DoD Influenza Surveillance and Mid-Season Vaccine Effectiveness

Armed Forces Health Surveillance Branch (AFHSB)

Naval Health Research Center (NHRC)

United States Air Force School of Aerospace Medicine (USAFSAM)

DoD Global Respiratory Pathogen Surveillance Program Partners

Presentation to the Vaccines and Related Biological Products Advisory Committee (VRBPAC) – 4 March 2020

Mark Scheckelhoff, PhD, MPH**

****Representing the DoD CONUS and OCONUS lab-based influenza surveillance activities**

"Medically Ready Force…Ready Medical Force"

Briefing Outline

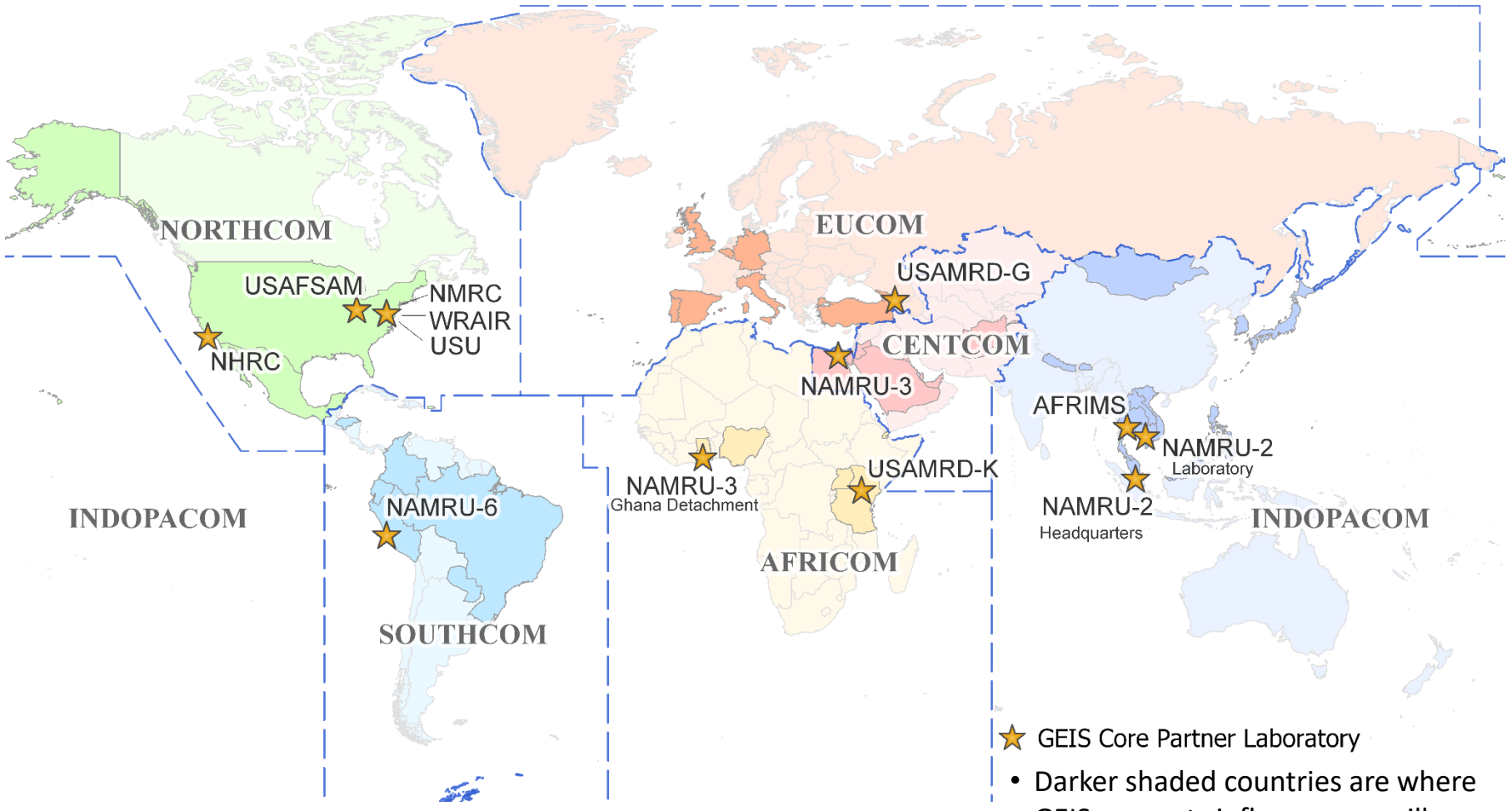
Purpose: Provide a concise update to the VRBPAC on DoD influenza surveillance activities for 2018-2019

1. Program Description
2. Strain Circulation
3. Molecular Analyses
4. Vaccine Effectiveness

Breadth of DoD Influenza Surveillance

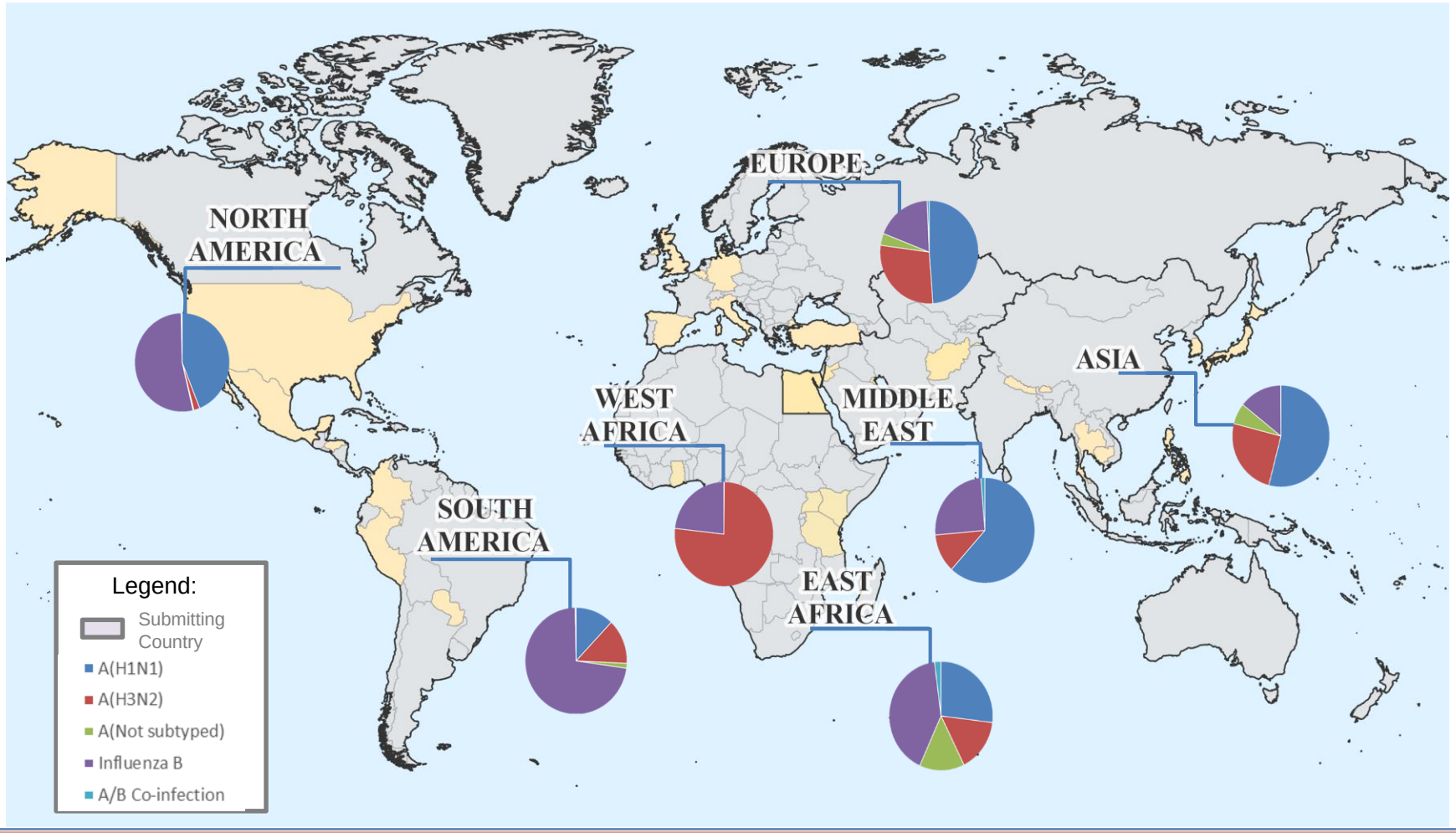
- **Global Influenza Surveillance**
  - Approximately 400 locations in over 30 countries
    - Military; Local government/academic
  - Extensive characterization capabilities within the DoD
    - Culture, PCR, Sequencing, Serology
  - Rapid sharing of results with CDC and/or regional WHO reference centers
    - Yearly average: ~30,000 samples collected and analyzed each year
- **Comprehensive Epidemiology and Analysis Capabilities**
  - 1.4 Million Active Duty records (health care utilization, immunizations, deployment, reportable diseases, etc.)
    - Produce Medical Surveillance Monthly Reports, Ad-hoc requests, Studies/analyses,
    - Weekly influenza reports
    - Vaccine safety and effectiveness studies

GEIS-Supported Influenza Surveillance Footprint



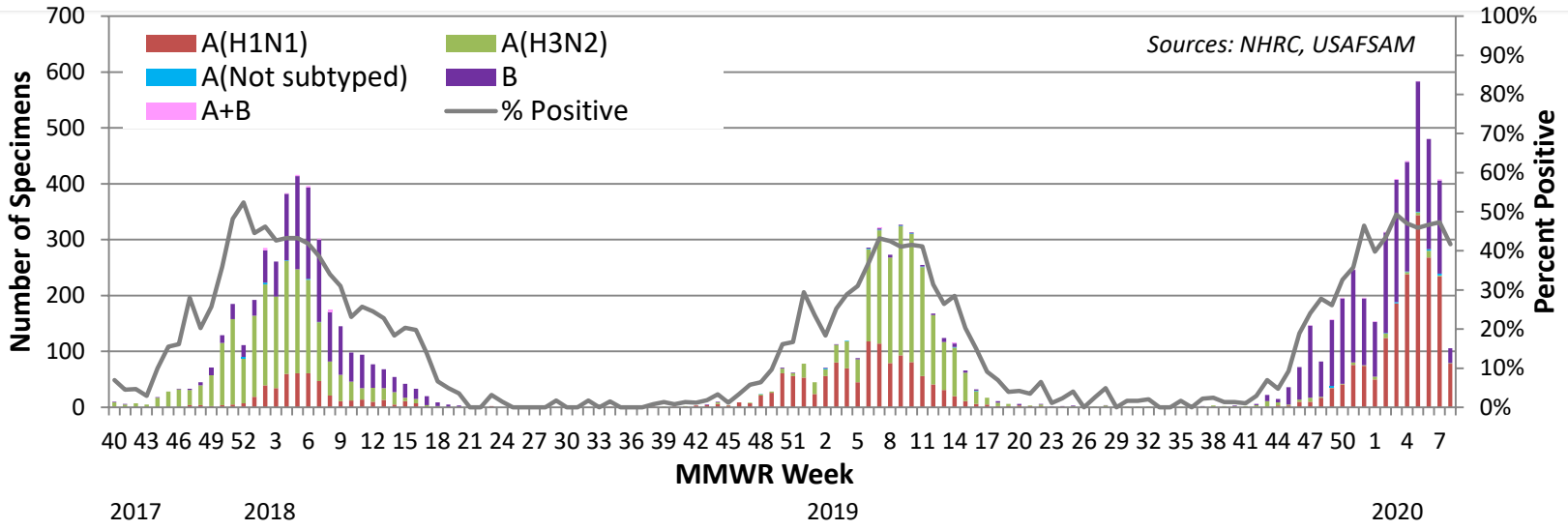
"Medically Ready Force…Ready Medical Force"

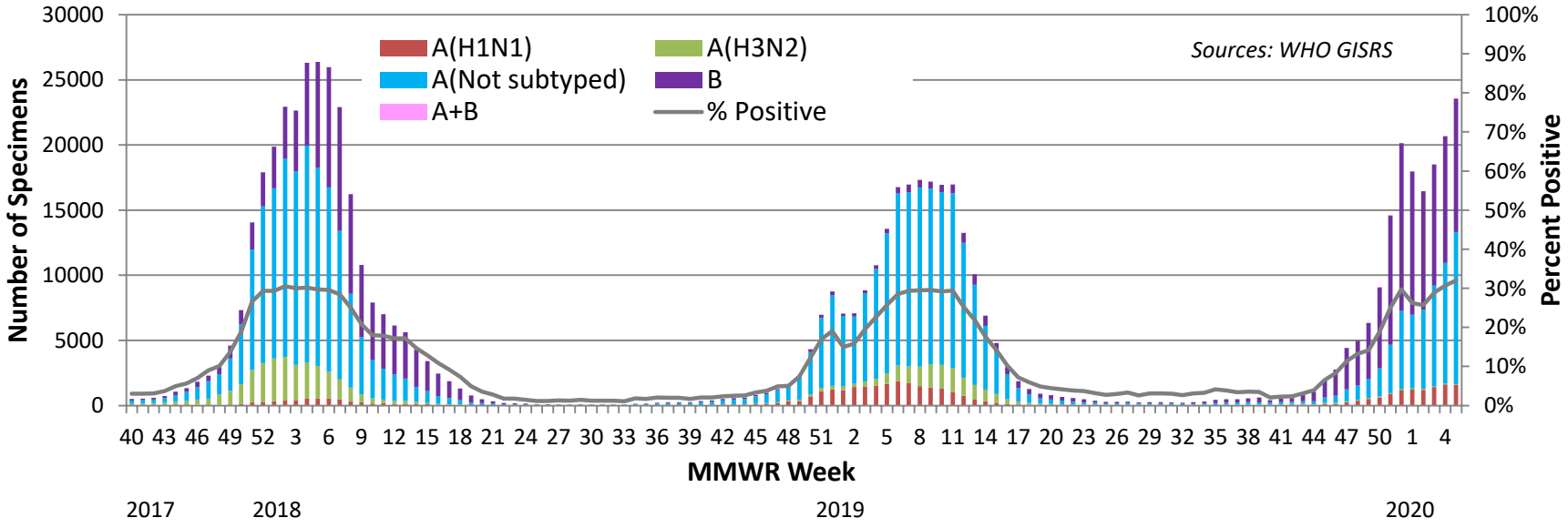
Submitting Countries and Subtype Circulation 2019-2020 Season



