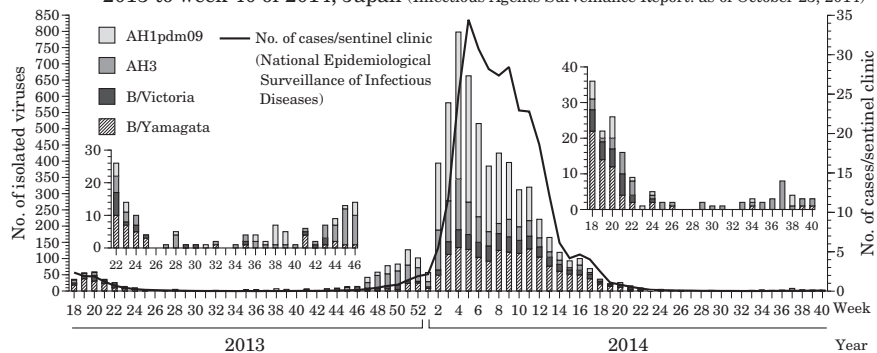


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<THE TOPIC OF THIS MONTH> 2013/14 influenza season, Japan

Figure 1. Weekly cases of influenza and isolation of influenza viruses from week 18 of 2013 to week 40 of 2014, Japan (Infectious Agents Surveillance Report: as of October 23, 2014)



In the 2013/14 season (from week 36/September of 2013 to week 35/August of 2014), influenza A(H1N1)pdm09 (AH1pdm09) became the main strain for the first time in past 3 seasons; other epidemic strains were influenza virus type B followed by the subtype AH3. The number of patients reached the peak in January as usual.

Incidence of Influenza patients: Under the National Epidemiological Surveillance of Infectious Diseases (NESID), 5,000 influenza sentinels (3,000 pediatric and 2,000 internal medicine clinics) report influenza cases at weekly basis (<http://www.nih.go.jp/niid/images/iasr/34/405/de4051.pdf>). The number of patients/week/sentinel (epidemic index) exceeded 1.0 in the national level (a sign of start of the epidemic season) in week 51 of 2013 and the level was maintained for 21 weeks till week 19 of 2014 (<http://www.nih.go.jp/niid/en/10/2096-weeklygraph/2572-trend-week-e.html>). The epidemic reached its peak in week 5 of 2014 with the incidence of 34.4 cases/sentinel (Fig. 1), whose level was the same as that of the previous season (36.4 per sentinel in week 4 of 2013). The total number of patients per sentinel for the whole season was 301.0 (239.0 in 2012/13 season).

In prefecture levels, the epidemic index exceeded 10.0 first in Okinawa in the 1st week of 2014. The number of prefectures with the epidemic index exceeding 10.0 increased to 30 in week 3 of 2014 and to 47 all prefectures in week 5, and then the influenza epidemic expanded nationwide. In 2013/14 season, Okinawa Prefecture didn't experience the summer season influenza that occurred every year since 2005 (see p. 262 of this issue).

The total number of influenza patients visiting medical institutions, which was estimated from sentinel reports, was about 15,720,000 from week 36 of 2013 to week 21 of 2014 (September 2, 2013–May 25, 2014).

The hospitalization surveillance started in September 2011 for estimating number of severe influenza cases. According to its report, total 9,905 patients were hospitalized in about 500 “designated hospital sentinels with ≥ 300 beds” in this season. The number of hospitalized patients was 5% less than in the previous season (10,373 in 2012/13) (see p. 261 of this issue).

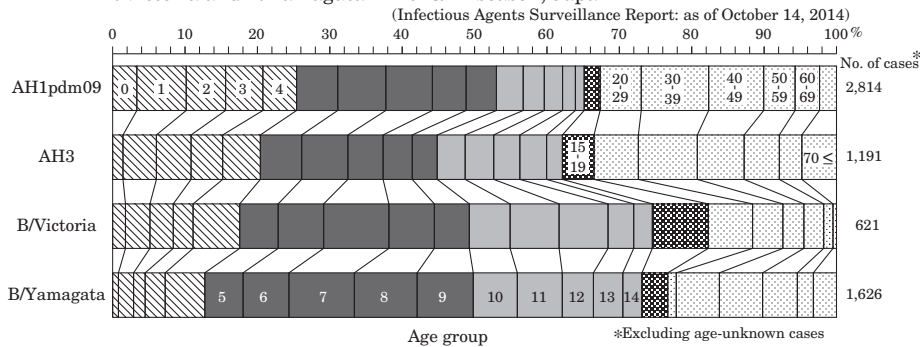
Isolation/detection of influenza virus: In 2013/14 season, the prefectural and municipal public health institutes (PHIs) reported total 8,230 isolation/detections (6,345 isolations and 1,885 detections without virus isolation) (Table 1 in p. 253 of this issue). Among them, 6,738 were reported from influenza sentinels and 1,492 from elsewhere (Table 2 in p. 253, see p. 258 of this issue).

