DoD Global, Laboratory-Based, Influenza Surveillance Program

USAF School of Aerospace Medicine

2014 - 2015

Cumulative Results

Locations	85
Collected	4,646
Tested	4,461

Influenza A	**1,654**
A(H1N1)pdm09	1
A(H3N2)	1,633
A/not subtyped	14
A & Coronavirus	1
A & Parainfluenza	1
A(H3N2) & Coronavirus	1
A(H3N2) & B & Adenovirus & Rhino/Enterovirus	1
A(H3N2) & RSV	1
A(H3N2) & Rhino/Enterovirus	1
Influenza B	**111**
B/Unknown or pending lineage	91
B & Rhino/Enterovirus	1
B/Victoria	6
B/Yamagata	13
Other Respiratory Pathogens	**601**
Adenovirus	73
Bordetella pertussis	0
Chlamydophila pneumoniae	0
Coronavirus	33
Human Metapneumovirus	13
Mycoplasma pneumoniae	26
Parainfluenza	114
RSV	125
Rhino/Enterovirus	161
Non-influenza Co-infections	56

Lab data are current as of 23 February 2015. Results are preliminary and may change as more results are received.

Respiratory Highlight
8-21 February 2015 (Surveillance Weeks 6 & 7)

- During 8-21 February 2015, a total of 378 specimens were collected and received from 52 locations. Results were finalized for 236 specimens from 48 locations. During Week 6, the laboratory identified 69 influenza A(H3N2) and 18 influenza B. During Week 7, 19 influenza A(H3N2) and 17 influenza B were identified. See Table 1 below for other respiratory viruses identified during Weeks 6 & 7.
- This report contains the molecular sequence report created on 20 February 2015.

Table 1. Results by region and location for specimens collected and finalized during Weeks 6 & 7

Region*		A(H3N2)	B	Adeno	Para	RSV	No Pathogen	Total
PACOM	CFA Okinawa, Japan	1	-	-	-	-	-	1
	JR Marianas - Andersen AFB, Guam	1	-	-	-	-	-	1
	Misawa AB, Japan	-	-	-	-	-	1	1
	Osan AB, South Korea	1	-	-	-	-	-	1
	Yokota AB, Japan	18	-	-	-	-	2	20
Region 1	Hanscom AFB, MA	3	-	-	-	-	1	4
	NHCNE Newport, RI	3	-	-	-	-	-	3
	USCG Academy, CT	4	-	-	-	-	1	5
Region 2	Ft Drum, NY	3	1	-	-	2	-	6
	JB McGuire-Dix-Lakehurst, NJ	1	-	-	-	-	1	2
	USMA - West Point, NY	8	-	-	-	-	3	11
Region 3	Dover AFB, DE	2	-	-	-	-	2	4
	JB Anacostia-Bolling, DC	1	-	-	-	-	-	1
	JB Andrews, MD	1	-	-	-	-	-	1
Region 4	CGS Mobile, AL	-	-	-	-	-	1	1
	Columbus AFB, MS	-	-	-	-	-	2	2
	Eglin AFB, FL	-	-	-	-	-	2	2
	Hurlburt Field, FL	-	-	-	-	-	3	3
	Keesler AFB, MS	-	-	-	-	1	-	1
	Maxwell AFB, AL	1	5	-	-	-	2	8
	Moody AFB, GA	3	-	2	-	-	4	9
	Robins AFB, GA	-	-	-	-	-	1	1
	Tyndall AFB, FL	-	-	-	-	-	1	1
Region 5	Scott AFB, IL	-	2	-	-	-	1	3
	Wright-Patterson AFB, OH	-	-	-	-	-	2	2
Region 6	Altus AFB, OK	1	1	-	1	-	11	14
	Barksdale AFB, LA	1	-	-	-	-	1	2
	Laughlin AFB, TX	1	-	-	-	-	1	2
	Little Rock AFB, AR	2	-	-	-	-	-	2
	Sheppard AFB, TX	3	1	-	-	-	8	12
	Tinker AFB, OK	5	13	1	-	1	10	30
Region 7	Ft Leavenworth, KS	-	-	1	-	-	2	3
	McConnell AFB, KS	4	2	-	-	-	2	8
	Offutt AFB, NE	2	2	-	-	-	-	4
Region 8	Buckley AFB, CO	-	1	-	-	-	-	1
	Ellsworth AFB, SD	1	4	-	2	-	4	11
	FE Warren AFB, WY	2	-	-	-	-	2	4
	Hill AFB, UT	-	-	-	-	1	2	3
	Malmstrom AFB, MT	2	-	-	-	-	-	2
	Minot AFB, ND	-	-	-	-	1	6	7
Region 9	Davis-Monthan AFB, AZ	2	-	-	-	-	6	8
	Edwards AFB, CA	-	-	-	-	-	1	1
	Los Angeles AFB, CA	1	-	-	-	-	-	1
	Nellis AFB, NV	-	-	-	-	1	-	1
	Travis AFB, CA	8	-	-	1	-	-	9
	Vandenberg AFB, CA	1	-	-	-	-	1	2
Region 10	Fairchild AFB, WA	1	1	-	-	1	3	6
	NH Bremerton, WA	-	2	-	2	1	4	9
Total		88	35	4	6	9	94	236

