

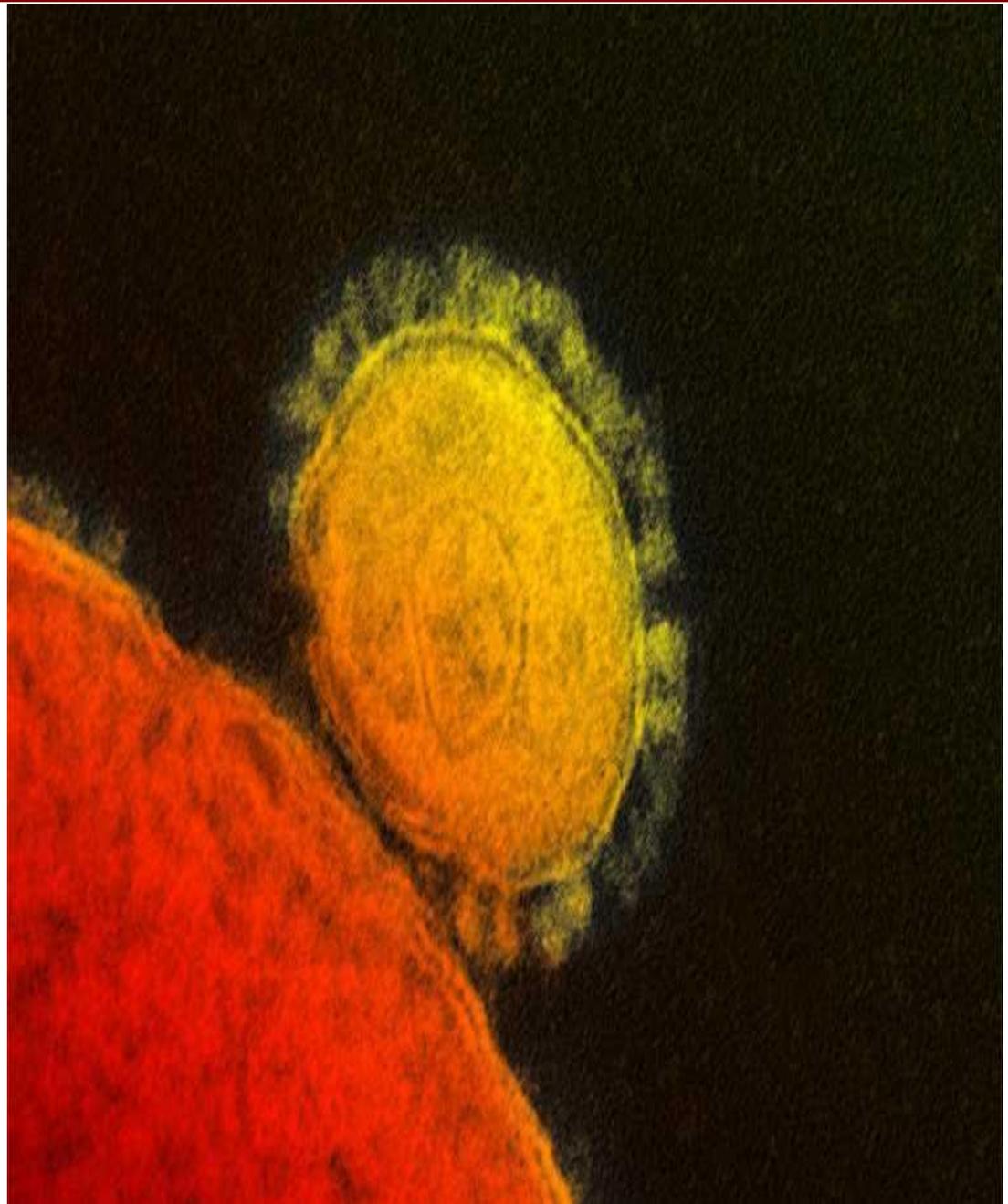
Zoonotic Disease

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

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MERS-CoV: Rocky Mountain Laboratories, National Institute of Allergy and Infectious Diseases, NIH.

Executive Summary

Human Disease

- In the third quarter of 2013 (1 July to 30 September), zoonotic diseases accounted for 6% (66 of 1,064) 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 3% (20 of 630) of all non-STI RMEs. In the non-AD beneficiary population, they accounted for 11% (46 of 434).
- During this period, borreliosis, including Lyme disease, accounted for the most frequently reported zoonosis in Disease Reporting System-internet (DRSi), and review of medical records and health insurance claims identified borreliosis as the most commonly coded visit in Military Health System Management Analysis and Reporting Tool (M2) as well. In DRSi, both Rocky Mountain Spotted Fever (RMSF) and arboviral encephalitis were the next most commonly reported zoonoses. In M2, RMSF and leptospirosis were the next most commonly coded visits. In both DRSi and M2 data, 30% of all zoonotic diseases occurred in AD SMs.
- Five cases of borreliosis were corroborated with medical visit data from the M2: 3 in AD SMs from MTFs in the PHCR-Europe area, and 2 in non-AD beneficiaries from PHCR-North area. One of the 3 AD SM exposures from the PHCR-Europe area was duty-related.

