



**INFORMATION FOR THE VACCINES AND RELATED BIOLOGICAL
PRODUCTS ADVISORY COMMITTEE,
CEBR, FDA**

February 27-28, 2007

**WHO COLLABORATING CENTER FOR SURVEILLANCE,
EPIDEMIOLOGY AND CONTROL OF INFLUENZA**

**Influenza Division
National Center for Immunization and Respiratory Diseases
Coordinating Center for Infectious Diseases
Centers for Disease Control and Prevention
Atlanta, GA 30333**

**WHO COLLABORATING CENTER FOR SURVEILLANCE,
EPIDEMIOLOGY AND CONTROL OF INFLUENZA**

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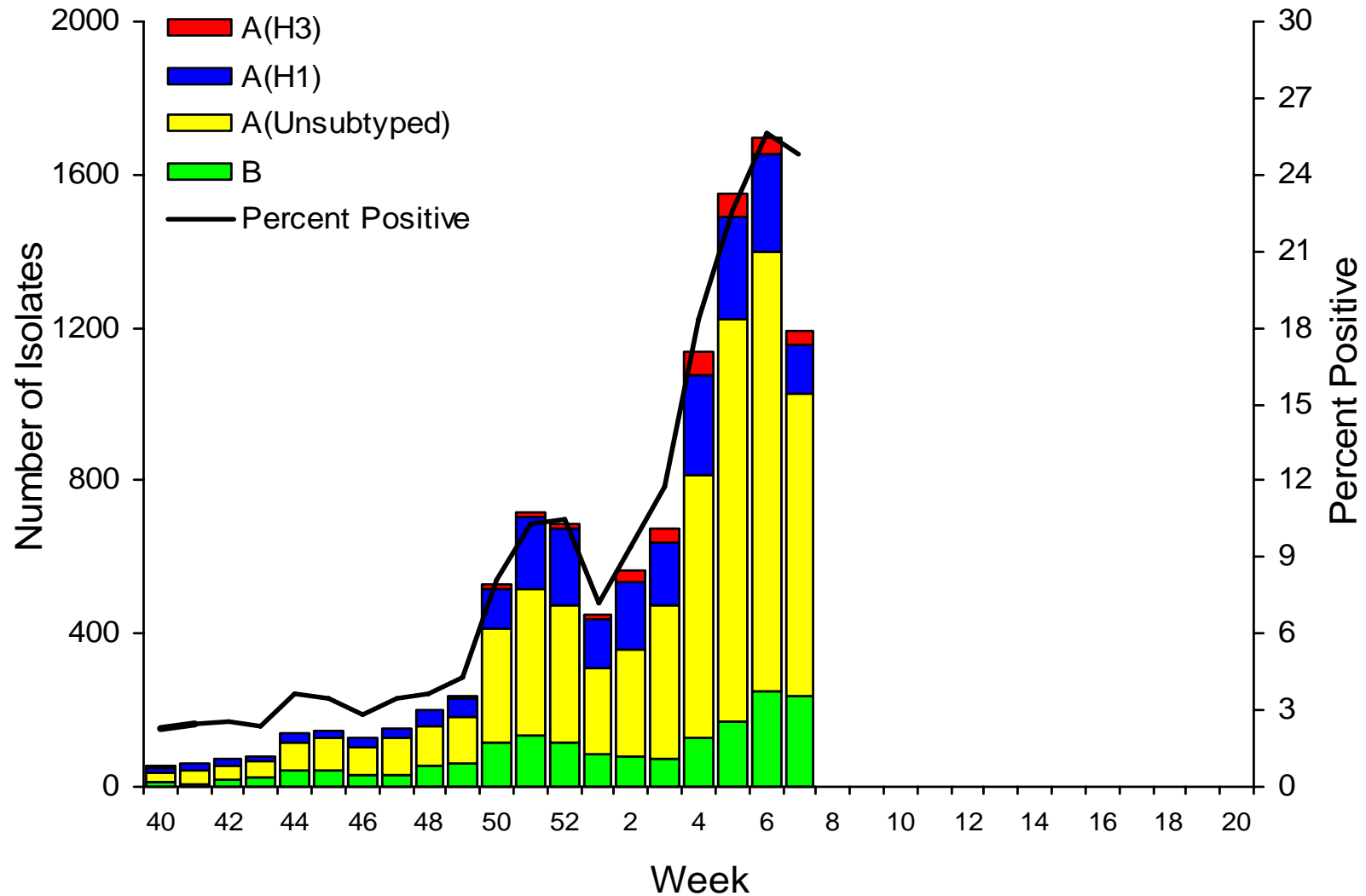
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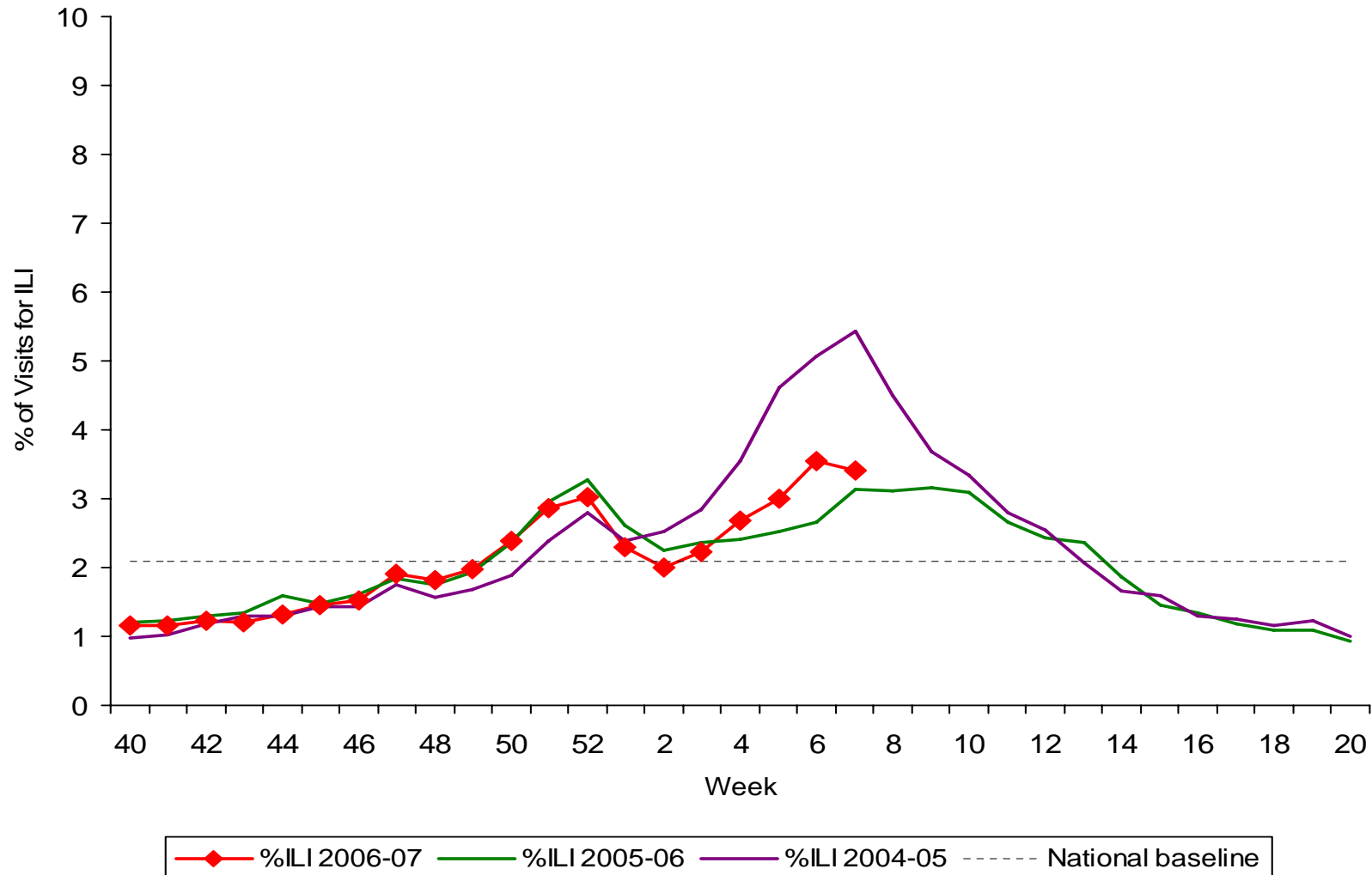
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U.S. Surveillance