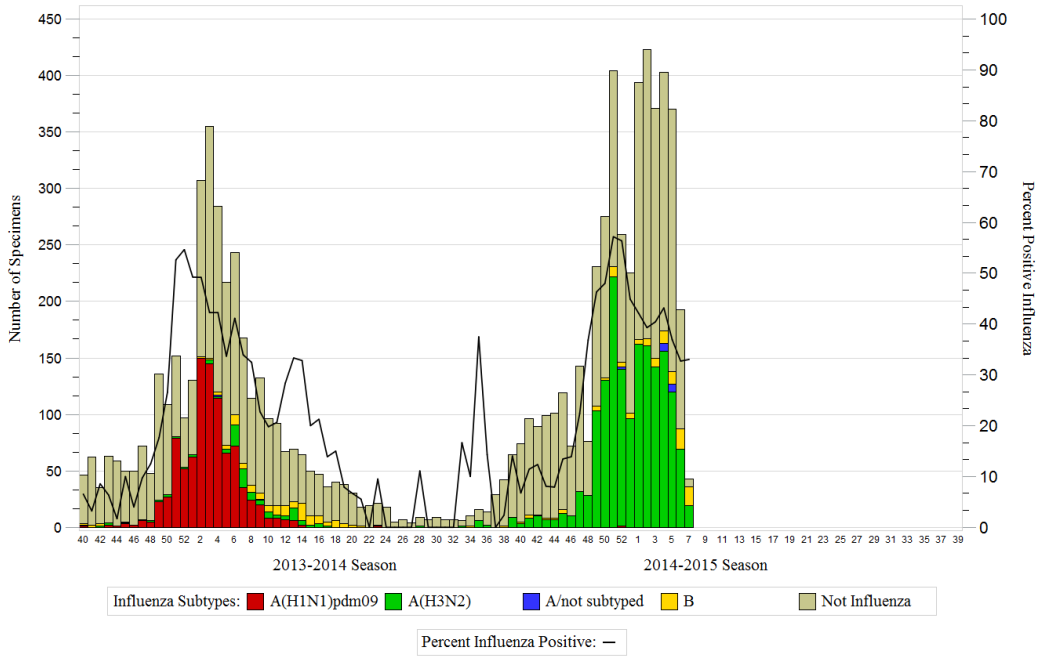
**US Regions are based on Health & Human Services regions. Other locations are defined by COCOM.*

Email: USAFSAM.PHRFlu@us.af.mil, https://gumbo2.area52.afnoapps.usaf.mil/epi-consult/influenza

DoD Global, Laboratory-Based, Influenza Surveillance Program

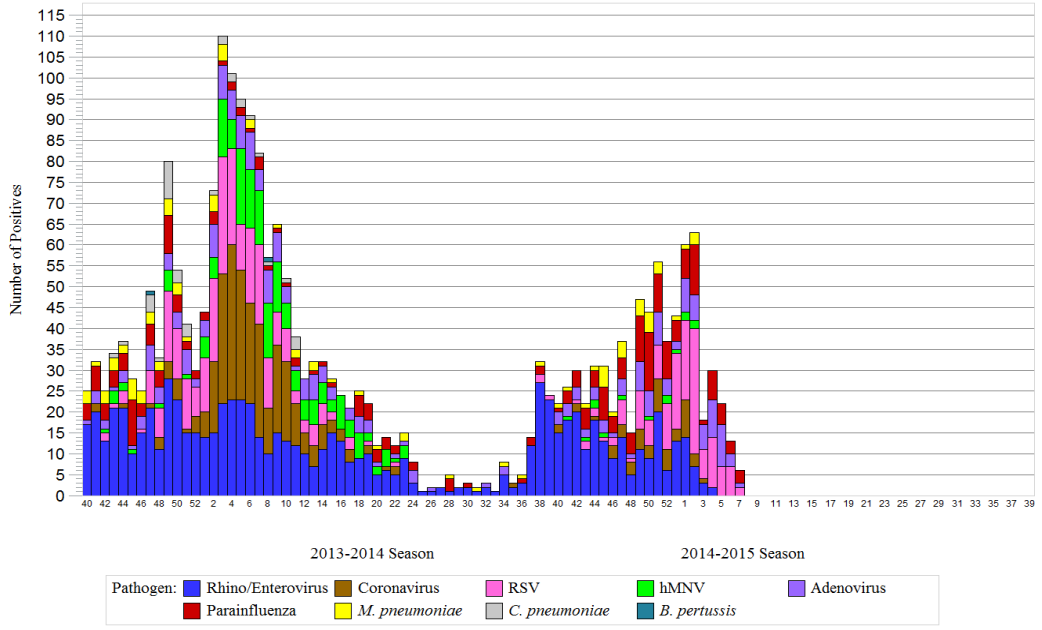
Laboratory Results - Cumulative for Season

Graph 1. Percent influenza positive by week: 2013-2014 surveillance year and through Week 7 of the 2014-2015 surveillance year



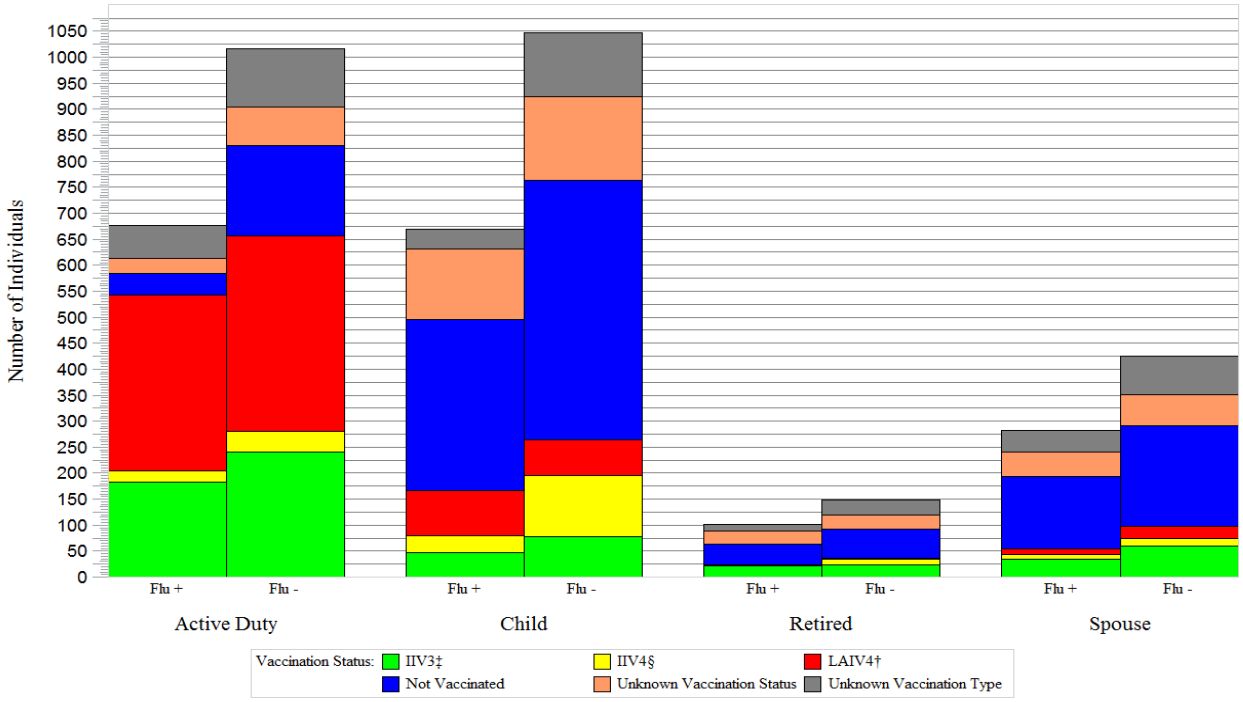
Note: One specimen positive for influenza A(H3N2)v has been excluded from the graph during the 2013-2014 season. Additionally, dual influenza co-infections are excluded from this graph. Specimens with pending results are used in the denominator to calculate percent positive, but are not displayed in the graph.

