INFORMATION FOR US CONSULTATION ON FORMULATION OF INFLUENZA VACCINES

30 January 2001

Prepared by

WHO COLLABORATING CENTRE FOR REFERENCE AND RESEARCH ON INFLUENZA
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PAGE

1 **EPIDEMIOLOGY**. 2

2 **INFLUENZA A(H1N1)**. 5

3 **INFLUENZA A(H3N2)**. 9

4 **INFLUENZA B** 13

5 **SEROLOGY**. 17

1. EPIDEMIOLOGY

Influenza virus isolates for antigenic and genetic analysis are sourced from a number of countries as indicated in Table 1.1.

TABLE 1.1
Influenza Isolates Analysed

Country	January - August 2000		September 2000 - January 2001	
	Influenza A	Influenza B	Influenza A	Influenza B
Australia	195	44	398	199
Malaysia	2	0	0	0
New Caledonia	13	0	5	1
New Zealand	46	13	98	28
Philippines	9	3	0	0
Singapore	30	12	0	0
South Africa	18	4	0	0
Thailand	133	16	0	8
Taiwan	25	7	3	1
Vietnam	1	6	0	0
Total	**472**	**105**	**504**	**237**

All regions covered by our surveillance experienced only mild to moderate influenza during the past 12 months. Summaries for the major contributing regions are:

Australia
Influenza activity was lower than in recent years with both subtypes of influenza A and influenza B present.

Figure 1.1
Influenza-Like Illness in Australia 1992 - 2000
Sentinel Practice Reports

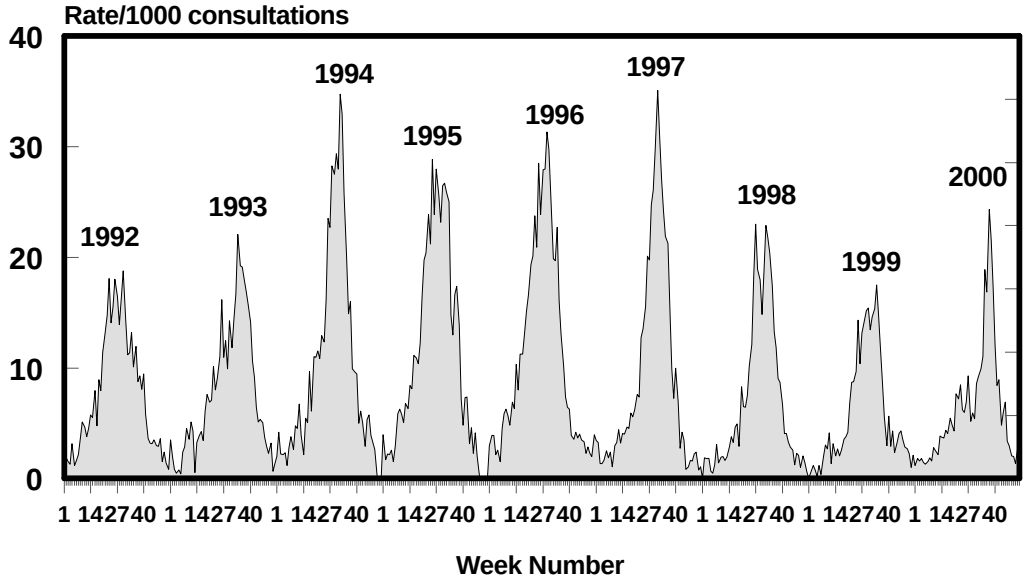

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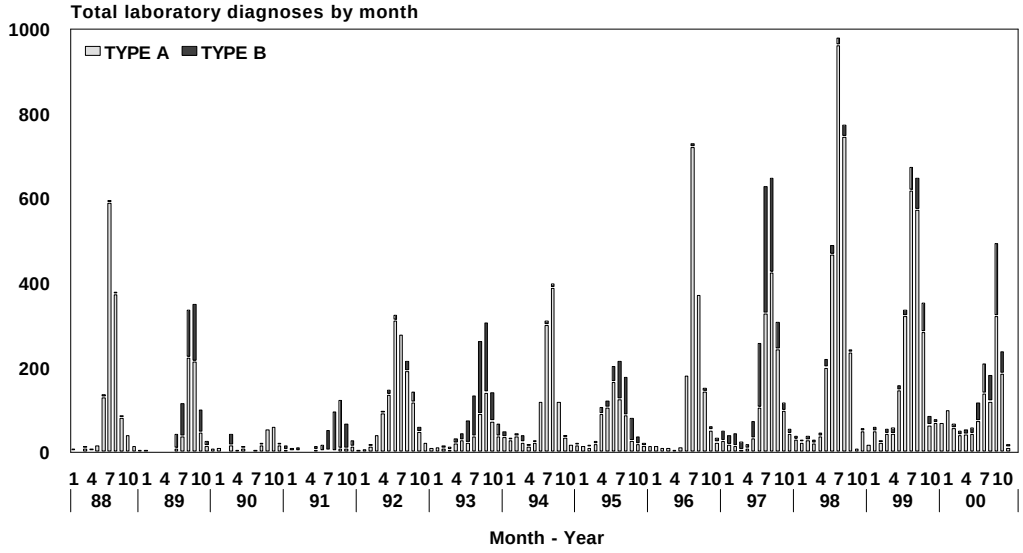
Figure 1.2
Laboratory Diagnosed Influenza – Australia 1988 - 2000



Data from Australian CDI

New Zealand

An extremely mild influenza season was experienced with mainly influenza A(H1) and some influenza B (Figures 1.3 and 1.4).

Figure 1.3
Influenza in New Zealand 2000

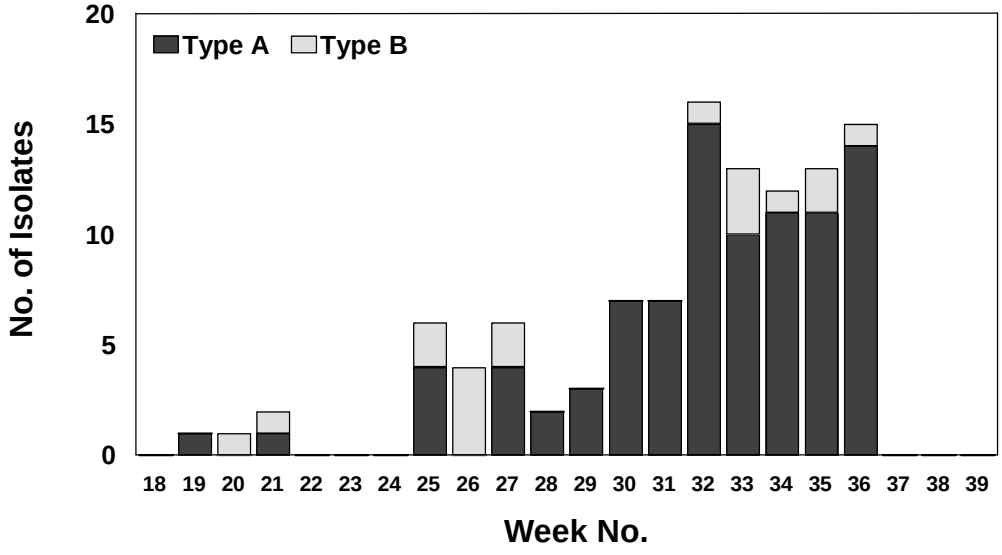
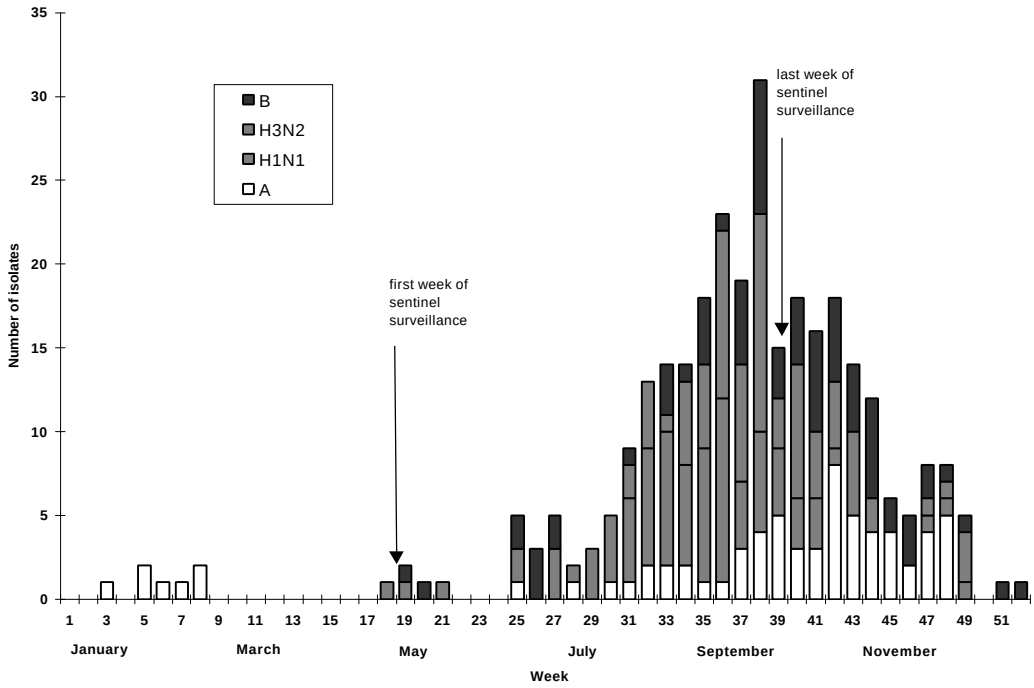


