pISSN 2005-811X
eISSN 2586-0860

www.kdca.go.kr

주간 건강과 질병

PUBLIC HEALTH WEEKLY REPORT, PHWR

Vol.15, No. 32, 2022

CONTENTS

질병관리청

COVID-19 Special Report

An epidemiological study of imported coronavirus disease 2019 cases; Incheon airport 2021

Ji Hye Moon, Myeong Eun Song, In Soo Choi, Seung Eun Lee, Chong Hee Choi
Incheon Airport National Quarantine Station, Korea Disease Control and Prevention Agency (KDCA)

Abstract

This report aimed to analyze confirmed cases of coronavirus disease 2019 (COVID-19) among imported cases at the Incheon Airport National Quarantine Station (IANQS) and to report on their epidemiological characteristics and trends while under quarantine.

In 2021, among the 11,961 imported COVID-19 cases, 1,287 (10.8%), excluding those confirmed via air ambulance, were confirmed through quarantine at the IANQS. Of these, 849 (66.0%) were male and 616 (47.9%) were in their 20s and 30s. Approximately 76.2% of the cases were Korean nationals.

According to the findings, approximately 19.3% of the cases were observed in June due to an increase in imported cases from Indonesia while, the number of imported cases gradually decreased to 2.8% in November. An analysis of the quarterly distribution of confirmed cases showed the highest number (n=420) in the third quarter and a rapid decrease in the fourth quarter (n=124). The decrease in confirmed cases was attributed to the reduced number of patients with symptoms and quarantine targets who were subjected to testing, from 2,941 in January to 1,000 in March and less than 1,000 after August.

Among the 14,977 symptomatic cases and quarantine targets, 1,263 (8.4%) were confirmed. Only 860 (66.8%) of 1,287 total confirmed cases were symptomatic. An additional 261 (20.3%) showed unrecognized fever during quarantine without reporting symptoms and 166 (12.9%) were asymptomatic. Among foreign nationals, 169 cases of unrecognized fever were reported, more than twice the 78 confirmed symptomatic cases.

In summary, the new COVID-19 variants and increased vaccination rates led to changes in the overall quarantine situation and the number of COVID-19 confirmed cases during quarantine in 2021. Analysis of these epidemiological characteristics is expected to povide reference data for future quarantine responses.

Keywords: Coronavirus disease 2019 (COVID-19), Quarantine, Airport

Introduction

Since the first report of a confirmed case of coronavirus disease 2019 (COVID-19) in the Republic of Korea (ROK), in a traveler who had visited Wuhan, on January 20, 2020, the number of confirmed cases of COVID-19 imported from overseas to the ROK was recorded as 11,961 in 2021, and 31,942 by April 2022 [1].

The number of confirmed cases imported from abroad in 2021, based on collecting samples at the Incheon Airport National Quarantine Station (IANQS), was 1,287, accounting for 10.8% of confirmed cases in the ROK. Both the Korean and overseas-import situation related to COVID-19 has changed much over time, for example, the start of COVID-19 vaccination in the United Kingdom on December 8, 2020, followed by

that in the ROK and elsewhere, and the mandatory submission of a COVID-19 polymerase chain reaction (PCR) result from February 24, 2021, for travelers entering the ROK from overseas, and the emergence of viral variants, and accordingly. Accordingly, the pattern of confirmed imported cases encountered at quarantine stations has changed over time. This report aimed to analyze the current status and characteristics of the 1,287 COVID-19 patients confirmed by sample collection at the IANQS in 2021, and to provide basic data for establishing future quarantine policies.

Result

1. Main characteristics of confirmed COVID-19 cases encountered at the IANQS in 2021

In 2021, 1,287 confirmed COVID-19 cases were identified after being tested at the IANQS, excluding those who arrived by air ambulance after being confirmed overseas. By quarter, most patients were identified in the third quarter (420; 32.6%), followed by the first quarter (373; 29.0%), second quarter (370; 28.7%), and fourth quarter (124; 9.6%). Thus, the number of confirmed cases identified at the quarantine station continued to increase during the first to third quarters and then decreased sharply in the fourth quarter. Among the confirmed cases, males accounted for 66.0% (n = 849), nearly twice as many as females (34.0%; n = 438). The 20-29-year age group was the largest by number (n = 331; 25.7%), followed by the 30-39-year age group (n = 285; 22.1%), and the 40-49-year age group (n = 228; 17.7%). Thus, individuals in their 20s and 30s accounted for 47.9% of confirmed cases, which was higher than the proportion of individuals in this age range among all confirmed cases across the country (29.6%) [2]. In addition, none of these individuals was aged over 80 years. It is not unexpected that more confirmed cases occurred among the younger generation, given the nature of travelling abroad (Table 1).

Table 1. Main characteristics of confirmed COVID-19 cases under quarantine at Incheon airport, per quarter, 2021

Category	Total		First quarter		Second quarter		Third quarter		Fourth quarter	
	n	%	n	%	n	%	n	%	n	%
Total	1,287	(100)	373	(29.0)	370	(28.7)	410	(32.6)	124	(9.6)
Sex										
Male	849	(66.0)	239	(64.1)	278	(75.1)	266	(63.3)	66	(53.2)
Female	438	(34.0)	134	(35.9)	92	(24.9)	154	(36.7)	58	(46.8)
Age group, years										
<10	31	(2.4)	6	(1.6)	10	(2.7)	13	(3.1)	2	(1.6)
10-19	97	(7.5)	30	(8.0)	19	(5.1)	36	(8.6)	12	(9.7)
20-29	331	(25.7)	87	(23.3)	68	(18.4)	124	(29.5)	52	(41.9)
30-39	285	(22.1)	81	(21.7)	91	(24.6)	82	(19.5)	31	(25.0)
40-49	228	(17.7)	62	(16.6)	83	(22.4)	70	(16.7)	13	(10.5)
50-59	197	(15.3)	65	(17.4)	62	(16.8)	63	(15.0)	7	(5.6)
60-69	98	(7.6)	32	(8.6)	34	(9.2)	26	(6.2)	6	(4.8)
70-79	20	(1.6)	10	(2.7)	3	(0.8)	6	(1.4)	1	(0.8)
≥80	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Nationality										
Korean	981	(76.2)	288	(77.2)	287	(77.6)	311	(74.0)	95	(76.6)
Foreigner	306	(23.8)	85	(22.8)	83	(22.4)	109	(26.0)	29	(23.4)
Continent of residence										
Asia	780	(60.6)	140	(37.5)	294	(79.5)	315	(75.0)	31	(25.0)
America	231	(17.9)	127	(34.0)	20	(5.4)	25	(6.0)	59	(47.6)
Europe	172	(13.4)	64	(17.2)	34	(9.2)	52	(12.4)	22	(17.7)
Africa	103	(8.0)	42	(11.3)	22	(5.9)	28	(6.7)	11	(8.9)
Oceania	1	(0.1)	0	(0.0)	0	(0.0)	0	(0.0)	1	(0.8)

The nationality of the confirmed cases was primarily Korean (n = 981; 76.2%), more than three times as many as foreigners (n = 306; 23.8%). More than half of these individuals resided in Asia (n = 780; 60.6%), followed by the Americas (n = 231; 17.9%), Europe (n = 172; 13.4%), Africa (n = 103; 8.0%), while a single case resided in Oceania (0.1%). However, these frequencies varied across the quarters of the year. Individuals residing in Asia accounted for 79.5% and 75.0% of confirmed cases in the second and third quarters, respectively. In the second quarter, due to the spread of the delta variant, up to 201 (68.4%) of the 294 confirmed cases from Asia resided in India and Indonesia. In the third quarter, individuals of Indonesian nationality accounted for the highest number of confirmed cases (n = 105) until July, and a total of 109 (34.6%). Confirmed cases were reported 58 from Uzbekistan and 63 from Russia, Kyrgyzstan, Tajikistan, and Kazakhstan. Thus, in the third quarter, 121 (38.4%) cases were from Russia and Central Asia. Individuals from the Americas accounted for only 5.4% and 6.0% in the second and third quarters, whereas this region accounted for 34.0% of cases in the first quarter and surged to 47.6% in the fourth quarter, which was due to the COVID-19 peak in the United States (178 of 231 confirmed cases, 77.1%) in January and December, with Americans accounting for the most of the confirmed cases [3]. The proportion of inbound travelers from Europe remained similar, except for the second quarter. The number of confirmed cases who arrived from the Republic of Türkiye was the highest, at 46 (26.7%), during this period; 35 confirmed cases (76.1%), all Korean citizens, were identified in July and August, and were presumed to be travelers for tour or missionary purposes. The second largest number of confirmed cases among inbound travelers were from Hungary (33 cases, 19.2%) and Poland (30 cases, 17.4%), who were mostly workers related to local factories of Korean companies. Of these 63 cases, 61 (96.8%) were reported in the first and second quarter of 2021.

2. Status of confirmed COVID-19 cases by period at the IANQS in 2021

The number of confirmed cases of COVID-19 at the IANQS identified per month in 2021 was 244 (19.0%) in July, followed by 167 (13.0%) in June and 160 (12.4%) in January, with the lowest number in November (18; 1.4%). Among the 11,961 confirmed cases imported into the ROK from overseas, 1,287 confirmed cases were identified at the IANQS. This proportion was highest

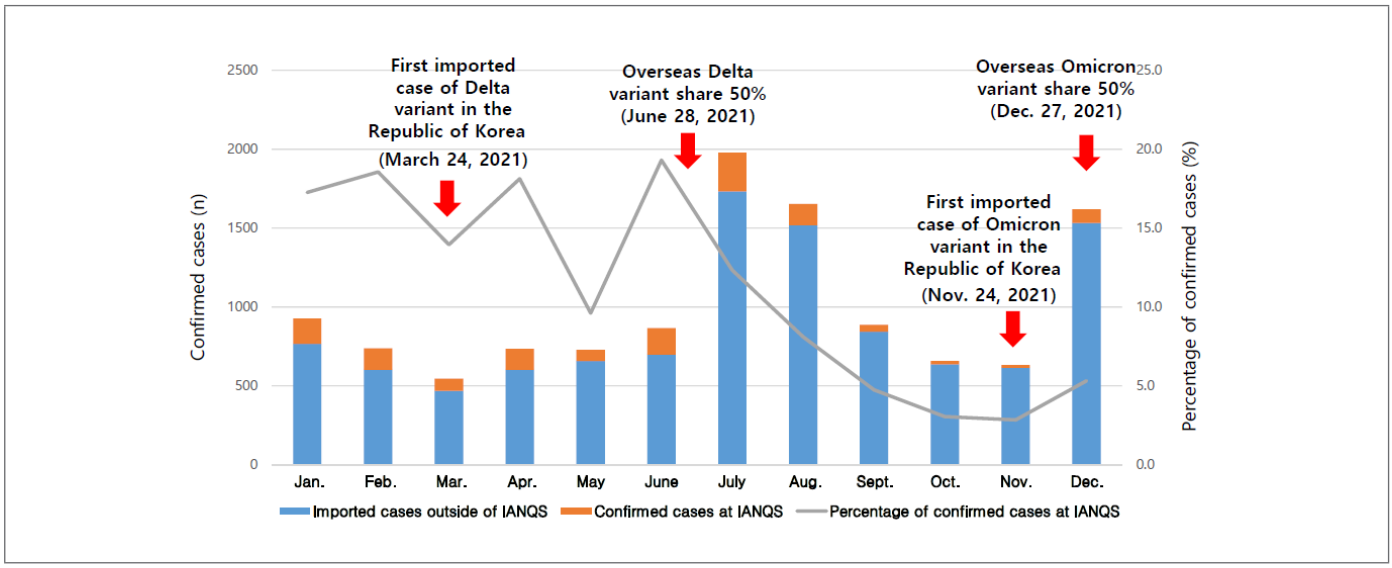


Figure 1. Percentage of confirmed COVID-19 cases at the Incheon Airport National Quarantine Station (IANQS) among total and monthly imported cases in 2021

(19.3%) in June, followed by 18.6% in February and 18.1% in April. In July, when the number of confirmed cases was the highest, the total number of imported confirmed cases was 1,977, which accounted for 12.3%, but excluding 271 confirmed cases (14.3%) in the Cheonghae military unit that month (Figure 1).

Regarding the influx of variants among the confirmed cases imported from abroad, there was no significant change in the number of confirmed cases imported from abroad since the first report of the delta variant in the ROK in March. Since June, when the Delta variant accounted for 50% of cases abroad, the number of imported Delta variant cases in the ROK rose sharply, and then showed a decreasing trend after peaking in July. The first report of the Omicron variant imported from overseas occurred in November, after which the share of the Omicron variant surged to 50% in December, and the number of confirmed cases imported from overseas also increased accordingly. In June, when the proportion of imported cases confirmed at the quarantine station was the highest, 114 were from Indonesia, accounting for 68.3% of the 167 confirmed cases. In Indonesia, the number of confirmed cases increased from June, and thus the number of confirmed cases at the quarantine station immediately increased. As most of the confirmed patients had not submitted COVID-19 PCR results, this was made a mandatory requirement en entering the ROK, and entry restrictions for those who did not submit the COVID-19 PCR results were applied from July 4, 2021. As of July 2, 2021, the average rate of having received at least one dose of COVID-19 vaccine among OECD member countries was 48.7%, and that of having received two doses was 32.6%. This, along with implementation of entry restrictions for those who did not submit a COVID-19 PCR test result led to a sharp decrease in identified cases toward the second half of the year, despite the increase in the number of inbound travelers [4] (Figure 2).

Excluding those who were asymptomatic but needed testing, the number of people tested decreased from 2,941 in January to 1,184 in July 2021. The lowest number (379) was recorded in October, but the number increased to 1,059 in December due to the spread of the Omicron variant. Of the 1,287 cases confirmed at the quarantine station, 24 were asymptomatic but were confirmed after testing for reasons such as exemption from humanitarian quarantine and referral to external agencies. Among 14,977 symptomatic people and those required to be tested at the quarantine station, excluding asymptomatic people who were tested for the above reasons, 1,263 were confirmed, indicating a positive testing rate of 8.4%. The positivity rate was

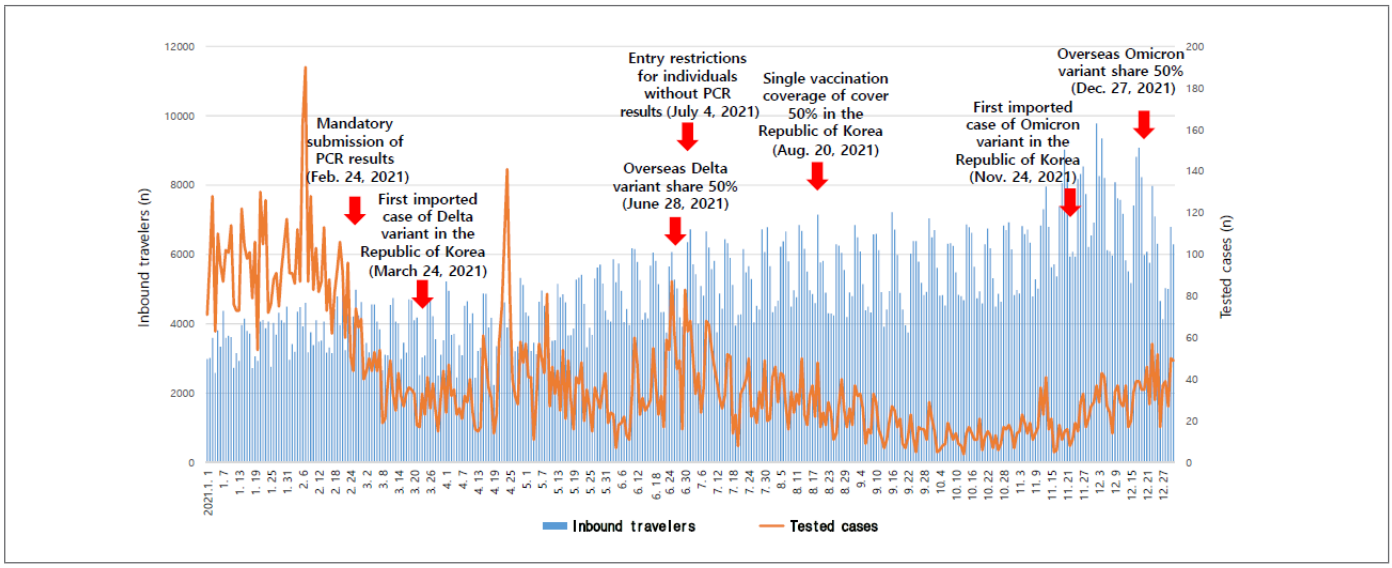


Figure 2. Trend of Incheon Airport National Quarantine Station inbound travelers and symptomatic/quarantine targets in 2021

PCR, Polymerase chain reaction

the highest at 19.9% in July, followed by 16.4% in June and 10.5% in August. Hence, the positivity rate exceeded 10% from June to August. Thereafter, it decreased to 3.0% in November and rose to 7.8% in December (Table 2).

In January and February, before the submission of negative PCR results for COVID-19 had become an entry requirement, there were more than 2,000 people with symptoms or who were targeted for testing for other reasons, but the positivity rate was in the range of 5%. From June to August, the period during which the prevalence of the Delta variant increased, the positivity rate reached 10% or more. It increased again in December with the increasing prevalence of the Omicron variant. Thus, the number of symptomatic cases and the positive test rate increased with the introduction of the Delta and Omicron variants.

3. Symptoms of confirmed COVID-19 cases at the IANQS in 2021

Among the 1,287 confirmed cases, 860 (66.8%) reported symptoms in the health declaration form. Of these confirmed cases, 261 (20.3%) had unrecognized fevers and reported themselves as asymptomatic but were confirmed to have a fever at the quarantine station, and 166 (12.9%) were asymptomatic confirmed cases (Table 3).

Of the 860 symptomatic cases, 33 (3.8%) were emergency patients who were urgently transferred to a medical institution during the quarantine stage due to respiratory distress and decreased oxygen saturation. Emergency transfers started with four cases each in January and February, rising to 12 cases in June and eight cases in July, during the Delta variant spreading period, but there were no such cases since July (Figure 3). There were no emergency patients due to the spread of the Omicron variant, which was first introduced into the ROK on November 24, 2021. In addition, Indonesians accounted for more than half of the 33 emergency patients (21; 63.6%), and the rest were all Koreans. Even considering the rapid increase in the number of confirmed cases of the Delta variant in Indonesia in the first half of 2021, this number was unusual compared to other countries. Among the 261 cases who did not report symptoms but who were confirmed by fever checks at the quarantine station, 67 were confirmed in July, the month in which the largest number of cases were identified. The proportion of individuals with unrecognized fever among all confirmed cases across Korea was the highest at 41 (30.8%) in April. Unrecognized fever cases dropped sharply after 33 were recorded in August: only five or fewer were confirmed from September to December. Even in December,

Table 2. Positive rate of samples collected from symptomatic and quarantined targets at Incheon Airport National Quarantine Station (2021)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number of tested cases	2,941	2,557	1,065	1,267	1,146	1,016	1,184	1,262	560	379	541	1,059	14,977
Confirmed cases	158	137	73	132	70	167	236	133	42	16	16	83	1,263
Positive rate (%)	5.4	5.4	6.9	10.4	6.1	16.4	19.9	10.5	7.5	4.2	3.0	7.8	8.4

when the number of confirmed cases again increased, the number of individuals with unrecognized fevers was the lowest, at 4.7% (n = 4). Although the increase or decrease of unrecognized fever was affected by the increase or decrease of symptomatic patients and although there was an increase due to actively targeted quarantine, the increase in the number of confirmed cases with unrecognized fever could serve as a predictor of an increase in the number of symptomatic patients. The most common reason for testing those reported as asymptomatic, but who were later confirmed as positive, was "being accompanied by symptomatic cases" (n = 50; 30.1%), "pre-confirmed diagnosis" (n = 44; 26.5%), "targeted for quarantine for reasons related to countries or workplaces with a high number of confirmed cases" (n = 43; 25.9%), "exempt from humanitarian quarantine or referral to external agencies" (n = 24; 14.5%), "contact with a confirmed case" (n = 4; 2.4%), and other (n = 1; 0 .6%). Of 43 who reported as being asymptomatic but who tested positive in target testing, 24 (55.8%) were encountered in April. At that time, i.e., in the early stages of the spread of the Delta variant from India, targeted quarantine was conducted on passengers with a history of staying in India, to prevent the delay in recognition and the spread of the Delta variant in Korea, and consequently, many asymptomatic cases were confirmed to be positive.

The symptoms of confirmed COVID-19 patients differed by nationality. Koreans accounted for 782 (90.9%) of the 860 in symptomatic confirmed cases, which amounted to more than

Table 3. Symptoms of confirmed COVID-19 cases at Incheon Airport National Quarantine Station in 2021

unit: n (%)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Symptomatic cases	111	92	45	61	55	123	148	88	35	14	13	75	860
	(69.4)	(67.2)	(59.2)	(45.9)	(78.6)	(73.7)	(60.7)	(65.7)	(83.3)	(70.0)	(72.2)	(87.2)	(66.8)
Unrecognized fever	32	33	14	41	6	23	67	33	5	2	1	4	261
	(20.0)	(24.1)	(18.4)	(30.8)	(8.6)	(13.8)	(27.5)	(24.6)	(11.9)	(10.0)	(5.6)	(4.7)	(20.3)
Asymptomatic fever	17	12	17	31	9	21	29	13	2	4	4	7	166
	(10.6)	(8.8)	(22.4)	(23.3)	(12.9)	(12.6)	(11.9)	(9.7)	(4.8)	(20.0)	(22.2)	(8.1)	(12.9)

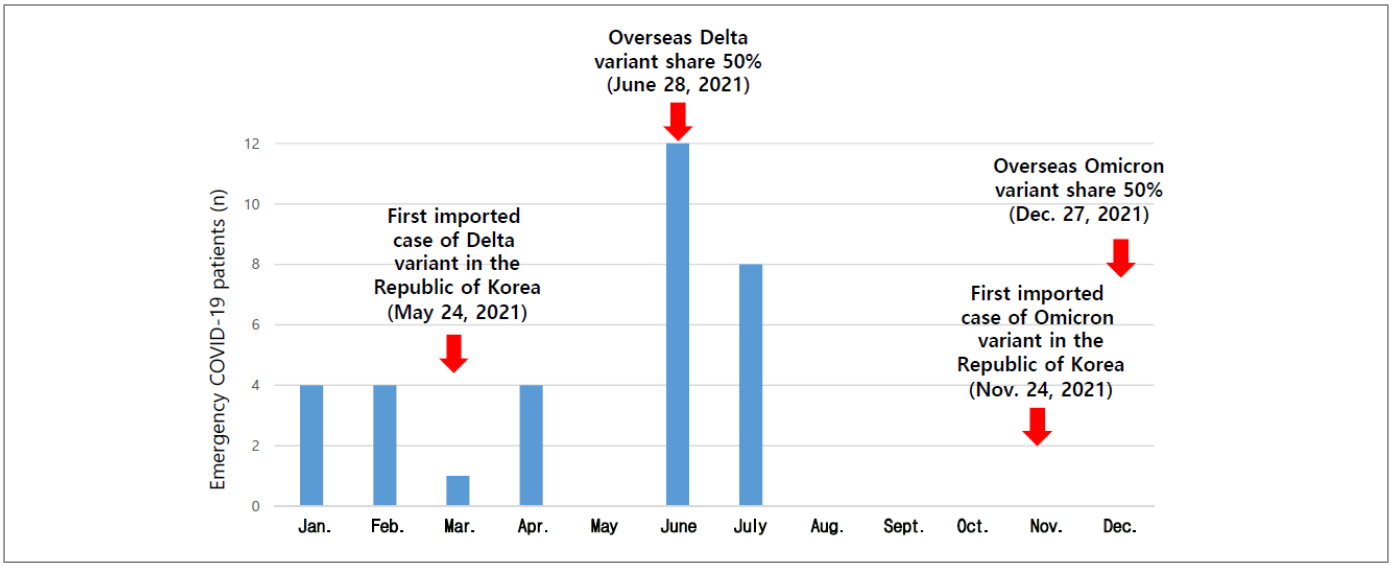


Figure 3. Emergency COVID-19 patients requiring urgent transfer at the Incheon Airport National Quarantine Station in 2021

90%. In the case of unrecognized fever, 169 of the 261 (64.8%) cases were foreigners, which was twice as many as Koreans (Figure 4). The number of foreign confirmed cases in 2021 was 306, of which 55.2% (n = 169) were confirmed after a fever check at the quarantine station although they had not reported having symptoms. The number of confirmed cases among those with unrecognized fever was more than double the number of confirmed cases (n = 78) who had reported symptoms. Of the 166 asymptomatic confirmed cases, 108 (65.1%) were Koreans. The reason for the test in these asymptomatic cases was "accompanied by symptomatic patients" and "pre-confirmed history" (n = 34; 31.5%) respectively, and "targeted for quarantine" (n = 21; 19.4%). In the case of foreigners, 22 cases (37.9%) were "targeted for quarantine," followed by "accompanied by symptomatic patients" at 16 (27.6%), and "pre-confirmed history" and "referral to external examination" (each n = 10; 17.2%).

4. Strengthening the quarantine response to COVID-19

The IANQS is holding regular quarantine planning meetings to determine which individuals will be subjected to reinforced quarantine by identifying trends in overseas outbreaks and continuously analyzing confirmed cases imported from overseas. The fever standard for symptomatic persons was adjusted from 37.5°C to 37.3°C, and asymptomatic people accompanied by a symptomatic person, who have a high transmission probability, were included as subjects targeted for testing. The IANQS has been taking a pre-emptive approach, before the government enhanced the quarantine response, with targeted quarantine including complete inspections for groups with epidemiological connections to areas where there are many asymptomatic confirmed cases or to high-risk countries. In 2021, due to the spread of the Delta variant, targeted quarantine for inbound travelers from India and Indonesia was the main quarantine response.

