

Zoonotic Disease

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

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Haemaphysalis longicornis tick. Used with permission of Rachel Cane, 2009.

Executive Summary

Human Disease

- In the second quarter of 2013 (1 April to 30 June), zoonotic diseases accounted for 3% (21 of 724) of all reported medical events (RMEs), excluding sexually transmitted infections (STIs). In the US Army Active Duty Service Member (AD SM) population, zoonotic diseases accounted for 2% (8 of 381) of all non-STI RMEs, and for 4% (13 of 343) in the non-AD beneficiary population (family members and retirees).
- During this period, 17 cases of borreliosis, including Lyme disease, were reported in Disease Reporting System-internet (DRSi): 5 in AD SMs and 12 in non-AD beneficiaries. Of these 17 borreliosis cases, 11 were from Medical Treatment Facilities (MTFs) in the PHC Region-North (PHCR-North) area, 4 from MTFs in the PHC Region-Europe (PHCR-Europe), and 1 case each from MTFs in the PHC Region-South (PHCR-South) and PHC Region-West (PHCR-West). Review of medical records and health insurance claims identified an additional 179 patients (41 AD SMs and 138 non-AD beneficiaries) with visits coded for borreliosis.
- One case of Dobrava hantavirus in an AD SM was reported from an MTF in the PHCR-Europe area, and was corroborated with medical visit data from the Military Health System Management Analysis and Reporting Tool (M2). This exposure was duty-related; the SM was admitted to Landstuhl Regional Medical Center (LRMC) for treatment and convalescence.

Animal Disease Summary

- During the period covered by this report, ProMED reported 5 domestic cases of rabies: 2 wolves in Alaska, 1 horse in Colorado, 1 raccoon in Rhode Island, and 1 dog in Texas. Overall, 22 people received post-exposure prophylaxis (PEP) as a result of direct or indirect contact with these rabid animals. One imported fatal human case was also noted, a Guatemalan man who had recently entered the US via Mexico.
- In the second quarter of 2013, 79 confirmed and one suspected rabies cases were reported to the Food and Agricultural Organization's (FAO) Emergency Prevention System database (EMPRES-i). Twelve were in humans.
- Influenza A(H5N1) activity continues in domestic bird flocks in five countries in Southeast Asia. Of these five countries, Nepal and Indonesia experienced the most events, 46 and 28 respectively. All but one of these outbreaks occurred in domestic flocks; one occurred in a wild crow in Nepal.
- No human rabies cases occurred among Army beneficiaries during the second quarter of 2013.

Vector Surveillance Summary

- In the second quarter of 2013, 858 *Ixodes scapularis*, *Dermacentor variabilis*, and *Amblyomma* spp. ticks were removed from human patients and submitted for testing to the DoD Tick Test Kit Program (human patient ticks) at Army Institute of Public Health (AIPH) and PHCR-Europe. A total of 38 (4%) *Ixodes* spp. tested positive for *Borrelia* spp., the causative agent of Lyme disease, and 11 (1%) *Amblyomma americanum* ticks tested positive for *Ehrlichia ewingii*, a causative agent of ehrlichiosis.
- PHCR-North Laboratory Services tick surveillance activities resulted in the collection and testing of 1,185 ticks from installations in CONUS. Of these, 103 (9%) ticks tested positive for disease-causing agents. Ticks were collected from tick drags as well as from rodents caught in tick drags.
- A total of 344 mosquito pools from Army installations were submitted for testing for West Nile Virus (WNV) during this reporting period: 253 from PHCR-South, 79 from PHCR-North, and 12 from PHCR-West. One *Culex* spp. pool from an installation in PHCR-North tested positive for WNV.

Human Disease Summary: US Army Soldiers and Non-AD Beneficiaries

Zoonotic Diseases Reported in DRSi from Army Installations and in Soldiers and Other Beneficiaries at Navy Installations, 1 April to 30 June 2013

Installation	Borreliosis		Ehrlichiosis/Anaplasmosis		Hantavirus		Rocky Mountain Spotted Fever		Tularemia	
	AD	Non-AD Ben	AD	Non-AD Ben	AD	Non-AD Ben	AD	Non-AD Ben	AD	Non-AD Ben
PHCR-Europe										
Hohenfels, Germany	1									
Landstuhl, Germany		1			1					
Schweinfurt, Germany		1								
Wiesbaden, Germany		1								
TOTAL	1	3			1					
PHCR-North										
Aberdeen Proving Ground, MD		1								
FHC Dumfries, VA		1								
Ft Drum, NY	3	1								
Ft Meade, MD		1								
Ft Lee, VA		1								
NHC New England, RI		3								
TOTAL	3	8								
PHCR-South										
Ft Campbell, KY			1							
Ft Rucker, AL							1			
Comayagua, Honduras	1									
TOTAL	1		1				1			
PHCR-West										
Ft Riley, KS		1							1	
Ft Wainwright, AK										
TOTAL		1							1	