Influenza virus isolated/detected in the 2013/14 season consisted of AH1pdm09 (43%), subtype AH3 (21%) and type B (36%). AH1pdm09 became dominant for the first time since 2010/11 season. Among type B viruses, ratio of Yamagata lineage to Victoria lineage was 7:3 (Table 1 in p. 253). The subtype AH3 reached the peak in week 4 of 2014, and then declined. Type B exceeded type A in week 10 of 2014 (Fig. 1; Fig. 2 in p. 253). The peak age was 5-9 years both for AH1pdm09 and type B Yamagata lineage (Fig. 3 and see p. 258 of this issue).

Antigenic characteristics of the 2013/14 season isolates and their drug resistance (see p. 254 of this issue): National Institute of Infectious Diseases conducted detailed antigen analysis of isolates from Japan and other Asian countries. All of the 255 AH1pdm09 isolates, except one antigen variant, were antigenically similar to the vaccine strain A/California/7/2009. All of the 244

(THE TOPIC OF THIS MONTH-Continued)

Figure 3. Age distribution of cases with isolation of influenza virus AH1pdm09, AH3, B/Victoria and B/Yamagata in 2013/14 season, Japan



subtype AH3 isolates were antigenically similar to the vaccine strain A/Texas/50/2012. All of the 163 Yamagata lineage isolates were all antigenically similar to vaccine strain B/Massachusetts/02/2012; among them 28% of the isolates belonged to the clade 2 genetic type (same as 2013/14 season vaccine strain), and 72% to the clade 3 genetic type (represented by B/Wisconsin/1/2010, a 2012/13 season vaccine strain). All of the 104 Victoria lineage isolate were antigenically similar to the vaccine strain B/Brisbane/60/2008.

Among 2,524 AH1pdm09 isolates in Japan, 105 isolates (4.2%) had the H275Y mutation, a marker of the oseltamivir/peramivir resistance. Sapporo City in Hokkaido experienced a local epidemic of the H275Y mutant from November 2013 to February 2014; as a consequence, the mutant occupied 28% of all the isolates in Hokkaido. So far tested, subtype AH3 and type B isolated in Japan were all sensitive to oseltamivir, zanamivir, peramivir, and laninamivir.

Immunological status of Japanese population (see p. 264 of this issue): According to the sero-surveillance conducted under the National Epidemiological Surveillance of Vaccine-Preventable Diseases (FY2013), among 6,571 sera collected before the 2013/14 season (from July to September in 2013), the HI antibody positives ($\geq 1:40$) to A/California/7/2009[A(H1N1)pdm09] were $\geq 70\%$ in the population in their teens and early twenties, and 20-30% among population younger than 4 years or older than 55 years. The population HI antibody positive to A/Texas/50/2012 [A(H3N2)] was around 40-50% or more in all the age groups except age group <4 years and 60-64 years whose antibody positive rate was relatively low ($\sim 30\%$). Antibody positives to B/Massachusetts/02/2012 (B Yamagata lineage) occupied $>50\%$ among population aged 15-29 years (highest among 20-24 year olds) and $\sim 10\%$ among the population younger than 4 years. The percentage of the antibody positives to B/Brisbane/60/2008 (B Victoria lineage) was the highest ($\sim 50\%$) among population aged 35-44 years, and $\sim 20\%$ among <4 year and 60-64 year aged groups.

Influenza vaccine: The quantity of trivalent vaccines produced for 2013/14 season was 33,880,000 vials (1ml/vial), of which estimated 25,810,000 vials were used.

The vaccine strain selected for 2014/15 season for the AH1 subtype was A/California/7/2009pdm09 (X-179A) which was the same as for 2010/11-2013/14 seasons, whereas the vaccine strain for AH3 was changed to A/New York/39/2012 (X-233A) strain. The vaccine strain for type B was B/Massachusetts/2/2012 (BX-51B) (Yamagata lineage) as in 2013/14 season (see pp. 267 & 269 of this issue).

Avian influenza A(H7N9): In China, influenza virus A(H7N9) broke out late in March 2013. So far, total 454 confirmed cases including 171 deaths have been reported. The epidemic consisted of two waves, the second wave (since October 2013) being larger in scale than the first (before October 2013). The number of patients in the second wave was 318 and that of deaths 127 (see p. 271 of this issue).

The avian influenza H7N9 was classified as "designated infectious disease" on 26 April, 2013 in Japan. Its laboratory diagnosis is now possible in 74 PHIs and 16 quarantine laboratories in Japan. All the laboratories have already received the H7N9 detection manual and the test kits (reagents for PCR tests, primers, probes, and a positive reference, etc.).

Avian influenza A(H5N1): In 2014, total 13 cases including 6 deaths (9 cases including 4 deaths in Cambodia; 2 cases and zero deaths in China, and 2 cases including 2 deaths in Vietnam) were reported (as of 17 October) (http://www.wpro.who.int/emerging_diseases/AvianInfluenza/en/).

