Influenza Weekly Report

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Chinese Center for Disease Control and Prevention
National Institute for Viral Disease Control and Prevention

Chinese Influenza Weekly Report (Week 32: August 9- 15, 2010)

(All data are preliminary and may change as more reports are received)

Pandemic (H1N1) 2009 Surveillance

During week 32, 19 confirmed cases of pandemic influenza H1N1 2009 were reported. No severe or death case was reported in this week. Except 1 severe case was reported in week 25, no severe case was reported since week 22. No death was reported for 14 consecutive weeks since week 19. Since the first case of pandemic influenza H1N1 2009 was reported on May 11, 2009, as of August 15, 2010, 128051 confirmed cases and 805 deaths of pandemic influenza H1N1 2009 have been reported nationwide, which cover 31 provinces and the Xinjiang Production and Construction Corps in mainland China.

(Note: After cases are reported to the system, the information would be checked by local CDC at all levels to ensure accuracy. From week 3, 2010, data collected in the weekly report refers to the information after examination.)

Outbreak Surveillance

During week 32, 1 outbreak[1] of seasonal influenza A (H3N2) was reported with 17 cases in total, which occurred in Guangdong. No death case was reported. No outbreak of pandemic influenza H1N1 2009 or ILI was reported.

Influenza-like Illness (ILI) Surveillance

During week 32, the percentage of visits with ILI (ILI%) of sentinel hospitals in South China was 4.1%, which was lower than that of week 31 (4.2%). It was lower than the level seen during the same period of 2007-2008 (4.9%) and 2008-2009 (4.7%) season. Except for week 41 and 42, the ILI% showed an increasing trend in general since the week 34 and reached peak in week 48 (7.7%), but it decreased rapidly after

[1] Outbreak refers to a sudden increase of acute febrile respiratory illness cases in a unit or area, confirmed by laboratory detection as seasonal influenza or pandemic influenza H1N1 2009 outbreak.

that. Since week 53, it showed a fluctuated trend. From week 24, the ILI% increased slightly. (Figure 1)

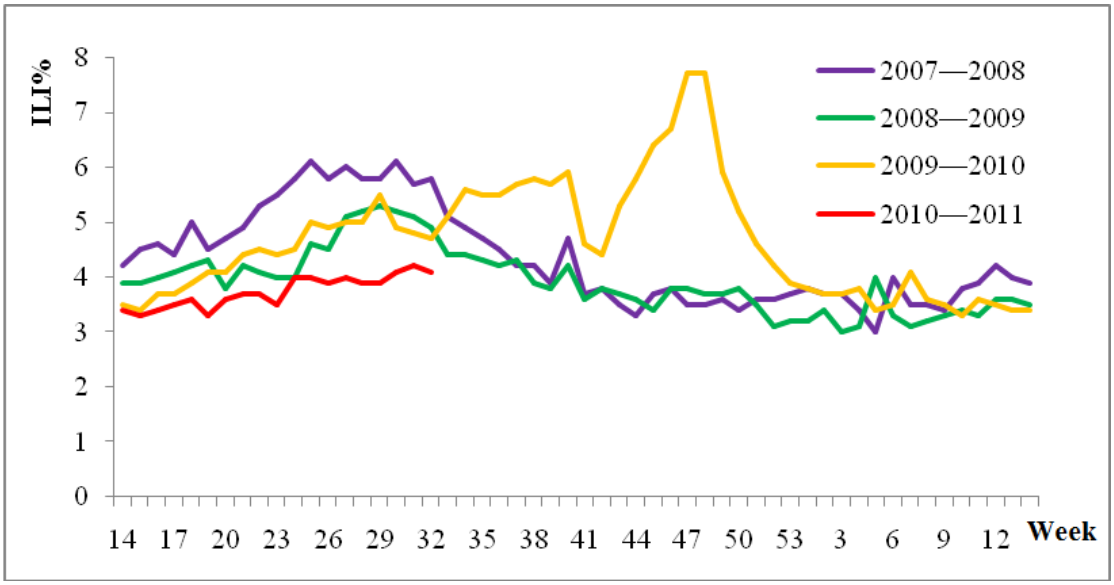

Figure 1. Percentage of Visits for ILI of Sentinel Hospitals in South China (2007-2010)