U.S. WHO/NREVSS Collaborating Laboratories Summary, 2006-07

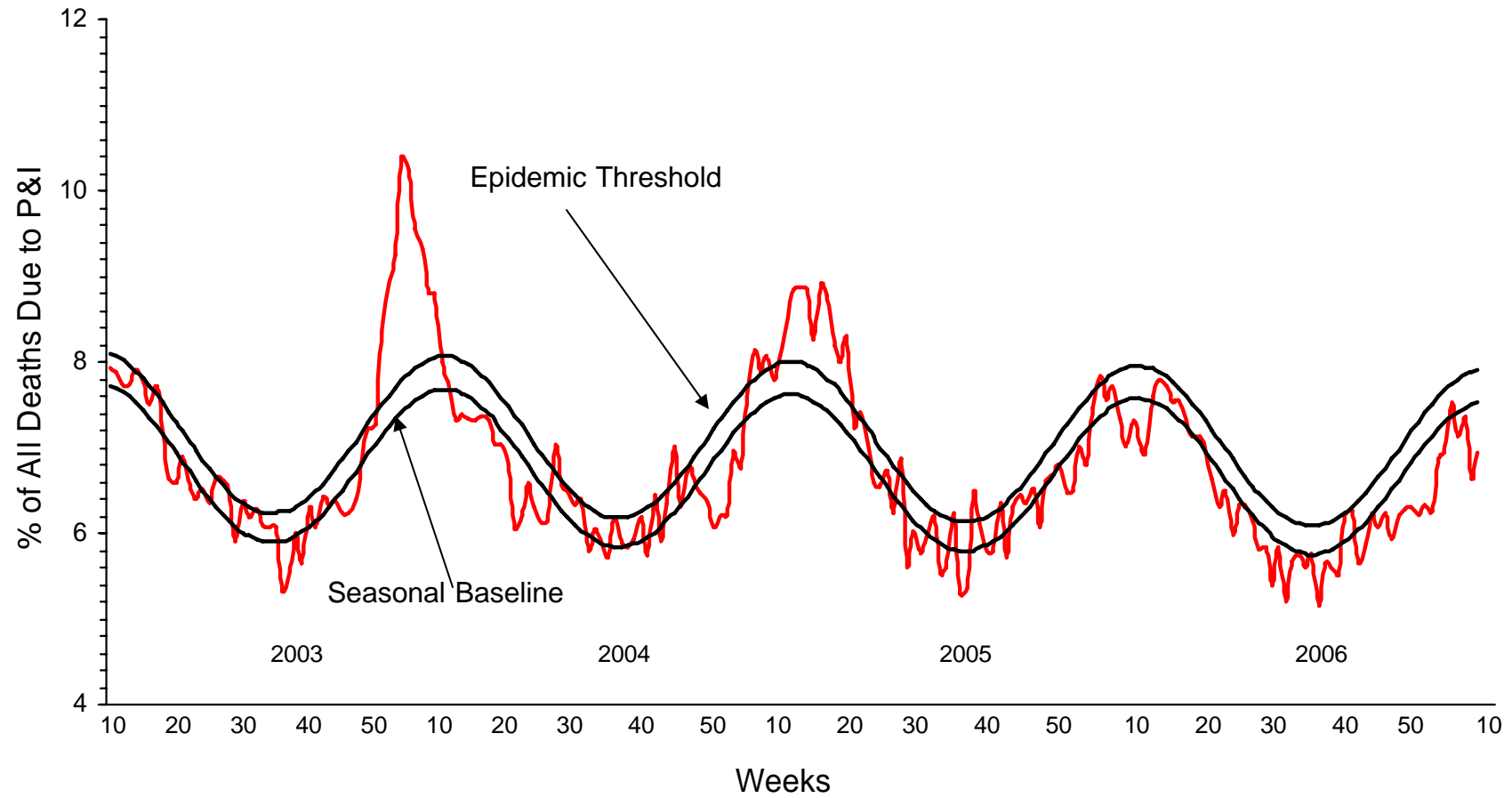


Percentage of Visits for Influenza-like Illness Reported by Sentinel Providers, National Summary 2006-07 and Previous 2 Seasons



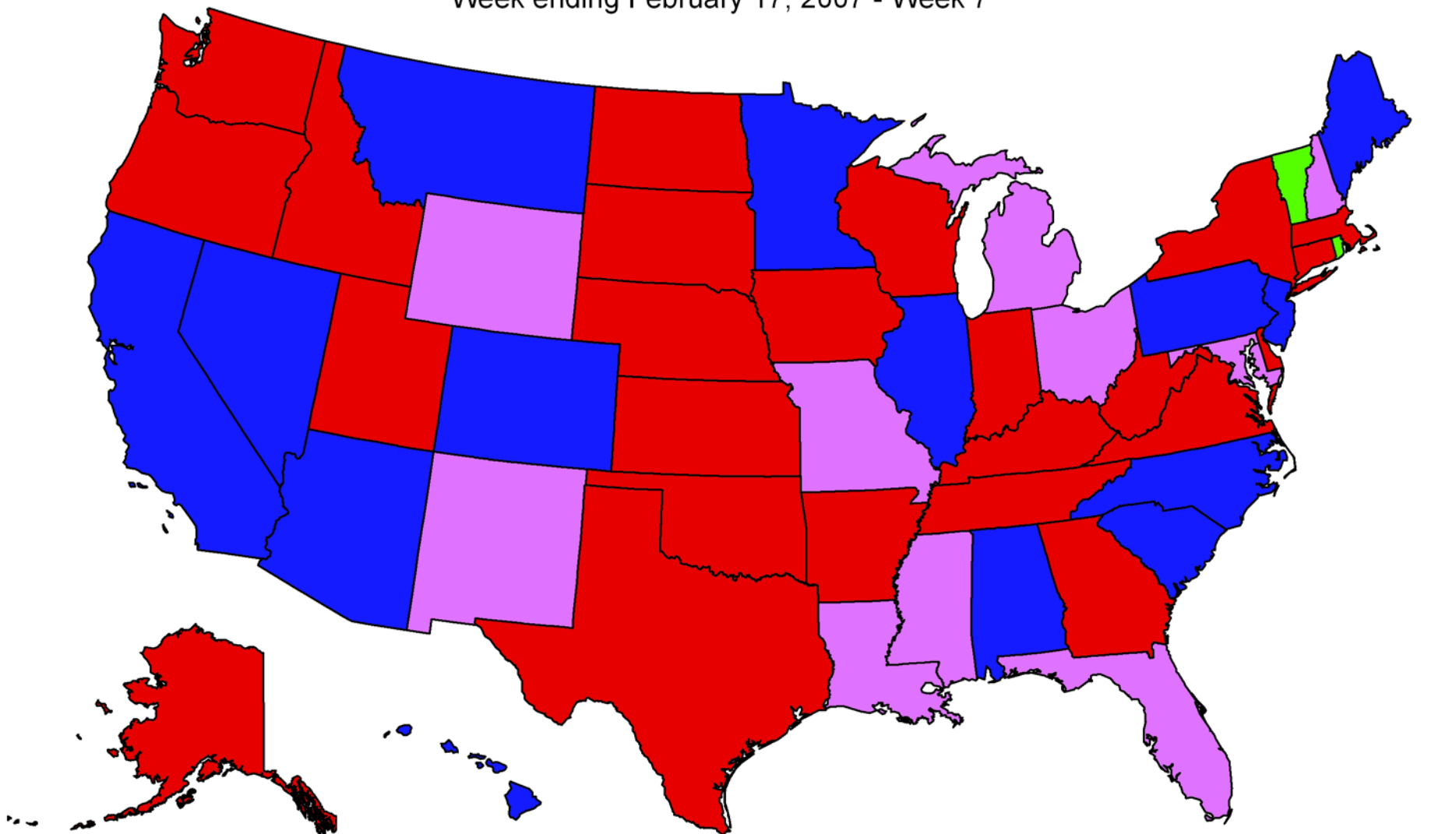
Pneumonia and Influenza Mortality for 122 U.S. Cities

Week Ending 02/17/2007



Weekly Influenza Activity Estimates Reported by State & Territorial Epidemiologists

