

Influenza A(H1N1) virus resistance to oseltamivir - 2008 influenza season, southern hemisphere

20 August 2008

During weeks 28-32 (6 July -9 August), influenza activity is increased in the southern hemisphere. Widespread influenza activity was reported by New Zealand with influenza A(H3) and B viruses circulating. Sporadic influenza activity has been detected in Argentina A(H1), Brazil (A, B) and Chile (A, B), (see *Seasonal influenza activity in the world, 2008* <http://www.who.int/csr/disease/influenza/update/en/index.html>).

WHO has received several reports from National Influenza Centres in the southern hemisphere regarding influenza A(H1N1) virus resistance to oseltamivir. In South Africa, a total of 139 A(H1N1) viruses have been isolated during the 2008 influenza season to date. Of those, 107 isolates have been tested for oseltamivir resistance by the National Institute of Communicable Diseases (NICD) and 100% were found to be resistant to oseltamivir by genotypic analysis. Only one of these 107 patients was receiving oseltamivir at the time of sampling, and no unusual clinical features or underlying conditions were found. From Australia, 10 of 10 A(H1N1) viruses tested, and from Chile, 4 of 32 A(H1N1) viruses tested showed the specific neuraminidase mutation (H274Y) associated with oseltamivir resistance.

WHO is collecting global data about this phenomenon from multiple laboratories participating in [Global Influenza Surveillance Network](#). Data from European countries participating in EISS were provided by the [EISS](#) and [VirGIL](#) project. This summary table will be updated regularly (every four weeks).

Oseltamivir resistance results were based on phenotypic and/or genotypic analyses.

For background and summary until week 24, 2008, see *Influenza A(H1N1) virus resistance to oseltamivir, Last quarter 2007 to first quarter 2008, Preliminary summary and future plans* http://www.who.int/csr/disease/influenza/oseltamivir_summary/en/index.html

Table 1. Influenza A(H1N1) virus resistance to oseltamivir (Second quarter 2008 - 20 August 2008)

WHO region	Country, area or territory	No. of H1N1 isolates tested	No.(%) of isolates resistant to oseltamivir
AFRO	Madagascar	9	0
	South Africa	107	107 (100%)
	Ghana	10	2 (20%)
	Seychelles	8	5
	Cameroon	2	2
AFRO Total		136	116 (85%)
AMRO	Chile	32	4 (13%)

	Argentina	5	2	
	Guadeloupe	1	0	
	Guatemala	2	0	
AMRO Total		40	6	(15%)
EMRO	Jordan	2	1	
EMRO Total		2	1	
EURO	France	1	1	
	Netherlands	1	0	
	Norway	7	6	
	Russian Federation	7	4	
EURO Total		17	12	(71%)
WPRO	Australia	10	10	(100%)
	China, Hong Kong SAR	583	97	(17%)
WPRO Total		593	107	(18%)
Grand Total		788	242	(31%)

*If the number of isolates tested was below 10, percentage is not shown.

Table 2. Influenza A(H1N1)virus resistance to oseltamivir (Last quarter 2007 - 31 March 2008)

WHO region	Country, area or territory	No. of H1N1 isolates tested	No.(%) of isolates resistant to oseltamivir
AFRO	Algeria	2	0
	Cameroon	5	3
	Kenya	11	0
	Madagascar	59	0
	Senegal	16	0
AFRO Total		93	3 (3%)
AMRO	Brazil	16	0
	Canada	508	134 (26%)
	Chile	5	0
	Ecuador	3	0
	El Salvador	1	0
	Honduras	2	0
	Mexico	20	0
	Montserrat	3	3
	United States of America	1026	126 (12%)
AMRO Total		1584	263 (17%)
EMRO	Egypt	6	0
	Iraq	1	0
	Marocco	1	0
	Qatar	4	0
EMRO Total		12	0
EURO	Austria	164	12 (7%)
	Belarus	7	2
	Belgium	32	17 (53%)
	Bulgaria	9	0
	Croatia	6	0

	Czech Republic	24	0	
	Denmark	45	2	(4%)
	Estonia	7	3	
	Finland	13	3	(23%)
	France	496	231	(47%)
	Germany	505	66	(13%)
	Greece	65	7	(11%)
	Hungary	11	0	
	Iceland	10	2	(20%)
	Ireland	63	7	(11%)
	Italy	106	1	(1%)
	Kazakhstan	1	1	
	Latvia	15	0	
	Luxembourg	227	59	(26%)
	Netherlands	170	46	(27%)
	Norway	265	178	(67%)
	Poland	8	1	
	Portugal	29	6	(21%)
	Romania	49	4	(8%)
	Russian Federation	128	58	(45%)
	Serbia	18	0	
	Slovakia	14	0	
	Slovenia	28	1	(4%)
	Spain	106	2	(2%)
	Sweden	36	4	(11%)
	Switzerland	53	10	(19%)
	Turkey	33	6	(18%)
	Ukraine	67	23	(34%)
	United Kingdom	346	37	(11%)
EURO Total		3156	789	(25%)
WPRO	Australia	84	3	(4%)
	China	4	0	
	China, Hong Kong SAR	666	79	(12%)
	Guam	15	0	
	Japan	1652	44	(3%)
	Malaysia	13	0	
	Mongolia	5	0	
	New Zealand	88	0	
	Philippines	37	0	
	Republic of Korea	99	0	
	Singapore	7	0	
WPRO Total		2670	126	(5%)
SEARO	Thailand	13	1	(8%)
SEARO Total		13	1	(8%)
Grand Total		7528	1182	(16%)

*If the number of isolates tested was below 10, percentage is not shown.