Graph 2. Other respiratory pathogen results by week: 2013-2014 surveillance year and through Week 7 of the 2014-2015 surveillance year



Note: Due to change in protocol between the surveillance years 2013-2014 and 2014-2015, a direct comparison between the years cannot be made.

Graph 3. Vaccination status by beneficiary type for the 2014-2015 surveillance year through Week 7



‡ Influenza, inactivated vaccine (trivalent)

§ Influenza, inactivated vaccine (quadrivalent)

† Live, attenuated influenza vaccine (quadrivalent)

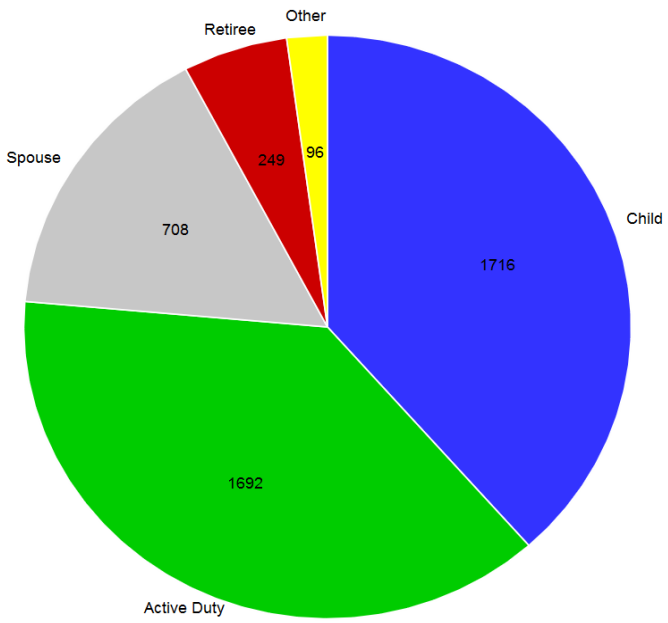
Table 2. ILI by age group for the 2014-2015 surveillance year through Week 7

Age Group	Frequency	Percent
0-5	925	20.74
6-9	343	7.69
10-17	449	10.07
18-24	613	13.74
25-44	1547	34.68
45-64	446	10.00
65+	127	2.85
Unknown	11	0.25

Demographic Summary

Of 4,461 ILI cases, 1,692 are service members (37.9%), 1,716 are children (38.5%), 708 (15.9%) are spouses, and 345 (7.7%) are retirees & other beneficiaries. The median age of ILI cases with known age (n=4,450) is 23 (range 0, 94) and 1,717 (38.5%) of these specimens are from ILI cases less than 18 years of age.

Graph 4. ILI by beneficiary status for the 2014-2015 surveillance year through Week 7



Laboratory Results—Through Current Surveillance Week 7

Table 3. Cumulative results by region and location for specimens collected during the 2014-2015 surveillance year

Region*		A(H1N1)pdm09	A(H3N2)	A/not subtyped	A/not subtyped & Corona	A/not subtyped & Para	A(H3N2) & B & Adeno & Rhino/Entero	A(H3N2) & Corona	A(H3N2) & RSV	A(H3N2) & Rhino/Entero	B	B/Victoria	B/Yamagata	B & Rhino/Entero	Adenovirus	Coronavirus	hMNV	*M. pneumoniae*	Parainfluenza	RSV	Rhinovirus/Enterovirus	Non-Influenza Co-infection	No Pathogen	Total
Deployed	Country 1, Location B	-	24	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	4	-	53	83
	Country 2, Location A	-	46	-	-	-	-	-	-	1	6	-	-	-	-	-	-	-	-	-	4	-	24	81
PACOM	CFA Okinawa, Japan	-	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	2	-	20	28
	Camp Zama, Japan	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
	Eielson AFB, AK	-	6	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	1	-	7	17
	JB Elmendorf-Richardson, AK	-	7	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	5	13
	JR Marianas - Andersen AFB, Guam	-	11	-	-	-	-	-	-	-	1	-	4	-	2	-	3	-	1	3	4	1	23	53
	JR Marianas - NH Guam, Guam	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	Kadena AB, Japan	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	5	10
	Kunsan AB, South Korea	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5
	Misawa AB, Japan	-	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	6	18
	Osan AB, South Korea	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	19
	Tripler AMC, HI	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16
	Yokota AB, Japan	-	60	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	1	-	1	1	20	86
Region 1	Hanscom AFB, MA	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	17	44
	NHCNE Newport, RI	-	14	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	2	1	2	12	32
	USCG Academy, CT	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	2	-	11	19
Region 2	Ft Drum, NY	-	40	-	-	-	-	-	-	-	5	-	-	-	3	1	-	1	2	6	10	5	44	117
	JB McGuire-Dix-Lakehurst, NJ	-	32	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	3	-	20	57
	USMA - West Point, NY	-	71	3	-	-	-	-	-	-	-	-	-	-	2	4	-	3	4	4	6	2	99	198
Region 3	CG Base Portsmouth, VA	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
	Dover AFB, DE	-	19	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	12	34
	JB Anacostia-Bolling, DC	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
	JB Andrews, MD	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	4	11
	JB Langley-Eustis, VA	-	7	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	1	10	20
	NCRM - Ft Belvoir CH, VA	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	4	1	4	11
	NCRM - Walter Reed NMMC, MD	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2
	NMC Portsmouth, VA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
Region 4	CGS Mobile, AL	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	3	16
	Columbus AFB, MS	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	24
	Eglin AFB, FL	-	12	1	-	-	-	-	-	-	2	-	-	-	1	-	-	1	-	4	1	2	38	62
	Ft Bragg, NC	-	30	-	-	-	-	-	-	-	-	-	-	-	2	3	2	-	3	7	3	1	36	87
	Ft Campbell, KY	-	30	-	-	-	-	-	-	-	1	1	-	-	4	-	-	-	4	2	3	1	43	89
	Hurlburt Field, FL	-	21	-	-	-	-	-	-	-	1	-	-	-	2	-	-	1	-	3	4	1	38	71
	JB Charleston (AF), SC	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	14
	JB Charleston (Navy), SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-	2	5
	Keesler AFB, MS	-	6	-	-	-	-	-	-	-	-	1	-	-	2	-	-	-	1	2	1	2	17	32
	MacDill AFB, FL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	7
	Maxwell AFB, AL	-	30	-	-	-	-	-	-	-	9	-	1	-	2	1	-	-	1	1	4	-	54	103
	Moody AFB, GA	-	86	-	-	-	-	-	-	-	1	2	2	-	6	7	1	1	6	4	11	4	55	186
	NH Beaufort, SC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	1	10	14
	NH Camp Lejeune, NC	-	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	9	73
	NH Jacksonville, FL	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	4	1	-	8
	Robins AFB, GA	-	34	-	-	-	-	-	-	-	1	-	1	-	1	1	-	-	-	-	-	-	37	75
	Seymour Johnson AFB, NC	-	15	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	3	4	-	11	35
	Shaw AFB, SC	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	9	16
	Tyndall AFB, FL	-	13	-	-	-	-	-	-	-	-	-	3	-	2	-	-	-	-	2	-	1	13	34
	USCG Base Elizabeth City, NC	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4