With the number of new confirmed cases in India increasing rapidly in April 2021, among passengers who arrived from India on a flight on April 6, 2021, one case was confirmed at the IANQS, and 13 at the local government inspection station thereafter. Accordingly, on April 14, 2021, a targeted quarantine was started for travelers inbound from India. Subsequently, due

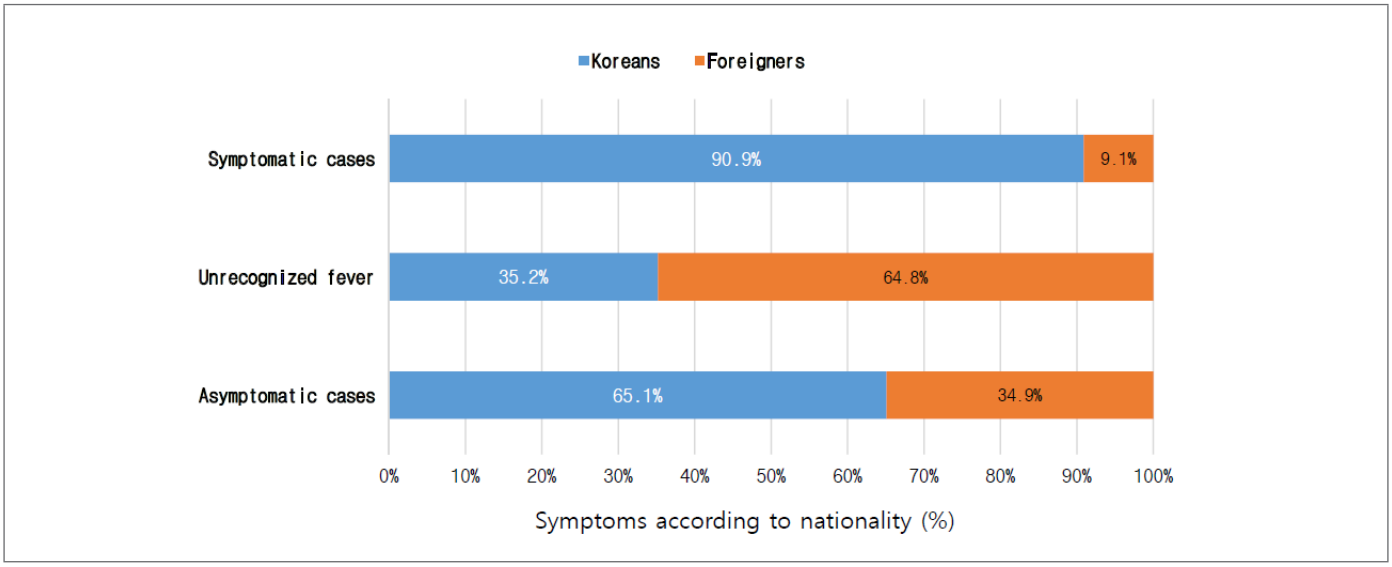


Figure 4. Nationality of patients with confirmed COVID-19 at the Incheon Airport National Quarantine Station in 2021 according to symptom

to worsening of the situation in India, reports of viral variants, and continuous reports of confirmed cases derived from India, the quarantine station expanded the inspections to all travelers inbound from India, on April 21, 2021. We designated India as a quarantine-strengthening country at the overseas-import situation assessment meeting on April 23, 2021. World Health Organization (WHO) designated the B.1.617 variant and other variants from India as global concerns that required analysis and tracking on April 27, 2021. The Central Disease Control Headquarters decided to test all travelers inbound from India in temporary living facilities from April 30, 2021, and from May 4, 2021, the quarantine was strengthened to facility quarantine for 7 days for all travelers inbound from India. The WHO included the B.1.617 variant from India as a major variant on May 11, 2021, and the name was changed to the Delta variant on May 31, 2021 (Figure 5).

At the IANQS, from April 14, 2021, when the targeted quarantine began, until April 30, 2021, when testing was started at all temporary living facilities due to the strengthening of government-level quarantine measures, 30 (68.1%) of 44 Delta variant-confirmed patients were confirmed at the IANQS, which contributed to delaying the initial domestic spread of the variant imported from abroad. Later on, the Delta variant also spread around the world, and the number of locally confirmed cases increased rapidly in Indonesia. While monitoring this closely, the number of confirmed cases imported into the ROK also surged from June (13 new cases per week [May 25-31, 2021] → 22 cases [June 1-7, 2021] → 58 cases [June 8-14, 2021] → 77 cases [June 15-21, 2021]). Hence, targeted quarantine for passengers arriving from Indonesia started on June 10, 2021, but because there are direct flights from Indonesia almost every day and the large number of inbound passengers, it was impossible to conduct a full inspection, such as the measure taken for those arriving from India. Indonesia was designated as a quarantine-strengthening country at the overseas-import situation assessment meeting on June 28, 2021, and on June 30, 2021, 24 confirmed cases from Indonesia were identified at the IANQS (188 entrants, positivity rate of 12.8%). After analyzing this situation, it was confirmed that many passengers who had not submitted a COVID-19 PCR test result, which was mandatory, were boarding inbound flights. Accordingly, from July 4, 2021, boarding restrictions were implemented for all those who had not submitted COVID-19

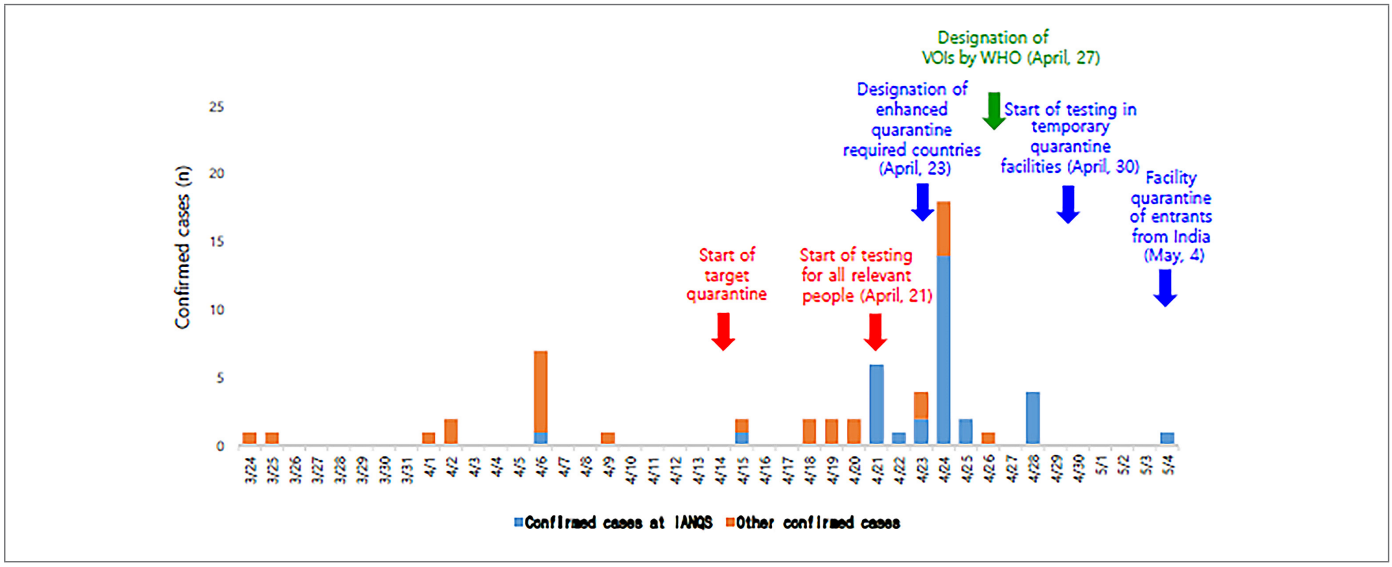


Figure 5. Delta variant occurrence and quarantine response enforcement status according to initial delta variant introduction date

IANQS, Incheon Airport National Quarantine Station; VOIs, Variants of Interest; WHO, World Health Organization

PCR test results. From June 10, 2021, when the targeted quarantine for Indonesia was implemented, until July 4, 2021, when boarding restrictions for those who did not submit PCR results were applied, 792 confirmed cases were imported from abroad, of which 320 were confirmed from Indonesia, accounting for 40.4%. Of the 320 confirmed cases from Indonesia, 160 (50.0%) were confirmed at the IANQS. The number of new local confirmed cases from Indonesia has decreased since peaking on July 15, 2021 [5]. The weekly influx from Indonesia was the highest, at 114, in the week of June 22-28, 2021. However, after implementing the boarding restrictions for those who did not submit PCR test results, on July 4, 2021, the number of weekly inbound confirmed cases from Indonesia gradually decreased, to 35 in the week of July 20-26, 2021. Implementing additional countermeasures according to analysis of the confirmed cases seemed to lead to a decrease in the number of imported cases (Figure 6).

Conclusions

In 2021, the second year of the global COVID-19 pandemic, viral variants appeared, and vaccination against COVID-19 started both domestically in the ROK and abroad. New enhanced measures were introduced, including mandating the submission of negative COVID-19 PCR test results for entry into the ROK. It was observed that the pattern of confirmed patients encountered at the quarantine station changed. This report conveys the characteristics of confirmed cases and changes over the 2021 period at the IANQS. The major change observed from January to December was the decrease in the number of those tested who were targeted for testing at the quarantine station, including those with symptoms, and consequently the decrease in the number of cases confirmed cases at the IANQS relative to all imported confirmed patients. The number of symptomatic patients was highest, at 2,941, in January 2021, when the Alpha variant was spreading. Since March 2021, this number has been below 2,000, and since August 2021, when the number of confirmed cases worldwide had increased due to the rise of the Delta variant, it has decreased to below 1,000. In October 2021, the number

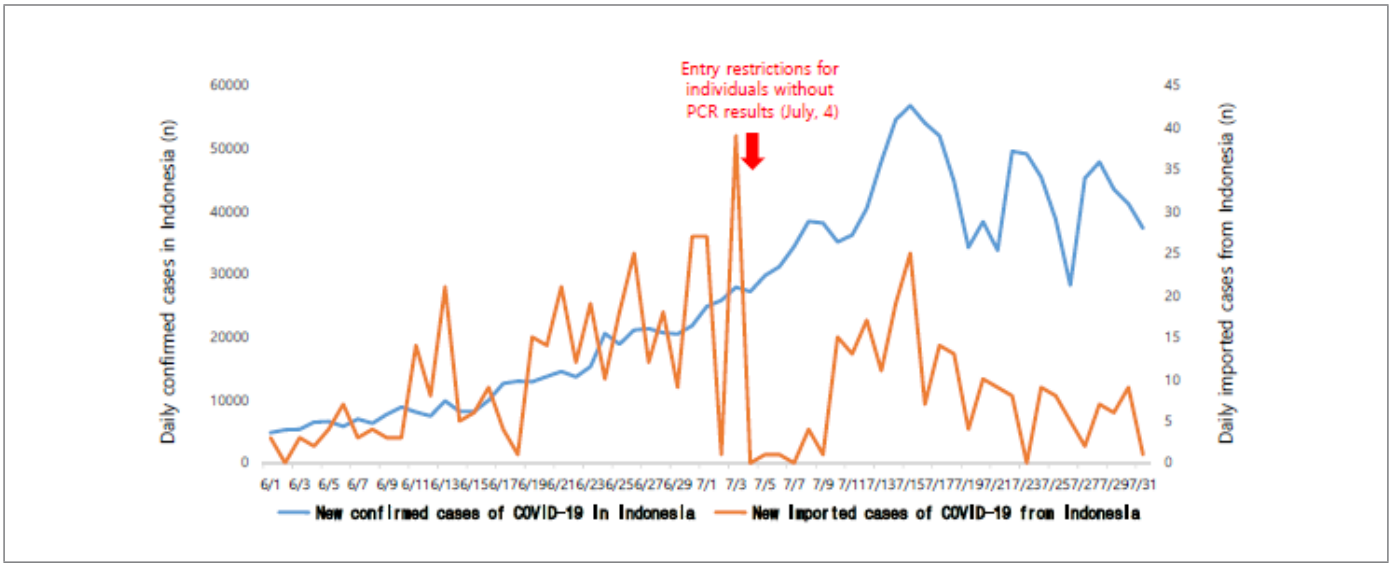


Figure 6. COVID-19 cases from versus those in Indonesia (June to July 2021)

plummeted to 379, the lowest number reported. Although the number of symptomatic cases decreased, the proportion of positive cases confirmed at the IANQS among the total overseas imported cases did not show a decreasing trend until August 2021. In June 2021, the proportion of confirmed cases was highest, at 19.3%, and in July, the number of confirmed cases was 244, the highest ever. However, since then, the number of tested individuals, including those who reported symptoms, has decreased by more than half, from 1,262 in August 2021, to 560 in September 2021. In the second half of the year, except for December, the number of confirmed cases among the approxaimtely 500 individuals tested each month decreased sharply, and the proportion of cases confirmed at the IANQS among the total imported cases also decreased, to an average of 4.3% between September and December 2021. This means that, even though the number of people reporting symptoms has decreased, the number of imported cases has not decreased. There is therefore a need for a discussion on whether the actual number of symptomatic cases has decreased or whether there were missing reports during the quarantine stage. Nevertheless, more publicity is needed for overseas travelers to report their health status during the quarantine stage. After analyzing the confirmed cases, symptoms were reported by only 66.8% of inbound passengers who were identified as confirmed cases. Cases with unrecognized fever accounted for 20.3% of all confirmed cases, indicating that a fever check at the entry stage is one of the main quarantine methods. However, as confirmed cases decreased sharply in the second half of the year, the number of unrecognized fever cases among the confirmed cases decreased significantly. Among the confirmed cases, from January to August 2021, the proportion of symptomatic patients was 64.5%, and the proportion of unrecognized fever cases was 22.2%. Among the confirmed cases, between September and December 2021, 82.5% of the confirmed cases had symptoms, while the proportion of cases with unrecognized fever was as low as 7.2%. In addition, there were differences in reporting of symptoms according to the nationality of the confirmed cases. In the case of foreigners, the number of confirmed cases who had unrecognized fever was higher than that of cases who reported symptoms, indicating a need for more active intervention to identify infected individuals during the quarantine stage.

In 2020, the number of imported cases confirmed at the IANQS was 1,527, out of 5,379 imported cases overall (28.4%), but in 2021, it decreased by more than half to 10.8%. The overall trend observed in 2021, such as a decrease in the proportion of imported cases, a decrease in the number of cases confirmed at the IANQS, and a decrease in the number of those with symptoms, may have been influenced by several factors. These factors include changes in policy, such as the inception of COVID-19 vaccination, the mandatory submission of negative PCR test results after the first year of the COVID-19 pandemic, and a decrease in compliance with quarantine guidelines due to the prolonged nature of the pandemic. In addition, despite this decreasing trend, new variants have arisen, and when the number of confirmed cases with these variants increased, the number of symptomatic cases and cases confirmed at the IANQS also increased with the variants' influx. This requires a more active response when variants first arise.

With the prolongation of the COVID-19 pandemic, quarantine measures are being eased domestically and abroad. Accordingly, the number of cases confirmed at the quarantine station is also changing. It is expected that this report will form a basis for establishing quarantine response measures in the event of a new infectious disease pandemic.

① What was previously known?

Incheon Airport National Quarantine Center started a strengthened quarantine response after the first confirmed case of COVID-19 on January 20, 2020.

By analyzing the confirmed status of imported cases, cases identified as having an epidemiological relationship were targeted for strengthened quarantine regulations, such as stricter fever standards.

② What was newly known?

Of confirmed cases at Incheon Airport National Quarantine Center in 2021, males accounted for 66.0%, nearly twice that of females (34.0%), while by age, those in their 20s and 30s accounted for 47.9%. The proportion of cases with unrecognized fever who had not reported having symptoms exceeded 20%, and the proportion of cases of unrecognized fever among foreigners was higher than that among Koreans. However, since August 2021, the number of symptomatic and confirmed cases has decreased. The proportion of cases confirmed at the quarantine station relative to the total number of imported cases has decreased.

③ What are the implications?

As the COVID-19 pandemic continues, a change in the confirmed cases has been observed at the quarantine station. The results related to identifying infected cases with unrecognized fever and to quarantine measures for foreign nationals are expected to be used as a reference when establishing response plans at the quarantine stage.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Correspondence to: Chong Hee Choi

Incheon Airport National Quarantine Station, Korea Disease Control and Prevention Agency

dental@korea.kr, 032-740-2727

Submitted: June 17, 2022; Revised: July 6, 2022; Accepted: July 6, 2022

References

1. Korea Centers for Disease Control and Prevention [Internet]. Coronavirus Infectious Disease-19 [cited 2022 May 11] Available from: http://ncov.mohw.go.kr/bdBoardList_Real.do?brdId=1&brdGubun=11&ncvContSeq=&contSeq=&board_id=&gubun=.
2. Jin-Hwa Jang, Shin-Young Park, Seon-Hee Ahn, et al. The main characteristics of the number of confirmed cases of COVID-19 in Korea in 2021. Weekly Health and Illness 2022;15(4):225-234.
3. Centers for Disease Control and prevention. COVID Data Tracker [Internet]. Available from:covid.cdc.gov/covid-data-tracker/#trends_dailycases.
4. Our World In Data. Coronavirus Pandemic(COVID-19) [Internet]. Available from: Ourworldindata.org/covid-vaccinations.
5. World Health Organization. WHO Coronavirus(COVID-19) Dashboard [Internet]. Available from: https://covid19.who.int/data.

This article has been translated from the Public Health Weekly Report (PHWR) Volume 15, Number 27, 2022.

코로나19 이슈

코로나19 변이 바이러스 감시 강화방안 소개

질병관리청 감염병진단분석국 신종병원체분석과 **김일환, 김희만, 박애경, 이남주, 이혁진, 김정아, 이채영, 이지은, 김은진***

*교신저자: ekim@korea.kr, 043-719-8140

코로나바이러스감염증-19(코로나19) 팬데믹의 장기화로 인해 다양한 변이 바이러스들이 출현하고, 2021년 11월 세계보건기구(WHO)에서 주요 변이(Variant of Concern, VOC)로 분류한 오미크론의 전 세계 확산과 함께 BA.2, BA.2.12, BA.4, BA.5, BA.2.75 등 오미크론 세부계통 변이 바이러스가 지속적으로 나타남에 따라, 전 세계 각국은 신종 변이 바이러스의 출현 여부를 계속 모니터링하고 있다[1].

질병관리청은 코로나19 바이러스의 감염병 등급 2급 조정에 따른 방역 및 의료체계의 전환으로 코로나19 변이 바이러스의 감시 강화를 위해 기존 호흡기바이러스 감시를 확대·개편한 국가 호흡기바이러스 통합감시(Korea Respiratory-virus Integrated Surveillance System, K-RISS)를 구축하여 운영하고 있다. 호흡기바이러스 통합감시는 의료기관을 대상으로 하는 인플루엔자 및 호흡기바이러스 7종(아데노/파라인플루엔자/계절코로나/리노/보카/메타뉴모/호흡기세포융합바이러스) 병원체 감시에 코로나19 변이 감시를 통합한 감시체계로, 선별진료소를 통해 확진된 코로나19 환자는 물론 1, 2, 3차 의료기관 150개소의 감시기관 내 확진자 및 호흡기질환자, 고위험군(중증환자 및 고령층 등)까지 코로나19 변이 감시 대상으로 포함하여 분석 대상에 대한 표본을 확대하였다. 이를 통해 감시 결과에 대한 대표성 강화는 물론, 코로나19 신종 변이 등 호흡기바이러스를 신속하게 검출, 위험도에 대한 모니터링 및 평가를 위한 데이터를 산출하고 있다. 호흡기바이러스 통합감시를 통해 확인된 코로나19 확진자 중 변이 감시의 분석 대상은 변이의 확산과 발생률을 유의하게 모니터링하기 위해 연령별 대표성을 고려한 표본추출을 통해 선별하고, 변이에 취약할 수 있는 중증환자 및 고령층 등을 대상에 추가하여 변이 분석을 위한 유전체분석을 실시한다. 다만, 유전체분석은 검체 내 바이러스의 RNA 양이 충분해야 정확한 분석이 가능하기 때문에 코로나19 PCR 검사 결과 Ct 값이 29 미만인 양성검체만을 대상으로 진행한다. 변이 감시를 위한 유전체분석은 유럽 질병예방통제센터(ECDC)의 변이 모니터링을 위한 표본산정기준(표 1)을 참고하여, 전체 확진자 내 1% 이상의 비율로 존재할 수 있는 신규 변이를 검출하기 위해 매주 약 1,600건 이상의 양성 검체를 대상으로 수행되고 있다[2,3]. 2022년 8월 현재 변이 감시를 위한 유전체분석은 질병관리청 및 권역별 질병대응센터 5개소, 보건환경연구원 3개소, 국방부 2개소, 민간기관 6개소에서 수행 중이다.

표 1. 코로나19 변이 바이러스 발생 비율에 따른 변이 검출을 위한 최소 분석 건수(ECDC, 2021. 5. 3.)

확진자 수(명)/주	변이 발생 비율에 따른 변이 검출을 위한 최소 분석 건수/주		
	1%	2.5%*	5%
＞100,000	1,522	600	292
50,001-100,000	1,500	597	292
25,001-50,000	1,478	593	291
10,001-25,000	1,435	586	289
5,001-10,000	1,321	567	284
2,501-5,000	1,167	536	276
1,001-2,500	947	484	262
501-1,000	604	375	227
＜500	377	273	185

* ECDC 제안 최소 권장 표본 수

변이 감시를 위한 유전체분석의 전 세계적인 경향은 오미크론이 급증한 2022년 1주차 약 300,000건으로 최대 분석을 나타낸 이후 감소 추세를 나타내고 있다[4]. 확진자 감소와 함께 2022년 19주차 이후부터는 주당 분석 수가 100,000건 미만으로 1주차 대비 60% 이상 감소하였고, 작년 델타 유행에 비해서도 변이 분석 수가 감소한 것을 확인할 수 있다. 해외 각국의 경우도 남아공은 5월 2,129건에서 6월 613건, 스웨덴은 2,404건에서 1,857건, 포르투갈 2,709건에서 1,849건, 스페인 7,533건에서 4,245건, 이탈리아 4,338건에서 3,876건으로 감소하였다. 그러나 질병관리청은 매월 약 6,400건의 유전체 분석을 꾸준히 유지하며 변이의 유행 추이, 신규 변이 출현 탐지 등에 대한 정보를 제공함으로 적절한 방역정책 수립에 기여하고 있다.

질병관리청은 국가 호흡기바이러스 통합감시체계의 안정적 운영과 함께 강화된 변이 감시를 유지하며, 국내 변이 유행현황 파악, 신규 변이 조기 탐지, 변이특성 분석 등 효율적인 변이 모니터링을 지속할 예정이다.

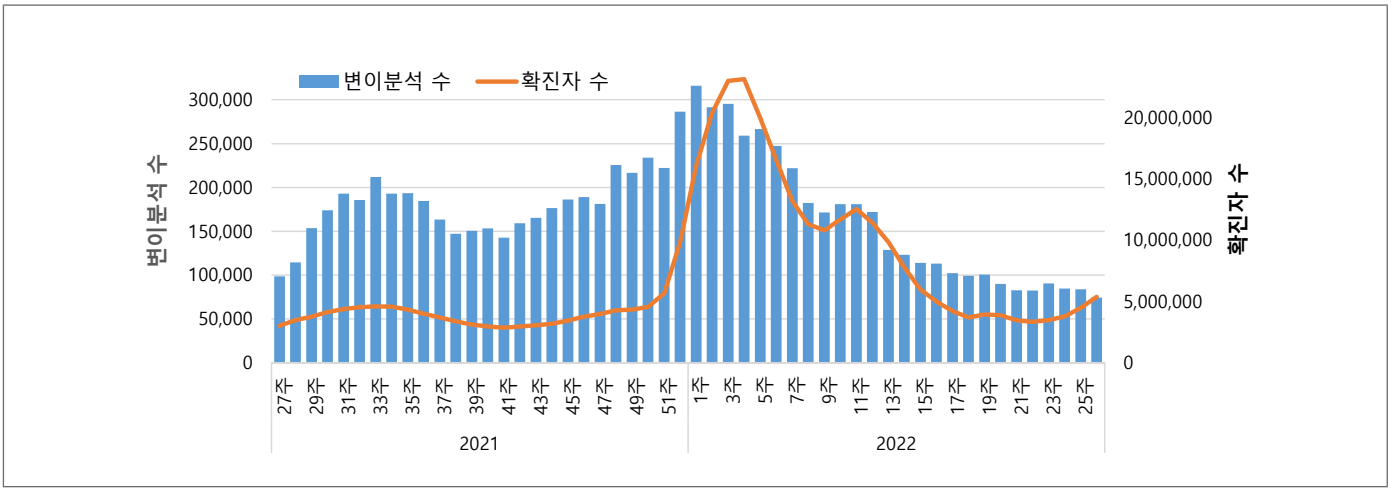


그림 1. 전 세계 코로나19 바이러스 변이 분석 수 및 확진자 현황(CovSPECTRUM, 2022. 7. 21.)

참고문헌

1. Tracking SARS-CoV-2 variants. World Health Organization.
2. Technical report: Guidance for representative and targeted genomic SARS-CoV-2 monitoring, European Centre for Disease Prevention and Control. 2021.5.3.
3. Guidance for surveillance of SARS-CoV-2 variants, World Health Organization. 2021.8.9.
4. Chen, C., Nadeau, S., Yared, M., Voinov, P., Ning, X., Roemer, C. & Stadler, T. "CoV-Spectrum: Analysis of globally shared SARS-CoV-2 data to Identify and Characterize New Variants" Bioinformatics (2021); doi: 10.1093/bioinformatics/btab856.

역학 · 관리보고서

국내 일본뇌염 확진 사례의 진단검사 결과 분석

질병관리청 감염병진단분석국 바이러스분석과 **이예지, 왕진숙, 강혜지, 이덕용, 한명국***

*교신저자: mghan@korea.kr, 043-719-8190

초 록

일본뇌염은 모기가 매개하는 인수공통감염병으로 회복 후 일부 환자에서 신경학적 후유증을 유발하는 질환이다. 병원체는 일본뇌염 바이러스로 혈청형은 하나이나 유전형은 5가지로 나누어지며 바이러스 혈증의 지속 기간이 짧아 유전자 검출률이 낮으므로 진단검사는 항체 검출을 중심으로 이루어지고 있다. 또한 플라비바이러스에 속하는 다른 바이러스와 혈청학적 교차반응으로 확인 진단에 어려움이 있다. 이 글에서는 항체 검출검사 결과에 근거하여 진단검사용 검체 종류와 채취 시기에 대해 고찰하였으며 확진 사례에서 감염된 일본뇌염 바이러스 유전형을 추정하고 웨스트나일열에 대한 혈청학적 교차반응을 조사하였다. 분석은 2020년에 확진된 일본뇌염 환자를 대상으로 하였다. 모든 대상자에서 일본뇌염 바이러스는 검출되지 않았으며, 급성기에 채취한 뇌척수액에서 모두 IgM 항체는 양성이었다. 회복기에 채취한 혈청에서는 IgG 항체가 급성기 혈청에 비해 4배 이상 상승하거나 1:256 이상으로 높았다. 바이러스 중화항체가도 급성기에 비해 회복기 혈청에서 상승하였거나 높게 측정되었으며 웨스트나일열은 모두 음성으로 판정되었다. 바이러스 유전형별 중화항체가 및 IgG 항체가 조사 결과에 근거하여 감염된 일본뇌염 바이러스 유전형은 GI과 GV로 추정되었다.

