USAF School of Aerospace Medicine & Defense Health Agency

DoD Global, Laboratory-Based, Influenza Surveillance Program

2015-2016

Cumulative Results

Locations	71
Collected	1,666
Tested	1,569

Influenza A	**68**
A(H1N1)pdm09	55
A(H1N1)pdm09 & Parainfluenza	1
A(H3N2)	11
A(H3N2) & B	1
A/not subtyped	0

Influenza B*	**35**

Other Respiratory Pathogens	**519**
Adenovirus	83
Bordetella pertussis	1
Chlamydophila pneumoniae	0
Coronavirus	51
Human Metapneumovirus	27
Mycoplasma pneumoniae	37
Parainfluenza	72
RSV	67
Rhino/Enterovirus	116
Non-influenza Viral Coinfections	53
Non-influenza Bacterial Coinfections	12
-*C. pneumo* coinfections (2)	
-*C. pneumo & M. pneumo (1)*	
-*M. pneumo* coinfections (6)	
-*B. pertussis* coinfections *(3)*	

Lab data are current as of 8 February 2016. Results are preliminary and may change as more results are received.
**Influenza B lineages will be reported in the periodic molecular sequencing reports.*

Respiratory Highlights
24 January - 6 February 2016 (Surveillance Weeks 4 & 5)

- During 24 January - 6 February 2016, a total of 278 specimens were collected and received from 49 locations. Results were finalized for 201 specimens from 46 locations. During Week 4, 17 influenza A(H1N1)pdm09, four A(H3N2), and six influenza B viruses were identified. Seven influenza A(H1N1)pdm09, one A(H3N2), one dual influenza coinfection, and three influenza B viruses were identified during Week 5.

- During Week 4 (24-30 January 2016), influenza activity increased slightly in the United States. **Viral Surveillance:** The most frequently identified influenza virus type reported by public health laboratories during Week 4 was influenza A, with influenza A(H1N1)pdm09 viruses predominating. **Pneumonia and Influenza (P&I) Mortality:** The proportion of deaths attributed to P&I was below their system-specific epidemic threshold. **Influenza-Associated Pediatric Deaths:** Two influenza-associated pediatric deaths were reported. **Influenza-Associated Hospitalizations:** A cumulative rate for the season of 2.6 laboratory-confirmed influenza-associated hospitalizations per 100,000 population was reported. **Outpatient Illness Surveillance:** The proportion of outpatient visits for influenza-like illness (ILI) was 2.2%, which is above the national baseline of 2.1%. **Geographic Spread of Influenza:** The geographic spread of influenza in Puerto Rico and three states was reported as widespread; Guam and 18 states reported regional activity; the District of Columbia and 16 states reported local activity; the U.S. Virgin Islands and 12 states reported sporadic activity; and one state reported no activity (CDC Fluview Summary, cited 10 February 2016).

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DoD Global, Laboratory-Based, Influenza Surveillance Program

Table 1. Results by region and location for specimens collected during Weeks 4 & 5

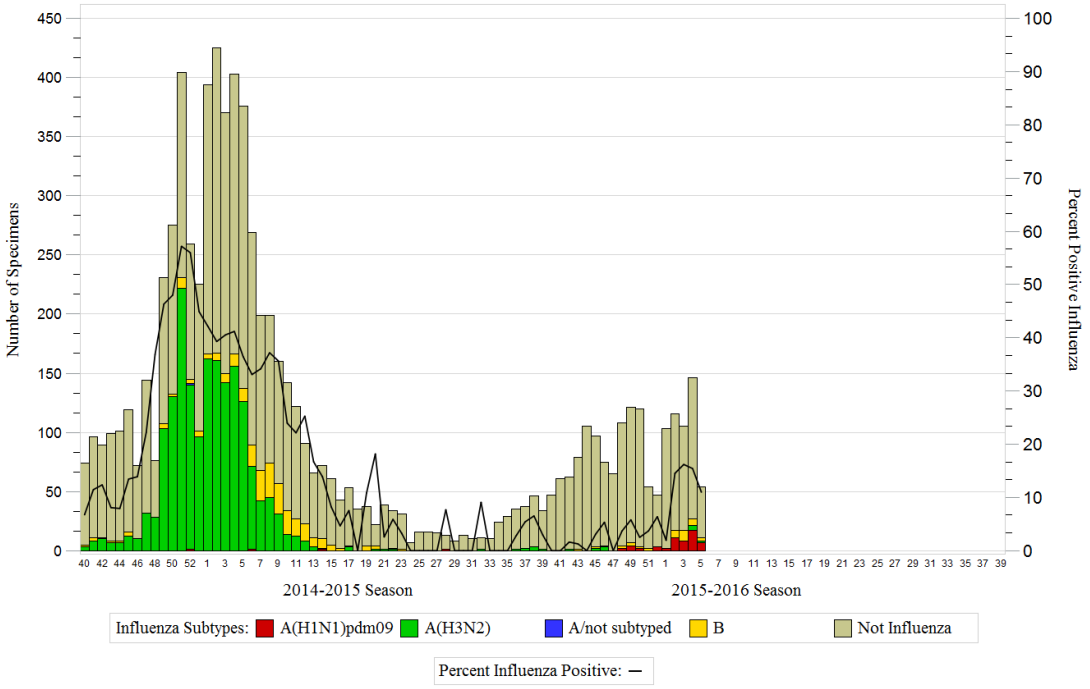
Region*		A(H1N1)pdm09	A(H3N2)	A(H3N2) & B	B	Adenovirus	Coronavirus	hMNV	*M. pneumoniae*	Parainfluenza	RSV	Rhinovirus/Enterovirus	Adeno & Corona	Adeno & RSV	Adeno & RSV & Rhino/Entero	Adeno & Rhino/Entero	Corona & hMNV	Corona & RSV	*M. pneumo* & Rhino/Entero	Para & RSV	RSV & Rhino/Entero	No Pathogen	Total
Deployed	Country 2, Location A	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	7
PACOM	CFA Okinawa, Japan	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Kadena AB, Japan	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Osan AB, South Korea	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Yokota AB, Japan	-	-	-	-	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	2	6
Region 1	Hanscom AFB, MA	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	2	5
	NHCNE Newport, RI	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Region 2	JB McGuire-Dix-Lakehurst, NJ	-	-	-	-	1	-	-	1	-	-	1	-	-	-	1	-	-	-	-	-	-	4
	USMA - West Point, NY	2	-	-	-	4	1	2	1	1	1	1	-	-	-	-	-	1	-	-	-	6	20
Region 3	Dover AFB, DE	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
	JB Andrews, MD	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	JB Langley-Eustis, VA	1	-	-	-	-	2	2	-	-	2	2	-	-	-	-	-	-	-	-	-	2	11
	NMC Portsmouth, VA	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	6
Region 4	Columbus AFB, MS	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3
	Eglin AFB, FL	1	-	-	-	-	-	1	-	-	4	1	-	-	-	-	-	-	-	-	-	4	11
	Ft Bragg, NC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	Ft Campbell, KY	-	-	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
	Hurlburt Field, FL	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	3	4
	Keesler AFB, MS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
	Maxwell AFB, AL	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	6	8
	Moody AFB, GA	-	-	-	-	2	-	-	-	-	1	2	-	-	1	-	-	-	-	-	-	1	7
	NH Jacksonville, FL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	Robins AFB, GA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
	Shaw AFB, SC	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Region 5	Wright-Patterson AFB, OH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
Region 6	Altus AFB, OK	-	-	-	-	-	1	1	-	-	1	-	-	-	-	-	-	-	-	-	-	1	4
	Cannon AFB, NM	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
	Laughlin AFB, TX	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3
	Little Rock AFB, AR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	Sheppard AFB, TX	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	2	4
	Tinker AFB, OK	-	-	-	1	2	-	-	-	-	4	-	-	-	-	-	-	-	-	-	1	-	8
	Vance AFB, OK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Region 7	McConnell AFB, KS	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	2	4
	Offutt AFB, NE	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2
Region 8	Ellsworth AFB, SD	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	2	5
	FE Warren AFB, WY	-	-	-	-	-	1	-	-	-	3	-	1	-	-	-	-	-	-	-	-	1	6
	Hill AFB, UT	2	-	-	1	-	-	1	-	-	-	2	-	-	-	-	-	-	1	-	-	10	17
	Minot AFB, ND	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Peterson AFB, CO	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	4
	USAF Academy, CO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Region 9	Davis-Monthan AFB, AZ	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2
	Luke AFB, AZ	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
	Nellis AFB, NV	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	3
	Travis AFB, CA	1	1	-	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	3	8
Region 10	Mt Home AFB, ID	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	NH Bremerton, WA	4	-	-	2	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	7
Total		24	5	1	9	13	12	13	4	1	17	15	1	1	1	1	1	4	1	1	3	73	201