Animal Disease

- During the period covered by this report, ProMED reported 18 confirmed and 3 suspected domestic cases of rabies: 5 each in bats, foxes, and cats; 2 in skunks, 1 dog, and 1 suspected case each in a bat, fox, and cow. Five (28%) of the confirmed cases occurred in animals in New Jersey. Overall, 6 people received post-exposure prophylaxis (PEP) as a result of direct or indirect contact with these rabid animals.
- In the third quarter of 2013, over 209 international confirmed rabies cases were reported to the Food and Agricultural Organization's (FAO) Emergency Prevention System database (EMPRES-i). Five were in humans from Chile, China, Namibia, Nepal, and Russia. The human rabies case in Chile was presumed to be the result of a dog bite.
- One cat was submitted to PHCR-Europe for rabies testing from a Central Command (CENTCOM) location and was negative.
- Influenza A activity continues in domestic bird flocks in four countries in South Asia. Of 4 countries that reported 32 total H5N1 infections in animals, Nepal reported 29 (91%): 16 in unspecified birds, 12 in chicken, and 1 in a house crow.

Vector Surveillance

- In the third quarter of 2013, 878 *Ixodes scapularis*, *Demacentor variabilis*, and *Amblyomma* spp. ticks were removed from human patients and submitted for testing to the DoD Tick Test Kit Program at the Army Institute of Public Health (AIPH) from CONUS locations. A total of 17 (2%) *Ixodes* spp. ticks tested positive for *Borrelia burgdorferi*, the causative agent of Lyme disease, and less than 1% tested positive for *Anaplasma phagocytophilum*, the causative agent of anaplasmosis. 14 *Amblyomma* spp. ticks tested positive for *Ehrlichia* spp: 8 for *E. chaffeensis* and 6 for *E. ewingii*.
- PHCR-North Laboratory Services environmental tick surveillance activities resulted in the collection and testing of 263 ticks from CONUS installations. Of these, 16 (6%) ticks tested positive for disease-causing agents. Ticks were collected from tick drags as well as from rodents caught in tick drags. 58 ticks were collected from host animals; none tested positive for disease-causing agents.
- During this reporting period, 49 of 925 (5%) mosquito pools from Army installations tested positive for West Nile Virus (WNV). 450 (49%) were collected from PHCR-South area.

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 July to 30 September 2013

Installation	Borreliosis		Encephalitis, Arboviral		Rocky Mountain Spotted Fever	
	AD	Non-AD Ben	AD	Non-AD Ben	AD	Non-AD Ben
PHCR-Europe						
Bamberg, Germany	1					
Bavaria, Germany	1					
Grafenwoehr, Germany	1					
Hohenfels, Germany	2	1				
Kelly-Stuttgart, Germany		3				
Landstuhl, Germany	3	5				
TOTAL	8	9				
PHCR-North						
Carlisle Barracks, PA		3				
FHC Dumfries, VA		1				
FHC Fairfax, VA		1				
Ft Belvoir, VA		2				
Ft Drum, NY	2	3				
Ft Knox, KY	1					1
Ft Lee, VA		1				
Ft Meade, MD	2	5				1
New Cumberland, PA		1				
NHC New England, RI	1	2				
Walter Reed NMMC, MD		3				1
West Point, NY	4	9				
TOTAL	10	31				3
PHCR-South						
Ft Hood, TX			1			
Ft Sill, OK		1				
TOTAL		1	1			
PHCR-West						
Ft Carson, CO			1			
Ft Wainwright, AK				1		
TOTAL			1	1		
PHCR-Pacific						
Ft Shafter, HI		1				
TOTAL		1				

- Excluding STIs, 1,064 RMEs were submitted to DRSi from 1 July to 30 September 2013 from MTFs in the PHCR areas. Of these, 66 (6%) were for zoonotic diseases, 20 in Active Duty Service Members (AD SMs) and 46 in non-AD beneficiaries. During this same time period in 2012, 83 RMEs had been reported in DRSi for a zoonotic disease; 35 in AD SMs and 48 in non-AD beneficiaries.
- Borreliosis (including Lyme disease) was reported in 41 individuals at MTFs in PHCR-North area and 17 individuals in PHCR-Europe area between 1 July 2013 to 30 September 2013. During this same time period in 2012, borreliosis was reported in 27 individuals at MTFs in PCHR-Europe area and 25 individuals at MTFs in PHCR-North area.
- West Nile Virus (WNV), St Louis Encephalitis (SLE), dengue fever, and related diseases are reported in the category arboviral encephalitis in DRSi. During this reporting period, 3 arboviral encephalitis cases were reported:
 - Two cases were WNV, one from Ft Carson and one from Ft Hood.
 - Chikungunya was reported in a non-AD beneficiary from Alaska who had traveled to the Philippines.