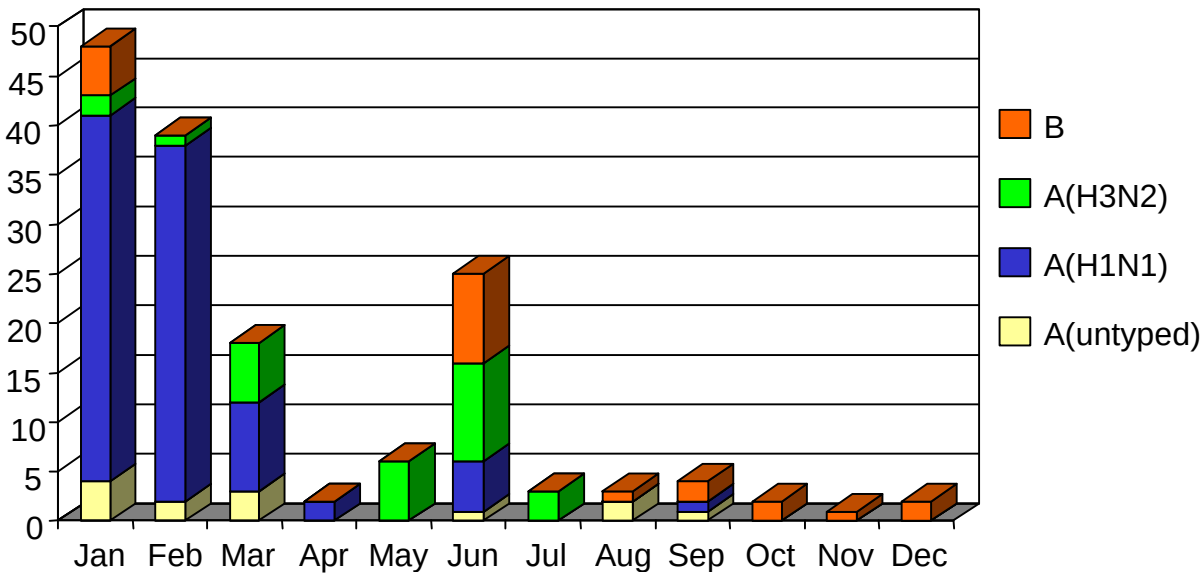
Figure 1.4
Influenza in New Zealand 2000



Thailand

Following significant levels of principally A(H1) influenza early in the year influenza activity declined in the second half of 2000 and was mainly due to influenza B.

Figure 1.5
Influenza in Thailand 2000



2. INFLUENZA A (H1N1) STRAINS

TABLE 2.1

Summary - Characterization of Influenza A(H1N1) Isolates Received January 2000 - January 2001

Country	Jan - Aug 2000	
	A/Bayern/7/95 lineage strains	A/New Caledonia/20/99 lineage strains
Australia	34	12
Malaysia	0	0
New Caledonia	0	7
New Zealand	0	35
Philippines	0	6
Singapore	0	15
South Africa	0	12
Thailand	0	103
Taiwan	0	12
Vietnam	0	0
Total	**34**	**202**

Country	Sep 2000 - Jan 2001	
	A/Bayern/7/95 lineage strains	A/New Caledonia/20/99 lineage strains
Australia	5	74
Malaysia	0	0
New Caledonia	0	0
New Zealand	0	41
Philippines	0	0
Singapore	0	0
South Africa	0	0
Thailand	0	0
Taiwan	0	0
Vietnam	0	0
Total	**5**	**115**

TABLE 2.2
Haemagglutination-Inhibition Reactions of Influenza A(H1N1)

		ANTISERUM							
		A	**B**	**C**	**D**	**E**	**Human**	**Passage**	**Date**
		BAY/7	JOH/82	BEIJ/262	SING/9	NC/20	**sera pool**		
	REF. Ag								
A	A/BAYERN/7/95	**1280**	>2560	20	20	20	80	X,E5	
B	A/JOHANNESBURG/82/96	>2560	**>2560**	80	80	80	320	E4	
C	A/BEIJING/262/95	20	40	**640**	640	320	80	E5	
D	A/SINGAPORE/9/98	<20	<20	80	**80**	80	40	X,MD4	
E	A/NEW CALEDONIA/20/99	<20	<20	40	40	**160**	20	E5	
	TEST Ag								
	A/JOHANNESBURG/31/2000	<20	<20	80	80	640	40	XE2	
	B/VICTORIA/526/2000	20	20	320	320	1280	80	MD2	15.9.00
	A/CHRISTCHURCH/95/2000	20	40	160	160	320	80	MD3	22.10.00
	A/STH AUST/78/2000	20	80	320	320	640	80	MD2	16.9.00
	A/WELLINGTON/8/2000	40	40	320	640	1280	160	MDX,MD1	
	A/AUCKLAND/100/2000	40	40	320	640	1280	160	MD3	29.8.00
	A/STH AUST/157/2000	20	40	320	320	1280	80	MD2	23.10.00
	A/PERTH/256/2000	20	20	160	320	640	80	MD2	21.9.00
	A/PERTH/266/2000	20	20	320	320	640	80	MD2	25.9.00

TABLE 2.3
Haemagglutination-Inhibition Reactions of Influenza A(H1N1)

		ANTISERUM								
		A	**B**	**C**	**D**	**E**	**F**	**Human**	**Passage**	**Date**
		BAY/7	JOH/82	BEIJ/262	SING/9	NC/20	FUJ/156	**Sera Pool**		
	REF. Ag									
A	A/BAYERN/7/95	**1280**	>2560	20	20	<20	<20	160	X,E5	
B	A/JOHANNESBURG/82/96	>2560	**>2560**	80	40	80	20	320	E5	
C	A/BEIJING/262/95	20	80	**1280**	1280	640	320	80	E5	
D	A/SINGAPORE/9/98	<20	<20	160	**160**	160	160	40	X,MD4	
E	A/NEW CALEDONIA/20/99	<20	<20	80	640	**320**	640	20	E5	
F	A/FUJIAN/156/2000	<20	20	80	160	640	**1280**	40	E2,E2,E1	
	TEST Ag									
	A/PERTH/46/2000	80	80	640	1280	>2560	>2560	160	X,MD1	16.10.00
	A/BANGKOK/335/2000	<20	<20	160	160	640	1280	80	E3,MD1	29.8.00
	A/HONG KONG/1841/2000	20	20	160	160	320	320	80	C2,C2,MD1	
	A/TEXAS/87/2000	<20	20	160	160	640	640	80	M1,C2,MD1	
	A/TEXAS/90/2000	640	>2560	20	20	20	20	160	M1,C2,MD1	
	A/WUHAN/292/2000	20	80	320	320	1280	>2560	160	E2,E2,E1	
	A/HONG KONG/1924/2000	<20	<20	160	160	640	640	80	C2,C2,MD1	
	A/ENGLAND/192/2000	80	320	80	40	160	40	160	C2,E1,E3	
	A/SINGAPORE/37/2000	<20	20	160	160	640	1280	80	MD3	9.6.00
	A/SINGAPORE/44/2000	<20	<20	80	80	320	640	80	MD2	24.10.00
	A/PERTH/16/2000	40	80	640	640	1280	>2560	160	X,MD1	4.9.00
	A/PERTH/17/2000	40	40	320	640	>2560	>2560	80	X,MD1	7.9.00