During week 32, the ILI% of sentinel hospitals in North China was 3.8%, which was similar as that of week 31 (3.8%). It was lower than the level seen during the same period of 2008-2009 season (4.9%). Except for week 41, the ILI% showed an increasing trend in general since week 36, and reached peak in week 44 (12.2%). After that, it showed a declining trend and fluctuated since week 53. During week 53 to week 7, the ILI% fluctuated from 5.2% to 6.1%; since week 8, the ILI% fluctuared from 3.7% to 4.6%. (Figure 2)

Figure 2. Percentage of Visits for ILI of Sentinel Hospitals in North China

(2007-2010)

Virologic Surveillance

During week 32, network laboratories tested 2272 specimens, of which 260 (11.4%) were positive for influenza: 219 (84.2%) were influenza A and 41 (15.8%) were influenza B. 6.2% (16/260) of positive specimens were pandemic influenza H1N1 2009. Of the 219 influenza A detections: 145 (66.2%) were influenza A (H3N2), 54 (24.7%) were influenza A (pandemic influenza H1N1 2009 excluded), 16 (7.3%) were pandemic influenza H1N1 2009. All of the 41 influenza B detections were influenza B (lineage not determined). (Table 1)

Table 1 Laboratory Detections of ILI Specimens (Week 32, 2010)

	Week 32		
	South China	**North China**	**Total**
No. of specimens tested	**1588**	**684**	**2272**
No. of positive specimens (%)	**233(14.7%)**	**27(3.9%)**	**260(11.4%)**
Influenza A	**192(82.4%)**	**27(100%)**	**219(84.2%)**
A (H1N1)	0(0)	0(0)	0(0)
A (H3N2)	130(67.7%)	15(55.6%)	145(66.2%)
A (pandemic influenza H1N1 2009 excluded)[2]	42(21.9%)	12(44.4%)	54(24.7%)
Pandemic influenza H1N1 2009	16(8.3%)	0(0)	16(7.3%)
A (pandemic influenza H1N1 2009 not excluded)[3]	4(2.1%)	0(0)	4(1.8%)
Influenza B	**41(17.6%)**	**0(0)**	**41(15.8%)**
B (lineage not determined)	41(100%)	0(0)	41(100%)

The percentage of tests that were positive for influenza reached peak (60.2%) in southern China in week 48 and reached peak (50.3%) in northern China in week 47, 2009. After that, it began to decrease. During week 21 (week ending May 30) to week 30 (week ending August 1), the percentage of tests that positive for influenza of

[2] Pandemic influenza H1N1 2009 excluded refers to influenza A virus, but not pandemic influenza H1N1 2009.

[3] Pandemic influenza H1N1 2009 not excluded refers to influenza A virus, but detection for pandemic influenza H1N1 2009 not performed.

northern China remained lower than 2%. Since week 30, it increased slightly. In this week, the percentage of tests that positive for influenza of northern China was 3.9%; the percentage of tests that positive for influenza of southern China reached bottom (4.1%) in week 24 (week ending June 30) and showed an increasing trend after that. In this week, the percentage of tests that positive for influenza of southern China was 14.7%.

The percentage of pandemic influenza H1N1 2009 virus reached peaked in week 49 and week 48 in southern China (93.3%) and northern China (87.7%) respectively.

Since week 48, 2009, the percentage of influenza B virus began to increase and became predominant strain in week 2, 2010 (week ending January 17, 2010). Since week 19, the percentage of influenza A in southern China showed an increasing trend. From week 29, the percentage of influenza A viruses (62.5%) exceeded that of influenza B viruses (37.5%). In this week, the percentage of influenza A viruses in southern and northern China was 82.4% and 100% respectively. Influenza A (H3N2) activity showed an increasing trend recently. The percentage of influenza A (H3N2) viruses exceeded that of influenza B and other influenza A viruses and became the predominant strain in week 30. (Figure 3, Figure 4)