주요 검색어: 일본뇌염, 일본뇌염 바이러스, 유전형, 중화항체, 확인진단검사

들어가는 말

일본뇌염(Japanese encephalitis)은 매년 전 세계적으로 약 67,900명의 환자가 발생한다고 보고되어 있으며, 대부분 불현성 감염으로 나타나나 250명 중 한 명 정도에서 임상증상이 나타난다. 일본뇌염은 급성으로 진행하여 고열, 현기증, 구토, 복통, 지각 이상 등을 보이며, 사망률은 20~30%이며 생존자의 30~50%에는 신경학적 후유증을 남기는 감염병이다[1-3]. 일본뇌염은 작은빨간집모기(*Culex triaeniorhynchus*)에 의해 주로 전파되며 돼지와 학·백로 등의 섭금류가 증폭숙주의 역할을 한다. 일본뇌염은 모기의 활동이 왕성한 여름부터 가을(8~11월)에 주로 발생한다[4,5].

일본뇌염 병원체는 일본뇌염 바이러스(Japanese encephalitis virus)로, 플라비바이러스과(*Flaviviridae*), 플라비바이러스속에 속한다. 유전자는 (+) 단일가닥 RNA이고 크기는 약 11 kb이며, 7개의 비구조단백질(Non-structural protein)과 3개의 구조단백질(Structural protein)로 이루어져 있다. 구조단백질 중 표피 단백질(Envelop protein) 유전자의 염기서열에 따라 5가지 유전형(Genotype(G) Ⅰ, Ⅱ, Ⅲ, Ⅳ, Ⅴ)으로 나뉜다[6,7].

국내에서는 1947년에 일본뇌염 환자가 처음 확인되었고, 2001년부터 2009년에는 10명 내외로 환자가 발생하였으나 2010년에는 26명으로 증가하면서 환자가 늘어나는 경향을 보인다[8,9]. 국내에 유행하는 일본뇌염 바이러스의 유전형은 1990년대 이후부터는 유전형 GⅢ에서 GI으로 바뀌었으며, 유전형 GV는 2010년에 모기에서 처음 검출되었다. 그 이후 국내에서 채집한 모기에서 유전형 GI과 GV가 검출되고 있다[5].

일본뇌염 바이러스는 감염 후 혈중에 존재하는 바이러스의

양이 적고, 감염 후 중화항체가 빠르게 생성되기 때문에 유전자를 검출하기가 어려우나 뇌척수액(Cerebrospinal fluid, CSF)이나 뇌 조직에서 바이러스가 검출된 사례도 보고되고 있다[10,11]. 발열 후 4일이 지나면 IgM 항체가 생성되고, 거의 동시에 IgG 항체도 형성된다. 발열 9~10일 후 CSF에서 검출되는 IgM 항체는 바이러스의 중추신경계 감염에 대한 95% 이상의 특이도가 있는 것으로 보고되어 있다[12](그림 1). 일본뇌염의 혈청학적 진단은 웨스트나일열 등과 같은 혈청군(Serocomplex)에 속하는 병원체와 교차반응이 있어 감별진단이 필요하다[13].

이 글에서는 일본뇌염 환자의 IgG 항체가 변화, 유전형 GI, GIII 및 GV에 대한 중화항체가 비교와 웨스트나일열 감별진단 결과에 대하여 기술하였다.

몸 말

1. 일본뇌염 확인 진단검사 결과

일본뇌염 혈청학적 검사는 선별검사의 일종인 효소면역측정법(Enzyme-linked Immunosorbent Assay, ELISA)에서 IgM 항체 검사를, 그리고 간접면역형광항체법(Indirect Immunofluorescence Assay, IFA)으로 IgG 항체가 상승 여부를 조사하였다. IFA 슬라이드는 일본뇌염 바이러스 유전형 GI, GIII, GV를 각각 감염시킨 BHK-21 세포를 이용하여 제작하였다. IgG 항체가는 유전형별로 항체가 및 상승 정도에 차이가 있었으며 유전형 중 가장 높은 항체가 또는 4배 이상 상승한 유전형의 항체가에 근거하여 판정하였다. 급성기와 회복기 혈청의 항체가 4배 이상 증가는 사례 3번, 4번, 6번 및 7번에서 확인되었으며 1:256 이상의 높은 항체가를 유지하거나 2배 상승은 사례 1번 및 5번에서 관찰되었다.

2. 일본뇌염 중화항체 검사 결과

일본뇌염 중화항체가의 유전형별 차이를 이용하여 감염된 일본뇌염 바이러스의 유전형을 추정하였다(그림 2, 표 1)[14-17]. 사례 1번과 7번을 제외하고 사례 3~6번은 급성기 혈청 채취 시기가 발병 후 6일 이내였으며 9~14일 차이를 두고 회복기 혈청을 채취하였다. 사례 1번의 경우 일본뇌염 바이러스 유전형 GI, GIII 및 GV에 대한 회복기 혈청의 중화항체가가 유지되거나 낮아지는 경향을 보여 중화항체가를 이용하여 유전형을 추정하기 어려웠다. 처음 채취한 혈청은 증상 발현 후 15일이 경과한 것으로 보아 IgG 항체와 중화항체가 형성된 시기에 채취된 것으로 추측되었다. 반면 사례 7번의 경우는 사례 1번과 같이 급성기 혈청의 채취가 증상 발현 후에 늦게 이루어졌고, 회복기 혈청 채취 간격도 20일 이상 차이가 나는데도 불구하고 다른 유전형에 비해 GV의 중화항체가만 상승하였다.

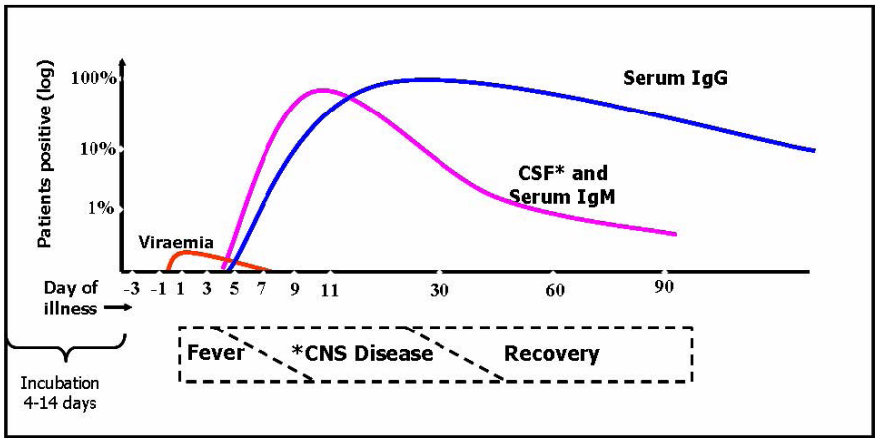


그림 1. 일본뇌염 바이러스 감염 후 증상 및 항체반응[12]

* CSF, Cerebrospinal fluid; CNS, Central nervous system

사례 3번 및 4번은 사례 7번과 유사하게 급성기 혈청에 비해 회복기 혈청의 중화항체가 상승이 유전형 GV에서 크게 상승함이 관찰되었고, 사례 5번은 급성기와 회복기 혈청의 중화항체가 상승을 볼 수 없었으나 유전형 GV의 중화항체가가 다른 유전형의 항체에 비해 최대 32배 높았다. 이러한 결과를 종합하여 사례 3번, 4번, 5번 및 7번은 유전형 GV에 감염된 것으로 추정되었다. 사례 6번은 급성기 대비 회복기 혈청에서 유전형 GIII와 GV에 대한 중화항체가가 유지되었으나 유전형 GI에 대한 중화항체가 4배 상승하여 감염된 바이러스 유전형으로 추정하였다.

3. 웨스트나일열 감별진단

일본뇌염 양성사례의 웨스트나일열 감별진단은 IFA 및 중화항체검사법을 이용하여 수행하였고, 일본뇌염 바이러스 유전형 GIII에 대한 결과를 이용하여 비교하였다(표 2). 웨스트나일 바이러스 IgG는 사례 3번 및 4번을 제외한 나머지 검체에서 검출(1:16~1:128)되었으나 회복기 혈청에서 4배 이상의 상승을 보이는 사례는 없었다. 이들 사례에서 일본뇌염 바이러스 GIII의 IgG 항체가가 1:64 이상 검출되었다. 웨스트나일 바이러스 중화항체가($PRNT_{50}$)는 사례 3번, 4번 및 6번에서는 검출되지

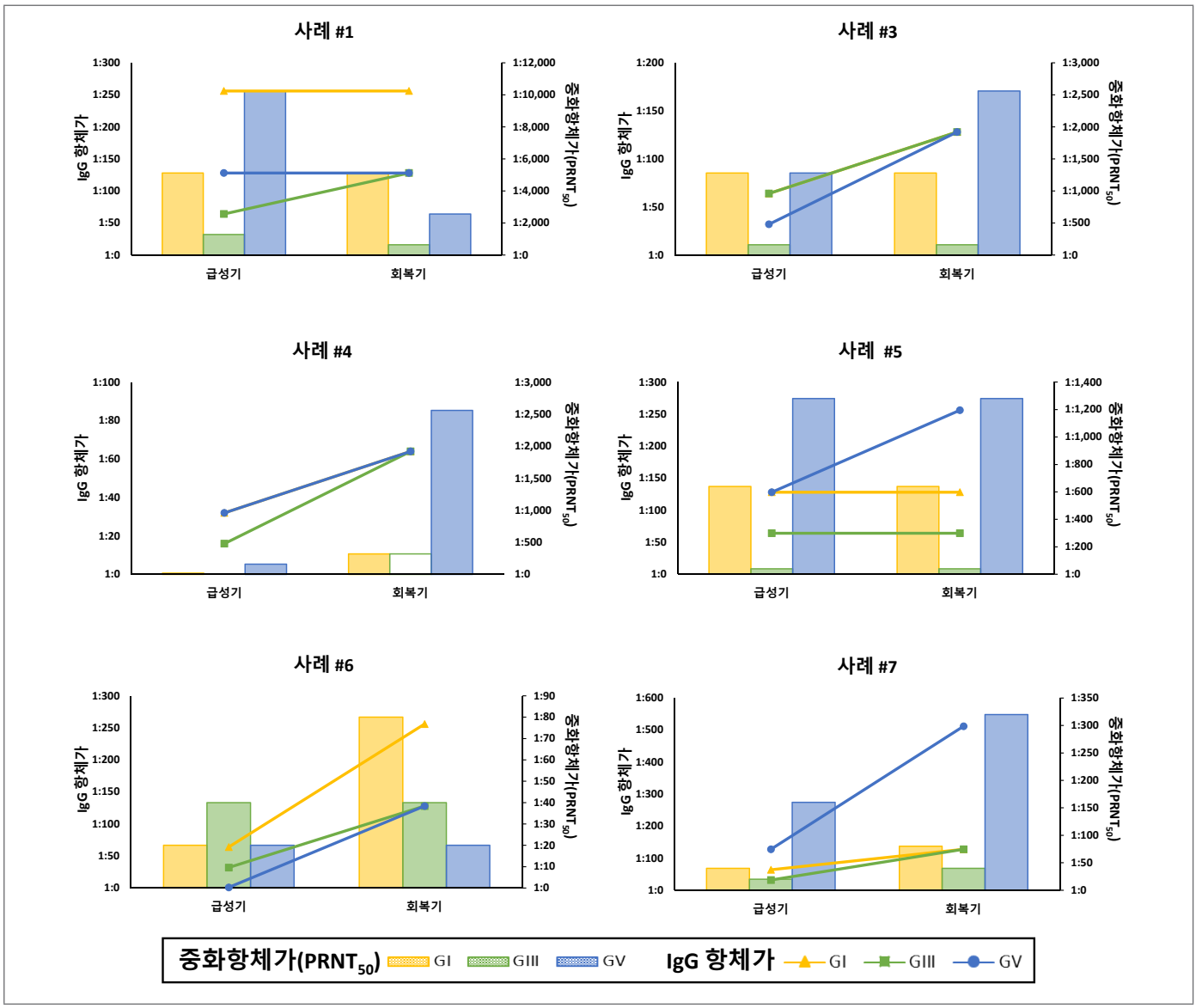


그림 2. 일본뇌염 바이러스 유전형별 IgG 및 중화항체가 변화

않았으며, 나머지 사례에서는 1:10~1:80의 중화항체가를 보였다. 웨스트나일 바이러스 중화항체가 검출된 검체들은 일본뇌염 바이러스 중화항체가 1:40 이상인 검체였다. 일본뇌염 바이러스와 웨스트나일 바이러스의 IgG와 중화항체가를 비율로 비교하였을 때, 웨스트나일 바이러스에 비하여 일본뇌염 바이러스의 IgG 항체가는 2~128배, 중화항체가는 2~320배까지 차이를 보였다(표 2). 보고된 문헌[18,19]에 근거하여 사례에서 측정된 웨스트나일 바이러스 중화항체는 같은 혈청군에 속하는 일본뇌염 바이러스와의 혈청학적 교차반응으로 검출된 항체로, 웨스트나일열 음성으로 판정하였다.

표 1. 일본뇌염 환자 혈청을 이용한 유전형별 중화항체가 비교

사례	발병 후 검체 채취일	중화항체가 비율($PRNT_{50}$)			추정 일본뇌염 바이러스 유전형
		GV/GI	GV/GIII	GI/GIII	
#1	15	2	8	4	추정 불가
	35	0.5	4	8	
#3	6	1	8	8	GV
	18	2	16	8	
#4	5	8	160	20	GV
	16	8	8	1	
#5	0	2	32	16	GV
	9	2	32	16	
#6	0	1	0.5	0.5	GI
	14	0.25	0.5	2	
#7	18	4	8	2	GV
	40	4	8	2	

표 2. 일본뇌염 및 웨스트나일열 IgG와 중화항체가 비교

사례	발병 후 검체 채취일	일본뇌염 바이러스(GIII)/WNV 항체가 비율	
		IgG 항체가	중화항체가($PRNT_{50}$)
#1	15	4	16
	35	8	16
#3	6	64	160
	18	128	160
#4	5	16	1*
	16	64	320
#5	0	64	2
	9	4	4
#6	0	32	40
	14	8	40
#7	18	2	20
	40	2	4

* 일본뇌염 및 웨스트나일 바이러스 중화항체가 모두 1:10 미만

맺는 말

국내 일본뇌염 의심 사례에서 일본뇌염 바이러스의 유전자가 2015년 1건, 2018년 2건의 뇌척수액에서 검출되었다[20,21]. 이러한 결과는 일본뇌염 의심 사례로부터 민감한 검사법인 유전자 검출검사를 위해서는 증상 발현 즉시 검체채취가 이루어지는 것이 중요하다고 하겠으나 유전자 검출검사는 혈중에 바이러스 유지기간(viremia)이 짧고 바이러스의 증식량이 낮기 때문에 검사법의 민감도는 높으나 유전자 미검출 사례가 대부분이다[12]. 그렇지만 급성기 뇌척수액은 혈액에 비해 유전자 검출 가능성이 높고 검출되는 IgM은 일본뇌염 바이러스에 대한 특이도가 95% 이상이기 때문에 일본뇌염 진단검사에 있어 중요한 검체이다. 정확한 진단을 위한 항체 역가 상승을 확인하기 위해서는 회복기의 혈청으로 항체검사를 하여야 하며, 회복기 혈청은 급성기 혈청 채취일 기준 14일 이후에 채취하는 것이 권고되고 있다. 중화항체검사는 다른 항체검사에 비해 노동집약적이고 시간도 오래 걸리지만 다른 플라비바이러스와의 교차반응을 확인할 수 있는 최적의 감별검사법이므로 보다 효율적인 검사법 개발이 필요하다고 하겠다.

국내에서 웨스트나일열 환자는 해외 유입사례를 제외하고 현재까지 보고된 사례는 없다. 그러나 일본뇌염 항체 검출검사 수행 시 웨스트나일 바이러스 등의 플라비바이러스와 교차반응이 일어나기 때문에 일본뇌염 항체가 검출된 사례에 대해서는 증상이 유사한 웨스트나일 바이러스에 대한 감별진단이 필요하다.

일본뇌염 바이러스의 표피단백질은 감염 시 중화항체를 형성하는데 중요한 역할을 하며, 각 유전형의 표피단백질의 상동성은 GI과 GIII는 89.7%, GIII와 GV는 79.3% 정도이다. 일본뇌염 바이러스는 단일 혈청형이기 때문에 모든 유전형의 중화항체가 교차반응을 보이지만, 백신 접종한 쥐, 돼지, 말을 이용한 일본뇌염 바이러스 유전형별 방어능 실험에서 GI, GIII, GV의 중화항체가가 차이가 있는 것이 보고되었다. 일본과 베트남에서 일본뇌염 바이러스 유전형 GV의 유입 여부를 조사하고자 일본뇌염 바이러스 유전형별 중화항체가를 비교하였다[14–17]. 보고된 연구 결과들을 종합할 때 본 보고서에서 조사한 일본뇌염 양성 사례 6건에서 감염된 일본뇌염 바이러스 유전형은 GI과 GV로 추정되며 이러한 결과는 국내 서식 모기에서 검출되는 일본뇌염 바이러스 유전형과 일치된 결과라고 하겠다. 일본뇌염 환자의 감염된 일본뇌염 바이러스의 유전형을 중화항체가로 추정하는 것은 백신접종이나 과거 불현성 감염에 의한 항체와 구분되어야 하므로 활용에 한계점이 없는 것은 아니다. 따라서 최근 감염에 의한 항체 형성 여부를 확인할 수 있는 추가 실험법의 확립이 필요하며, 일본뇌염 확진자를 대상으로 유전형별 항체가에 대한 추가검사를 추진할 계획이다.

① 이전에 알려진 내용은?

일본뇌염은 가을철에 집중적으로 환자가 발생하고 있으며, 진단검사는 뇌척수액과 혈청을 이용한 유전자와 항체 검출검사를 수행하고 있다. 국내 모기에서 검출되는 일본뇌염 바이러스의 유전형은 GI과 GV이다.

② 새로이 알게 된 내용은?

일본뇌염 양성 사례 중 웨스트나일열에 대한 감별진단 결과, 웨스트나일열은 음성이었으며, 일본뇌염 환자를 대상으로 유전형별 중화항체가와 항체전환(Serocomversion) 결과를 이용하여 감염된 일본뇌염 바이러스의 유전형을 GI과 GV로 추정하였다.

③ 시사점은?

일본뇌염 진단검사에 있어서 의심 증상 발생 즉시 채취한 급성기 검체(뇌척수액, 혈청)와 회복기 혈청의 확보가 중요하다. 감염된 일본뇌염 바이러스의 유전형 규명은 백신 접종력, 항체 지속력 등의 축적된 역학자료와 통합분석으로 유전형간 교차방어 정도를 이해하는데 활용 가능할 것이다.

참고문헌

1. Vaughn DW, Hoke CH Jr. The epidemiology of Japanese encephalitis: prospects for prevention. Epidemiol Rev. 1992;14:197–221.
2. Zheng Y, Li M, Wnag H, Liang. Japanese encephalitis and Japanese encephalitis virus in mainland China. Review in Nedical

Virology. 2012;;22(5):301–322.
3. Campbell GL, Hills SL, Fischer M. Estimated global incidence of Japanese encephalitis: a symstematic review. Bull World Health Organ. 2011;89(10):766–774, 774A–774E.
4. Im JH, Kim TS, Chung MH, Baek JH, Kwon HY, Lee JS. Current Status and a perspective of Mosquito–Borne Diseases in the Republic of Korea. Vector–Bone and Zoonotic Diseases. 2021;21(2):69–77.
5. Sanborn MA, Wuertz KM, Kim HC, Yang Y, Li T, Pollett SD, Jarman RG, Berry IM, Klein TA, Hang J. Identification of Japanese Encephalitis virus Genotype V and Other Mosquito–borne Viruses in Camp Humphreys, Republic of Korea, using Metagenomic Analysis. bioRixiv. 2021; doi: https://doi.org/10.1101/2021.03.15.435489
6. Turtle L and Solomon T. Japanese encephalitis–the prospects for new treatments. Nature Reviews 2018.
7. Solomon T. Recent advances in Japanese encephaliti. Journal Neurovirology. 2003;9:274–283.
8. Wang H, Liang G. Epidemiology of Japanese encephalitis: past, present, and future prospects. Therapeutics and clinical Risk Management 2015;11:435–448.
9. 질병관리청. 감염병포털(http://www.kdca.go.kr/npt/).
10. Mathur A, Kumar R, Sharma S, Kulsheshtha R, Kumar A, Caturvedi UC. Rapid diagnosis of Japanese encephalitis by immunofluorescent examination of cerebrospinal fluid. Indian Journal of Medical Research. 1990;91:1–4.
11. Desai A, Shankar SK, Ravi V, Chandramuki A, Devi–Gouie M. Japanese encephalitis virus antigen in the brain and its topographical distribution. Acta neuropathologica. 1995;89:368–37.
12. World Health Organ. Manual for the Laboratory Diagnosis of Japanese Encephalitis virus Infection. 2007.
13. Auerswald H, Ruget AS, Ladreyt H, In S, ao S, Sorn S Tum S, Duong V, Dussart P, Cappelle J, Chevalier V. Serological Evidence for Japanese Encephaliti and West Nile virus Infections in Domestic Birds in Cambodia. Frontiers in Veterinary Science. 2020;7:15.
14. Kang BK, Hwang JM, Moon H, Han SY, Kim J, Yang DK, Park BK, Song D. Compariosn of the antigenic relationship between Japanese encephalitis virus genotypes 1 and 3. Clinical and Experimental Vaccine Research. 2016;5:26–30.
15. Cao L, Fu S, Gao X, Li M, Cui S, Li X, Cao Y, Lei W, He Y, Wang H, Yan J, Gao J, Lian G. Low Protective Efiicacy of the Current Japanese Encephalitis Vaccine agianst the Emerging Genotype 5 Japanese Encephalitis virus. PLOS NEGLECTED TROPICAL DISEASES. 2016;10(5):E000466.
16. Maeki T, Tajima S, Kyaw AK, Matusmoto F, Miura K, Yamashita A, Yoshikawa A, Negishi K Noguchi Y, Tadoboro K, Abe K, Taruya J, Koh J, Ito H, Ikegaya A, Abe F, Wada M, Nishigata T, Ikeda M, Kato F, Taniguchi S, Nakayama E, Takasaki T, Morita K, Lim CK, Saijo M. Comparison of Neutralizing Antibody Titers against Japanese Encephalitis Virus Genotype V Strain With Those against Gennotype I and III strains in the Sera of Japanese Encephalitis Patients in Japan in 2016. Japanese Jounal of infectious Diseases. 2018;71:360–364.
17. Naguyen TTT, Tajima S, Ikeda M, Nguyen TT, Le TTH, Pham HTT, Pham DQ, Le MTQ, Maeki T, Taniguchi S, Kato F, Moi ML, orita K, Lim CK, Saijo M, Hasebe F. Neutralization Potency of Sera From Vietnamese Patients With Japanese Encephalitis (JE) against Genotype I and V JE Viruses. Japanese Jounal of infectious Diseases. 2019;72:115–117.
18. Maeki T, Tajima S, Ikeda M, Kato F, Taniguchi S, Nakayama E, Takasaki T, Lim CK, Saijo M. Analysis of cross–reactivity between flaviviruses with sera of patients with Japanese encephalitis showed the impotance of neutralization tests for the diagnosis of Japanese encephalitis. Journal of Infection and Chemotherapy. 2019;(25):786–790.
19. Gulati BR, Singha H, Singh BK, Virmani N, Khurana SK, Singh RK. Serosurvillanc fo Japaneses encephalitis vius infection among equines in India. Jornal of Veterinary Science. 2011;112(4):341–345.
20. Woo JH, Jeong YE, Jo JE, Shim SM, Ryou JS, Kim KC, Lee WJ, Lee JY. Genetic Chaacerization of Japanese Encephalitis virus Genotype 5 Isolated from Patient, South Korea, 2015. Emerging Infectious Diseases. 2020;26(5):1002–1006.
21. 이혁진, 이은주, 최우영, 한명국. 2018년 국내 일본뇌염 실험실 검사 현황. 주간 건강과 질병. 2019;12(33):1260–1266.

Abstract

Laboratory-based diagnosis results of Japanese encephalitis in the Republic of Korea

Ye-Ji Lee, Jin-Sook Wang, Hae Ji Kang, Deog-young Lee, Myung-Guk Han
Division of Viral Diseases, Bureau of infectious Diseases Diagnosis Control, Korea Disease Control and Prevention Agency (KDCA)

Japanese encephalitis (JE) is a vector-borne zoonotic disease caused by the Japanese encephalitis virus (JEV). The virus belongs to genus *Flaviviru*, Family *Flaviviridae*, and classified into five (I-V) genotypes according to the nucleotide sequence of the envelope protein. Because of low JE viral titer and rapid production of neutralizing antibodies, serological tests are commonly used for diagnostic tests. But Serological cross reactivity of *flavivirus* make difficult to diagnosis of JE. This report considered the types of samples for diagnostic tests and the timing of sample collections based on the antibody testing results. In addition, JE confirmed case was estimated infected genotype and for differential diagnosis of West Nile fever, cross-reactivity was confirmed. The analysis was conducted on Japanese encephalitis patients confirmed in 2020. Virus detection test (PCR test) was negative in all samples. We confirmed IgM positive using enzyme-linked immunosorbent assay in the acute phase of cerebrospinal fluid. In the indirect immunofluorescence assay test, the IgG antibody titers increased more than four times in the convalescent sera compared to the acute sera or were maintained as high as 1:256 or more. Neutralizing antibody titers in the PRNT were elevated or maintained in the convalescent sera compared to the acute stage in all sera. West Nile fever antibodies showed lower antibody titers than JE, and all were determined to be West Nile fever negative. On the results, the genotypes of JEV were estimated to be GI and GV with neutralizing antibodies.