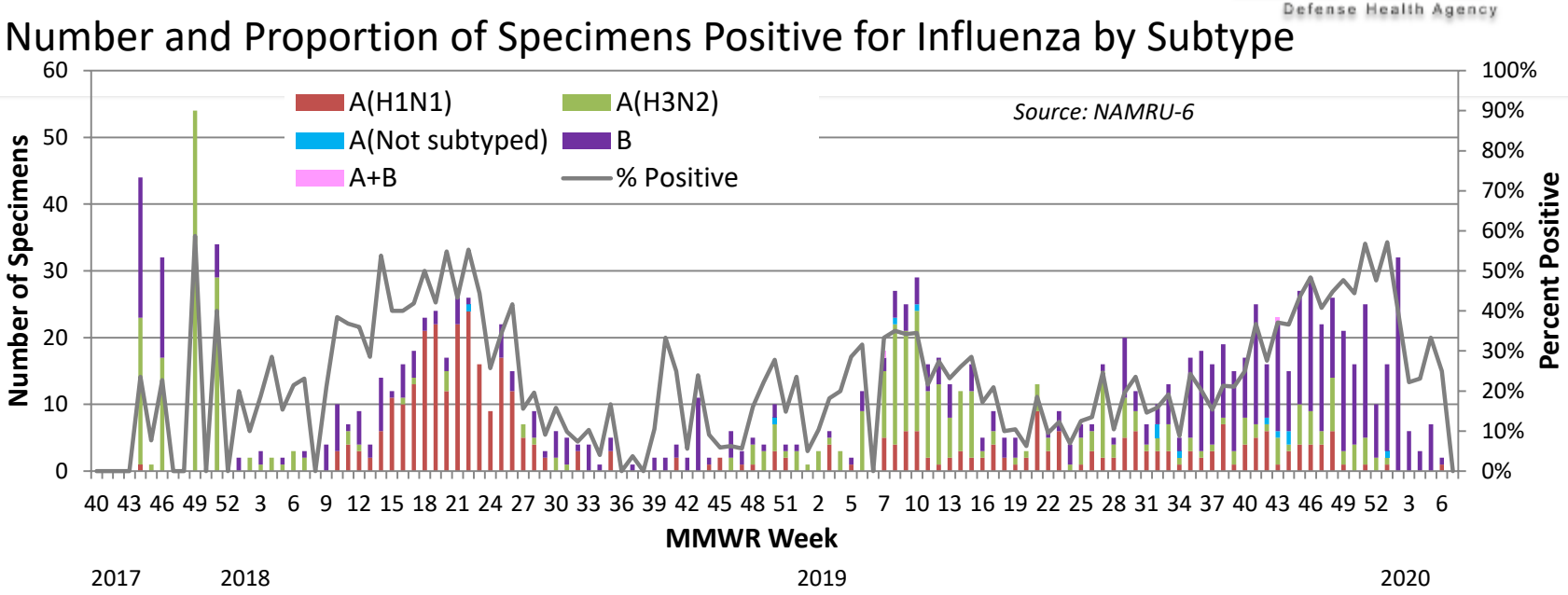
Subtype Circulation: North America

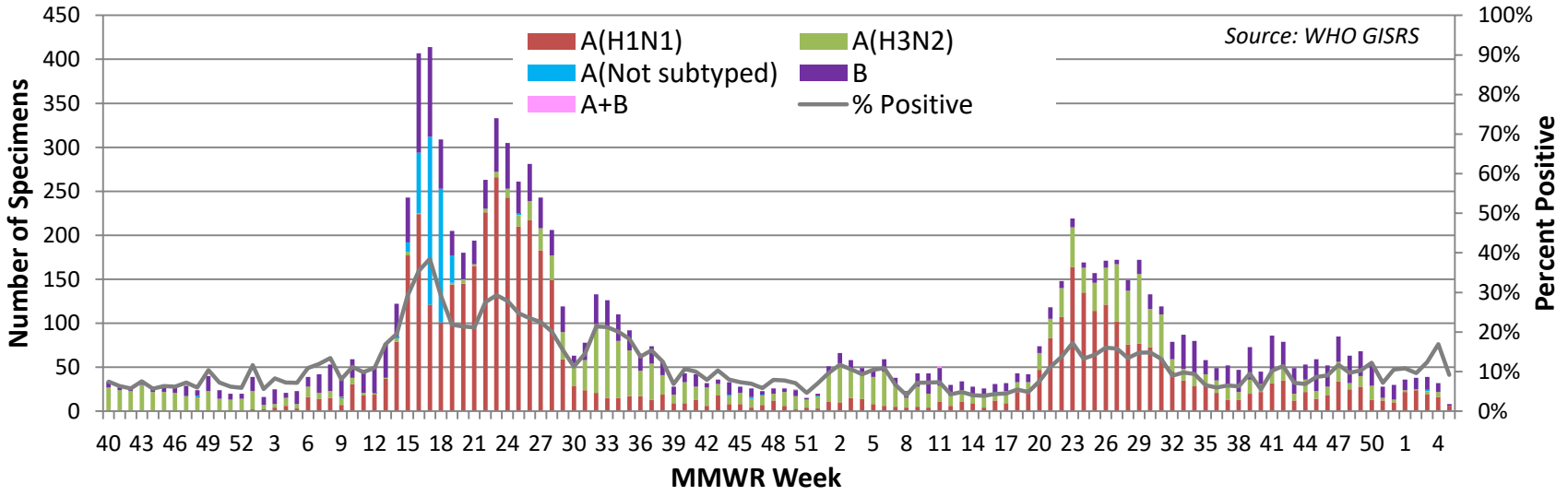
Number and Proportion of Specimens Positive for Influenza by Subtype





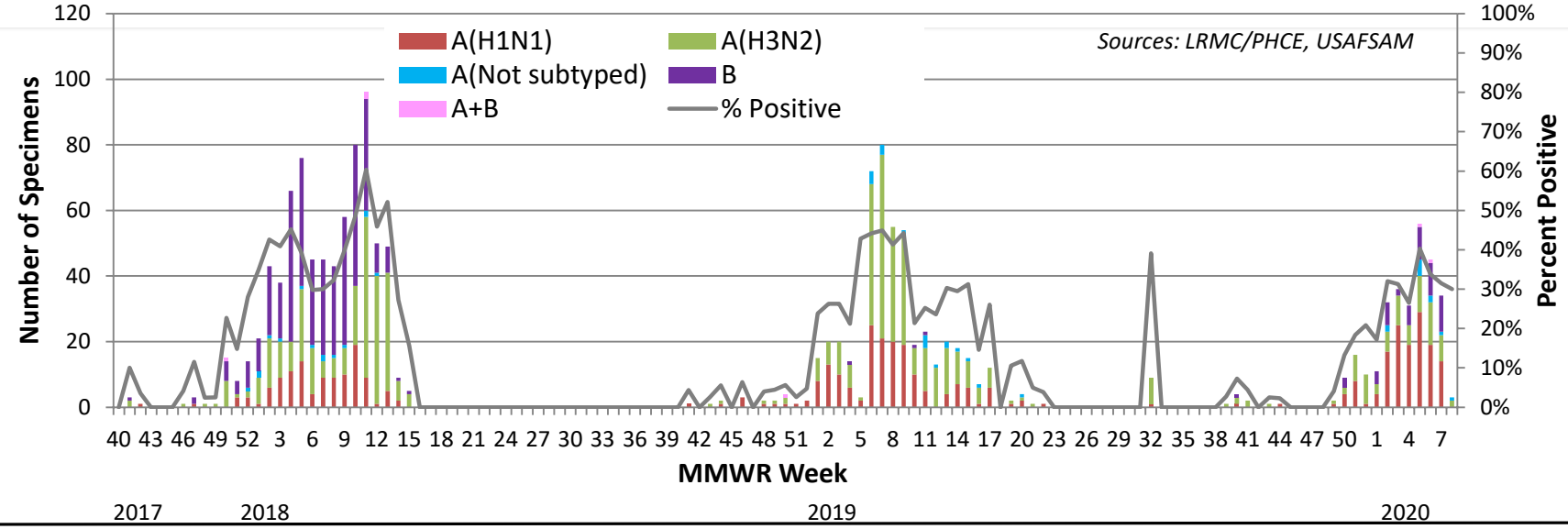
Subtype Circulation: South America

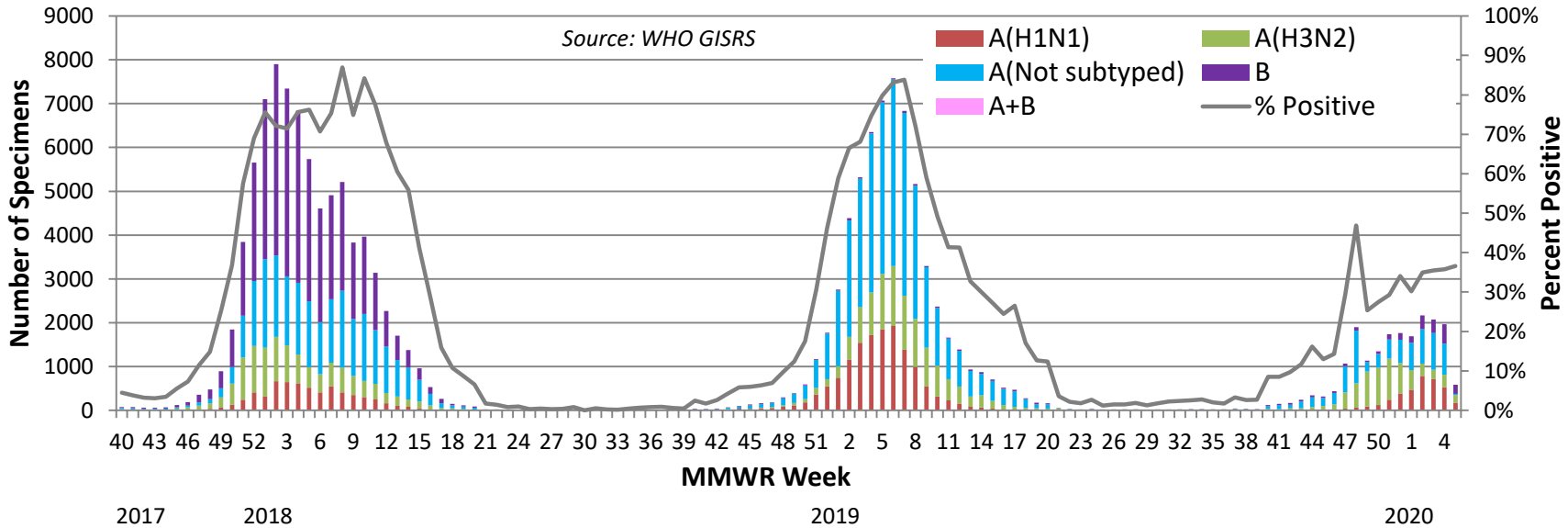




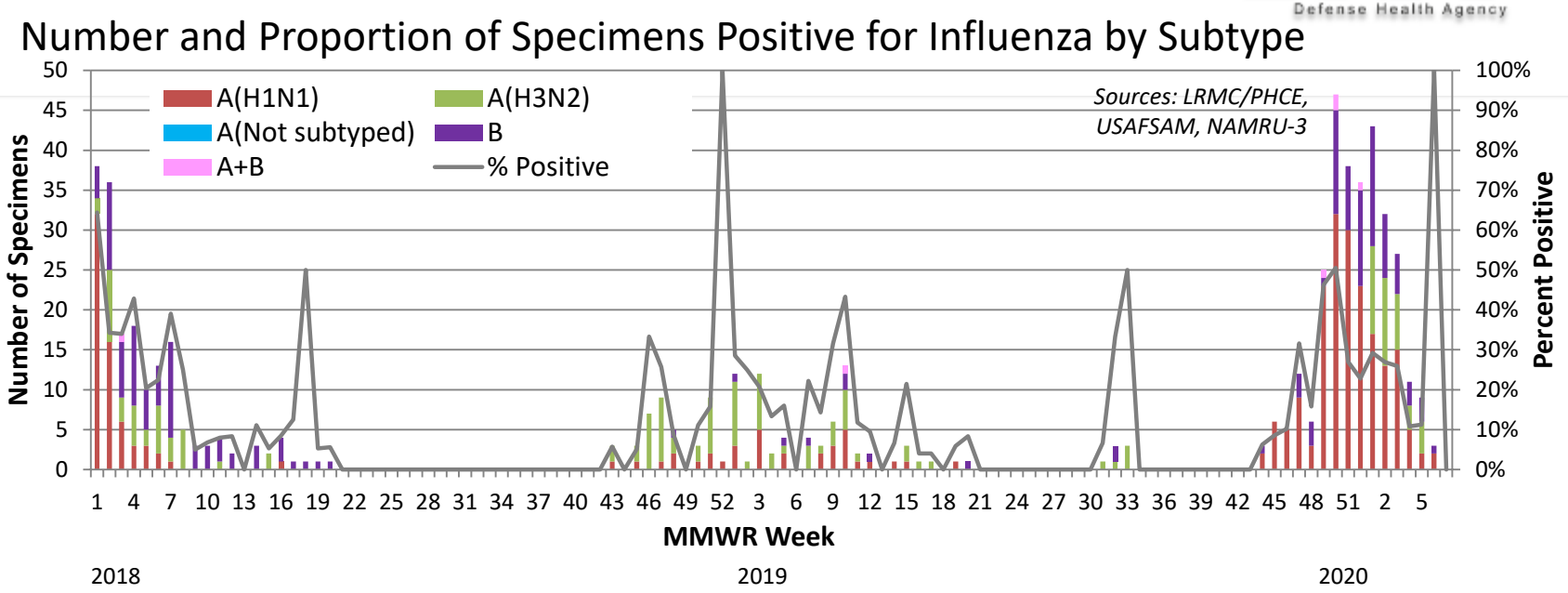
Subtype Circulation: Europe

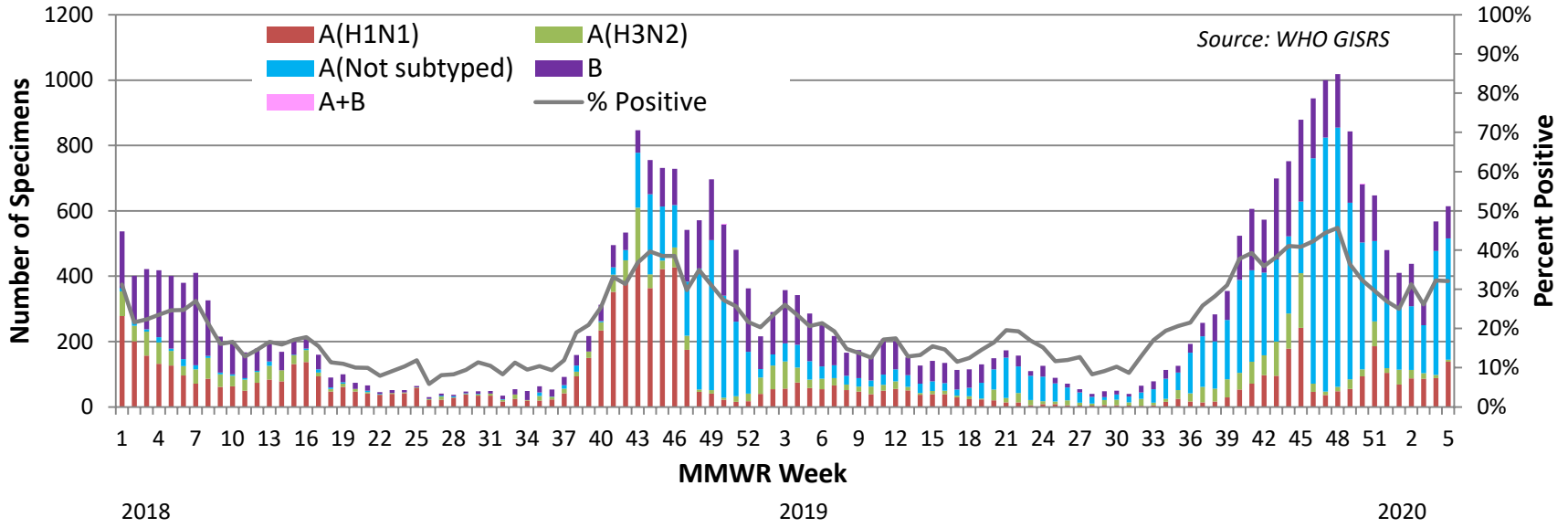
Number and Proportion of Specimens Positive for Influenza by Subtype