**CONUS locations are based on Health & Human Services regions. Other locations are defined by COCOM.*

DoD Global, Laboratory-Based, Influenza Surveillance Program

Laboratory Results - Cumulative for Season

Graph 1. Percent influenza positive by week: 2014-2015 surveillance year and through Week 5 of the 2015-2016 surveillance year

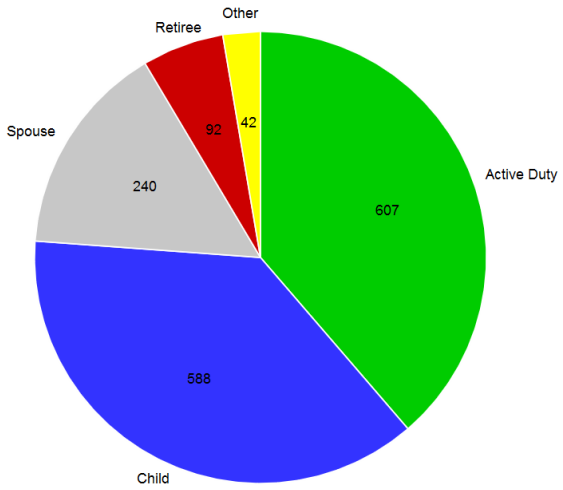


Note: Dual influenza co-infections are excluded from this graph. Specimens with pending results are used in the denominator to calculate percent positive, but are not displayed in the graph.

Table 2. ILI by age group for the 2015-2016 surveillance year through Week 5

Age Group	Frequency	Percent
0-5	378	24.09
6-9	83	5.29
10-17	129	8.22
18-24	259	16.51
25-44	521	33.21
45-64	157	10.01
65+	42	2.68

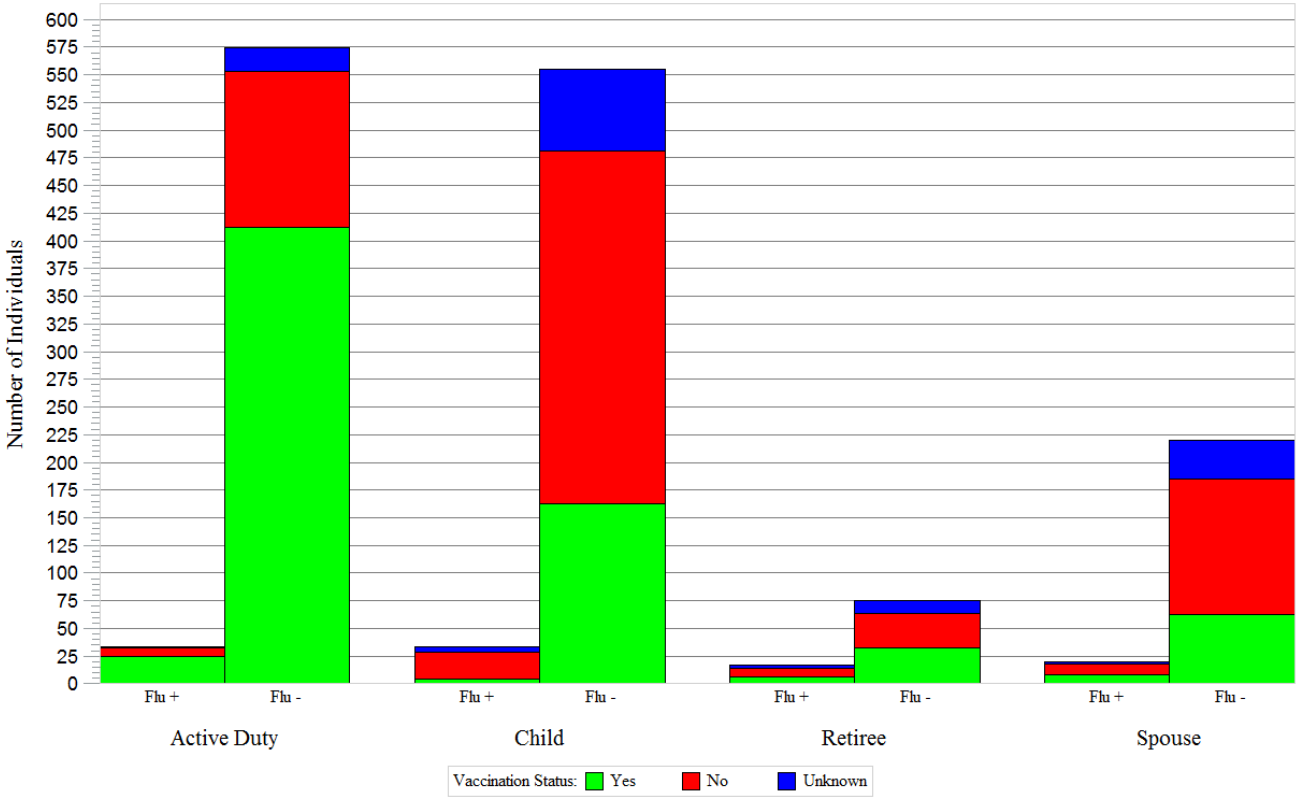
Graph 2. ILI by beneficiary status for the 2015-2016 surveillance year through Week 5