Keywords: Japaneses encephalitis, Japanese encephalitis virus, Genotypes, Neutralizing antibody, Confirmation test

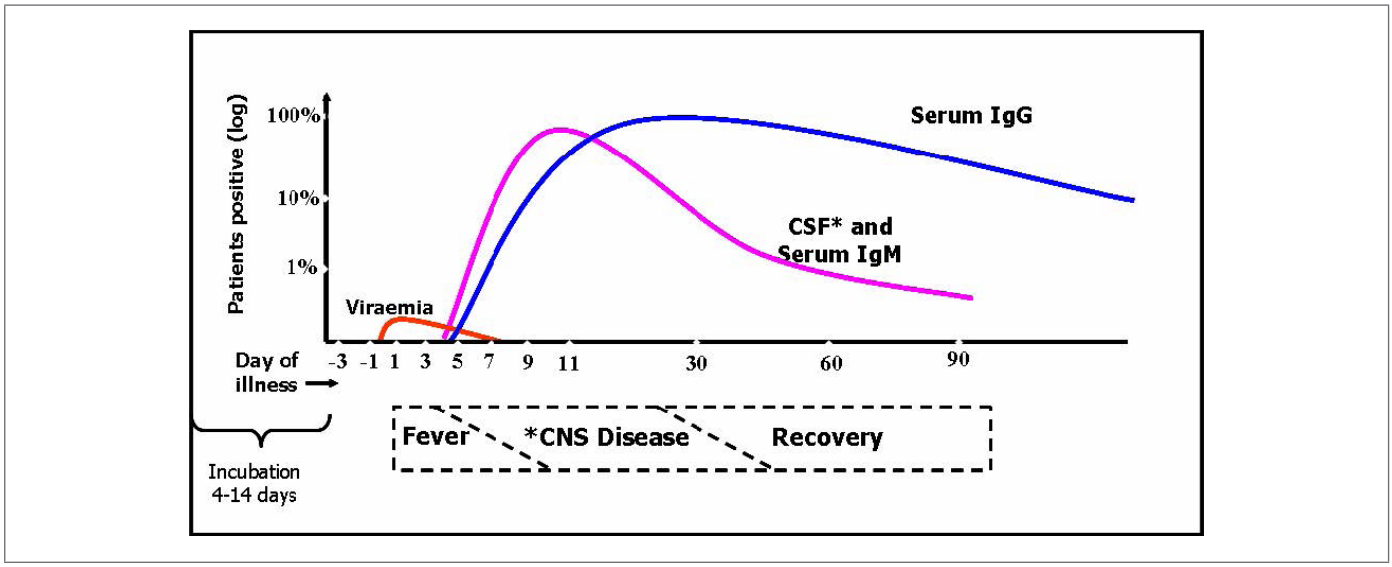


Figure 1. Schematic antibody response in Japanese encephalitis infection [12]

* CSF, Cerebrospinal fluid; CNS, Central nervous system

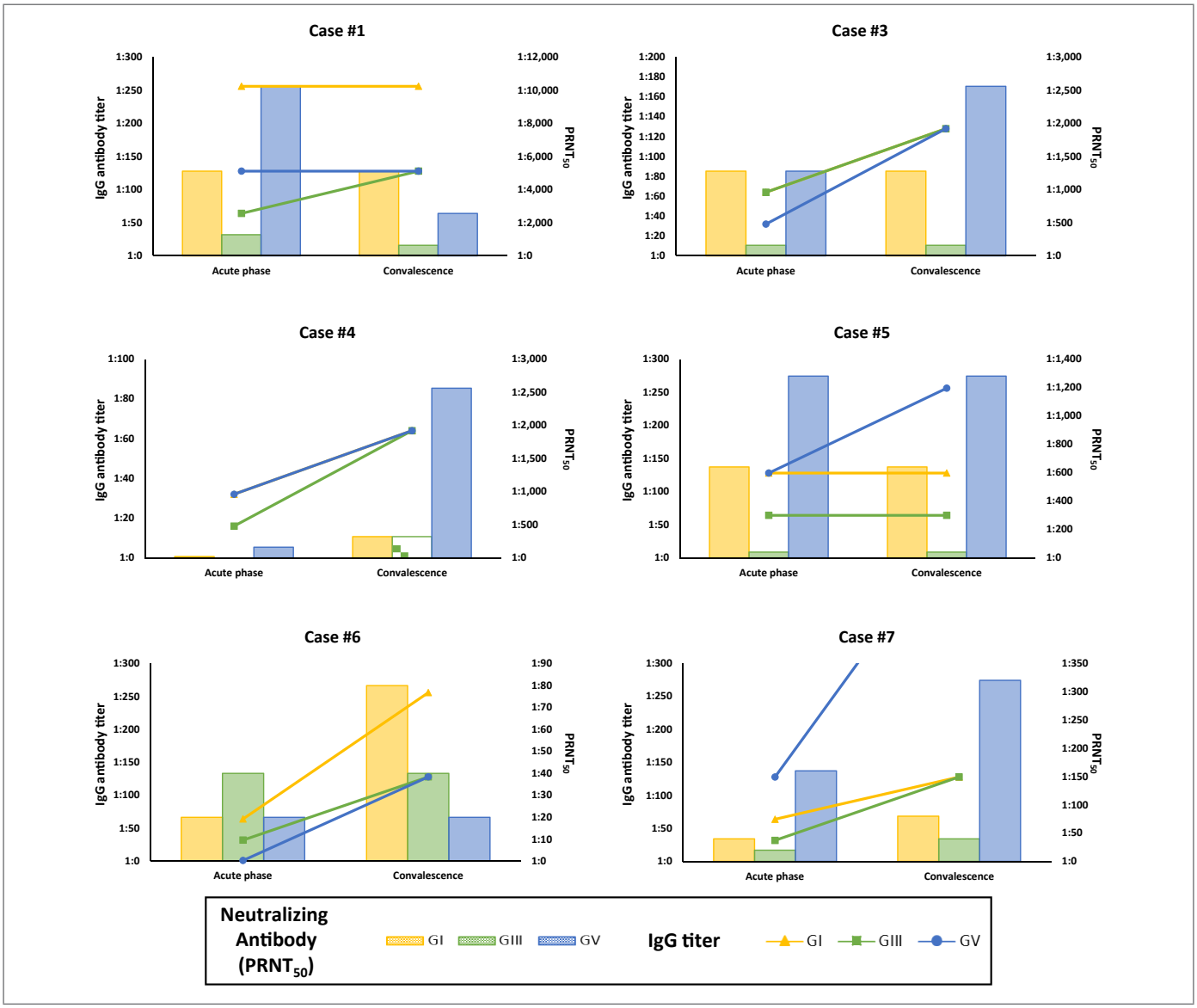


Figure 2. Changes in IgG and neutralizing antibody titer by genotypes of Japanese encephalitis virus (JEV)

Table 1. Comparison of neutralizing antibody titer by Japanese encephalitis virus (JEV) genotypes from Japanese encephalitis (JE) cases

Case No.	Day after onset	Neutralizaing Antibody titer ($PRNT_{50}$)			Predicted JEV Genotype
		GV/GI	GV/GIII	GI/GIII	
#1	15	2	8	4	Unpredictable
	21	1	8	8	
	35	0.5	4	8	
#3	6	1	8	8	GV
	18	2	16	8	
#4	5	8	160	20	GV
	16	8	8	1	
#5	0	2	32	16	GV
	9	2	32	16	
#6	0	1	0.5	0.5	GI
	14	0.25	0.5	2	
#7	18	4	8	2	GV
	40	4	8	2	

* PRNT, Plaque reduction neutralization test

Table 2. Ratio of IgG and neutralizing antibody titers of Japanese encephalitis virus (JEV) and West Nile virus (WNV)

Case No.	Day after onset	IgG	$PRNT_{50}$
		JEV(GIII)/WNV	JEV(GIII)/WNV
#1	15	4	16
	35	8	16
#3	6	64	160
	18	128	160
#4	5	16	1*
	16	64	320
#5	0	64	2
	9	4	4
#6	0	32	40
	14	8	40
#7	18	2	20
	40	2	4

* Neutralizing antibody titers of JEV, WNV are under 1:10

만성질환 통계

청소년 주관적 건강인지율 추이, 2011~2021

자신의 건강상태가 건강한 편이라고 생각하는 청소년은 2021년 남학생 69.7%, 여학생 59.3%로 2020년에 비해 감소하였음. 주관적 건강인지율은 남학생이 여학생에 비해 높았고, 중학생이 고등학생보다 더 높았음(그림 1, 2).

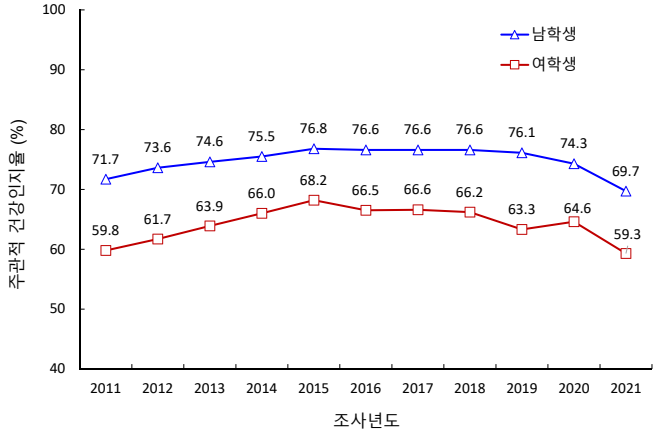


그림 1. 성별 주관적 건강인지율, 2011~2021

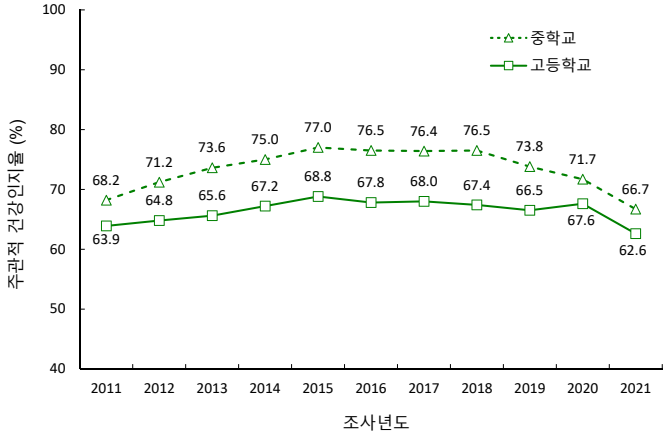


그림 1. 학교급별 주관적 건강인지율, 2011~2021

* 주관적 건강인지율 : 평상시 자신의 건강상태가 '매우 건강한 편' 또는 '건강한 편'이라고 생각하는 사람의 분율

출처: 제17차(2021년) 청소년건강행태조사 통계, http://www.kdca.go.kr/yhs/

작성부서: 질병관리청 만성질환관리국 건강영양조사분석과

Noncommunicable disease statistics

Trends in perceived health status among adolescents, 2011~2021

Adolescents who perceived themselves to be in good or very good health were 69.7% for male students and 59.3% for female students in 2021, which decreased when compared to 2020. The data in 2021 indicated that male students perceived health status more than female students and middle school students more than high school students (Figure 1, 2).

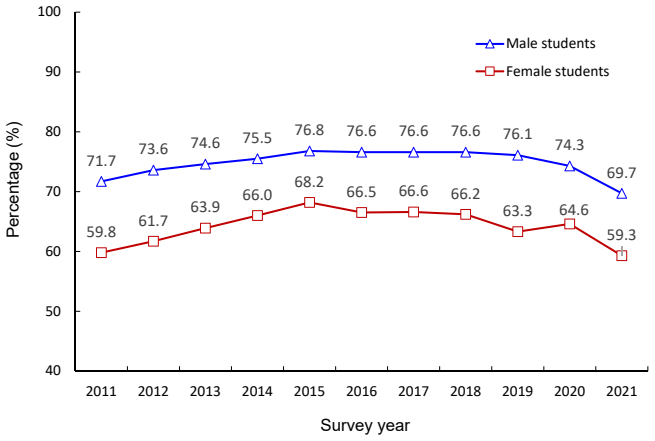


Figure 1. Trends in perceived health status among adolescents by sex, 2011–2021

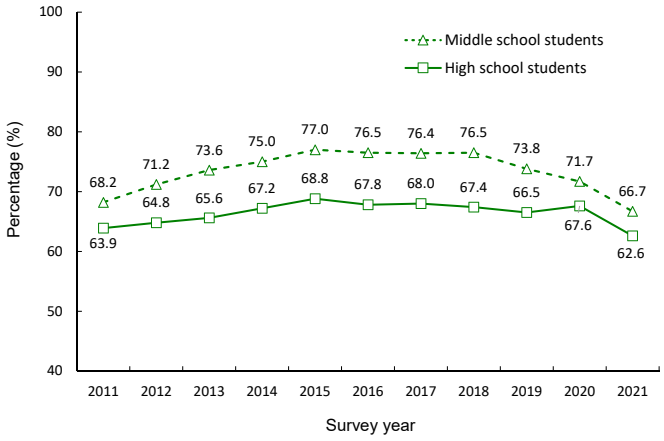


Figure 1. Trends in perceived health status among adolescents by school levels, 2011–2021

* Perceived health status: perception of oneself to be in good or very good health, among adolescents.

Source: The Korea Youth Risk Behavior Survey (KYRBS), http://www.kdca.go.kr/yhs/

Reported by: Division of Health and Nutrition Survey and Analysis, Korea Disease Control and Prevention Agency

1.1 환자감시 : 전수감시 감염병 주간 발생 현황 (32주차)

표 1. 2022년 32주차 보고 현황(2022. 8. 6. 기준)*

단위 : 보고환자수†

감염병†	금주	2022년 누계	5년간 주별 평균§	연간현황					금주 해외유입현황 : 국가명(신고수)
				2021	2020	2019	2018	2017	
제2급감염병									
결핵	361	10,518	457	18,335	19,933	23,821	26,433	28,161	
수두	324	11,117	898	20,929	31,430	82,868	96,467	80,092	
홍역	0	0	0	0	6	194	15	7	
콜레라	0	0	0	0	0	1	2	5	
장티푸스	4	29	2	61	39	94	213	128	
파라티푸스	13	33	2	29	58	55	47	73	
세균성이질	1	25	2	18	29	151	191	112	
장출혈성대장균감염증	9	134	6	165	270	146	121	138	
A형간염	24	1,365	189	6,583	3,989	17,598	2,437	4,419	
백일해	1	23	11	21	123	496	980	318	
유행성이하선염	103	3,979	235	9,708	9,922	15,967	19,237	16,924	
풍진	0	0	0	0	0	8	0	7	
수막구균 감염증	0	0	0	2	5	16	14	17	
폐렴구균 감염증	4	210	5	269	345	526	670	523	
한센병	0	1	0	5	3	4			
성홍열	12	288	115	678	2,300	7,562	15,777	22,838	
반코마이신내성황색 포도알균(VRSA) 감염증	0	1	0	2	9	3	0	0	
카바페넴내성장내세균 속균종(CRE) 감염증	537	16,896	341	23,311	18,113	15,369	11,954	5,717	
E형간염	14	320	8	494	191	–	–	–	
제3급감염병									
파상풍	0	12	1	21	30	31	31	34	
B형간염	6	264	7	453	382	389	392	391	
일본뇌염	0	0	0	23	7	34	17	9	
C형간염	117	5,299	202	10,115	11,849	9,810	10,811	6,396	
말라리아	9	211	22	294	385	559	576	515	
레지오넬라증	13	205	9	383	368	501	305	198	
비브리오패혈증	7	11	3	52	70	42	47	46	
발진열	3	33	0	9	1	14	16	18	
쯔쯔가무시증	24	631	28	5,915	4,479	4,005	6,668	10,528	
렙토스피라증	4	60	3	144	114	138	118	103	
브루셀라증	0	4	0	4	8	1	5	6	
신증후군출혈열	1	108	6	310	270	399	433	531	
후천성면역결핍증(AIDS)	17	445	23	773	818	1,006	989	1,008	
크로이츠펠트-야콥병(CJD)	0	14	1	67	64	53	53	36	
뎅기열	2	20	4	3	43	273	159	171	인도(1), 인도네시아(1)
큐열	0	36	3	46	69	162	163	96	
라임병	0	2	1	8	18	23	23	31	
유비저	0	0	0	2	1	8	2	2	
치쿤구니야열	0	2	0	0	1	16	3	5	
중증열성혈소판감소 증후군(SFTS)	5	74	9	172	243	223	259	272	
지카바이러스감염증	0	0	0	0	1	3	3	11	

* 2022년 통계는 변동가능한 잠정통계이며, 2022년 누계는 1주부터 금주까지의 누계를 말함
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 미포함 질병: 에볼라바이러스병, 마버그열, 라싸열, 크리미안콩고출혈열, 남아메리카출혈열, 리프트밸리열, 두창, 페스트, 탄저, 보툴리눔독소증, 야토병, 신종감염병증후군, 중증급성호흡기증후군(SARS), 중동호흡기증후군(MERS), 동물인플루엔자 인체감염증, 신종인플루엔자, 디프테리아, 폴리오, b형헤모필루스인플루엔자, 발진티푸스, 공수병, 황열, 웨스트나일열, 진드기매개뇌염
§ 최근 5년(2017~2021년)의 해당 주의 신고 건수와 이전 2주, 이후 2주 동안의 신고 건수(총 25주) 평균임

표 2. 지역별 보고 현황(2022. 8. 6. 기준)(32주차)*

단위 : 보고환자수†

지역	제2급감염병											
	결핵			수두			홍역			콜레라		
	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡
전국	361	10,518	14,596	324	11,117	38,651	0	0	39	0	0	0
서울	52	1,746	2,571	46	1,437	4,317	0	0	5	0	0	0
부산	18	667	977	15	702	2,120	0	0	1	0	0	0
대구	11	524	694	19	471	2,082	0	0	2	0	0	0
인천	20	529	772	9	513	1,948	0	0	2	0	0	0
광주	11	218	365	12	360	1,399	0	0	0	0	0	0
대전	10	249	328	0	286	1,002	0	0	5	0	0	0
울산	3	179	296	12	308	1,120	0	0	0	0	0	0
세종	1	34	54	2	138	466	0	0	15	0	0	0
경기	73	2,364	3,171	117	3,357	10,838	0	0	0	0	0	0
강원	17	469	623	9	278	933	0	0	1	0	0	0
충북	9	330	450	9	291	1,116	0	0	0	0	0	0
충남	26	573	706	5	433	1,429	0	0	1	0	0	0
전북	12	435	571	7	399	1,610	0	0	1	0	0	0
전남	24	569	788	21	410	1,530	0	0	2	0	0	0
경북	38	848	1,062	14	574	2,119	0	0	2	0	0	0
경남	30	665	967	25	987	3,621	0	0	2	0	0	0
제주	6	119	200	2	173	1,001	0	0	0	0	0	0

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2022. 8. 6. 기준)(32주차)***

단위 : 보고환자수†

지역	제2급감염병											
	장티푸스			파라티푸스			세균성이질			장출혈성대장균감염증		
	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡
전국	4	29	79	13	33	29	1	25	66	9	134	111
서울	1	6	15	2	5	4	1	3	16	2	12	13
부산	0	4	8	3	4	3	0	3	4	0	8	3
대구	1	3	3	0	1	2	0	0	4	0	5	4
인천	0	0	5	0	2	2	0	1	5	0	8	5
광주	0	0	1	0	0	1	0	0	2	2	32	11
대전	0	0	3	0	0	1	0	0	1	0	2	2
울산	0	0	3	2	2	0	0	0	1	0	3	3
세종	0	0	1	0	0	0	0	0	0	0	0	1
경기	1	9	19	2	10	6	0	9	13	1	29	36
강원	0	0	2	0	0	1	0	0	2	0	3	5
충북	0	0	2	0	0	1	0	1	1	0	3	3
충남	0	1	3	0	0	1	0	1	5	0	2	2
전북	0	0	1	0	0	1	0	2	1	0	5	2
전남	1	2	2	3	6	2	0	2	3	1	9	7
경북	0	2	4	0	0	1	0	1	5	2	6	6
경남	0	2	5	1	3	2	0	2	2	1	4	4
제주	0	0	2	0	0	1	0	0	1	0	3	4

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2022. 8. 6. 기준)(32주차)***

단위 : 보고환자수†

지역	제2급감염병											
	A형간염			백일해			유행성이하선염			풍진		
	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡	금주	2022년 누계	5년 누계 평균‡
전국	24	1,365	4,622	1	23	212	103	3,979	9,273	0	0	1
서울	6	273	916	0	2	25	19	516	1,109	0	0	1
부산	0	44	107	0	0	17	6	198	527	0	0	0
대구	2	46	62	0	3	7	5	159	375	0	0	0
인천	3	94	350	0	2	14	4	214	466	0	0	0
광주	2	35	60	0	0	10	3	117	329	0	0	0
대전	0	29	424	0	0	6	0	113	285	0	0	0
울산	1	13	25	0	0	6	4	123	285	0	0	0
세종	0	8	71	0	0	3	1	44	57	0	0	0
경기	5	456	1,529	1	2	36	33	1,161	2,620	0	0	0
강원	0	32	87	0	1	2	2	147	327	0	0	0
충북	2	60	229	0	2	6	2	91	246	0	0	0
충남	0	85	351	0	1	4	1	188	405	0	0	0
전북	0	72	162	0	0	5	3	142	410	0	0	0
전남	3	30	67	0	0	12	1	204	394	0	0	0
경북	0	42	79	0	3	13	5	197	469	0	0	0
경남	0	26	68	0	7	44	13	308	818	0	0	0
제주	0	20	35	0	0	2	1	57	151	0	0	0

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2022. 8. 6. 기준)(32주차)***

단위 : 보고환자수†

지역	제2급감염병						제3급감염병					
	수막구균 감염증			성홍열			파상풍			B형간염		
	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†
전국	0	0	6	12	288	6,969	0	12	19	6	264	239
서울	0	0	1	1	50	969	0	0	2	1	44	39
부산	0	0	0	0	12	494	0	1	2	0	8	17
대구	0	0	0	0	7	216	0	0	2	1	14	7
인천	0	0	1	0	11	335	0	0	0	0	14	14
광주	0	0	0	2	20	333	0	1	1	0	6	6
대전	0	0	0	0	19	260	0	0	1	0	6	9
울산	0	0	0	1	6	297	0	0	0	0	6	5
세종	0	0	0	0	2	42	0	1	0	0	2	1
경기	0	0	2	5	99	2,040	0	2	2	2	86	63
강원	0	0	1	0	10	118	0	0	0	0	10	8
충북	0	0	0	0	3	127	0	0	1	0	10	8
충남	0	0	0	0	8	296	0	2	2	1	10	13
전북	0	0	0	0	4	246	0	1	1	0	14	10
전남	0	0	0	2	14	254	0	2	2	1	13	11
경북	0	0	0	0	8	343	0	1	2	0	8	11
경남	0	0	1	1	12	507	0	1	1	0	12	15
제주	0	0	0	0	3	92	0	0	0	0	1	2

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2022. 8. 6. 기준)(32주차)***

단위 : 보고환자수†

지역	제3급감염병											
	일본뇌염			말라리아			레지오넬라증			비브리오패혈증		
	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†
전국	0	0	0	9	211	315	13	205	198	7	11	10
서울	0	0	0	1	28	46	3	45	50	1	2	2
부산	0	0	0	0	7	3	0	9	11	0	0	1
대구	0	0	0	0	2	3	0	11	8	1	1	0
인천	0	0	0	1	29	42	0	18	14	0	0	1
광주	0	0	0	0	0	4	0	7	4	0	0	0
대전	0	0	0	0	2	3	0	4	2	0	0	0
울산	0	0	0	0	2	2	0	0	2	0	0	0
세종	0	0	0	0	1	0	0	0	0	0	0	0
경기	0	0	0	6	125	181	7	49	44	1	3	1
강원	0	0	0	1	9	10	0	7	5	1	1	0
충북	0	0	0	0	3	2	1	5	8	0	0	0
충남	0	0	0	0	1	4	0	4	5	0	0	1
전북	0	0	0	0	0	2	0	0	6	0	0	0
전남	0	0	0	0	1	2	1	16	9	1	1	2
경북	0	0	0	0	0	4	1	6	13	2	2	0
경남	0	0	0	0	1	5	0	6	7	0	1	2
제주	0	0	0	0	0	2	0	18	10	0	0	0

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2022. 8. 6. 기준)(32주차)***

단위 : 보고환자수†

지역	제3급감염병											
	발진열			쯔쯔가무시증			렙토스피라증			브루셀라증		
	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†
전국	3	33	4	24	631	705	4	60	40	0	4	2
서울	0	1	1	0	15	24	0	4	2	0	0	1
부산	0	0	0	1	19	25	0	1	2	0	0	0
대구	0	1	0	0	4	7	0	0	1	0	0	0
인천	0	10	1	0	8	9	0	0	1	0	0	0
광주	0	0	1	1	10	14	0	2	2	0	0	0
대전	0	0	0	0	16	13	0	6	1	0	0	0
울산	0	0	0	0	11	13	0	1	1	0	0	0
세종	0	0	0	0	1	3	0	1	0	0	0	0
경기	3	13	0	1	27	47	2	14	6	0	0	0
강원	0	2	0	1	8	9	0	1	2	0	0	0
충북	0	0	0	0	9	15	0	0	2	0	0	0
충남	0	0	0	0	30	72	0	5	7	0	0	0
전북	0	0	0	4	105	95	0	5	3	0	0	1
전남	0	4	1	7	191	191	1	11	4	0	2	0
경북	0	0	0	0	17	32	0	5	4	0	0	0
경남	0	1	0	9	157	127	1	3	2	0	2	0
제주	0	1	0	0	3	9	0	1	0	0	0	0

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2022. 8. 6. 기준)(32주차)***

단위 : 보고환자수†

지역	제3급감염병											
	신증후군출혈열			크로이츠펠트-야콥병(CJD)			뎅기열			큐열		
	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†
전국	1	108	158	0	14	34	2	20	65	0	36	74
서울	0	1	5	0	3	7	0	7	21	0	1	4
부산	0	2	4	0	1	3	0	1	4	0	0	1
대구	0	3	3	0	1	2	0	0	3	0	3	1
인천	0	0	2	0	0	1	0	0	4	0	1	2
광주	0	3	2	0	0	1	0	1	1	0	2	3
대전	0	2	2	0	0	2	0	0	1	0	3	3
울산	0	0	1	0	1	0	0	0	2	0	1	2
세종	0	1	0	0	0	0	0	0	0	0	0	0
경기	0	26	30	0	4	8	1	7	19	0	2	10
강원	0	5	8	0	1	1	0	0	1	0	1	0
충북	0	3	9	0	0	1	0	0	1	0	5	15
충남	0	6	18	0	0	1	0	1	2	0	7	10
전북	1	18	24	0	1	1	0	2	1	0	2	4
전남	0	25	27	0	0	1	0	0	1	0	1	10
경북	0	6	16	0	1	2	0	0	2	0	3	4
경남	0	7	6	0	1	3	1	1	1	0	4	5
제주	0	0	1	0	0	0	0	0	1	0	0	0