- Excluding STIs, 724 RMEs were submitted to DRSi from 1 April to 30 June 2013 from MTFs in the PHCR areas. Of these, 21 (3%) were for zoonotic diseases, 8 in Active Duty Service Members (AD SMs) and 13 in non-AD beneficiaries. During this same time period in 2012, 98 RMEs had been reported in DRSi for a zoonotic disease; 34 in AD SMs and 64 in non-AD beneficiaries.
- Borreliosis (including Lyme disease) remains the most commonly reported zoonosis. Four cases from Europe and 11 from MTFs in the PHCR-North area were reported between 1 April to 30 June 2013. During this same time period in 2012, 31 cases from Europe and 47 cases from MTFs in the PHCR-North area were reported.
- In May an AD SM from Europe was admitted to Landstuhl Regional Medical Center (LRMC) with fever, muscle aches, abdominal pain, blurred vision, and dyspnea. Serologic testing revealed hantavirus infection with Dobrava virus, a strain found in central Europe, which caused Hemorrhagic Fever with Renal Syndrome (HFRS). This exposure was duty-related.
- One case of tularemia was reported in an AD SM from Kansas. Diagnosis was confirmed by a fourfold rise in serum antibodies. Tularemia is endemic in [Kansas](#), and this SM reported no travel outside of the state in at least 10 days before illness began.

Human Disease Summary: US Army Soldiers and Non-AD Beneficiaries

Zoonotic Disease Cases Identified from Soldier and Other Beneficiary Medical Visit Data in M2, 1 April to 30 June 2013

Installation	Babesiosis		Borreliosis		Ehrlichiosis (E. chaffeensis)		Ehrlichiosis (E. ewingii)		Cutaneous Leishmaniasis		Leptospirosis		Rickettsiosis (R. parkeri)		Rocky Mountain Spotted Fever		Tick-borne Encephalitis		
	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	AD	BEN	
PHCR-Europe																			
Landstuhl, Germany			2	12															
Vicenza, Italy			1																
PHCR-North																			
Ft Belvoir, VA		1	12	59		1	1						1	2					
Ft Knox, KY			1	2										1					
Ft Bragg, NC			1	9									1			1	4		1
West Point, NY			4	18															
PHCR-South																			
Ft Campbell, KY	1		3	4	1		1	1					1		2	1			
Ft Hood, TX			2	2															
Ft Gordon, GA			3	1															
Ft Benning, GA			2	4															
Ft Polk, LA				4															
Ft Sill, OK			2	2															
Joint Base San Antonio, TX			3	3				1		1	1								1
Ft Stewart, GA			1	4			1	1											
Ft Jackson, SC				4															
PHCR-West																			
Ft Wainwright, AK																			
Ft Carson, CO				2								1							
Ft Riley, KS			1	3						1									
Joint Base Lewis McChord, WA									2								1		
Ft Bliss, TX				1	1														
Ft Leonard Wood, MO			3	2		1													
PHCR-Pacific																			
Ft Shafter, HI				2						1	3	1							
Total	1	1	41	138	2	2	3	3	2	2	4	3	3	3	3	10	0	2	

- In- and outpatient records from MTFs available in M2 were reviewed for zoonotic disease diagnoses at Army MTFs in the PHC regions. Verification of diagnoses was not possible due to lack of access to full medical records. Cases listed in this section may not meet RME reporting guidelines or may represent follow-up visits for earlier diagnoses.
- From 1 April to 30 June 2013, 227 medical encounters with zoonotic disease diagnoses were identified in M2, mostly among direct care outpatient records (CAPER). In contrast, during the previous quarter, the majority were identified in purchased care outpatient records. Of these 227 records, 4 were not included in the above table: 1 visit each coded for hantavirus from Landstuhl, visceral leishmaniasis from Ft Knox, Q fever from Ft Wainwright, and West Nile Virus (WNV) from Joint Base San Antonio. Only hantavirus and Q fever were associated with AD SM visits. Because Q fever is not commonly found in Alaska and has had an incidence there of 0 in past years ([CDC](#)), this case was likely deployment- or duty-related.
- Borreliosis (including Lyme disease) was the most common zoonosis diagnosed: 41 AD SMs and 138 non-AD beneficiaries had visits associated with this code. Rocky Mountain Spotted Fever was the second most common zoonosis identified: 3 AD SMs and 10 non-AD beneficiaries had visits associated with this code.
- Of 7 visits coded for leptospirosis, 4 (57%) were from Hawaii, where leptospirosis is known to occur more frequently ([CDC](#)). It is unclear whether these cases were acquired locally or were related to travel.
- Of the 227 potential cases identified, only 4 were corroborated with DRSi reports: 2 borreliosis cases, 1 ehrlichiosis (*E. chaffeensis*) case, and 1 hantavirus case.