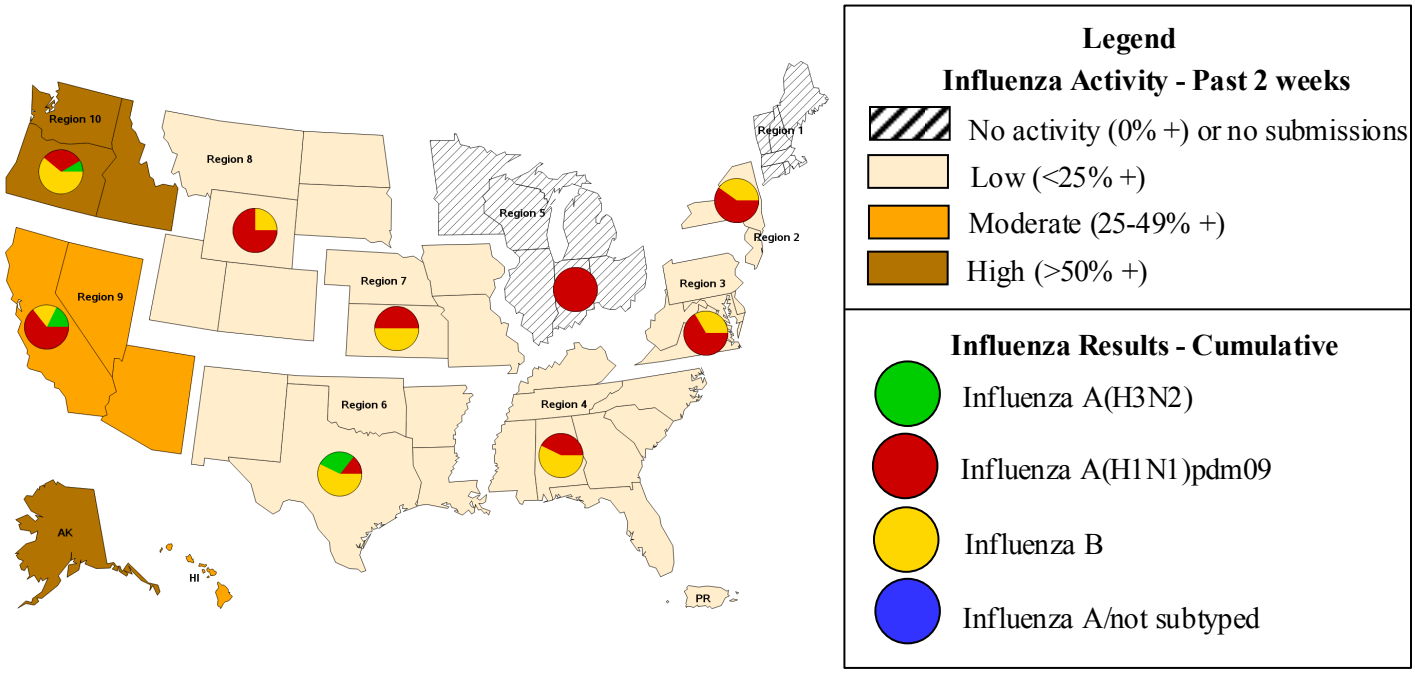
Demographic Summary

Of 1,569 ILI cases, 607 are service members (38.7%), 588 are children (37.5%), 240 are spouses (15.3%), and 134 (8.5%) are retirees and other beneficiaries. The median age of ILI cases with known age (n=1,569) is 23 (range 0, 93).

Graph 3. Vaccination status by beneficiary type for the 2015-2016 surveillance year through Week 5

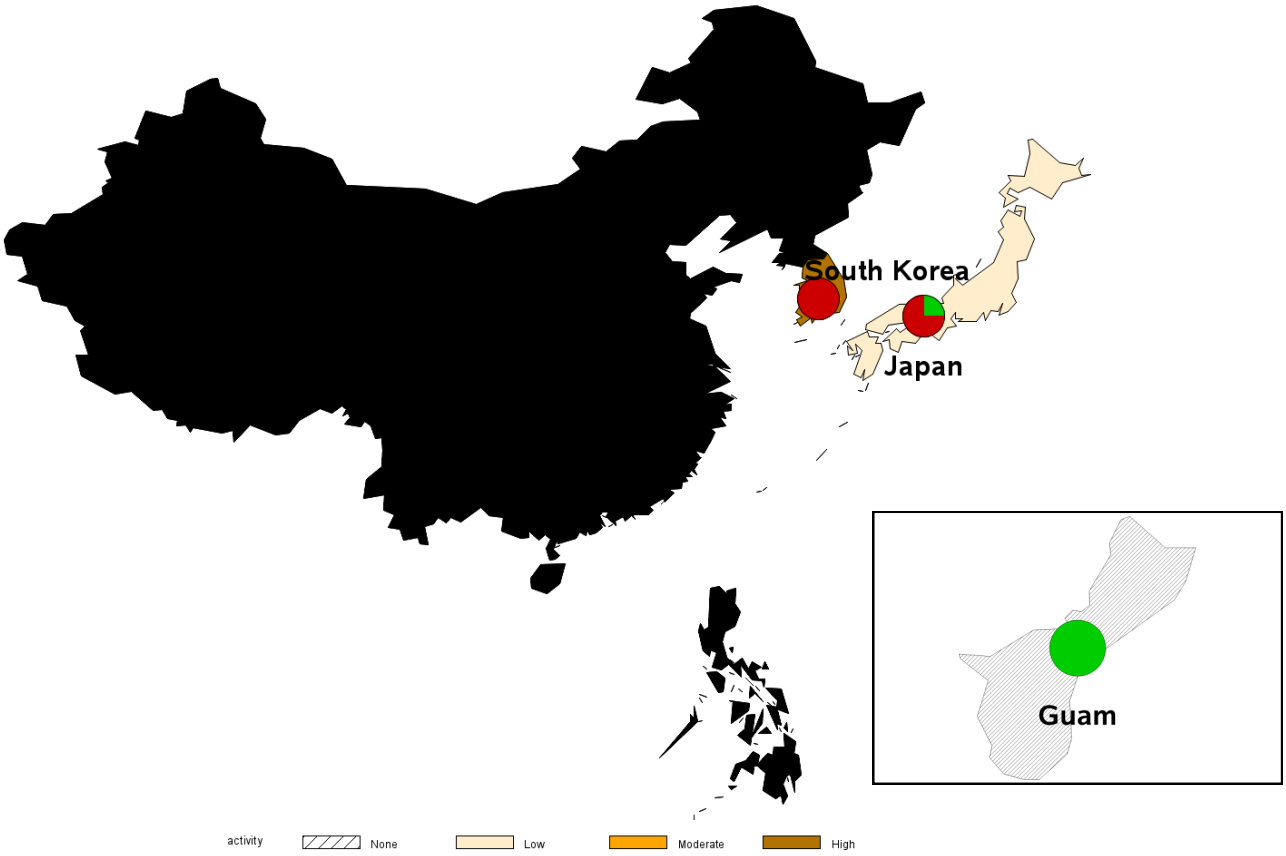


Map 1. Influenza subtypes and activity level by region for the 2015-2016 surveillance year through Week 5

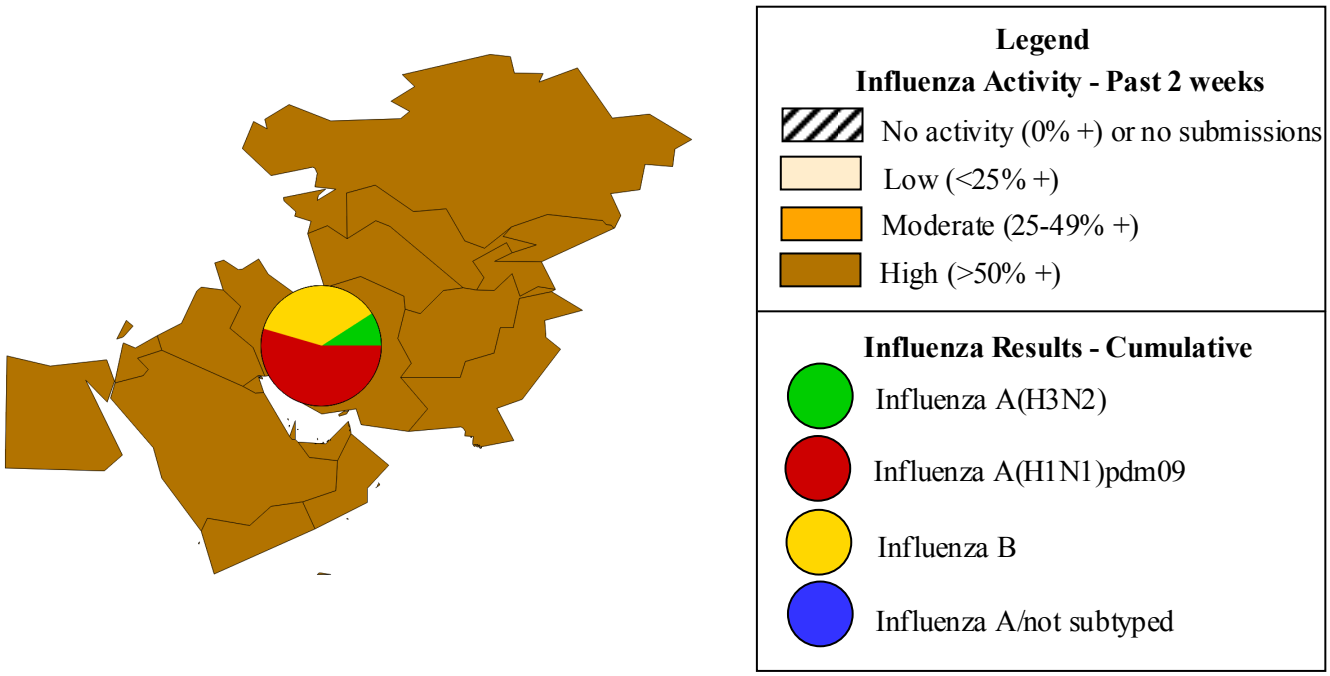


88ABW-2015-5508 and PA email guidance dated 10 November 2015.