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

Continued on Page 5

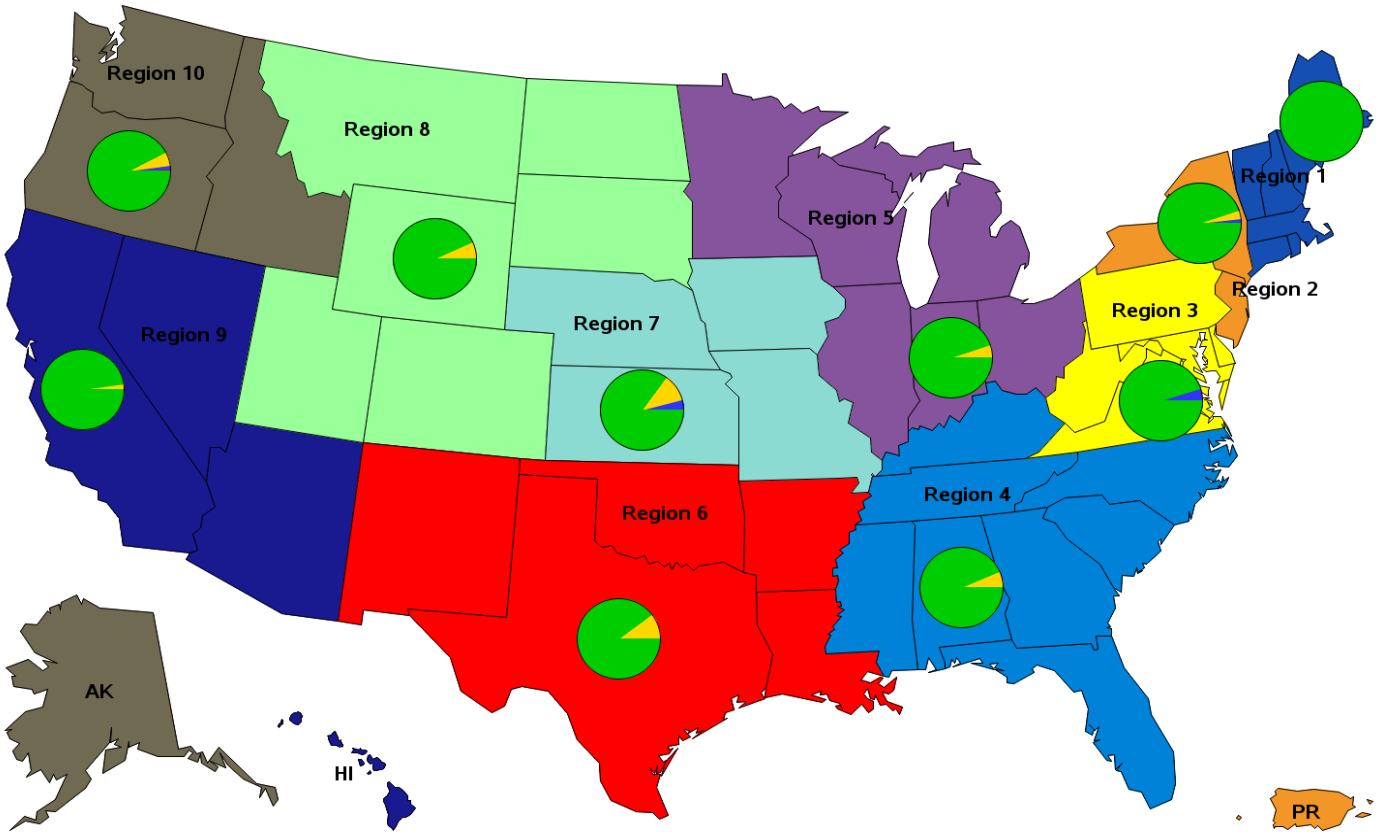
Laboratory Results—Through Current Surveillance Week 7

Table 3. Cumulative results by region and location for specimens collected during the 2014-2015 surveillance year (Continued from Page 4)