Week ending February 17, 2007 - Week 7



No Report

No Activity

Sporadic

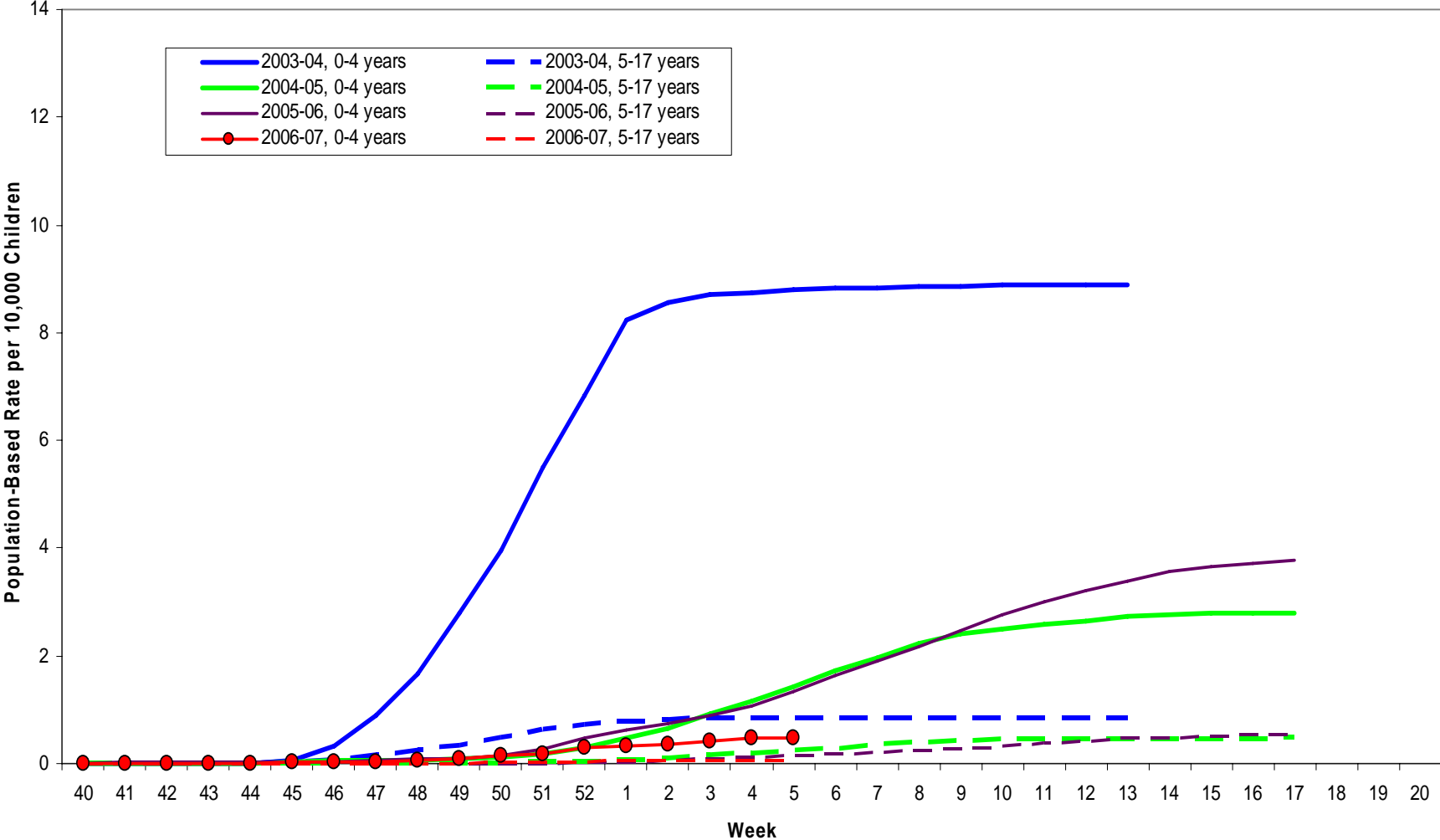
Local Activity

Regional

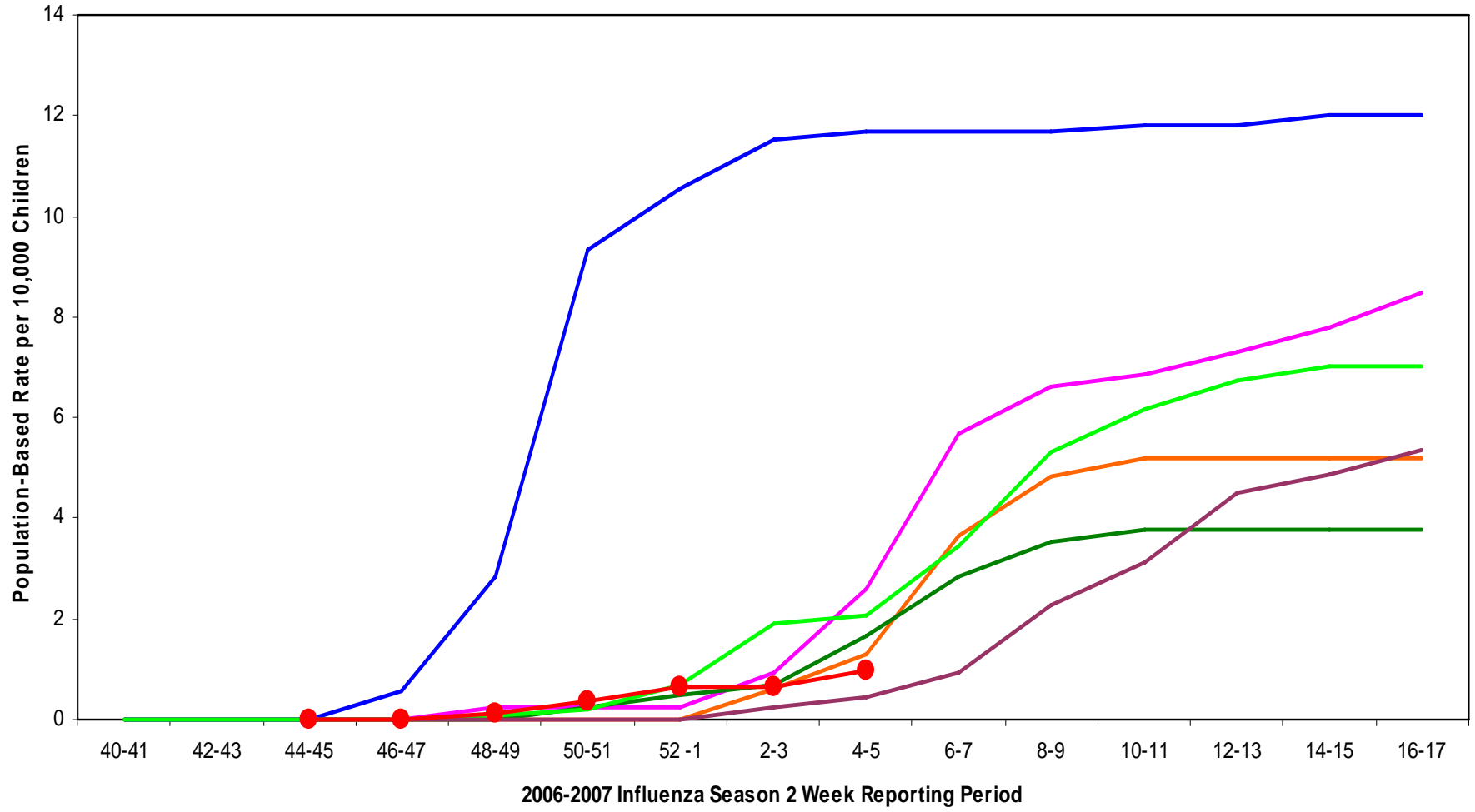
Widespread



EIP Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children Aged 0-4 and 5-17 years, 2006-07 and Previous 3 Seasons



NVSN Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children 0 - 4 Years, 2006-07 and Previous 6 Seasons



— 2000-2001
 — 2001-2002
 — 2002-2003
 — 2003-2004
 — 2004-2005
 — 2005-2006
 ● 2006-2007

Influenza A(H1N1) Viruses

HEMAGGLUTINATION INHIBITION REACTIONS OF INFLUENZA H1 VIRUSES (02/22/07)

REFERENCE ANTIGENS	REFERENCE FERRET ANTISERA							Date	Passage
	NC/20	KY/2	VA/1	ST/8	HI/15	HK/2652	SI/3	collected	
1 A/NEW CALEDONIA/20/1999*	640	640	320	640	160	160	320	06/09/99	E4/E2
2 A/KENTUCKY/02/2006	640	320	320	320	80	80	80	03/23/06	E3
3 A/VIRGINIA/01/2006 *	640	320	320	320	160	80	160	01/17/06	E3
4 A/ST PETERSBURG/08/2006 *	640	320	320	320	80	80	80	02/27/06	E1/E2
5 A/HAWAII/15/2001	40	80	80	160	320	320	320	02/17/01	M2/C3
6 A/HONG KONG/2652/2006	40	80	80	80	320	1280	320	07/17/06	E2
7 A/SOLOMON ISLANDS/03/2006 *	80	80	160	40	320	320	320	08/21/06	E2/E1
8 A/S. ISLANDS/03/2006 IVR-145	80	80	160	40	320	320	320	REASS	E9/E1
TEST ANTIGENS									
9 A/ALABAMA/23/2006	2560	320	640	160	160	320	320	12/12/06	X/C2
10 A/TEXAS/26/2006	2560	1280	1280	320	160	160	160	12/19/06	M1/C1
11 A/WISCONSIN/01/2007	1280	640	1280	320	160	160	320	02/01/07	M1/C1
12 A/TENNESSEE/02/2007	1280	640	640	320	160	160	160	01/05/07	X2/C1
13 A/NORTH DAKOTA/01/2007	1280	1280	1280	640	160	160	160	01/02/07	MX/C1
14 A/MEMPHIS/01/2007	1280	1280	1280	320	160	320	320	01/11/07	C1/C1
15 A/ILLINOIS/02/2006	1280	640	640	320	80	160	160	12/23/06	R11/C1
16 A/ALABAMA/22/2006	1280	640	1280	320	160	160	160	12/21/06	X/C1
17 A/NEW YORK/01/2007	1280	640	640	640	160	160	160	01/06/07	M1/C1
18 A/COLORADO/04/2006	1280	1280	640	320	160	160	160	11/09/06	M1/C1
19 A/MINNESOTA/04/2007	1280	640	640	320	80	160	80	01/27/07	MX/C1
20 A/MISSOURI/12/2006	640	320	320	320	160	160	160	12/19/06	E3
21 A/NEW JERSEY/04/2006	640	320	640	320	160	160	160	12/31/06	E1
22 A/ILLINOIS/01/2006	640	640	640	320	80	160	160	12/11/06	MX/C1
23 A/MASSACHUSETTS/03/2007	640	320	640	160	80	160	160	01/10/07	X1/C1
24 A/HAWAII/02/2007	640	640	640	320	80	160	80	01/10/07	M1/C1
25 A/COLORADO/02/2007	640	640	320	320	80	80	80	01/12/07	M1/C1
26 A/NEW MEXICO/02/2006	320	320	160	160	80	80	80	12/31/06	E2
27 A/TEXAS/25/2006	80	40	320	80	320	320	320	12/20/06	M1/C1
28 A/INDONESIA/2389/2006	1280	640	1280	320	160	320	160	02/22/06	C2/C1
29 A/THAILAND/677/2006	640	320	640	320	160	320	160	10/02/06	C2/C1
30 A/THAILAND/678/2006	640	160	640	80	80	320	160	09/28/06	C2/C1
31 A/THAILAND/718/2006	320	160	320	160	80	160	80	10/18/06	C2/C1
32 A/ULAANBAATAR/97/2007	320	160	160	160	80	80	80	01/04/07	C2/C2
33 A/THAILAND/717/2006	80	20	160	80	160	320	320	10/18/06	C2/C1
34 A/THAILAND/580/2006	80	80	160	160	160	1280	640	10/01/06	C3/C1
35 A/THAILAND/689/2006	80	40	160	40	160	320	320	09/29/06	C2/C1
36 A/SINGAPORE/62/2006	80	160	160	160	320	640	640	07/12/06	C1/C1
37 A/THAILAND/674/2006	40	40	160	80	160	640	640	09/25/06	C2/C1
38 A/SINGAPORE/66/2006	40	80	160	80	320	640	640	07/10/06	C2/C1
39 A/SINGAPORE/70/2006	40	80	160	160	320	640	320	07/25/06	C2/C1
40 A/SINGAPORE/73/2006	40	160	160	160	640	640	640	08/23/06	C1/C1
41 A/ULAANBAATAR/116/2007	20	40	40	20	320	640	320	01/03/07	E2/E1