FIGURE 2.1
Phylogenetic Relationships of Influenza A(H1N1) Haemagglutinins

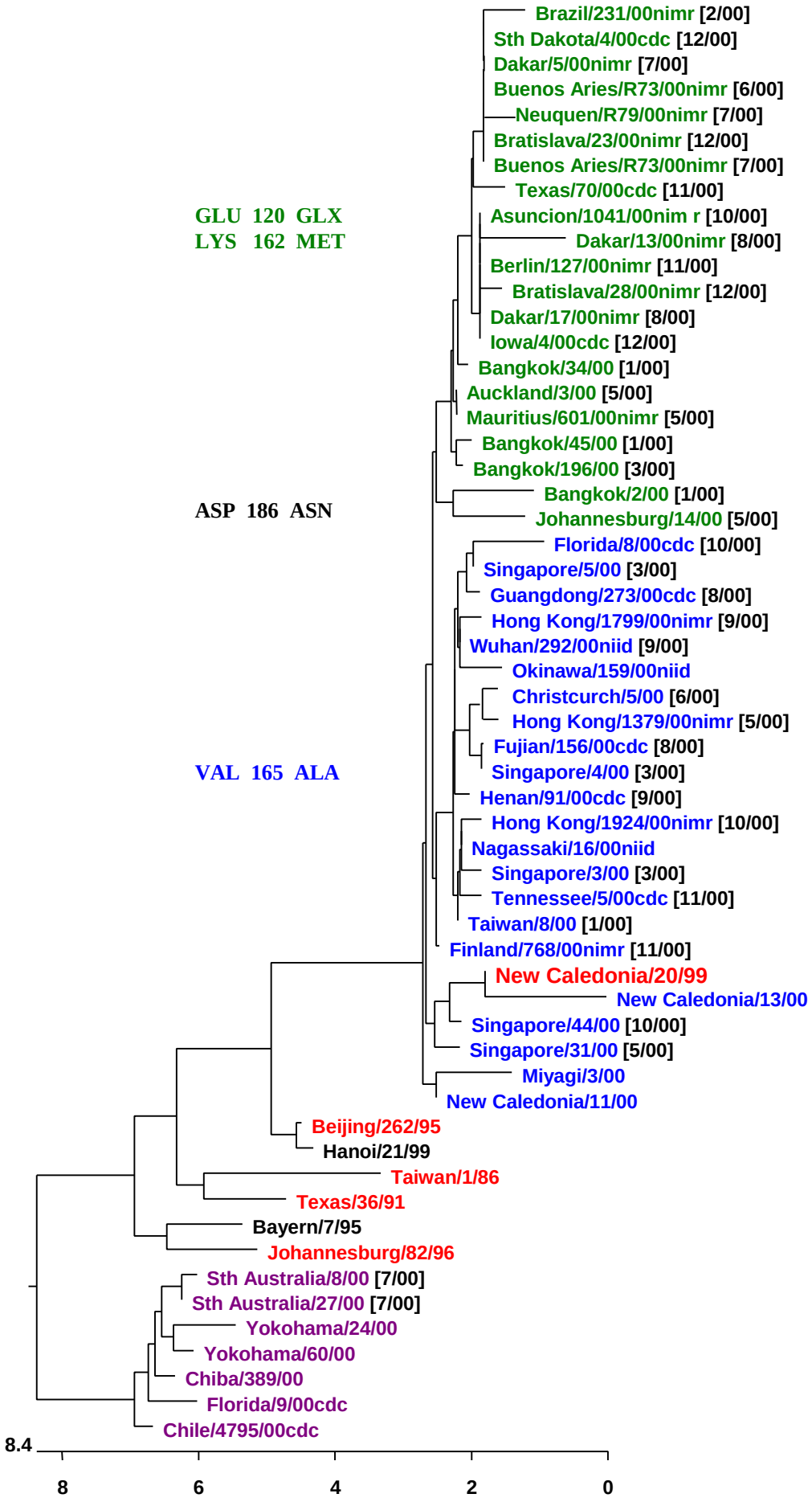
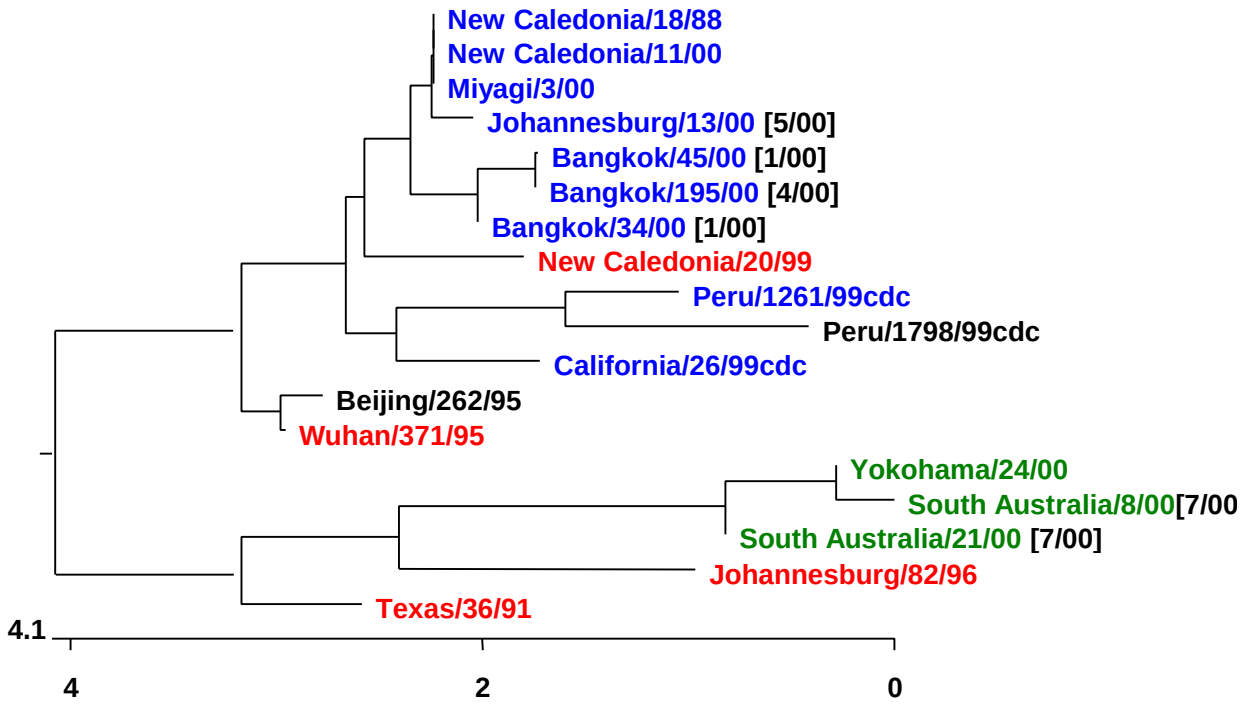


FIGURE 2.2
Phylogenetic Relationships of Influenza A(H1N1) Neuraminidases



3. INFLUENZA A (H3N2) STRAINS

TABLE 3.1

Summary - Characterization of Influenza A(H3N2) Isolates Received January 2000 - January 2001

Country	Jan - Aug 2000			
	A/Sydney/5/97 lineage strains	A/Sydney/5/97 low reacting strains*	A/Moscow/10/99 lineage strains	A/Moscow/10/99 low reacting strains*
Australia	7	23	98	21
Malaysia	0	0	2	0
New Caledonia	0	0	6	0
New Zealand	0	2	7	2
Philippines	0	1	1	1
Singapore	0	0	12	3
South Africa	0	0	3	3
Thailand	0	0	27	3
Taiwan	7	3	3	0
Vietnam	0	0	1	0
Total	**14**	**29**	**160**	**33**

Country	Sep 2000 - Jan 2001			
	A/Sydney/5/97 lineage strains	A/Sydney/5/97 low reacting strains*	A/Moscow/10/99 lineage strains	A/Moscow/10/99 low reacting strains*
Australia	0	0	197	122
Malaysia	0	0	0	0
New Caledonia	0	0	5	0
New Zealand	0	0	36	21
Philippines	0	0	0	0
Singapore	0	0	0	0
South Africa	0	0	0	0
Thailand	0	0	0	0
Taiwan	0	0	2	1
Vietnam	0	0	0	0
Total	**0**	**0**	**240**	**144**

