	1	0	0	0	0	0
		TOTAL	25	16	8	32%	0	0
	Europe	Canine	1	1	0	0	0	0
		Feline	2	3	0	0	0	0
		Bat	1	1	0	0	0	0
		TOTAL	4	5	0	0	0	0
	FADL	Cuba§	Feline	41	0	0	0	0
South§		Canine	20	28	1	5%	0	0
		Feline	9	12	1	11%	0	0
		Bat	33	7	0	0	5	15%
		Fox	2	3	0	0	0	0
		Raccoon	1	0	0	0	0	0
		Skunk	4	1	0	0	1	25%
		Deer	1	0	0	0	0	0
		Goat	2	4	0	0	0	0
TOTAL		72	55	2	3%	6	8%	
North		Canine	2	2	0	0	0	0
		Feline	5	8	0	0	0	0
		Bat	1	1	0	0	0	0
		Raccoon	1	0	0	0	0	0
		Skunk	2	0	0	0	0	0
		Squirrel	1	0	0	0	0	0
TOTAL		12	11	0	0	0	0	
West		Canine	7	9	0	0	1	14%
		Feline	9	19	0	0	0	0
		Bat	12	13	2	17%	0	0
		Raccoon	2	2	0	0	0	0
		Skunk	1	3	0	0	0	0
		Squirrel	1	1	0	0	0	0
		Rabbit	1	2	0	0	0	0
TOTAL		33	49	2	6%	1	3%	
Pacific		Canine	1	1	0	0	0	0
		Feline	1	10	0	0	0	0
	TOTAL	2	11	0	0	0	0	

*Central Command: Afghanistan, Kuwait, Saudi Arabia.
 Europe: Germany, Spain.
 South: AR, FL, GA, LA, OK, SC, TN, TX.
 North: KY, MD, NC, NY.
 West: AK, AZ, CA, CO, KS, MO, NE, ND, WA.
 Pacific: Japan.

**DFA: Direct Fluorescent Antibody;
 No samples were tested using Mouse Neuroblastoma Cells (MNA).



Bats are principal reservoirs for 10 of 11 lyssavirus species, including the rabies virus.⁸

§ Rabies testing numbers from a feline surveillance program at Guantanamo Bay, Cuba data not included in PHCR-South's data.

- In 2014, PHCR-Europe received 25 animal samples from Central Command for rabies testing. The majority of specimens were canine (44%) and feline (44%); 88% of samples were from Afghanistan. Most human exposures were associated with felines (88%, 14/16). 8 specimens, all canine, tested DFA indeterminate due to poor sample quality.
- PHCR-Europe tested 3 specimens submitted from Germany (2 felines and 1 bat) and 1 from Spain (canine). All were associated with human exposures, and all tested negative.
- US military installations from PHCRs North, South, West, and Pacific submitted 160 samples to the DoD Food Analysis and Diagnostic Laboratory (FADL) for rabies testing in 2014. Specimens were associated with 126 human exposures.
- Four samples were DFA indeterminate; 2 bats (1 from California, 1 from Nebraska), 1 canine from Arkansas, and 1 feline from Texas. 7 specimens were positive; 6 from Texas (5 bats, 1 skunk) and 1 canine from Colorado.
- All samples from PHCR-North and Pacific were negative. 6.1% (2/33) of specimens from West were indeterminate and 3.0% (1/33) were positive, while 1.8% (2/113) of specimens from South were indeterminate and 5.3% (6/113) were positive.

Animal Disease Summary: *U.S. Rabies*

United States Annual Rabies Data Summary, 2014

State*	Data up to	Domestic				Wild						Total
		Feline	Canine	Other/Unk	Total	Bat	Skunk	Fox	Raccoon	Other/Unk	Total	
Alabama	DEC 30	1	2	1	4	16	1	8	45	2	72	76
Arizona	DEC 31	0	0	78	78	85	59	8	0	1	153	231
Arkansas	DEC 31	3	1	3	7	33	109	1	0	0	143	150
California	DEC 31	2	1	0	3	150	24	1	0	0	175	178
Colorado	NOV 7	2	0	0	2	90	24	1	2	1	118	120
Connecticut	NOV 30	5	0	2	7	23	38	8	92	4	165	172
Florida	DEC 31	16	2	1	19	19	0	5	50	0	74	93
Illinois	DEC 31	0	0	0	0	40	0	0	0	0	40	40
Iowa	SEP 11	1	0	2	3	7	2	0	0	0	9	12
Kansas	DEC 31	7	0	11	18	4	47	0	0	0	51	69
Maine	DEC 31	2	0	1	3	4	13	8	14	1	40	43
Maryland	AUG 9	11	0	0	11	35	5	22	108	3	173	184
Massachusetts	DEC 31	4	0	0	4	34	25	8	37	6	110	114
Michigan	DEC 31											38
Minnesota	DEC 31	1	0	0	1	28	3	1	0	0	32	33
Missouri	DEC 31	2	0	0	2	16	9	0	0	0	25	27
Nebraska	OCT 29	0	0	4	4	10	7	0	0	0	17	21
New Hampshire	OCT 30	1	0	0	1	6	1	3	7	1	18	19
New Jersey	JUN 30	9	0	0	9	18	10	3	85	0	116	125
New Mexico	SEP 9	0	0	0	0	7	5	1	0	0	13	13
New York	OCT 31	22	0	5	27	92	34	24	143	7	300	327
North Carolina	DEC 31	15	4	3	22	31	70	41	184	5	331	353
Ohio	OCT 24	0	0	0	0	19	1	0	4	0	24	24
Oklahoma	DEC 31	5	9	19	33	2	69	0	0	0	71	104
Oregon	DEC 15	0	0	0	0	10	0	3	0	0	13	13
Pennsylvania	NOV 30	40	2	1	43	62	36	16	198	9	321	364
South Carolina	SEP 30											110
Tennessee	DEC 27	0	1	1	2	8	29	0	0	0	37	39
Texas	OCT 31	22	13	26	61	475	452	20	23	4	974	1,035
Vermont	DEC 31	1	0	0	1	3	17	3	28	3	54	55
Virginia	SEP 9	18	0	8	26	20	104	35	169	8	336	362
Washington	DEC 18	0	0	0	0	15	0	0	0	0	15	15
West Virginia	JUN 30	0	0	0	0	1	6	1	19	2	29	29
Wyoming	DEC 31	1	0	0	1	6	52	1	0	0	59	60
Total		191	35	166	392	1,369	1,252	222	1,208	57	4,108	4,648

- For all or part of 2014, 32 states had publicly available animal rabies data listing species of animal tested. Two states only published total number of positives, and 15 did not publish data. Hawaii is rabies-free.
- A total of 4,648 animals tested positive for rabies in 2014 in the U.S.
- The number of animals tested was not available. States that report more positives may be performing more tests.
- Texas reported the most positive results (22.3%, 1,035/4,648).
- Similar to 2013, NC, VA, PA, and NY reported 300 or more positives.
- Among known animal type, most positives were from wild animals (91.3%, 4,108/4,500).

*Only states that conduct and report rabies testing data are shown.

Note: Numbers represent positive cases for each animal type in each state. Data was collected from publicly available reports. When complete data for 2014 was not available, the most recent numbers are listed along with the date of last entry.

- Bats were the most commonly identified rabid animal, making up 29.5% of all positive results. Bats are the only animal represented in all 32 states' data. Different species of bats are tested depending on the area, but species information was not always published.
- Raccoons (26.0%), skunks (26.9%), and foxes (4.8%) were the next most commonly reported positive animals, followed by felines (4.1%), other/unknown domestic (3.6%) and wild (1.2%) animals, and canines (0.8%). Other/unknown mammals tested include: cattle, groundhogs, horses, bobcats, rodents, rabbits, goats, coyotes, sheep, opossum, and deer.

Animal Disease Summary: *Veterinary Surveillance*

Zoonotic Diseases Identified in US Army Veterinary Medical Records in ROVR, 2014

Region	Ehrlichiosis		Anaplasmosis		Borreliosis		RMSF‡		Babesiosis		Leptospirosis		Leishmaniasis	
	POA*	GOA*	POA	GOA	POA	GOA	POA	GOA	POA	GOA	POA	GOA	POA	GOA
Central Command§	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Europe	12	0	9	4	12	1	0	1	0	1	2	0	6	0
Pacific	13	3	8	2	7	4	0	0	0	3	1	0	0	2
North	103	30	54	18	259	28	3	8	1	12	0	1	1	2
South	121	9	16	5	41	7	1	4	0	18	2	1	0	17
West	86	10	16	4	39	6	1	3	0	7	0	0	0	4
ALL REGIONS	335	52	103	34	358	46	5	16	1	41	5	2	8	25
ALL REGIONS TOTAL	387		137		404		21		42		7		33	

‡ Rocky Mountain Spotted fever (RMSF).