Human Disease Summary: Notable Medical Events

Civilian Cases of Hantavirus Reported in ProMED, 1 April to 30 June 2013

Location	Hantavirus type	# Cases: confirmed (suspected)	Animal Infected	Illness Type
Canada		1		
<i>Saskatchewan</i>	Sin Nombre*	1	Human	HPS
United States		5		
<i>Oklahoma</i>	Sin Nombre*	1	Human	HPS
<i>New Mexico</i>	Sin Nombre*	1	Human	HPS
<i>Arizona</i>	Sin Nombre*	2	Human	HPS
<i>Montana</i>	Sin Nombre*	1	Human	HPS
Panama		3 (1)		
<i>Cocle</i>	Choclo*	(1)	Human	HPS
<i>Los Santos</i>	Choclo*	1	Human	HPS
<i>Veraguas</i>	Choclo*	2	Human	HPS
Bolivia		4		
<i>Cochabamba</i>	Laguna Negra*	4	Human	HPS
Costa Rica		(1)		
	Choclo*	(1)	Human	HPS
Argentina		4		
<i>Salta</i>	Unspecified	1	Human	HPS
<i>Buenos Aires</i>	Unspecified	2	Human	HPS
<i>Entre Rios</i>	Unspecified	1	Human	HPS

- Hantaviruses in the Americas can result in Hantavirus Pulmonary Syndrome (HPS); this syndrome may have a case fatality rate as high as 60%.
- Overall, 17 confirmed cases and 2 suspect cases of hantavirus in civilians were reported during this time period. Six deaths were reported in one case each from Arizona, Oklahoma, Montana, Canada, and Bolivia.
- Due to the virus subtypes that are associated with hantavirus, all 19 cases resulted in Hantavirus Pulmonary Syndrome. Although there is no specific cure for hantavirus infection, early recognition and treatment of infected individuals can reduce progression of disease and increase chances of survival.
- Hantavirus in the United States is carried primarily by 4 rodents: deer mice, cotton rats, rice rats, and white-footed mice. These 4 rodents carry different hantavirus strains: Sin Nombre (SNV), Black Creek Canal (BCCV), Bayou virus (BV), and New York virus (NYV). The [CDC](#) notes that other rodents may act as hosts to other types of hantaviruses that can cause both HPS and Hemorrhagic Fever with Renal Syndrome (HFRS).

* Denotes the most likely virus based on the known geographic distribution.

Civilian Avian-Associated Human Flu Cases Reported in FAO's EMPRES-I Database, 1 April to 30 June 2013

Africa		
Country	Serotype	# of cases*
China	H7N9	100
Egypt	H5N1	1
Asia		
Cambodia	H5N1	1
Viet Nam	H5N1	1
Indonesia	H5N1	1

* Events reported in EMPRES-i are assumed to be individual cases and not disease clusters.

- Since 2003, [WHO](#) has reported a total of 633 human cases of human influenza A(H5N1): 60% (n=377) of the cases died.
- From 1 April to 30 June 2013, WHO reported 4 human cases of human influenza A(H5N1) from Cambodia, Vietnam, Indonesia, and Egypt.
- From 1 April to 30 June 2013, WHO reported a total of 100 human cases of influenza A(H7N9) in China.
- During this time period, 43 (43%) cases resulted in death. No H7N9 cases were reported from Army installations or in Soldiers at non-Army locations.

Animal Disease Summary: Rabies

Laboratory Services Rabies Specimen Testing, 1 April to 30 June 2013

	Species	# Samples Tested	# Human Exposures	# DFA* Indeterminate	% DFA Indeterminate	# DFA Positive	% DFA Positive	# MNA* Positive	% MNA Positive
Central Command									
Afghanistan	Canine	2	2	0	0	0	0	0	0
	Feline	1	1	0	0	0	0	0	0
	Bat	2	2	2	100				
	TOTAL	5	5	2	40	0	0	0	0
Kuwait	Canine	1	1	0	0	0	0	0	0
	TOTAL	1	1	0	0	0	0	0	0
PHCR-South									
Ft Bragg, NC	Canine	3	3	0	0	0	0	0	0
	Feline	1	1	0	0	0	0	0	0
	TOTAL	4	4	0	0	0	0	0	0
Ft Irwin, CA	Feline	1	1	0	0	0	0	0	0
	TOTAL	1	1	0	0	0	0	0	0
Ft Knox, KY	Feline	1	1	0	0	0	0	0	0
	TOTAL	1	1	0	0	0	0	0	0
Ft Polk, LA	Canine	1	1	0	0	0	0	0	0
	TOTAL	1	1	0	0	0	0	0	0
Ft Sam Houston, TX	Bat	1	1	0	0	0	0	1	100
	TOTAL	1	1	0	0	0	0	1	100