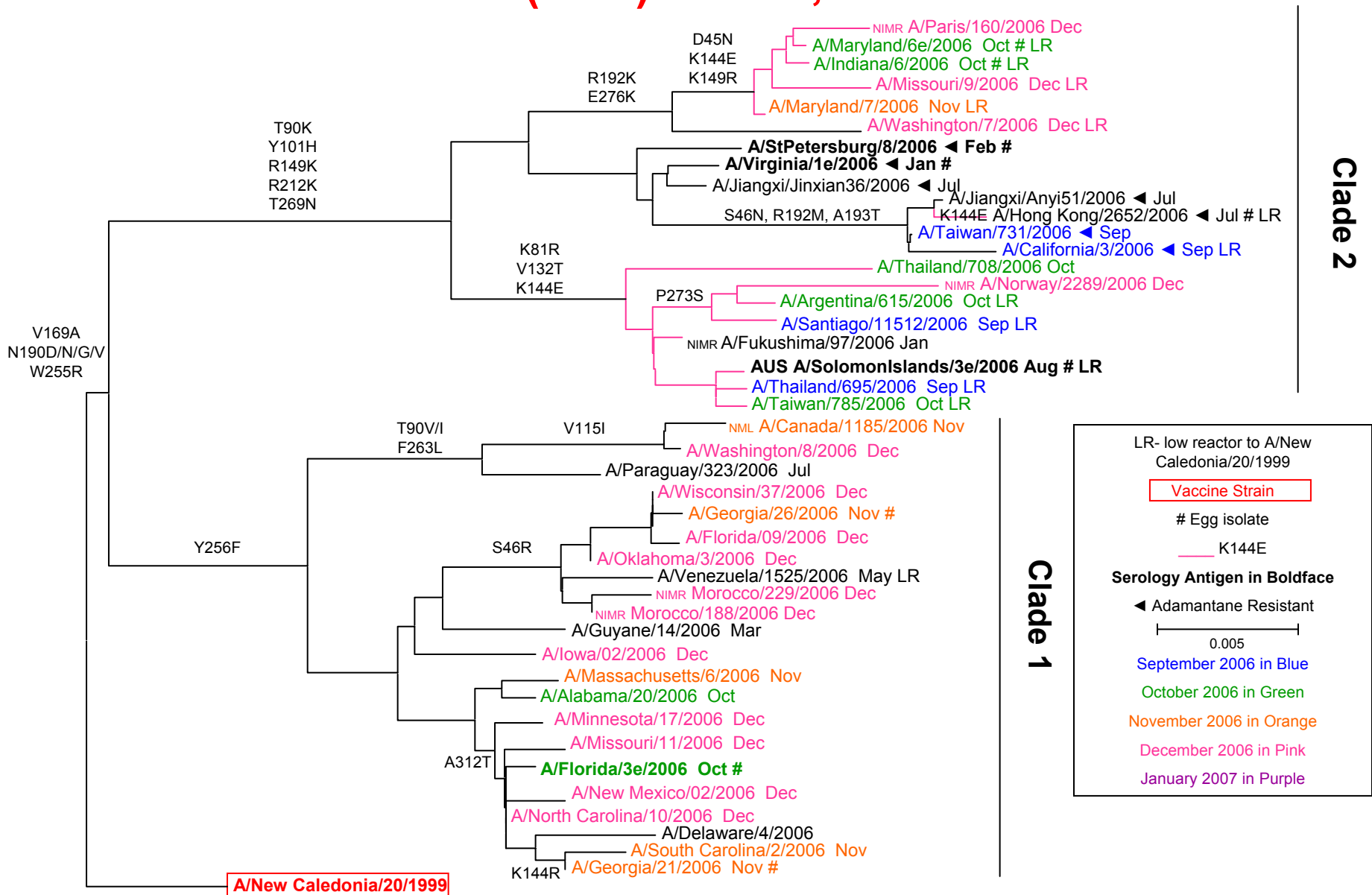
*Serology antigens

Influenza A (H1N1) Isolates Characterized by CDC

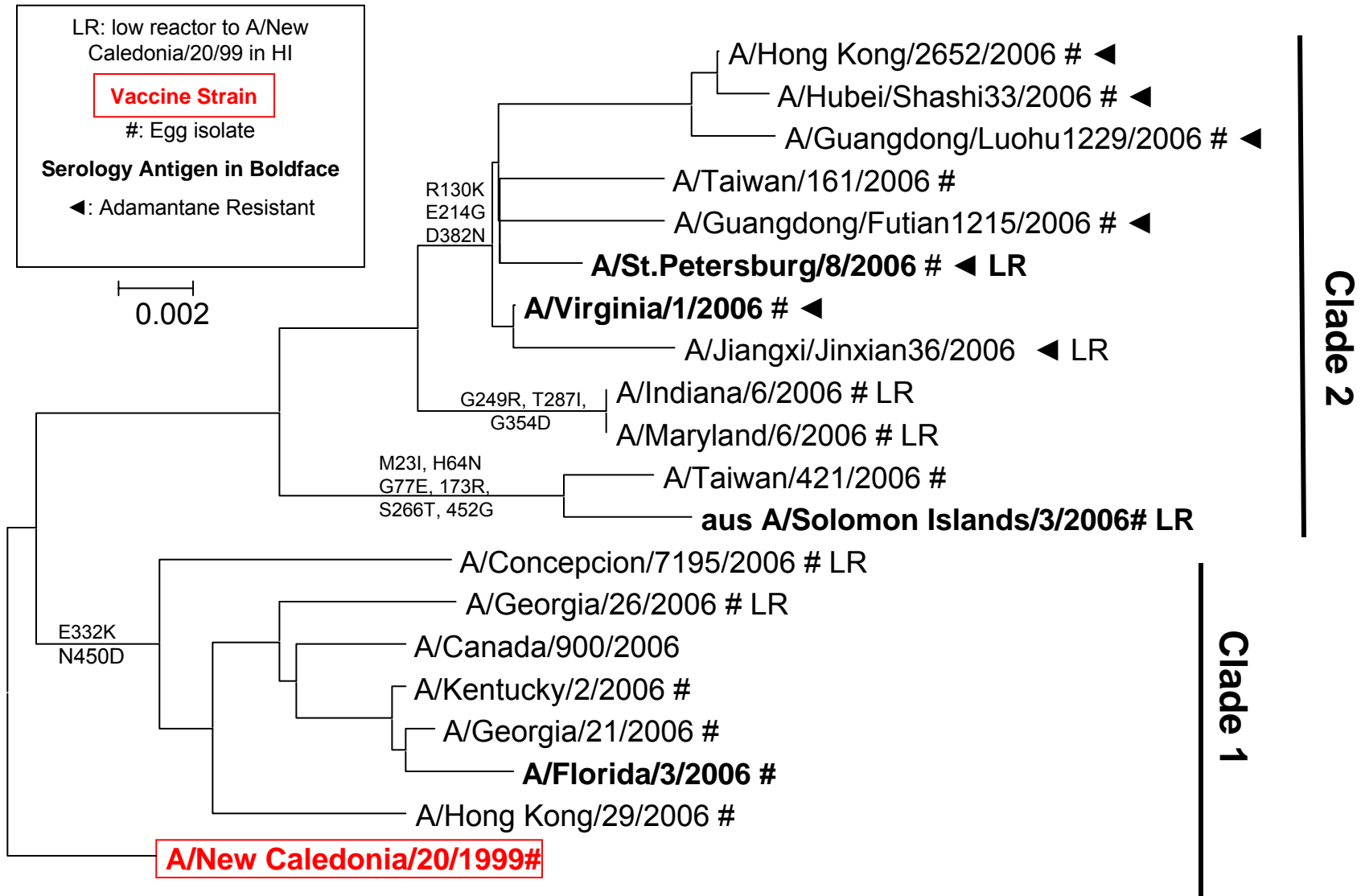
	U.S.A.	North America	Europe	Asia	Cent/So America	Africa, Australia, New Zealand	Total (%)
April 2006 – September 2006							
A/N.Caledonia/20/99-like	46		5	36	114	1	202 (69%)
A/N.Caledon./20/99 (low)	6		1	43	38	1	89 (31%)
						Total	291
October 2006 – February 2007							
A/N.Caledonia/20/99-like	142	9		4			155 (88%)
A/N.Caledon./20/99 (low)	8	1		11	1		21 (12%)
						Total	176
Total	202	10	6	94	153	2	467

Preliminary Data 02/22/2007

Evolutionary Relationships Among Influenza H1N1 HA (HA1) Genes, 2006



Evolutionary Relationships Among Influenza A (H1N1) Neuraminidase Genes, 2006



HI Antibody Responses to the H1 Component of the 2007 Influenza Vaccine

PEDIATRIC POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
USA ¹	28	A/New Caledonia/20/99*	57	6	28	7	54
	27	A/St. Petersburg/8/2006	50	6	17	4	32
	27	A/Virginia/1/2006	54	6	21	7	44
	27	A/Florida/3/2006	43	6	15	7	30
	27	A/Solomon Islands/3/2006 **	11	5	8	0	11

Preliminary Data 01/31/2007

1. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

* A/New Caledonia/20/99-like is the H1N1 component of the vaccine.

** K-144-E

HI Antibody Responses to the H1 Component of the 2007 Influenza Vaccine

ADULT POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
Australia¹	23	A/New Caledonia/20/99*	13	25	38	46	70
	23	A/St. Petersburg/8/2006	17	15	22	29	39
	3	A/Virginia/1/2006	0	16	20	33	67
UK²	24	A/New Caledonia/20/99*	63	6	52	8	58
	24	A/St. Petersburg/8/2006	54	6	30	4	50
	24	A/Virginia/1/2006	63	7	49	8	58
	24	A/Florida/3/2006	63	7	35	8	46
	24	A/Solomon Islands/3/2006**	54	6	35	4	46
Japan³	30	A/New Caledonia/20/99*	20	8	14	3	20
	30	A/St. Petersburg/8/2006	17	6	9	0	7
	30	A/Virginia/1/2006	20	6	12	0	17
	30	A/Florida/3/2006	17	6	11	0	13
	30	A/Solomon Islands/3/2006**	17	6	9	0	7
USA⁴	24	A/New Caledonia/20/99*	21	21	46	33	58
	24	A/St. Petersburg/8/2006	21	12	21	25	38
	24	A/Virginia/1/2006	25	19	45	33	54
	24	A/Florida/3/2006	17	14	27	21	46
	24	A/Solomon Islands/3/2006**	17	15	26	25	42

Preliminary Data 01/31/2007

1. Sera were kindly provided by Dr. Ian Barr, WHO Collaborating Center, Melbourne, Australia. The populations were vaccinated with the 2006 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin. [NOT SUFFICIENT VOLUME OF SERA]

2. Sera were kindly provided by Dr. John Wood, NIBSC, Hertfordshire, UK. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

3. Sera were kindly provided by Dr. Takato Odagiri, WHO Collaborating Center, Tokyo, Japan. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Hiroshima/52/2005 IVR-142 (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

4. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

* A/New Caledonia/20/99-like is the H1N1 component of the vaccine.