TABLE 3.2
Haemagglutination-Inhibition Reactions of Influenza A(H3N2) Isolates

		ANTISERUM								
		A	**B**	**C**	**D**	**E**	**F**	**Human Sera Pool**	**Passage**	**Date**
		SYD/5	MOS/10	PAN/2007	TEHRAN	SYD/203	ULAN			
	REF. Ag									
A	A/SYDNEY/5/97	**640**	640	640	640	1280	640	80	CEK2,E5	
B	A/MOSCOW/10/99	320	**>2560**	640	640	1280	1280	160	E7	
C	A/PANAMA/2007/99	80	40	**640**	160	160	640	40	E7	
D	A/TEHRAN/14/99	160	640	640	**1280**	1280	1280	80	X2,E3	
E	A/SYDNEY/203/2000	640	1280	640	640	**>2560**	1280	80	E4	
F	A/ULAN/UDE/01/2000	320	80	320	640	320	**1280**	80	E6	
	TEST Ag									
	A/VICTORIA/346/2000	320	1280	640	640	640	640	160	X,MD1	
	A/WELLINGTON/13/2000	80	320	320	320	320	320	40	MDX,MD1	
	A/WAIKATO/7/2000	640	1280	640	1280	1280	1280	80	MDX,MD1	
	A/WAIKATO/10/2000	320	1280	1280	1280	>2560	1280	160	MEKX,MD1	
	A/WAIKATO/14/2000	640	1280	1280	1280	>2560	>2560	320	MDX,MD1	
	A/WAIKATO/15/2000	320	640	640	640	640	640	80	MEKX,MD1	
	A/WAIKATO/17/2000	40	160	80	160	80	80	<20	MEKX,MD1	
	A/STH AUST/101/2000	40	160	160	160	160	160	20	MDX,MD1	28.9.00
	A/STH AUST/136/2000	160	640	640	1280	1280	320	40	MDX,MD1	11.10.00
	A/BRISBANE/71/2000	80	160	160	160	160	160	<20	MDX,MD1	20.9.00
	A/BRISBANE/72/2000	80	640	640	640	1280	320	40	MDX,MD1	23.9.00
	A/BRISBANE/75/2000	80	160	160	320	320	320	20	MDX,MD1	03.10.00

FIGURE 3.1
Phylogenetic Relationships of Influenza A(H3N2) Haemagglutinins

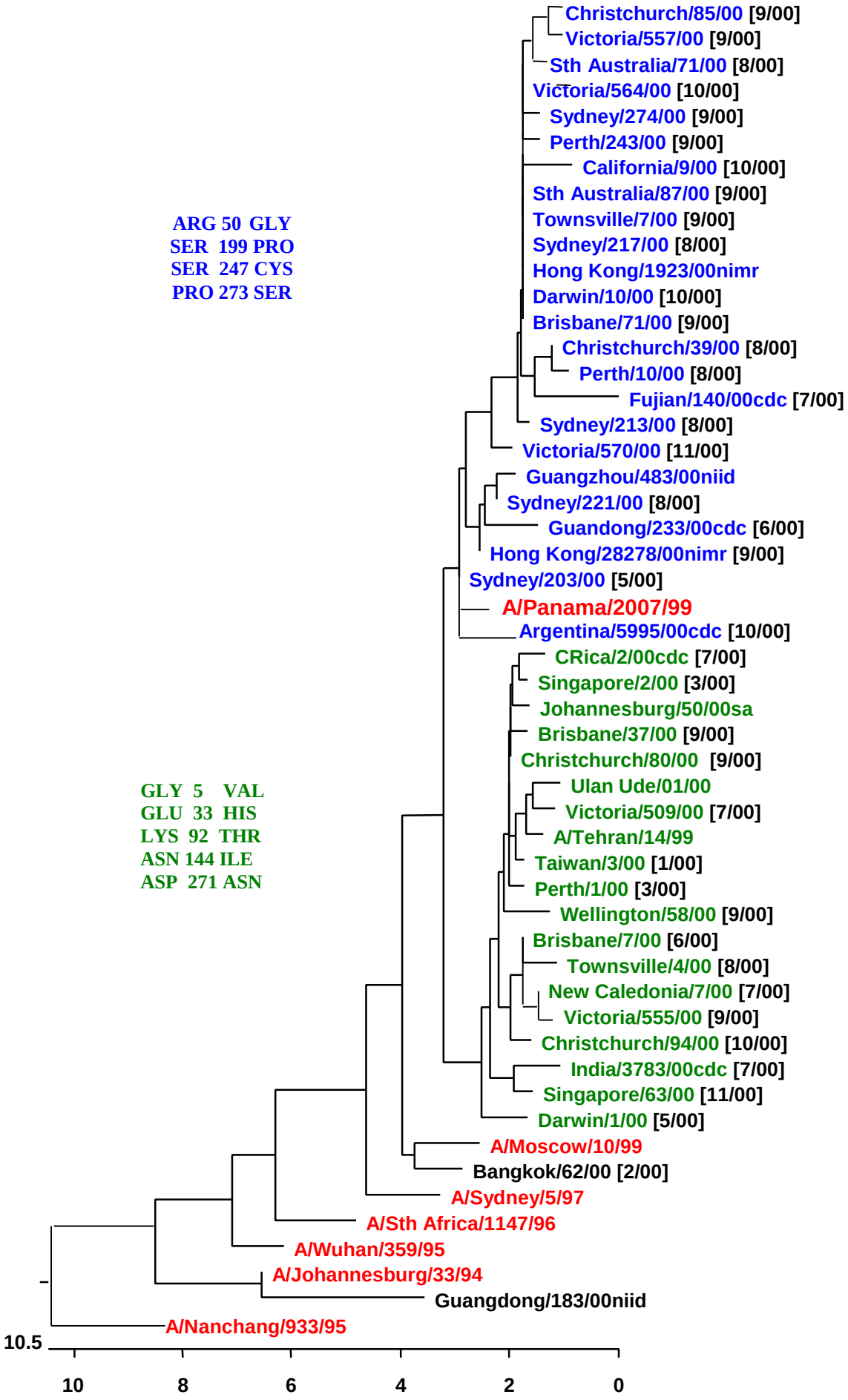
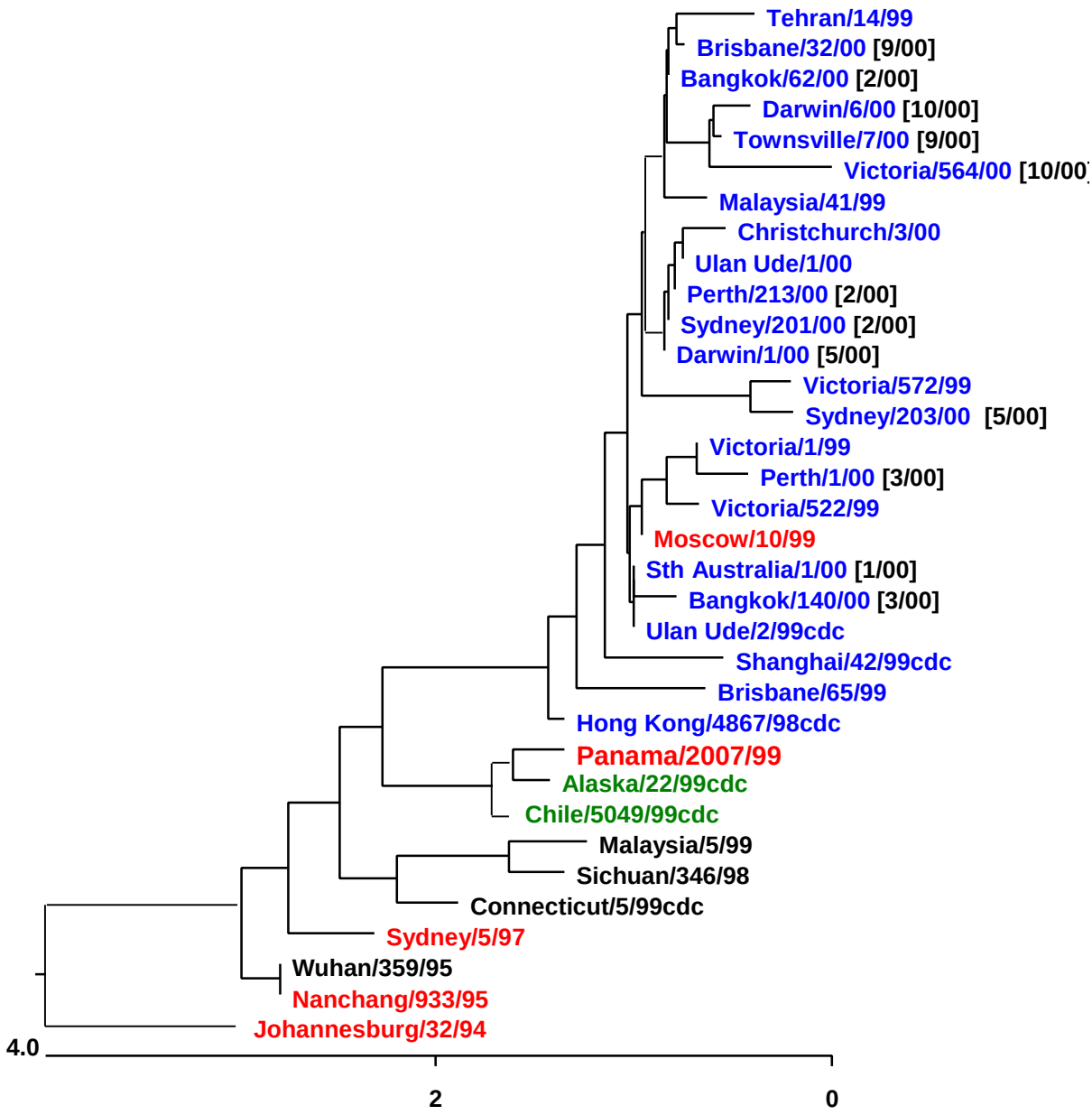