Map 2. Influenza subtypes and activity level by country for the 2015-2016 surveillance year through Week 5 (Pacific)*



Map 3. Influenza subtypes and activity level for CENTCOM for the 2015-2016 surveillance year through Week 5*



Note - Specimens for CENTCOM were tested at USAFSAM or Landstuhl Regional Medical Center (LRMC).
*Due to the receipt of a small number of specimens from these areas that subsequently tested positive for influenza, flu activity level appears inflated.

DoD Global, Laboratory-Based, Influenza Surveillance Program

Laboratory Results—Through Current Surveillance Week 5

Table 3. Cumulative results by region and location for specimens collected during the 2015-2016 surveillance year

Region*		A(H1N1)pdm09	A(H3N2)	A(H1N1)pdm09 & Para	A(H3N2) & B	B	Adenovirus	*B. pertussis*	Coronavirus	hMNV	*M. pneumoniae*	Parainfluenza	RSV	Rhinovirus/Enterovirus	Non-Influenza Viral Coinfection	Non-Influenza Bacterial Coinfection	No Pathogen	Total
Deployed	Country 2, Location A	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8
PACOM	CFA Okinawa, Japan	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4
	Eielson AFB, AK	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	4	5
	JB Elmendorf-Richardson, AK	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	3
	JR Marianas - Andersen AFB, Guam	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3
	Kadena AB, Japan	-	-	-	-	-	-	-	2	-	2	-	-	2	-	-	11	17
	Misawa AB, Japan	-	-	-	-	-	-	-	-	-	-	-	1	3	-	-	4	8
	Osan AB, South Korea	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	5
	Yokota AB, Japan	3	-	-	-	-	3	-	1	-	2	1	2	-	1	-	17	30
Region 1	Hanscom AFB, MA	-	-	-	-	-	3	-	-	-	-	2	-	-	2	-	16	23
	NHCNE Newport, RI	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	5	7
	USCG Academy, CT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
Region 2	Ft Drum, NY	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	3	5
	JB McGuire-Dix-Lakehurst, NJ	-	-	-	-	-	1	-	-	-	3	-	-	5	2	-	13	24
	USMA - West Point, NY	2	-	1	-	2	11	-	5	5	3	3	4	3	3	2	61	105
Region 3	Dover AFB, DE	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	10	11
	JB Anacostia-Bolling, DC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	JB Andrews, MD	-	-	-	-	-	1	-	-	1	1	-	1	-	-	-	-	4
	JB Langley-Eustis, VA	1	-	-	-	-	5	-	4	2	-	3	8	4	1	-	10	38
	NCRM - Walter Reed NMMC, MD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
	NMC Portsmouth, VA	1	-	-	-	1	4	-	1	-	5	1	1	2	-	1	18	35
Region 4	CGS Mobile, AL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	Columbus AFB, MS	-	-	-	-	-	1	-	1	-	-	-	1	2	-	-	15	20
	Eglin AFB, FL	2	-	-	-	-	5	-	-	1	-	4	6	4	-	-	33	55
	Ft Bragg, NC	-	-	-	-	-	2	-	1	1	1	-	3	-	-	1	20	29
	Ft Campbell, KY	-	-	-	-	-	1	-	1	2	-	2	-	3	-	-	15	24
	Hurlburt Field, FL	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	14	17
	Keesler AFB, MS	-	-	-	-	-	-	-	-	-	1	-	-	2	1	-	22	26
	MacDill AFB, FL	-	-	-	-	-	-	-	-	-	-	2	1	-	-	-	1	4
	Maxwell AFB, AL	1	-	-	-	-	3	-	-	-	-	1	2	2	1	-	32	42
	Moody AFB, GA	-	-	-	-	4	7	-	1	1	2	2	5	9	3	-	18	52
	NH Beaufort, SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	NH Camp Lejeune, NC	-	-	-	-	-	-	-	-	-	1	-	1	1	-	-	4	7
	NH Jacksonville, FL	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	6	9
	Robins AFB, GA	-	-	-	-	-	-	-	-	-	2	1	1	-	-	-	9	13
	Seymour Johnson AFB, NC	-	-	-	-	-	2	-	1	-	-	-	-	2	1	1	9	16
	Shaw AFB, SC	-	-	-	-	-	-	-	2	-	3	-	-	4	1	1	8	19
	Tyndall AFB, FL	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	3
Region 5	Scott AFB, IL	1	-	-	-	-	2	-	-	-	-	1	-	1	-	-	16	21
	Wright-Patterson AFB, OH	-	-	-	-	-	1	-	-	-	-	-	-	3	-	-	7	11
Region 6	Altus AFB, OK	-	-	-	-	-	3	-	3	1	-	2	1	2	3	-	32	47
	Barksdale AFB, LA	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	3	4
	Cannon AFB, NM	-	-	-	-	1	1	-	2	-	-	-	-	2	-	-	15	21
	Laughlin AFB, TX	-	2	-	-	-	-	-	1	-	-	-	-	-	-	-	3	6
	Little Rock AFB, AR	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	11	12
	Sheppard AFB, TX	1	-	-	-	2	3	-	2	1	3	1	1	6	3	-	49	72
	Tinker AFB, OK	-	-	-	-	1	4	-	1	-	1	5	7	4	6	1	25	55
	Vance AFB, OK	-	-	-	-	-	1	-	-	-	-	1	-	1	-	-	33	36
Region 7	Ft Leavenworth, KS	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	9	11
	McConnell AFB, KS	-	-	-	-	-	1	-	1	-	2	2	-	7	-	1	29	43
	Offutt AFB, NE	2	-	-	-	1	2	-	-	-	-	3	-	1	-	-	31	40
Region 8	Ellsworth AFB, SD	3	-	-	-	-	1	-	1	1	1	5	-	-	4	-	21	37
	FE Warren AFB, WY	-	-	-	-	-	-	1	2	-	-	3	5	2	2	-	19	34
	Hill AFB, UT	4	-	-	-	3	1	-	-	3	1	-	1	9	-	1	50	73
	Malmstrom AFB, MT	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	2
	Minot AFB, ND	2	-	-	-	-	-	-	1	-	-	1	-	1	-	-	5	10
	Peterson AFB, CO	-	-	-	1	-	1	-	3	-	-	-	1	1	3	-	19	29
	USAF Academy, CO	-	-	-	-	-	-	-	-	-	-	4	-	1	-	-	10	15
Region 9	Davis-Monthan AFB, AZ	-	1	-	-	-	-	-	3	-	-	-	-	1	-	-	9	14
	Edwards AFB, CA	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	6	8
	Luke AFB, AZ	1	-	-	-	2	-	-	-	-	-	-	-	-	-	-	8	11
	NH Twentynine Palms, CA	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Nellis AFB, NV	12	2	-	-	2	6	-	3	-	-	7	3	6	6	-	47	94
	Travis AFB, CA	4	2	-	-	1	2	-	2	7	1	5	3	8	3	-	32	70
	USCG Island Alameda, CA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
	Vandenberg AFB, CA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	7
Region 10	Fairchild AFB, WA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
	JB Lewis-McChord, WA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
	Mt Home AFB, ID	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	7	8
	NH Bremerton, WA	7	1	-	-	13	3	-	2	-	1	10	4	7	5	1	37	91
Total		55	11	1	1	35	83	1	51	27	37	72	67	116	53	12	947	1569

**CONUS locations are based on Health & Human Services regions. Other locations are defined by COCOM.*

88ABW-2015-5508 and PA email guidance dated 10 November 2015.