** K-144-E

HI Antibody Responses to the H1 Component of the 2007 Influenza Vaccine

ELDERLY POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
Australia¹	23	A/New Caledonia/20/99*	22	7	13	4	25
	23	A/St. Petersburg/8/2006	13	6	8	0	8
UK²	24	A/New Caledonia/20/99*	42	6	18	0	29
	24	A/St. Petersburg/8/2006	29	5	12	0	29
	24	A/Virginia/1/2006	33	6	19	0	29
	24	A/Florida/3/2006	38	6	17	0	29
	24	A/Solomon Islands/3/2006**	17	6	10	0	21
Japan³	30	A/New Caledonia/20/99*	23	19	41	40	63
	30	A/St. Petersburg/8/2006	20	10	19	20	33
	30	A/Virginia/1/2006	27	16	35	33	63
	30	A/Florida/3/2006	17	14	23	27	43
	29	A/Solomon Islands/3/2006**	20	19	32	37	55
USA⁴	24	A/New Caledonia/20/99*	21	9	15	13	21
	24	A/St. Petersburg/8/2006	13	7	9	4	13
	24	A/Virginia/1/2006	17	9	14	13	21
	24	A/Florida/3/2006	13	8	13	13	21
	24	A/Solomon Islands/3/2006**	13	7	9	0	4

Preliminary Data 01/31/2007

1. Sera were kindly provided by Dr. Ian Barr, WHO Collaborating Center, Melbourne, Australia. The populations were vaccinated with the 2006 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin. [NOT SUFFICIENT VOLUME OF SERA]
 2. Sera were kindly provided by Dr. John Wood, NIBSC, Hertfordshire, UK. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
 3. Sera were kindly provided by Dr. Takato Odagiri, WHO Collaborating Center, Tokyo, Japan. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Hiroshima/52/2005 IVR-142 (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
 4. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
- * A/New Caledonia/20/99-like is the H1N1 component of the vaccine.
 ** K-144-E

Influenza A(H3N2) Viruses

HEMAGGLUTINATION INHIBITION REACTIONS OF INFLUENZA H3 VIRUSES (02/21/07)

REFERENCE ANTIGENS		REFERENCE FEERET ANTISERA								Date	Passage
		CA/7	WI/67	WI/67	KY/03	STI/7981	FL/2	NP/921	CN/1212	collected	
1	A/CALIFORNIA/07/2004	<u>640</u>	320	160	160	160	160	160	160	09/16/04	SpfCK3E4
2	A/WISCONSIN/67/2005	160	<u>640</u>	1280	320	640	640	320	320	08/31/05	SpfCK3E4
3	A/WISCONSIN/67/05 R-161B*	80	640	<u>1280</u>	160	320	320	320	80	REASS	EX/E1
4	A/KENTUCKY/03/2006	80	320	160	<u>320</u>	320	640	640	320	04/02/06	SpfCK2E2
5	A/SANTIAGO/7981/2006*	160	320	320	320	<u>1280</u>	640	320	320	06/23/06	E3/E2
6	A/FLORIDA/02/2006	40	320	320	160	320	<u>320</u>	320	160	01/19/06	SpfCK3E3
7	A/NEPAL/921/2006	160	320	640	640	640	640	<u>640</u>	640	07/11/06	SpfCK2E3
8	A/CANADA/1212/2006*	160	160	160	320	640	640	640	<u>640</u>	12/06/06	C1/C2
TEST ANTIGENS											
9	A/TEXAS/01/2007	160	640	320	640	320	320	1280	320	01/16/07	M1/C1
10	A/VIRGINIA/08/2006	320	640	1280	320	640	640	640	640	12/19/06	M1/C1
11	A/MARYLAND/09/2006	80	320	160	160	640	320	320	320	12/17/06	M1/C2
12	A/FLORIDA/02/2007	160	160	320	160	320	320	160	160	01/08/07	CX/C1
13	A/NORTH CAROLINA/02/2007	80	160	160	160	160	80	80	80	01/18/07	MX/C1
14	A/WASHINGTON/01/2007	160	160	80	160	160	160	160	80	01/10/07	M2/C1
15	A/MISSOURI/01/2007	40	40	160	80	80	80	160	80	01/29/07	M1/C1
16	A/NORTH CAROLINA/01/2007	40	40	80	80	160	80	80	80	01/18/07	MX/C1
17	A/HAWAII/08/2006	40	20	40	40	80	20	40	40	12/12/06	C1/C1
18	A/HAWAII/06/2006	80	20	40	40	80	40	40	40	12/28/06	C1/C1
19	A/CANADA/29/2006	1280	640	320	160	640	640	640	640	12/17/06	X1/C1
20	A/CANADA/23/2007	160	160	160	160	640	320	320	640	01/03/07	X1/C1
21	A/CANADA/02/2006	40	40	40	40	160	160	160	160	12/18/06	X1/C1
22	A/CANADA/32/2006	40	40	40	40	160	160	160	80	11/24/06	X1/C1
23	A/LYON/1248/2006	160	640	320	640	640	320	1280	640	UNKN	C3/C1
24	A/LYON/1292/2006	160	320	160	320	320	320	320	320	12/18/06	C3/C1
25	A/TOULON/1244/2006	80	160	160	160	640	320	640	640	12/06/06	CXC1/C1
26	A/BORDEAUX/1276/2006	80	160	160	160	320	320	320	640	11/30/06	C3/C1
27	A/LYON/1359/2006	160	160	160	160	320	160	160	160	12/27/06	C2/C1
28	A/CX ROUSSE/12125241/2006	80	160	80	160	160	160	160	320	12/12/06	CXC1/C1
29	A/LYON/CHU/52.339/2006	160	80	160	160	160	160	160	160	12/30/06	C2/C1
30	A/LYON/1305/2006	80	80	80	160	160	80	160	160	12/19/06	C2/C1
31	A/LYON/10/2006	160	80	160	80	320	80	320	160	12/29/06	C2/C1
32	A/LYON/27/2007	160	80	320	80	320	160	320	320	01/04/07	C2/C1
33	A/LYON/CHU/52.58/2006	80	40	80	80	160	80	160	160	12/25/06	C2/C1
34	A/INCHEON/677/2006	640	320	320	160	320	320	160	320	11/14/06	C4/C1
35	A/KOREA/7236/2007	80	320	160	160	320	160	160	160	01/16/07	X/C1
36	A/SINGAPORE/77/2006	160	80	160	80	640	320	320	320	08/03/06	C3/C2