FIGURE 3.2
Phylogenetic Relationships of Influenza A(H3N2) Neuraminidases



4. INFLUENZA B STRAINS

TABLE 4.1

Summary - Characterization of Influenza B Isolates Received January 2000 - January 2001

Country	Jan - Aug 2000		
	B/Beijing/184/93 lineage strains	**B/Shangdong/7/97 lineage strains**	**B/Sichuan/379/99 lineage strains**
Australia	43	0	1
Malaysia	0	0	0
New Caledonia	0	0	0
New Zealand	11	0	2
Philippines	3	0	0
Singapore	12	0	0
South Africa	4	0	0
Thailand	16	0	0
Taiwan	6	1	0
Vietnam	0	6	0
Total	**95**	**7**	**3**

Country	Sep 2000 - Jan 2001		
	B/Beijing/184/93 lineage strains	**B/Shangdong/7/97 lineage strains**	**B/Sichuan/379/99 lineage strains**
Australia	128	0	71
Malaysia	0	0	0
New Caledonia	0	0	1
New Zealand	14	0	14
Philippines	0	0	0
Singapore	0	0	0
South Africa	0	0	0
Thailand	0	0	8
Taiwan	1	0	0
Vietnam	0	0	0
Total	**143**	**0**	**94**

TABLE 4.2
Haemagglutination-Inhibition Reactions of Influenza B Isolates

		ANTISERUM								
		A	**B**	**C**	**D**	**E**	**F**	**G**		
		BEIJ/184	YAM/166	SHEN/654	SICH/379	B/JOH/5	AUCK/1	JOH/45	PASSAGE	DATE
	REF. Ag									
A	B/BEIJING/184/93	**320**	320	20	1280	320	320	640	E10	
B	B/YAMANASH/166/98	320	**640**	40	>2560	640	640	640	E10	
C	B/SHENZHEN/654/99	40	40	**320**	160	160	160	160	E8	
D	B/SICHUAN/379/99	160	160	20	**640**	160	160	160	E11	
E	B/JOHANNESBURG/5/99	160	160	20	1280	**320**	160	640	E5	
F	B/AUCKLAND/1/2000	320	160	<20	320	160	**320**	320	CEK1E4	
G	B/JOHANNESBURG/45/99	160	160	20	640	160	160	**320**	E8	
	TEST Ag									
	B/VICTORIA/525/2000	160	40	160	320	320	160	320	MD2	13.9.00
	B/CHRISTCHURCH/9/2000	80	20	160	320	160	160	160	MD3	30.8.00
	B/CHRISTCHURCH/7/2000	160	40	160	640	640	320	640	MD2	16.8.00
	B/VICTORIA/733/2000	160	20	160	160	320	160	160	MD2	22.8.00
	B/VICTORIA/741/2000	80	40	160	320	320	160	320	MD2	05.9.00
	B/VICTORIA/1/2000	160	40	160	640	640	640	640	MD1	
	B/SHANGHAI/72/99	160	160	20	640	320	160	320	E5	
	B/MEXICO/84/2000	160	80	40	640	320	160	320	E5	
	B/MADAGASCAR/50212/99	80	160	20	640	160	80	320	E6	

TABLE 4.3
Haemagglutination-Inhibition Reactions of Influenza B Isolates

		ANTISERUM						
		A	**B**	**C**	**D**	**E**	**PASSAGE**	**DATE**
		BEIJ/184	YAM/166	SICH/379	B/JOH/5	VIC/504		
	REF. Ag							
A	B/BEIJING/184/93	**320**	320	640	640	320	E10	
B	B/YAMANASH/166/98	320	**320**	1280	320	160	E11	
C	B/SICHUAN/379/99	160	160	**640**	320	320	E9	
D	B/JOHANNESBURG/5/99	320	320	1280	**320**	320	E5	
E	B/VICTORIA/504/2000	80	<20	160	160	**320**	CEK1E1	
	TEST Ag							
	B/CHRISTCHURCH/22/2000	160	40	640	320	640	MD3	2.10.00
	B/VICTORIA/114/2000	160	80	640	320	640	MDX,MD1	26.9.00
	B/VICTORIA/107/2000	160	20	320	160	320	MKX,MD1	16.8.00
	B/WELLINGTON/21/2000	160	40	640	320	640	MDCK2	27.9.00
	B/BRISBANE/30/2000	160	40	640	320	640	MDX,MD1	19.9.00
	B/BRISBANE/38/2000	320	80	640	320	320	MDX,MD1	25.9.00
	B/STH AUST/85/2000	80	<20	160	160	320	MDX,MD1	7.9.00
	B/STH AUST/86/2000	80	20	320	160	320	MDX,MD1	7.9.00
	B/VICTORIA/321/2000	80	<20	320	160	640	X,MD1	12.9.00