*POA: Privately-Owned Animal, GOA: Government-Owned Animal.

§ Central Command locations for which data was identified: Afghanistan and Bahrain.

- Deployment of the Remote Online Veterinary Record (ROVR) began in January 2014, however full DoD-wide implementation at Veterinary Treatment Facilities (VTFs) was not achieved until May 2014. For this reason, the data presented in this report does not represent a full calendar year for every location.
- The majority of tick-borne zoonoses were identified by serological screening (antibody) tests, therefore cases likely represent exposure and not necessarily clinical disease. Animals diagnosed in one region may have been exposed elsewhere.
- Overall, 77.9% (109/140) of Public Health Command VTFs captured data relevant to this report. In addition, 1 case of leishmaniasis in a privately-owned animal in Bahrain and 1 case of anaplasmosis in an animal deployed to Afghanistan were identified.
- Borreliosis (39.2%, 404/1,031) and ehrlichiosis (37.5%, 387/1,031) were the most commonly identified zoonoses, both in privately-owned animals (POA) and government-owned animals (GOA). Almost three quarters (71.0%, 287/404) of all borreliosis cases were identified from areas in PHCR-North.
- The majority of ehrlichiosis cases were identified in Public Health Command Region-North (34.4%, 133/387), South (33.4%, 130/387), and West (24.8%, 96/387).
- Rocky Mountain Spotted Fever, babesiosis, and leishmaniasis were identified more frequently in government versus privately-owned animals; 76.2% (16/21), 97.0% (41/42), and 75.8% (25/33) of cases were in GOA, respectively. This may be due to geographic areas in which government-owned animals serve, as well as differences in exposure activities (e.g., time spent outdoors) and healthcare requirements.
- Overall, 79.0% (815/1,031) of all records were for privately-owned animals.
- The most common zoonosis in PHCR-South, West, and Pacific was ehrlichiosis, comprising 53.7% (130/242), 54.5% (96/176), and 37.2% (16/43) of all cases in each region, respectively. In PHCR-North, borreliosis comprised the majority of all cases (55.2%, 287/520). In PHCR-Europe, anaplasmosis, borreliosis, and ehrlichiosis each comprised roughly a quarter of all cases from the region.
- For details on animal diseases identified in ROVR by specific location, see Appendix D on page 20.

Animal Disease Summary: Avian Influenza

International Avian Influenza Reported in FAO's EMPRES-I, 2014

Region	Country	Animal Type	Animal Type	No. of Events	Region Total
H7N9 (Low Pathogenic)					
Asia	China*	Domestic & wild	Chicken, duck, geese, pheasant, pigeon, unsp. bird	27	27
H5N1 (Highly Pathogenic)					
Asia	Cambodia	Domestic	Chicken, duck, unsp. bird	5	391
	China*	Domestic	Chicken, duck, geese, pigeon	38	
	DPR Korea	Domestic	Chicken, geese	3	
	India	Domestic & wild	Chicken, crow	6	
	Indonesia	Domestic & wild	Chicken, duck, owl, quail, turkey, unsp. bird	295	
	Nepal	Domestic	Chicken	1	
	Viet Nam	Domestic	Chicken, duck, unsp. bird	43	
Africa	Egypt	Domestic	Chicken, duck, geese, quail, turkey, unsp. bird	363	364
	Libya	Domestic	Unsp. bird	1	
Europe	Russia	Domestic	Unsp. bird	2	2

- In 2014, 10 countries reported 784 avian influenza events; Egypt and Indonesia together report the majority of all events (84%).
- China remains the only country to report avian influenza H7N9 events and human cases.
- H5N1 and H7N9 retain pandemic potential because they continue to circulate in some poultry flocks, most humans lack immunity, and they can cause high human mortality. For details, visit: http://www.who.int/mediacentre/factsheets/avian_influenza/en/.
- For information on human infections with H5N1, see *Avian-Associated Human Influenza Cases* on page 5.

*China including Hong Kong Special Administrative Region.

Vector Surveillance: Mosquito Summary

Military Mosquito Pool Testing for West Nile Virus in the United States, 2014

Region	Mosquito Type	West Nile Virus		
		No. Pools	No. Positive	% Positive
North	<i>Culex</i> spp.	930	85	9.1%
	<i>Aedes</i> spp.	218	0	0
	<i>Anopheles</i> spp.	16	0	0
	<i>Coquillettidia</i> spp.	1	0	0
	<i>Culiseta</i> spp.	1	0	0
	<i>Psorophora</i> spp.	1	0	0
South	<i>Culex</i> spp.	1020	2	0.2%
	<i>Aedes</i> spp.	102	0	0
	<i>Culiseta</i> spp.	22	0	0
West	<i>Culex</i> spp.	224	12	5.4%
TOTAL	<i>Culex</i> spp.	2174	99	4.6%
	<i>Aedes</i> spp.	320	0	0
	<i>Anopheles</i> spp.	16	0	0
	<i>Coquillettidia</i> spp.	1	0	0
	<i>Culiseta</i> spp.	23	0	0
	<i>Psorophora</i> spp.	1	0	0

- In 2014, 2,535 mosquito pools were tested for West Nile Virus (WNV): 2,174 pools of *Culex* spp. mosquitoes, 320 *Aedes* spp., 23 *Culiseta* spp., 16 *Anopheles* spp., and 1 pool each of *Coquillettidia* spp. and *Psorophora* spp.
- All of the WNV-positive pools were *Culex* spp. mosquitoes; no other mosquito types tested positive.
- PHCR-North reported 85.9% (85/99) of all WNV-positive pools. 9.1% (85/930) of all *Culex* spp. mosquito pools tested from PHCR-North were WNV-positive.
- Surveillance efforts by PHCR-North were centered on the Washington, D.C. area; the majority (71.7%, 71/99) of WNV-positive pools were from this area, and the weekly Minimum Infection Rate (MIR) peaked at 25 infected mosquitoes per thousand mosquitoes tested.

- Of 224 pools of *Culex* spp. mosquitoes tested by PHCR-West, 12 (5.4%) were WNV-positive. All WNV-positive pools were collected from Fort Bliss, TX.
- 2 pools of *Culex* spp. mosquitoes tested by PHCR-South were WNV-positive (0.2%). The MIR at Lackland AFB, TX in 2014 was 1.3 females per thousand females tested (2 infected pools of 54 female *Culex quinquefasciatus* mosquitoes out of 1,552 *C. quinquefasciatus* females total).
- Given the emergence of chikungunya virus in the Americas in 2014, 100 mosquito pools comprised of 949 mosquitoes were tested by PHCR-South for chikungunya virus; none were positive (data not shown).
- For details on mosquito testing by specific reporting state and location, see Appendix E on page 21.

Vector Surveillance: Mosquito Summary

Mosquito Pool Testing by Region Europe, 2014

Submitting Location	Mosquito Type	Total Pools Tested	West Nile Virus		Chikungunya Virus		Dengue Virus		Plasmodium spp.	
			No. Positive Pools	% Positive Pools						
Africa	<i>Culex</i> spp.	1,226	2	0.2%						
	<i>Aedes</i> spp.	195	0	0	0	0	1	0.5%		
	<i>Anopheles</i> spp.	9							1	11%
Afghanistan	<i>Culex</i> spp.	22	0	0						
	<i>Anopheles</i> spp.	8							0	0
TOTAL	<i>Culex</i> spp.	1,248	2	0.2%	0	0	0	0	0	0
	<i>Aedes</i> spp.	195	0	0	0	0	1	0.5%	0	0
	<i>Anopheles</i> spp.	17	0	0	0	0	0	0	1	5.9%

- In 2014, PHCR-Europe tested 1,460 mosquito pools submitted from locations in Africa and Afghanistan.
- PHCR-Europe tested 1,248 *Culex* spp. mosquitoes in 2014; 2 tested positive for WNV (0.2%).
- 1 of 195 (0.5%) *Aedes* spp. mosquito pools submitted from locations in Africa tested positive for dengue virus.
- Of 17 *Anopheles* spp. mosquito pools tested for *Plasmodium* spp., 1 positive pool from Africa was identified. Overall, 5.9% of all mosquito pools tested for *Plasmodium* spp. tested positive.