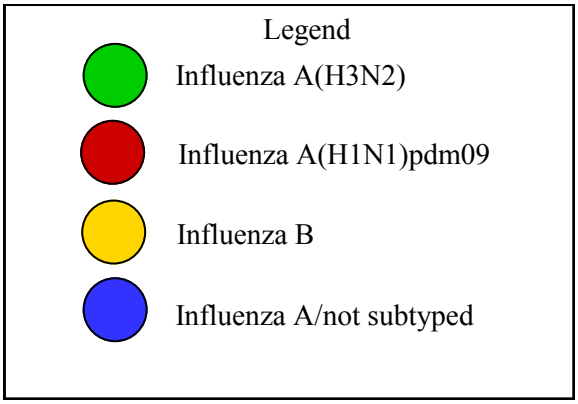
Region*		A(H1N1)pdm09	A(H3N2)	A/not subtyped	A/not subtyped & Corona	A/not subtyped & Para	A(H3N2) & B & Adeno & Rhino/Entero	A(H3N2) & Corona	A(H3N2) & RSV	A(H3N2) & Rhino/Entero	B	B/Victoria	B/Yamagata	B & Rhino/Entero	Adenovirus	Coronavirus	hMNV	*M. pneumoniae*	Parainfluenza	RSV	Rhinovirus/Enterovirus	Non-Influenza Co-infection	No Pathogen	Total
Region 5	Scott AFB, IL	-	23	-	-	-	-	-	-	-	2	-	-	-	1	1	-	-	2	-	1	-	26	56
	Wright-Patterson AFB, OH	-	12	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	4	6	-	29	53
Region 6	Altus AFB, OK	-	17	-	-	-	-	-	-	-	1	-	-	1	2	1	-	-	1	6	3	2	67	101
	Barksdale AFB, LA	-	10	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	1	8	21
	Cannon AFB, NM	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	12
	Ft Hood, TX	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	Holloman AFB, NM	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Laughlin AFB, TX	-	10	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	-	-	1	2	15	31
	Little Rock AFB, AR	-	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	45
	SAMMC, TX	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
	Sheppard AFB, TX	-	69	-	-	-	-	-	-	-	4	-	-	-	3	3	-	1	3	5	3	4	77	172
	Tinker AFB, OK	-	120	1	-	-	1	-	1	-	20	1	-	-	2	2	1	1	7	7	7	2	161	334
	USCG New Orleans, LA	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Vance AFB, OK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
Region 7	Ft Leavenworth, KS	-	5	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	14	21
	McConnell AFB, KS	-	29	4	-	1	-	-	-	-	5	-	-	-	-	2	-	-	-	-	1	-	23	65
	Offutt AFB, NE	-	66	-	-	-	-	-	-	-	8	-	-	-	3	-	-	2	8	-	9	1	127	224
Region 8	Buckley AFB, CO	-	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	1	-	10	15
	Ellsworth AFB, SD	-	26	-	-	-	-	-	-	-	9	-	1	-	2	1	-	2	8	-	2	-	27	78
	FE Warren AFB, WY	-	33	-	-	-	-	-	-	-	1	-	-	-	2	-	-	-	9	1	3	-	26	75
	Hill AFB, UT	-	34	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	4	3	4	-	33	80
	Malmstrom AFB, MT	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	3	8
	Minot AFB, ND	-	17	-	-	-	-	-	-	-	-	-	-	-	2	-	-	3	3	5	1	1	28	60
	Peterson AFB, CO	-	50	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	2	1	3	1	31	90
	USAF Academy, CO	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-	19	47
Region 9	Davis-Monthan AFB, AZ	-	22	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	1	1	-	1	35	62
	Edwards AFB, CA	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	9	18
	Los Angeles AFB, CA	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Luke AFB, AZ	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	10	23
	Nellis AFB, NV	-	17	-	-	-	-	-	-	-	2	-	-	-	1	-	-	-	-	1	-	-	19	40
	Travis AFB, CA	-	50	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	11	11	11	3	149	238
	USCG Island Alameda, CA	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	8
	Vandenberg AFB, CA	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	13
Region 10	CGS North Bend, OR	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	Fairchild AFB, WA	-	19	1	-	-	-	-	-	-	1	-	-	-	1	-	-	-	1	3	-	-	15	41
	Mt Home AFB, ID	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	6	17
	NH Bremerton, WA	1	94	1	-	-	-	-	-	-	6	-	-	-	10	-	3	2	18	26	14	9	272	456
Total		1	1633	14	1	1	1	1	1	1	91	6	13	1	73	33	13	26	114	125	161	56	2095	4461

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

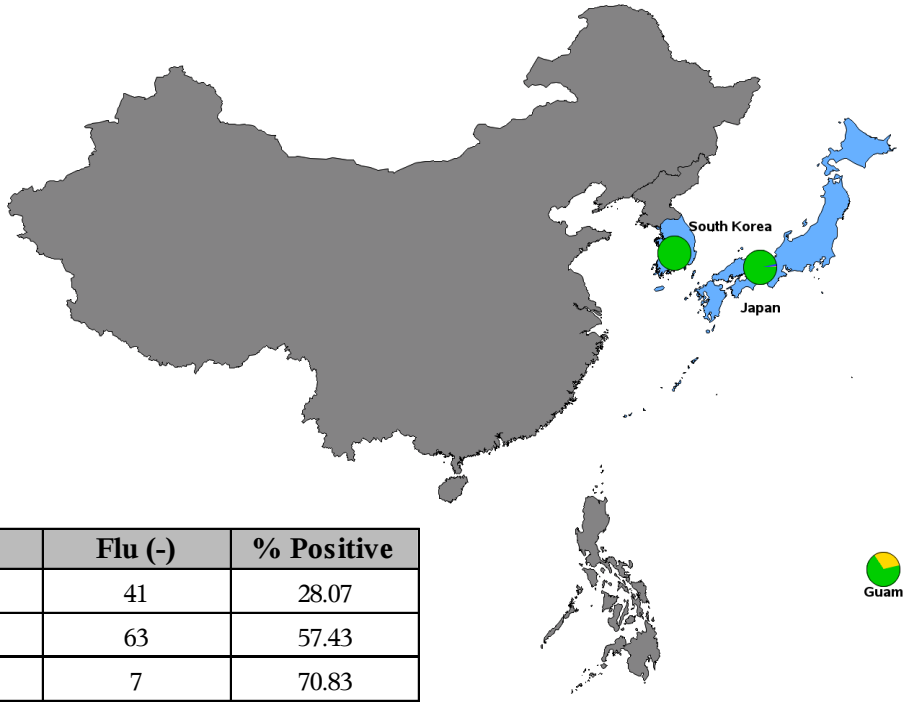
Map 1. Percentage of influenza positives by region for the 2014-2015 surveillance year through Week 7



Region	Flu (+)	Flu (-)	% Positive
Region 1	42	57	42.42
Region 2	152	245	38.29
Region 3	42	47	47.19
Region 4	407	573	41.53
Region 5	37	76	32.74
Region 6	282	476	37.2
Region 7	118	198	37.34
Region 8	205	256	44.47
Region 9	138	301	31.44
Region 10	146	414	26.07