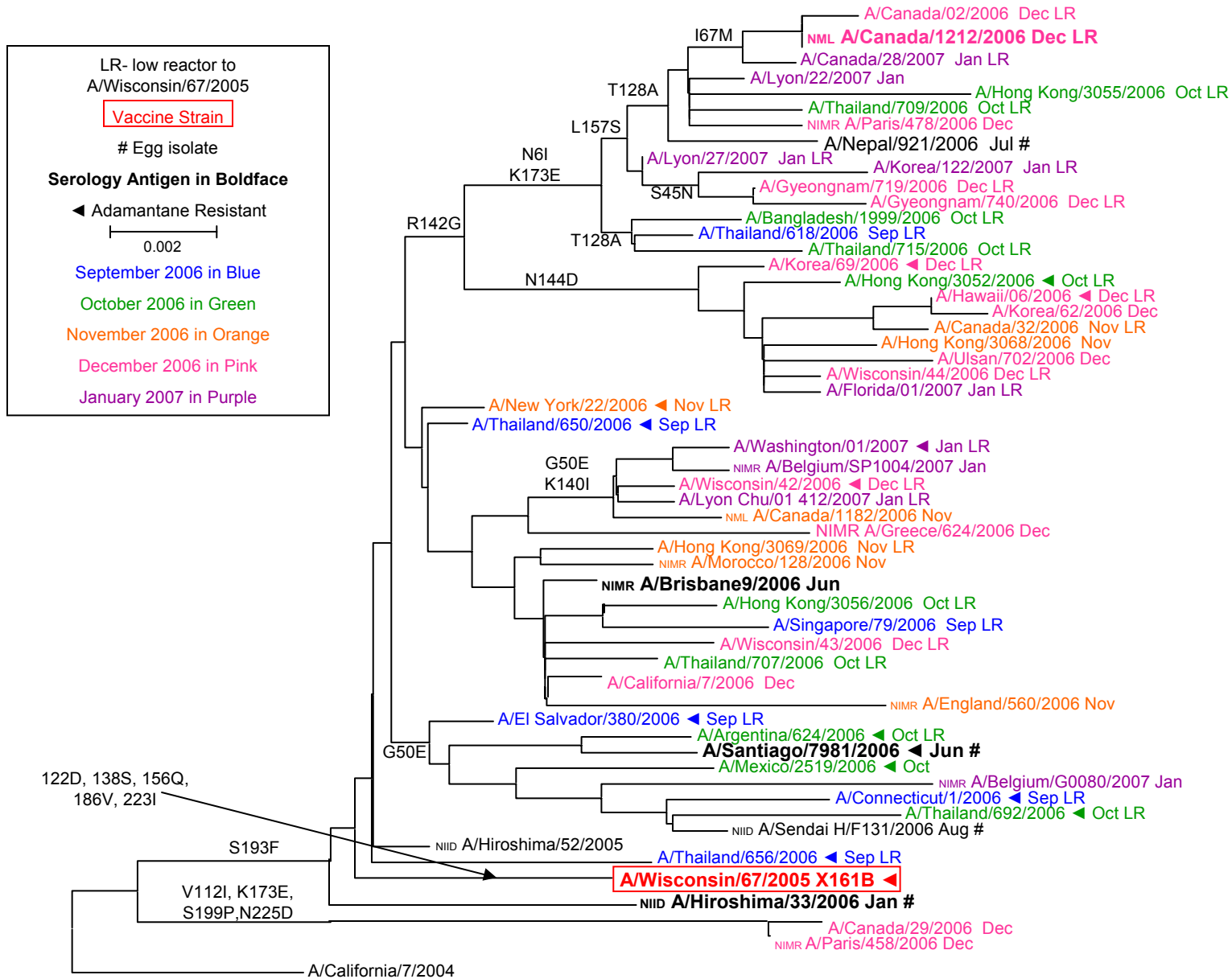
* Serology antigens

Influenza A (H3N2) Isolates Characterized by CDC

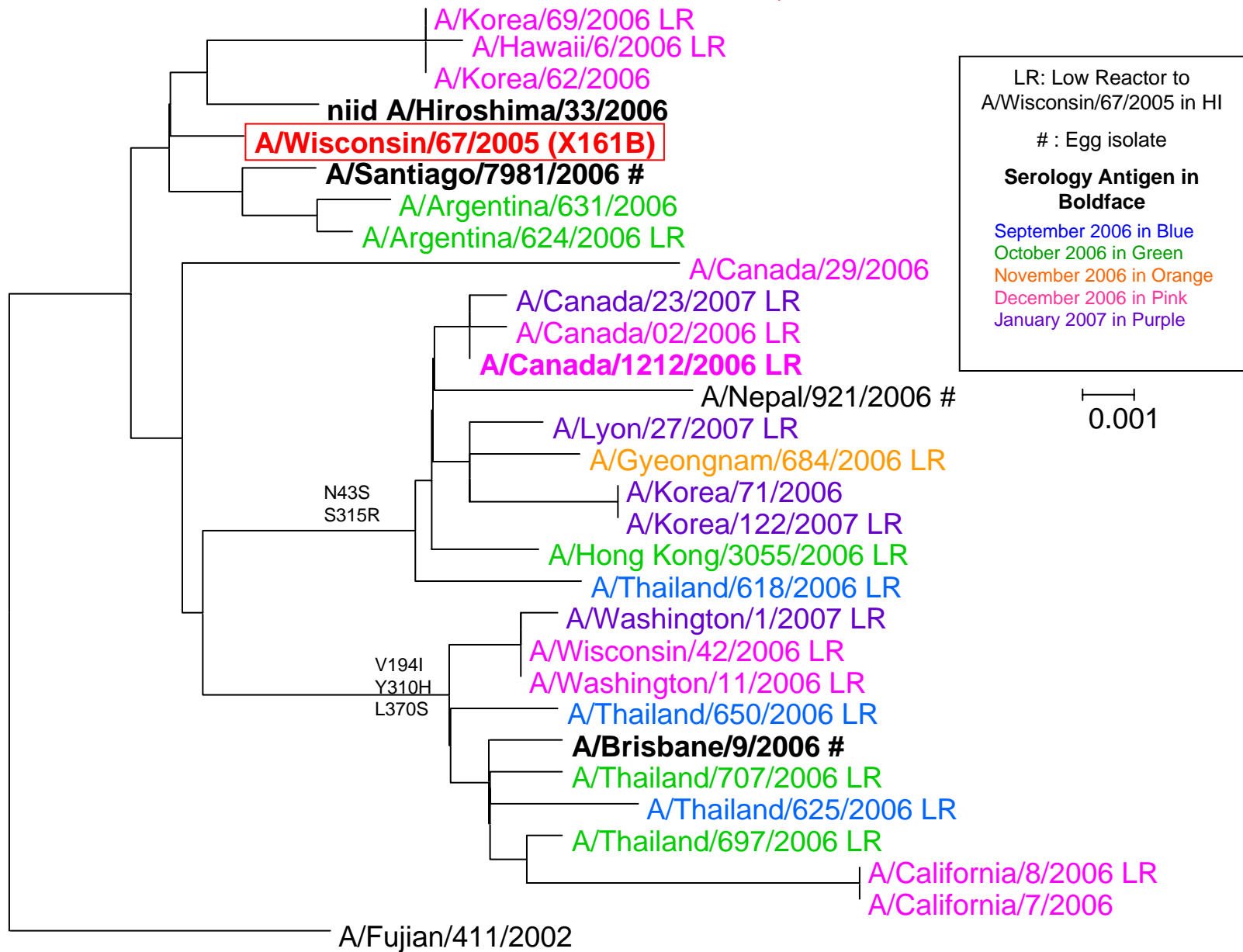
	U.S.A.	North America	Europe	Asia	Cent/So America	Africa, Australia, New Zealand	Total (%)
April 2006 – September 2006							
A/California/07/2004-like	4		9	10	21		44 (18%)
A/Wisconsin/67/2005-like	18	1	5	26	66	3	119 (50%)
A/Wisconsin/67/2005-like (low)	6		10	47	12		75 (32%)
						Total	238
October 2006 – February 2007							
A/Wisconsin/67/2005-like	11	4	4	19	6		44 (41%)
A/Wisconsin/67/2005-like (low)	15	8	17	19	3	1	63 (59%)
						Total	107
Total	54	13	45	121	108	4	345

Preliminary data 02/22/2007

Evolutionary Relationships Among Influenza H3N2 HA (HA1) Genes, 2006



Evolutionary Relationships Among Influenza A (H3N2) Neuraminidase Genes, 2006



HI Antibody Responses to the H3 Component of the 2007 Influenza Vaccine

PEDIATRIC POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
USA ¹	28	A/Wisconsin/67/2005 (X-161B*)	86	10	76	18	71
	28	A/Brisbane/9/2006	68	8	45	14	68
	28	A/Santiago/7981/2006	40	7	20	11	29
	28	A/Canada/1212/2006**	32	9	23	14	36
	28	A/Hiroshima/33/2006	29	7	16	11	29

Preliminary Data 01/29/2007

1. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

* A/Wisconsin/67/2005-like is the H3N2 component of the vaccine.

** A/Canada/1212/2006-A/Nepal/921/2006 genetic group

HI Antibody Responses to the H3 Component of the 2007 Influenza Vaccine

ADULT POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
Australia¹	24	A/Wisconsin/67/2005 (X-161B*)	71	15	101	25	96
	24	A/Brisbane/9/2006	67	15	65	21	79
	24	A/Santiago/7981/2006	46	8	22	8	38
	23	A/Canada/1212/2006**	4	8	14	4	9
	23	A/Hiroshima/33/2006	42	7	14	8	22
UK²	24	A/Wisconsin/67/2005 (X-161B*)	79	9	151	13	88
	24	A/Brisbane/9/2006	75	7	92	4	83
	24	A/Santiago/7981/2006	50	6	18	4	42
	24	A/Canada/1212/2006**	38	6	14	4	25
	24	A/Hiroshima/33/2006	42	5	15	4	33
Japan³	30	A/Wisconsin/67/2005 (X-161B*)	40	22	67	40	70
	30	A/Brisbane/9/2006	33	16	39	30	53
	30	A/Santiago/7981/2006	13	6	10	3	20
	30	A/Canada/1212/2006**	23	9	17	7	27
	28	A/Hiroshima/33/2006	21	6	10	0	21
USA⁴	24	A/Wisconsin/67/2005 (X-161B*)	83	14	120	33	100
	24	A/Brisbane/9/2006	79	13	78	21	88
	24	A/Santiago/7981/2006	50	7	23	4	38
	24	A/Canada/1212/2006**	67	5	19	0	25
	24	A/Hiroshima/33/2006	46	9	23	4	33

Preliminary Data 01/29/2007

1. Sera were kindly provided by Dr. Ian Barr, WHO Collaborating Center, Melbourne, Australia. The populations were vaccinated with the 2006 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin. [NOT SUFFICIENT VOLUME OF SERA]

2. Sera were kindly provided by Dr. John Wood, NIBSC, Hertfordshire, UK. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin .

3. Sera were kindly provided by Dr. Takato Odagiri, WHO Collaborating Center, Tokyo, Japan. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Hiroshima/52/2005 IVR-142 (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

4. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

* A/New Caledonia/20/99-like is the H1N1 component of the vaccine.

** A/Canada/1212/2006-A/Nepal/921/2006 genetic group

HI Antibody Responses to the H3 Component of the 2007 Influenza Vaccine

ELDERLY POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
Australia¹	24	A/Wisconsin/67/2005 (X-161B*)	75	14	80	29	79
	24	A/Brisbane/9/2006	67	12	46	13	71
	24	A/Santiago/7981/2006	50	5	18	0	38
	23	A/Canada/1212/2006**	13	6	9	0	4
	23	A/Hiroshima/33/2006	48	5	15	0	21
UK²	24	A/Wisconsin/67/2005 (X-161B*)	75	11	160	21	92
	24	A/Brisbane/9/2006	79	10	135	8	92
	24	A/Santiago/7981/2006	70	5	32	0	63
	24	A/Canada/1212/2006**	29	7	12	8	13
	16	A/Hiroshima/33/2006	50	10	27	13	55
Japan³	30	A/Wisconsin/67/2005 (X-161B*)	40	12	31	27	60
	30	A/Brisbane/9/2006	33	10	20	17	50
	30	A/Santiago/7981/2006	17	6	9	3	13
	30	A/Canada/1212/2006**	7	8	11	7	10
	29	A/Hiroshima/33/2006	10	5	7	3	7
USA⁴	24	A/Wisconsin/67/2005 (X-161B*)	63	19	87	38	92
	24	A/Brisbane/9/2006	63	13	57	29	79
	24	A/Santiago/7981/2006	29	7	14	8	29
	24	A/Canada/1212/2006**	21	7	12	8	17
	24	A/Hiroshima/33/2006	25	6	12	4	17

Preliminary Data 01/29/2007

1. Sera were kindly provided by Dr. Ian Barr, WHO Collaborating Center, Melbourne, Australia. The populations were vaccinated with the 2006 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin. [NOT SUFFICIENT VOLUME OF SERA]

2. Sera were kindly provided by Dr. John Wood, NIBSC, Hertfordshire, UK. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin .

3. Sera were kindly provided by Dr. Takato Odagiri, WHO Collaborating Center, Tokyo, Japan. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Hiroshima/52/2005 IVR-142 (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

4. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

* A/New Caledonia/20/99-like is the H1N1 component of the vaccine.