Vector Surveillance: Tick Summary

Environmental and Host Tick Collection Testing by Region, 2014

- In 2014, PHCR-Europe, North, and West tested a total of 2,836 ticks: 1,910 were ticks collected from the environment, and 926 were ticks removed from hosts, including animals (both domestic and wild) and humans. No ticks submitted for testing from PHCR-South were positive for any pathogens and their data is not included in this report.
- PHCR-Europe tested 994 ticks (159 from hosts, 835 environmental), PHCR-North tested 872 ticks (608 from hosts, 264 environmental) and PHCR-West tested 970 (159 from hosts, 811 environmental).

Host

- 72 *Ixodes* spp. ticks were collected from humans in Europe and submitted to PHCR-Europe; 4 (5.6%) were positive for *A. phagocytophilum* and 3 (4.2%) were positive for *Borrelia* spp.
- 85 *Ixodes* spp. ticks collected from animals were tested by PHCR-Europe; 1 (1.2%) was positive for *A. phagocytophilum* and 2 (2.4%) for *Borrelia* spp. 1 *Ixodes* spp. tick also tested positive for tick-borne encephalitis virus (TBEV).
- PHCR-Europe tested 1 *Hyalomma* spp. tick from Djibouti, Africa; it was negative for Crimean-Congo hemorrhagic fever (data not shown).
- Of 550 *Ixodes* spp. ticks from hosts tested by PHCR-North, 22 (4.0%) were positive for *A. phagocytophilum*, 57 (10.4%) were positive for *B. burgdorferi*, and 7 (1.3%) were positive for *B. miyamotoi*.
- Two government-owned canines in PHCR-North had ticks that tested positive for pathogens: 1 *A. maculatum* tick (collected from a TSA dog) tested positive for *R. parkeri* and 1 *Dermacentor reticulatus* tick was positive for *R. raoultii*.
- PHCR-West tested 159 ticks collected from hosts; they were negative for any pathogens tested.

Environment

- PHCR-Europe tested 835 ticks collected from the environment. Of 816 *I. ricinus*, 1.5% (12) were positive for *A. phagocytophilum* and 0.9% (7) were positive for *Borrelia* spp. 1 of 19 *D. marginatus* and 6/816 *I. ricinus* were positive for tick-borne encephalitis virus (TBEV).
- PHCR-North tested 264 ticks collected from the environment. 18/131 (13.7%) *I. scapularis* ticks were positive for *Babesia* spp., 3/128 (2.3%) *A. americanum* ticks were positive for *E. chaffeensis*, and 3/5 (60.0%) *A. maculatum* ticks were positive for *R. andeanae*.
- PHCR-West tested 811 ticks collected from the environment. 15 of 611 *A. americanum* ticks in 2 pools were positive for *E. chaffeensis*, with a resultant MIR of 3.3 per 1,000 ticks. All other ticks tested negative for select pathogens.

Vector Surveillance: Tick Summary

Positive Results of Environmental and Host Tick Testing by Region, 2014

Collection Source	Region	Location	Host Type	<i>Ixodes</i> spp.				<i>Ixodes scapularis</i>	<i>Amblyomma americanum</i>	<i>Amblyomma maculatum</i>	<i>Dermacentor reticulatus</i>	
				<i>Anaplasma phagocytophilum</i> ‡	<i>Borrelia</i> spp.‡	<i>Borrelia burgdorferi</i> ‡	<i>Borrelia miyamotoi</i> ‡	<i>Babesia</i> spp.	<i>Ehrlichia chaffeensis</i>	<i>Rickettsia</i>		
				POS	POS	POS	POS	POS	POS	<i>parkeri</i>	<i>andeanae</i>	<i>raoultii</i>
Host	Europe	Ansbach, GM	Human		1							
		Baumholder, GM										
		Grafenwoehr, GM										
		Hofenhels, GM		1								
		Illesheim, GM										
		Kaiserslautern, GM										
		Landstuhl, GM										
		SHAPE, BE										
		Stuttgart, GM		2	1							
		Vilseck, GM		1	1							
	Ansbach, GM	1										
	Aviano, IT											
	Baumholder, GM											
	Hofenhels, GM											
	Kaiserslautern, GM		2									
Spangdahlem, GM												
Stuttgart, GM												
Vilseck, GM												
Wiesbaden, GM												
EUROPE TOTAL				5	5							
North	West Point, NY	Felines Canines Deer Humans Raccoons		17	29	6						
	Fort Belvoir, VA				6			1		1		
	Fort AP Hill, VA		5		22	1						
	JB Langley-Eustis, VA											
NORTH TOTAL				22	57	7		1		1		
HOST TOTAL				27	5	57	7		1		1	
Europe	EUROPE TOTAL			12*	7*							
North	Fort Knox, KY	N/A						3		3		
	Wendell H. Ford RTC, KY											
	Fort Drum, NY				45		18					
	JB Langley-Eustis, VA											
NORTH TOTAL						45	18	3		3		
West	Fort Hunter Liggett, CA	N/A						15				
	Fort Leavenworth, KS											
	Fort Leonard Wood, MO											
	Fort Riley, KS											
	Ord Military Com., CA											
	Vandenberg AFB, CA											
Yakima Training Ctr, WA												
WEST TOTAL							15					
ENVIRONMENT TOTAL				12	7	45	18	18		3		

Note: Only if at least one value for HOST or ENVIRONMENT TOTAL was not equal to zero is the column/pathogen displayed.

‡ Unless specified, tick type is *Ixodes scapularis*.

* *Ixodes ricinus*.

- PHCR-South had no positive tick testing results; no data from PHCR-South is displayed.
- One *Hyalomma* spp. tick was tested by PHCR-Europe and was negative for Crimean Congo hemorrhagic fever virus (data not shown). 8 ticks tested by PHCR-Europe were positive for TBEV (data not shown): 1 *Ixodes* spp. tick collected from a host, and 6/816 (0.7%) *I. ricinus* and 1/19 (5.2%) *D. marginatus* collected from the environment.
- All ticks removed from unspecified hosts in PHCR-West were negative for pathogens (data not shown).
- To view complete tick testing information, including number and species tested, see Appendix F on pages 22-23.

Vector Surveillance: Tick Summary

Department of Defense Human Tick Test Kit Program, 2014

- During 2014, 2,934 ticks removed from humans in the contiguous United States were submitted to the DoD Human Tick Test Kit Program. 90.9% (n=2,668) of ticks were sent from locations in PHCR-North, 4.0% (n=117) from locations in PHCR-South, and 5.1% (n=149) from locations in PHCR-West.
- 265 *I. scapularis* ticks were tested for *Anaplasma phagocytophilum*, *Borrelia burgdorferi*, and *Babesia microti*. 29.1% (77/265) tested positive for *B. burgdorferi*, the causative agent of Lyme disease; all positives submitted from PHCR-North and West. 4.2% (n=11/265) of ticks tested positive for *A. phagocytophilum*, the causative agent of human granulocytic anaplasmosis. Two ticks (1 from PHCR-North and 1 from West) tested positive for *B. microti*, the cause of babesiosis.
- 2,208 *A. americanum* ticks were submitted for testing. 1.1% (24/2,208) were positive for *E. chaffeensis* and 1.9% (41/2,208) were positive for *E. ewingii*. All ticks positive for *E. chaffeensis* were from PHCR-North.
- 445 *Dermacentor variabilis* ticks were submitted for testing from installations in all three CONUS regions, and none were positive for *R. rickettsia*, the causative agent of Rocky Mountain Spotted Fever.
- 16 *A. maculatum* ticks were tested; 1 (6.3%) was positive for *R. parkeri*. The tick was collected from PHCR-North.