FIGURE 4.1
Phylogenetic Relationships of Influenza B Haemagglutinins

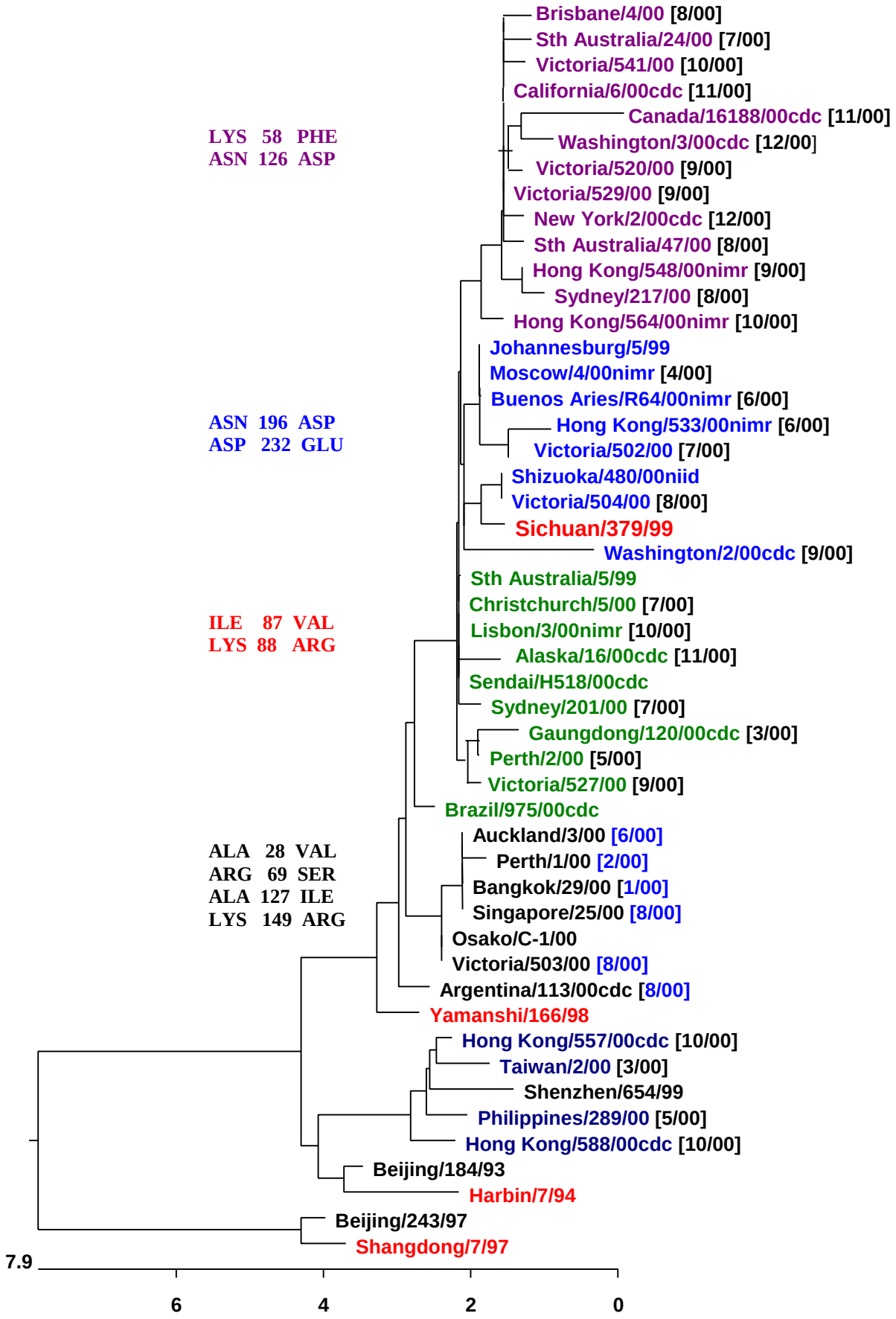
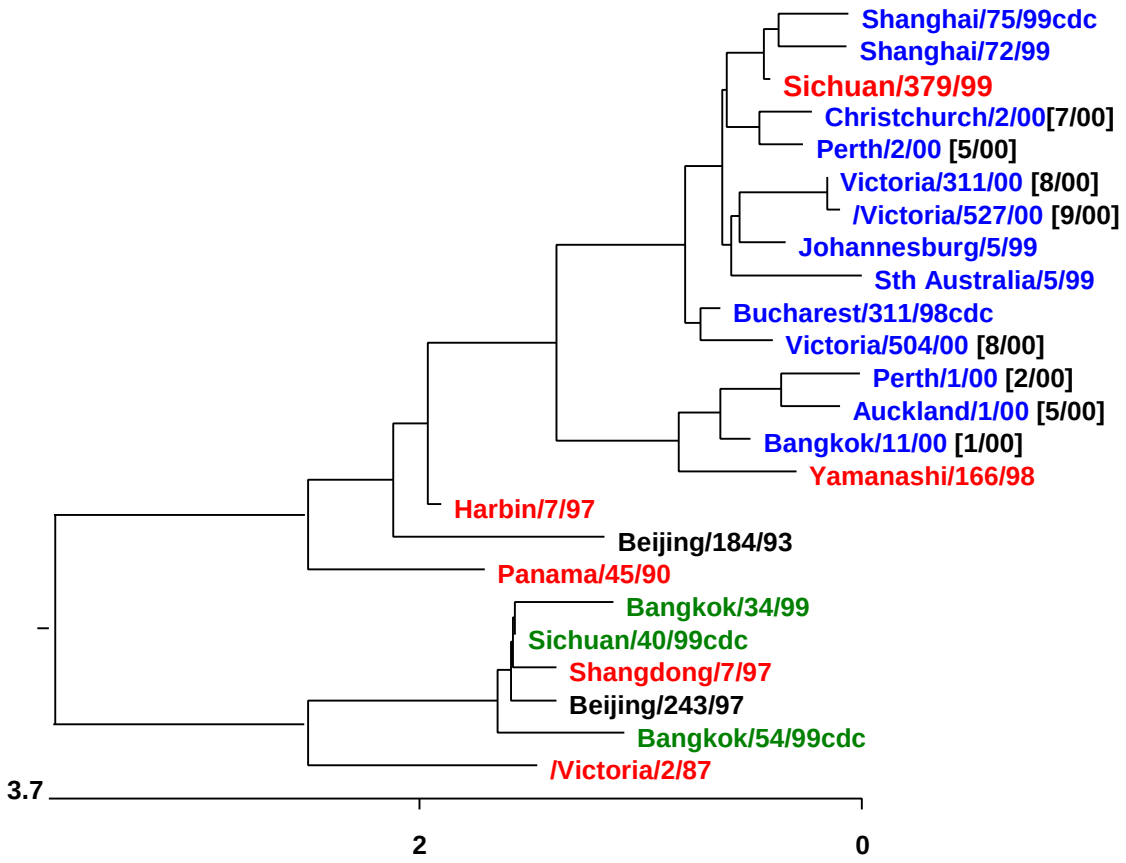


FIGURE 4.2
Phylogenetic Relationships of Influenza B Neuraminidases



5 SEROLOGY

Antibody assays were performed using panels of pre- and post-immunization sera from young adults and older adults immunised in Australia, Europe, Japan and USA during 2000. Vaccinees received a single dose of vaccine containing:

For Australia

an A/New Caledonia/20/99 (H1N1)-like strain
an A/Sydney/5/97 (H3N2)-like strain
a B/Beijing/184/93-like strain
(actual B/Yamanashi/166/98)

For Europe, Japan and the USA

an A/New Caledonia/20/99 (H1N1)-like strain
an A/Moscow/10/99 (H3N2)-like strain
(actual A/Panama/2007/99)
a B/Beijing/184/93-like strain
(actual B/Yamanashi/166/98)

Assays Conducted January 2001

TABLE 5.1
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H1N1) Vaccine Component
Young Adults

Population	N	Antigen	Passage History	% Rise	GMT		%$40	
					Pre	Post	Pre	Post
Australian Younger Adult	22	A/Wuhan/292/2000	E2/E3	36	116.7	300.4	95	100
		A/New Caledonia/20/99	E4	73	25.7	132.4	41	95
		A/Texas/87/2000	MDCK1	59	8	32.1	14	64
American Younger Adult	24	A/Wuhan/292/2000	E2/E3	42	82.3	310.8	75	100
		A/New Caledonia/20/99	E4	46	41.2	179.5	54	100
		A/Texas/87/2000	MDCK1	38	26.7	92.4	50	88
British Younger Adult	24	A/Wuhan/292/2000	E2/E3	96	16.3	359.1	29	100
		A/New Caledonia/20/99	E4	100	8.4	232.8	0	100
		A/Texas/87/2000	MDCK1	100	6.3	169.5	0	96
Japanese Younger Adult	28	A/Wuhan/292/2000	E2/E3	46	13.1	46.4	14	61
		A/New Caledonia/20/99	E4	39	9.5	36.2	11	50
		A/Texas/87/2000	MDCK1	25	8	18.1	11	39

TABLE 5.2
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H1N1) Vaccine Component
Older Adults

Population	N	Antigen	Passage History	% Rise	GMT		%$40	
					Pre	Post	Pre	Post
Australian Older Adult	25	A/Wuhan/292/2000	E2/E3	24	97.1	205.3	100	100
		A/New Caledonia/20/99	E4	72	21.1	89.4	52	88
		A/Texas/87/2000	MDCK1	56	9.7	27.9	12	56
American Older Adult	25	A/Wuhan/292/2000	E2/E3	33	59.9	138.4	75	88
		A/New Caledonia/20/99	E4	42	24.5	71.3	50	75
		A/Texas/87/2000	MDCK1	29	16.8	32.7	33	63
British Older Adult	25	A/Wuhan/292/2000	E2/E3	88	18.9	226.2	38	100
		A/New Caledonia/20/99	E4	88	9.2	130.7	4	92
		A/Texas/87/2000	MDCK1	88	8.7	89.8	4	92
Japanese Older Adult	30	A/Wuhan/292/2000	E2/E3	77	7.2	34	3	50
		A/New Caledonia/20/99	E4	60	5.6	19.5	3	33
		A/Texas/87/2000	MDCK1	40	5.07	12.9	0	23

Assays Conducted in September 2000

TABLE 5.3
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H1N1) Vaccine Component
Young Adults