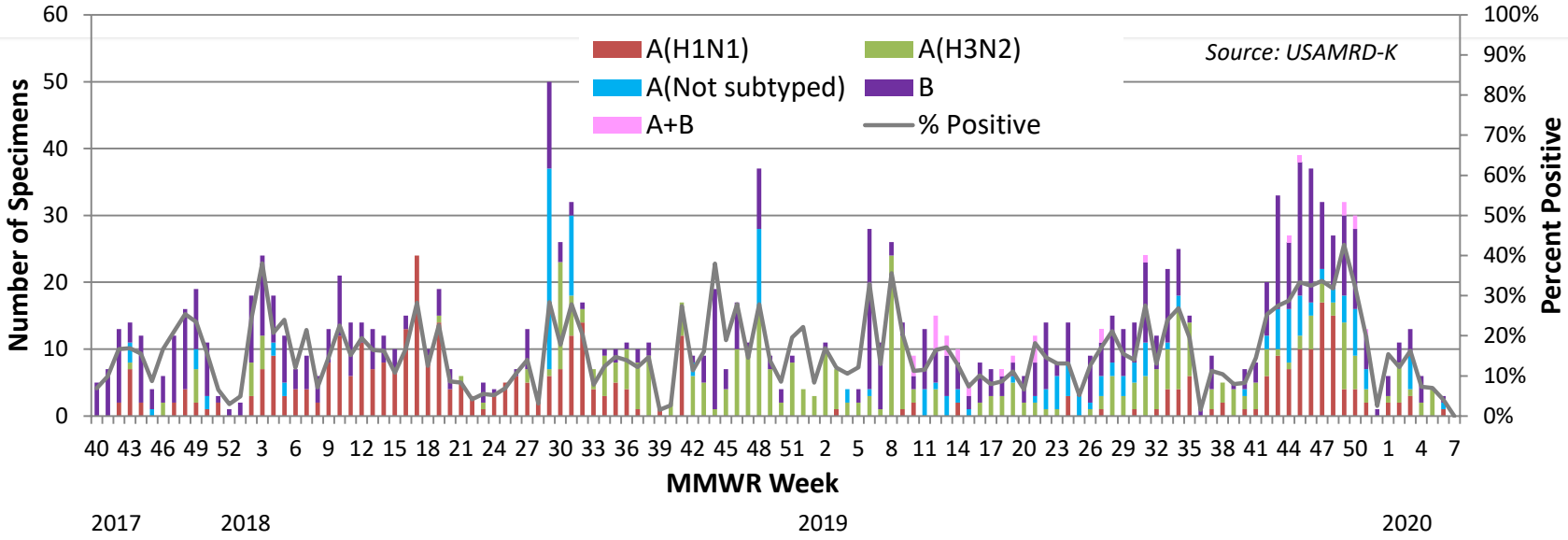
Subtype Circulation: Middle East

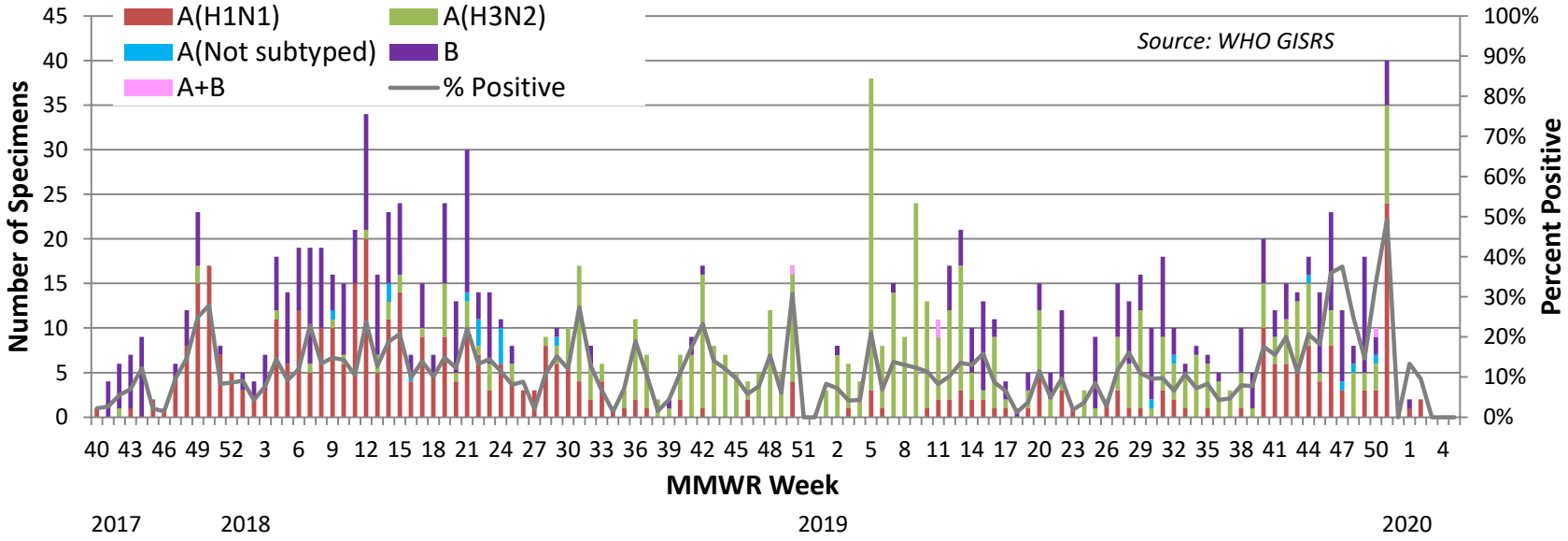




Subtype Circulation: East Africa

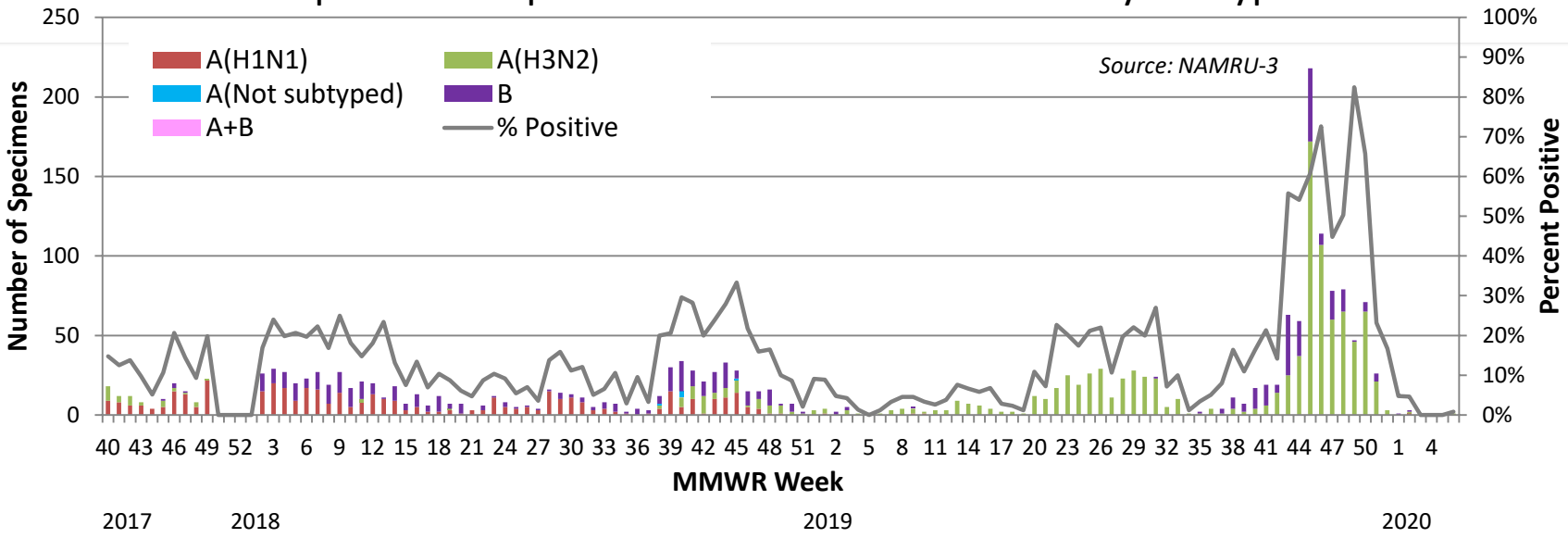
Number and Proportion of Specimens Positive for Influenza by Subtype

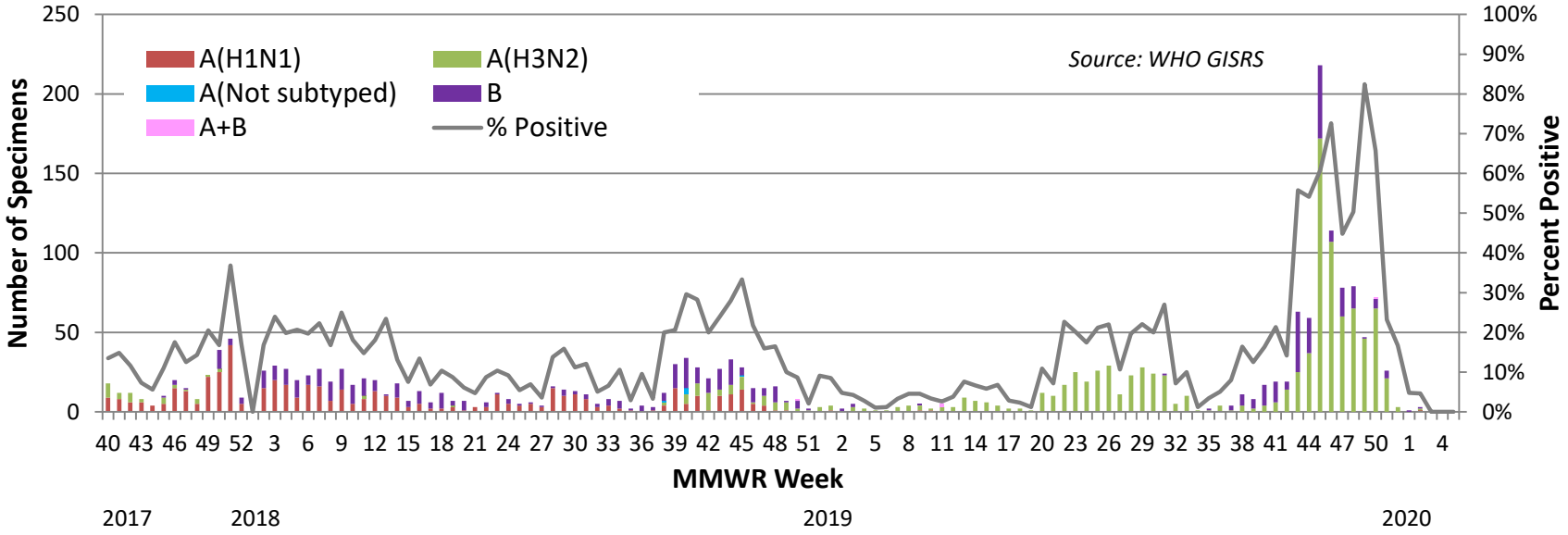




Subtype Circulation: West Africa (Ghana)

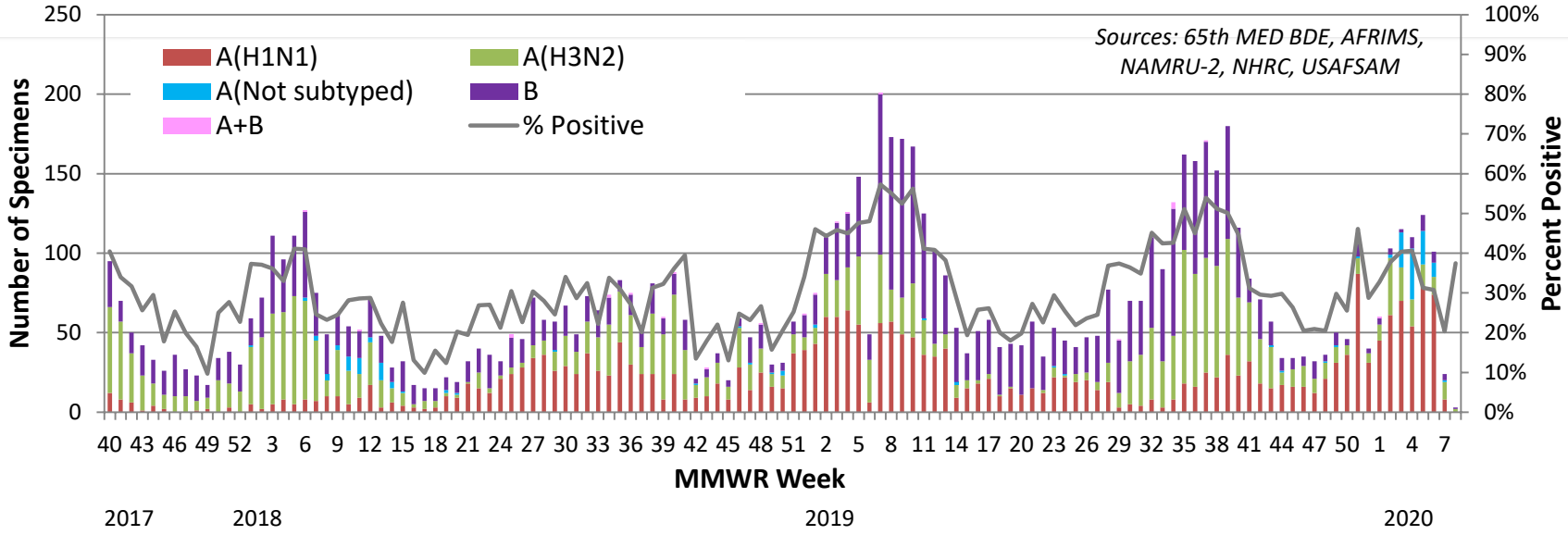
Number and Proportion of Specimens Positive for Influenza by Subtype