Region	State	Submitting Location	Total No. Ticks Tested	<i>Ixodes scapularis</i>						<i>Amblyomma americanum</i>				<i>A. maculatum</i>		<i>D. variabilis</i>	
				<i>Anaplasma phagocytophilum</i>		<i>Babesia microti</i>		<i>Borrelia burgdorferi</i>		<i>Ehrlichia chaffeensis</i>		<i>Ehrlichia ewingii</i>		<i>Rickettsia parkeri</i>		<i>Rickettsia rickettsii</i>	
				POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED
North	Kentucky±	Fort Knox	1,303	0	5	0	5	0	5	18	1,135	25	1,135	0	0	0	163
	Maine	Camp Keyes	3	0	2	0	2	1	2	0	0	0	0	0	0	0	1
	Maryland	Aberdeen Proving Ground	339	4	42	0	42	7	42	2	223	2	223	0	0	0	74
		Fort Detrick	8	0	3	0	3	2	3	0	4	0	4	0	0	0	1
		Fort Meade	42	0	3	0	3	0	3	0	36	1	36	0	0	0	3
		Walter Reed NMMC	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Massachusetts	Massachusetts ARNG	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0
		Camp Edwards	4	0	3	0	3	2	3	0	0	0	0	0	0	0	1
	New Jersey	Picatinny Arsenal	6	0	4	0	4	1	4	0	1	0	1	0	0	0	1
		JB Dix-Lakehurst-McGuire	133	2	14	0	14	6	14	1	105	5	105	0	0	0	14
	New York	Fort Drum	38	1	37	0	37	14	37	0	0	0	0	0	0	0	1
	North Carolina	Fort Bragg	9	0	0	0	0	0	0	0	6	0	6	1	2	0	1
		Sunny Point MOT	7	0	1	0	1	0	1	0	4	1	4	0	1	0	1
	Pennsylvania	Carlisle Barracks	21	0	16	0	16	3	16	0	4	0	4	0	0	0	1
		Fort Indiantown Gap	101	0	56	0	56	7	56	0	4	0	4	0	0	0	41
		Pennsylvania ARNG	8	0	0	1	0	0	0	0	7	0	7	0	0	0	1
	Virginia	Fort Belvoir	230	0	16	0	16	4	16	0	192	2	192	0	0	0	22
		Fort Lee	47	0	0	0	0	0	0	1	46	0	46	0	0	0	1
		Fort McCoy	86	1	19	0	19	11	19	0	1	0	1	0	0	0	66
		JB Andrews	7	0	1	0	1	0	1	0	5	0	5	0	0	0	1
JB Myer-Henderson Hall		17	0	4	0	4	1	4	0	10	0	10	0	0	0	3	
Wash. D.C.	Fort Pickett	246	0	0	0	0	0	0	1	233	4	233	0	0	0	13	
	Pentagon	11	0	2	0	2	0	2	1	8	0	8	0	0	0	1	
NORTH TOTAL			2,668	8	229	1	229	59	229	24	2,024	40	2,024	1	3	0	412
South	Alabama	Redstone Arsenal	10	0	0	0	0	0	0	0	8	0	8	0	0	0	2
	Georgia	Fort Stewart	2	0	0	0	0	0	0	2	0	2	0	0	0	0	
	Kentucky±	Fort Campbell	95	0	0	0	0	0	0	71	1	71	0	13	0	11	
	Oklahoma	Fort Sill	4	0	0	0	0	0	0	0	2	0	2	0	0	0	2
		McAlister AAP	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0
	South Carolina	Fort Jackson	3	0	1	0	1	0	1	0	2	0	2	0	0	0	0
		McCrary Training Center	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0
	Texas	Fort Hood	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0
SOUTH TOTAL			117	0	1	0	1	0	1	0	88	1	88	0	13	0	15
West	Kansas	Fort Leavenworth	36	0	0	0	0	0	0	0	31	0	31	0	0	0	5
		Fort Riley	38	0	0	0	0	0	0	0	30	0	30	0	0	0	8
	Minnesota	Camp Ripley	37	3	35	1	35	18	35	0	0	0	0	0	0	2	
	Missouri	Fort Leonard Wood	38	0	0	0	0	0	0	0	35	0	35	0	0	0	3
	WEST TOTAL			149	3	35	1	35	18	35	0	96	0	96	0	0	0
GRAND TOTAL			2,934	11	265	2	265	77	265	24	2,208	41	2,208	1	16	0	445

± Fort Knox, KY is in PHCR-North; Fort Campbell, KY is in PHCR-South.

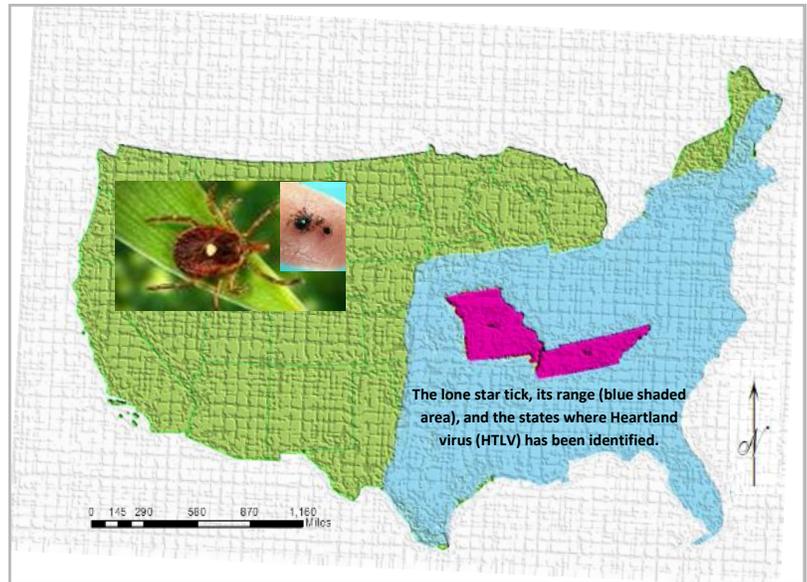
Focus On: Heartland Virus (HRTV)

Background

- Heartland virus (HRTV) was accidentally discovered in 2009 when two farmers from geographically distant regions of Missouri were hospitalized with ehrlichiosis-like symptoms.⁹ Tests revealed a new pathogenic virus—the first *Phlebovirus* discovered in the United States.¹⁰
- Phleboviruses* are transmitted by a variety of arthropods (e.g., mosquitoes, sandflies, ticks). HRTV is transmitted by the lone Star tick (*Amblyomma americanum*), the same tick that can transmit pathogens that cause ehrlichiosis.
- In 2012 and 2013, six additional people were diagnosed with HRTV, one of whom had other health conditions and died.⁹

Clinical Features and Epidemiology

- Signs and symptoms of HRTV infection include: fever, leukopenia (reduced white blood cell count), thrombocytopenia (reduced platelet count), lethargy (tiredness), and lack of appetite.⁹
- The disease has only been reported in humans in Missouri and Tennessee.⁹
- The lone star tick (*A. americanum*) has been identified as a vector that can transmit HRTV.^{9,10} Most lone star ticks are found in the eastern and southeastern United States.
- Larval ticks likely become infected with the virus during a blood meal from a viremic animal. Transmission to humans occurs when ticks are seeking new hosts.¹⁰
- Human exposure is most likely to occur in spring and early summer when *A. americanum* nymphs are numerous and searching for a host.¹⁰
- Laboratory analysis of the virus has shown that it is most closely related to severe fever with thrombocytopenia syndrome (SFTS) virus, an emerging infectious disease in Asia,¹⁰ and to Malsoor virus, recently identified in bats in India.¹¹
- In one study of domestic and captive farmed animals around Minnesota, 10-18% of animals (cattle, goats, sheep, deer, and elk) carried antibodies to a HRTV-like virus; none of the animals appeared symptomatic, raising questions as to how harmful this virus may be to animals.¹²
- A study of HRTV's close relative, SFTS virus, suggests that limited person-to-person transmission is possible.¹² However, while over 2,000 cases of SFTS have been reported since its discovery in 2009,¹³ only 8 cases of HRTV have been identified in the same time period.



Outlook

- As contact between humans, domesticated and wild animals, and ticks increases around the world, additional tick-borne diseases are likely to be identified, including some that are pathogenic to humans.
- Although the number of identified HRTV infections remains low, it is important to maintain awareness of this, and other, emerging pathogens.
- Studies to determine if other insects or animals may be involved in the transmission cycle of HRTV are underway, as are studies examining if Heartland virus is present in other regions of the United States.¹⁴
- There are no medications or vaccines available to prevent or treat HRTV. Prevention consists of measures to prevent tick bites, such as: avoiding wooded and bushy areas, wearing long sleeves and pants when outdoors, using insect repellent, conducting tick checks after being outside, and examining gear and pets for ticks.^{9,14}

References: *Data Sources*

Case Definitions and Incidence Rules Used for Human Zoonotic Disease Surveillance

For this report, zoonotic diseases are defined as diseases with an animal host or reservoir that can be transmitted to a human. Reportable Medical Event (RME) case reports and medical encounters were queried as suggested in the 2012 Armed Forces RME Guidelines and Case Definitions. Modifications were applied such that only medical encounters with any of the defining diagnoses in the first four diagnostic positions were considered a case as opposed to any diagnostic position. This modification reduces the selection of potential chronic disease events. More information on these rules can be found at: http://afhsc.mil/viewDocument?file=CaseDefs/Web_11_INFECTIOUS_DISEASE_NOV11.pdf.