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 July to 30 September 2013

Installation	Borreliosis		Brucellosis		Ehrlichiosis (E. chaffeensis)		Ehrlichiosis (E. ewingii)		Hantavirus		Cutaneous Leishmaniasis		Visceral Leishmaniasis		Leptospirosis		Q Fever		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	AD	BEN	AD	BEN	AD	BEN	
PHCR-Europe																									
Landstuhl, Germany	9	23																							
Vicenza, Italy																									
PHCR-North																									
Ft Belvoir, VA																									
Ft Knox, KY		3																							
Ft Bragg, NC	6	4									1							1	2	1	3			1	
West Point, NY	7	26					1				1														
PHCR-South																									
Ft Campbell, KY	7	5		1											1						2	2			
Ft Hood, TX	2	4																							
Ft Gordon, GA	4	2																							
Ft Benning, GA	2	6						1																	
Ft Polk, LA		3																						1	
Ft Sill, OK	1	3																							
Joint Base San Antonio, TX		3												1											
Ft Stewart, GA	1	2			1		1																		
Ft Jackson, SC	1	3													1				1						
PHCR-West																									
Ft Wainwright, AK		1																							
Ft Carson, CO	1	9									1														
Ft Riley, KS	2	1																							
Joint Base Lewis McChord, WA		4																							
Ft Bliss, TX		1																							
Ft Leonard Wood, MO	4	4																		2	2				
PHCR-Pacific																									
Ft Shafter, HI		3							1						2	1							1		
Total	47	110	0	1	0	1	0	3	0	1	1	2	1	0	2	2	1	0	1	5	5	7	0	1	

- In- and outpatient records available in M2 from MTFs in the PHC regions were reviewed for zoonotic disease diagnoses. 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 July to 30 September 2013, 191 medical encounters with zoonotic disease diagnoses were identified in M2, mostly among direct care outpatient records (CAPER). Similarly, during the previous quarter, the majority were identified in direct care outpatient records. 58 medical encounters were associated with AD SM visits.
- Borreliosis (including Lyme disease) was the most common zoonosis diagnosed: 47 AD SMs and 110 non-AD beneficiaries had visits associated with this code. Rocky Mountain Spotted Fever was the second most common zoonosis identified: 5 AD SMs and 7 non-AD beneficiaries had visits associated with this code.
- Of 4 visits coded for leptospirosis, 3 were diagnosed from Hawaii, where leptospirosis is known to occur more frequently ([CDC](#)). 2 of these 3 medical encounters were associated with AD SMs who reported exposure to waterfalls in Hawaii prior to presentation. Both patients developed thrombocytopenia, anemia, and renal insufficiency. The AD SMs who had visits associated with visceral leishmaniasis and Q fever (1 each) were diagnosed during deployment. A diagnosis of chronic brucellosis was identified this quarter; this was a previously diagnosed condition and the non-AD beneficiary was seen for a follow-up visit.
- Of the 191 potential cases identified, only 5 borreliosis cases were corroborated with DRSi reports.

Human Disease Summary: Notable Medical Events

Cases of Middle East Respiratory Syndrome-Coronavirus Reported to WHO, 1 July to 30 September 2013

Location	# Cases: confirmed	Deaths*	Dates of diagnosis
Saudi Arabia	1	2	7 Jul 2013
	1		11 Jul 2013
	2		18 Jul 2013
	2		21 Jul 2013
	1	1	29 Jul 2013
	3		25-Jul-13
	6		23 Jul - 1 Aug 2013
	4		8 Aug - 17 Aug 2013
		2	28-Aug-13
	4		15 Aug - 2 Sep 2013
	18		1 Sep - 11 Sep 2013
	6		15 Sep - 23 Sep 2013
Qatar	2		28 Aug 2013
	1		6 Sep 2013
		1	19 Sep 2013
United Arab Emirates	1		13 Jul 2013
	4		18 Jul 2013
		1	28 Aug 2013

- Middle East respiratory syndrome-coronavirus (MERS-CoV) is a novel virus first detected in April 2012. As of 30 September, 9 countries have reported cases of human infection with MERS-CoV: France, Germany, Italy, Jordan, Qatar, Saudi Arabia, Tunisia, the United Arab Emirates (UAE), and the United Kingdom. All cases have had some connection, either direct or indirect, with the Middle East. MERS-CoV has recently been found to be genetically related to a virus in bats, but the definitive source of human infection with MERS-CoV remains unknown.

- Overall, 56 confirmed cases of MERS-CoV were reported to WHO from 1 July to 30 September 2013. Seven deaths were reported in cases from Saudi Arabia, Qatar, and the UAE.

