

HBs antigen positivity rates among blood donors with no prior blood donation history and among persons who received a viral hepatitis exam in Japan .....	149	Norovirus GI.6 outbreak associated with drinking water in Fukuoka Prefecture .....	159
Current situation of acute hepatitis B virus infection in Japan .....	151	Food poisoning outbreak due to <i>Salmonella</i> Nagoya in a nursing home for the elderly-Chiba City .....	160
Epidemiology of hepatitis B virus infection among children before the start of routine immunization of hepatitis B virus vaccine in Japan .....	152	Notifications of enterohemorrhagic <i>E. coli</i> O157 food poisoning attributed to consumption of raw beef/beef liver after enhanced restrictions on raw beef/beef liver .....	161
Diagnosis of hepatitis B virus infection .....	154	Emergency response against imported measles after elimination of measles-Ibaraki Prefecture .....	163
Seroepidemiology of hepatitis B virus infection: National Epidemiological Surveillance of Vaccine-Preventable Diseases -Chiba Prefecture .....	155	Varicella cases among non-Japanese adults mainly from Asia .....	164
Introduction of hepatitis B virus vaccine as a routine immunization in Japan .....	156	Trends in multiple drug-resistant <i>Acinetobacter</i> infections, week 38 of 2014 to week 53 of 2015 in Japan-National Epidemiological Surveillance of Infectious Diseases .....	165
Reactivation of hepatitis B virus during chemotherapy .....	157		

### <THE TOPIC OF THIS MONTH> Acute hepatitis B, April 2006-December 2015

Acute hepatitis B is caused by infection with hepatitis B virus (HBV) of *Hepadnaviridae*. After an incubation period of approximately 3 months, the disease starts with general malaise, flu-like symptoms, anorexia, chills, and vomiting, often followed by brown urine or jaundice. Infection among infants is usually symptomless but often lapses into a carrier state. Infection among adults generally resolves within 1-2 months. However, fulminant hepatitis occurs in 1% of adult cases and approximately 60-70% among them are fatal. A proportion of infants and adult cases who are carriers can develop chronic hepatitis; adults with competent immunity rarely become carriers (see p. 157 of this issue).

#### National Epidemiological Surveillance of Infectious Diseases

HBV infection has been monitored on a monthly basis since 1987 when it was included in the infectious disease surveillance program involving 500 sentinel hospitals in Japan. Upon revision of the Infectious Diseases Control Law in April 1999, HBV infection was included in the category "acute viral hepatitis", a category IV infectious disease that requires notification of all diagnosed cases. With the amendment of the Infectious Diseases Control Law in November 2003, it was classified as "viral hepatitis (excluding hepatitis A and E)", a category V infectious disease. A physician who has made the diagnosis of hepatitis B (excluding chronic hepatitis, liver cirrhosis and liver cancer) shall notify the case to the health center within 7 days (<http://www.nih.go.jp/niid/images/iasr/37/438/de4381.pdf>).

From April 2006 when the notification format was revised to the current form till December 2015, a total of 2,400 cases were reported with the diagnosis of "viral hepatitis (excluding hepatitis A and E)" (as of 27 May 2016). Among them, 1,933 were hepatitis B (81%), 366 were hepatitis C (15%), and 1 was reported as both hepatitis B and C. In addition, there were 100 cases of viral hepatitis attributed to other causes, such as 73 cases of cytomegalovirus infection and 24 cases of the EB virus infection. The annual reported number of acute hepatitis B cases ranged from 174-236 (males: 134-195 cases; females: 34-54 cases) (Fig. 1).

**Signs and symptoms:** Among a total of 1,933 cases, 1,492 (77%) had liver dysfunction, 1,412 (73%) general malaise, 1,163 (60%) jaundice, 716 (37%) brown urine, 385 (20%) fever, and 315 (16%) vomiting. Other complaints included anorexia, abdominal discomfort, gastric discomfort, and arthralgia, etc. (224 cases, 12%). There were 44 (2%) fulminant hepatitis cases and 10 cases that had deceased at the time of notification.