The Military Health System Management Analysis and Reporting Tool (M2)

M2 is a web-based data repository that contains select information on military treatment facility (MTF) medical records, personnel data, ancillary care records, and Tricare insurance claims for non-MTF care. M2 was queried based on zoonotic disease ICD-9 codes as referenced in the 2012 Armed Forces RME Guidelines and Case Definitions. ICD-9 codes listed in the first four diagnostic fields were used to select inpatient and outpatient medical encounters from the year of interest based on the encounter date in M2. Direct care records from Army and Joint Base MTFs and purchased care records from non-MTFs in their designated catchment areas were included. Historic medical data for the prior 5 years were also reviewed to exclude chronic or previously diagnosed infections.

Disease Reporting System-internet (DRSi)

DRSi is a web-based application developed by the Navy and Marine Corps Public Health Center (NMCPHC) that all Services use to monitor Reportable Medical Events (RME). Cases that meet RME case definitions are entered into DRSi by individuals at MTFs. These medical event reports are reviewed by the US Army Public Health Command Disease Epidemiology Program for completeness and accuracy. For this report, only RME records that are considered final with a case status of confirmed or probable are included; records were queried using date of diagnosis.

US Army Public Health Command Laboratory Sciences Portfolio

US Army Public Health Command Laboratory Sciences at the Army Institute of Public Health (AIPH) and at each Public Health Command Region (PHCR-Europe, Pacific, North, South, West) completed all of the vector surveillance testing (mosquito, tick, etc.) and US Army installation-related rabies specimen testing. Each PHCR collates the results from their area of responsibility for the calendar year and sends the data to the USAPHC Disease Epidemiology Program.

Remote Online Veterinary Record (ROVR)

ROVR is a secure application that electronically stores and transmits elements of Army veterinary clinical encounters at all levels of care for animals owned by the government (all agencies) or DoD families. Deployment of ROVR began in January 2014, and full DoD-wide implementation at all VTFs occurred in May 2014. ROVR has a searchable database that is populated by medical entries from patient medical encounters. ROVR was queried for select zoonotic diseases for all species by a veterinarian and results were sent to the USAPHC Disease Epidemiology Program.

Global Animal Disease Information System (EMPRES-i)

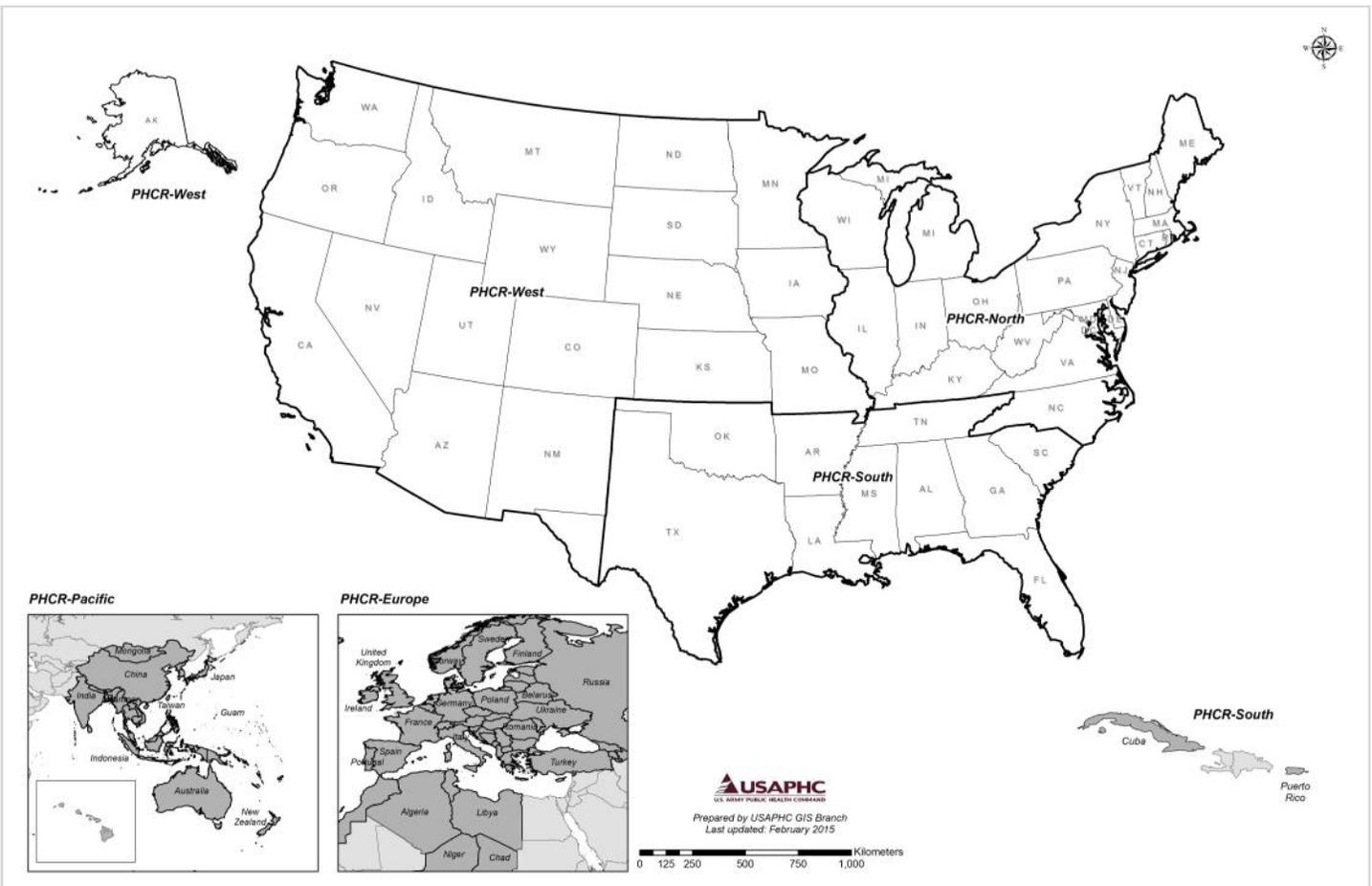
EMPRES is the Emergency Prevention System within the Food and Agricultural Organization of the United Nations (FAO); their database is EMPRES-i (Global Animal Disease Information System). EMPRES-i uses official and unofficial sources to compile reports of animal disease. For this report, all confirmed H5N1, H7N9, and rabies events with distinct identification numbers were considered separate events. Events were queried based on date of report in the system.

US State's Animal Rabies Testing

Each U.S. state is responsible for animal rabies testing and publishing results. USAPHC personnel query each State's official website to identify animal rabies testing information. All information is compiled and summarized.

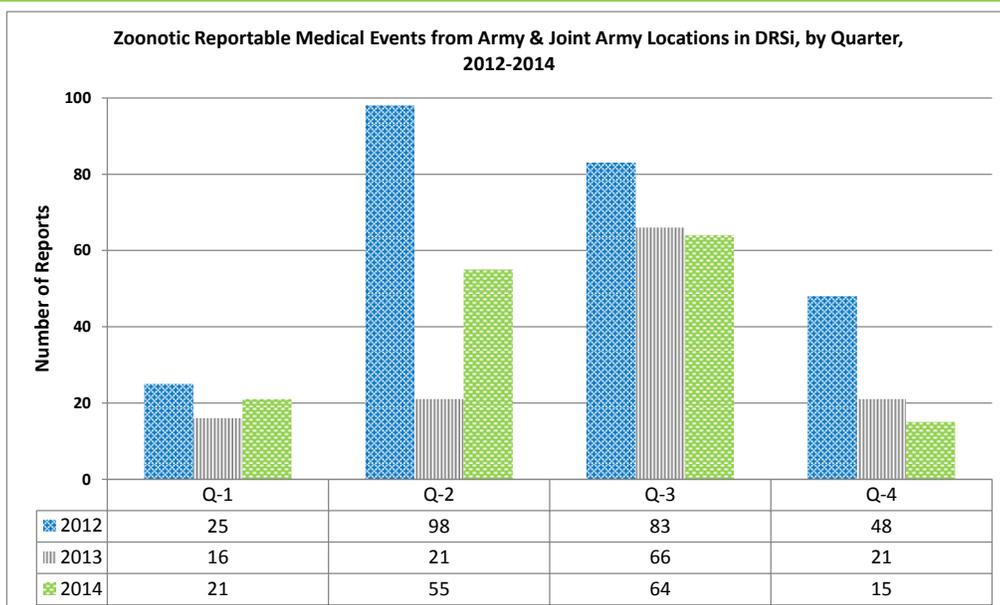
Appendix A

U.S. Army Public Health Command Regions 2014



Note: Public Health Command Regions and Regional Medical Commands share the same boundaries but differ for administrative purposes.