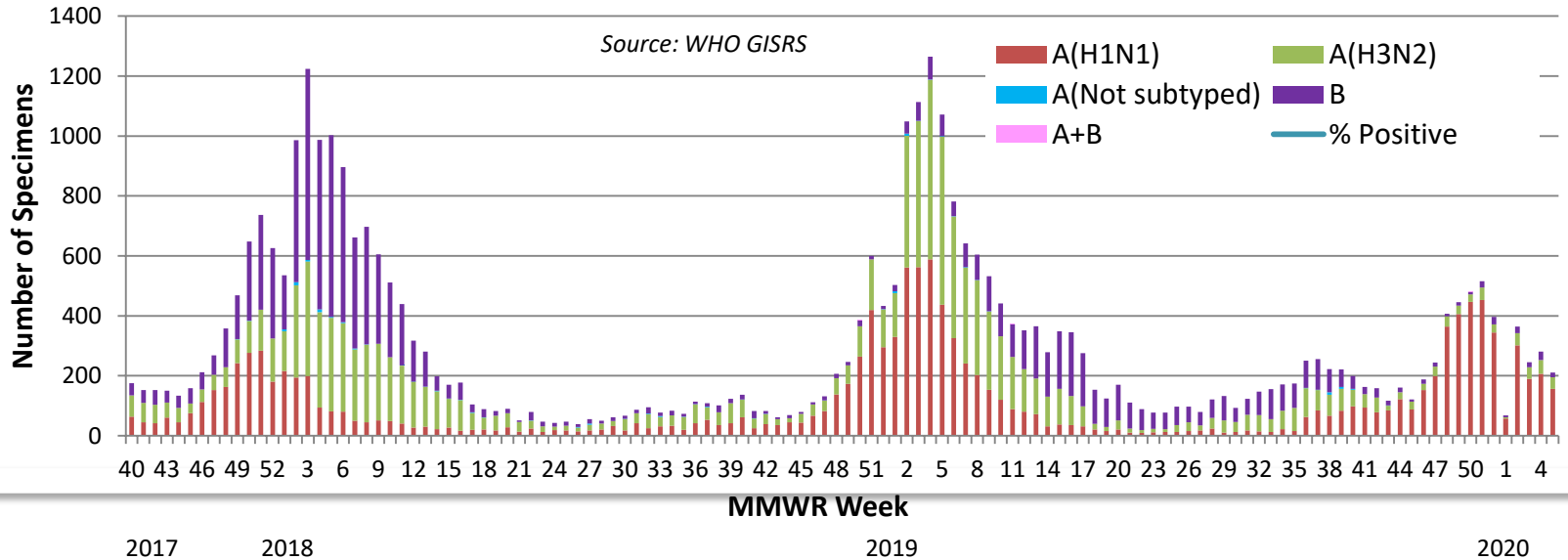




Subtype Circulation: Asia

Number and Proportion of Specimens Positive for Influenza by Subtype



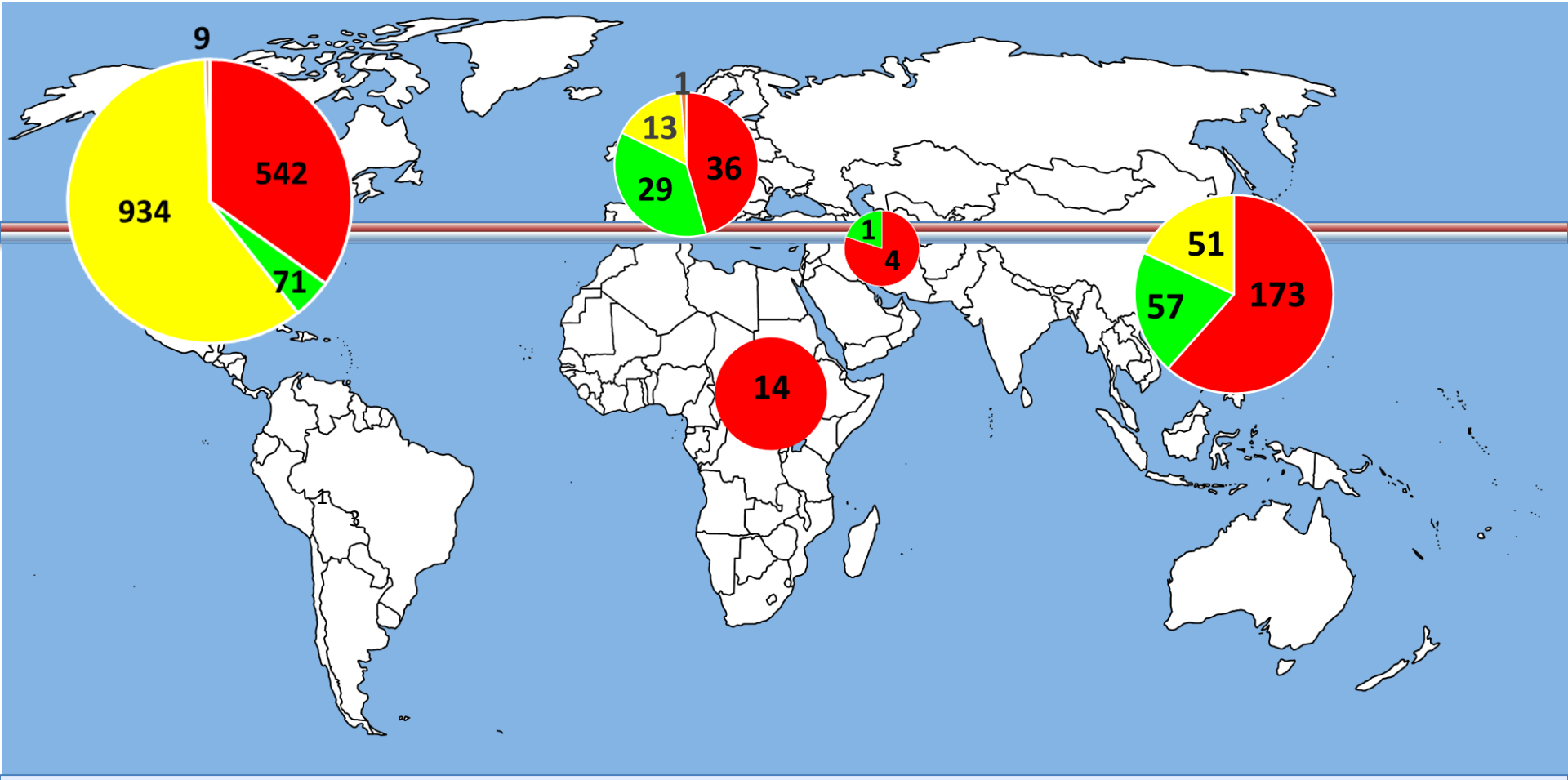


Summary of Circulating Subtype 2019-2020 Season

- In **North America** DoD surveillance is similar to national trends with a predominance of **Influenza B;** in recent surveillance **A(H1N1)** predominates
- Activity during the season in **South America** showed a predominance of **Influenza B***
- Activity in **Europe** shows **A(H1N1)** predominating
- **Asia** data show early predominance of **A(H3N2)** with recent predominance of **A(H1N1)***
- In the **Middle East A(H1N1)** predominates
- **East Africa** data show nearly evenly mixed predominance of **influenza B** with recent predominance of **A(H3N2)***
- Activity in **West Africa** shows **A(H3N2)** predominating

*Most data from tropics

DoD / USAFSAM Phylogenetic Analysis 2019-2020 Influenza Season



A(H1N1)pdm09

A(H3N2)

B/Victoria

B/Yamagata

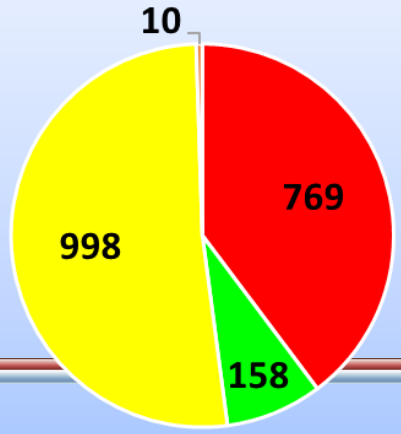
Contributors

- USAFSAM Sentinel Sites (1752)
- Deployed Locations (5)
- AFRIMS (64)
- NAMRU-2 (7)
- NHRC (93)
- USAMRD-K (14)

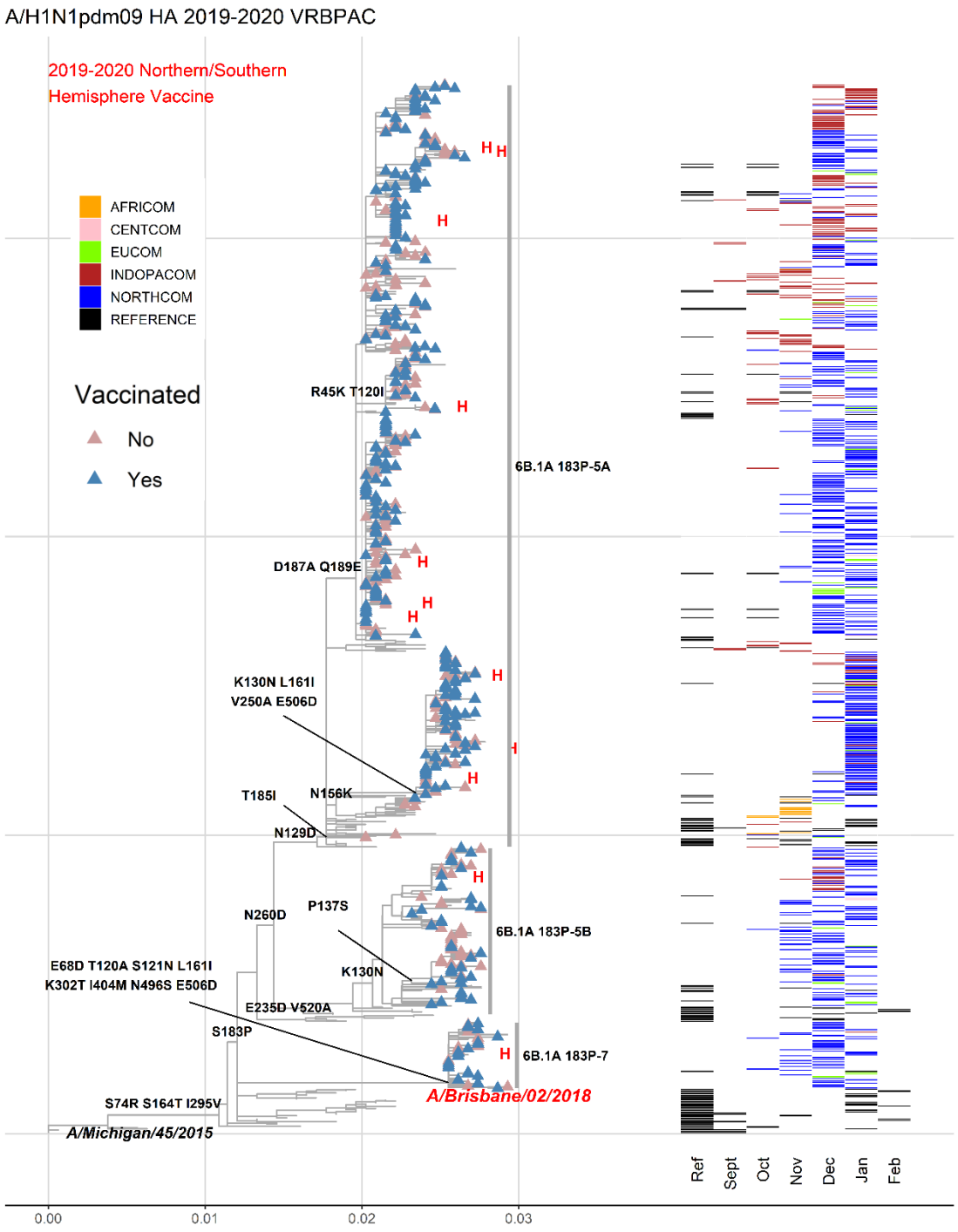
- Hospitalized Cases (34)

Countries

Cambodia
Country 1
England
Germany
Italy
Japan
Kenya
Mexico
Philippines
South Korea
Spain
Thailand
United States
Guam



Total = 1935



nfluenza A(H1N1)pdm09

769 influenza A(H1N1)pdm09 specimens sequenced

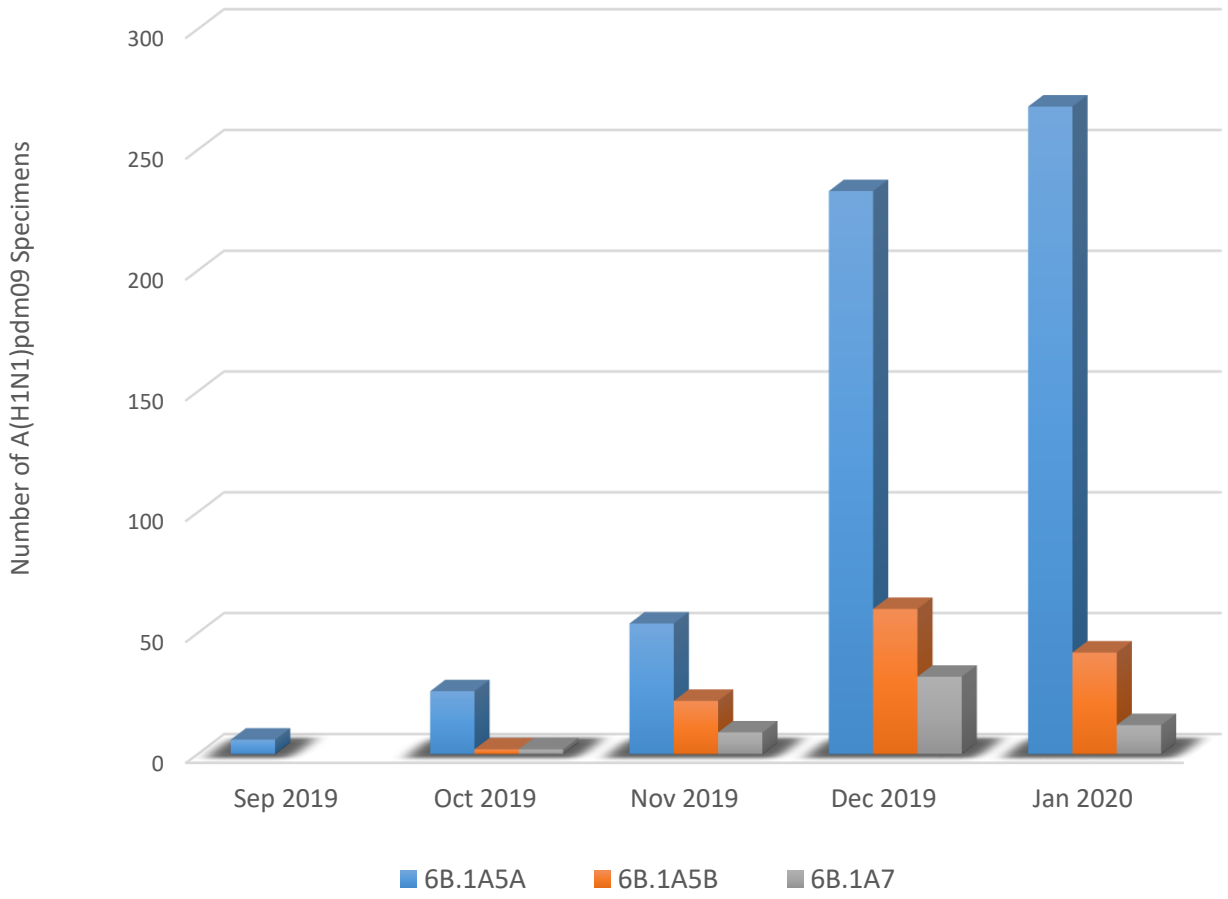
All clade 6B.1A with 183P substitution, with 76.5% in subgroup 5A, 16.4% in subgroup 5B, and 7.1% in subgroup 7