- Of the 56 cases confirmed by laboratory diagnosis during the third quarter of 2013, at least 4 cases each reported from Saudi Arabia and the UAE were healthcare workers caring for a previously lab-confirmed case. At least 7 other cases from Saudi Arabia were family members or close contacts of a previously lab-confirmed case. Five cases reported no exposure to either cases or animals. One of the two cases reported from Qatar in August traveled to Medina, Saudi Arabia and became symptomatic upon returning to Qatar.

- For more detailed information on MERS-CoV as well as more recent case estimates, see page 8.

*No overlap between reported cases and subsequent deaths.

Avian-Associated Human Flu Cases Reported to WHO, 1 July to 30 September 2013

Country	Influenza Serotype	# of Cases
China	H7N9	2
Cambodia	H5N1	7
Indonesia	H5N1	1

- Since 2003, [WHO](#) has reported a total of 641 human cases of human influenza A (H5N1). Cases have been reported from 15 countries, and 59% (n=380) resulted in death.
- From 1 July to 30 September 2013, WHO reported 8 human cases of human influenza A(H5N1): 7 cases from Cambodia and 1 from Indonesia.
- From 1 July to 30 September 2013, WHO reported 2 human cases of influenza A (H7N9) in China. Neither case resulted in death.
- No avian influenza cases were reported from Army installations or in Soldiers at non-Army locations.

Animal Disease Summary: Rabies

Laboratory Services Rabies Specimen Testing, 1 July to 30 September 2013

	Species	# Samples Tested	# Human Exposures	# DFA* Indeterminate	% DFA Indeterminate	# DFA Positive	% DFA Positive	# MNA* Positive	% MNA Positive
Central Command									
Afghanistan	Feline	1	1	0	0	0	0	0	0
	TOTAL	1	1	0	0	0	0	0	0
PHCR-Europe									
Ansbach, Germany	Canine	1	2	0	0	0	0	0	0
	TOTAL	1	2	0	0	0	0	0	0
Kaiserslautern, Germany	Feline	1	1	0	0	0	0	0	0
	Bat	1	0	0	0	0	0	0	0
	TOTAL	2	0	0	0	0	0	0	0
PHCR-West									
Ft Lewis, WA	Bat	5	0	0	0	0	0	0	0
	Non-Human Primate	1	2	0	0	0	0	0	0
	TOTAL	6	2	0	0	0	0	0	0
PHCR-South									
Ft Benning, GA	Bat	1	0	0	0	0	0	0	0
	TOTAL	1	0	0	0	0	0	0	0
Ft Bragg, NC	Feline	2	1	0	0	0	0	0	0
	TOTAL	2	1	0	0	0	0	0	0
Ft Hood, TX	Feline	1	1	0	0	0	0	0	0
	TOTAL	1	1	0	0	0	0	0	0
Ft Knox, KY	Canine	1	1	0	0	0	0	0	0
	Feline	1	1	0	0	0	0	0	0
	TOTAL	2	2	0	0	0	0	0	0
Ft Leonard Wood, MO	Feline	2	0	0	0	0	0	0	0
	TOTAL	2	0	0	0	0	0	0	0
Ft Polk, LA	Canine	1	0	0	0	0	0	0	0
	TOTAL	1	0	0	0	0	0	0	0
Ft Sam Houston, TX	Canine	3	2	0	0	0	0	0	0
	Bat	3	1	2	67	0	0	0	0
	TOTAL	6	3	2	33	0	0	0	0
Ft Sill, OK	Feline	1	2	0	0	0	0	0	0
	TOTAL	1	2	0	0	0	0	0	0

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

- In the third quarter of 2013, 1 cat from a CENTCOM location was submitted to PHCR-Europe for rabies testing, as well as three other animals from locations in Germany. None were positive.
- Continental United States (CONUS) Army Installations submitted 22 animals to the Department of Defense's (DoD) Food Analysis and Diagnostic Laboratory (FADL) for rabies testing. Of these, 9 (41%) were bats, 7 (32%) were cats, 5 (23%) were dogs, and 1 (5%) was a non-human primate. These submissions were associated with 11 human exposures. All were negative except 2 of the 3 bat samples from Ft Sam Houston, which were indeterminate for rabies. Indeterminate test results should be treated as positives; persons sustaining risk exposures should be evaluated for rabies prophylaxis.
- Across the United States, the [CDC](#) reported 970 rabid animals were identified in the third 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 July to 30 September 2013