Population	N	Antigen	Passage History	% Rise	GMT		% ³ 40		% ³ 160	
					Pre	Post	Pre	Post	Pre	Post
Australian Younger Adult	22	A/New Caledonia/20/99	IVR-116	72	22.7	96.6	32	96	0	46
		A/New Caledonia/20/99	E4	77	16.0	77.5	23	91	0	36
		A/Auckland/3/2000	CEK1E3	63	20.6	80.0	32	86	5	46
		A/Johannesburg/82/96	E5	9	120.5	205.8	96	91	64	77
American Younger Adult	24	A/New Caledonia/20/99	IVR-116	38	23.8	75.5	38	83	13	25
		A/New Caledonia/20/99	E4	38	15.9	56.6	29	71	8	21
		A/Auckland/3/2000	CEK1E3	38	17.8	61.7	33	75	13	17
		A/Johannesburg/82/96	E5	29	80.0	201.5	79	92	33	71
British Younger Adult	24	A/New Caledonia/20/99	IVR-116	96	6.3	164.6	0	83	0	63
		A/New Caledonia/20/99	E4	96	5.6	164.6	0	92	0	58
		A/Auckland/3/2000	CEK1E3	92	5.8	155.4	0	79	0	67
		A/Johannesburg/82/96	E5	88	23.1	269.0	54	96	0	63

TABLE 5.4
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H1N1) Vaccine Component
Older Adults

Population	N	Antigen	Passage History	% Rise	GMT		% ³ 40		% ³ 160	
					Pre	Post	Pre	Post	Pre	Post
Australian Older Adult	25	A/New Caledonia/20/99	IVR-116	68	25.0	97.1	48	100	0	48
		A/New Caledonia/20/99	E4	60	16.9	60.6	40	84	0	16
		A/Auckland/3/2000	CEK1E3	60	19.5	64.1	32	88	0	12
		A/Johannesburg/82/96	E5	0	139.3	217.0	100	100	68	88
American Older Adult	24	A/New Caledonia/20/99	IVR-116	17	15.0	40.0	25	58	4	21
		A/New Caledonia/20/99	E4	17	10.6	24.5	13	46	0	8
		A/Auckland/3/2000	CEK1E3	25	11.9	30.8	13	46	4	17
		A/Johannesburg/82/96	E5	8	53.4	77.7	8	83	17	29
British Older Adult	24	A/New Caledonia/20/99	IVR-116	83	7.7	80.0	4	79	0	33
		A/New Caledonia/20/99	E4	88	6.1	69.2	4	75	0	29
		A/Auckland/3/2000	CEK1E3	88	6.1	69.2	4	79	0	29
		A/Johannesburg/82/96	E5	71	21.8	130.7	42	92	8	50

TABLE 5.5
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H3N2) Vaccine Component
Young Adults

Population	N	Antigen	Passage History	% Rise	GMT		%$40	
					Pre	Post	Pre	Post
Australian Younger Adult	22	A/Panama/2007/99	E7	32	31.1	82.5	55	91
		A/Fujian/40/2000	E2E4	27	20.0	62.2	36	82
		A/Hong Kong/1923/2000	C2/C2/MDCK1	45	12.9	37.6	27	64
		A/Lyon/1242/2000	MDCK4	32	10.0	22.7	9	27
American Younger Adult	24	A/Panama/2007/99	E7	54	42.4	146.7	54	96
		A/Fujian/40/2000	E2E4	46	34.6	109.9	54	96
		A/Hong Kong/1923/2000	C2/C2/MDCK1	66	23.1	87.2	46	100
		A/Lyon/1242/2000	MDCK4	42	14.6	40.0	17	83
British Younger Adult	24	A/Panama/2007/99	E7	92	16.3	179.5	17	100
		A/Fujian/40/2000	E2E4	96	11.2	174.4	13	100
		A/Hong Kong/1923/2000	C2/C2/MDCK1	100	9.7	77.7	0	92
		A/Lyon/1242/2000	MDCK4	79	8.4	33.6	0	58
Japanese Younger Adult	28	A/Panama/2007/99	E7	29	16.0	33.6	21	57
		A/Fujian/40/2000	E2E4	29	14.9	30.5	18	46
		A/Hong Kong/1923/2000	C2/C2/MDCK1	18	12.5	21.0	11	36
		A/Lyon/1242/2000	MDCK4	11	7.6	11.0	4	11

TABLE 5.6
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H3N2) Vaccine Component
Older Adults

Population	N	Antigen	Passage History	% Rise	GMT		%$40	
					Pre	Post	Pre	Post
Australian Older Adult	25	A/Panama/2007/99	E7	60	27.9	84.5	44	92
		A/Fujian/40/2000	E2E4	40	23.0	59.0	36	72
		A/Hong Kong/1923/2000	C2/C2/MDCK1	32	12.5	27.1	20	56
		A/Lyon/1242/2000	MDCK4	12	11.5	20	8	28
American Older Adult	24	A/Panama/2007/99	E7	33	34.6	84.7	54	88
		A/Fujian/40/2000	E2E4	29	31.7	73.3	50	83
		A/Hong Kong/1923/2000	C2/C2/MDCK1	42	20.6	51.9	33	88
		A/Lyon/1242/2000	MDCK4	25	13.3	25.9	13	42
British Older Adult	24	A/Panama/2007/99	E7	83	20.0	146.7	38	100
		A/Fujian/40/2000	E2E4	79	17.3	119.8	33	96
		A/Hong Kong/1923/2000	C2/C2/MDCK1	54	15.9	56.6	29	75
		A/Lyon/1242/2000	MDCK4	33	9.2	23.1	8	33
Japanese Older Adult	30	A/Panama/2007/99	E7	53	14.1	51.6	23	70
		A/Fujian/40/2000	E2E4	50	13.8	49.2	30	67
		A/Hong Kong/1923/2000	C2/C2/MDCK1	43	11.5	30.3	13	63
		A/Lyon/1242/2000	MDCK4	13	8.3	13.2	10	13

Assays Conducted September 2000

TABLE 5.7
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H3N2) Vaccine Component
Young Adults

Population	N	Antigen	Passage History	% Rise	GMT		% ³ 40		% ³ 160	
					Pre	Post	Pre	Post	Pre	Post
Australian Younger Adult	22	A/Sydney/5/97	CEK2E5	27	37.6	90.7	55	96	9	41
		A/Panama/2007/99	E7	27	56.6	145.5	96	100	18	59
		A/Tehran/14/99	E2E5	23	66.2	145.5	73	96	0	36
		A/Sydney/203/2000	E4	18	40.0	90.7	73	96	0	36
		A/Ulan Ude/1/2000	E5	23	87.9	187.2	100	100	27	68
		A/Victoria/509/2000	CEK3E2	14	99.7	187.2	100	100	36	77
		A/Brazil/991/2000	EXE4	9	106.2	193.2	100	100	36	77
American Younger Adult	24	A/Sydney/5/97	CEK2E5	25	25.9	56.6	50	75	13	25
		A/Panama/2007/99	E7	50	24.5	92.4	38	92	13	38
		A/Tehran/14/99	E2E5	38	25.2	71.3	38	75	13	29
		A/Sydney/203/2000	E4	42	17.8	58.2	38	75	13	29
		A/Ulan Ude/1/2000	E5	42	40.0	123.3	71	96	17	50
		A/Victoria/509/2000	CEK3E2	42	29.1	87.2	42	92	17	42
		A/Brazil/991/2000	EXE4	33	40.0	103.7	58	96	17	42
British Younger Adult	24	A/Sydney/5/97	CEK2E5	96	10.9	100.8	17	92	0	42
		A/Panama/2007/99	E7	96	9.7	130.7	8	50	4	42
		A/Tehran/14/99	E2E5	96	9.4	130.7	0	100	0	38
		A/Sydney/203/2000	E4	96	7.1	106.8	0	100	0	38
		A/Ulan Ude/1/2000	E5	96	13.3	253.9	21	100	0	79
		A/Victoria/509/2000	CEK3E2	96	10.3	142.5	8	100	0	46
		A/Brazil/991/2000	EXE4	96	13.7	184.8	17	100	0	58

TABLE 5.8
Haemagglutination Inhibition Antibody Responses
Influenza Type A(H3N2) Vaccine Component
Older Adults