Molecular Sequence Analysis Report

USAFSAM Epidemiology Laboratory Service

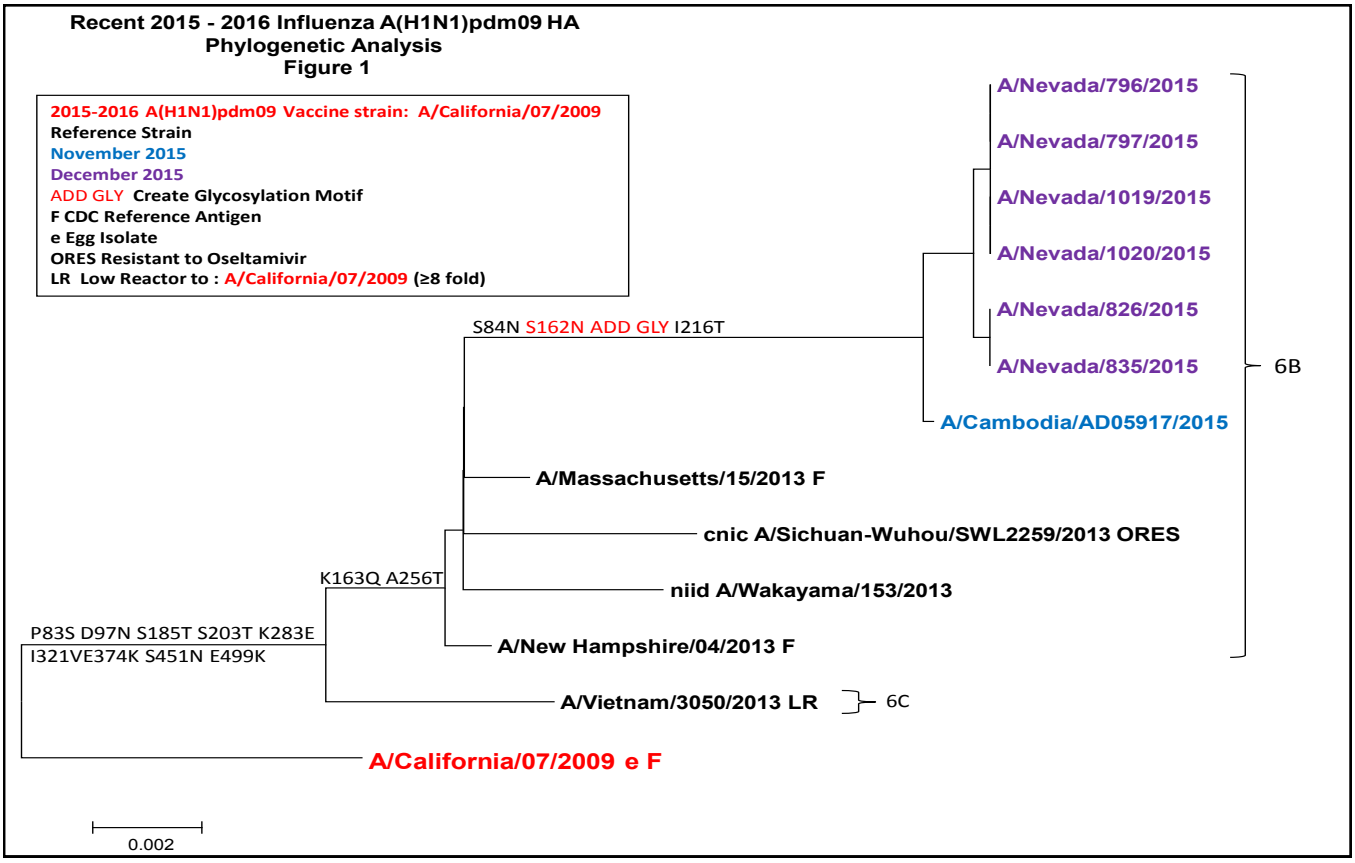
This second report for the 2015-2016 season contains sequence data for 18 specimens that were collected between 7 October and 24 December 2015 and subsequently analyzed by USAFSAM. Specimens were collected from seven sentinel sites, and additional sequence data were received from NAMRU-2 in Cambodia. Among these specimens, seven (39%) were influenza A(H1N1)pdm09, two (11%) were influenza B/Victoria, and nine (50%) were influenza B/Yamagata.

The hemagglutinin (HA) gene from select influenza positives was sequenced using dye terminator, Sanger-based methods. Preliminary data are based on the sequence analysis of the hemagglutinin gene. Antigenic sites, receptor binding sites and glycosylation motifs are predicated upon correlations with previously published experimental evidence.[1,3,4] Sequence data was constructed and analyzed using multiple software programs. Genetic and predicted antigenic information that resulted from this analysis is shared with United States Centers for Disease Control and Prevention (CDC), World Health Organization (WHO) and potentially contribute to the seasonal Northern and Southern hemisphere vaccine component selections.

		A(H1N1)pdm09	B/Victoria	B/Yamagata
CONUS	**Georgia,** Moody AFB		1	
	Kansas, McConnell AFB			1
	Nevada, Nellis AFB	6		
	New York, USMA – West Point		1	
	Texas, Sheppard AFB			1
	Utah, Hill AFB			1
	Washington, NH Bremerton			1
OCONUS	**Cambodia,** NAMRU-2	1		5
TOTAL		**7**	**2**	**9**

Influenza A(H1N1)pdm09

- The influenza A(H1N1)pdm09 sequences are characterized in a neighbor-joining phylogenetic tree with reference strains rooted from the current vaccine strain, A/California/07/2009-like virus [Figure 1].
- The A(H1N1)pdm09 specimens characterized for this report exhibited an overall protein homology of 96.9% compared to the 2015-2016 influenza vaccine component, A/California/07/2009-like virus.
- All of the A(H1N1)pdm09 viruses sequenced for this report contain mutations consistent with one of the circulating subgroup, referred as group 6B. Isolates of this group share two distinguishing mutations, K163Q (lysine to glutamine), and A256T (alanine to threonine).
- Gain or loss of *N*-linked glycosylation sites has been shown to alter HA protein surface topology. A gain in glycosylation could be advantageous to the virus by virtue of a masking effect on important antibody recognition sites, thus potentially modulating viral antigenicity.[4] Observations are based solely on sequence motifs. For the influenza A(H1N1)pdm09 specimens characterized in this report, one mutation, S162N (serine to asparagine), was observed that could cause a gain of a glycosylation motif.
- Of the 14 mutations present in the A(H1N1)pdm09 specimens, five occurred at predicted antigenic sites and one at the receptor binding site.[2,5]



Influenza B

- The influenza B isolates are characterized in lineage specific, neighbor-joining phylogenetic trees with reference strains and are rooted from previous vaccines; B/Ohio/01/2005-like virus for B Victoria specimens [Figure 2] and B/Florida/04/2006-like virus for B/Yamagata specimens [Figure 3].

- The distinguishing characteristic between the two influenza B lineages (Victoria & Yamagata) is defined by an amino acid deletion in viruses belonging to the Yamagata lineage.[1] Two of the influenza B viruses characterized in this report fall into the Victoria lineage, while the other 9 fall into the Yamagata lineage.