State	# of Animal Cases (Suspect)	Animal Infected	Animal Type
Montana	1	Bat	Wild
New Jersey	1	Cat	Domestic
	4	Fox	Wild
North Carolina	1	Cat	Domestic
	2	Cat	Stray
Virginia	1 (1)	Fox	Wild
	1	Bat	Wild
Minnesota	1	Skunk	Wild
Texas	1	Dog	Domestic
	(1)	Bat	Wild
Rhode Island	(1)	Cow	Domestic
Massachusetts	1	Skunk	Wild
Wisconsin	1	Bat	Wild
North Dakota	1	Cat	Stray
Florida	1	Bat	Wild
Kentucky	1	Bat	Wild

- In the third quarter of 2013, 18 confirmed and 3 suspected animal cases were reported in the United States by ProMED. The majority of human exposures involved infected bats and foxes.
- In Stanhope, New Jersey, 4 of 5 trapped foxes were tested and found to be rabid. Several residents reported being attacked by the same animals.
- Four rabies episodes involved human exposures due to interactions with stray or unknown domestic cats.
- The United States Department of Agriculture (USDA) is continuing a rabies vaccine pilot [study](#) in which they will distribute vanilla-flavored packets of oral rabies vaccination baits by hand or by aircraft in New Hampshire, New York, West Virginia, Ohio, and Vermont. Raccoon and skunk populations will be sampled for rabies prevalence before and after vaccine release.

International Rabies Reporting through FAO's EMPRES-I, 1 July to 30 September 2013

Country	Animal Infected	Animal Type	# Events
Peru	Cattle	Domestic	48
Greece	Red fox	Wild	4
Taiwan	Unspecified Mammal	Wild	4
	Ferret-Badger	Wild	141
	Asian House Shrew	Wild	1
	Dog	Domestic	1
Chile	Human		1
Russia	Human		1
Indonesia	Dog	Wild	1
Namibia	Human		2
Israel	Dog	Stray	1
Nepal	Human		3
Vietnam	Dog	Stray	Unknown
China	Human		1

- In the third quarter of 2013, over 209 confirmed rabies cases were reported either to the Food and Agricultural Organization's (FAO) Emergency Prevention System database (EMPRES-i) or were noted in ProMED Mail.
- The outbreak in Peruvian cattle is ongoing and likely attributable to infected vampire bats which are known to carry and transmit the virus. The 48 cases noted here are in addition to the 69 cattle reported in the first two quarters of 2013.
- Taiwan recently identified rabies among wild ferret-badgers, interrupting nearly 50 years of rabies-free status. Most cases have been reported from wild ferret-badgers, but 1 case each has been reported in a domestic dog and a house shrew. Increased awareness led to the discovery of cases in other species.
- Chile also lost its rabies-free status, which it had held since 2010. One human case was diagnosed and presumed to be the result of a dog bite. The country's aggressive rabies vaccination program is countered by a large vampire bat population.

Animal Disease Summary

Laboratory Services Animal Testing, 1 July to 30 September 2013

- In the third quarter of 2013, blood and serum samples from 3 pet dogs and 3 military working dogs (MWD) were submitted for testing by the Ft Belvoir VTF. Samples were submitted from Ft Knox, Groton Naval Base, Quantico Vet Clinic, and Ft Belvoir VTF.
- Blood and serum samples collected from host animals were tested for several tick-borne pathogens, including *Babesia* spp., *Ehrlichia* spp., and *Bartonella* spp. All samples were negative.

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

Country	Influenza Serotype	Animal(s) Infected	Animal Type	# of Events
China	H7N9	Unspecified bird	Domestic	1
India	H5N1	Unspecified bird	Domestic	1
Indonesia	H5N1	Duck	Domestic	2
Nepal	H5N1	Chicken	Domestic	12
	H5N1	Unspecified bird	Domestic	16
	H5N1	House crow	Domestic	1

- H5N1 animal infections continued in Asia, and China saw one confirmed infection with avian influenza A(H7N9) in animals in the third quarter of 2013.
- Influenza A(H7N9) virus causes only subclinical infections in poultry, and it is possible that the virus continues to circulate in China and perhaps in neighboring countries.
- Influenza A(H5N1) virus is thought to be circulating widely in poultry in Indonesia.
- Overall, official reports of animal influenza outbreaks remained at their expected seasonal level during this reporting period. Due in part to recent emergence of avian influenza A(H7N9) virus and human infections with this virus, there is enhanced surveillance for various subtypes of avian influenza in animals in China, neighboring countries, and globally.
- WHO guidelines state that continued vigilance is needed within China and neighboring countries to detect pathogenic avian influenza A infections in animals. Any country experiencing outbreaks of influenza virus infection in animals should implement appropriate biosafety measures to reduce threats from potentially infected animals. Collaboration with animal health partners is necessary to optimally control this disease.