Yearly Comparison of Zoonotic Diseases in DoD Beneficiaries Reported in DRSi



Appendix B: Rabies Testing by PHCR-Europe Laboratory Services

Animal Rabies Testing by Species and Location Submitting Specimen, 2014

Region	Country	Submitting Location	Species	No. Tested	No. Human Exposures	No. DFA** Indeterminate	% DFA Indeterminate	No. DFA Positive	% DFA Positive
Central	Afghanistan	N/A	Canine	11	2	8	73	0	0
			Feline	8	11	0	0	0	0
			Foxes	2	0	0	0	0	0
			Jackal	1	0	0	0	0	0
			Total	22	13	8	36	0	0
	Kuwait	N/A	Feline	2	2	0	0	0	0
			Total	2	2	0	0	0	0
	Saudi Arabia	N/A	Feline	1	1	0	0	0	0
			Total	1	1	0	0	0	0
	Europe	Germany	Rheinland-Pfalz	Bat	1	1	0	0	0
Total				1	1	0	0	0	0
Stuttgart			Feline	1	2	0	0	0	0
			Total	1	2	0	0	0	0
Spangdahlem		Feline	1	1	0	0	0	0	
		Total	1	1	0	0	0	0	
Spain		Rota	Canine	1	1	0	0	0	0
			Total	1	1	0	0	0	0

**DFA: Direct Fluorescent Antibody; Mouse Neuroblastoma Cells (MNA) tests were not performed

Appendix C: Rabies Testing by DoD Food Analysis & Diagnostics Laboratory

Animal Rabies Testing by Species and Location Submitting Specimen, 2014

Region	State/ Country	Submitting Location(s)	Species	No. Tested	No. Human Exposures	No. DFA** Indeterminate	% DFA Indeterminate	No. DFA Positive	% DFA Positive
South	AR	Little Rock AFB	TOTAL-Canine	1	1	1	100	0	0
	FL	Eglin AFB	TOTAL-Feline	1	1	0	0	0	0
	GA	Fort Benning Fort Gordon Fort Stewart	Canine	7	8	0	0	0	0
			Feline	2	3	0	0	0	0
			Bat	1	0	0	0	0	0
			TOTAL	10	11	0	0	0	0
	KY [¥]	Fort Campbell	TOTAL-Feline	2	4	0	0	0	0
	LA	Barksdale AFB Fort Polk	Canine	3	4	0	0	0	0
			Bat	1	2	0	0	0	0
			Goat	2	4	0	0	0	0
			TOTAL	6	10	0	0	0	0
	OK	Fort Sill	TOTAL-Canine	2	1	0	0	0	0
	SC	Parris Island	TOTAL-Canine	1	6	0	0	0	0
	TN	Millington	TOTAL-Skunk	1	1	0	0	0	0
	TX [±]	Camp Bullis Fort Hood Fort Sam Houston Lackland AFB NAS Corpus Christi	Canine	6	8	0	0	0	0
			Feline	6	8	1	17	0	0
			Bat	31	5	0	0	5	16
Fox			2	3	0	0	0	0	
Raccoon			1	0	0	0	0	0	
Skunk			3	0	0	0	1	33	
Deer			1	0	0	0	0	0	
TOTAL			50	24	1	2	6	12	
CUBA	Guantanamo Bay	TOTAL-Feline	41	0	0	0	0	0	
SOUTH TOTAL EXCLUDING CUBA				74	59	2	3	6	8
SOUTH TOTAL INCLUDING CUBA				115	59	2	2	6	5
North	IL	Scott AFB	TOTAL-Canine	1	1	0	0	0	0
	KY [¥]	Fort Knox	Canine	1	1	0	0	0	0
			Bat	1	1	0	0	0	0
			Squirrel	1	0	0	0	0	0
			TOTAL	3	2	0	0	0	0
	MD	Fort Meade	TOTAL-Raccoon	1	0	0	0	0	0
	NC	Fort Bragg	TOTAL-Feline	3	4	0	0	0	0
NY	West Point	TOTAL-Skunk	2	0	0	0	0	0	
NORTH TOTAL				10	7	0	0	0	0

**DFA: Direct Fluorescent Antibody; Mouse Neuroblastoma Cells (MNA) tests were not performed.

¥ Fort Knox, KY is in PHCR-North; Fort Campbell, KY is in PHCR-South.

± Fort Bliss, TX is in PHCR-West. No specimens were submitted from Fort Bliss in 2014, so Texas is shown as part of PHCR-South only.

Continued on Next Page

Appendix C (Continued): Rabies Testing by DoD Food Analysis & Diagnostics Laboratory

Animal Rabies Testing by Species and Location Submitting Specimen, 2014

Region	State/ Country	Submitting Location(s)	Species	No. Tested	No. Human Exposures	No. DFA** Indeterminate	% DFA Indeterminate	No. DFA Positive	% DFA Positive
West	AK	JB Elmendorf-Richardson	TOTAL-Canine	1	2	0	0	0	0
	AZ	Fort Huachuca	Canine	1	1	0	0	0	0
			Feline	2	3	0	0	0	0
			Bat	1	1	0	0	0	0
			Skunk	1	3	0	0	0	0
			Squirrel	1	1	0	0	0	0
			Rabbit	1	2	0	0	0	0
			TOTAL	7	11	0	0	0	0
	CA	29 Palms Beale AFB Edwards AFB Fort Irwin Travis AFB	Canine	1	1	0	0	0	0
			Feline	2	7	0	0	0	0
			Bat	3	6	1	33	0	0
			Raccoon	1	1	0	0	0	0
			TOTAL	7	15	1	14	0	0
	CO	Fort Carson	TOTAL-Canine	1	2	0	0	1	100
	KS	Fort Leavenworth Fort Riley	Canine	3	3	0	0	0	0
			Feline	3	3	0	0	0	0
			Bat	5	4	0	0	0	0
			TOTAL	11	10	0	0	0	0
	MO	Fort Leonard Wood	Feline	1	3	0	0	0	0
			Bat	1	1	0	0	0	0
Raccoon			1	1	0	0	0	0	
TOTAL			3	5	0	0	0	0	
NE	Offutt AFB	TOTAL-Bat	1	1	1	100	0	0	
ND	Minot AFB	TOTAL-Feline	1	3	0	0	0	0	
WA	JB Lewis-McChord	TOTAL-Bat	1	0	0	0	0	0	
WEST TOTAL				33	49	2	6	1	3
Pacific	JAPAN	Kadena AFB Yokosuka NB	Canine	1	1	0	0	0	0
			Feline	1	10	0	0	0	0
			TOTAL	2	11	0	0	0	0
	PACIFIC TOTAL				2	11	0	0	0

**DFA: Direct Fluorescent Antibody; Mouse Neuroblastoma Cells (MNA) tests were not performed.

Appendix D: Veterinary Surveillance

Zoonotic Diseases at U.S. Army Veterinary Treatment Facilities Identified in ROVR, 2014