*DFA: Direct Fluorescent Antibody; MNA: Mouse Neuroblastoma Cells

- In the second quarter of 2013, 6 animals from Central Command (CENTCOM) locations were submitted to PHCR-E for rabies testing. Of these, 3 (50%) were dogs, 2 (33%) were bats, and 1 (17%) was a cat. Two (33%) bats submitted from Afghanistan were indeterminate for rabies. Indeterminate test results should be treated as positives; persons sustaining risk exposures should be evaluated for rabies prophylaxis.
- Continental United States (CONUS) Army Installations submitted 8 animals to the Department of Defense's (DoD) Food Analysis and Diagnostic Laboratory (FADL) for rabies testing. Of these, 4 (50%) were dogs, 3 (38%) were cats, and 1 (11%) was a bat. Each submission was associated with a human exposure, but only the bat sample from Ft Sam Houston tested positive for rabies.
- Across the United States, the [CDC](#) reported 812 rabid animals were identified in the second quarter of 2013; the majority were from the West South Central and South Atlantic regions.

Animal Disease Summary: Rabies

Rabies Cases in the United States Reported in ProMED, 1 April to 30 June 2013

State	# of Animal Cases	Animal Infected	Animal Type
Rhode Island	1	Raccoon	Wild
Texas	1	Dog	Stray
Alaska	2	Wolves	Wild
Colorado	1	Horse	Domestic

- In the second quarter of 2013, 5 animal cases and 1 imported human case were reported in the United States by ProMED. The human case occurred in Corpus Christi, Texas in May and resulted in the death of the patient, a 28 year-old Guatemalan male who had recently entered the US via Mexico. Disease was caused by a canine rabies virus variant common in Central America.
- A total of 18 people, including 4 children, were given post-exposure prophylaxis (PEP) for rabies after a family brought a rabid raccoon into their Rhode Island home in May.
- Two wolves in Alaska were found to be infected with rabies, raising concerns the disease may be spreading to interior regions.
- A stray dog in a Texas animal shelter tested positive for rabies in May; 3 city workers were given PEP.

International Rabies Reporting through FAO's EMPRES-I, 1 April to 30 June 2013

Country	Animal Infected	Animal Type	# Cases (Suspected)
Peru	Cattle	Domestic	42
	Sheep	Domestic	1
	Swine	Domestic	2
	Horse	Domestic	3
Greece	Dog	Domestic	1
	Red fox	Wild	10
Slovakia	Red fox	Wild	1
	Dog	Domestic	2
	European Pine Marten	Wild	1
Colombia	Cattle	Domestic	2
South Africa	Human		(1)
	Dog	Domestic	1
India	Human		6

- In the second quarter of 2013, 79 confirmed and one suspected rabies cases were reported to the Food and Agricultural Organization's (FAO) Emergency Prevention System database (EMPRES-i). Due to space restrictions, only countries reporting multiple cases are included in the table.
- India reported 6 human rabies cases; South Africa reported 1 suspected human case. Five additional human cases were reported from Philippines, Kazakhstan, Ghana, Haiti, and Guatemala.
- The outbreak in Peruvian cattle is ongoing. The 42 cattle likely infected by vampire bats are in addition to the 27 cattle reported infected from 1 January to 31 March 2013.
- Spain and Morocco each reported single cases of rabid dogs.
- In South Africa, [WHO](#) is finalizing preparations to open a canine rabies vaccine bank, part of a rabies control program that hopes to eliminate most human rabies deaths by providing regular supply and availability of dog rabies vaccines. The first vaccine doses will be available during the third quarter of 2013.

Animal Disease Summary: Tick-borne Disease

Laboratory Services Animal Testing, 1 April to 30 June 2013

- In the second quarter of 2013, 2 pet dogs and one government-owned animal had serum samples submitted for testing by the Ft Belvoir VTF. None of these samples tested positive for a tick-borne disease.
- Six *A. americanum* ticks were submitted by Ft Belvoir from 4 Military Working Dogs (MWDs); 1 tick tested positive for *E. ewingii*. A *D. variabilis* tick, also removed from a MWD, tested negative for any pathogens. The same facility also submitted 3 *A. americanum* and 1 *D. variabilis* ticks from 1 service dog; all ticks tested negative for any pathogens. From 11 pet dogs, 51 *A. americanum* and 7 *D. variabilis* were collected; 3 of the former tested positive for *E. ewingii*.
- Ft Dix submitted 3 *A. americanum* and 2 *D. variabilis* ticks from 1 MWD; all 5 ticks tested negative for any pathogens.
- PHCR-Europe submitted a total of 48 ticks from Baumholder (n=11), Heidelberg (n=1), Kaiserslautern (n=20), Hohenfels (n=15), and Vicenza (n=1). Of these, 2 ticks from Baumholder tested positive, 1 for *Anaplasma phagocytophilum* and 1 for *Borrelia* spp.; 1 tick from Kaiserslautern tested positive for *A. phagocytophilum*; and 3 ticks from Hohenfels tested positive for *Borrelia* spp.