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2022. 8. 6. 기준)(32주차)***

단위 : 보고환자수†

지역	제3급감염병								
	라임병			중증열성혈소판감소증후군(SFTS)			지카바이러스감염증		
	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†	금주	2022년 누계	5년 누계 평균†
전국	0	2	11	5	74	106	0	0	–
서울	0	1	4	0	1	4	0	0	–
부산	0	0	0	0	3	1	0	0	–
대구	0	0	0	0	0	2	0	0	–
인천	0	0	1	0	1	1	0	0	–
광주	0	0	0	0	2	0	0	0	–
대전	0	0	0	0	1	1	0	0	–
울산	0	0	0	0	1	3	0	0	–
세종	0	0	0	0	0	0	0	0	–
경기	0	1	2	0	8	16	0	0	–
강원	0	0	1	3	14	14	0	0	–
충북	0	0	0	2	10	2	0	0	–
충남	0	0	1	0	3	13	0	0	–
전북	0	0	1	0	7	7	0	0	–
전남	0	0	0	0	5	8	0	0	–
경북	0	0	1	0	9	14	0	0	–
경남	0	0	0	0	5	13	0	0	–
제주	0	0	0	0	4	7	0	0	–

* 2022년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2017~2021년)의 1주부터 해당 주까지 누계의 평균임

1.2 환자감시 : 표본감시 감염병 주간 발생 현황 (32주차)

1. 인플루엔자 주간 발생 현황(32주차, 2022. 8. 6. 기준)

- 2022년도 제32주 인플루엔자 표본감시(전국 200개 표본감시기관) 결과, 의사환자분율은 외래환자 1,000명당 3.3명으로 지난주(3.6명) 대비 감소

※ 2021-2022절기 유행기준은 5.8명(/1,000)

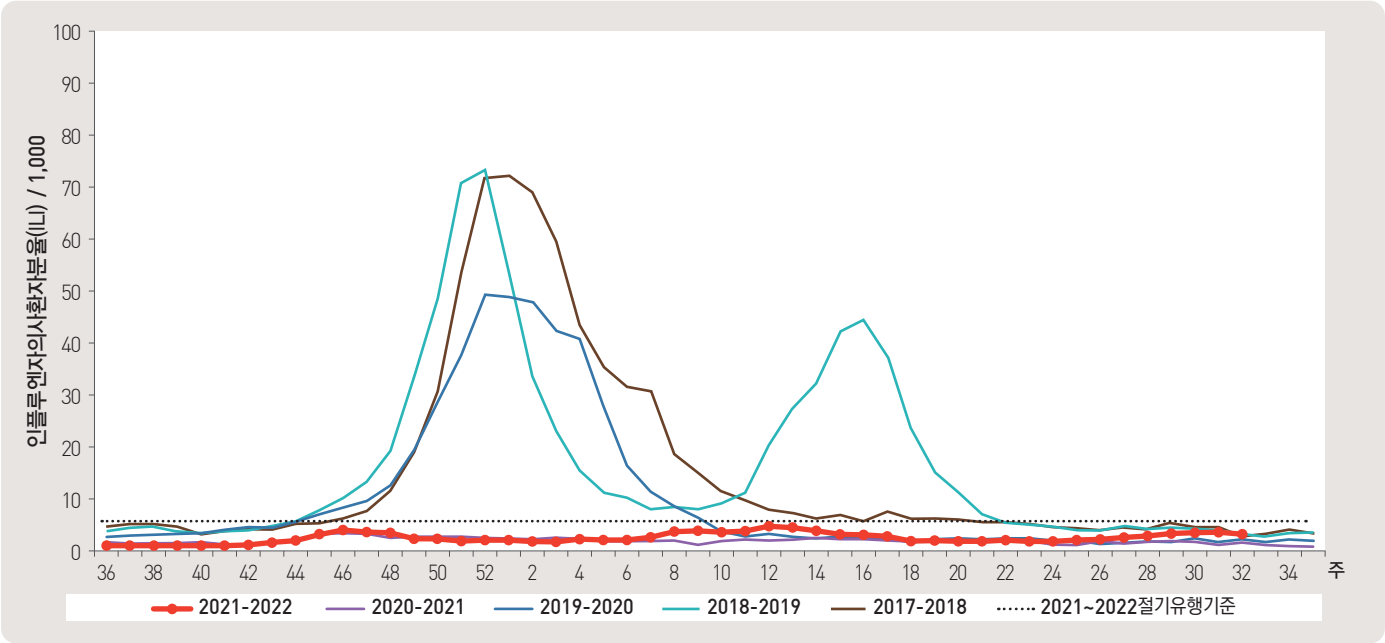


그림 1. 외래 환자 1,000명당 인플루엔자 의사환자 발생 현황

2. 수족구 발생 주간 현황(32주차, 2022. 8. 6. 기준)

- 2022년도 제32주차 수족구병 표본감시(전국 110개 의료기관) 결과, 의사환자분율은 외래환자 1,000명당 22.0명으로 전주(20.3명) 대비 증가

※ 수족구병은 2009년 6월 법정감염병으로 지정되어 표본감시체계로 운영

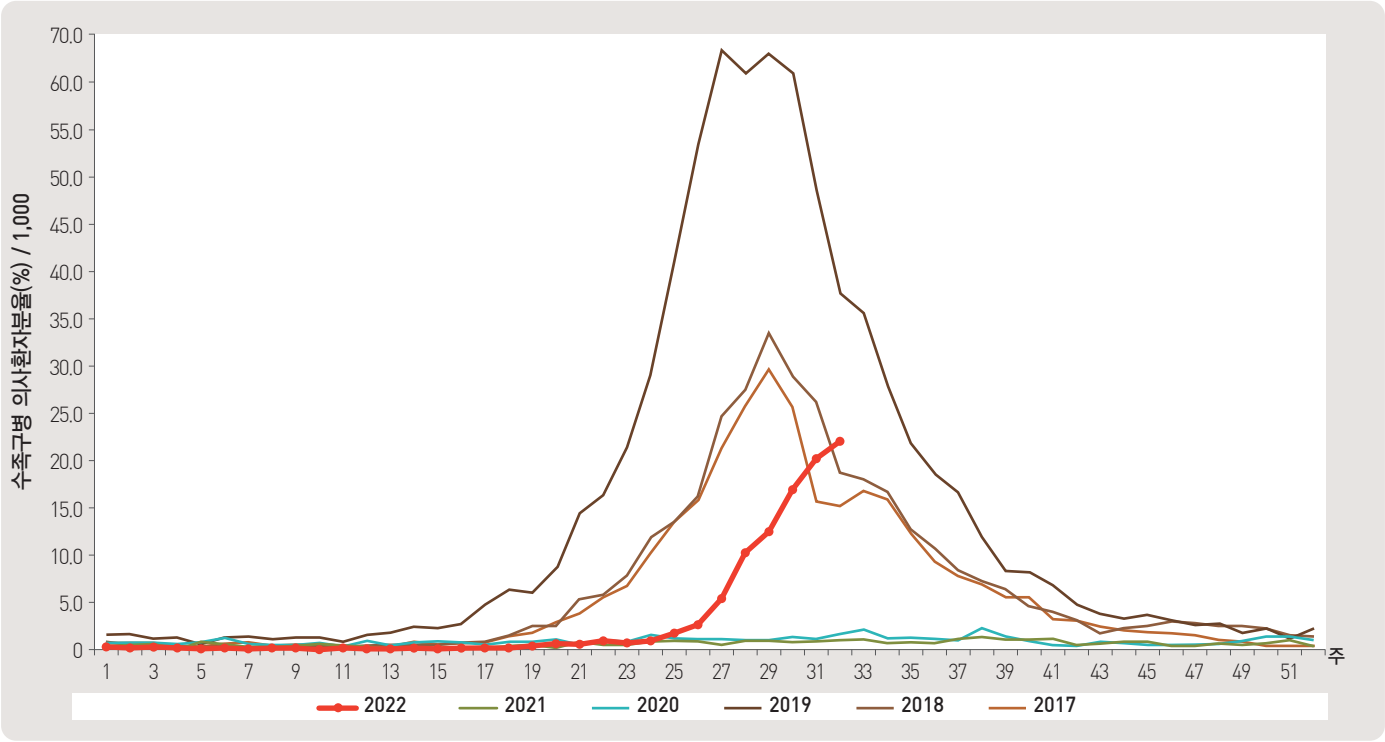


그림 2. 외래 환자 1,000명당 수족구 발생 현황

▶ 자세히 보기 : 질병관리청 → 간행물·통계 → 감염병발생정보 → 표본감시주간소식지

3. 안과 감염병 주간 발생 현황(32주차, 2022. 8. 6. 기준)

- 2022년도 제32주차 유행성각결막염의 외래환자 1,000명당 분율은 5.6명으로 전주 6.0명 대비 감소
- 동기간 급성출혈성결막염의 환자 분율은 0.1명으로 전주 0.1명 대비 동일

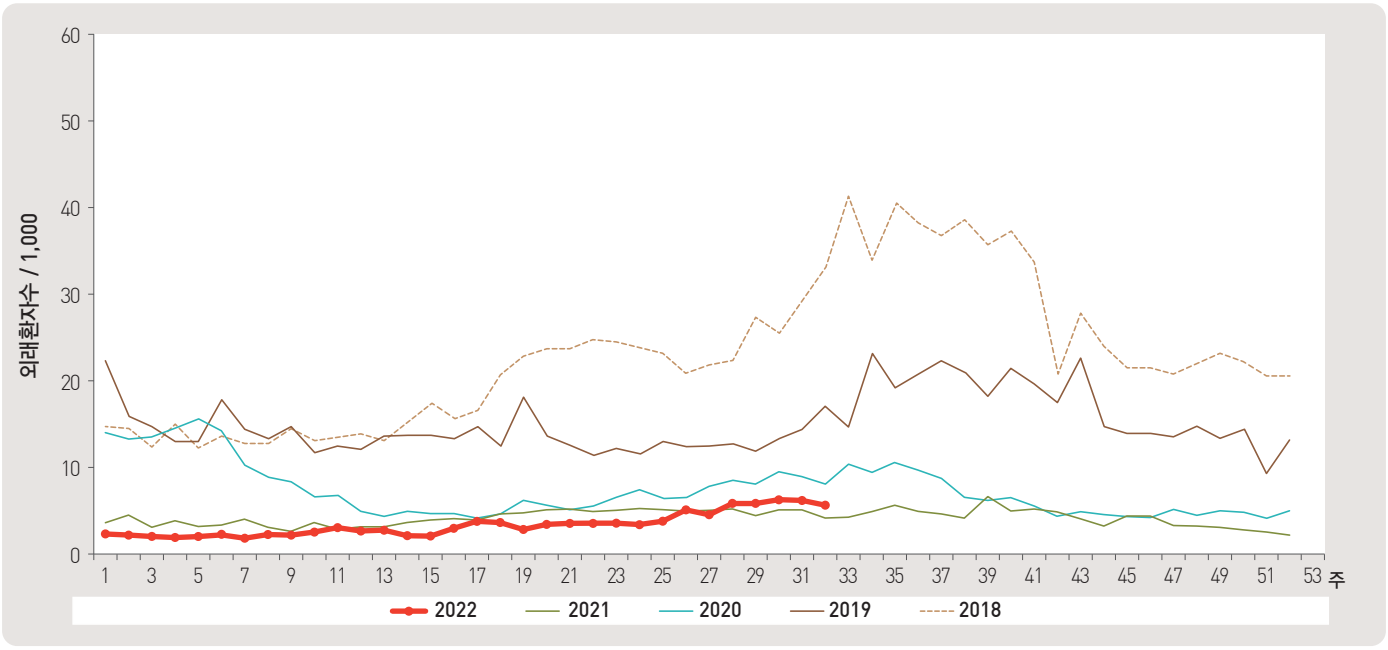


그림 3. 외래 환자 1,000명당 유행성각결막염 발생 현황

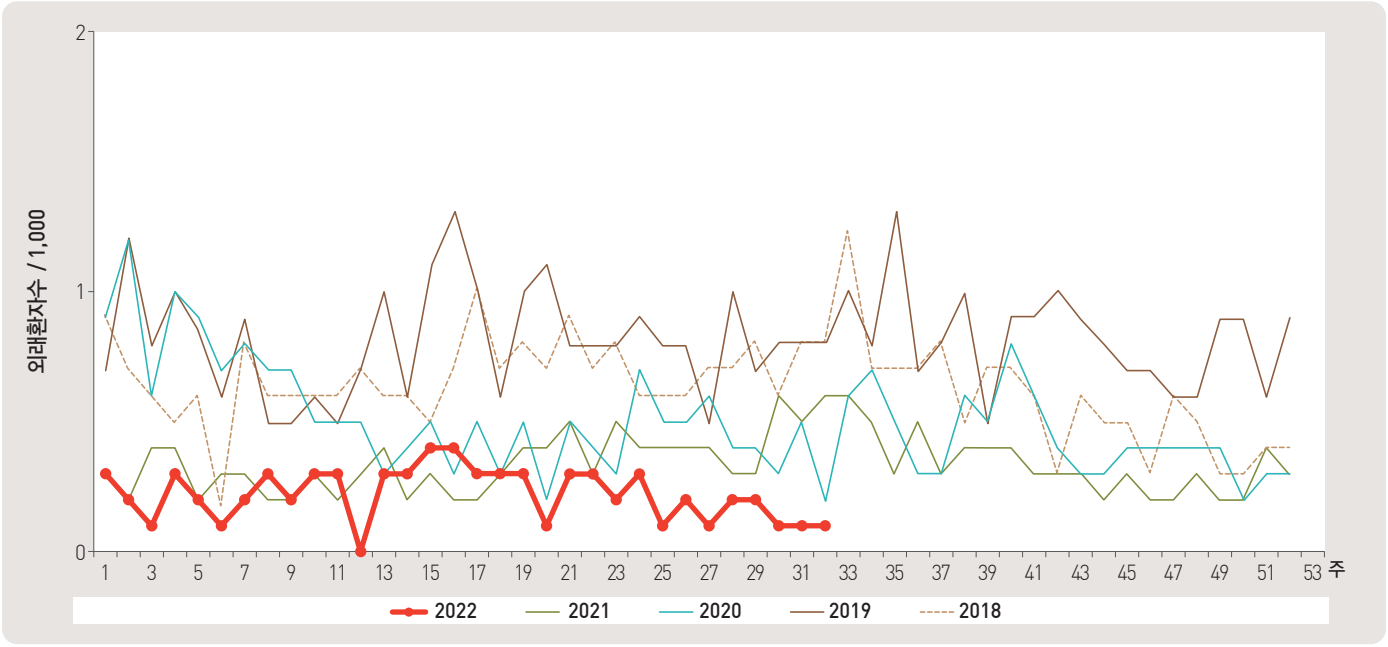


그림 4. 외래 환자 1,000명당 급성출혈성결막염 발생 현황

4. 성매개감염병 주간 발생 현황(32주차, 2022. 8. 6. 기준)

- 2022년도 제32주차 성매개감염병 표본감시기관(전국 보건소 및 의료기관 579개 참여)에서 신고기관 당 사람유두종바이러스 감염증 4.9건, 성기단순포진 2.8건, 첨규콘딜롬 2.2건, 클라미디아감염증 2.1건, 2기 매독 1.5건, 1기 매독 1.3건, 임질 1.2건, 선천성 매독 0.0건을 신고함.

* 제32주차 신고의료기관 수: 임질 23개, 클라미디아감염증 69개, 성기단순포진 61개, 첨규콘딜롬 40개, 사람유두종바이러스 감염증 51개, 1기 매독 4개, 2기 매독 4개, 선천성 매독 0개

단위 : 신고수/신고기관 수

임질			클라미디아 감염증			성기단순포진			첨규콘딜롬		
금주	2022년 누적	최근 5년 누적 평균§	금주	2022년 누적	최근 5년 누적 평균§	금주	2022년 누적	최근 5년 누적 평균§	금주	2022년 누적	최근 5년 누적 평균§
1.2	4.5	6.4	2.1	15.4	21.4	2.8	30.7	29.7	2.2	12.3	17.1

사람유두종바이러스감염증			매독								
			1기			2기			선천성		
금주	2022년 누적	최근 5년 누적 평균§	금주	2022년 누적	최근 5년 누적 평균§	금주	2022년 누적	최근 5년 누적 평균§	금주	2022년 누적	최근 5년 누적 평균§
4.9	60.9	23.3	1.3	2.3	0.9	1.5	2.2	1.0	0.0	1.0	0.4

누계 : 매년 첫 주부터 금주까지의 보고 누계
† 각 질병별로 규정된 신고 범위(환자, 의사환자, 병원체보유자)의 모든 신고 건을 포함
§ 최근 5년(2017~2021년) 누적 평균(Cum. 5-year average) : 최근 5년 1주차부터 금주까지 누적 환자 수 평균

1.3 수인성 및 식품매개 감염병 집단발생 주간 현황 (32주차)

▣ 수인성 및 식품매개 감염병 집단발생 주간 현황(32주차, 2022. 8. 6. 기준)

- 2022년도 제32주에 집단발생이 6건(사례수 57명)이 발생하였으며 누적발생건수는 302건(사례수 4,445명)이 발생함.

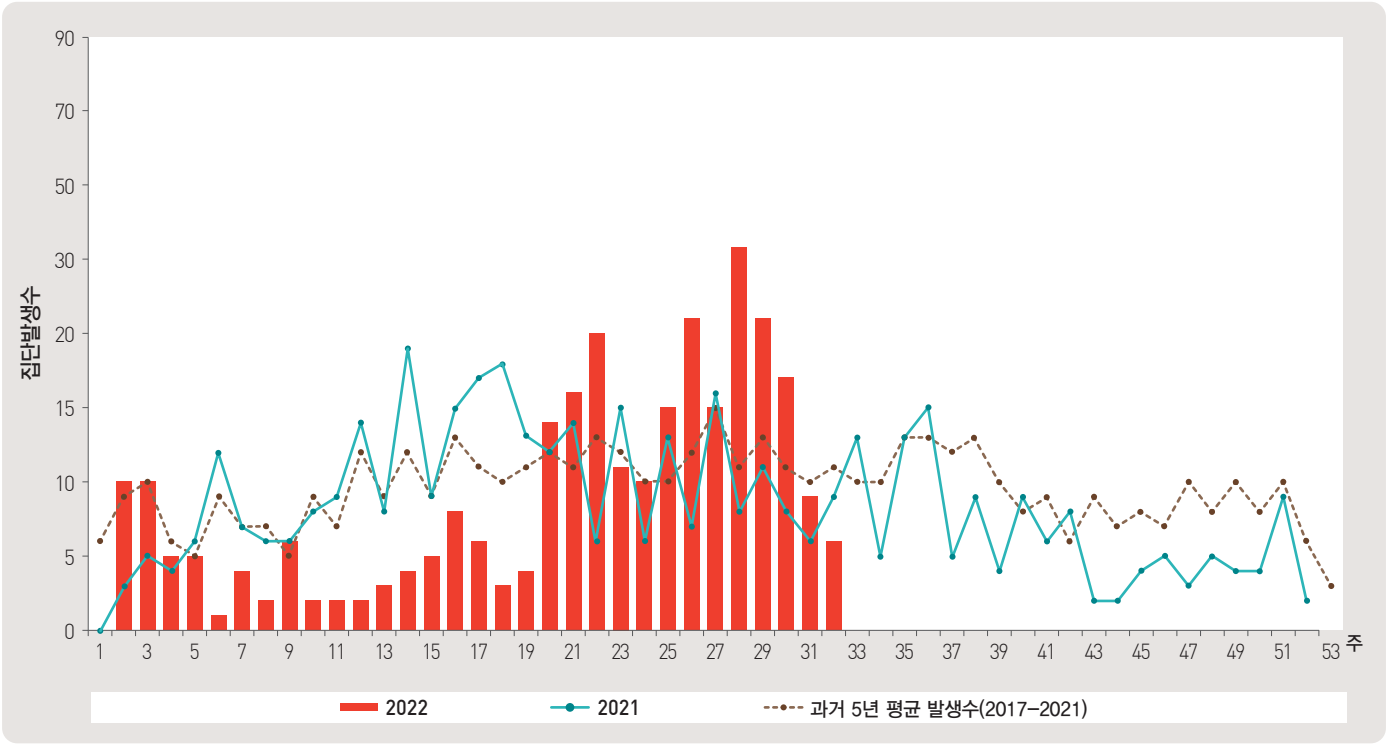


그림 5. 수인성 및 식품매개 감염병 집단발생 현황

2.1 병원체감시 : 인플루엔자 및 호흡기바이러스 주간 감시 현황

1. 인플루엔자 바이러스 주간 현황(32주차, 2022. 8. 6. 기준)

- 2022년도 제32주에 전국 63개 감시사업 참여의료기관에서 의뢰된 호흡기검체 127건 중 양성 5건(A(H3N2) 5건).

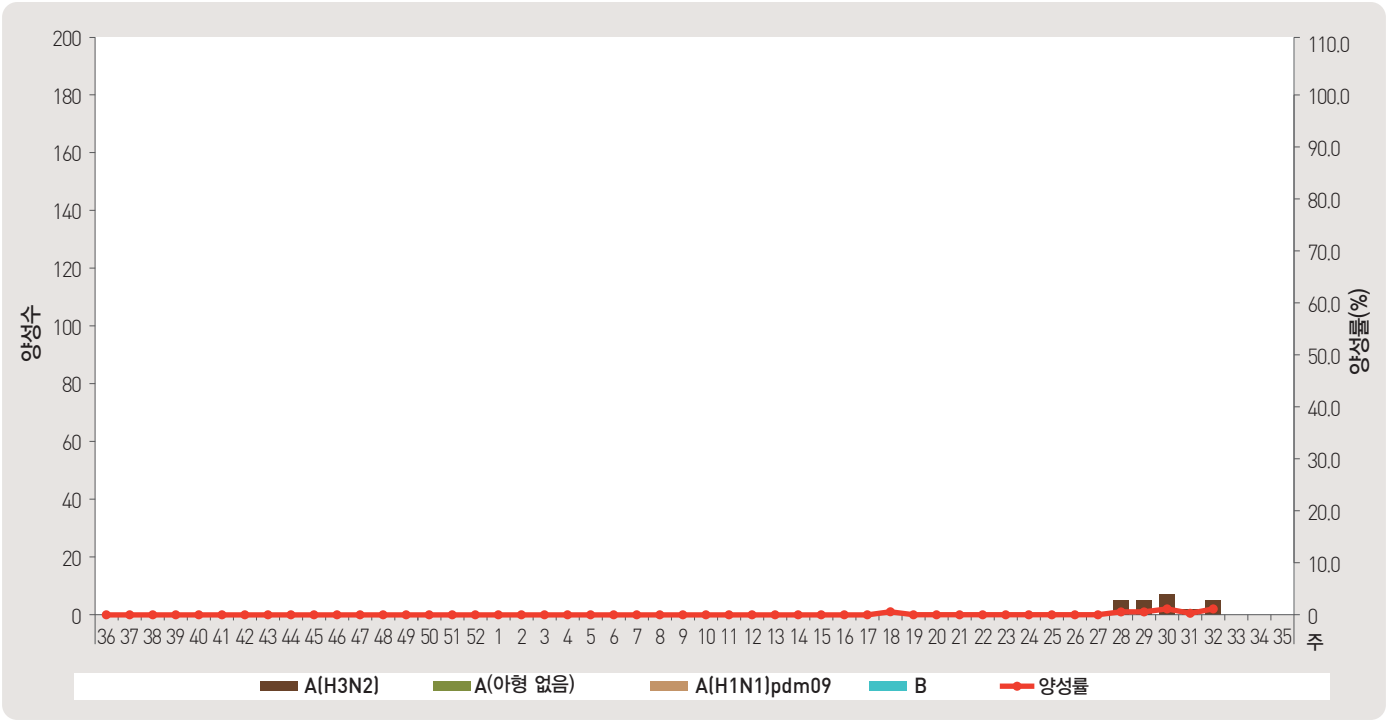


그림 6. 인플루엔자 바이러스 검출 현황

2. 호흡기 바이러스 주간 현황(32주차, 2022. 8. 6. 기준)

- 2022년도 제32주 호흡기 검체에 대한 유전자 검사결과 48.0%의 호흡기 바이러스가 검출되었음.
  (최근 4주 평균 175개의 호흡기 검체에 대한 유전자 검사결과를 나타내고 있음)

※ 주별통계는 잠정통계이므로 변동가능

2022 (주)	주별		검출률 (%)							
	검체 건수	검출률 (%)	아데노 바이러스	파라 인플루엔자 바이러스	호흡기 세포융합 바이러스	인플루엔자 바이러스	코로나 바이러스	리노 바이러스	보카 바이러스	메타뉴모 바이러스
29	219	52.1	4.6	0.0	0.5	2.3	3.7	27.9	12.8	0.5
30	195	55.9	3.1	0.5	2.1	3.6	2.6	26.7	17.4	0.0
31	159	64.2	6.3	0.0	4.4	1.3	5.7	27.7	16.4	2.5
32	127	48.0	3.9	0.0	1.6	3.9	2.4	22.0	11.0	3.1
4주 누적※	700	55.1	4.4	0.1	2.0	2.7	3.6	26.4	14.6	1.3
2021년 누적∀	4,619	65.1	6.8	12.9	1.9	0.0	0.3	34.1	9.2	0.0

※ 4주 누적 : 2022년 7월 10일 – 2022년 8월 6일 검출률임 (지난 4주간 평균 175개의 검체에서 검출된 수의 평균).
∀ 2021년 누적 : 2020년 12월 27일 – 2021년 12월 25일 검출률임.

▶ 자세히 보기 : 질병관리청 → 간행물·통계 → 감염병발생정보 → 표본감시주간소식지

2.2 병원체감시 : 급성설사질환 바이러스 및 세균 주간 감시 현황 (31주차)

▣ 급성설사질환 바이러스 및 세균 주간 검출 현황(31주차, 2022. 7. 30. 기준)

- 2022년도 제31주 실험실 표본감시(18개 시·도 보건환경연구원 및 72개 의료기관) 급성설사질환 원인 바이러스 검출 건수는 54건(49.1%), 세균 검출 건수는 49건(22.4%) 이었음.