**Gender, age and transmission routes:** Among a total of 1,933 cases reported, 1,503 were male and 430 were female (male to female ratio of 3.5; the ratio was  $\geq 3$  every year except in 2006 when it was 2.5) (Fig. 1). Cases peaked during age 25-29 years in both genders, and there were few patients aged 14 years or younger or 70 years or older (Fig. 2). The suspected transmission route (multiple responses allowed) among the 1,933 cases were: 1,349 cases attributed the infection to sexual contact (70%), 47 cases (28 from male; 19 from female) to puncture/incision by contaminated materials (2.4%), 13 to blood or blood product transfusion, 3 to

Figure 1. Number of acute hepatitis B cases by gender, April 2006-December 2015, Japan

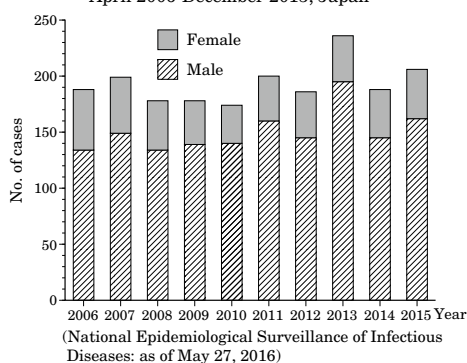
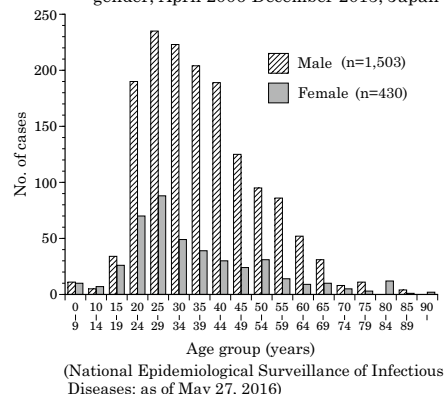


Figure 2. Age distribution of acute hepatitis B cases by gender, April 2006-December 2015, Japan



(THE TOPIC OF THIS MONTH-Continued)

Table. No. of reported acute hepatitis B cases, by prefecture, April 2006-December 2015

Prefecture	No. cases	Per 1,000,000 person-years*	Prefecture	No. cases	Per 1,000,000 person-years*
Hokkaido	29	0.54	Shiga	16	1.16
Aomori	10	0.75	Kyoto	52	2.02
Iwate	5	0.39	Osaka	182	2.11
Miyagi	51	2.23	Hyogo	139	2.55
Akita	18	1.70	Nara	14	1.03
Yamagata	4	0.35	Wakayama	10	1.02
Fukushima	9	0.45	Tottori	1	0.17
Ibaraki	20	0.69	Shimane	15	2.14
Tochigi	23	1.17	Okayama	72	3.80
Gunma	19	0.97	Hiroshima	93	3.33
Saitama	51	0.73	Yamaguchi	5	0.35
Chiba	39	0.64	Tokushima	5	0.65
Tokyo	380	2.96	Kagawa	6	0.62
Kanagawa	99	1.12	Ehime	28	2.01
Niigata	12	0.52	Kochi	16	2.15
Toyama	27	2.53	Fukuoka	95	1.92
Ishikawa	9	0.79	Saga	5	0.60
Fukui	5	0.64	Nagasaki	19	1.37
Yamanashi	19	2.26	Kumamoto	6	0.34
Nagano	39	1.86	Oita	13	1.11
Gifu	12	0.59	Miyazaki	42	3.79
Shizuoka	29	0.79	Kagoshima	15	0.90
Aichi	101	1.40	Okinawa	34	2.50
Mie	40	2.21	Total	1,933	1.55

\*2010 Population Census of Japan  
(National Epidemiological Surveillance of Infectious Diseases: as of May 27, 2016)

mother-to-child infection, 1 to intravenous drug abuse, and 533 cases to other or unknown transmission route (28%). Among males who attributed the infection to sexual contact (1,091 cases), 715 (66%) attributed to heterosexual contact and 226 (21%) to homosexual contact (20 cases among them had both homosexual and heterosexual contacts). No clear response was obtained from 170 cases. Among 258 females who attributed the infection to sexual contact, most were attributed to heterosexual contact (231 cases, 90%); 27 cases responded as unknown infection route. Cases attributed to sexual contact peaked at age 25-34 years for males and 20-29 years for females. Suspected places of infection were mostly in Japan (1,786 cases, 92%). There were 127 cases suspected to have been infected abroad (7%), 11 cases suspected to have been infected domestically or abroad, and the information was unknown for 9 cases. Respectively, 69% (1,234/1,786) of domestic cases and 83% (105/127) of cases believed to have been infected abroad were suspected to have been sexually acquired.