International Avian Influenza Reported in FAO's EMPRES-I, 1 April to 30 June 2013

Country	Influenza Serotype	Animal(s) Infected	Animal Type	# of Events
China	H7N9	Chicken	Domestic	8
	H7N9	Pigeon	Domestic	4
	H7N9	Unspecified bird	Domestic	12
Dem. People's Rep of Korea				
	H5N1	Duck	Domestic	1
Indonesia	H5N1	Chicken	Domestic	18
	H5N1	Duck	Domestic	7
	H5N1	Quail	Domestic	3
Nepal	H5N1	Chicken	Domestic	12
	H5N1	Chicken, Duck, Unspecified Bird	Domestic	2
	H5N1	Unspecified bird	Domestic	31
	H5N1	Crow	Wild	1
Vietnam	H5N1	Swallow	Wild	1

- H5N1 animal infections continued in Asia, and China saw continued confirmed infections with avian influenza A(H7N9) in animals in the second quarter of 2013.
- Natural infections with H7N9 virus occur in chickens, ducks, and other birds, but are asymptomatic. The virus is transmitted from avian hosts to humans via droplets or contact, but there is limited evidence to support sustained human-to-human transmission.
- The tradition of live animal markets in China appears to have contributed in part to H7N9 infections; the incidence of human infections with H7N9 decreased sharply after live animal markets were closed. H7N9 might also follow a seasonal outbreak pattern similar to that of other avian influenza viruses.
- Knowledge about H7N9's main virus reservoirs and the extent and distribution of the virus in animals, however, remains limited.

Vector Surveillance: Tick Summary

Department of Defense Human Tick Test Kit Program, 1 April to 30 June 2013

Installation	Tick Species	Total Tested	<i>Anaplasma phagocytophilum</i>		<i>Ehrlichia chaffeensis</i>		<i>Ehrlichia ewingii</i>		<i>Borrelia burgdorferi</i>		<i>Rickettsial parkeri</i>	
PHCR-North												
Aberdeen Proving Ground, MD		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	26	0	0					7	27		
	<i>Amblyomma americanum</i>	150			3	2	3	2				
	Total:	176	0	0	3	2	3	2	7	4		
Fort Belvoir, VA		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	10	0	0					3	30		
	<i>Amblyomma americanum</i>	158			0	0	1	1				
	Total:	168	0	0	0	0	1	1	3	2		
Ft Campbell, KY		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i> *	1	0	0					1	100		
	<i>Amblyomma americanum</i>	85			0	0	0	0				
	<i>Amblyomma maculatum</i>	8									2	25
	Total:	94	0	0	0	0	0	0	1	1	2	2
Carlisle Barracks, PA		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	8	0	0					4	50		
	<i>Amblyomma americanum</i>	1			0	0	0	0				
	Total:	9	0	0	0	0	0	0	4	44		
Ft Detrick, MD		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	2	0	0					1	50		
	Total:	2	0	0					1	50		
Ft Drum, NY		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	31	0	0					8	26		
	Total:	31	0	0					8	26		
Ft AP Hill, VA		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	1	0	0					0	0		
	<i>Amblyomma americanum</i>	78			1	1	3	4				
	Total:	79	0	0	1	1	3	4	0	0		
Joint Base Dix-Lakehurst, NJ		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	3	0	0					1	33		
	<i>Amblyomma americanum</i>	24			0	0	2	8				
	Total:	27	0	0	0	0	2	7	1	4		
Ft Lee, VA		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	1	0	0					0	0		
	<i>Amblyomma americanum</i>	14			0	0	1	7				
	Total:	15	0	0	0	0	1	7	0	0		
Letterkenny AD, PA		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	1	0	0					1	100		
	Total:	1	0	0					1	100		
Ft Meade, MD		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	3	0	0					1	33		
	<i>Amblyomma americanum</i>	14			0	0	0	0				
	Total:	17	0	0	0	0	0	0	1	6		
Pentagon DTHC, VA		count	count	%	count	%	count	%	count	%	count	%
	<i>Amblyomma americanum</i>	11			1	9	0	0				
	Total:	11			1	9	0	0				
Tobyhanna AD, PA		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	2	0	0					1	50		
	Total:	2	0	0					1	50		
Sunny Point MOT, NC		count	count	%	count	%	count	%	count	%	count	%
	<i>Amblyomma americanum</i>	1					1	100				
	Total:	1					1	100				
PHCR-West												
Installation	Tick Species	Total Tested	<i>Anaplasma phagocytophilum</i>		<i>Ehrlichia chaffeensis</i>		<i>Ehrlichia ewingii</i>		<i>Borrelia burgdorferi</i>		<i>Rickettsial parkeri</i>	
Ft McCoy, WI		count	count	%	count	%	count	%	count	%	count	%
	<i>Ixodes scapularis</i>	25	2	8					7	28		
	Total:	25	2	8					7	28		