◆ 급성설사질환 바이러스

주		검체수	검출 건수(검출률, %)					
			노로바이러스	그룹 A 로타바이러스	장내 아데노바이러스	아스트로바이러스	사포바이러스	합계
2022	28	116	31 (26.7)	0 (0.0)	19 (16.4)	3 (2.6)	7 (6.0)	60 (51.7)
	29	128	36 (28.1)	0 (0.0)	12 (9.4)	11 (8.6)	6 (4.7)	65 (50.8)
	30	94	25 (26.6)	0 (0.0)	9 (9.6)	14 (14.9)	8 (8.5)	56 (59.6)
	31	110	24 (21.8)	0 (0.0)	8 (7.3)	9 (8.2)	13 (11.8)	54 (49.1)
2022년 누적		2,050	651 (31.8)	25 (1.2)	169 (8.2)	74 (3.6)	41 (2.0)	960 (46.8)

* 검체는 5세 이하 아동의 급성설사 질환자에게서 수집됨.

◆ 급성설사질환 세균

주		검체수	분리 건수(분리율, %)								
			살모넬라균	병원성 대장균	세균성 이질균	장염 비브리오균	비브리오 콜레라균	캄필로 박터균	클라스트리듐 퍼프린젠스	황색 포도알균	바실루스 세레우스균	합계
2022	28	287	14 (4.9)	28 (9.8)	0 (0.0)	0 (0.0)	0 (0.0)	8 (2.8)	9 (3.1)	12 (4.2)	9 (3.1)	82 (28.6)
	29	345	13 (3.8)	36 (10.4)	0 (0.0)	0 (0.0)	0 (0.0)	11 (3.2)	12 (3.5)	11 (3.2)	14 (4.1)	99 (28.7)
	30	261	17 (6.5)	33 (12.6)	0 (0.0)	0 (0.0)	0 (0.0)	16 (6.1)	2 (0.8)	11 (4.2)	13 (5.0)	93 (35.6)
	31	219	8 (3.7)	22 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (1.4)	5 (2.3)	7 (3.2)	4 (1.8)	49 (22.4)
2022년 누적		6,172	146 (2.4)	250 (4.1)	0 (0.0)	0 (0.0)	0 (0.0)	125 (2.0)	179 (2.9)	223 (3.6)	129 (2.1)	1,065 (17.3)

* 2022년 실험실 감시체계 참여기관(72개 의료기관)

▶ 자세히 보기 : 질병관리청 → 간행물·통계 → 감염병발생정보 → 표본감시주간소식지 → 감염병포털 → 실험실소식지

2.3 병원체감시 : 엔테로바이러스 주간 감시 현황 (31주차)

▣ 엔테로바이러스 주간 검출 현황(31주차, 2022. 7. 30. 기준)

- 2022년도 제31주 실험실 표본감시(17개 시·도 보건환경연구원, 전국 64개 참여병원) 결과, 엔테로바이러스 검출률 47.9%(12건 양성/20검체), 2022년 누적 양성률 20.8%(52건 양성/250검체)임.

  – 무균성수막염 0건(2022년 누적 1건), 수족구병 및 포진성구협염 11건(2022년 누적 43건), 합병증 동반 수족구 0건(2022년 누적 0건), 기타 1건(2022년 누적 8건)임.

◆ 무균성수막염

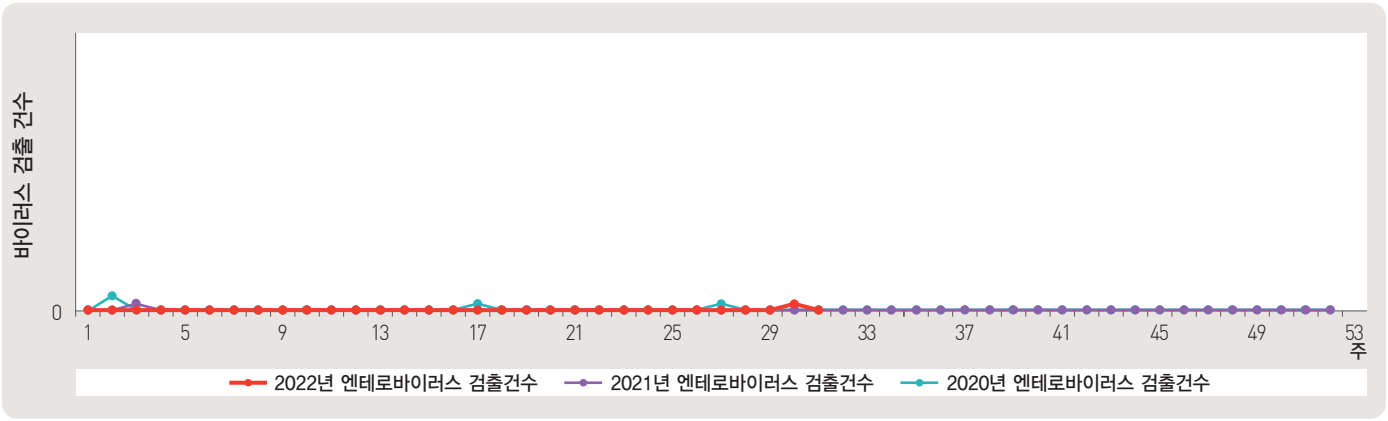


그림 7. 무균성수막염 바이러스 검출수

◆ 수족구병 및 포진성구협염

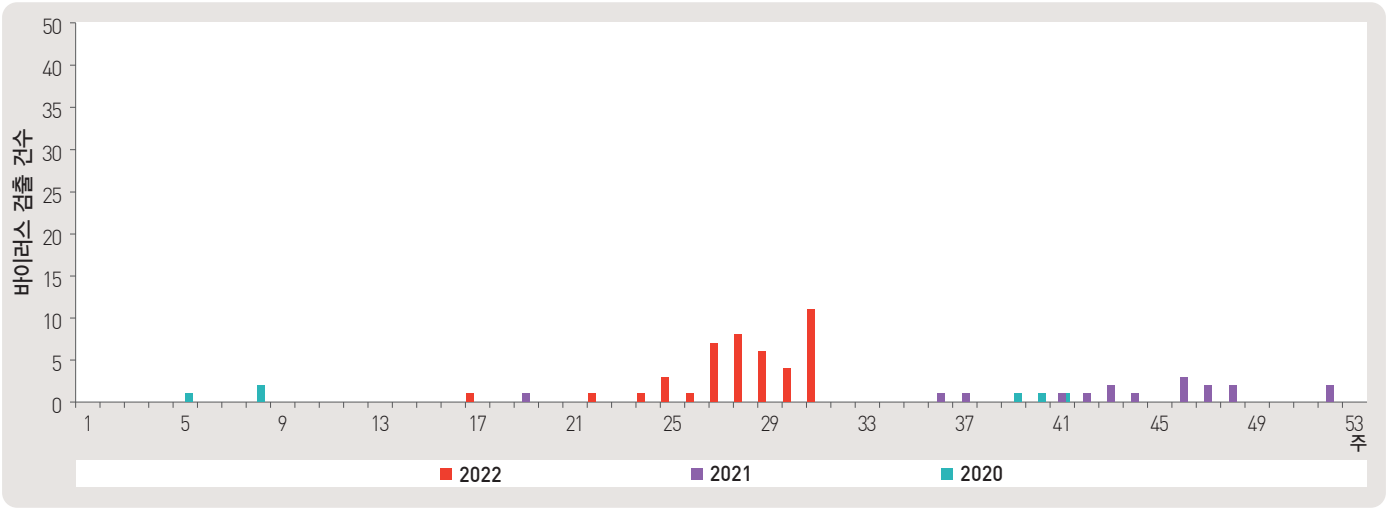


그림 8. 수족구 및 포진성구협염 바이러스 검출수

◆ 합병증 동반 수족구

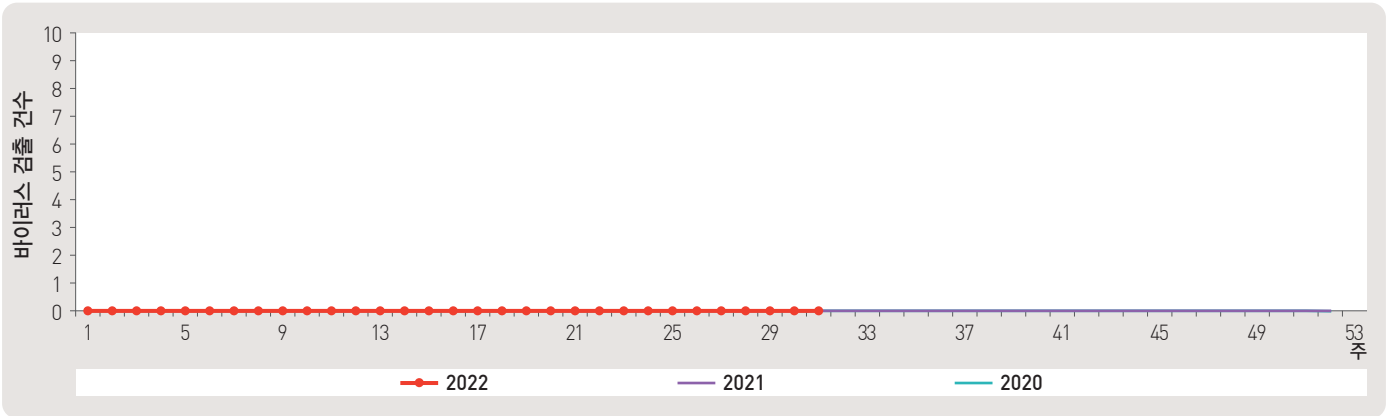


그림 9. 합병증 동반 수족구 바이러스 검출수

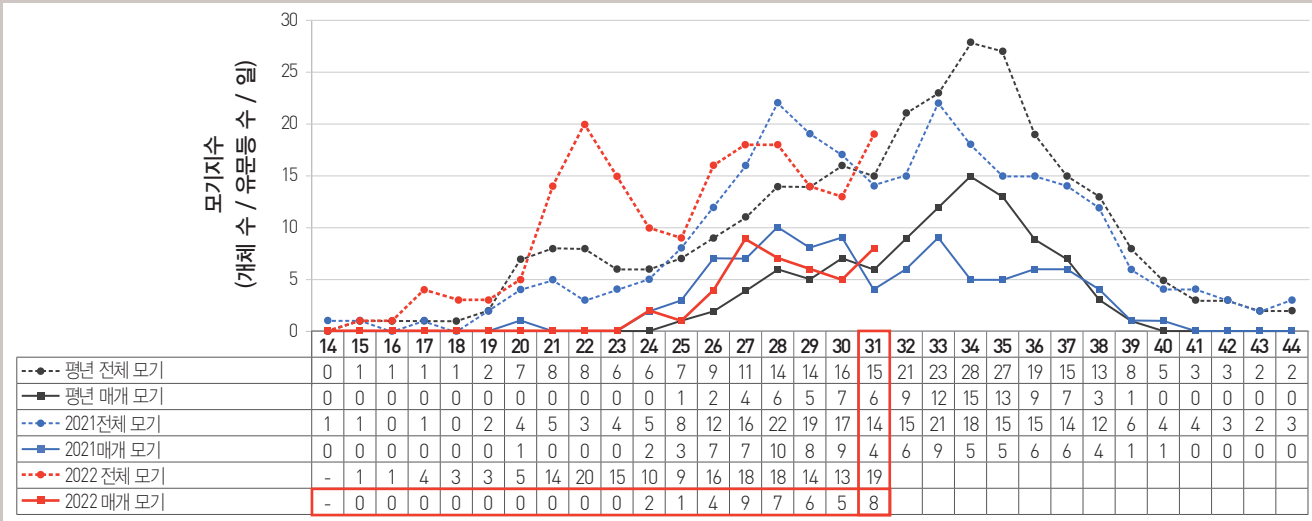
▶ 자세히 보기 : 질병관리청 → 간행물·통계 → 감염병발생정보 → 표본감시주간소식지 → 감염병포털 → 실험실소식지

3.1 매개체감시 / 말라리아 매개모기 주간 발생 현황 (31주차)

▣ 매개체감시 / 말라리아 매개모기 주간 발생 현황(31주차, 2022. 7. 30. 기준)

- 2022년도 제31주 말라리아 매개모기 주간 발생 현황(3개 시·도, 총 50개 채집지점)
  - 전체모기 : 평균 19개체로 평년 15개체 대비 4개체 및 전년 14개체 대비 5개체 증가
  - 말라리아 매개모기 : 평균 8개체로 평년 6개체 대비 2개체 및 전년 4개체 대비 4개체 증가
    * 전체 채집 모기 4,287개체 중 말라리아 매개모기는 1,714개체(40.0%)가 채집됨.
    * 채집된 전체 매개모기 중 36.4%(624마리)가 파주 조산리에서 채집됨.

※ 모기수 산출법: 1주일간 유문등에 채집된 모기의 평균수(개체수/트랩/일)
※ 2022년은 말라리아 매개모기 감시는 15주차부터 실시하여 14주차는 값이 없음.



	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
평년 전체 모기	0	1	1	1	1	2	7	8	8	6	6	7	9	11	14	14	16	15	21	23	28	27	19	15	13	8	5	3	3	2	2
평년 매개 모기	0	0	0	0	0	0	0	0	0	0	0	1	2	4	6	5	7	6	9	12	15	13	9	7	3	1	0	0	0	0	0
2021전체 모기	1	1	0	1	0	2	4	5	3	4	5	8	12	16	22	19	17	14	15	21	18	15	15	14	12	6	4	4	3	2	3
2021매개 모기	0	0	0	0	0	0	1	0	0	0	2	3	7	7	10	8	9	4	6	9	5	5	6	6	4	1	1	0	0	0	0
2022 전체 모기	-	1	1	4	3	3	5	14	20	15	10	9	16	18	18	14	13	19													
2022 매개 모기	-	0	0	0	0	0	0	0	0	0	2	1	4	9	7	6	5	8													

그림 10. 말라리아 매개모기 주별 발생 현황

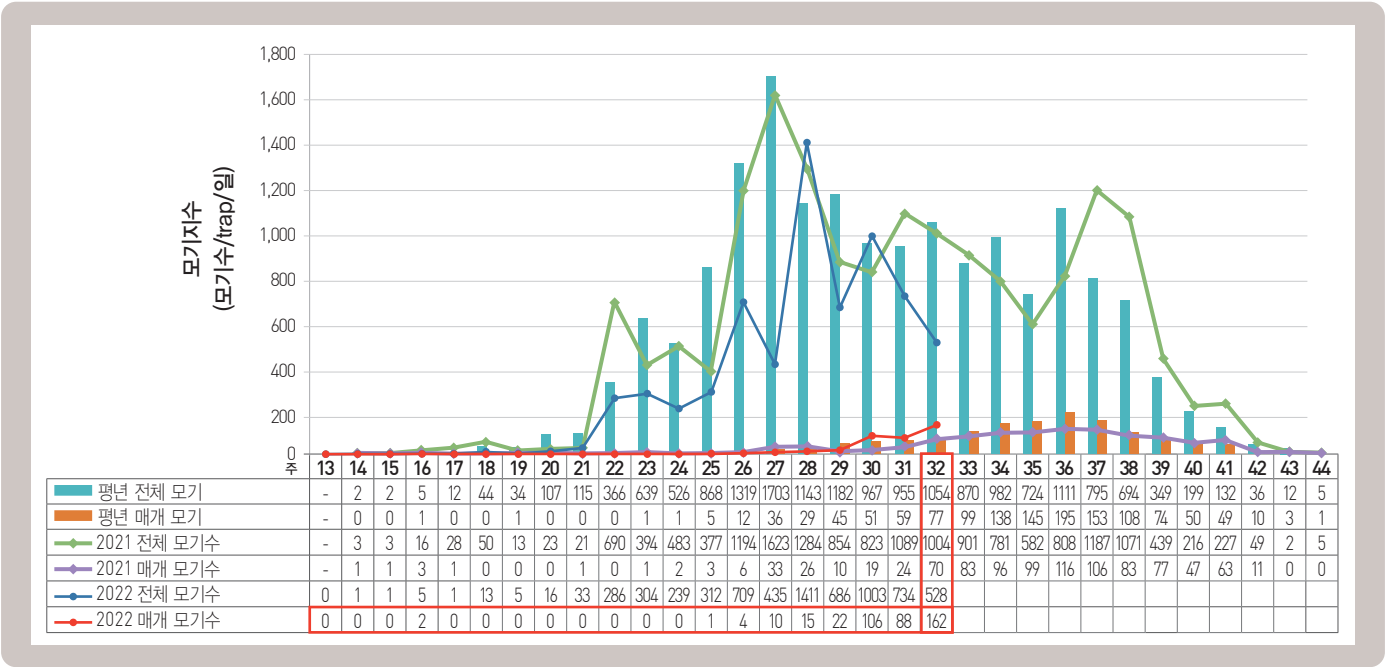
3.2 매개체감시 / 일본뇌염 매개모기 주간 발생 현황 (32주차)

▣ 일본뇌염 매개모기 주간 발생 현황(32주차, 2022. 8. 6. 기준)

- 2022년 제32주 일본뇌염 매개모기 주간 발생현황: 9개 시·도 보건환경연구원(부산, 강원, 충북, 충남, 전북, 전남, 경북, 경남, 제주)
  - 전체모기 수(채집 모기 수/trap/일)
    : 평균 528개체 [평년 1,054개체 대비 526개체 및 전년 1,004개체 대비 476개체 낮은 수준]
  - 일본뇌염 매개모기(작은빨간집모기, *Ct**) 수 (채집 모기 수/trap/일)
    : 평균 162개체 [평년 77개체 대비 85개체 및 전년 70개체 대비 92개체 높은 수준]

    **C.t.: Culex tritaeniorhynchus* (작은빨간집모기)

> • 방법: 유문등(誘蚊燈)을 이용한 모기 채집
> • 모기수 산출법: 하룻밤 한 대의 유문등에 채집된 모기 평균수(유문등 개수 11개/2일)를 환산하여 Trap index로 나타냄
> • 정보제공: 평년(최근 5년, 2017-2021년) 및 전년(2021년) 대비 누적 개체 수와 주별 개체 수 정보제공



주	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
평년 전체 모기	-	2	2	5	12	44	34	107	115	366	639	526	868	1319	1703	1143	1182	967	955	1054	870	982	724	1111	795	694	349	199	132	36	12	5
평년 매개 모기	-	0	0	1	0	0	1	0	0	0	1	1	5	12	36	29	45	51	59	77	99	138	145	195	153	108	74	50	49	10	3	1
2021 전체 모기수	-	3	3	16	28	50	13	23	21	690	394	483	377	1194	1623	1284	854	823	1089	1004	901	781	582	808	1187	1071	439	216	227	49	2	5
2021 매개 모기수	-	1	1	3	1	0	0	0	1	0	1	2	3	6	33	26	10	19	24	70	83	96	99	116	106	83	77	47	63	11	0	0
2022 전체 모기수	0	1	1	5	1	13	5	16	33	286	304	239	312	709	435	1411	686	1003	734	528												
2022 매개 모기수	0	0	0	2	0	0	0	0	0	0	0	0	1	4	10	15	22	106	88	162												

그림 11. 일본뇌염 매개모기 주간 발생 현황

주요 통계 이해하기

〈통계표 1〉은 지난 5년간 발생한 법정감염병과 2022년 해당 주 발생현황을 비교한 표로, 금주 환자 수(Current week)는 2022년 해당 주의 신고건수를 나타내며, 2022년 누계 환자수(Cum. 2022)는 2022년 1주부터 해당 주까지의 누계 건수, 그리고 5년 주 평균 환자수(5-year weekly average)는 지난 5년(2017-2021년) 해당 주의 신고건수와 이전 2주, 이후 2주의 신고건수(총 25주) 평균으로 계산된다. 그러므로 금주 환자수(Current week)와 5년 주 평균 환자수(5-year weekly average)의 신고건수를 비교하면 해당 주 단위 시점과 예년의 신고 수준을 비교해 볼 수 있다. 연도별 환자수(Total no. of cases by year)는 지난 5년간 해당 감염병 현황을 나타내는 확정 통계이며 연도별 현황을 비교해 볼 수 있다.

예) 2022년 12주의 5년 주 평균 환자수(5-year weekly average)는 2017년부터 2021년의 10주부터 14주까지의 신고 건수를 총 25주로 나눈 값으로 구해진다.

* 5년 주 평균 환자수(5-year weekly average)=(X1 + X2 + ⋯ + X25)/25

	10주	11주	12주	13주	14주
2022년			해당 주		
2021년	X1	X2	X3	X4	X5
2020년	X6	X7	X8	X9	X10
2019년	X11	X12	X13	X14	X15
2018년	X16	X17	X18	X19	X20
2017년	X21	X22	X23	X24	X25

〈통계표 2〉는 17개 시·도 별로 구분한 법정감염병 보고 현황을 보여 주고 있으며, 각 감염병별로 최근 5년 누계 평균 환자수(Cum, 5-year average)와 2022년 누계 환자수(Cum, 2022)를 비교해 보면 최근까지의 누적 신고건수에 대한 이전 5년 동안 해당 주까지의 평균 신고건수와 비교가 가능하다. 최근 5년 누계 평균 환자수(Cum, 5-year average)는 지난 5년(2017-2021년) 동안의 동기간 신고 누계 평균으로 계산된다.

기타 표본감시 감염병에 대한 신고현황 그림과 통계는 최근 발생양상을 신속하게 파악하는데 도움이 된다.

Statistics of selected infectious diseases

Table 1. Reported cases of national infectious diseases in Republic of Korea, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Classification of disease‡	Current week	Cum. 2022	5-year weekly average	Total no. of cases by year					Imported cases of current week : Country (no. of cases)
				2021	2020	2019	2018	2017	
Category Ⅱ									
Tuberculosis	361	10,518	457	18,335	19,933	23,821	26,433	28,161	
Varicella	324	11,117	898	20,929	31,430	82,868	96,467	80,092	
Measles	0	0	0	0	6	194	15	7	
Cholera	0	0	0	0	0	1	2	5	
Typhoid fever	4	29	2	61	39	94	213	128	
Paratyphoid fever	13	33	2	29	58	55	47	73	
Shigellosis	1	25	2	18	29	151	191	112	
EHEC	9	134	6	165	270	146	121	138	
Viral hepatitis A	24	1,365	189	6,583	3,989	17,598	2,437	4,419	
Pertussis	1	23	11	21	123	496	980	318	
Mumps	103	3,979	235	9,708	9,922	15,967	19,237	16,924	
Rubella	0	0	0	0	0	8	0	7	
Meningococcal disease	0	0	0	2	5	16	14	17	
Pneumococcal disease	4	210	5	269	345	526	670	523	
Hansen's disease	0	1	0	5	3	4			
Scarlet fever	12	288	115	678	2,300	7,562	15,777	22,838	
VRSA	0	1	0	2	9	3	0	0	
CRE	537	16,896	341	23,311	18,113	15,369	11,954	5,717	
Viral hepatitis E	14	320	8	494	191	–	–	–	
Category Ⅲ									
Tetanus	0	12	1	21	30	31	31	34	
Viral hepatitis B	6	264	7	453	382	389	392	391	
Japanese encephalitis	0	0	0	23	7	34	17	9	
Viral hepatitis C	117	5,299	202	10,115	11,849	9,810	10,811	6,396	
Malaria	9	211	22	294	385	559	576	515	
Legionellosis	13	205	9	383	368	501	305	198	
Vibrio vulnificus sepsis	7	11	3	52	70	42	47	46	
Murine typhus	3	33	0	9	1	14	16	18	
Scrub typhus	24	631	28	5,915	4,479	4,005	6,668	10,528	
Leptospirosis	4	60	3	144	114	138	118	103	
Brucellosis	0	4	0	4	8	1	5	6	
HFRS	1	108	6	310	270	399	433	531	
HIV/AIDS	17	445	23	773	818	1,006	989	1,008	
CJD	0	14	1	67	64	53	53	36	
Dengue fever	2	20	4	3	43	273	159	171	India(1), Indonesia(1)
Q fever	0	36	3	46	69	162	163	96	
Lyme Borreliosis	0	2	1	8	18	23	23	31	
Melioidosis	0	0	0	2	1	8	2	2	
Chikungunya fever	0	2	0	0	1	16	3	5	
SFTS	5	74	9	172	243	223	259	272	
Zika virus infection	0	0	0	0	1	3	3	11	

Abbreviation: EHEC= Enterohemorrhagic *Escherichia coli*, VRSA= Vancomycin-resistant *Staphylococcus aureus*, CRE= Carbapenem-resistant Enterobacteriaceae, HFRS= Hemorrhagic fever with renal syndrome, CJD= Creutzfeldt-Jacob Disease, SFTS= Severe fever with thrombocytopenia syndrome.
Cum: Cumulative counts from 1st week to current week in a year.

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

‡ The reported surveillance data excluded no incidence data such as Ebola virus disease, Marburg Hemorrhagic fever, Lassa fever, Crimean Congo Hemorrhagic fever, South American Hemorrhagic fever, Rift Valley fever, Smallpox, Plague, Anthrax, Botulism, Tularemia, Newly emerging infectious disease syndrome, Severe Acute Respiratory Syndrome, Middle East Respiratory Syndrome, Human infection with zoonotic influenza, Novel Influenza, Diphtheria, Poliomyelitis, *Haemophilus influenza* type b, Epidemic typhus, Rabies, Yellow fever, West Nile fever and Tick-borne Encephalitis.