Vector Surveillance: Tick Summary

Environmental Tick Collection Program, 1 July to 30 September 2013

Installation	<i>Ehrlichia chaffeensis</i>		<i>Ehrlichia ewingii</i>		<i>Rickettsia parkeri</i>		<i>Rickettsia rickettsii</i>	
	# positive	# tested	# positive	# tested	# positive	# tested	# positive	# tested
PHCR-North								
Wendell H. Ford RTC, KY	2	94	4	94	10	39	0	102
Region Total	2	94	4	94	10	39	0	102
PHCR-West								
Fort Leonard Wood, MO	0	11	0	11	0	0	0	1
Fort Riley, KS	0	10	0	10	0	3	0	3
Region Total	0	21	0	21	0	3	0	4
Command Total	2	115	4	115	10	42	0	106

- During the third quarter of 2013, 263 ticks were collected from the environment at installations in PHCR-North and PHCR-West areas and tested for pathogens. Of these 263 ticks, 115 were *Ambylomma americanum*, 106 were *Dermacentor variabilis*, and 42 were *A. maculatum*.
- Fewer than 2% of *A. americanum* tested positive for *Ehrlichia chaffeensis*; 3.5% tested positive for *Ehrlichia ewingii*. 24% of *A. maculatum* ticks tested positive for *Rickettsia parkeri*, a bacteria in the spotted fever group. No *Dermacentor variabilis* were positive for *R. rickettsia*, the causative agent of Rocky Mountain Spotted Fever.

Host Tick Collection Program, 1 July to 30 September 2013

Installation	<i>Babesia microti</i>		<i>Anaplasma phagocytophilum</i>		<i>Ehrlichia chaffeensis</i>		<i>Ehrlichia ewingii</i>		<i>Borrelia burgdorferi</i>		<i>Rickettsia parkeri</i>		<i>Rickettsia rickettsii</i>	
	#pos	# tested	#pos	# tested	#pos	# tested	#pos	# tested	#pos	# tested	#pos	# tested	#pos	# tested
PHCR-North														
Aberdeen Proving Ground, MD	0	2	0	2	0	2	0	2	0	2	0	2	0	2
Fort Meade, MD					0	1	0	1					0	0
Joint Base Dix-Lakehurst-McGuire, NJ					0	1	0	1					0	1
Fort Belvoir, VA	0	15	0	15	0	15	0	15	0	15	0	15	0	15
Region Total	0	17	0	17	0	19	0	19	0	17	0	17	0	18
PHCR-West														
Fort Riley, KS					0	12	0	12					0	26
Region Total					0	12	0	12					0	26
Command Total	0	17	0	17	0	31	0	31	0	17	0	17	0	44

- During the third quarter of 2013, 58 ticks collected from pet dogs and MWDs were tested for disease-causing agents.
 - Of the 38 ticks submitted by installations in the PHCR-West area, 26 were *D. variabilis* and 12 were *A. americanum*. None tested positive for any pathogens.
 - Of the 20 ticks submitted by installations in the PHCR-North area, 17 were *R. sanguineus/turanicus*, 2 were *A. americanum*, and 1 was a *D. variabilis* tick. None tested positive for any pathogens.

Vector Surveillance: Tick Summary

DOD Human Tick Test Kit Program, 1 July to 30 September 2013

- From 1 July to 30 September 2013, a total of 878 ticks collected from human patients were submitted for testing to the DoD Human Tick Test Kit Program (AIPH) from CONUS locations. Of these, 594 ticks were *Amblyomma americanum*, 216 were *Dermacentor variabilis*, 67 were *Ixodes scapularis*, and 1 was *Amblyomma maculatum*. The DoD Human Tick Test Kit Program conducts testing on individual ticks only; none were pooled.
- Of the 13 *I. scapularis* ticks submitted from installations in PHCR-West area, 2 (15%) tested positive for *Babesia microti*, the causative agent of babesiosis, and 4 (31%) tested positive for *Borrelia burgdorferi*, the causative agent of Lyme disease.
- Of the 54 *I. scapularis* ticks submitted from installations PHCR-North area, 2 (4%) tested positive for *Anaplasma phagocytophilum*, the causative agent of anaplasmosis, and 13 (24%) tested positive for *B. burgdorferi*. Less than 2% of *A. americanum* ticks tested positive for *Ehrlichia chaffeensis* (8 of 552) and *E. ewingii* (6 of 552), both causative agents of ehrlichiosis.
- No ticks submitted for testing from installations in PHCR-South area tested positive for any pathogens.
- Of the 878 total ticks submitted, only 3 *I. scapularis* ticks were co-infected: one with both *B. microti* and *B. burgdorferi*, and 2 with both *A. phagocytophilum* and *B. burgdorferi*.