**Notifications by prefecture:** Among the total of 1,933 cases, cases were reported from all 47 prefectures. Prefectures that reported the greatest number of cases were Tokyo (380 cases), Osaka (182 cases) and Hyogo (139 cases). There were 13 prefectures that reported fewer than 10 cases (Table). A total of 733 medical facilities reported acute hepatitis B cases; 8 medical facilities (1.1%) reported at least 20 cases and 407 medical facilities (56%) reported a single case.

**Laboratory diagnosis:** Among the 1,933 cases, 1,921 (99%) were diagnosed by anti-HBc IgM detection and 16 cases by the PCR method (13 cases in combination with the IgM test) (see pp. 149 & 154 of this issue). Among those with genotype information since 2013, HBV genotype A was detected in 164 cases (49%), genotype B in 65 cases (20%), and genotype C in 104 cases (31%) (see p. 151 of this issue).

### Screening of blood for transfusion

In the late 1960's, as a measure of prevention against transfusion-associated hepatitis, Japan replaced transfusion blood from blood that was sold to that which was donated, and in 1972, introduced HBs antigen screening. Since 1989, blood for transfusion or blood products for plasma fractionation partitions has been tested for both HBs antigen and HBc antibody (Fig. 3). In 2008, the chemiluminescent enzyme immunoassay was introduced, and in 2012, a higher standard for test criteria was introduced. These practices increased the detection sensitivity, and resulted in the increased detections of HBs antigen positive specimens in 2008 and that of HBc antibody positive specimens in 2012 (Fig. 3). Furthermore, since October 1999, all HBV sero-negative donated blood samples have been screened by the nucleic-acid-based test (NAT) for the HBV genome, which greatly shortened the (post-infection antigen-/antibody-negative) "window" period.

### Prevention of mother-to-child HBV infection

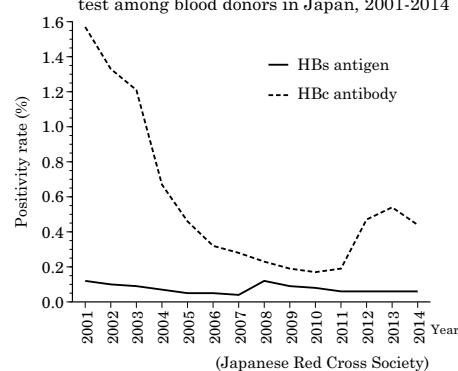
The "Mother-to-child HBV transmission prevention program" was initiated in June 1985, which resulted in the marked reduction of HBV carriers among children. From October 2016, HBV vaccine will be introduced as a routine pediatric vaccination, which will contribute to the prevention of horizontal transmission of HBV (see pp. 152, 155 & 156 of this issue).

### Further remarks

In recent years, 170-240 acute hepatitis B cases have been reported annually. While blood transfusion-related cases have decreased, sexually transmitted cases now comprise nearly 70% of the total cases reported. Awareness of sexual transmission of HBV infection should be raised among age groups at risk, i.e., those in their 20s and early 30s.

As jaundice was absent in 40% of the reported acute hepatitis B cases, there may be many HBV-infected persons unaware of their own infection, who may only realize their infection when liver dysfunction is detected from a liver function test. It is recommended that people receive a liver function test when possible.

Figure 3. HBV positivity rate with the serological screening test among blood donors in Japan, 2001-2014



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.

Infectious Disease Surveillance Center, National Institute of Infectious Diseases

Toyama 1-23-1, Shinjuku-ku, Tokyo 162-8640, JAPAN Tel (+81-3)5285-1111