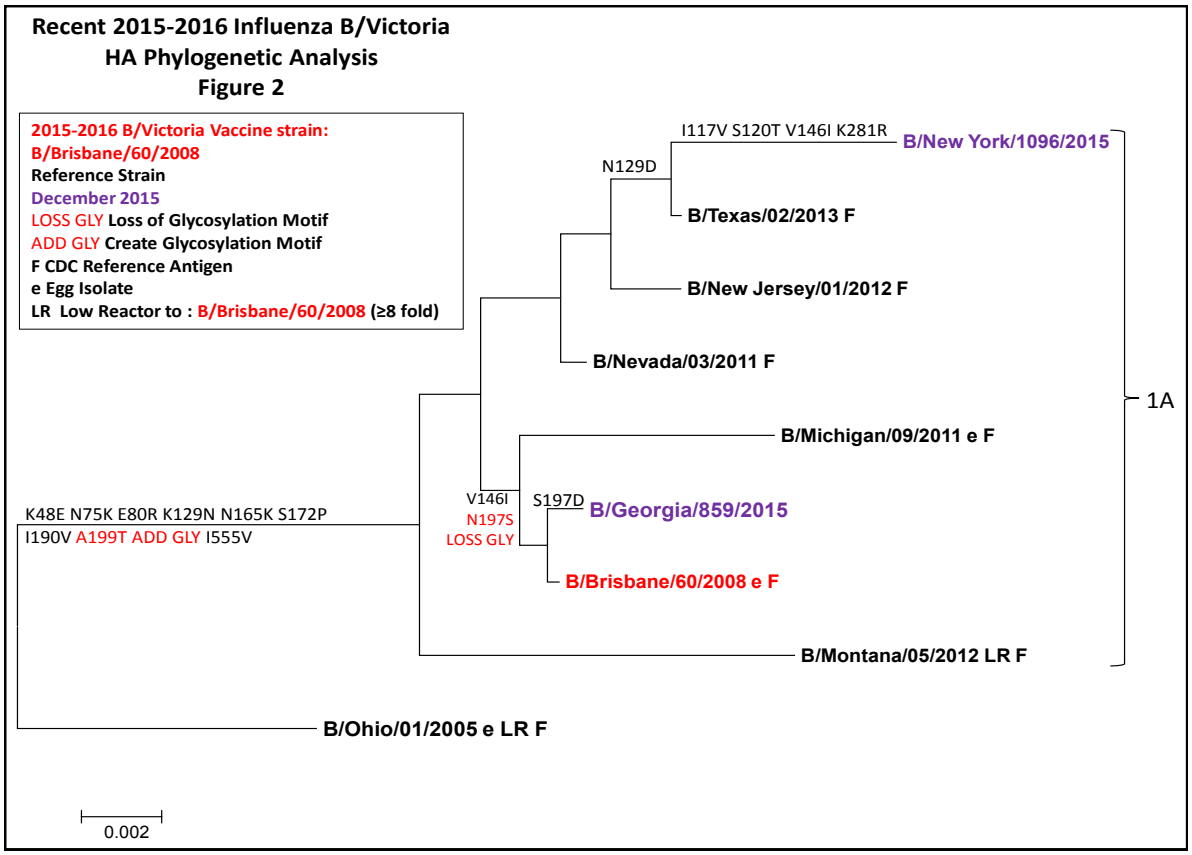
- The influenza B/Victoria specimens characterized for this report exhibited a protein homology of 98.9-99.6% when compared to the 2015-2016 B Victoria vaccine component, B/Brisbane/60/2008-like virus, while the influenza B/Yamagata specimens exhibited a protein homology of 98.6-99.1% when compared to the 2015-2016 B/Yamagata vaccine strain, B/Phuket/3073/2013-like virus.

- Both influenza B/Victoria specimens classify into group 1A, while all 9 influenza B/Yamagata specimens classify into group 3.

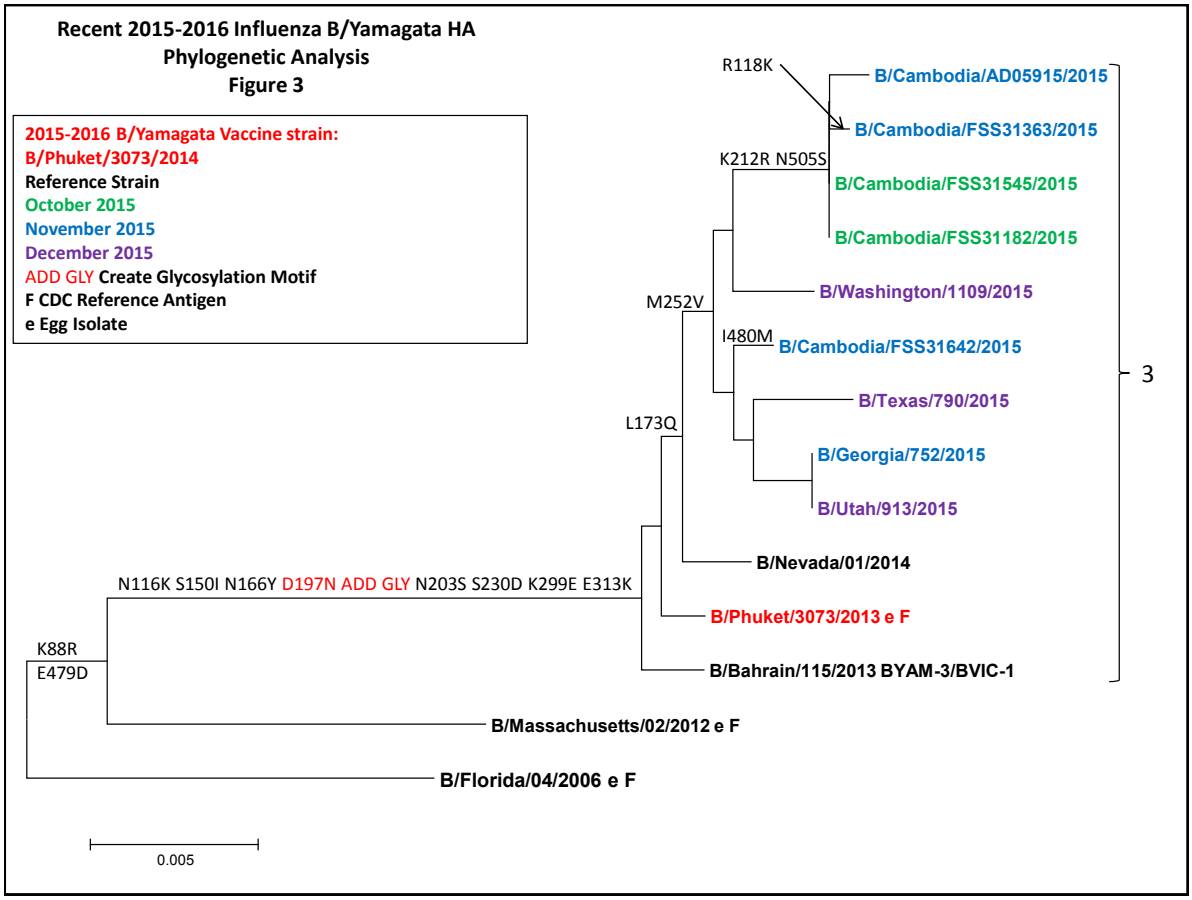
- Among the influenza B/Victoria specimens one mutation, N197S (asparagine to serine), was observed that could cause the loss of a glycosylation motif while the mutation A199T (alanine to threonine) was observed that could cause the gain of a glycosylation motif. For the influenza B/Yamagata specimens, only the mutation D197N (aspartic acid to asparagine) was observed that could lead to the gain of a glycosylation motif. All three of these mutations impact the same glycosylation site for influenza B hemagglutinin.

- Two specimens, B/Georgia/752/2015 and B/Georgia/859/2015, were tested as originals because they were PCR positive for influenza B but failed to grow viral cultures, and these patients were vaccinated with the quadrivalent live attenuated influenza vaccine nasal spray (LAIV4) two and four days prior to specimen collection, respectively. B/Georgia/752/2015 does not reside on the same branch as the vaccine strain, and has a nucleotide homology of 99.1% to the egg grown vaccine strain, B/Phuket/3073/2013_e-like virus, and is therefore not likely to be a derived vaccine strain. B/Georgia/859/2015 resides on the same branch as the egg grown B/Victoria vaccine component, B/Brisbane/60/2008_e-like virus, aside from the single mutation S197D, and has a nucleotide homology of 99.9% to the vaccine, and is therefore more likely to be derived from the LAIV4 influenza B component.