Table 2. Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category II											
	Tuberculosis			Varicella			Measles			Cholera		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	361	10,518	14,596	324	11,117	38,651	0	0	39	0	0	0
Seoul	52	1,746	2,571	46	1,437	4,317	0	0	5	0	0	0
Busan	18	667	977	15	702	2,120	0	0	1	0	0	0
Daegu	11	524	694	19	471	2,082	0	0	2	0	0	0
Incheon	20	529	772	9	513	1,948	0	0	2	0	0	0
Gwangju	11	218	365	12	360	1,399	0	0	0	0	0	0
Daejeon	10	249	328	0	286	1,002	0	0	5	0	0	0
Ulsan	3	179	296	12	308	1,120	0	0	0	0	0	0
Sejong	1	34	54	2	138	466	0	0	15	0	0	0
Gyonggi	73	2,364	3,171	117	3,357	10,838	0	0	0	0	0	0
Gangwon	17	469	623	9	278	933	0	0	1	0	0	0
Chungbuk	9	330	450	9	291	1,116	0	0	0	0	0	0
Chungnam	26	573	706	5	433	1,429	0	0	1	0	0	0
Jeonbuk	12	435	571	7	399	1,610	0	0	1	0	0	0
Jeonnam	24	569	788	21	410	1,530	0	0	2	0	0	0
Gyeongbuk	38	848	1,062	14	574	2,119	0	0	2	0	0	0
Gyeongnam	30	665	967	25	987	3,621	0	0	2	0	0	0
Jeju	6	119	200	2	173	1,001	0	0	0	0	0	0

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

Table 2. *(Continued)* Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category II											
	Typhoid fever			Paratyphoid fever			Shigellosis			Enterohemorrhagic *Escherichia coli*		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	4	29	79	13	33	29	1	25	66	9	134	111
Seoul	1	6	15	2	5	4	1	3	16	2	12	13
Busan	0	4	8	3	4	3	0	3	4	0	8	3
Daegu	1	3	3	0	1	2	0	0	4	0	5	4
Incheon	0	0	5	0	2	2	0	1	5	0	8	5
Gwangju	0	0	1	0	0	1	0	0	2	2	32	11
Daejeon	0	0	3	0	0	1	0	0	1	0	2	2
Ulsan	0	0	3	2	2	0	0	0	1	0	3	3
Sejong	0	0	1	0	0	0	0	0	0	0	0	1
Gyonggi	1	9	19	2	10	6	0	9	13	1	29	36
Gangwon	0	0	2	0	0	1	0	0	2	0	3	5
Chungbuk	0	0	2	0	0	1	0	1	1	0	3	3
Chungnam	0	1	3	0	0	1	0	1	5	0	2	2
Jeonbuk	0	0	1	0	0	1	0	2	1	0	5	2
Jeonnam	1	2	2	3	6	2	0	2	3	1	9	7
Gyeongbuk	0	2	4	0	0	1	0	1	5	2	6	6
Gyeongnam	0	2	5	1	3	2	0	2	2	1	4	4
Jeju	0	0	2	0	0	1	0	0	1	0	3	4

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

Table 2. *(Continued)* Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category II											
	Viral hepatitis A			Pertussis			Mumps			Rubella		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	24	1,365	4,622	1	23	212	103	3,979	9,273	0	0	1
Seoul	6	273	916	0	2	25	19	516	1,109	0	0	1
Busan	0	44	107	0	0	17	6	198	527	0	0	0
Daegu	2	46	62	0	3	7	5	159	375	0	0	0
Incheon	3	94	350	0	2	14	4	214	466	0	0	0
Gwangju	2	35	60	0	0	10	3	117	329	0	0	0
Daejeon	0	29	424	0	0	6	0	113	285	0	0	0
Ulsan	1	13	25	0	0	6	4	123	285	0	0	0
Sejong	0	8	71	0	0	3	1	44	57	0	0	0
Gyonggi	5	456	1,529	1	2	36	33	1,161	2,620	0	0	0
Gangwon	0	32	87	0	1	2	2	147	327	0	0	0
Chungbuk	2	60	229	0	2	6	2	91	246	0	0	0
Chungnam	0	85	351	0	1	4	1	188	405	0	0	0
Jeonbuk	0	72	162	0	0	5	3	142	410	0	0	0
Jeonnam	3	30	67	0	0	12	1	204	394	0	0	0
Gyeongbuk	0	42	79	0	3	13	5	197	469	0	0	0
Gyeongnam	0	26	68	0	7	44	13	308	818	0	0	0
Jeju	0	20	35	0	0	2	1	57	151	0	0	0

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

Table 2. *(Continued)* Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category II						Diseases of Category III					
	Meningococcal disease			Scarlet fever			Tetanus			Viral hepatitis B		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	0	0	6	12	288	6,969	0	12	19	6	264	239
Seoul	0	0	1	1	50	969	0	0	2	1	44	39
Busan	0	0	0	0	12	494	0	1	2	0	8	17
Daegu	0	0	0	0	7	216	0	0	2	1	14	7
Incheon	0	0	1	0	11	335	0	0	0	0	14	14
Gwangju	0	0	0	2	20	333	0	1	1	0	6	6
Daejeon	0	0	0	0	19	260	0	0	1	0	6	9
Ulsan	0	0	0	1	6	297	0	0	0	0	6	5
Sejong	0	0	0	0	2	42	0	1	0	0	2	1
Gyonggi	0	0	2	5	99	2,040	0	2	2	2	86	63
Gangwon	0	0	1	0	10	118	0	0	0	0	10	8
Chungbuk	0	0	0	0	3	127	0	0	1	0	10	8
Chungnam	0	0	0	0	8	296	0	2	2	1	10	13
Jeonbuk	0	0	0	0	4	246	0	1	1	0	14	10
Jeonnam	0	0	0	2	14	254	0	2	2	1	13	11
Gyeongbuk	0	0	0	0	8	343	0	1	2	0	8	11
Gyeongnam	0	0	1	1	12	507	0	1	1	0	12	15
Jeju	0	0	0	0	3	92	0	0	0	0	1	2

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

Table 2. *(Continued)* Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category Ⅲ											
	Japanese encephalitis			Malaria			Legionellosis			*Vibrio vulnificus* sepsis		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	0	0	0	9	211	315	13	205	198	7	11	10
Seoul	0	0	0	1	28	46	3	45	50	1	2	2
Busan	0	0	0	0	7	3	0	9	11	0	0	1
Daegu	0	0	0	0	2	3	0	11	8	1	1	0
Incheon	0	0	0	1	29	42	0	18	14	0	0	1
Gwangju	0	0	0	0	0	4	0	7	4	0	0	0
Daejeon	0	0	0	0	2	3	0	4	2	0	0	0
Ulsan	0	0	0	0	2	2	0	0	2	0	0	0
Sejong	0	0	0	0	1	0	0	0	0	0	0	0
Gyonggi	0	0	0	6	125	181	7	49	44	1	3	1
Gangwon	0	0	0	1	9	10	0	7	5	1	1	0
Chungbuk	0	0	0	0	3	2	1	5	8	0	0	0
Chungnam	0	0	0	0	1	4	0	4	5	0	0	1
Jeonbuk	0	0	0	0	0	2	0	0	6	0	0	0
Jeonnam	0	0	0	0	1	2	1	16	9	1	1	2
Gyeongbuk	0	0	0	0	0	4	1	6	13	2	2	0
Gyeongnam	0	0	0	0	1	5	0	6	7	0	1	2
Jeju	0	0	0	0	0	2	0	18	10	0	0	0

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

Table 2. *(Continued)* Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category Ⅲ											
	Murine typhus			Scrub typhus			Leptospirosis			Brucellosis		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	3	33	4	24	631	705	4	60	40	0	4	2
Seoul	0	1	1	0	15	24	0	4	2	0	0	1
Busan	0	0	0	1	19	25	0	1	2	0	0	0
Daegu	0	1	0	0	4	7	0	0	1	0	0	0
Incheon	0	10	1	0	8	9	0	0	1	0	0	0
Gwangju	0	0	1	1	10	14	0	2	2	0	0	0
Daejeon	0	0	0	0	16	13	0	6	1	0	0	0
Ulsan	0	0	0	0	11	13	0	1	1	0	0	0
Sejong	0	0	0	0	1	3	0	1	0	0	0	0
Gyonggi	3	13	0	1	27	47	2	14	6	0	0	0
Gangwon	0	2	0	1	8	9	0	1	2	0	0	0
Chungbuk	0	0	0	0	9	15	0	0	2	0	0	0
Chungnam	0	0	0	0	30	72	0	5	7	0	0	0
Jeonbuk	0	0	0	4	105	95	0	5	3	0	0	1
Jeonnam	0	4	1	7	191	191	1	11	4	0	2	0
Gyeongbuk	0	0	0	0	17	32	0	5	4	0	0	0
Gyeongnam	0	1	0	9	157	127	1	3	2	0	2	0
Jeju	0	1	0	0	3	9	0	1	0	0	0	0

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

Table 2. *(Continued)* Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category Ⅲ											
	Hemorrhagic fever with renal syndrome			Creutzfeldt-Jacob Disease			Dengue fever			Q fever		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	1	108	158	0	14	34	2	20	65	0	36	74
Seoul	0	1	5	0	3	7	0	7	21	0	1	4
Busan	0	2	4	0	1	3	0	1	4	0	0	1
Daegu	0	3	3	0	1	2	0	0	3	0	3	1
Incheon	0	0	2	0	0	1	0	0	4	0	1	2
Gwangju	0	3	2	0	0	1	0	1	1	0	2	3
Daejeon	0	2	2	0	0	2	0	0	1	0	3	3
Ulsan	0	0	1	0	1	0	0	0	2	0	1	2
Sejong	0	1	0	0	0	0	0	0	0	0	0	0
Gyonggi	0	26	30	0	4	8	1	7	19	0	2	10
Gangwon	0	5	8	0	1	1	0	0	1	0	1	0
Chungbuk	0	3	9	0	0	1	0	0	1	0	5	15
Chungnam	0	6	18	0	0	1	0	1	2	0	7	10
Jeonbuk	1	18	24	0	1	1	0	2	1	0	2	4
Jeonnam	0	25	27	0	0	1	0	0	1	0	1	10
Gyeongbuk	0	6	16	0	1	2	0	0	2	0	3	4
Gyeongnam	0	7	6	0	1	3	1	1	1	0	4	5
Jeju	0	0	1	0	0	0	0	0	1	0	0	0

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

Table 2. *(Continued)* Reported cases of infectious diseases by geography, week ending August 6, 2022 (32nd week)*

Unit: No. of cases†

Reporting area	Diseases of Category Ⅲ								
	Lyme Borreliosis			Severe fever with thrombocytopenia syndrome			Zika virus infection		
	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
Overall	0	2	11	5	74	106	0	0	–
Seoul	0	1	4	0	1	4	0	0	–
Busan	0	0	0	0	3	1	0	0	–
Daegu	0	0	0	0	0	2	0	0	–
Incheon	0	0	1	0	1	1	0	0	–
Gwangju	0	0	0	0	2	0	0	0	–
Daejeon	0	0	0	0	1	1	0	0	–
Ulsan	0	0	0	0	1	3	0	0	–
Sejong	0	0	0	0	0	0	0	0	–
Gyonggi	0	1	2	0	8	16	0	0	–
Gangwon	0	0	1	3	14	14	0	0	–
Chungbuk	0	0	0	2	10	2	0	0	–
Chungnam	0	0	1	0	3	13	0	0	–
Jeonbuk	0	0	1	0	7	7	0	0	–
Jeonnam	0	0	0	0	5	8	0	0	–
Gyeongbuk	0	0	1	0	9	14	0	0	–
Gyeongnam	0	0	0	0	5	13	0	0	–
Jeju	0	0	0	0	4	7	0	0	–

Cum: Cumulative counts from 1st week to current week in a year

* The reported data for year 2021, 2022 are provisional but the data from 2017 to 2020 are finalized data.

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

1. Influenza, Republic of Korea, weeks ending August 6, 2022 (32nd week)

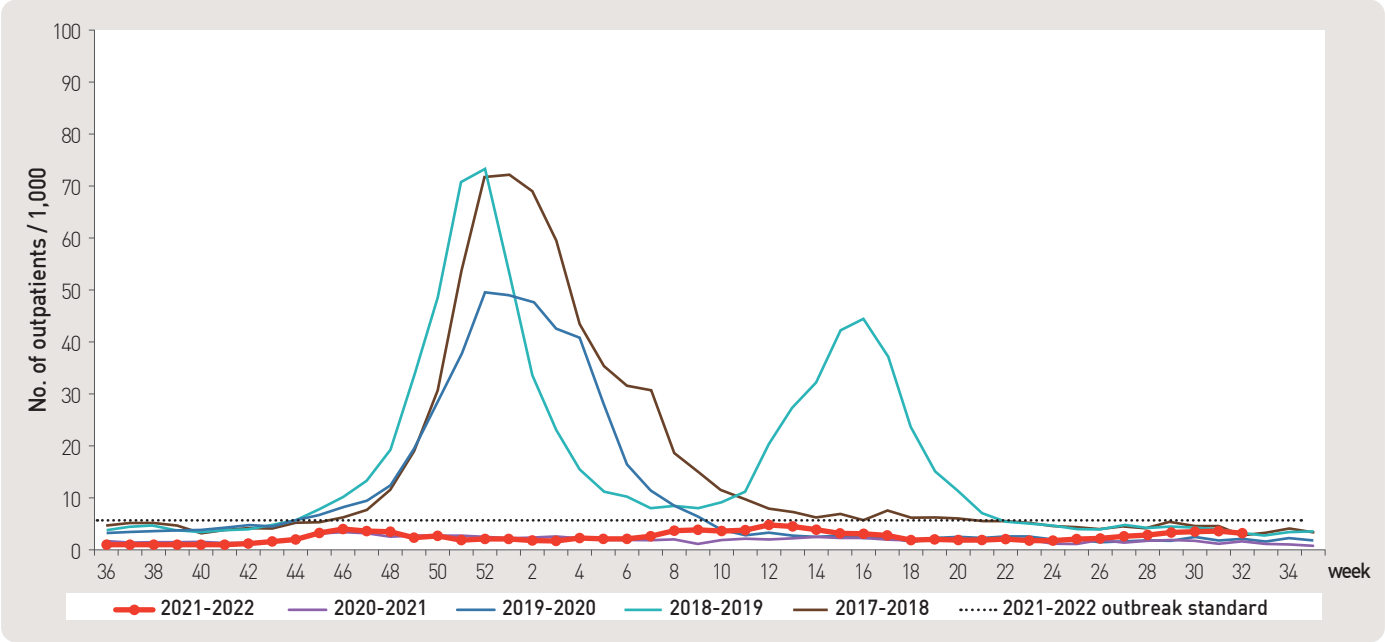


Figure 1. Weekly proportion of influenza-like illness per 1,000 outpatients, 2017-2018 to 2021-2022 flu seasons

2. Hand, Foot and Mouth Disease (HFMD), Republic of Korea, weeks ending August 6, 2022 (32nd week)

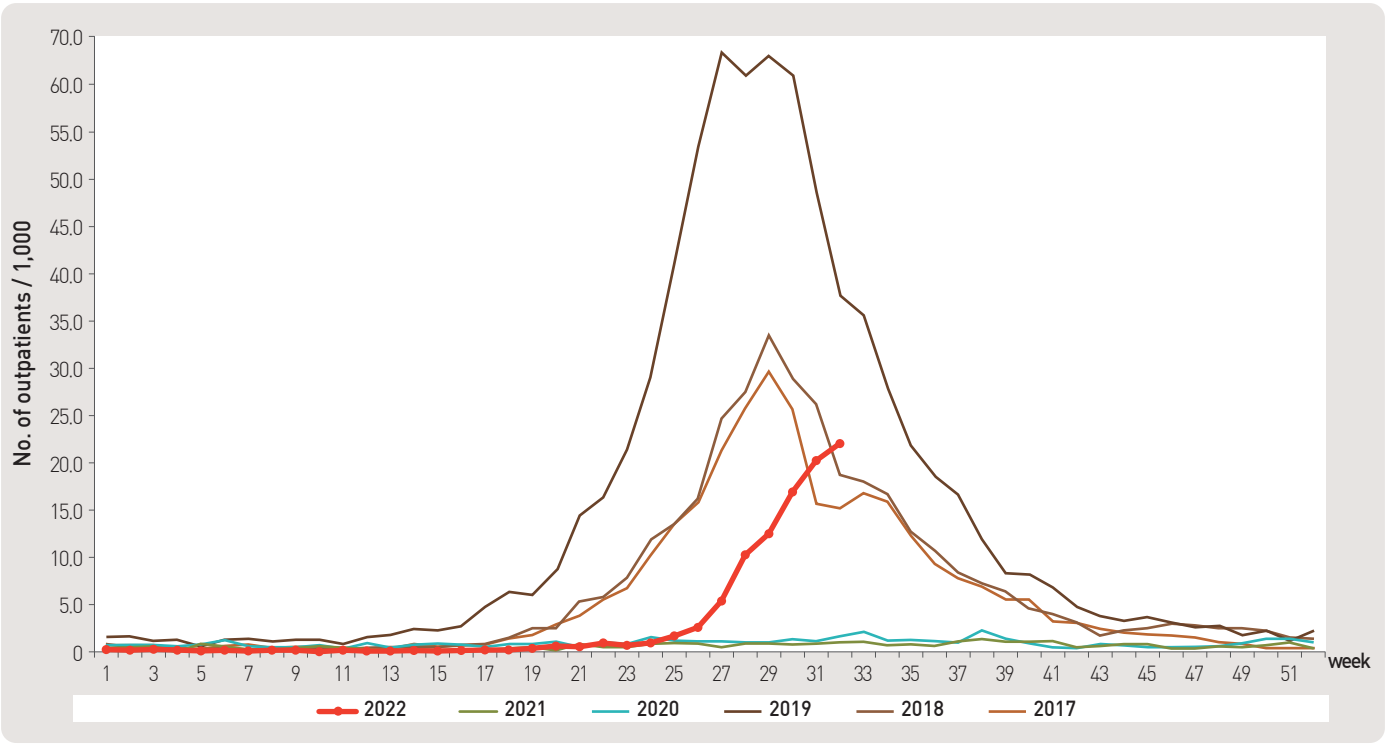


Figure 2. Weekly proportion of hand, foot and mouth disease per 1,000 outpatients, 2017-2022

3. Ophthalmologic infectious disease, Republic of Korea, weeks ending August 6, 2022 (32nd week)

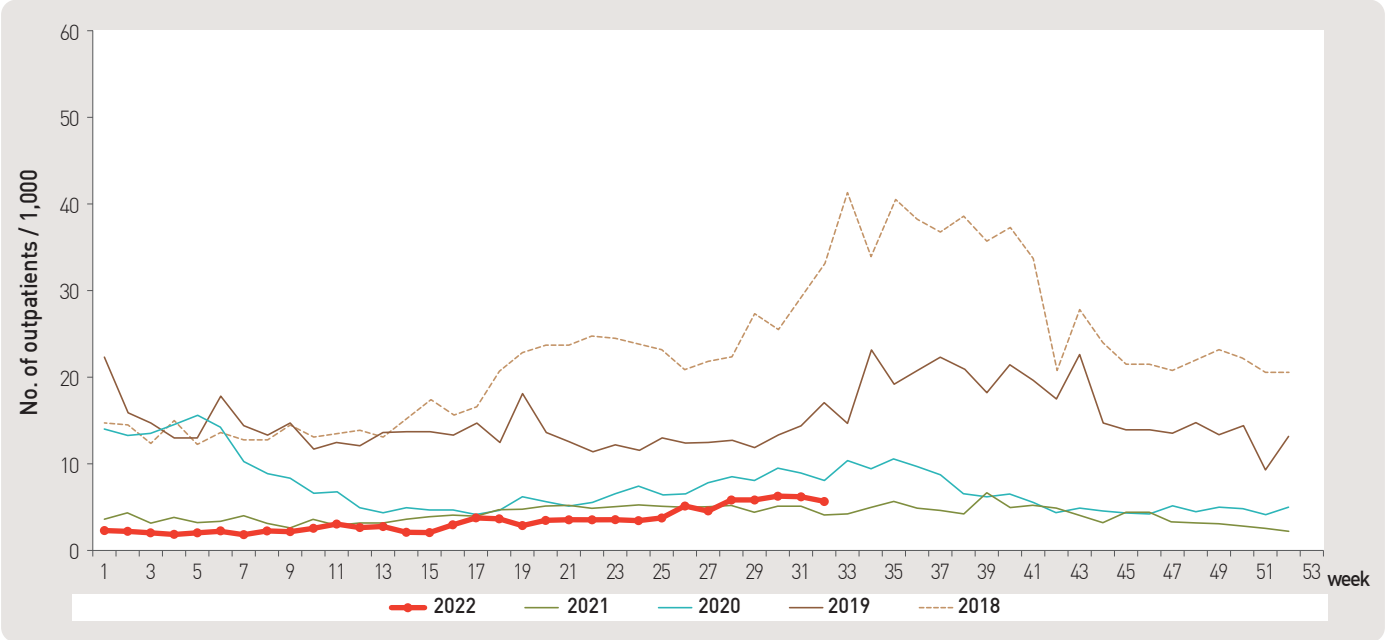


Figure 3. Weekly proportion of epidemic keratoconjunctivitis per 1,000 outpatients

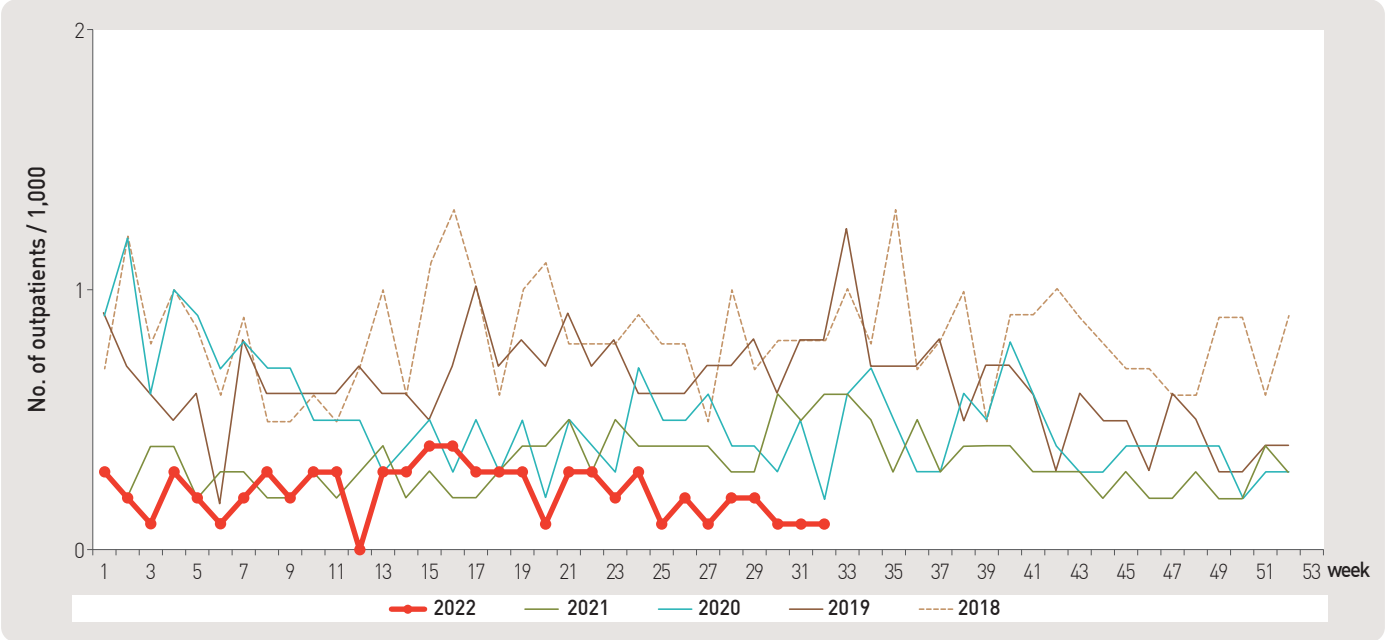


Figure 4. Weekly proportion of acute hemorrhagic conjunctivitis per 1,000 outpatients

4. Sexually Transmitted Diseases†, Republic of Korea, weeks ending August 6, 2022 (32nd week)

Unit: No. of cases/sentinels

Gonorrhea			Chlamydia			Genital herpes			Condyloma acuminata		
Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
1.2	4.5	6.4	2.1	15.4	21.4	2.8	30.7	29.7	2.2	12.3	17.1

Human Papilloma virus infection			Syphilis								
			Primary			Secondary			Congenital		
Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§	Current week	Cum. 2022	Cum. 5-year average§
4.9	60.9	23.3	1.3	2.3	0.9	1.5	2.2	1.0	0.0	1.0	0.4

Cum: Cumulative counts from 1st week to current week in a year

† According to surveillance data, the reported cases may include all of the cases such as confirmed, suspected, and asymptomatic carrier in the group.

§ Cum. 5-year average is mean value calculated by cumulative counts from 1st week to current week for 5 preceding years.