Region	State/Country	Locations	Ehrlichiosis		Anaplasmosis		Borreliosis		RMSF		Babesiosis		Leptospirosis		Leishmaniasis	
			POA*	GOA	POA	GOA	POA	GOA	POA	GOA	POA	GOA	POA	GOA	POA	GOA
North	Connecticut	NSB New London	1		7		11									
	Delaware	Dover AFB			1											
	Illinois	NTC Great Lakes • Scott AFB	2	1			3				1					
	Kentucky	Fort Campbell	34		1		2									
	Maine	Hanscom AFB	1		9		11	1			1					
	Maryland	Aberdeen Proving Ground • Andrews AFB • Fort Meade	18	5	4	2	67	4			1		1	1	1	2
	New Jersey	JB McGuire-Dix-Lakehurst	8	2	7	1	15	1								
	New York	Fort Drum • West Point	15		21		96									
	North Carolina	Fort Bragg • MCAS Cherry Point • MCB Camp Lejeune	8	8		1	8	2		6	1	5				
	Ohio	Wright-Patterson AFB	1													
	Pennsylvania	Carlisle Barracks	2		2		28									
	Rhode Island	NS Newport	3		2		6									
Virginia	Fort Belvoir • Fort Lee • JB Myer-Henderson Hall JEB Little Creek-Fort Story • MCB Quantico • NB Norfolk	10	14		14	12	20	3	2		4					
NORTH TOTAL			103	30	54	18	259	28	3	8	1	12	0	1	1	2
South	Alabama	Maxwell AFB	2													
	Arkansas	Little Rock AFB	8	3	1											
	Florida	Eglin AFB • MacDill AFB • NAS Pensacola • NS Mayport Patrick AFB • Tyndall AFB	5	1	2		4			1		1				
	Georgia	Fort Benning • Fort Gordon • Fort Rucker • Fort Stewart Moody AFB • NSB Kings Bay • Robbins AFB	28		2	1	15			1		1				
	Louisiana	Barksdale AFB • Fort Polk	7	1	1		4	1				2				
	Oklahoma	Fort Sill • Tinker AFB	27		1	1				1						
	Puerto Rico	Fort Buchanan	9		4											
	South Carolina	Charleston AFB • Fort Jackson • Shaw AFB	24		2	1	12									1
	Texas [±]	Dyess AFB • Fort Hood • JB San Antonio Lackland AFB • NAS Corpus Christi • NAS Fort Worth JRB Randolph AFB	11	4	3	2	6	6	0	2		15	1	1		16
	SOUTH TOTAL			121	9	16	5	41	7	1	4	0	18	2	1	0
West	Alaska	Fort Richardson • Fort Wainwright	3		1	1	1									1
	Arizona	Davis-Monthan AFB • Fort Huachuca Yuma Proving Ground	1	2			2									
	California	Beale AFB • Camp Pendleton • Edwards AFB • Fort Irwin MCAS Miramar • NB Ventura County Presidio of Monterey • Vandenberg AFB	4	2	1	1	4	1				1				
	Colorado	Air Force Academy • Fort Carson	3	1	2		8	1		1						
	Kansas	Fort Leavenworth • Fort Riley • McConnell AFB	22	1	5		5					2				
	Missouri	Fort Leonard Wood • Whiteman AFB	20	4			4	2		2						2
	Nebraska	Offutt AFB	15				2					1				
	Nevada	Nellis AFB	3		3	1						1				
	New Mexico	Kirtland AFB	6				3									
	North Dakota	Minot AFB	2				1									
	South Dakota	Ellsworth AFB	4		3		4	1				1				1
	Texas [±]	Fort Bliss	1		1		1			1						
	Utah	Hill AFB					2									
Washington	JB Lewis-McChord • NAS Whidbey Island NB Kitsap-Bangor	2			1	2	1				1					
WEST TOTAL			86	10	16	4	39	6	1	3	0	7	0	0	0	4
Europe	Belgium	Chievres AB			1											
	Germany	Ansbach • Baumholder • Hohenfels • Kaiserslautern Stuttgart • Vilseck • Wiesbaden	5		6	2	8	1		1			2		3	
	Italy	Aviano • Naples • Sigonella • Vicenza	7		2		4								3	
	Spain	Rota NS				1										
	United Kingdom	RAF Feltwell				1						1				
EUROPE TOTAL			12	0	9	4	12	1	0	1	0	1	2	0	6	0
Central Command	Afghanistan	n/a				1										
	Bahrain	n/a													1	
CENTRAL COMMAND TOTAL			0	0	0	1	0	0	0	0	0	0	0	0	1	0
Pacific	Guam	Andersen AFB	4		1		1									
	Hawaii	Hickam AFB • MCB Kaneohe Bay • Schofield Barracks	3	1	1		4	1		0		2	1			2
	Japan	Camp Zama • Kadena AB • Misawa AB • NB Yokosuka	5	2	4	2	2	3								
	Korea	Osan AB • Yongsan	1		2							1				
PACIFIC TOTAL			13	3	8	2	7	4	0	0	0	3	1	0	0	2
GRAND TOTAL			335	52	103	34	358	46	5	16	1	41	5	2	8	25
GRAND TOTAL BY ORGANISM			387		137		404		21		42		7		33	

*POA: Privately-owned animal. GOA: Government-owned animal.

± Fort Bliss, TX falls within the PHCR-West area of responsibility.

Appendix E: Mosquito Testing

Mosquito Pool Testing for West Nile Virus by Submitting Location, 2014

Region	State/ District	Locations	Mosquito Type	West Nile Virus		
				No. Pools Tested	No. Positive Pools	% Positive Pools
North	Kentucky±	Fort Knox	Culex spp.	35	0	0
			Aedes spp.	18	0	0
			Anopheles spp.	2	0	0
	Maryland	Aberdeen Proving Ground (AA & EA) • Andrews AFB • Walter Reed NMMC Walter Reed (Forest Glen and Glen Haven)	Culex spp.	249	11	4.4%
			Aedes spp.	71	0	0
			Anopheles spp.	4	0	0
	New York	Fort Drum	Culex spp.	45	0	0
			Aedes spp.	6	0	0
			Anopheles spp.	2	0	0
			Coquillettidia spp.	1	0	0
	Virginia	Arlington Naval Service Center • Henderson Hall MCB JB Myer-Henderson Hall • Quantico MCB	Culex spp.	98	3	3.1%
			Aedes spp.	51	0	0
			Anopheles spp.	6	0	0
			Psorophora spp.	1	0	0
	Washington, D.C.	Anacostia Annex • Armed Forces Retirement Housing • Fort McNair JB Anacostia-Bolling • Marine Barracks • Naval Observatory Naval Research Laboratory • Washington Navy Yard	Culex spp.	503	71	14.1%
			Aedes spp.	72	0	0
	NORTH TOTAL			Culex spp.	930	85
Aedes spp.				218	0	0
Anopheles spp.				16	0	0
Coquillettidia spp.				1	0	0
Culiseta spp.				1	0	0
			Psorophora spp.	1	0	0
South	Alabama	Fort Rucker	Culex spp.	51	0	0
			Aedes spp.	12	0	0
	Florida	Naval Base Pensacola	Culex spp.	123	0	0
			Aedes spp.	13	0	0
			Culiseta spp.	9	0	0
	Georgia	Fort Benning • Fort Gordon • Fort Stewart	Culex spp.	63	0	0
			Aedes spp.	19	0	0
	Kentucky±	Fort Campbell	Culex spp.	3	0	0
			Aedes spp.	1	0	0
	Louisiana	NAS JBR New Orleans	Culex spp.	4	0	0
			Aedes spp.	1	0	0
	Mississippi	NAS Meridian • NCBC Gulfport	Culex spp.	24	0	0
			Aedes spp.	2	0	0
	Oklahoma	Fort Sill	Culex spp.	34	0	0
			Aedes spp.	3	0	0
	South Carolina	Fort Jackson	Culex spp.	87	0	0
			Aedes spp.	9	0	0
Culiseta spp.			1	0	0	
Texas±	Fort Hood • Camp Bullis JB San Antonio (Fort Sam Houston, Randolph AFB, Lackland AFB)	Culex spp.	631	2	0.3%	
		Aedes spp.	42	0	0	
SOUTH TOTAL			Culex spp.	1,020	2	0.2%
			Aedes spp.	102	0	0
			Culiseta spp.	22	0	0
West	Arizona	Yuma Proving Ground	Culex spp.	14	0	0
	Kansas	Fort Leavenworth • Fort Riley	Culex spp.	44	0	0
	Missouri	Fort Leonard Wood	Culex spp.	2	0	0
	New Mexico	Donna Anna • McGregor Range • Meyer Range	Culex spp.	8	0	0
	Texas±	Fort Bliss	Culex spp.	128	12	9.4%
	Washington	Bangor • Indian Island • JB Lewis-McChord • Keyport • Manchester	Culex spp.	28	0	0
			Culex spp.	224	12	5.4%
WEST TOTAL			Culex spp.	2,174	99	4.6%
			Aedes spp.	320	0	0
			Anopheles spp.	16	0	0
			Coquillettidia spp.	1	0	0
			Culiseta spp.	23	0	0
			Psorophora spp.	1	0	0
GRAND TOTAL			Culex spp.	2,174	99	4.6%
			Aedes spp.	320	0	0
			Anopheles spp.	16	0	0
			Coquillettidia spp.	1	0	0
			Culiseta spp.	23	0	0
			Psorophora spp.	1	0	0

± Fort Knox, KY is in PHCR-North; Fort Campbell, KY is in PHCR-South. Fort Bliss, TX is in PHCR-West; other Texas installations are in PHCR-South.