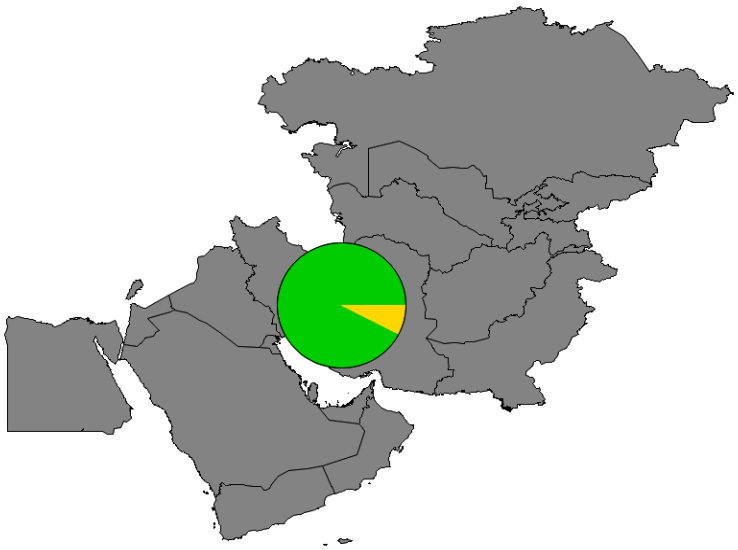


Map 2. Percentage of influenza positives by country for the 2014-2015 surveillance year through Week 7 (Pacific)



Country	Flu (+)	Flu (-)	% Positive
Guam	16	41	28.07
Japan	85	63	57.43
South Korea	17	7	70.83

Map 3. Percentage of influenza positives by country for the 2014-2015 surveillance year through Week 7 (CENTCOM)



Country	Flu (+)	Flu (-)	% Positive
Country 1	24	59	28.92
Country 2	53	28	65.43
Country 6	2	24	7.69

*Note – Specimens for CENTCOM were tested at USAFSAM or Landstuhl Regional Medical Center (LRMC).

Legend

- Influenza A(H3N2)
- Influenza A(H1N1)pdm09
- Influenza B
- Influenza A/not subtyped

Countries marked in blue contain sentinel sites

Molecular Sequence Analysis Report

USAFSAM Epidemiology Laboratory Service

This is the fourth report for the 2014-2015 season. Out of 173 total specimens collected between 23 October 2014 and 7 January 2015 and subsequently analyzed by USAFSAM, 163 were Influenza A(H3N2) virus specimens (94%), six were Influenza B/Yamagata virus specimens (4%), and four were Influenza B/Victoria virus specimens (2%).

		A(H3N2)	B/Yamagata	B/Victoria
CONUS	**Alabama** CGS Mobile	3		
	Alabama Maxwell AFB	1	1	
	California Edwards AFB	1		
	California NHRC – San Diego	4		1
	California Travis AFB	5		
	Colorado Dover AFB	3		
	Colorado Peterson AFB	14		
	Colorado USAF Academy	1		
	District of Columbia JB Anacostia-Bolling	1		
	Florida Eglin AFB	1		
	Florida Hurlburt Field (AFB)	2		
	Florida Tyndall AFB	1		
	Georgia Moody AFB	6	1	1
	Georgia Robins AFB	7	1	
	Idaho Mt Home AFB	1		
	Illinois Scott AFB	4		
	Kansas McConnell AFB	2		
	Kentucky Ft Campbell	5		1
	Louisiana Barksdale AFB	2		
	Maryland NCRM – Walter Reed NMMC	1		
	Massachusetts Hanscom AFB	3		
	Nebraska Offutt AFB	8		
	Nevada Nellis AFB	3		
	New Jersey JB McGuire-Dix-Lakehurst	1		
	New York Ft Drum	6		
	New York USMA – West Point	2		
	North Carolina Ft Bragg	2		
	North Carolina Seymour Johnson AFB	3		
	North Carolina USCG Base Elizabeth City	1		
	North Dakota Minot AFB	1		
	Oklahoma Altus AFB	1		
	Oklahoma Tinker AFB	17		1
	South Carolina JB Charleston (AF)	2		
	South Carolina Shaw AFB	1		
	South Dakota Ellsworth AFB	3	1	
	Texas Sheppard AFB	7		
	Utah Hill AFB	8	1	
	Virginia CG Base Portsmouth	2		
	Virginia JB Langley-Eustis	3		
	Washington NH Bremerton	16		
	Wyoming FE Warren AFB	1		
OCONUS	**Country 1** Location B	1		
	Germany LRMC	3	1	
	Japan Yokota AB	3		
TOTAL		**163**	**6**	**4**

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.