*Tick acquired while patient in Virginia. Species does not occur in Ft Campbell area.

Vector Surveillance: Tick Summary

DOD Human Tick Test Kit Program, 1 April to 30 June 2013

- From 1 April to 30 June 2013, 1,006 ticks collected from human patients were submitted for testing for disease-causing agents. The DoD Human Tick Test Kit Program conducts testing on individual ticks only; none were pooled.
- Of the 1,006 ticks submitted, 38 (4%) *Ixodes* spp. tested positive for *Borrelia* spp., the causative agent of Lyme disease, and 11 (1%) *Amblyomma americanum* ticks tested positive for *Ehrlichia ewingii*, one of the causative agents of ehrlichiosis. Less than 1% of ticks tested positive for *A. phagocytophilum*, *E. chaffeensis*, or *R. parkeri* each.
- Included in the 1,006 ticks submitted for testing were 148 *Dermacentor variabilis* ticks, not shown in table. All 148 of these ticks tested negative for disease-causing agents.
- Of these 1,006 ticks, 52 were submitted for testing by PHCR-Europe. All were *Ixodes* spp.; 3 were positive for *Borrelia* spp.

Environmental Tick Collection Program, 1 April to 30 June 2013

Installation	Date Collected	Tick Type	Ticks Tested	<i>Ehrlichia chaffeensis</i>	<i>Ehrlichia ewingii</i>	<i>Rickettsial parkeri</i>	<i>Rickettsia rickettsii</i>				
PHCR-North											
Fort Knox, KY	July 1, 2013		TOTAL #	# Pos.	%	# Pos.	%	# Pos.	%	# Pos.	%
		<i>Dermacentor variabilis</i>	45			0	0			3	7
		<i>Amblyomma americanum</i>	198	2	1	0	0				
		<i>Amblyomma maculatum</i>	4					1	25		
		Total:	247	2	1	0	0	1	0	3	1
Wendell H. Ford RTC, KY	July 1, 2013		TOTAL #	# Pos.	%	# Pos.	%	# Pos.	%	# Pos.	%
		<i>Dermacentor variabilis</i>	107							2	2
		<i>Amblyomma americanum</i>	175	1	1	4	2				
		<i>Amblyomma maculatum</i>	36					5	14		
		Total:	318	1	0	4	1	5	2	0	0
PHCR-South											
Fort Campbell, KY	July 1, 2013		TOTAL #	# Pos.	%	# Pos.	%	# Pos.	%	# Pos.	%
		<i>Dermacentor variabilis</i>	148							6	4
		<i>Amblyomma americanum</i>	106	4	4	2	2				
		<i>Amblyomma maculatum</i>	66					10	15		
		Total:	320	4	1	2	1	10	3	6	2
PHCR-West											
Fort Leonard Wood, MO			TOTAL #	# Pos.	%	# Pos.	%	# Pos.	%	# Pos.	%
		<i>Dermacentor variabilis</i>	1							1	100
		<i>Amblyomma americanum</i>	11	0	0						
		Total:	12	0	0					1	8
Fort Riley, KS			TOTAL #	# Pos.	%	# Pos.	%	# Pos.	%	# Pos.	%
		<i>Dermacentor variabilis</i>	7							0	0
		<i>Amblyomma americanum</i>	12	0	0						
		Total:	19	0	0					0	0

- In the second quarter of 2013, 1,185 ticks were tested by PHC Region labs. A total of 103 (9%) ticks tested positive for disease-causing agents.
- Of these 103 ticks, 46 tested positive for *B. canis*, and 16 for *R. parkeri*, the causative agent of maculatum infection, a mild febrile illness characterized by a maculopapular rash. 12 ticks tested positive for *R. rickettsii*, the causative agent of Rocky Mountain Spotted Fever. 11 ticks tested positive for *B. burgdorferi*, the causative agent of Lyme disease. 10 ticks tested positive for *E. chaffeensis* and 8 tested positive for *E. ewingii*, both of which cause ehrlichiosis.