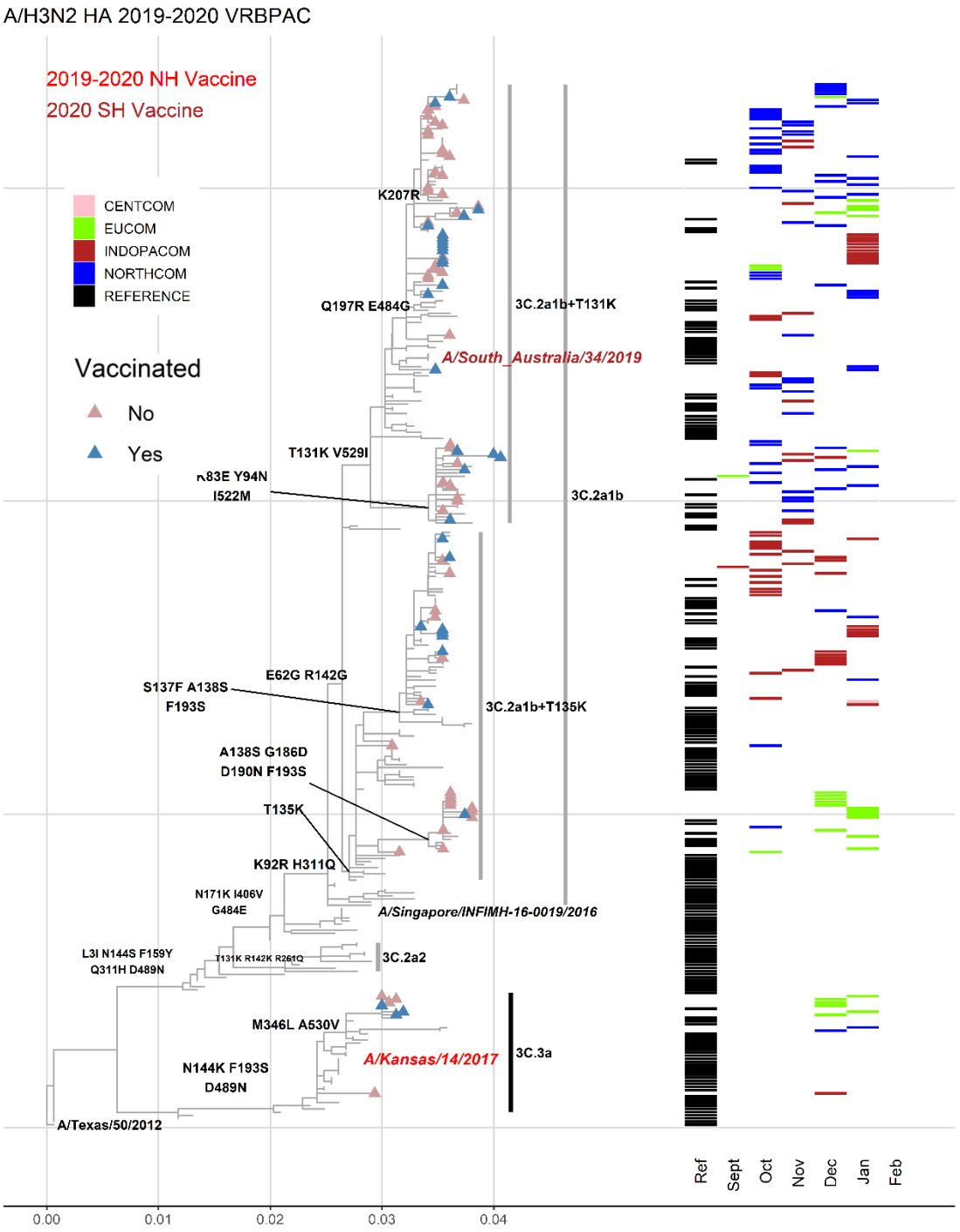
15 A(H1N1)pdm09 specimens collected from hospitalized patients, with 13 (86.7%) in subgroup 5A, and 1 each in groups 5B and 7

Among 6B.1A5A viruses, 91.1% had D187A and Q189E, and 23.9% had K130N

Among 6B.1A5B viruses, 45.6% had P137S

A(H1N1)pdm09 HA Clades Sep 2019-Jan 2020

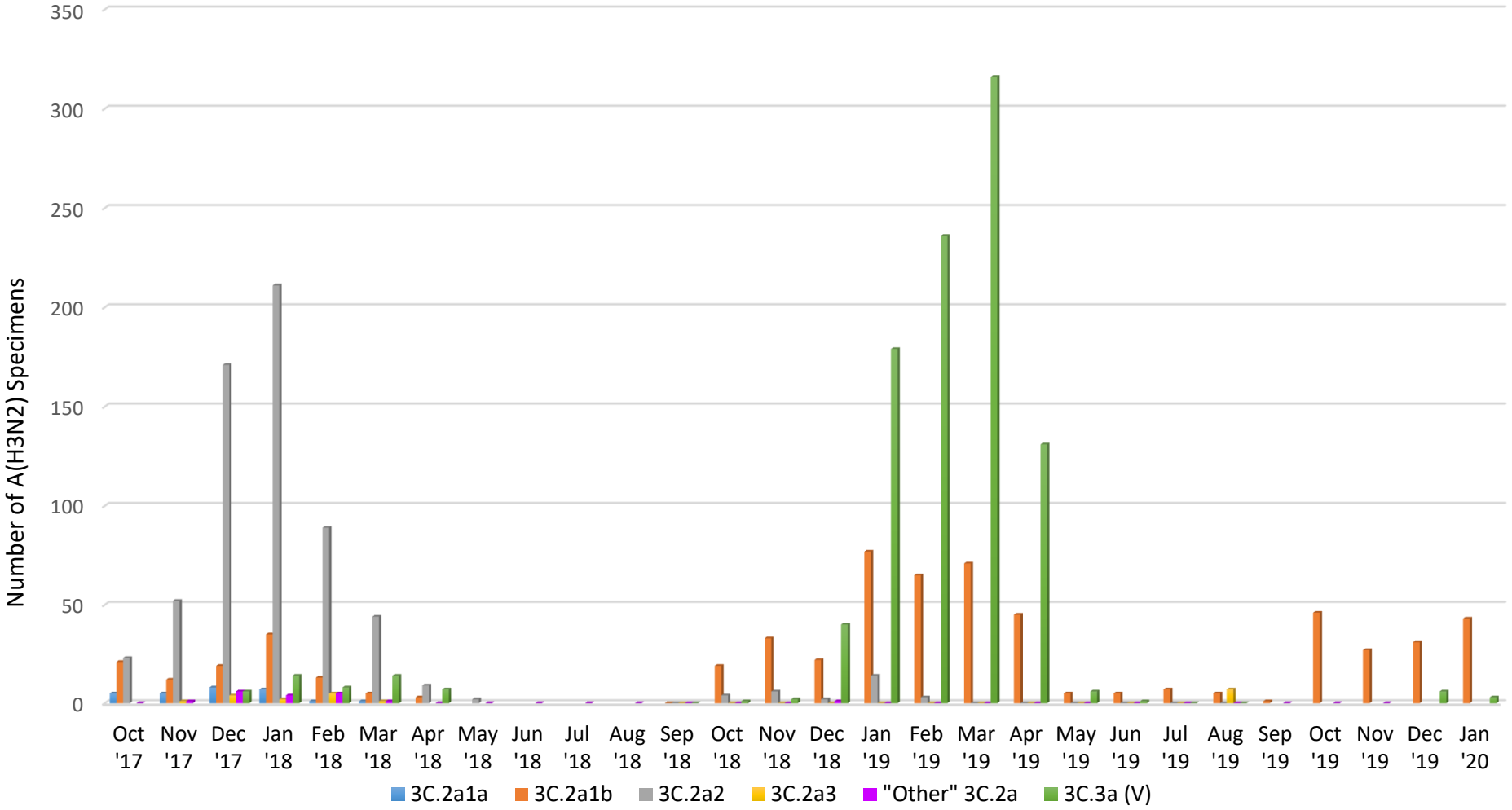


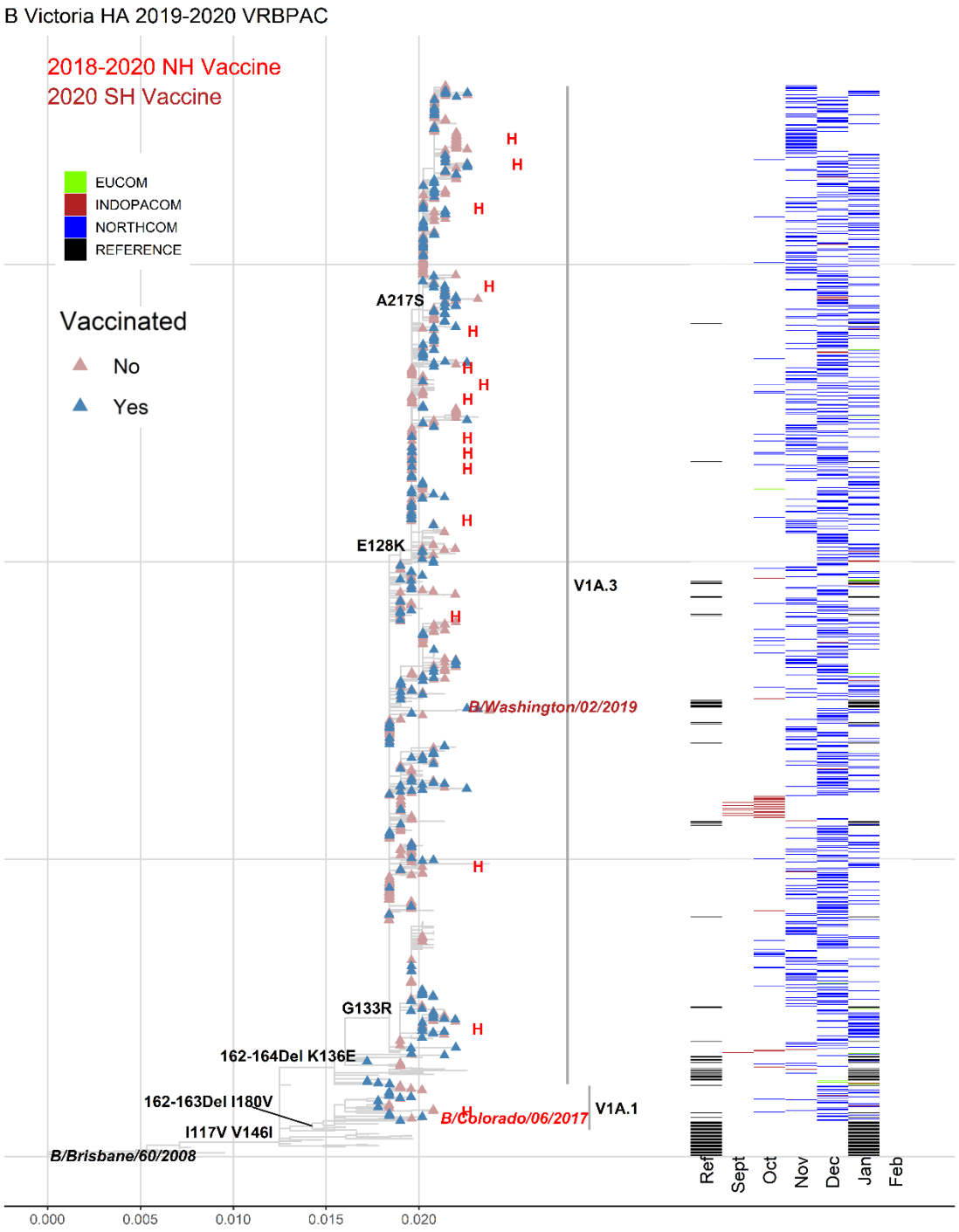


Influenza A(H3N2)

- 158 influenza A(H3N2) specimens sequenced
- 94.3% in clade 3C.2a1b and 5.7% in clade 3C.3a
- 73.0% of the 3C.2a1b viruses had the substitution T131K (same as 2020 SH vaccine strain A(South Australia/34/2019) and 44.9% had Q197R

A(H3N2) HA Clades Oct 2017-Jan 2020





ıfluenza B/Victoria Lineage

998 influenza B/Victoria specimens sequenced

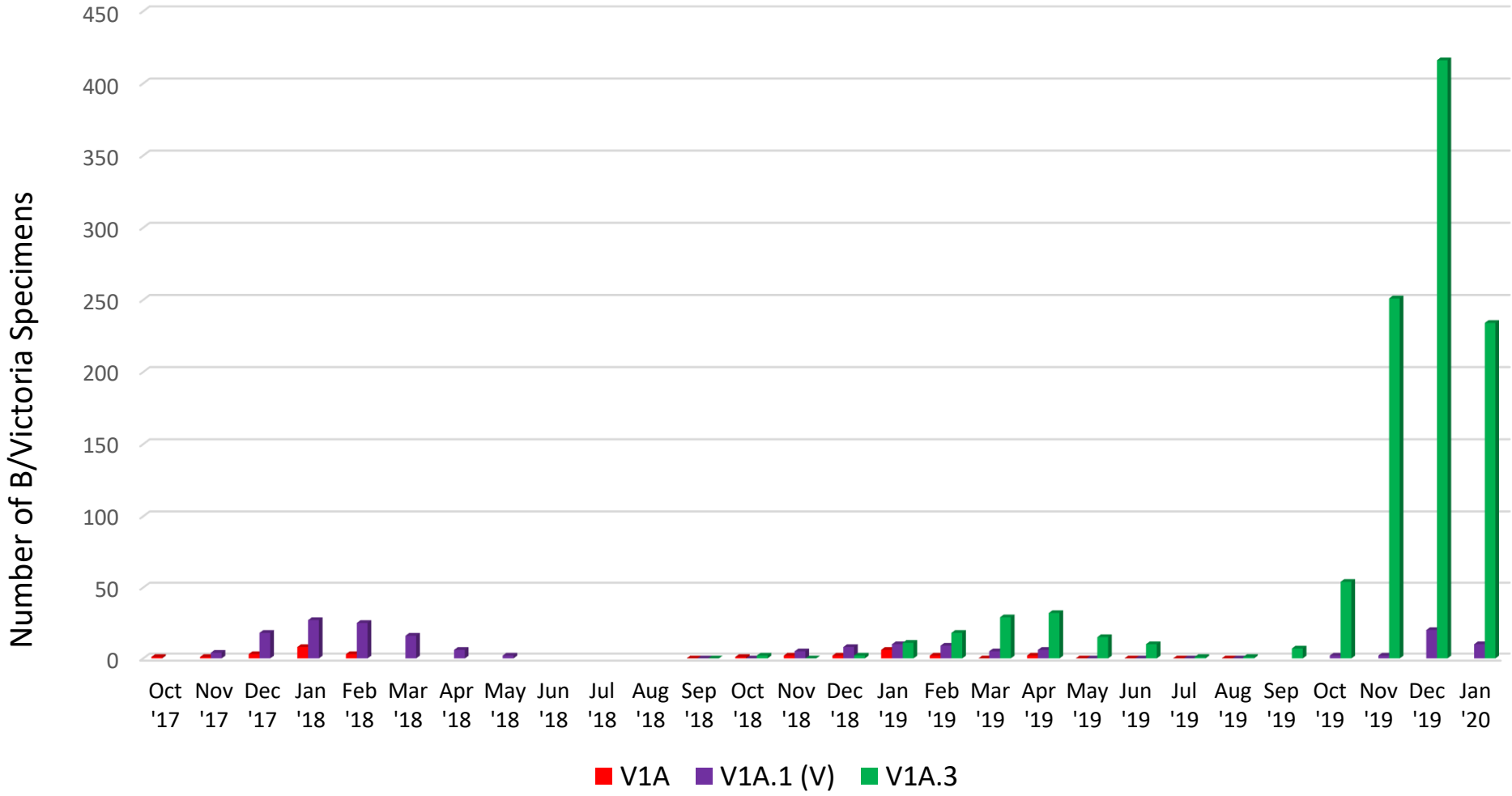
96.6% in clade V1A.3 (3-del) and 3.4% in clade V1A.1 (2-del)

19 collected from hospitalized patients, with 18 (94.7%) in clade V1A.3 and 1 in V1A.1