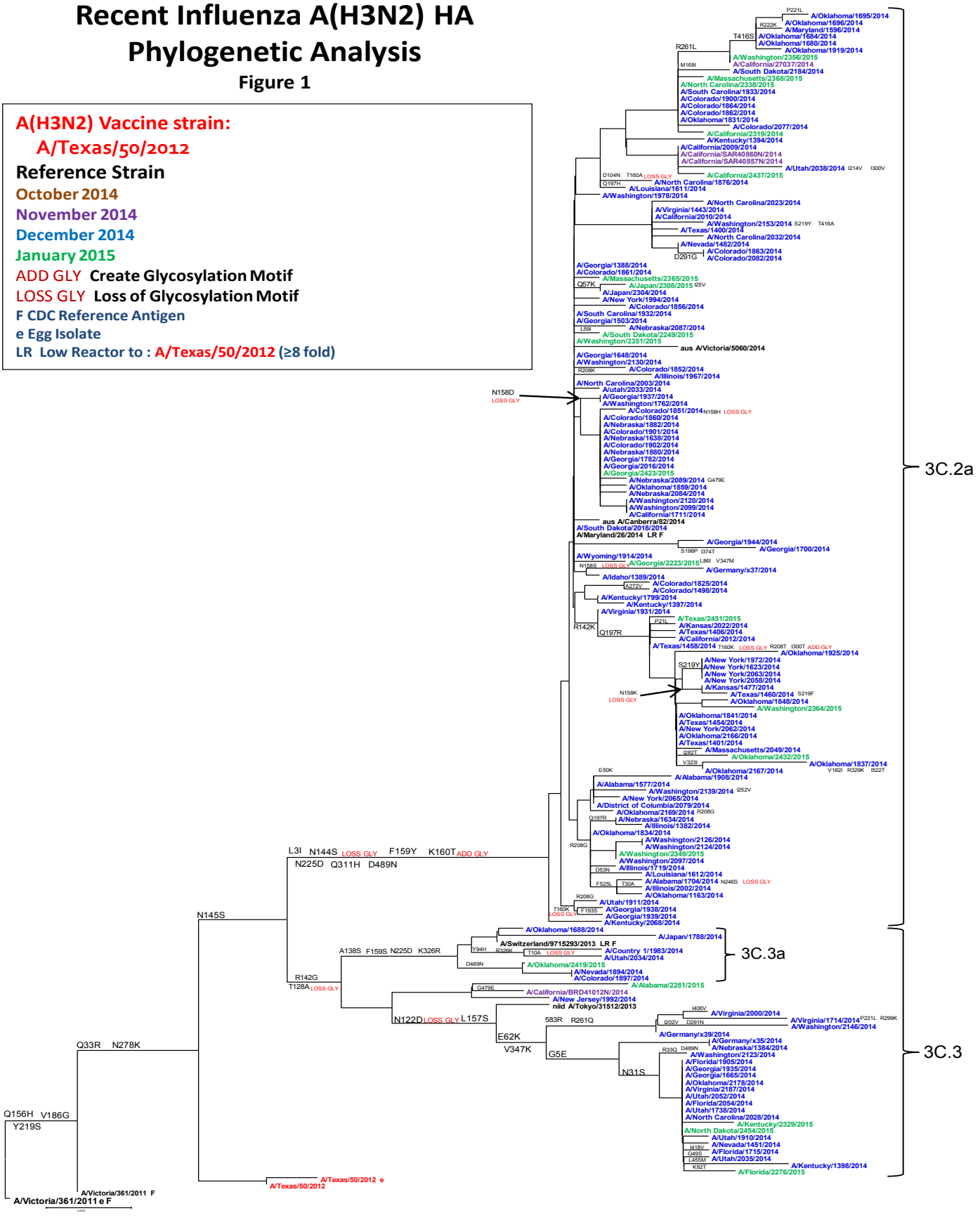
Influenza A(H3N2)

- Isolates are characterized in a neighbor-joining phylogenetic tree with reference strains and other recently sequenced isolates rooted from the previous vaccine, A/Victoria/361/2011-like virus [Figure 1].
- The A(H3N2) specimen characterized for this report by USAFSAM exhibited an overall protein identity of 96.6-98.7% as compared to the A(H3N2) component of the 2014-2015 vaccine formulation, A/Texas/50/2012-like virus.
- 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 163 influenza A(H3N2) specimens characterized in this report, 11 mutations: T10A (threonine to alanine), N122D (asparagine to aspartic acid), T128A (threonine to alanine), N144S (asparagine to serine), N158K (asparagine to lysine), N158S (asparagine to serine), N158H (asparagine to histidine), N158D (asparagine to aspartic acid), T160A (threonine to alanine), T160K (threonine to lysine), and N246S (asparagine to serine) were observed that could cause a loss of a glycosylation motif. Two mutations, K160T (lysine to threonine) and I300T (isoleucine to threonine), were observed that could cause a gain of a glycosylation motif.
- Based on the mutations observed, all of the A(H3N2) viruses analyzed belong to clade 3C. Within this clade, 129 (79%) viruses classify as group 3C.2a, 27 (17%) classify as group 3C.3, and 7 (4%) viruses further classify as group 3C.3a [Figure 1].
- Out of the total 66 mutations, 19 occurred at predicted antigenic sites and six at the receptor binding site.[2,5]

Recent Influenza A(H3N2) HA Phylogenetic Analysis

Figure 1

A(H3N2) Vaccine strain:
A/Texas/50/2012
Reference Strain
October 2014
November 2014
December 2014
January 2015
ADD GLY **Create Glycosylation Motif**
LOSS GLY **Loss of Glycosylation Motif**
F CDC Reference Antigen
e Egg Isolate
LR Low Reactor to : A/Texas/50/2012 (≥8 fold)



Influenza B

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

- The distinguishing characteristic between the two lineages (Victoria & Yamagata) is defined by an amino acid deletion in viruses belonging to the Yamagata lineage.[1] Six of the influenza B specimens characterized for this report reside within the Yamagata lineage (60%) while four reside within the Victoria lineage (40%).

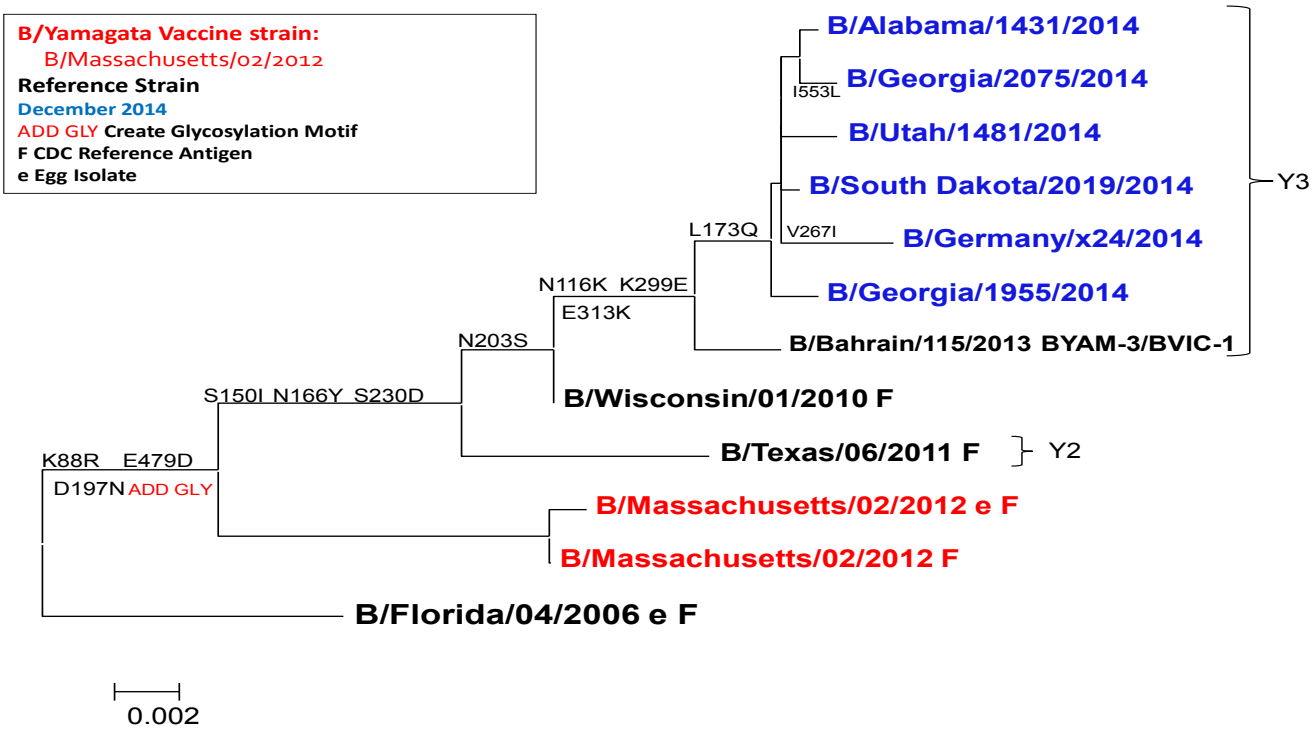
- The influenza B Yamagata specimens characterized for this report exhibited an overall protein identity of 97.4-97.5% when compared to the 2013-2014 influenza B/Yamagata vaccine strain, B/Massachusetts/02/2012-like virus. When compared to the 2013-2014 influenza B/Victoria vaccine strain, B/Brisbane/60/2008-like virus, the B/Victoria specimens exhibited a protein homology of 99.1-99.5%.