Department of Defense Human Tick Test Kit Program, 1 July to 30 September 2013

Installation	Ticks Tested TOTAL #	<i>Ixodes scapularis</i>						<i>Amblyomma americanum</i>				<i>Amblyomma maculatum</i>		<i>Dermacentor 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
PHCR-North															
Aberdeen Proving Grounds, MD	101	0	5	0	5	0	5	0	65	0	65			0	31
Carlisle Barracks, PA	1	0	1	0	1	0	1								
Fort Belvoir, VA	42	1	4	0	4	1	4	0	33	1	33			0	5
Fort AP Hill, VA	86							1	86	2	86				
Ft Bragg, NC	2							0	2	0	2				
Ft Detrick, MD	1													0	1
Ft Drum, NY	3	0	2	0	2	0	2	0	1	0	1				
Ft Eustis, VA	20							0	20	0	20				
Ft Indiantown Gap, PA	77	0	13	0	13	4	13	0	1	0	1			0	63
Ft Knox, KY	27							1	25	0	25			0	2
Ft Lee, VA	8							0	7	0	7			0	1
Ft McCoy, WI	94	1	25	0	25	7	25	0	2	0	2			0	67
Ft Meade, MD	7	0	1	0	1	0	1	0	3	0	3			0	3
Ft Myer, VA	2	0	1	0	1	1	1							0	1
Ft Pickett, VA	302							6	282	3	282			0	20
JB Andrews, MD	1							0	1	0	1				
JB Dix-Lakehurst-McGuire, NJ	27							0	21	0	21			0	6
Pentagon, VA	1							0	1	0	1				
Picatinny Arsenal, NJ	3	0	2	0	2	0	2							0	1
Sunny Point MOT, NC	2							0	2	0	2				
Region Total	807	2	54	0	54	13	54	8	552	6	552	0	0	0	201
PHCR-South															
Ft Campbell, KY	30							0	20	0	20	0	1	0	9
Ft Jackson, SC	2							0	1	0	1			0	1
Ft Rucker, AL	1							0	1	0	1				
Redstone Arsenal, AL	3							0	2	0	2			0	1
Region Total	36	0	0	0	0	0	0	0	24	0	24	0	1	0	11
PHCR-West and -Pacific															
Camp Ripley, MN	13	2	13	0	13	4	13								
Ft Leavenworth, KS	10							0	7	0	7			0	3
Ft Leonard Wood, MO	4							0	3	0	3			0	1
Ft Riley, KS	8							0	8	0	8				
Region Total	35	2	13	0	13	4	13	0	18	0	18	0	0	0	4
Grand Total	878	2	67	0	67	17	67	8	594	6	594	0	1	0	216

Vector Surveillance: Mosquito Summary

Mosquito Pool Testing, 1 July to 30 September 2013

Installation	Mosquito Type	Total Pools Tested	West Nile Virus	
PHCR North				
Armed Forces Retirement Housing, Washington DC		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	19	2	11
	<i>Aedes spp.</i>	8	0	0
	TOTAL	27	2	7
Fort Knox, KY		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	2	0	0
	TOTAL	2	0	0
Fort McNair, Washington DC		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	8	0	0
	<i>Aedes spp.</i>	12	0	0
	TOTAL	20	0	0
Joint Base Anacostia-Bolling, Washington DC		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	133	23	17
	<i>Aedes spp.</i>	11	0	0
	TOTAL	144	23	16
Joint Base Myer-Henderson Hall, VA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	11	0	0
	<i>Aedes spp.</i>	12	0	0
	TOTAL	23	0	0
Walter Reed National Military Medical Center, MD		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	46	6	13
	<i>Aedes spp.</i>	21	0	0
	TOTAL	67	6	9
Walter Reed, Forest Glen Annex, MD		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	18	0	0
	<i>Aedes spp.</i>	8	0	0
	TOTAL	26	0	0
Walter Reed, Glen Haven Annex, MD		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	4	0	0
	<i>Aedes spp.</i>	4	0	0
	TOTAL	8	0	0
PHCR South				
Fort Stewart, GA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	51	1	2
	<i>Aedes spp.</i>	3	0	0
	<i>Culiseta spp.</i>	6	0	0
	TOTAL	60	1	2
Fort Polk, LA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	21	0	0
	TOTAL	21	0	0
Fort Sill, OK		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	164	16	10
	<i>Aedes spp.</i>	1	0	0
	TOTAL	165	16	10
Fort Jackson, FL		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	72	0	0
	<i>Culiseta spp.</i>	1	0	0
	TOTAL	73	0	0
Camp Bullis, TX		#	# Pools Positive	% Pools Positive
	<i>Aedes spp.</i>	1	0	0
	TOTAL	14	0	0
Joint Base Fort Sam Houston, TX		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	15	0	0
	<i>Aedes spp.</i>	5	0	0
	TOTAL	20	0	0
Fort Hood, TX		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	114	0	0
	<i>Aedes spp.</i>	4	0	0
	TOTAL	118	0	0
PHCR West				
Fort Bliss, TX		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	73	16	22
	TOTAL	73	16	22
Fort Carson, CO		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	6	0	0
	TOTAL	6	0	0
Joint Base Lewis McChord, WA		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	37	0	0
	TOTAL	37	0	0
Fort Riley, KS		#	# Pools Positive	% Pools Positive
	<i>Culex spp.</i>	28	3	11
	TOTAL	28	3	11