** A/Canada/1212/2006-A/Nepal/921/2006 genetic group

Influenza B Viruses

REFERENCE FERRET ANTISERA

Date

REFERENCE ANTIGENS	SH/361	FL/7	MI/2	FL/4	SH/7	OH/1	MY/2506	CH/131	TX/39	collected	Passage
1 B/SHANGHAI/361/2002	640	640	320	160	20	20	80	40	20	06/12/02	E2/E2
2 B/FLORIDA/07/2004*	160	320	320	160	5	5	40	40	20	10/01/04	E3
3 B/MICHIGAN/02/2006*	160	160	320	80	5	5	10	20	5	01/12/06	E3
4 B/FLORIDA/04/2006	160	160	160	160	5	5	20	20	10	11/01/06	E2
5 B/SHANDONG/07/1997	5	20	5	20	1280	640	640	640	640	11/03/97	E4/E3
6 B/OHIO/01/2005*	5	5	5	5	640	640	320	640	320	02/23/05	E2
7 B/MALAYSIA/2506/2004*	10	5	5	10	1280	1280	1280	2560	2560	06/12/04	E3/E2
8 B/CHONGQING/131/2006*	10	20	10	10	1280	640	640	640	640	03/27/06	E1/E1
9 B/TEXAS/39/2006*	5	20	5	10	320	640	640	320	640	11/05/06	E3

TEST ANTIGENS

10 B/IOWA/02/2006	80	320	160	160	10	10	40	40	10	12/05/06	E2
11 B/FLORIDA/07/2006	20	160	160	160	10	5	40	40	20	12/20/06	M1/C1
12 B/THAILAND/682/2006	320	320	320	320	10	10	10	20	20	10/07/06	C2/C1
13 B/SINGAPORE/26/2006	160	320	320	320	10	10	20	80	40	08/23/06	C1/C1
14 B/THAILAND/683/2006	160	320	320	320	5	5	10	10	10	10/07/06	C1/C1
15 B/GEORGIA/11/2006	5	5	5	5	640	640	640	ND	ND	11/28/06	E3
16 B/NEW MEXICO/01/2007	5	5	5	5	1280	640	640	640	320	01/03/07	MX/C1
17 B/IOWA/03/2006	5	5	5	5	320	320	160	320	320	12/13/06	C1/C1
18 B/DELAWARE/02/2006	5	5	5	10	320	160	160	320	160	11/28/06	X/C1
19 B/FLORIDA/08/2006	5	5	5	10	320	160	160	160	320	12/28/06	X/C1
20 B/MISSISSIPPI/04/2006	5	20	5	10	160	160	160	320	160	10/18/06	E1
21 B/TEXAS/43/2006	5	5	5	5	320	160	160	320	320	12/17/06	M1/C1
22 B/VICTORIA/505/2006	5	5	10	20	640	160	160	320	160	06/04/06	CXC1/C1
23 B/THAILAND/711/2006	5	5	10	20	1280	1280	1280	640	640	10/12/06	C2/C1
24 B/THAILAND/719/2006	5	5	10	20	640	1280	1280	1280	640	10/12/06	C2/C1
25 B/THAILAND/696/2006	5	5	10	20	640	640	640	1280	1280	10/07/06	C3/C1
26 B/THAILAND/639/2006	5	5	5	5	2560	640	640	640	320	10/03/06	C2/C1
27 B/THAILAND/714/2006	5	5	5	20	640	320	160	320	320	10/17/06	C2/C1
28 B/QINGHAI/HUZHU19/2006	10	40	10	20	320	160	160	320	160	03/29/06	C1/C1
29 B/THAILAND/685/2006	5	5	5	5	320	160	80	320	160	10/04/06	C2/C1
30 B/THAILAND/703/2006	5	5	5	10	320	160	160	640	160	10/10/06	C2/C1
31 B/THAILAND/710/2006	5	5	5	20	320	160	160	160	160	10/12/06	C2/C1
32 B/THAILAND/712/2006	5	5	5	20	320	160	160	160	160	10/13/06	C2/C1
33 B/THAILAND/583/2006	5	5	5	5	160	80	80	320	80	10/02/06	C1/C1
34 B/THAILAND/686/2006	5	5	5	10	160	80	80	320	160	10/05/06	C2/C1

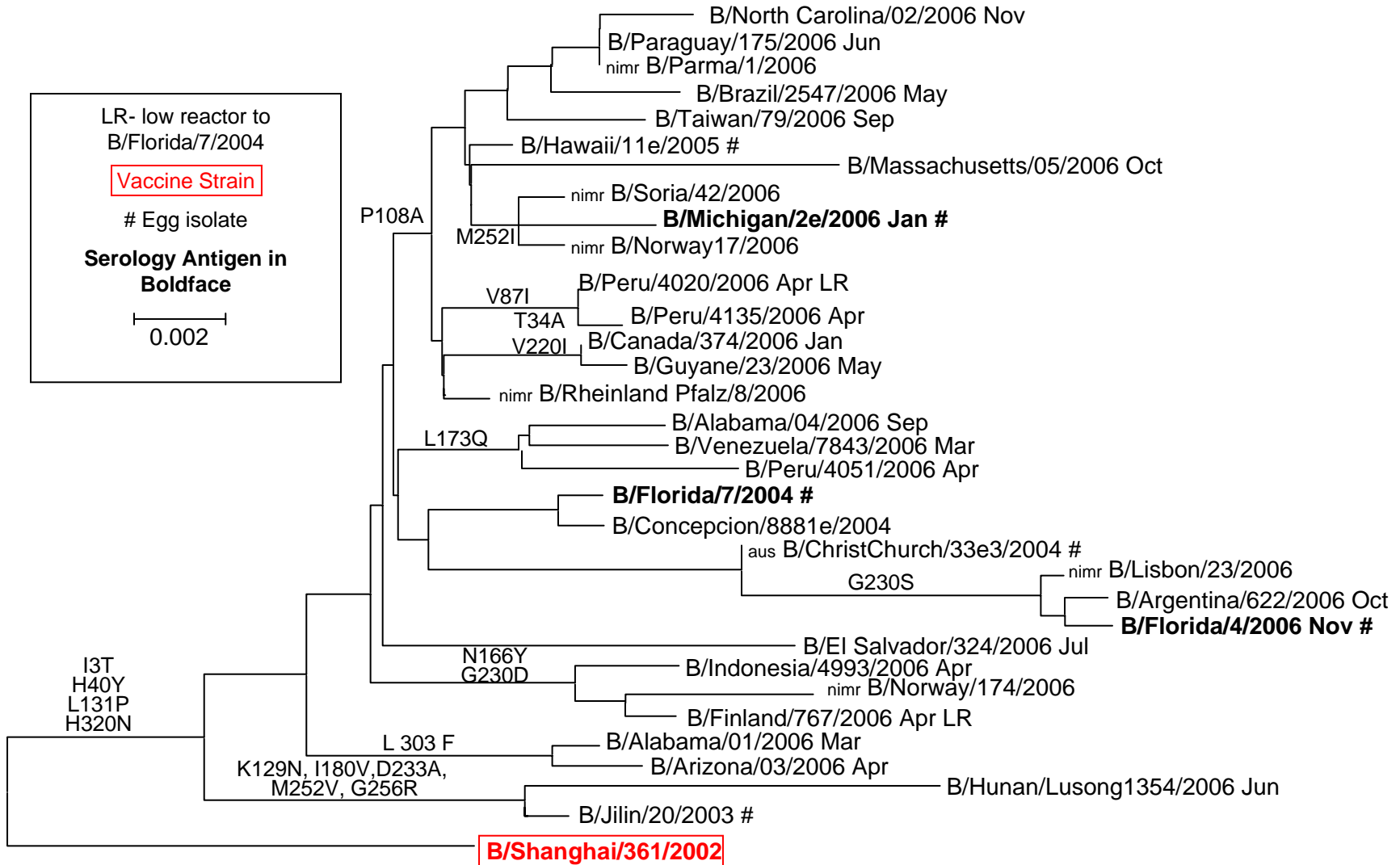
*Serology antigen

Influenza B Isolates Characterized by CDC

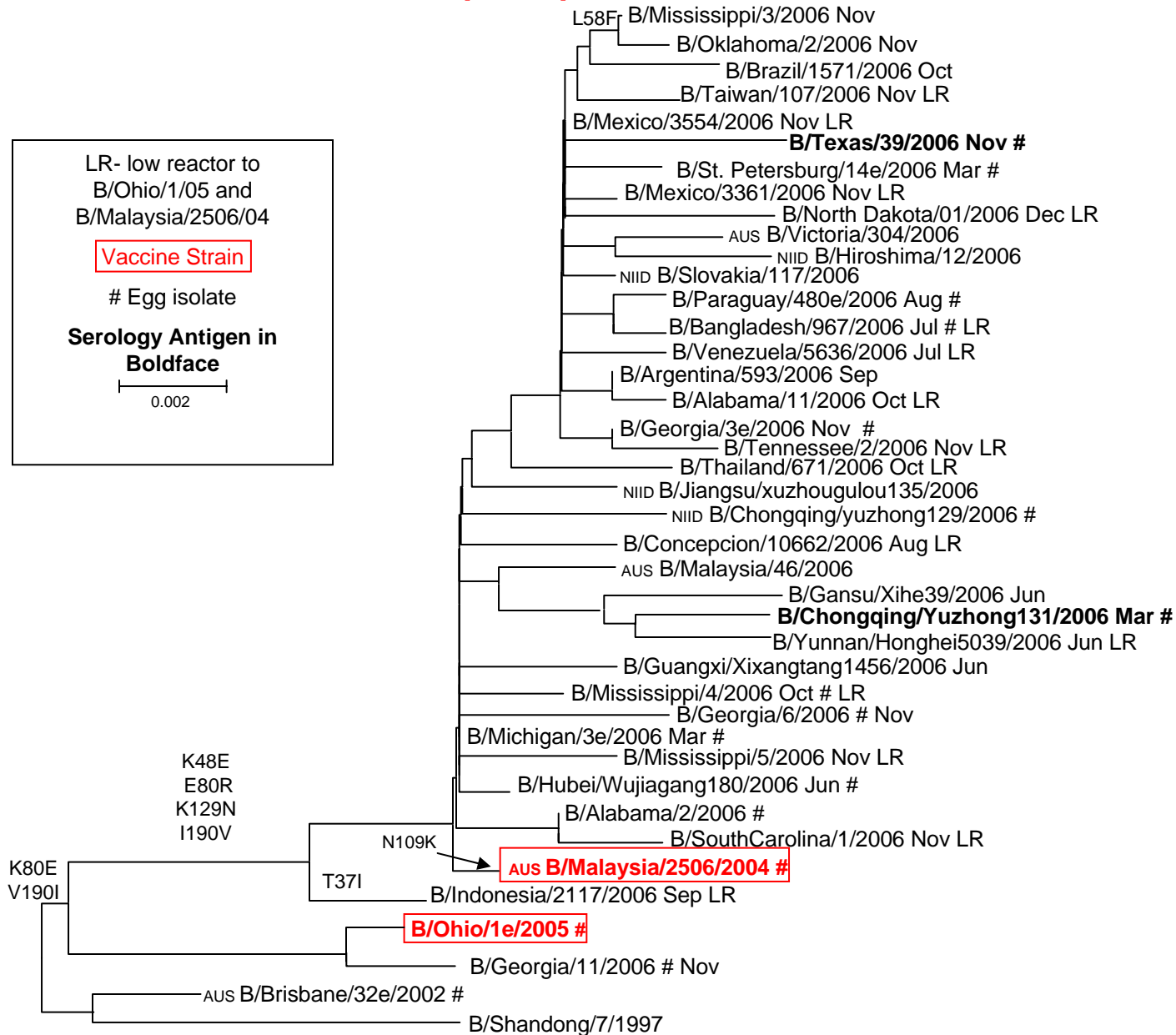
	U.S.A.	North America	Europe	Asia	Cent/So America	Africa, Australia, New Zealand	Total (%)
April 2006 – September 2006							
B/Ohio/01/2005-like**	62	2	3	21	17	2	107 (32%)
B/Ohio/01/2005-like (low)**	49	1	12	49	36	4	151 (46%)
B/Florida/07/2004-like*	7			35	23		65 (21%)
B/Florida/07/2004-like (low)*			1		1		2 (1%)
						Total	330
October 2006 – February 2007							
B/Ohio/01/2005-like**	18	2		10	1		31 (31%)
B/Ohio/01/2005-like (low)**	28	2		13	1		44 (45%)
B/Florida/07/2004-like*	19	1		2	2		24 (24%)
B/Florida/07/2004-like (low)*							
							99
Total	184	8	16	131	83	7	429