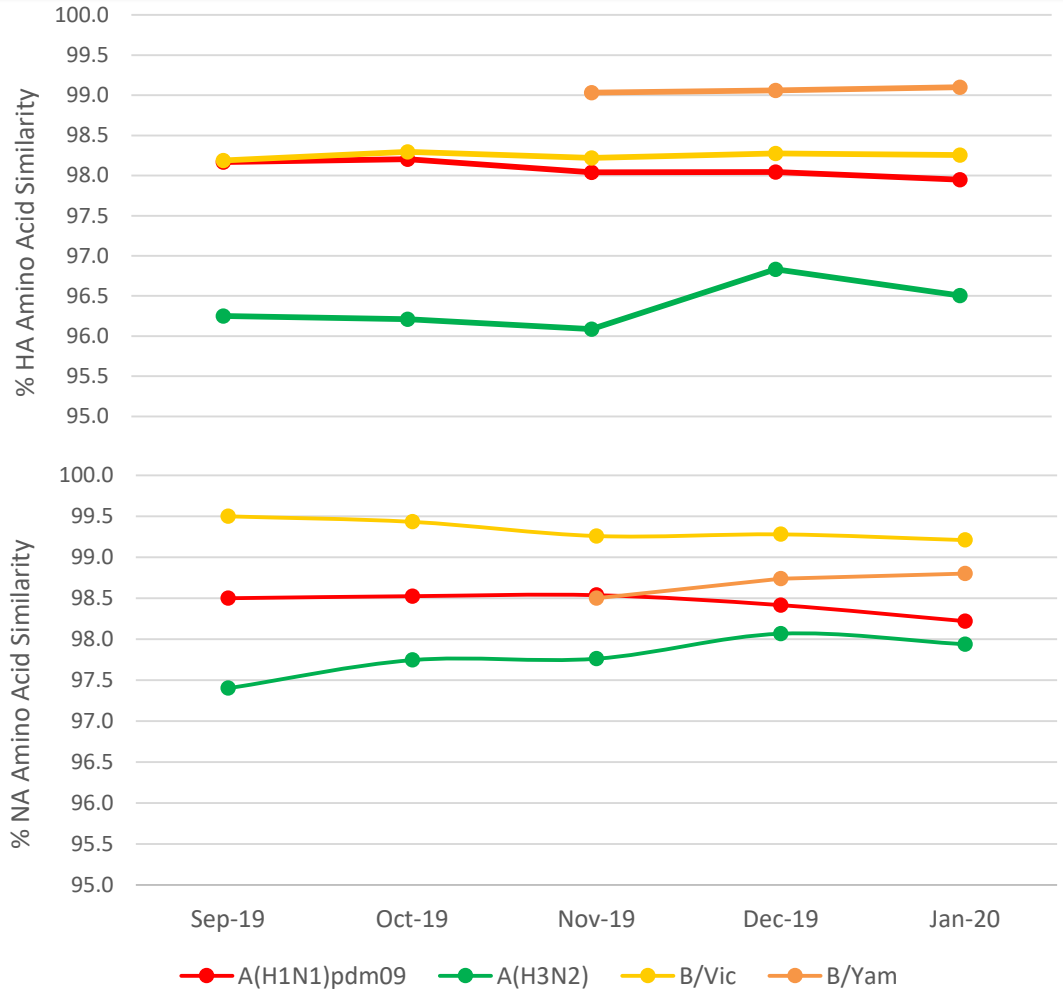
Nearly all V1A.3 viruses had G133R (98.9%) and K136E (99.9%), and 49.1% had E128K

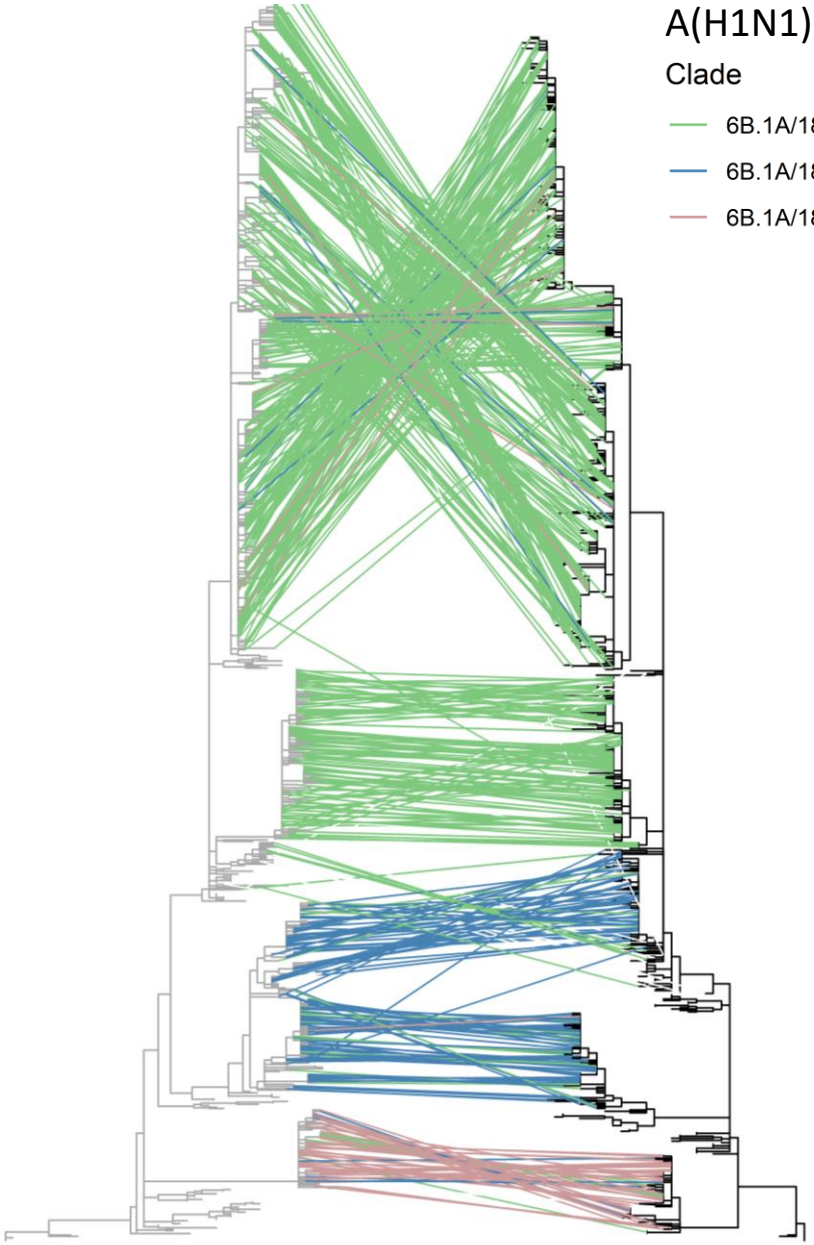
Additionally, 10 influenza B/Yamagata specimens were collected and all were clade Y3 (data not shown)

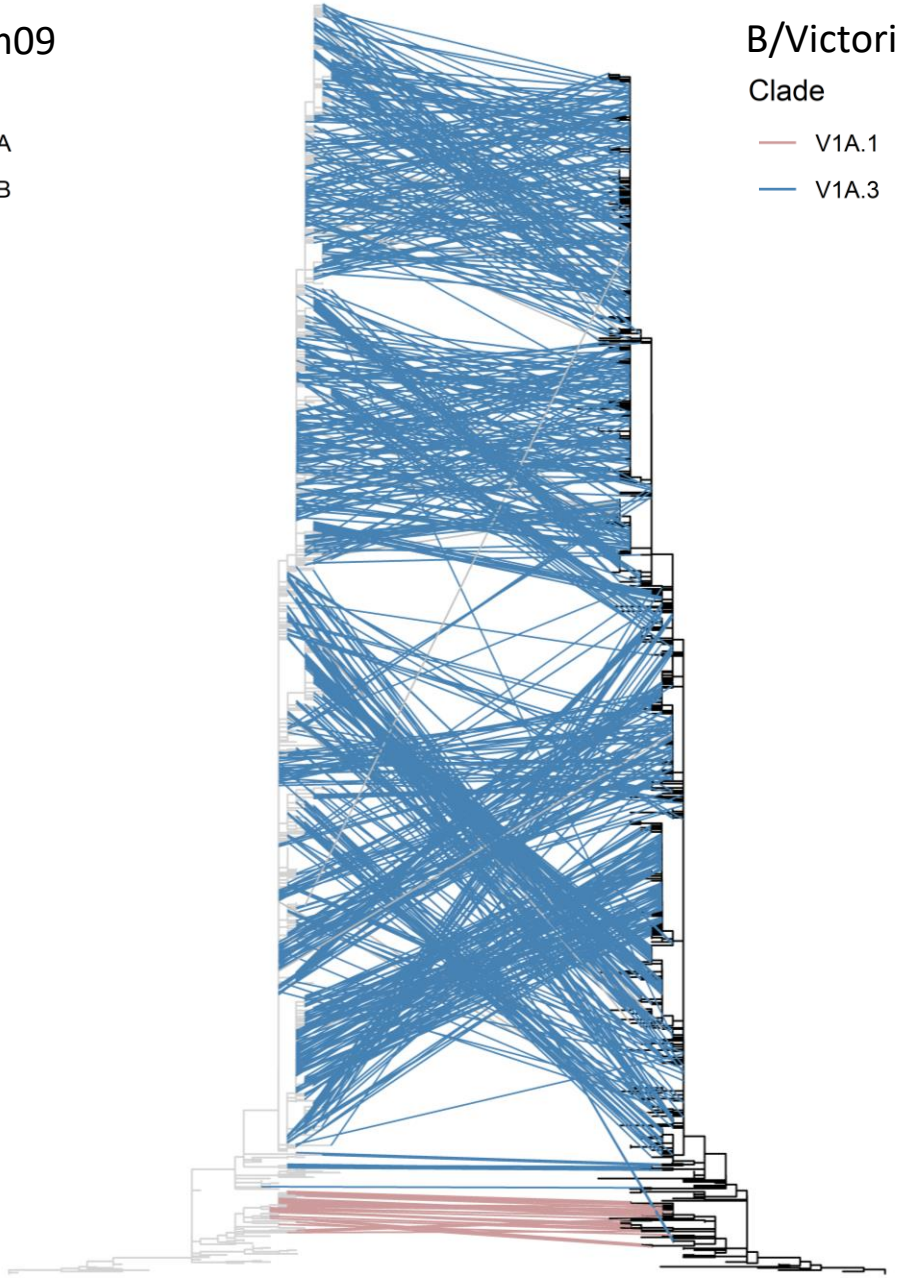
B/Victoria HA Clades
Oct 2017-Jan 2020



Surface Protein Similarity







"Medically Ready Force…Ready Medical Force"

Microneutralization Titers for Influenza Virus A (H1N1) samples

		Reference Antiserum			
		A/Brisbane/2/2018	A/Michigan/45/2015	A/California/7/2009	Passage
Reference Virus					
A(H1N1)pdm09	A/Brisbane/2/2018	**20480**	10240	5120	Egg
A(H1N1)pdm09	A/Michigan/45/2015	20480	**10240**	5120	Egg
A(H1N1)pdm09	A/California/7/2009	2560	1280	**1280**	Egg
Test Antigen					
A(H1N1)pdm09	A/Georgia/10013/2019	3620	2560	640	PMK
A(H1N1)pdm09	A/Washington/9902/2019	2560	1280	640	PMK
A(H1N1)pdm09	A/Colorado/9862/2019	2560	1280	640	PMK
A(H1N1)pdm09	A/Alabama/9860/2019	5120	2560	1280	PMK
A(H1N1)pdm09	A/Japan/10014/2019	3620	1280	320	PMK
A(H1N1)pdm09	A/Ohio/9894/2019	5120	2560	320	PMK
A(H1N1)pdm09	A/Guam/9874/2019	5120	2560	640	PMK
A(H1N1)pdm09	A/Georgia/9866/2019	3620	1280	320	PMK
A(H1N1)pdm09	A/Delaware/9864/2019	5120	2560	640	PMK
A(H1N1)pdm09	A/Virginia/9900/2019	1810	1280	320	PMK
A(H1N1)pdm09	A/Texas/9896/2019	2560	1810	640	PMK
A(H1N1)pdm09	A/Nevada/9885/2019	5120	2560	905	PMK
A(H1N1)pdm09	A/Alabama/9860/2019	2560	2560	453	SIAT1

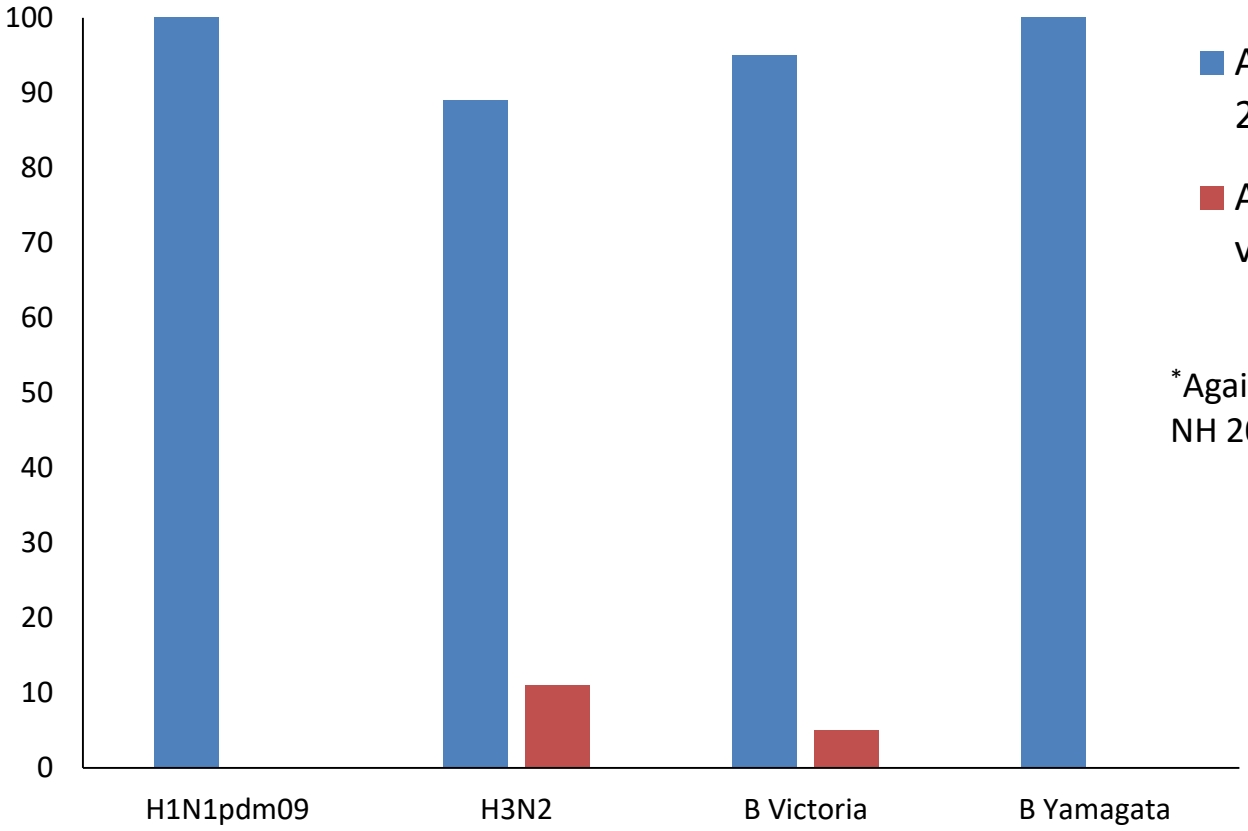
Microneutralization Titers for Influenza Virus A (H3N2) samples

		Reference Antiserum			
	Reference Virus	A/Kanasas/14/2017	A/Singapore/INFIMH-16-0019/2016	A/Hong Kong/4801/2014	Passage
	A/Kanasas/14/2017	**1280**	160	1280	Egg
	A/Singapore/INIMF-16-0019	5120	**10240**	10240	Egg
	A/Hong Kong/4801/2014	5120	7241	**10240**	Egg
	Test antigens				
A(H3N2)	A/Nevada/10019/2019	320	160	<160	PMK
A(H3N2)	A/Japan/9879/2019	640	320	320	PMK
A(H3N2)	A/Virginia/9898/2019	452	320	160	PMK
A(H3N2)	A/England/9865/2019	1810	905	905	PMK
A(H3N2)	A/Maryland/9883/2019	226	160	<160	PMK
A(H3N2)	A/Virginia/9899/2019	640	320	640	PMK
A(H3N2)	A/Ohio/9893/2019	*160*	<160	<160	PMK
A(H3N2)	A/Colorado/10011/2019	320	160	160	PMK
A(H3N2)	A/Washington/9903/2019	320	320	160	SIAT1