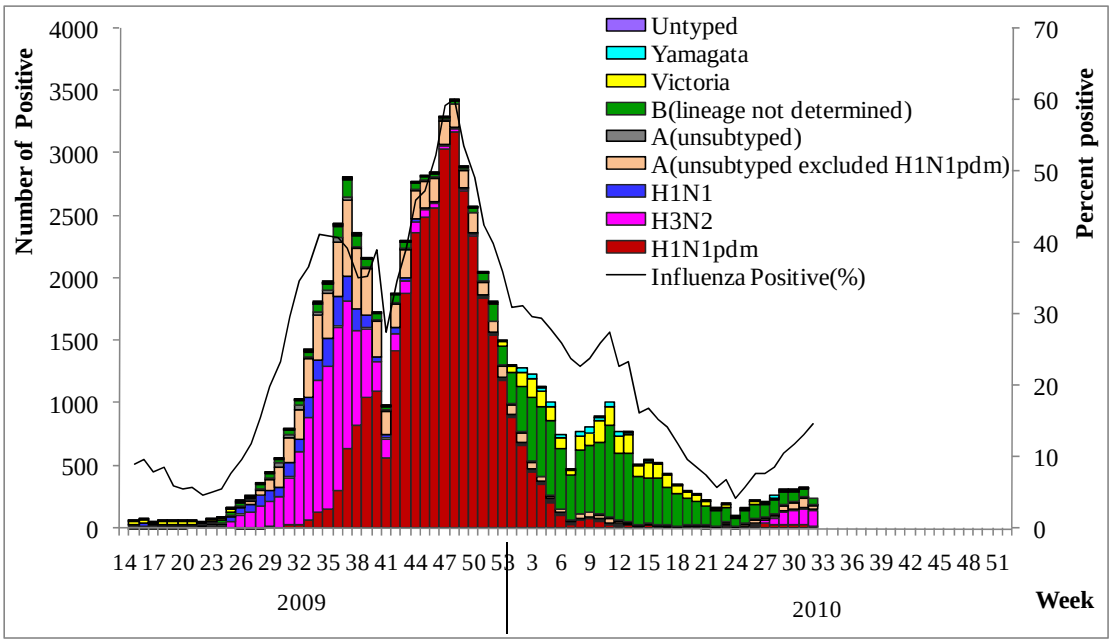

Figure 3. Influenza positive tests reported by southern network laboratories (Week 14, 2009 –Week 32, 2010)

Note: Analysis in this part is base on the result of network laboratories. If it is not consistent

with the result of NIC, please refer to the result of NIC confirmation.

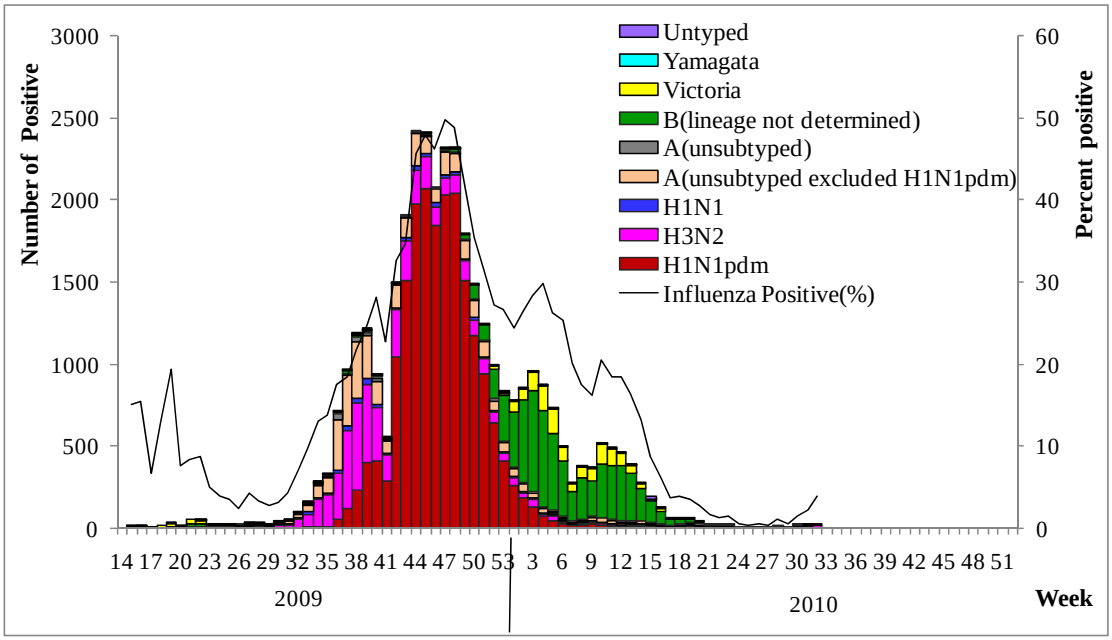

Figure 4. Influenza positive tests reported by northern network laboratories (Week 14, 2009 –Week 32, 2010)

Note: Analysis in this part is base on the result of network laboratories. If it is not consistent with the result of NIC, please refer to the result of NIC confirmation.