Vector Surveillance: Mosquito Summary

Mosquito Pool Testing, 1 April to 30 June 2013

Installation	Mosquito Type	Total Pools Tested	West Nile Virus	
PHCR-North				
Armed Forces Retirement Home, Washington DC		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	2	0	0
	<i>Aedes spp.</i>	1	0	0
	TOTAL	3	0	0
Ft McNair		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	3	1	33.33
	<i>Aedes spp.</i>	1	0	0
	TOTAL	4	1	25
Joint Base Anacostia-Bolling		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	56	0	0
	<i>Aedes spp.</i>	3	0	0
	TOTAL	59	0	0
Joint Base Myer-Henderson Hall		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	4	0	0
	<i>Aedes spp.</i>	2	0	0
	TOTAL	6	0	0
Walter Reed, Forest Glen Annex		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	3	0	0
	<i>Aedes spp.</i>	1	0	0
	TOTAL	4	0	0
Walter Reed, Glen Haven Annex		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	1	0	0
	<i>Aedes spp.</i>	2	0	0
	TOTAL	3	0	0
PHCR-South				
Fort Sam Houston, TX		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	9	0	0
	TOTAL	9	0	0
Fort Hood, TX		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	106	0	0
	<i>Aedes spp.</i>	6	0	0
	TOTAL	112	0	0
Fort Jackson, FL		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	28	0	0
	<i>Aedes spp.</i>	8	0	0
	<i>Culiseta spp.</i>	4	0	0
	TOTAL	40	0	0
Fort Polk, LA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	27	0	0
	TOTAL	27	0	0
Fort Stewart, GA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	49	0	0
	<i>Aedes spp.</i>	9	0	0
	<i>Culiseta spp.</i>	7	0	0
	TOTAL	65	0	0
PHCR-West				
Fort Bliss, TX		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	1	0	0
	TOTAL	1	0	0
Joint Base Lewis McChord, WA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	1	0	0
	TOTAL	1	0	0
Yakima Training Center, WA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	3	0	0
	TOTAL	3	0	0
Fort Riley, KS		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	7	0	0
	TOTAL	7	0	0

- From 1 April to 30 June 2013, 344 mosquito pools were submitted for testing from Army installations.
- A total of 253 (74%) mosquito pools were submitted to PHCR-South, 79 (23%) to PHCR-North, and 12 (3%) to PHCR-West. *Culex* spp. are the primary vector for West Nile Virus (WNV).
- Ft McNair submitted 3 *Culex* spp. pools: 1 was positive for West Nile virus.
- No infected pools were detected in PHCR-South during this time period.
- PHCR-West tested 12 *Culex* mosquito pools, none of which were positive for WNV.
- In the second quarter of 2013, no WNV infections were reported in Army AD SMs. A medical encounter coded for WNV was identified in M2 for a non-AD beneficiary in San Antonio, Texas.
- [CDC](#) reported 53 cases of WNV in the US thus far in calendar year 2013: 21 (40%) neuroinvasive cases and 32 (60%) non-neuroinvasive cases. Three (6%) deaths have been reported.
- A total of 2,920 *Culex* spp. and 2 *Aedes* spp. were collected from Djibouti and sent to PHCR-Europe. No pools tested positive for disease-causing agents.

Focus On: Severe Fever with Thrombocytopenia Syndrome

Overview

- Where mosquito-borne illnesses have been mitigated, ticks are emerging as the leading cause of vector-borne disease. Increased awareness on the part of clinicians, improved surveillance and modern diagnostics have in recent years led to the discovery of a seemingly inexhaustible global supply of new tick-borne pathogens. Many of these diseases have only recently been described and in some cases the causative agent is unproven or poorly characterized. Severe Fever with Thrombocytopenia Syndrome (SFTS) is an emerging disease that has recently been added to the list of mutually reportable diseases officially recognized by US Forces Japan and the Government of Japan.

Background

- Background: In the summers of 2006, 2007 and 2008, hundreds of agricultural workers in central China became seriously ill with high fever and gastrointestinal symptoms. The most severe cases suffered from spontaneous hemorrhage secondary to thrombocytopenia, and many died. The case fatality rate was initially feared to be as high as 30%. Investigators presumptively attributed the outbreaks to human granulocytic anaplasmosis (HGA), though the clinical picture associated with these cases was somewhat atypical for HGA and histories of tick-bites were rare among cases. By 2009, researchers had begun to associate the illness with a novel bunyavirus, subsequently named Severe Fever with Thrombocytopenia Syndrome Virus (SFTSV). ¹