- All six specimens of the influenza B/Yamagata lineage classify into group Y3, similar to the 2012-2013 B/Yamagata vaccine strain, B/Wisconsin/01/2010-like virus. Group 2 and 3 strains share three amino acid changes, S150I (serine to isoleucine), N166Y (asparagine to tyrosine), and S230D (serine to aspartic acid), while the mutation N203S (asparagine to serine) is unique to group 3 strains [Figure 2].

- All four influenza B/Victoria specimens in this report were characterized as being in group 1A, identified by the mutations N75K (asparagine to lysine), N165K (asparagine to lysine), and S172P (serine to proline) [Figure 3].

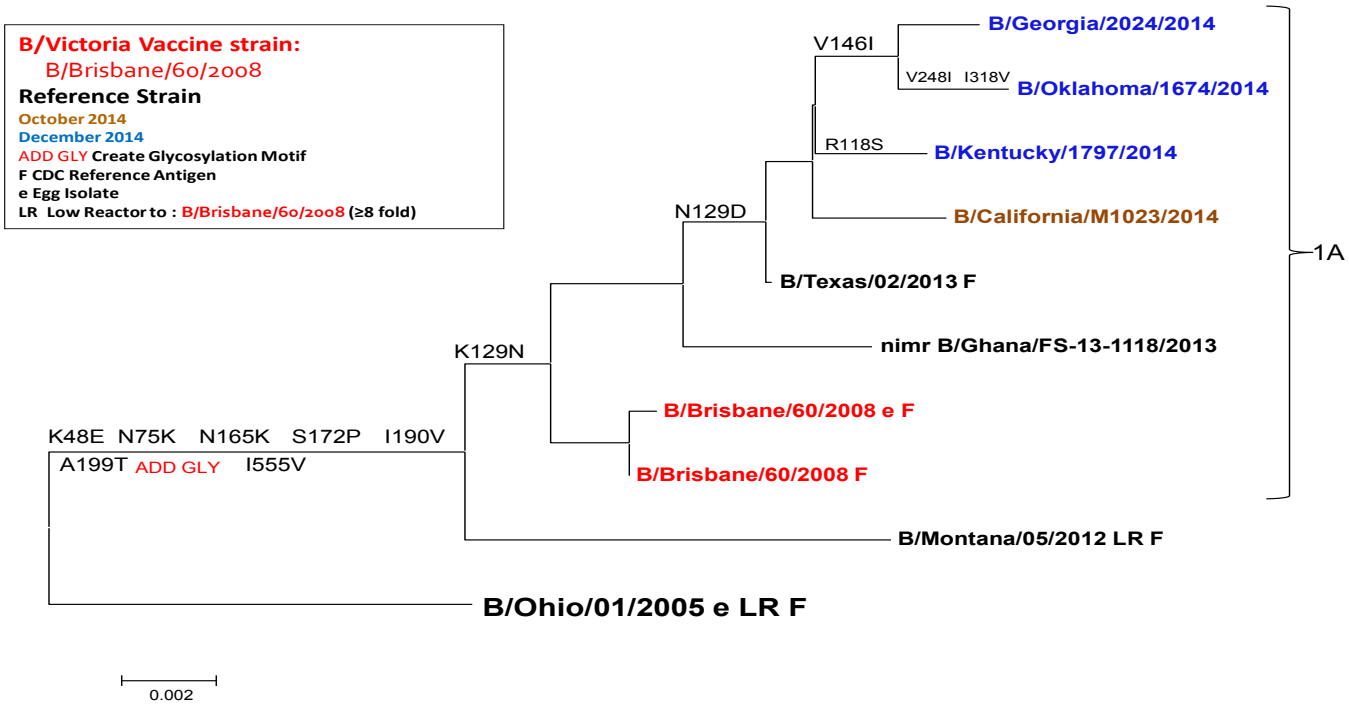
Recent Influenza B/Yamagata Lineage HA Phylogenetic Analysis

Figure 2



Recent Influenza B/Victoria Lineage HA Phylogenetic Analysis

Figure 3



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DoD Global Laboratory-Based Influenza Surveillance Program

USAF School of Aerospace Medicine

2014 - 2015

Respiratory Surveillance
2014-2015 Year
(beginning 28 September 2014)

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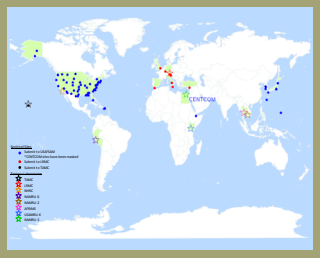

Contributions to the CDC for National Influenza Surveillance

All sequence data are sent to the CDC and selected original specimens or isolates are sent for further characterization and possible use as influenza vaccine seed viruses. Specimens may also undergo antiviral testing.

DoD Global, Influenza Surveillance Program
https://gumbo2.area52.afnoapps.usaf.mil/epi-consult/influenza

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:

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.