Recent 2015-2016 Influenza B/Victoria HA Phylogenetic Analysis
Figure 2



Recent 2015-2016 Influenza B/Yamagata HA Phylogenetic Analysis
Figure 3



References:

1. Wright, P, Neumann, G, Kaqaoka, Y 2007. Orothomyxoviruses In: Knipe, D.M., Howley, P.M. (Eds.), Fields Virology. Wolters Kluwer, Lippincott Williams & Wilkins, Philadelphia, pp.1692-1740.
2. Kongchanagul A., Suptawiwat, O., Kanrai, P., Uiprasertkul, M., Puthavathana, P., and Auewarakul P. (2008) Positive selection at the receptor-binding site of haemagglutinin H5 in viral sequences derived from human tissues. Journal of Gen. Vir. **89**, 1805-1810.
3. Cherry JL, Lipman DJ, Nikolskaya A, Wolf YI. Evolutionary Dynamics of N-Glycosylation Sites of Influenza Virus Hemagglutinin. *PLoS Curr Influenza*. 2009 August 18: RRN1001.
4. Deem, M., and Pan, K. (2009). The epitope regions of H1-subtype influenza A, with application to vaccine efficacy. Protein Engineering, Design and Selection. **22**, no. 9. 543-546.
5. Wolf YI, Viboud C, Holmes EC, Koonin EV, Lipman DJ. Long intervals of stasis punctuated by bursts of positive selection in the seasonal evolution of influenza A virus. *Biol Direct*. 2006; 1: 34. Published online 2006 October 26. doi: 10.1186/1745-6150-1-34.

USAFSAM POCs for sequence data and analysis are:

Mr. Jim Hanson: james.hanson.7@us.af.mil
Mr. Bill Gruner: william.gruner.1.ctr@us.af.mil
Ms. Marie Powell: marie.powell.2@us.af.mil

Monthly EUCOM Respiratory Surveillance Supplemental Report Through 6 February 2016

In cooperation and agreement with U.S. Army Public Health Command Region-Europe (PHCR-E), the DoD Global, Laboratory-based, Influenza Surveillance Program has analyzed data from surveillance sites that submit specimens to Landstuhl Regional Medical Center (LRMC), Germany. LRMC's laboratory is the forward laboratory for military sites in Europe.

Lab results are preliminary and may change as more results are received.

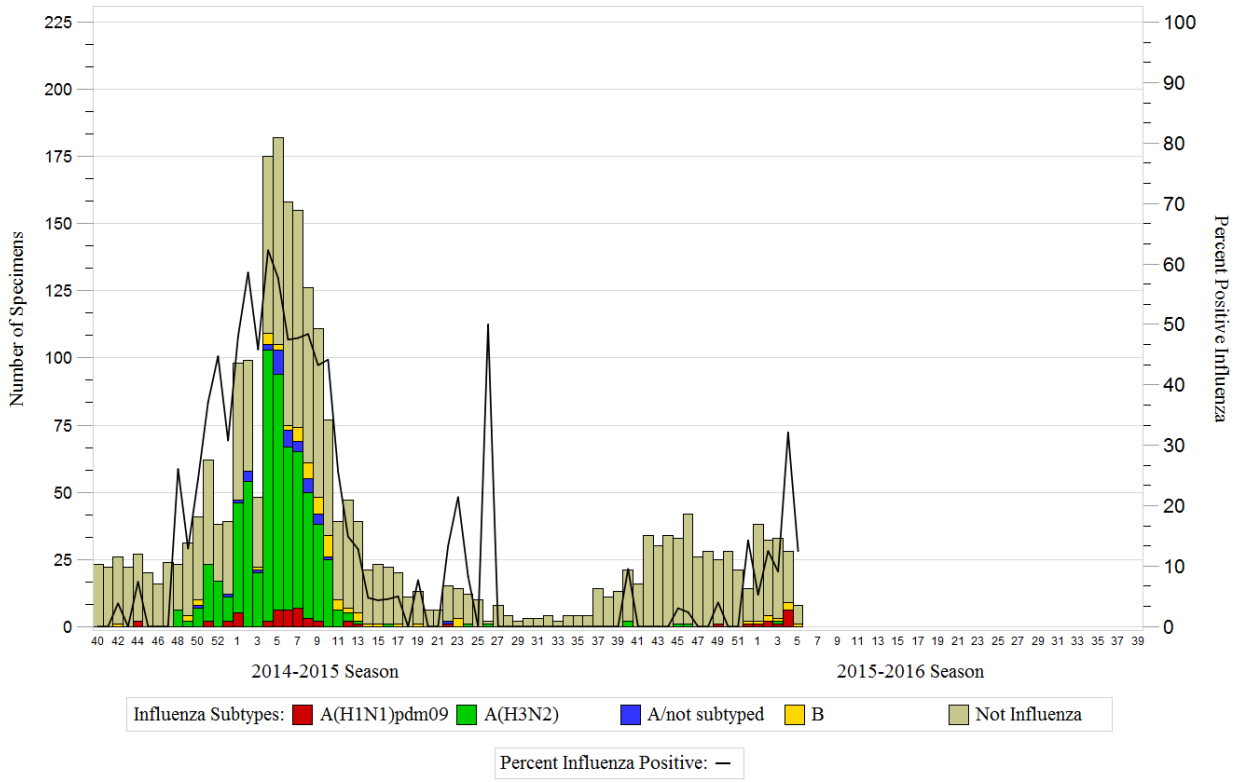
Table 4. Results by region and location for specimens collected and finalized during Weeks 1-5

Region		A(H1N1)pdm09	A(H3N2)	A(H1N1)pdm09 & hMNV	A(H1N1)pdm09 & Rhino/Entero	B	B & Rhino/Entero	Adenovirus	hMNV	Parainfluenza	RSV	Rhinovirus/Enterovirus	hMNV & Rhino/Entero	Para & Rhino/Entero	RSV & Rhino/Entero	No Pathogen	Total
Deployed	Country 2, Location A	1	-	-	-	4	-	-	-	-	-	-	-	-	-	2	7
	Country 6, Location A	-	-	-	-	-	-	-	-	1	-	2	-	-	-	1	4
EUCOM	Incirlik AB, Turkey	-	1	-	1	-	-	-	2	-	1	1	-	-	-	2	8
	Landstuhl RMC, Germany	-	-	-	-	1	-	1	1	-	6	3	-	1	-	18	31
	NAVSTA Rota, Spain	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
	NSA Naples, Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	RAF Lakenheath, England	3	-	1	-	1	-	1	1	1	-	8	-	-	1	15	32
	Ramstein AB, Germany	1	-	-	-	1	-	-	-	-	1	1	-	-	-	9	13
	Spangdahlem AB, Germany	-	-	-	-	-	1	-	1	-	-	-	1	-	-	3	6
	USAG Stuttgart, Germany	3	-	-	-	-	-	-	6	-	2	1	-	-	-	6	18
	USAG Vicenza, Italy	-	-	-	-	-	-	-	-	-	1	1	-	-	-	1	3
	Vilseck AHC, Germany	-	-	-	-	-	-	-	3	1	2	2	1	-	1	4	14
Total		8	1	1	1	7	1	2	14	3	13	19	2	1	2	64	139