Microneutralization Titers for Influenza Virus B samples

		Reference Antiserum		
		B/Colorado/06/2017	B/Phukett/3073/2013	Passage
Reference Virus				
B/Vic	B/Colorado/06/2017	**2560**	40	Egg
B/Yam	B/Phukett/3073/2013	80	**1280**	Egg
Test Antigens				
B/Vic	B/Georgia/9912/2019	3620	<40	PMK
B/Vic	B/Kentucky/9915/2019	3620	<40	PMK
B/Vic	B/Kentucky/9914/2019	2560	<40	PMK
B/Vic	B/Kentucky/9917/2019	1280	<40	PMK
B/Vic	B/Washington/10133/2019	3620	<40	PMK
B/Vic	B/Texas/10099/2019	3620	<40	PMK
B/Vic	B/Texas/10098/2019	2560	<40	PMK
B/Vic	B/Nevada/10096/2019	2560	<40	PMK
B/Vic	B/Italy/9913/2019	3620	<40	PMK
B/Vic	B/Virginia/10132/2019	1280	<40	PMK
B/Vic	B/Texas/10100/2019	640	<40	PMK
B/Vic	B/South Carolina/10097/2019	1810	<40	PMK
B/Vic	B/Kentucky/10040/2019	905	<40	PMK
B/Vic	B/Colorado/10036/2019	2560	<40	PMK
B/Vic	B/Arizona/10034/2019	1810	<40	PMK
B/Yam	B/Nevada/9922/2019	<40	2560	PMK
B/Vic	B/Washington/10133/2019	640	<40	SIAT1
B/Vic	B/Colorado/10036/2019	320	<40	SIAT1
B/Vic	B/Florida/10037/2019	453	<40	SIAT1
B/Vic	B/Washington/10009/2019	905	<40	SIAT1
B/Vic	B/Washington/10010/2019	640	<40	SIAT1

Antigenic Characterization Summary



*Against reference viruses representing NH 2019-20 vaccine component:

A(H1N1)pdm09 - A/Brisbane/02/2018
A(H3N2) –A/Kansas/14/2017
B/Yam - B/Phuket/3073/2013
B/Vic – B/Colorado/06/2017

Midseason
Vaccine Effectiveness (VE)
Estimates

VE Preview

- Mid-year estimates provided by:
  - AFHSB AF Satellite - US Air Force School of Aerospace Medicine (USAFSAM)
  - Naval Health Research Center (NHRC)
  - AFHSB Epidemiology and Analysis Section
- Case test-negative control studies used to estimate VE
  - All studies used case test-negative control method
  - Each influenza infection from USAFSAM and NHRC was confirmed by RT-PCR or viral culture; AFHSB also used positive rapid tests (but excluded rapid test negatives)
  - Analyses performed for influenza types and subtypes

AFHSB Air Force Satellite / USAFSAM Analyses

DoD Beneficiaries & U.S.-Mexico Border Civilians

- Adjusted Estimates of Vaccine Effectiveness
  - Population: DoD healthcare beneficiaries (excluding Service Members) and civilian populations at clinics near the U.S.–Mexico border (Border Infectious Disease Surveillance; BIDS)
  - Time period: November 3, 2019 – February 15, 2020 (Weeks 45-07)

- Analysis by influenza type/subtype
  - Overall
  - B
  - A (any influenza A specimen)
  - A(H1N1)pdm09
  - A(H3N2)
- Analysis by population
  - Overall
  - Children
  - Adults

- Insufficient data for a 65+ age group & adult A(H3N2) analysis
- Adjusted for age group, time of specimen collection, location, and gender

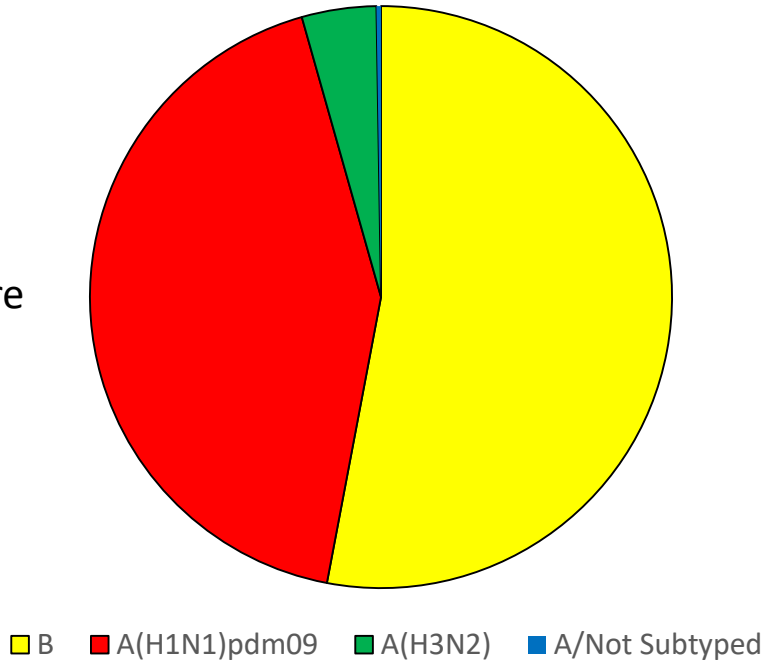
USAFSAM

DoD Beneficiaries & U.S.-Mexico Border Civilians

- **Laboratories Contributing Specimens for VE Analysis** (**n=3,745**)
  - US Air Force School of Aerospace Medicine (USAFSAM) **n = 3,375**
  - Landstuhl Regional Medical Center (LRMC) **n = 234**
  - Naval Health Research Center (NHRC) **n= 136**

- **Adjusted Estimates of Vaccine Effectiveness**
  - Cases: **n =1,595**; confirmed by RT-PCR or viral culture
  - Controls: **n=2,150**; test-negative
  - Vaccination rates: cases **43%**, controls **57%**

  - Of total cases:
    - **23%** were influenza B
    - **18%** were influenza A(H1N1)pdm09
    - **2%** were influenza A (H3N2)
    - **0.1%** were influenza A/Not Subtyped



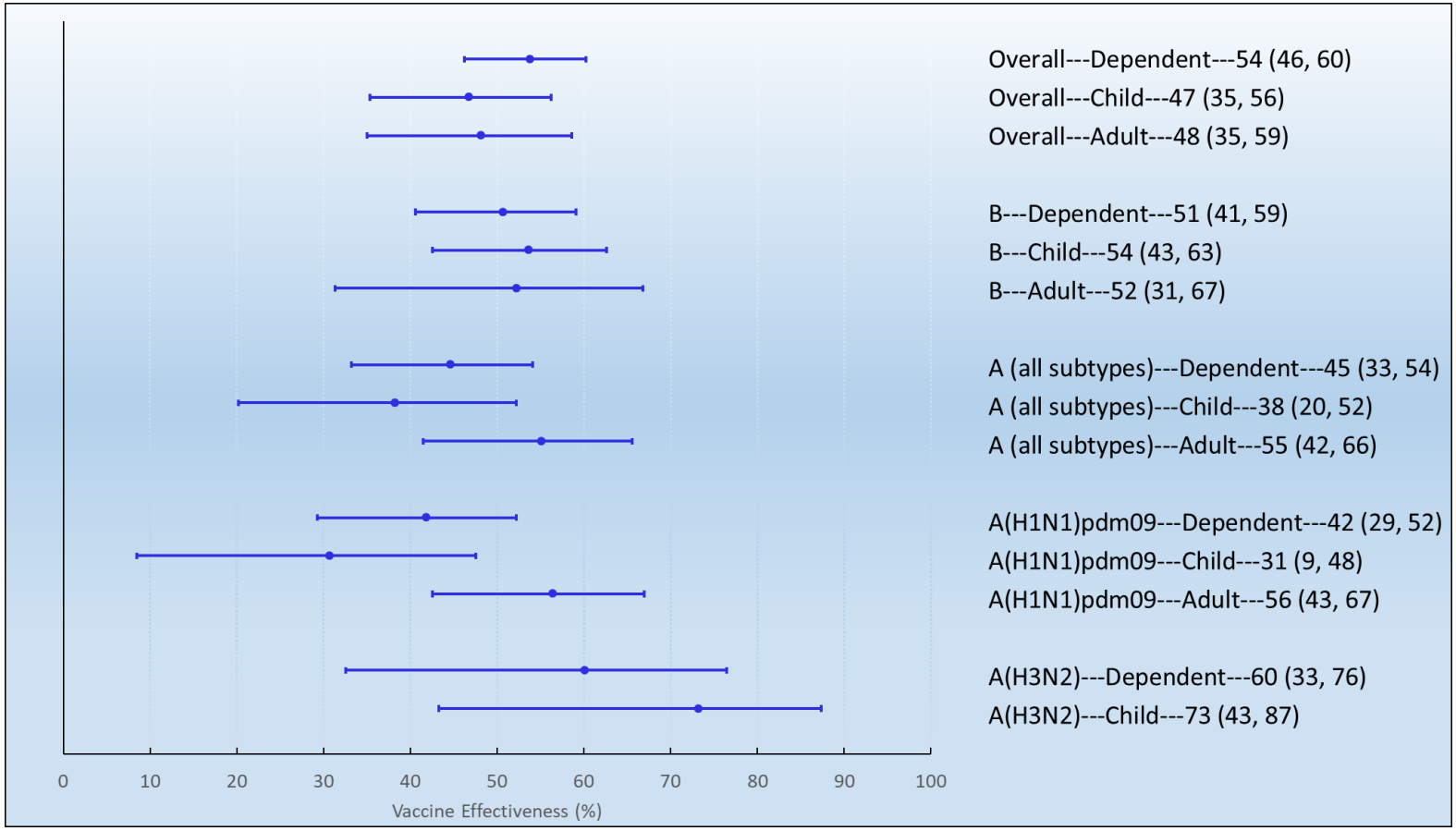
USAFSAM

Characteristics of Cases and Controls (n=3,745)

Characteristic		Cases (n=1,595) No.(%)	Controls (n=2,150) No.(%)	p-Value
Gender				
	Male	715 (44.83)	828 (38.51)	<0.0001
	Female	880 (55.17)	1,322 (61.49)	
Age				
	2-8	624 (39.12)	747 (34.74)	<0.0001
	9-17	423 (26.52)	378 (17.58)	
	18-49	334 (20.94)	584 (27.16)	
	50-64	168 (10.53)	274 (12.74)	
	65+	46 (2.88)	167 (7.77)	
Month of illness				
	November	139 (8.71)	447 (20.79)	<0.0001
	December	375 (23.51)	643 (29.91)	
	January	732 (45.89)	732 (34.05	
	February	349 (21.88)	328 (15.26)	
Geographic Region				
	Eastern CONUS	595 (37.30)	750 (34.88)	<0.0001
	Western CONUS	769 (48.21)	918 (42.70)	
	OCONUS	231 (14.48)	482 (22.42)	
Surveillance Hub				
	LRMC	56 (3.51)	178 (8.28)	<0.0001
	NHRC	52 (3.26)	84 (3.91)	
	USAFSAM	1,487 (93.23)	1,888 (87.81)	
Vaccination Status				
	Vaccinated	690 (43.26)	1,205 (56.05)	<0.0001
	Unvaccinated	905 (56.74)	945 (43.95)	
Flu				
	B	845 (52.98)	0 (0)	<0.0001
	A(H1N1)pdm09	680 (42.63)	0 (0)	
	A(H3N2)	66 (4.14)	0 (0)	
	A/Not Subtyped	4 (0.25)	0 (0)	
	Not Flu	0 (0)	2150 (100)	

CONUS=Continental United States; OCONUS=Outside Continental United States; LRMC=Landstuhl Regional Medical Center; NHRC=Naval Health Research Center; USAFSAM=United States Air Force School of Aerospace Medicine

USAFSAM
Summary of DoD Dependents and U.S.-Mexico Border VE Results



USAFSAM
Adjusted VE Estimates 2019-2020

Type	Population	Vaccine Status	Cases (%)	Controls (%)	Crude VE (95% CI)	Adjusted VE* (95% CI)
Overall	All Dependents	Vaccinated	690 (18)	1205 (32)	40 (32, 48)	54 (46, 60)
		Unvaccinated	905 (24)	945 (25)		
	Children (2-17 yrs)	Vaccinated	459 (21)	632 (29)	39 (28, 49)	47 (35, 56)
		Unvaccinated	588 (27)	493 (23)		
	Adults (≥18)	Vaccinated	228 (15)	564 (36)	42 (29, 53)	48 (35, 59)
		Unvaccinated	317 (20)	452 (29)		
B	All Dependents	Vaccinated	323 (11)	1205 (40)	51 (43, 59)	51 (41, 59)
		Unvaccinated	522 (17)	945 (32)		
	Children (2-17 yrs)	Vaccinated	255 (14)	632 (35)	51 (40, 59)	54 (43, 63)
		Unvaccinated	402 (23)	493 (28)		
	Adults (≥18)	Vaccinated	66 (5)	564 (47)	56 (39, 68)	52 (31, 67)
		Unvaccinated	120 (10)	452 (38)		
A	All Dependents	Vaccinated	367 (13)	1205 (42)	25 (11, 36)	45 (33, 54)
		Unvaccinated	383 (13)	945 (33)		
	Children (2-17 yrs)	Vaccinated	204 (13)	632 (42)	14 (-8, 32)	38 (20, 52)
		Unvaccinated	186 (12)	493 (33)		
	Adults (≥18)	Vaccinated	162 (12)	564 (41)	34 (16, 48)	55 (42, 66)
		Unvaccinated	197 (14)	452 (33)		
A(H1N1)pdm09	All Dependents	Vaccinated	336 (12)	1205 (43)	23 (9, 36)	42 (29, 52)
		Unvaccinated	344 (12)	945 (33)		
	Children (2-17 yrs)	Vaccinated	188 (13)	632 (43)	11 (-14, 30)	31 (9, 48)
		Unvaccinated	164 (11)	493 (33)		
	Adults (≥18)	Vaccinated	147 (11)	564 (42)	35 (16, 49)	56 (43, 67)
		Unvaccinated	180 (13)	452 (34)		
A(H3N2)	All Dependents	Vaccinated	29 (1)	1205 (54)	39 (-1, 62)	60 (33, 76)
		Unvaccinated	37 (2)	945 (43)		
	Children (2-17 yrs)	Vaccinated	15 (1)	632 (54)	44 (-9, 72)	73 (43, 87)
		Unvaccinated	21 (2)	493 (42)		

CI=confidence interval; VE=(1-odds ratio) x 100.
*VE Adjusted for age group, time of specimen collection, location, and gender

Summary of DoD Beneficiaries & U.S.-Mexico Border Civilians

- Overall VE was moderately protective and significant
- A(H1N1)pdm09: VE was highest among adults at 56%
- A(H3N2): VE was highest among children at 73%
- B: VE was highest among children at 54%