- From 1 July to 30 September 2013, 925 mosquito pools were submitted for testing from military installations.
- *Culex* mosquitoes, the primary vector for West Nile Virus (WNV), accounted for 835 (90%) pools.
- PHCR-North tested 241 *Culex* mosquito pools collected from locations within the Washington DC metropolitan area; 31 (13%) were positive for WNV.
- PHCR-South tested 450 *Culex* mosquito pools; 17 (4%) were positive for WNV. One positive pool was collected from Ft Stewart; all other positives were from Ft Sill.
- Of 144 *Culex* mosquito pools tested by PHCR-West, 19 (13%) were positive for WNV. Positive pools were collected from Ft Riley and Ft Bliss.
- In the third quarter of 2013, two WNV infections were reported in Army AD SMs: one from an AD SM in Colorado, and another from an AD SM in Texas.
- As of the end of this reporting period, [CDC](#) reported 1,927 total cases of WNV in calendar year 2013. 938 (49%) cases were neuroinvasive and 73 (6%) infections resulted in death.

Focus On: Middle East Respiratory Syndrome Coronavirus

Background

- In late September 2012, WHO reported 2 cases of a novel coronavirus from unrelated previously healthy individuals with travel history to the Kingdom of Saudi Arabia (KSA) and Qatar. Retrospective analysis revealed two cases of what is now known as Middle East Respiratory Syndrome Coronavirus (MERS-CoV) had occurred in April 2012 in Jordan.

Current Status

- As of 7 November 2013, 150 confirmed cases (ages range from 14 months to 94 years; at least 51 are female; median age is 53) with 64 deaths have been reported to WHO since the earliest identified cases in April 2012. Among 61 identified fatalities, 43 (70.5%) have had at least one comorbid condition. The most recent known date of onset is 23 October 2013; however, nearly half of all cases reported an unknown onset date.
- There have been 124 cases with 53 fatalities in KSA, 2 fatal cases from Jordan, 7 cases (3 fatal) from Qatar, 3 cases with 2 fatalities from the UK, 1 case in Italy, 6 cases (2 fatal) from the United Arab Emirates (UAE), 2 cases (1 fatal) from Tunisia, and 1 case from Oman. Initial cases outside the Arabian Peninsula have been linked to prior travel to the region.
- In late May 2013, the Secretary of the Department of Health and Human Services determined MERS-CoV had the potential to become a public health emergency and an Emergency Use Authorization (EUA) was signed, allowing a diagnostic test to be used for the detection of MERS-CoV. This test is available to all 50 state health departments, as well as several DoD and international laboratories.
- WHO has held 3 Emergency Committee meetings, each time declaring that MERS-CoV had not yet met conditions for a Public Health Emergency of International Concern (PHEIC).

Clinical Features and Epidemiology

- Most patients presented with severe acute respiratory disease with symptoms of fever, cough, and shortness of breath requiring hospitalization and, eventually, advanced respiratory support. More recently, several asymptomatic persons have been identified by contact tracing using RT-PCR for confirmatory diagnosis. These individuals tend to be younger and healthier.
- 15 clusters have been noted, indicating limited human-to-human transmission among close contacts and health care workers. Based on available data, 25 cases (16.8%) have been identified as health care workers (20 from KSA, 4 from UAE, and 1 from Jordan). Analysis of clusters from a comprehensive database of all cases revealed that in the absence of infection control, *R*-values ranged from 0.8-1.3, also suggesting limited sustained transmissibility.
- There are no specific treatments recommended for MERS-CoV infection. Medical care is strictly supportive.
- While the source of reservoir of the virus is still not known, there is increasing evidence supporting a zoonotic origin. Bats and camels continue to be mentioned as potentially involved in transmission, and recent [findings](#) confirm that MERS-CoV has been circulating among camels. Genetic fragments similar to MERS-CoV have been amplified from samples taken from bats in KSA. Neutralizing antibodies have been detected in dromedary camels from Oman, suggesting that they have been exposed to MERS-CoV or a related coronavirus. However, as most reported human cases do not have a history of direct contact with camels, work is still ongoing to understand their potential role in disease transmission.

The Armed Forces Health Surveillance Center's Division of Integrated Biosurveillance (DIB) coordinates AFHSC and DoD health surveillance information for dissemination to the Combatant Commands, DoD Preventive Medicine professionals, and the Office of the Assistant Secretary of Defense for Health Affairs leadership. DIB works closely with the other U.S. Government and international agencies to generate timely, verified, and actionable health information. For additional information, including testing guidance and laboratory contacts, please visit AFHSC's website (www.afhsc.mil).

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 July and 30 September 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

Additional 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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