Clinical Features and Epidemiology

- SFTS has an incubation period of one to two weeks. Signs and symptoms include fever, lymphadenitis and gastrointestinal symptoms such as diarrhea. Severe cases may progress to altered mental status, multi-organ system failure and death. Non-specific laboratory findings include thrombocytopenia and leukocytopenia. Current estimates of case fatality range from 6-10%. Lethal cases occur disproportionately among the elderly.
- The consistently seasonal pattern of outbreaks suggests that a vector is involved in transmission, and subsequent work has confirmed the presence of the virus in the tick *Haemaphysalis longicornis*. Person-to-person transmission via infected blood has also been described. ²
- Researchers from China have found the seroprevalence in goats to be as high as 95% in affected areas, suggesting that goats may play an important role in transmission of the disease by acting as an animal reservoir. Dogs in these areas have seropositivity rates of around 50%, but rates in cattle are 0%. ³
- The true incidence of the disease is unknown. Cases of SFTS have been identified in central and northwestern Chinese provinces, as well as Korea and Japan. Eight deaths attributed to SFTS have occurred in southern Korea since the virus was first described. No cases have been reported in the vicinity of Seoul. Japan has also reported eight SFTS deaths. While SFTS has not been identified in the United States, a phylogenetically similar virus was reported in 2012 from two patients in Missouri with thrombocytopenia and symptoms similar to those of SFTS: fever, fatigue, anorexia and diarrhea. ⁴
- To see spatial distribution of HealthMap Alerts for tick-borne diseases in Asia and the world, please visit: <http://healthmap.org/v.php?id=1739822&al=1&trto=en&trfr=en>.

Reference: Data Resource Summary

Case Definitions and Incidence Rules Used for Human Zoonotic Disease Surveillance

For this report, zoonotic diseases were defined as diseases with an animal host or reservoir that can be transmitted to a human. RME definitions or ICD-9 codes were used to select medical encounters as suggested in the 2012 Armed Forces RME Guidelines and Case Definitions. Armed Forces Health Surveillance Center (AFHSC) case definitions and incident rules were then applied: one RME or one inpatient encounter with any of the defining diagnoses in any diagnostic position is considered a case. Borreliosis, Crimean-Congo hemorrhagic fever, eastern/western equine arboviruses and West Nile fever virus all must have two outpatient encounters occurring within 60 days of each other, with any of the defining ICD-9 codes in any diagnostic position to be considered an outpatient case.

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 medical and personnel data repository that contains information on military medical treatment facility medical records, demographic data, laboratory records, as well as Tricare insurance claims (inpatient and outpatient). 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 were used to select medical encounters from the first quarter of 2013 based on the date of service variable in M2. Data were pulled to identify inpatient and outpatient encounters for those patients who had received military medical facility care and services purchased through the Tricare Management Agency medical insurance program.

Disease Reporting System-internet (DRSi)

DRSi is a web-based application developed by the Navy that the Army uses to monitor RMEs. Cases that meet RME case definitions are entered manually by personnel at each MTF into the DRSi platform. These medical event reports are reviewed at the US Army Public Health Command Disease Epidemiology Program for completeness and accuracy. For this report, the system was queried based on date of diagnosis for all medical event reports entered between 1 April and 30 June 2013.

US Army Public Health Command Laboratory Sciences Portfolio

US Army Public Health Command Laboratory Sciences at the Army Institute of Public Health (AIPH) and PHCR-Europe, -North, and -South completed all of the vector-borne surveillance testing and US Army installation-related rabies specimen testing. Each PHCR collated the results from their area of responsibility and sent the data to the USAPHC Disease Epidemiology program at the end of the quarter for the purposes of this Zoonotic Disease Summary.

Global Animal Disease Information System (EMPRES-i)

EMPRES is the Emergency Prevention System group within the Food and Agricultural Organization of the United Nations (FAO). EMPRES has developed the database EMPRES-i, which stands for the Emergency Prevention System's Global Animal Disease Information System. The EMPRES-i system uses official and unofficial sources to confirm or deny reports of animal disease. For the purposes of this report, all confirmed H5N1, H7N9, and rabies events with distinct identification numbers were considered separate events. Events were queried based on the date of report into the system.

Program for Monitoring Emerging Diseases (ProMED)

The Program for Monitoring Emerging Diseases (ProMED) is an internet-based system for rapid global dissemination on issues of public health concern, and is managed by the International Society for Infectious Diseases. It is populated by a variety of sources, including official notifications and media alerts; reports can be contributed by individual subscribers as well. Submissions are reviewed by qualified moderators before being posted to the system for global dissemination. For the purposes of this report, each alert was individually assessed to determine the number and location of events. When case counts could be ascertained, they were summarized; otherwise the number of different events were reported. Follow-up reports were not included. ProMED mail was searched using the search function on the website for key events identified over the course of the quarter by the authors, who monitor the ProMED emails as part of their daily routines.

US Army Public Health Command Zoonotic Disease Summary

Other 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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