Service Member Vaccine Effectiveness Estimates

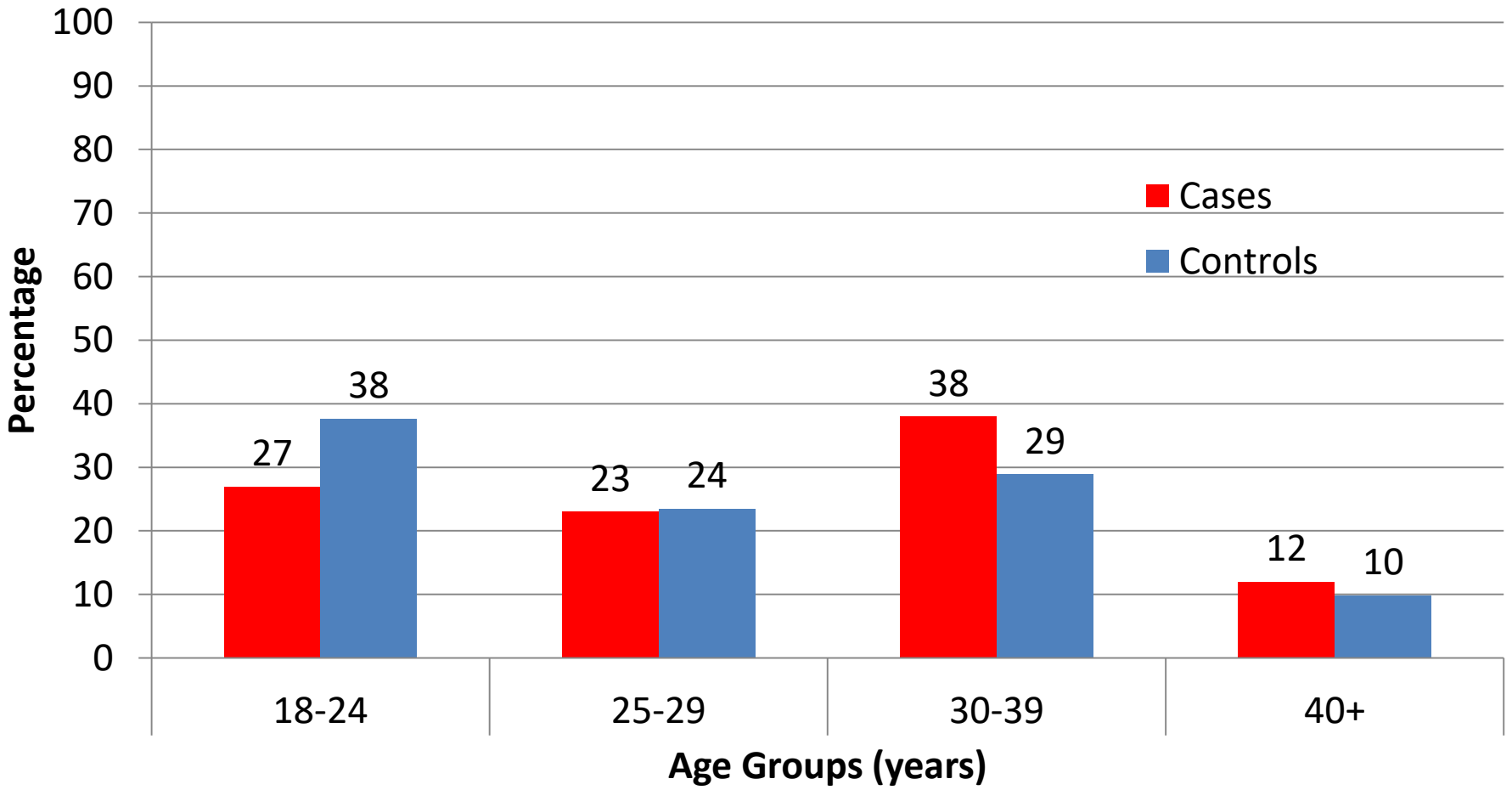
Service Members: Study Design

- Case / Test-negative control design
- Population: Active component Service Members
  - Army, Navy, Air Force, Marines
  - CONUS and OCONUS
- Time Period:
  - Influenza B and A(H1N1): Restricted to peak influenza months (Nov 1 – Feb 15)
  - Influenza A (any subtype) and A(H3N2): Restricted to peak Flu A months (Jan 1- Feb 15)
- Lab-confirmed flu cases: positive by rapid, RT-PCR, or culture assays
- Test-negative Controls: negative by RT-PCR or culture assays (subjects with negative rapid excluded)
- Models adjusted for sex, age category, and month of diagnosis
- Type and sub-type VE calculated, if analysis supported by data

Service Members: Vaccination Information & Case Subtypes

- Vaccination
  - IIV was the only vaccine type among the study subjects
  - 92% of subjects had prior flu vaccine in previous 5 years
- Cases
  - Influenza A (any subtype) = 1,911
  - Influenza A(H3N2) = 37
  - Influenza A(H1N1) = 347
  - Influenza B = 2,033

Service Members:
Cases and Controls by Age Group



Service Members: Interim VE Estimates 2019-2020

Influenza Type/Subtype	Time Period	Vaccine Type	Cases N (%)	Controls N (%)	Crude VE (95% CI)	Adjusted VE (95% CI)*
Influenza A (any subtype)	JAN-FEB	Vaccinated	1732 (91)	2038 (92)	13 (-8, 30)	12 (-10, 30)
		Unvaccinated	179 (9)	184 (8)		
A(H1N1)	JAN-FEB	Vaccinated	308 (89)	2038 (92)	29 (-3, 51)	28 (-5, 51)
		Unvaccinated	39 (11)	184 (8)		
A(H3N2)	NOV-FEB	Vaccinated	22 (59)	3699 (74)	49 (2, 74)	58 (9, 80)
		Unvaccinated	15 (41)	1283 (26)		
Influenza B	NOV-FEB	Vaccinated	1515 (75)	3699 (74)	-1 (-14, 10)	31 (20, 40)
		Unvaccinated	518 (25)	1283 (26)		

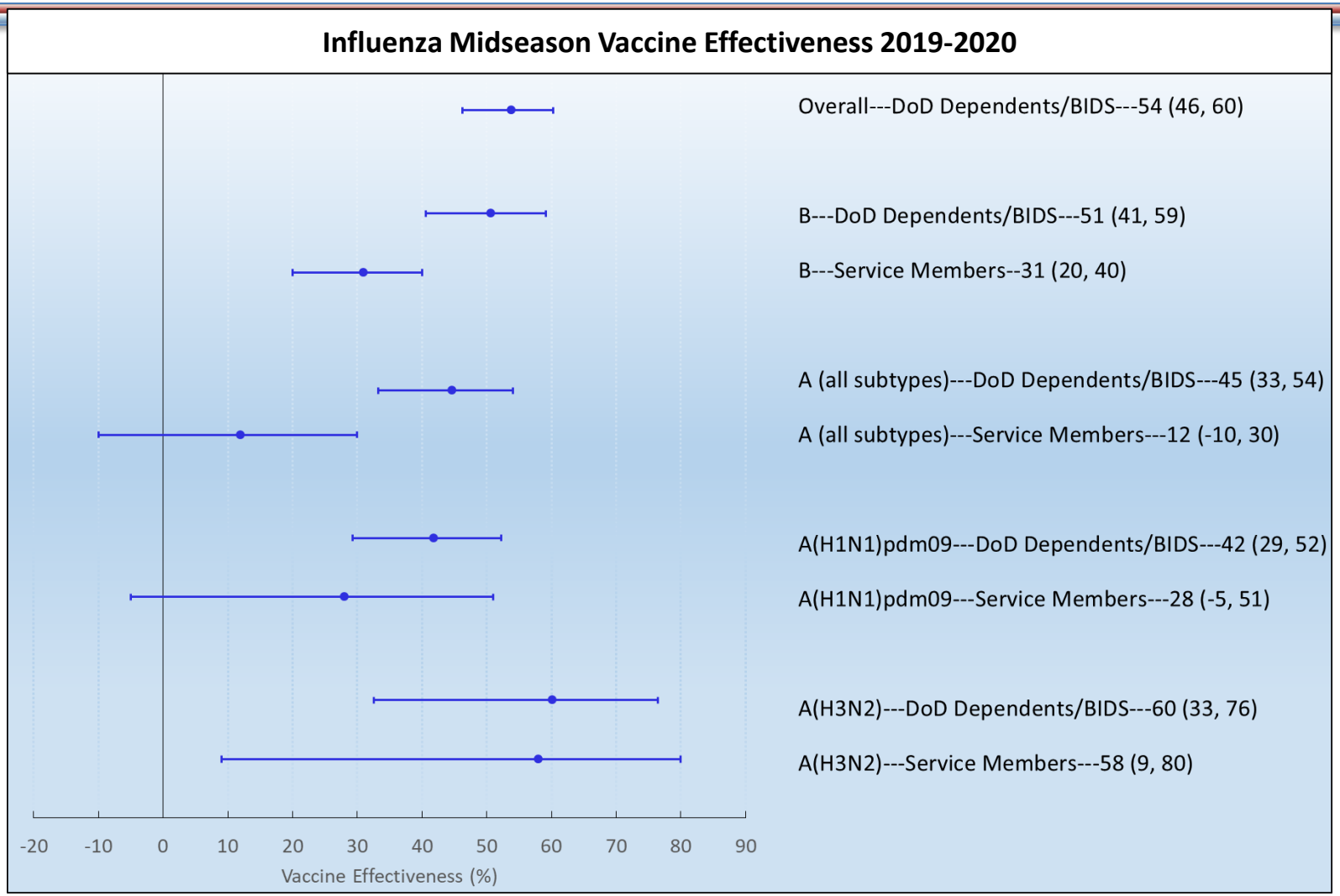
*Adjusted for sex, age, and month of diagnosis

Service Members: VE Summary

Among Service Members, the 2019-2020 influenza vaccine provided:

- Low to moderate protection against influenza B (31%)
- Moderate protection against A(H3N2) (58%)
- Non-statistically significant low protection against influenza overall (12%) and A(H1N1) (28%)

Summary of DoD VE Results



Summary of DoD VE Results

- Statistically significant VE estimates indicated an overall midseason VE of 54%
  - VE for influenza A 45%, indicating moderate protection
  - VE for influenza B ranged from 31-51%, indicating low to moderate protection
  - VE for A(H1) and ranged 42%, indicating moderate protection
  - Protection was best for A(H3) and ranged from 58-60%, indicating moderate protection

Limitations

- Generalizability
  - Subjects were medically attended; did not assess vaccine impact on less severe cases
  - Active Duty military population is highly immunized; this could have a negative impact on VE (potential method issues and biological effects such as attenuated immune response with repeated exposures)
  - Populations are younger; did not assess vaccine impact in older, high-risk populations

Vaccine Strain Recommendations

- Based on the genetic and VE data, recommendations for the 2020-2021 influenza vaccine
  - For the 2019-2020 influenza vaccine A(H1N1) component: Consider alternate to A/Brisbane/02/2018-like virus, potentially a clade 6B.1A, subgroup 5A representative virus
  - For the 2019-2020 influenza vaccine A(H3N2) component: Consider transition to H3N2 3C.2a1b clade virus
  - For the 2019-2020 influenza vaccine B/Victoria component: Consider replacement of B/Colorado/06/2017-like virus with representative 3-deletion virus
  - The above three influenza strains are recommended for the trivalent vaccine, and for the quadrivalent vaccine to include these three in addition to the B/Yamagata component: maintain the B/Phuket/3073/2013-like virus

Thank you

Acknowledgements

65th MEDICAL BRIGADE
LTC Christopher Hatcher
SGT Arthur Cross
SGT Alicia Manthe
Ms. Inkyong Chang
Ms. Hee Eun Kim

AFRIMS
COL Mark Fukuda
COL John Maza
COL Norm Waters
LTC Stefan Fernandez
MAJ Katie Poole-Smith
Dr. Chonticha Klungthong
Ms. Thipwong Tipawan
Ms. Tippa Wongstitwilairoong

LRMC/PHC-Europe
COL Rodney Coldren
COL Alexander Kayatani
CPT Cole Anderson
SSgt Brianne Holdbrook
Dr. Michael Koenig
Mr. Fritz Castillo

NAMRU-2
CAPT Patrick Blair
LCDR Robert Hontz
LCDR Jose Garcia
CDR Frederick Stell
Mr. John Brooks
Mr. Vireak Heang
Mr. Agus Rachmat
Ms. Chenda Yi

NAMRU-3
LCDR Michael Gregory
LCDR David Wolfe
Dr. Hala Bassaly
Dr. Anne Fox
Dr. Emad Mohareb
Dr. Mayar Said
Dr. Tamer Saied
Mr. Ehab Amir

University of Ghana – Noguchi Memorial Institute for Medical Research
Dr. William Ampofo
Dr. Ivy Asante
Ms. Augustina Arjarquah
Mr. Erasmus Kotey

Jordan Royal Medical Services
LT COL William Haddidin
Capt Mohamed Maiyta

Central Public Health Lab, Jordan
Dr. Mohmaud Gazo

Ministry of Health, Jordan
Dr. Sami ElSheikh

NAMRU-6
LT Eugenio Abente
Dr. Sonia Ampuero
Dr. Max Grogl
Dr. Yeny Tinoco
Dr. Marita Silva
Dr. Giselle Soto
Ms. Angélica Espinoza
Ms. Carolina Guevara

NHRC
LT Nathaniel Christy
Dr. Chris Myers
Ms. Carrie Falgout
Mr. Christian Hansen
Ms. Erin Hansen

CDC-BIDS
Dr. Kathleen Moser
Ms. Eva Fabian
Ms. Alba Phippard

CA and County Depts of Health
Dr. Olivia Arizmendi
Dr. Maria Fierro
Dr. Paula Kriner
Dr. Yadira Medrano
Dr. Esmeralda Iniguez-Stevens

Acknowledgements

USAMRD-K
Maj Gen (Dr.) Denis Janga
LTC John Distelhorst
Dr. Wallace Bulimo
Dr. Denis Byarugaba
Dr. Bernard Erima
Dr. Hannah Kibuuka
Dr. Chesnodi Kulanga
Dr. Gerald Misinzo
Dr. Fred Wabwire-Mangen
Ms. Janet Majanja
Mr. Derrick Mimbe

Tanzania National Influenza Center
Mr. Lawrence Mapunda
Ms. Vumilia Mwalongo

AFHSB
COL Douglas Badzik
COL James Stein
CAPT Guillermo Pimentel
CDR Mark Scheckelhoff
Dr. Angelia Cost
Dr. Jose "Toti" Sanchez
Ms. Zheng Hu
Ms. Ashley Treharne
Ms. Alexis Oetting
Dr. Sara Bazaco
Ms. Lindsay Morton

AFHSB AF Satellite
Ms. Kathy Bush
Mr. Joshua Cockerham
Mr. Robert Coleman
Mr. Paul Sjoberg
Ms. Laurie DeMarcus
Ms. Kristine Fumia
Ms. Geeta Kersellius
Ms. Sarah Purves
Ms. Lisa Shoubaki
Ms. Caroline Smith
Mr. Jeffrey Thervil
Mr. Gregory Wolff

USAFSAM
Lt Col Anthony Robbins
Capt Amy Bogue
SSgt Dominic Anderson
SSgt Brandon Ray
SSgt Ashley Seaton
SSgt Ashley Serrano
SrA Dalton Barrie
Dr. Anthony Fries
Dr. Elizabeth Macias
Ms. Pamela Bentley
Mr. Matthew Couch
Ms. Kathleen Davenport
Ms. Carol Garrett
Mr. William Gruner
Mr. James Hanson
Mr. Matthew Levine
Mr. Andrew Martin
Ms. Renee Mayhon
Mr. Donald Minnich
Ms. Dannielle Parlett
Ms. Marie Powell
Mr. Andrew Rhinevault
Mr. Matthew Sanders
Mr. David Sia
Ms. Aleta Yount

Questions?

CDR Mark Scheckelhoff, PhD, MPH
Focus Area Lead, AFHSB-GEIS Respiratory Infections Surveillance
Tel: 301-319-3258
E-mail: mark.r.scheckelhoff.mil@mail.mil

COL Douglas Badzik, MD, MPH
Chief, Armed Forces Health Surveillance Branch
E-mail: douglas.a.badzik.mil@mail.mil

CAPT Guillermo Pimentel, PhD
Chief, AFHSB-Global Emerging Infections Surveillance
E-mail: guillermo.pimentel2.mil@mail.mil