Preliminary Data 02/20/2007

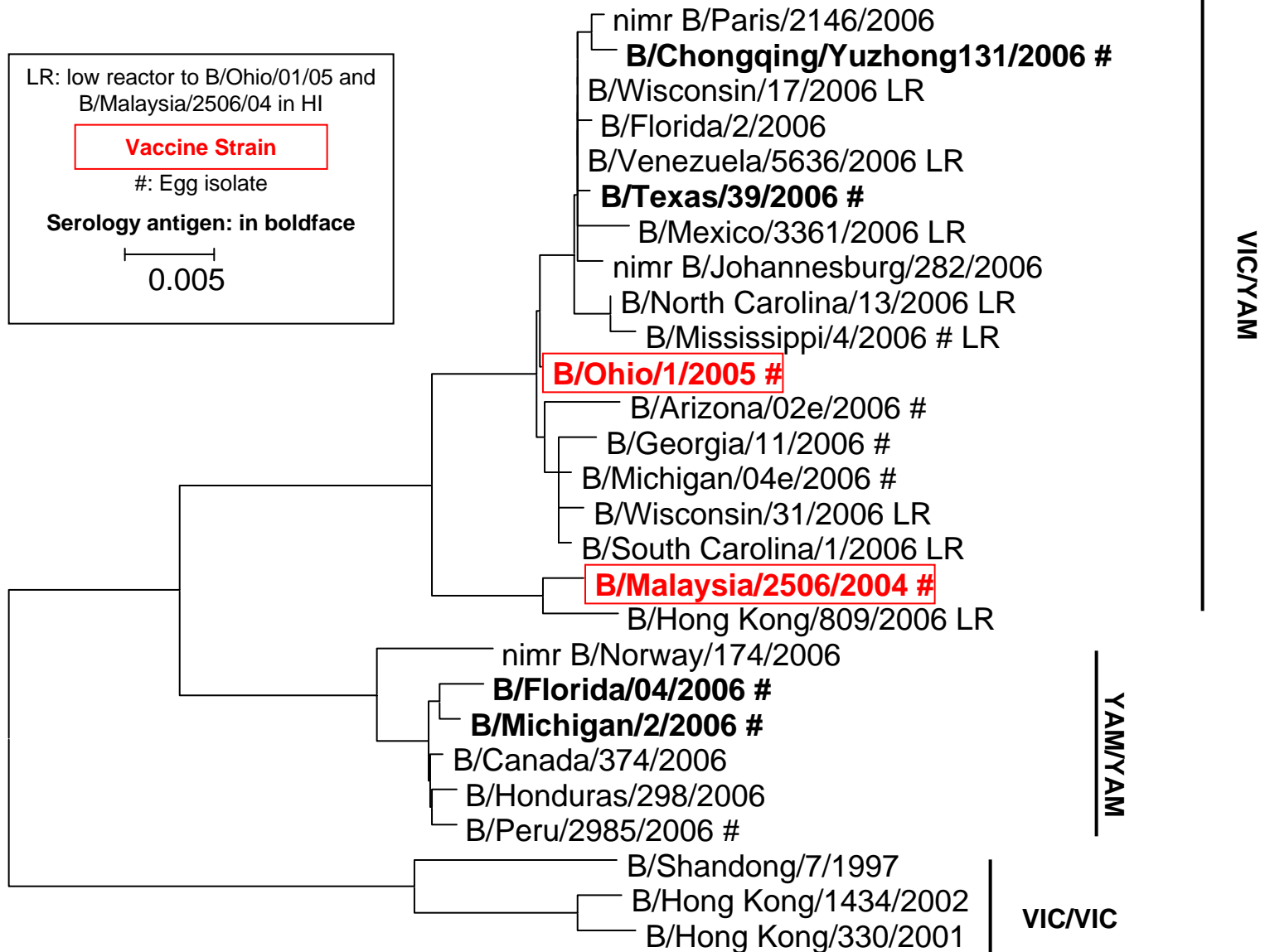
Evolutionary Relationships Among Influenza B (Yamagata lineage) HA (HA1) Genes, 2006



Evolutionary Relationships Among Influenza B (Victoria lineage) HA (HA1) Genes, 2006



Evolutionary Relationships Among Influenza B Neuraminidase Genes, 2006



HI Antibody Responses to the B Component of the 2007 Influenza Vaccine

PEDIATRIC POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
USA ¹	28	B/Malaysia/2506/2004* #	39	5	15	0	36
	28	B/Ohio/1/2005 #	43	5	14	0	36
	28	B/Chongqing/Yz131/2006 #	39	5	13	0	29
	27	B/Texas/39/2006 #	48	5	14	0	33
	28	B/Florida/4/2006	14	6	8	4	14
	28	B/Michigan/2/2006	11	6	8	4	11

Preliminary Data 01/29/2007

1. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

* B/Malaysia/2506/2004-like is the B component of the vaccine.

Victoria lineage viruses.

HI Antibody Responses to the B Component of the 2007 Influenza Vaccine

ADULT POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
Australia¹	23	B/Malaysia/2506/2004* #	52	22	98	39	96
UK²	24	B/Malaysia/2506/2004* #	83	8	69	8	79
	24	B/Ohio/1/2005 #	89	11	126	21	91
	24	B/Chongqing/Yz131/2006 #	83	8	64	13	71
	19	B/Texas/39/2006 #	83	7	60	9	67
	23	B/Florida/4/2006	58	12	44	17	71
	23	B/Michigan/2/2006	63	10	42	17	67
	Japan³	30	B/Malaysia/2506/2004* #	23	20	52	40
30		B/Ohio/1/2005 #	20	32	78	57	80
30		B/Chongqing/Yz131/2006 #	27	17	44	33	67
30		B/Texas/39/2006 #	23	19	44	37	70
30		B/Florida/4/2006	7	12	19	17	33
30		B/Michigan/2/2006	7	11	14	13	27
USA⁴		24	B/Malaysia/2506/2004* #	71	21	147	38
	23	B/Ohio/1/2005 #	65	22	151	46	91
	24	B/Chongqing/Yz131/2006 #	67	19	127	33	92
	22	B/Texas/39/2006 #	59	23	113	41	88
	24	B/Florida/4/2006	38	36	116	63	88
	24	B/Michigan/2/2006	46	48	160	67	92

Preliminary Data 02/02/2007

1. Sera were kindly provided by Dr. Ian Barr, WHO Collaborating Center, Melbourne, Australia. The populations were vaccinated with the 2006 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
2. Sera were kindly provided by Dr. John Wood, NIBSC, Hertfordshire, UK. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
3. Sera were kindly provided by Dr. Takato Odagiri, WHO Collaborating Center, Tokyo, Japan. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Hiroshima/52/2005 IVR-142 (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
4. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.

* B/Malaysia/2506/2004 is the B component of the vaccine.

Victoria lineage viruses

HI Antibody Responses to the B Component of the 2007 Influenza Vaccine

ELDERLY POPULATIONS

Population	N	Antigen	% Rise	Pre GMT	Post GMT	% with HI titer \geq 40	
						Pre Vaccine	Post Vaccine
Australia¹	24	B/Malaysia/2506/2004* #	67	10	39	4	71
UK²	24	B/Malaysia/2506/2004* #	96	8	69	4	79
	23	B/Ohio/1/2005 #	78	8	67	4	83
	23	B/Chongqing/Yz131/2006 #	70	8	42	4	65
	24	B/Texas/39/2006 #	67	7	42	4	71
	24	B/Florida/4/2006	54	11	44	17	71
	24	B/Michigan/2/2006	58	13	45	17	54
Japan³	30	B/Malaysia/2506/2004* #	43	24	70	47	87
	29	B/Ohio/1/2005 #	37	40	92	70	90
	30	B/Chongqing/Yz131/2006 #	37	24	61	47	83
	30	B/Texas/39/2006 #	37	22	64	43	87
	30	B/Florida/4/2006	17	50	70	83	93
	30	B/Michigan/2/2006	13	67	108	83	97
USA⁴	24	B/Malaysia/2506/2004* #	54	22	76	46	92
	24	B/Ohio/1/2005 #	42	26	80	54	88
	24	B/Chongqing/Yz131/2006 #	42	22	65	42	83
	24	B/Texas/39/2006 #	54	19	62	33	83
	24	B/Florida/4/2006	13	27	48	54	79
	24	B/Michigan/2/2006	13	46	82	79	88

Preliminary Data 02/02/2007

1. Sera were kindly provided by Dr. Ian Barr, WHO Collaborating Center, Melbourne, Australia. The populations were vaccinated with the 2006 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin. [NOT SUFFICIENT VOLUME OF SERA]
 2. Sera were kindly provided by Dr. John Wood, NIBSC, Hertfordshire, UK. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
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 4. Sera were kindly provided by Dr. Zhiping Ye, FDA, Bethesda, MD. The populations were vaccinated with the 2006-2007 trivalent influenza vaccine containing 15ug each of A/Wisconsin/67/2005 X161B (H3N2)-like, A/New Caledonia/20/99(H1N1)-like, and B/Malaysia/2506/2004-like hemagglutinin.
- * A/New Caledonia/20/99-like is the H1N1 component of the vaccine.
Victoria lineage viruses.