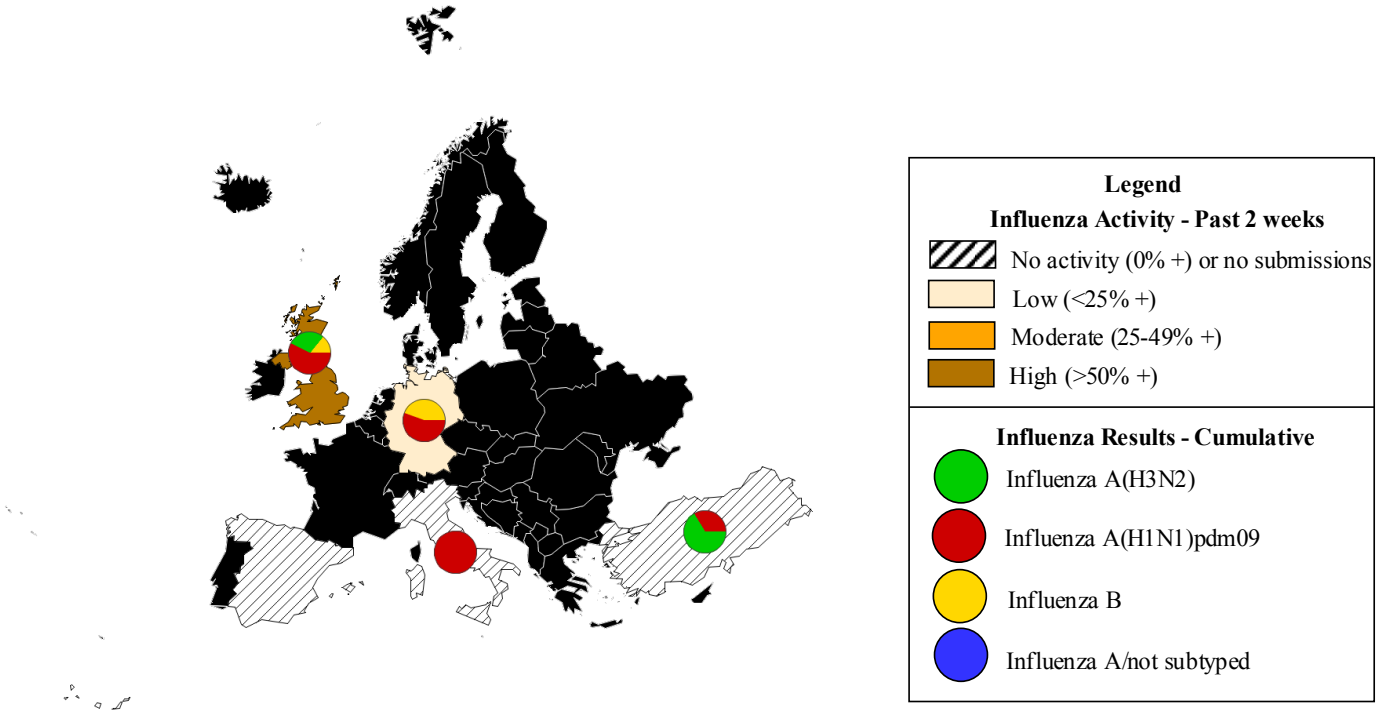
Table 5. Cumulative results by region and location for specimens collected during the 2015-2016 surveillance year

Region		A(H1N1)pdm09	A(H3N2)	A(H1N1)pdm09 & hMNV	A(H1N1)pdm09 & Rhino/Entero	A(H3N2) & Rhino/Entero	B	B & Rhino/Entero	Adenovirus	hMNV	Parainfluenza	RSV	Rhinovirus/Enterovirus	Adeno & Rhino/Entero	hMNV & Rhino/Entero	Para & Rhino/Entero	RSV & Rhino/Entero	No Pathogen	Total
Deployed	Country 2, Location A	1	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	2	7
	Country 6, Location A	-	1	-	-	-	-	-	-	-	1	-	8	-	-	-	-	13	23
EUCOM	Aviano AB, Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	3
	Incirlik AB, Turkey	-	1	-	1	1	-	-	-	2	1	1	4	-	-	-	-	5	16
	Landstuhl RMC, Germany	-	-	-	-	-	2	-	1	2	7	6	18	-	-	3	-	64	103
	NAVSTA Rota, Spain	-	-	-	-	-	-	-	-	-	3	1	4	-	-	-	-	6	14
	NSA Naples, Italy	1	-	-	-	-	-	-	-	-	1	-	3	-	-	-	-	11	16
	RAF Lakenheath, England	3	2	1	-	-	1	-	2	5	8	23	42	-	1	3	19	65	175
	Ramstein AB, Germany	1	-	-	-	-	1	-	1	1	2	1	7	-	-	-	1	15	30
	Spangdahlem AB, Germany	-	-	-	-	-	-	1	-	1	-	-	-	-	1	-	-	3	6
	USAG Stuttgart, Germany	4	-	-	-	-	-	-	-	6	3	3	11	-	1	-	-	21	49
	USAG Vicenza, Italy	-	-	-	-	-	-	-	-	-	-	1	4	-	-	-	-	6	11
	Vilseck AHC, Germany	-	-	-	-	-	-	-	-	3	6	4	6	1	1	3	1	13	38
Total		10	4	1	1	1	8	1	4	20	32	40	107	1	4	9	21	227	491

Graph 4. Percent influenza positive by week: 2014-2015 surveillance year and through Week 5 of the 2015-2016 surveillance year



Map 4. Influenza subtypes and activity level by country for the 2015-2016 surveillance year through Week 5 (Europe)



USAF School of Aerospace Medicine & Defense Health Agency

DoD Global, Laboratory-Based, Influenza Surveillance Program

Background

The DoD-wide program was established by the Global Emerging Infections Surveillance and Response System (GEIS) in 1997. The surveillance network includes the U.S. Air Force School of Aerospace Medicine (USAFSAM) (sentinel site respiratory surveillance), the Naval Health Research Center (recruit and shipboard population-based respiratory surveillance), the Naval Medical Research Unit (NAMRU-3) in Cairo, Egypt, the Naval Medical Research Unit (NAMRU-2) in Phnom Penh, Cambodia, the Armed Forces Research Institute of Medical Sciences (AFRIMS) in Bangkok, Thailand, the Naval Medical Research Unit-6 (NAMRU-6) in Lima, Peru, and the United States Army Medical Research Unit-Kenya (USAMRU-K) located in Nairobi, Kenya. This work is supported by the Air Force and the Division of Global Emerging Infections Surveillance and Response System (GEIS) Operations, a Division of the Armed Forces Health Surveillance Center (AFHSC).

Sentinel Site Surveillance at USAFSAM

In 1976, the U.S. Air Force Medical Service began conducting routine, global, laboratory-based influenza surveillance. Air Force efforts expanded to DoD-wide in 1997. USAFSAM manages the surveillance program that includes global surveillance among DoD beneficiaries at over 80 sentinel sites (including deployed locations) and many non-sentinel sites (please see map on the left). Unique sentinel sites include three DoD overseas medical research laboratories (AFRIMS, NAMRU-6, USAMRU-K) and the US Army Public Health Command Region South (PHCR-S). These sites collect specimens from local residents in surrounding countries that may not otherwise be covered in existing surveillance efforts.

Since the 2006-2007 season, Landstuhl Regional Medical Center (LRMC) has served EUCOM as a USAFSAM contributing laboratory. The initiative seeks to provide more timely results and efficient transport of specimens.

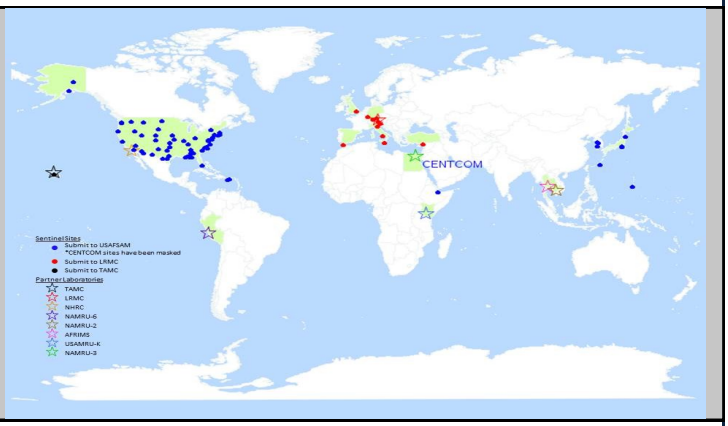
For an expanded view of this report, visit our website. Also available on the website is a list of previous weekly surveillance reports, program information (including an educational briefing and instruction pamphlets for clinic staff), and an overview of historical data. Please visit the AFHSC/GEIS website for an overview of influenza surveillance at all collaborating organizations.

Errata:

DoD Global, Laboratory-Based, Influenza Surveillance Program
https://gumbo2.wpafb.af.mil/epi-consult/influenza/index.cfm

For Public Health Services
937-938-3196; DSN 798-3196

For Laboratory Services
937-938-3163; DSN 798-3163



Collaborating Partners

In addition to all participating DoD military sentinel sites, several collaborating partners (described above) may be further understood by reviewing the partner's website.

88ABW-2015-5508 and PA email guidance dated 10 November 2015.