Appendix F: Tick Testing

Environment and Host Tick Testing by Submitting Location and Testing Region, 2014

Ticks Tested: *Ixodes* spp. and *Amblyomma* spp.

Collection Source	Region	Location	Host Type	<i>Ixodes</i> spp.								<i>Ixodes scapularis</i>						<i>Amblyomma americanum</i>				<i>Amblyomma maculatum</i>					
				<i>Anaplasma phagocytophilum</i> ‡		<i>Borrelia spp.</i> ‡		<i>Borrelia burgdorferi</i> ‡		<i>Borrelia miyamotoi</i> ‡		<i>Babesia spp.</i>		<i>Babesia microti</i>		<i>Babesia canis</i>		<i>Ehrlichia chaffeensis</i>		<i>Ehrlichia ewingii</i>		<i>Rickettsia parkeri</i>		<i>Rickettsia andeanae</i>			
				POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED		
Host	Europe	Ansbach, GM	Human	0	4	1	4																				
		Baumholder, GM		0	2	0	2																				
		Grafenwoehr, GM		0	8	0	8																				
		Hofenhels, GM		1	18	0	18																				
		Illesheim, GM		0	1	0	1																				
		Kaiserslautern, GM		0	3	0	3																				
		Landstuhl, GM		0	10	0	10																				
		SHAPE, BE		0	2	0	2																				
		Stuttgart, GM		2	23	1	23																				
		Wilseck, GM		1	1	1	1																				
	North	Ansbach, GM	Animal	1	16	0	16																				
		Aviano, IT		0	7	0	7																				
		Baumholder, GM		0	7	0	7																				
		Hofenhels, GM		0	10	0	10																				
		Kaiserslautern, GM		0	33	2	33																				
		Spangdahlem, GM		0	2	0	2																				
		Stuttgart, GM		0	1	0	1																				
		Wilseck, GM		0	8	0	8																				
		Wiesbaden, GM		0	1	0	1																				
		EUROPE TOTAL				5	157	5	157																		
West	West Point, NY	Feline	17	293			29	293	6	293			0	293	0	293											
	Fort Belvoir, VA	Canine Deer	0	9			6	9		9			0	9	0	9	0	9	0	9	1	1					
	Fort AP Hill, VA	Human	5	248			22	248	1	248			0	248	0	248											
	JB Langley-Eustis, VA	Raccoon		0			0	0		0			0	0	0	0	0	21	0	21		0					
	NORTH TOTAL				22	550			57	550	7	550			0	550	0	550	0	30	0	30	1	1			
West	Camp Pendleton, CA	Host Unsp.					0	1									0	10									
	Fort Leavenworth, KS						0	5									0	2									
	Fort Leonard Wood, MO																0	33									
	Fort Riley, KS																										
	JB Lewis-McChord, WA						0	1*																			
Ord Military Com., CA					0	5*																					
Vandenberg AFB, CA					0	2*																					
WEST TOTAL								0	14								0	45									
HOST TOTAL				27	707	5	157	57	564	7	550			0	550	0	550	0	75	0	30	1	1				
Environment	EUROPE TOTAL				12	816**	7	816**																			
	North	Fort Knox, KY	N/A																					3	5		
		Wendell H. Ford RTC, KY																3	127	0	127						
		Fort Drum, NY						45	131				18	131	0	131	0	131									
		JB Langley-Eustis, VA																0	1	0	1						
	NORTH TOTAL				0	131			45	131			18	131	0	131	0	131	3	128	0	128			3	5	
	West	Fort Hunter Liggett, CA	N/A					0	59*									0	0								
		Fort Leavenworth, KS																0	54								
		Fort Leonard Wood, MO																15	447								
		Fort Riley, KS																0	110								
Ord Military Com., CA							0	8*									0	0									
Vandenberg AFB, CA							0	26*									0	0									
Yakima Training Ctr, WA															0	0											
WEST TOTAL				0	76			0	93							15	611										
ENVIRONMENT TOTAL				12	1,023	7	816	45	224			18	131	0	131	0	131	18	739	0	128			3	5		

‡ Unless specified, tick type tested is *Ixodes scapularis*.

* *Ixodes pacificus*.

** *Ixodes ricinus*.

Continued on Next Page

Appendix F (Continued): Tick Testing

Environment and Host Tick Testing by Submitting Location and Testing Region, 2014

Ticks Tested: *Dermacentor* spp. and *Rhipicephalus* spp.

Collection Source	Region	Location	Host Type	<i>Dermacentor reticulatus</i>		<i>D. variabilis</i>		<i>D. occidentalis</i>		<i>D. andersoni</i>		<i>Rhipicephalus sanguineus</i>		<i>Dermacentor</i> spp.							
				<i>Rickettsia raoultii</i>		<i>Rickettsia rickettsii</i>		<i>Rickettsia rickettsii</i>		<i>Rickettsia rickettsii</i>		<i>Rickettsia rickettsii</i>		<i>A. phagocytophilum</i>		<i>Borrelia</i> spp.		<i>Ehrlichia</i> spp.			
				POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED	POS	TESTED		
Host	Europe	Ansbach, GM	Human																		
		Baumholder, GM																			
		Grafenwoehr, GM																			
		Hofenhels, GM																			
		Illshheim, GM																			
		Kaiserslautern, GM																			
		Landstuhl, GM																			
		SHAPE, BE																			
		Stuttgart, GM																			
		Vilseck, GM																			
	Ansbach, GM	Animal																			
	Aviano, IT												0	1	0	1	0	1			
	Baumholder, GM																				
	Hofenhels, GM																				
	Kaiserslautern, GM																				
Spangdahlem, GM																					
Stuttgart, GM																					
Vilseck, GM																					
Wiesbaden, GM																					
EUROPE TOTAL													0	1	0	1	0	1			
North	West Point, NY	Felines																			
	Fort Belvoir, VA	Canines Deer	1	2	0	15															
	Fort AP Hill, VA	Humans																			
	JB Langley-Eustis, VA	Raccoons			0	7															
NORTH TOTAL				1	2	0	22														
West	Camp Pendleton, CA	Host Unsp.			0	2															
	Fort Leavenworth, KS				0	1															
	Fort Leonard Wood, MO					0															
	Fort Riley, KS				0	27															
	JB Lewis-McChord, WA					0															
	Ord Military Com., CA					0	1														
	Vandenberg AFB, CA					0	15	0	10			0	40								
WEST TOTAL						0	46	0	10		0	40						4			
HOST TOTAL				1	2	0	68	0	10		0	40	0	1	0	1	0	5			
Environment	Europe	EUROPE TOTAL§																			
	North	Fort Knox, KY	N/A																		
		Wendell H. Ford RTC, KY																			
		Fort Drum, NY																			
		JB Langley-Eustis, VA																			
	NORTH TOTAL																				
	West	Fort Hunter Liggett, CA	N/A			0		0		0											
		Fort Leavenworth, KS				0		0		0											
		Fort Leonard Wood, MO				0		0		0											
		Fort Riley, KS				0		0		0											
Ord Military Com., CA					0		0		0												
Vandenberg AFB, CA					0	20	0	45		0											
Yakima Training Ctr, WA			0	20	0	0	0	22													
WEST TOTAL						0	40	0	45	0	22										
ENVIRONMENT TOTAL						0	40	0	45	0	22										

** 4 *D. variabilis* ticks tested for *Ehrlichia chaffeensis*. Zero positives.

§ PHCR Europe tested 19 *Dermacentor marginatus*, 1 (5.2%) was positive for tick-borne encephalitis virus (TBEV) (data not shown).

U.S. Army Public Health Command Zoonotic Disease Summary

Disease Epidemiology Program Resources:

Epidemiology Training: <http://phc.amedd.army.mil/topics/healthsurv/de/Pages/Epi-TechTraining.aspx>

DRSi Resources: <http://phc.amedd.army.mil/topics/healthsurv/de/Pages/DRSiResources.aspx>

Resource Materials: <http://phc.amedd.army.mil/topics/healthsurv/de/Pages/ResourceMaterials.aspx>

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