Antigenic Characterization

1. Pandemic Influenza H1N1 2009

As of August 15, 2010, CNIC has sequenced 571 pandemic influenza H1N1 2009 viruses. All the viruses have high homology (＞ 98%) with the A/California/07/2009 (H1N1) reference virus selected by WHO and the A/Sichuan/SWL1/2009 reference virus in mainland China. Only 1 virus possesses mutation at the NA gene at amino acid position 274 and is resistant to the neuraminidase inhibitors. The significance of mutations at other amino acid positions is still unclear.

As of August 15, 2010, CNIC has antigenically characterized 2401 pandemic influenza H1N1 2009 viruses. 2 viruses demonstrate reduced titers (≥8 fold lower in HI titer) with anti-sera produced against A/California/7/2009, which were isolated from Hunan and Zhejiang in December 9, 2009 and December 15, 2009 respectively. Other viruses are antigenically similar to the A/California/07/2009 (H1N1) reference virus selected by WHO and the A/Sichuan/SWL1/2009 reference virus in mainland

China.

2. Seasonal Influenza

During week 32, CNIC has antigenically characterized 10 influenza A (H3N2) viruses. All of them (100%) demonstrate reduced titers (≥8 fold lower in HI titer) with anti-sera produced against A/Brisbane/10/2007(H3N2); 1 (10%) demonstrates reduced titers (≥8 fold lower in HI titer) with anti-sera produced against A/Perth/16/2009(H3N2), 9 (90%) are related to A/Perth/16/2009(H3N2)-like.

During week 32, CNIC has antigenically characterized 22 influenza B/Victoria viruses. 21 (95.5%) are related to B/Brisbane/60/2008-like. 1 (4.5%) demonstrates reduced titers (≥8 fold lower in HI titer) with anti-sera produced against B/Brisbane/60/2008.

During week 32, CNIC has antigenically characterized 19 influenza B/Yamagata viruses. 12 (63.2%) are related to B/Florida/4/2006-like. 7 (36.8%) demonstrates reduced titers (≥8 fold lower in HI titer) with anti-sera produced against B/Florida/4/2006.

During January 1- August 15, 2010, CNIC has antigenically characterized 16 influenza A (H1N1) viruses. 13 (81.3%) are related to A/Brisbane/59/2007 (H1N1)-like; 3 (18.8%) demonstrate reduced titers (≥8 fold lower in HI titer) with anti-sera produced against A/Brisbane/59/2007 (H1N1).

During January 1- August 15, 2010, CNIC has antigenically characterized 69 influenza A (H3N2) viruses. 7 (10.1%) are related to A/Brisbane/10/2007(H3N2)-like; 62 (89.9%) demonstrate reduced titers (≥8 fold lower in HI titer) with anti-sera produced against A/Brisbane/10/2007(H3N2). 47 (47/66, 71.2%) are related to A/Perth/16/2009 (H3N2)-like; 19 (19/66, 28.8%) demonstrates reduced titers (≥8 fold lower in HI titer) with anti-sera produced against A/Perth/16/2009 (H3N2).

During January 1- August 15, 2010, as the antigenic characterization done by CNIC for influenza B viruses show that 1795 (1795/2020, 88.9%) are related to B/Brisbane/60/2008; 225 (225/2020, 11.1%) demonstrate reduced titers (≥8 fold lower in HI titer) with anti-sera produced against B/Brisbane/60/2008; 27 (27/1307,

2.1%) are related to B/Malaysia/2506/2004-like; 1280 (1280/1307, 97.9%) demonstrate reduced titers (≥8 fold lower in HI titer) with anti-sera produced against B/Malaysia/2506/2004.

During January 1- August 15, 2010, CNIC has antigenically characterized 482 influenza B/Yamagata viruses. 364 (75.5%) are related to B/Florida/4/2006-like; 118 (24.5%) demonstrate reduced titers (≥8 fold lower in HI titer) with anti-sera produced against B/Florida/4/2006.

Antiviral Resistance

In week 32, CNIC has tested 2 pandemic influenza H1N1 2009 viruses for antiviral resistance by sequence analysis. All the viruses are sensitive to the neuraminidase inhibitors (oseltamivir). As of August 15, 2010, CNIC has tested 571 pandemic influenza H1N1 2009 viruses for antiviral resistance by sequence analysis. All viruses are resistant to adamantine; only 1 virus is resistant to the neuraminidase inhibitors, others are still sensitive to the neuraminidase inhibitors. The resistant strain, A/Hunan/SWL3/2009(H1N1), was isolated from an imported case of Hunan province and had been reported to WHO in early July, 2009.