Population	N	Antigen	Passage History	% Rise	GMT		% ³ 40		% ³ 160	
					Pre	Post	Pre	Post	Pre	Post
Australian Older Adult	25	A/Sydney/5/97	CEK2E5	36	25.7	67.7	40	80	8	24
		A/Panama/2007/99	E7	28	59.0	131.7	92	100	8	52
		A/Tehran/14/99	E2E5	32	51.3	124.6	64	100	8	28
		A/Sydney/203/2000	E4	28	37.8	86.9	64	100	8	28
		A/Ulan Ude/1/2000	E5	20	75.7	160.0	100	100	16	64
		A/Victoria/509/2000	CEK3E2	16	80.0	155.6	100	100	20	60
		A/Brazil/991/2000	EXE4	8	97.1	164.5	100	100	20	72
American Older Adult	24	A/Sydney/5/97	CEK2E5	33	20.6	42.4	38	67	0	13
		A/Panama/2007/99	E7	50	20.0	59.9	29	83	4	25
		A/Tehran/14/99	E2E5	42	21.2	51.9	29	75	0	13
		A/Sydney/203/2000	E4	33	18.9	43.6	29	75	0	13
		A/Ulan Ude/1/2000	E5	46	32.7	87.2	58	92	4	38
		A/Victoria/509/2000	CEK3E2	42	21.8	53.4	33	75	0	17
		A/Brazil/991/2000	EXE4	29	30.8	71.3	54	88	8	33
British Older Adult	24	A/Sydney/5/97	CEK2E5	75	13.7	80.0	21	83	4	29
		A/Panama/2007/99	E7	75	16.3	109.9	29	92	4	50
		A/Tehran/14/99	E2E5	79	13.7	92.4	21	83	8	46
		A/Sydney/203/2000	E4	75	14.1	97.9	21	83	8	46
		A/Ulan Ude/1/2000	E5	79	23.1	184.8	42	100	8	71
		A/Victoria/509/2000	CEK3E2	71	17.3	106.8	33	88	8	50
		A/Brazil/991/2000	EXE4	71	19.4	130.7	38	100	8	58

TABLE 5.9
Haemagglutination Inhibition Antibody Responses
Influenza Type B Vaccine Component
Young Adults

Population	N	Antigen	Passage History	% Rise	GMT		%$40	
					Pre	Post	Pre	Post
Australian Younger Adult	22	B/Yamanashi/166/98	E6	45	51.5	212.4	77	100
		B/Victoria/504/2000	CEK1E10	36	58.4	199.4	86	100
		B/Alaska/16/200	E5	36	66.2	226.2	91	100
American Younger Adult	24	B/Yamanashi/166/98	E6	42	67.3	246.7	67	100
		B/Victoria/504/2000	CEK1E10	38	59.9	201.5	67	100
		B/Alaska/16/200	E5	38	47.6	151.0	63	100
British Younger Adult	24	B/Yamanashi/166/98	E6	96	23.1	319.9	38	100
		B/Victoria/504/2000	CEK1E10	100	28.3	348.8	42	100
		B/Alaska/16/200	E5	100	23.8	293.3	38	100
Japanese Younger Adult	28	B/Yamanashi/166/98	E6	32	50.0	131.2	75	96
		B/Victoria/504/2000	CEK1E10	25	56.6	141.3	71	100
		B/Alaska/16/200	E5	29	55.2	141.3	71	96

TABLE 5.10
Haemagglutination Inhibition Antibody Responses
Influenza Type B Vaccine Component
Older Adults

Population	N	Antigen	Passage History	% Rise	GMT		%$40	
					Pre	Post	Pre	Post
Australian Older Adult	25	B/Yamanashi/166/98	E6	32	51.3	135.4	72	100
		B/Victoria/504/2000	CEK1E10	32	44.7	117.9	64	96
		B/Alaska/16/200	E5	40	47.2	114.7	68	100
American Older Adult	24	B/Yamanashi/166/98	E6	4	65.3	97.9	83	88
		B/Victoria/504/2000	CEK1E10	4	59.9	87.2	79	88
		B/Alaska/16/200	E5	0	63.5	84.7	79	88
British Older Adult	24	B/Yamanashi/166/98	E6	75	21.8	269.0	38	100
		B/Victoria/504/2000	CEK1E10	79	22.4	213.5	29	100
		B/Alaska/16/200	E5	83	22.4	261.3	33	100
Japanese Older Adult	30	B/Yamanashi/166/98	E6	30	10.7	28.3	17	43
		B/Victoria/504/2000	CEK1E10	43	13.5	41.9	30	53
		B/Alaska/16/200	E5	47	12.3	38.2	27	53

Assays Conducted in September 2000

TABLE 5.11
Haemagglutination Inhibition Antibody Responses
Influenza Type B Vaccine Component
Young Adults

Population	N	Antigen	Passage History	% Rise	GMT		% ³ 40		% ³ 160	
					Pre	Post	Pre	Post	Pre	Post
Australian Younger Adult	22	B/Yamanashi/166/98	E6	55	85.2	438.3	91	100	41	100
		B/Johannesburg/5/99	E4	59	49.9	233.4	73	100	18	73
		B/Sichuan/379/99	CEK1E4	50	54.8	212.4	86	100	18	73
		B/Auckland/1/2000	CEK1E2	50	56.6	256.6	86	100	18	82
		B/Christchurch/2/2000	CEK2E3	36	58.4	165.1	86	100	18	64
		B/Nanchang/1/2000	X1E1E4	18	28.3	62.2	50	86	0	64
		B/Zagreb/3578/99	EXE3E1	50	49.9	175.8	68	100	18	64
American Younger Adult	24	B/Yamanashi/166/98	E6	38	67.3	269.0	38	100	33	79
		B/Johannesburg/5/99	E4	50	49.0	232.8	67	100	29	75
		B/Sichuan/379/99	CEK1E4	33	44.9	164.6	63	92	21	58
		B/Auckland/1/2000	CEK1E2	-	-	-	-	-	-	-
		B/Christchurch/2/2000	CEK2E3	42	27.5	103.7	46	92	17	50
		B/Nanchang/1/2000	X1E1E4	25	12.2	28.3	17	38	4	17
		B/Zagreb/3578/99	EXE3E1	38	31.7	103.7	54	88	21	46
British Younger Adult	24	B/Yamanashi/166/98	E6	100	17.8	452.4	38	100	0	96
		B/Johannesburg/5/99	E4	100	12.2	261.3	29	96	0	88
		B/Sichuan/379/99	CEK1E4	96	13.7	246.7	29	100	4	79
		B/Auckland/1/2000	CEK1E2	96	13.3	226.2	38	100	0	75
		B/Christchurch/2/2000	CEK2E3	100	12.6	190.2	17	83	0	46
		B/Nanchang/1/2000	X1E1E4	67	7.1	35.6	0	54	0	13
		B/Zagreb/3578/99	EXE3E1	96	13.0	190.2	25	100	0	75

TABLE 5.12
Haemagglutination Inhibition Antibody Responses
Influenza Type B Vaccine Component
Older Adults

Population	N	Antigen	Passage History	% Rise	GMT		% ³ 40		% ³ 160	
					Pre	Post	Pre	Post	Pre	Post
Australian Older Adult	24	B/Yamanashi/166/98	E6	29	87.2	211.1	96	100	42	83
		B/Johannesburg/5/99	E4	36	45.9	121.2	76	100	12	56
		B/Sichuan/379/99	CEK1E4	38	43.6	111.6	67	96	8	50
		B/Auckland/1/2000	CEK1E2	29	59.9	135.4	79	96	25	58
		B/Christchurch/2/2000	CEK2E3	16	54.3	99.8	80	100	16	40
		B/Nanchang/1/2000	X1E1E4	4	21.1	33.9	32	60	4	8
		B/Zagreb/3578/99	EXE3E1	28	43.5	111.6	72	100	8	36
American Older Adult	24	B/Yamanashi/166/98	E6	4	75.5	113.1	92	100	20	54
		B/Johannesburg/5/99	E4	4	53.4	80.0	71	75	21	38
		B/Sichuan/379/99	CEK1E4	4	36.7	58.2	67	79	13	25
		B/Auckland/1/2000	CEK1E2	-	-	-	-	-	-	-
		B/Christchurch/2/2000	CEK2E3	4	27.5	40.0	54	71	8	8
		B/Nanchang/1/2000	X1E1E4	4	19.4	25.2	33	33	8	8
		B/Zagreb/3578/99	EXE3E1	8	30.8	46.2	54	88	21	46
British Older Adult	24	B/Yamanashi/166/98	E6	83	25.9	348.8	42	100	4	83
		B/Johannesburg/5/99	E4	88	12.2	179.5	17	96	4	63
		B/Sichuan/379/99	CEK1E4	88	13.3	169.5	17	100	0	54
		B/Auckland/1/2000	CEK1E2	79	16.8	174.4	38	96	4	63
		B/Christchurch/2/2000	CEK2E3	83	12.2	113.1	17	83	0	46
		B/Nanchang/1/2000	X1E1E4	54	11.6	37.7	13	54	4	21
		B/Zagreb/3578/99	EXE3E1	71	15.4	155.4	17	100	4	50