Avian influenza in Japan: In April 2014, there was an outbreak of the highly pathogenic avian influenza in a meat poultry farm in Kumamoto Prefecture. On the 22nd day after the completion of the preventive measures, the setting of the movement restriction area has been released. The genotype of the virus was identical to that H5N8 subtype isolated in the Republic of Korea suggesting its Korean origin.

Act on special measures against the new type influenza: The act was issued on 11 May 2012 and enforced on 13 April 2013 with the objectives of protecting life and health of Japanese citizens and minimizing the adverse effects on the daily life and economy. The Japanese government produced a government action plan and all the prefectures in Japan completed prefecture level action plan in June 2013.

Additional comments: Trends of influenza outbreaks should be monitored continuously by sentinel surveillance, school outbreak surveillance, hospitalization surveillance and other possibilities. The virus isolation should be conducted throughout the year and the antigenic and genetic changes of the epidemic strains should be monitored so as to secure vaccine candidate strains. Monitoring of the resistance to anti-influenza drugs among isolates and the antibody level of Japanese population should be continued for risk management in future.

Flash reports on the isolation and detection of influenza viruses in 2013/14 season are found in see p. 272 of this issue and <http://www.nih.go.jp/niid/en/iasr-inf-e.html>.

The statistics in this report are based on 1) the data concerning patients and laboratory findings obtained by the National Epidemiological Surveillance of Infectious Diseases undertaken in compliance with the Law Concerning the Prevention of Infectious Diseases and Medical Care for Patients of Infections, and 2) other data covering various aspects of infectious diseases. The prefectural and municipal health centers and public health institutes (PHIs), the Department of Food Safety, the Ministry of Health, Labour and Welfare, and quarantine stations, have provided the above data.

(特集つづき)

表1. インフルエンザウイルス分離・検出報告数, 2010/11~2013/14シーズン

Table 1. Isolation/detection of influenza viruses during 2010/11-2013/14 seasons

型 Type	シーズン* Season*			
	2010/11	2011/12	2012/13	2013/14
A H1pdm09	3,819 (2,438)	11 (4)	109 (54)	2,841 (654)
A H1	-	-	-	-
A H3	2,339 (1,523)	3,709 (1,434)	3,667 (1,379)	1,199 (534)
A NT	- (2)	- (14)	- (15)	- (4)
B/Victoria	1,450 (3)	1,088 (14)	357 (28)	627 (116)
B/Yamagata	33	547 (8)	805 (31)	1,637 (295)
B NT	49 (313)	82 (304)	49 (195)	20 (273)
C	- (12)	25 (36)	- (2)	21 (9)
合計 Total	7,690 (4,291)	5,462 (1,814)	4,987 (1,704)	6,345 (1,885)

A NT: A亜型未同定, B NT: B系統未同定

A NT: A not subtyped, B NT: B lineage not determined

*各シーズン(当年9月~翌年8月)に採取された検体から各地方衛生研究所で分離されたウイルス報告数, - 報告なし, ()内はウイルスは分離されていないが, 遺伝子検出または抗原検出による報告数を別掲

(病原微生物検出情報: 2014年10月14日現在報告数)

*Sampling season during September through August in the following year.

() Gene or antigen detection, not included in the total

[Infectious Agents Surveillance Report: as of October 14, 2014 from prefectural and municipal public health institutes (PHIs)]

表2. インフルエンザウイルス分離・検出報告数, 2013/14シーズン

Table 2. Isolation/detection of influenza viruses, 2013/14 season

型 Type	Total (A+B)	2013/14 season	
		(A)	(B)
A H1pdm09	3,495	2,792	703
A H1	-	-	-
A H3	1,733	1,424	309
A NT	4	1	3
B/Victoria	743	639	104
B/Yamagata	1,932	1,637	295
B NT	293	227	66
C	30	18	12
合計 Total	8,230	6,738	1,492

(A) インフルエンザ定点(小児科+内科) Reports from influenza sentinels (pediatric & internal medicine clinics)

(B) インフルエンザ定点以外(基幹定点+その他) Other reports from hospital sentinels & clinics

A NT: A亜型未同定, B NT: B系統未同定

A NT: A not subtyped, B NT: B lineage not determined

2013年9月~2014年8月に採取された検体より各地方衛生研究所で分離・検出されたウイルス報告数, - 報告なし

(病原微生物検出情報: 2014年10月14日現在報告数)

Detections from samples collected during September 2013 through August 2014.

(Infectious Agents Surveillance Report: as of October 14, 2014 from PHIs)

図2. 都道府県別インフルエンザウイルス分離報告状況, 2013/14シーズン (病原微生物検出情報: 2014年10月14日現在報告数)

Figure 2. Isolation of influenza viruses by prefecture in 2013/14 season

(Infectious Agents Surveillance Report: As of October 14, 2014 from PHIs)