▣ Waterborne and foodborne disease outbreaks, Republic of Korea, weeks ending August 6, 2022 (32nd week)

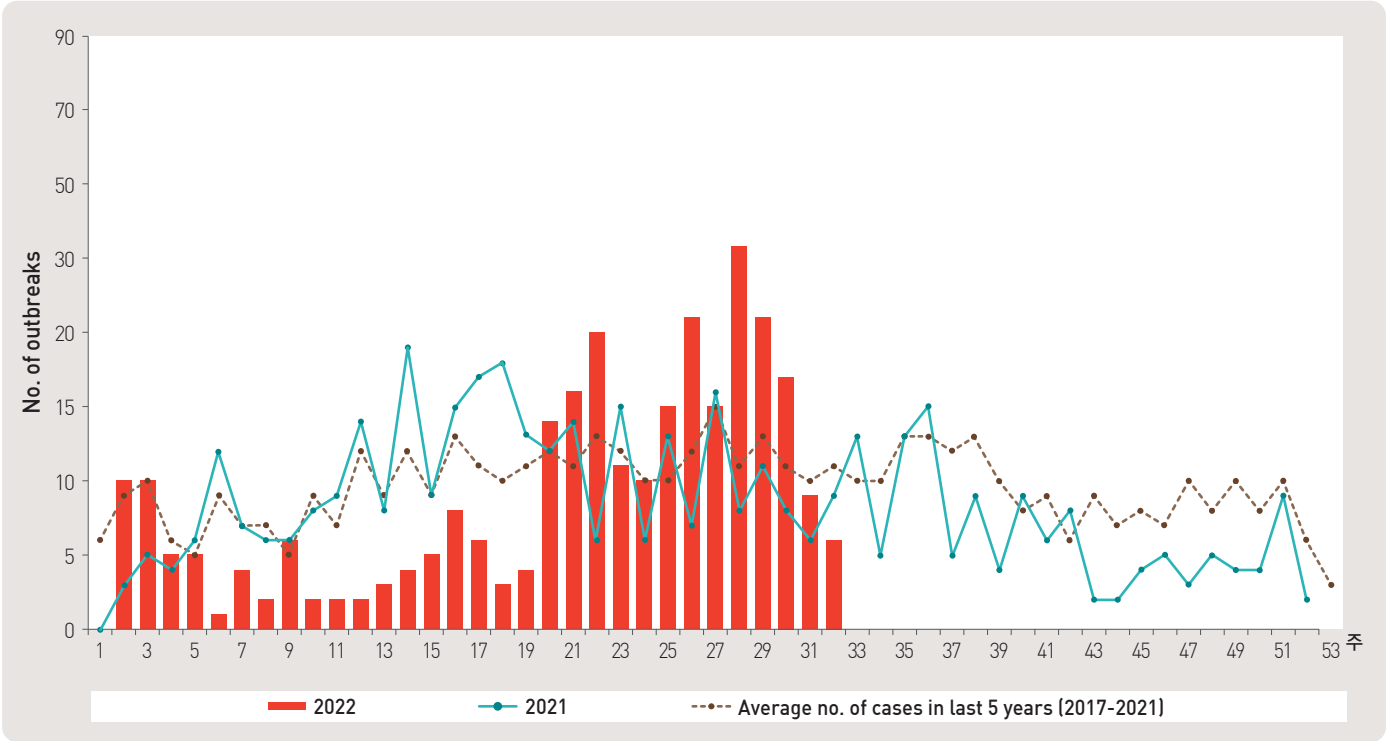


Figure 5. Number of waterborne and foodborne disease outbreaks reported by week, 2021–2022

1. Influenza viruses, Republic of Korea, weeks ending August 6, 2022 (32nd week)

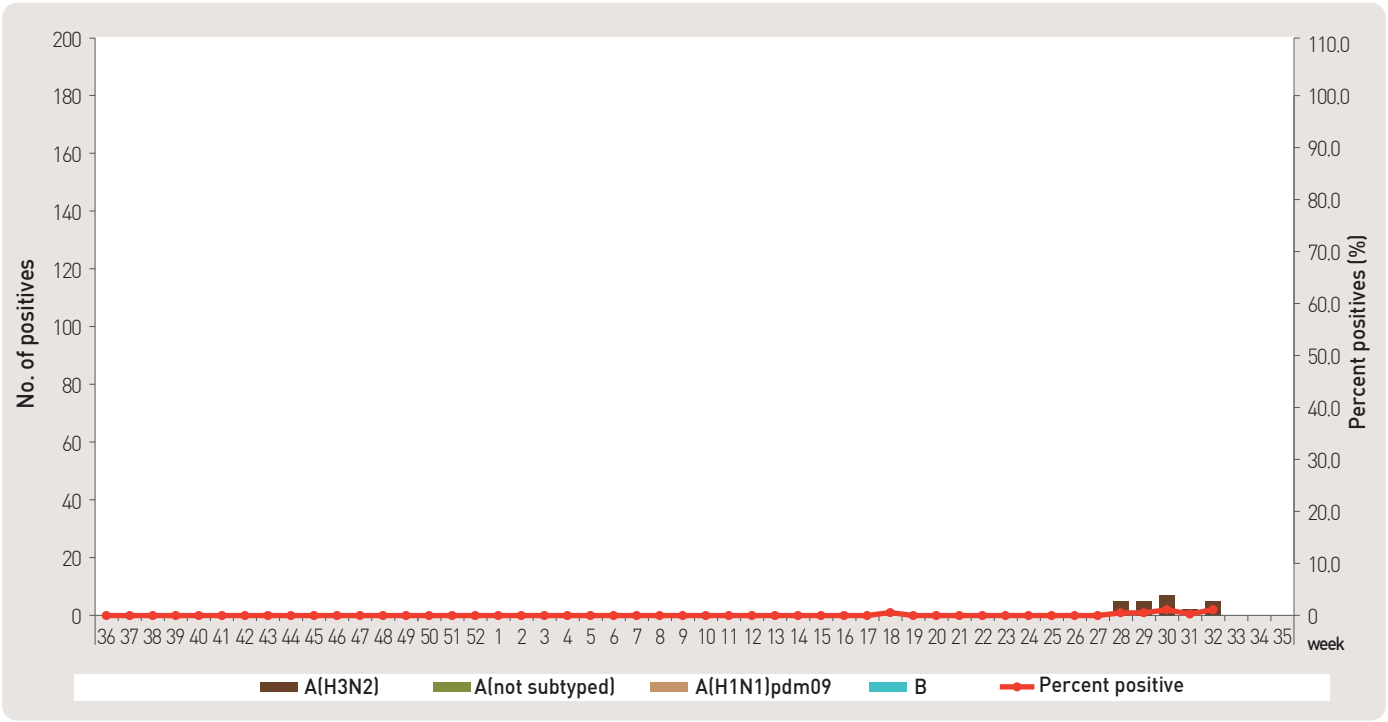


Figure 6. Number of specimens positive for influenza by subtype, 2021–2022 flu season

2. Respiratory viruses, Republic of Korea, weeks ending August 6, 2022 (32nd week)

2022 (week)	Weekly total		Detection rate (%)							
	No. of samples	Detection rate (%)	HAdV	HPIV	HRSV	IFV	HCoV	HRV	HBoV	HMPV
29	219	52.1	4.6	0.0	0.5	2.3	3.7	27.9	12.8	0.5
30	195	55.9	3.1	0.5	2.1	3.6	2.6	26.7	17.4	0.0
31	159	64.2	6.3	0.0	4.4	1.3	5.7	27.7	16.4	2.5
32	127	48.0	3.9	0.0	1.6	3.9	2.4	22.0	11.0	3.1
Cum.※	700	55.1	4.4	0.1	2.0	2.7	3.6	26.4	14.6	1.3
2021 Cum.∀	4,619	65.1	6.8	12.9	1.9	0.0	0.3	34.1	9.2	0.0

- HAdV : human Adenovirus, HPIV : human Parainfluenza virus, HRSV : human Respiratory syncytial virus, IFV : Influenza virus, HCoV : human Coronavirus, HRV : human Rhinovirus, HBoV : human Bocavirus, HMPV : human Metapneumovirus

※ Cum. : the rate of detected cases between July 10, 2022 – August 6, 2022 (Average No. of detected cases is 175 last 4 weeks)

∀ 2021 Cum. : the rate of detected cases between December 27, 2020 – December 25, 2021

▣ Acute gastroenteritis-causing viruses and bacteria, Republic of Korea, weeks ending July 30, 2022 (31st week)

◆ Acute gastroenteritis-causing viruses

Week		No. of sample	No. of detection (Detection rate, %)					
			Norovirus	Group A Rotavirus	Enteric Adenovirus	Astrovirus	Sapovirus	Total
2022	28	116	31 (26.7)	0 (0.0)	19 (16.4)	3 (2.6)	7 (6.0)	60 (51.7)
	29	128	36 (28.1)	0 (0.0)	12 (9.4)	11 (8.6)	6 (4.7)	65 (50.8)
	30	94	25 (26.6)	0 (0.0)	9 (9.6)	14 (14.9)	8 (8.5)	56 (59.6)
	31	110	24 (21.8)	0 (0.0)	8 (7.3)	9 (8.2)	13 (11.8)	54 (49.1)
2022 Cum.		2,050	651 (31.8)	25 (1.2)	169 (8.2)	74 (3.6)	41 (2.0)	960 (46.8)

* The samples were collected from children ≤5 years of sporadic acute gastroenteritis in Korea.

◆ Acute gastroenteritis-causing bacteria

Week		No. of sample	No. of isolation (Isolation rate, %)								
			Salmonella spp.	Pathogenic *E.coli*	*Shigella spp.*	*V.parahaemolyticus*	*V. cholerae*	*Campylobacter spp.*	*C.perfringens*	*S. aureus*	*B. cereus*	Total
2022	28	287	14 (4.9)	28 (9.8)	0 (0.0)	0 (0.0)	0 (0.0)	8 (2.8)	9 (3.1)	12 (4.2)	9 (3.1)	82 (28.6)
	29	345	13 (3.8)	36 (10.4)	0 (0.0)	0 (0.0)	0 (0.0)	11 (3.2)	12 (3.5)	11 (3.2)	14 (4.1)	99 (28.7)
	30	261	17 (6.5)	33 (12.6)	0 (0.0)	0 (0.0)	0 (0.0)	16 (6.1)	2 (0.8)	11 (4.2)	13 (5.0)	93 (35.6)
	31	219	8 (3.7)	22 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (1.4)	5 (2.3)	7 (3.2)	4 (1.8)	49 (22.4)
2022 Cum.		6,172	146 (2.4)	250 (4.1)	0 (0.0)	0 (0.0)	0 (0.0)	125 (2.0)	179 (2.9)	223 (3.6)	129 (2.1)	1,065 (17.3)

* Bacterial Pathogens: *Salmonella spp., E. coli (EHEC, ETEC, EPEC, EIEC), Shigella spp., Vibrio parahaemolyticus, Vibrio cholerae, Campylobacter spp., Clostridium perfringens, Staphylococcus aureus, Bacillus cereus, Listeria monocytogenes, Yersinia enterocolitica.*
* Hospital participating in Laboratory surveillance in 2022 (72 hospitals)

▣ Enterovirus, Republic of Korea, weeks ending July 30, 2022 (31st week)

◆ Aseptic meningitis

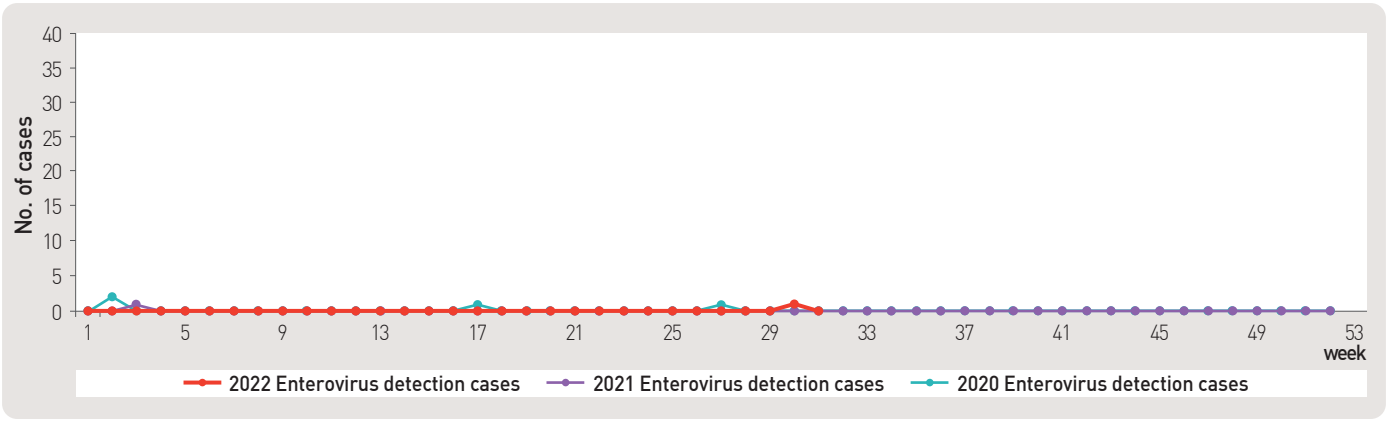


Figure 7. Detection case of enterovirus in aseptic meningitis patients from 2020 to 2022

◆ HFMD and Herpangina

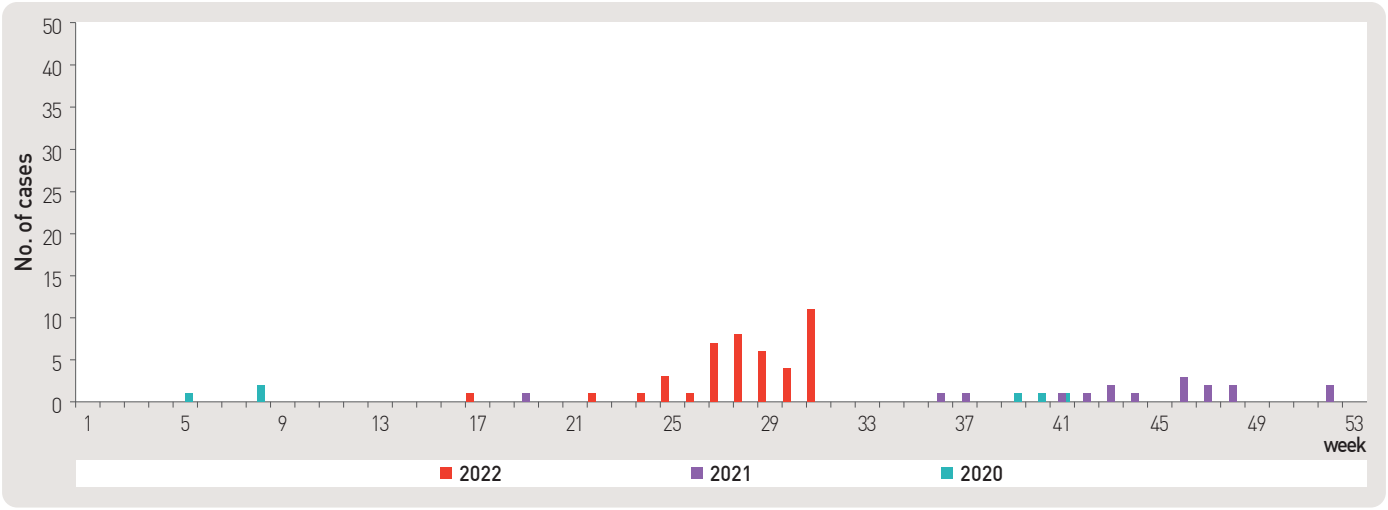


Figure 8. Detection case of enterovirus in HFMD and herpangina patients from 2020 to 2022

◆ HFMD with Complications

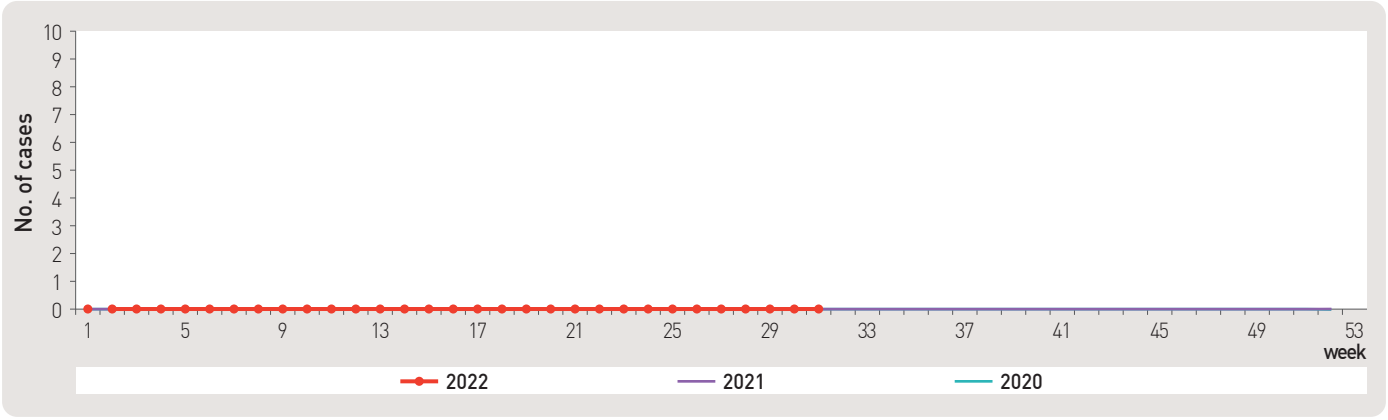
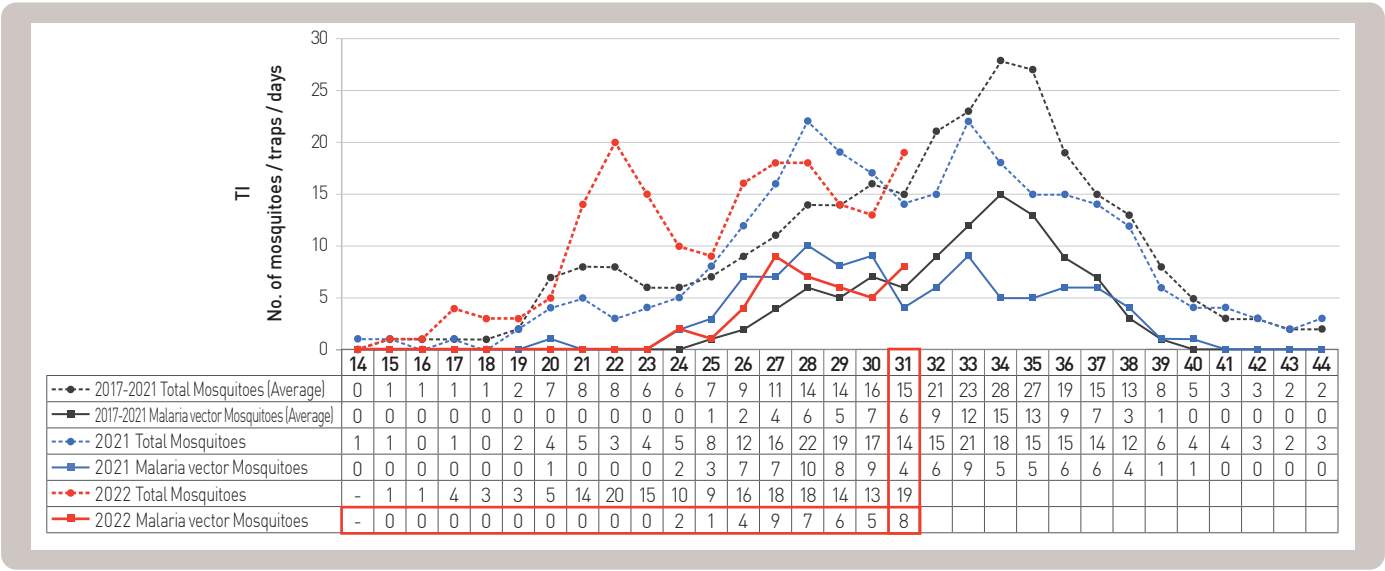


Figure 9. Detection case of enterovirus in HFMD with complications patients from 2020 to 2022

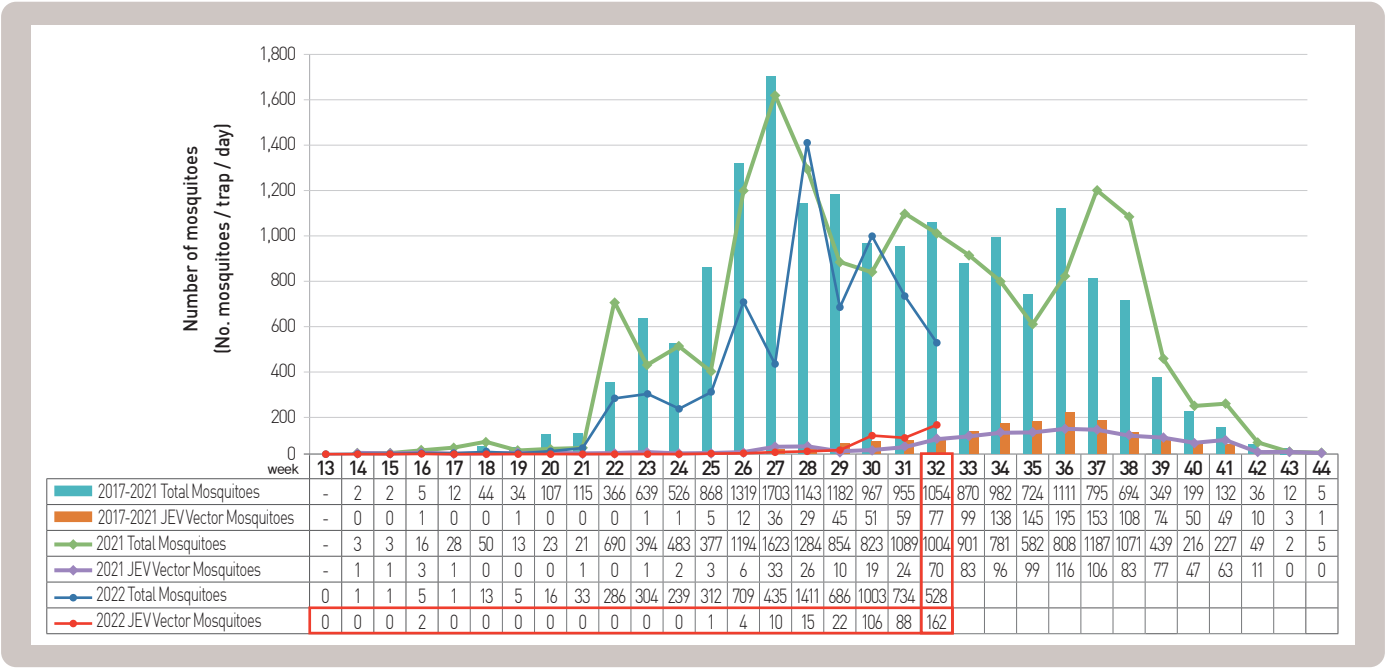
▣ Vector surveillance / malaria vector mosquitoes, Republic of Korea, week ending July 30, 2022 (31st week)



	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
2017-2021 Total Mosquitoes (Average)	0	1	1	1	1	2	7	8	8	6	6	7	9	11	14	14	16	15	21	23	28	27	19	15	13	8	5	3	3	2	2
2017-2021 Malaria vector Mosquitoes (Average)	0	0	0	0	0	0	0	0	0	0	0	1	2	4	6	5	7	6	9	12	15	13	9	7	3	1	0	0	0	0	0
2021 Total Mosquitoes	1	1	0	1	0	2	4	5	3	4	5	8	12	16	22	19	17	14	15	21	18	15	15	14	12	6	4	4	3	2	3
2021 Malaria vector Mosquitoes	0	0	0	0	0	0	1	0	0	0	2	3	7	7	10	8	9	4	6	9	5	5	6	6	4	1	1	0	0	0	0
2022 Total Mosquitoes	-	1	1	4	3	3	5	14	20	15	10	9	16	18	18	14	13	19													
2022 Malaria vector Mosquitoes	-	0	0	0	0	0	0	0	0	0	2	1	4	9	7	6	5	8													

Figure 10. The weekly incidences of malaria vector mosquitoes in 2022

▣ Vector surveillance/Japanese encephalitis vector mosquitoes, Republic of Korea, week ending August 6, 2022 (32nd week)



week	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
2017-2021 Total Mosquitoes	-	2	2	5	12	44	34	107	115	366	639	526	868	1319	1703	1143	1182	967	955	1054	870	982	724	1111	795	694	349	199	132	36	12	5
2017-2021 JEV Vector Mosquitoes	-	0	0	1	0	0	1	0	0	0	1	1	5	12	36	29	45	51	59	77	99	138	145	195	153	108	74	50	49	10	3	1
2021 Total Mosquitoes	-	3	3	16	28	50	13	23	21	690	394	483	377	1194	1623	1284	854	823	1089	1004	901	781	582	808	1187	1071	439	216	227	49	2	5
2021 JEV Vector Mosquitoes	-	1	1	3	1	0	0	0	1	0	1	2	3	6	33	26	10	19	24	70	83	96	99	116	106	83	77	47	63	11	0	0
2022 Total Mosquitoes	0	1	1	5	1	13	5	16	33	286	304	239	312	709	435	1411	686	1003	734	528												
2022 JEV Vector Mosquitoes	0	0	0	2	0	0	0	0	0	0	0	0	1	4	10	15	22	106	88	162												

Figure 11. The weekly incidences of Japanese encephalitis vector mosquitoes in 2022

About PHWR Disease Surveillance Statistics

The Public Health Weekly Report (PHWR) Disease Surveillance Statistics is prepared by the Korea Disease Control and Prevention Agency (KDCA). These provisional surveillance data on the reported occurrence of national notifiable diseases and conditions are compiled through population-based or sentinel-based surveillance systems and published weekly, except for data on infrequent or recently-designated diseases. These surveillance statistics are informative for analyzing infectious disease or condition numbers and trends. However, the completeness of data might be influenced by some factors such as a date of symptom or disease onset, diagnosis, laboratory result, reporting of a case to a jurisdiction, or notification to Korea Disease Control and Prevention Agency. The official and final disease statistics are published in infectious disease surveillance yearbook annually.

Using and Interpreting These Data in Tables

- Current Week – The number of cases under current week denotes cases who have been reported to KDCA at the central level via corresponding jurisdictions (health centers, and health departments) during that week and accepted/approved by surveillance staff.
- Cum. 2022 – For the current year, it denotes the cumulative (Cum) year-to-date provisional counts for the specified condition.
- 5-year weekly average – The 5-year weekly average is calculated by summing, for the 5 proceeding years, the provisional incidence counts for the current week, the two weeks preceding the current week, and the two weeks following the current week. The total sum of cases is then divided by 25 weeks. It gives help to discern the statistical aberration of the specified disease incidence by comparing difference between counts under current week and 5-year weekly average.

For example,

* 5-year weekly average for current week= (X1 + X2 + … + X25) / 25

	10	11	12	13	14
2022			Current week		
2021	X1	X2	X3	X4	X5
2020	X6	X7	X8	X9	X10
2019	X11	X12	X13	X14	X15
2018	X16	X17	X18	X19	X20
2017	X21	X22	X23	X24	X25

- Cum. 5-year average – Mean value calculated by cumulative counts from 1st week to current week for 5 preceding years. It gives help to understand the increasing or decreasing pattern of the specific disease incidence by comparing difference between cum. 2022 and cum. 5-year average.

Contact Us

Questions or comments about the PHWR Disease Surveillance Statistics can be sent to phwrcdc@korea.kr or to the following:

Mail:
Division of Climate Change and Health Protection Korea Disease Control and Prevention Agency (KDCA)
187 Osongsaengmyeong 2-ro, Osong-eup, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do, Korea, 28160

편집위원회

발간등록번호 11-1351159-000002-03

www.kdca.go.kr

「주간 건강과 질병, PHWR」은 질병관리청에서 시행되는 조사사업을 통해 생성된 감시 및 연구 자료를 기반으로 근거중심의 건강 및 질병관련 정보를 제공하고자 최선을 다할 것이며, 제공되는 정보는 질병관리청의 특정 의사와는 무관함을 알립니다.

본 간행물에서 제공되는 감염병 통계는 「감염병의 예방 및 관리에 관한 법률」에 의거, 국가감염병감시체계를 통해 신고된 자료를 기반으로 집계된 것으로 집계된 당해년도 자료는 의사환자 단계에서 신고된 것이며 확진 결과시 혹은 다른 병으로 확인될 경우 수정될 수 있는 잠정 통계임을 알립니다.

「주간 건강과 질병, PHWR」은 질병관리청 홈페이지를 통해 주간 단위로 게시되고 있으며, 정기적 구독을 원하시는 분은 phwrcdc@korea.kr로 신청 가능합니다. 이메일을 통해 보내지는 본 간행물의 정기적 구독 요청시 구독자의 성명, 연락처, 직업 및 이메일 주소가 요구됨을 알려 드립니다.

「주간 건강과 질병」 발간 관련 문의 : phwrcdc@korea.kr / 043-219-2955, 2958, 2959

창 간 : 2008년 4월 4일
발 행 : 2022년 8월 11일
발 행 인 : 백경란
발 행 처 : 질병관리청
사 무 국 : 질병관리청 건강위해대응관 미래질병대비과

(28159) 충북 청주시 흥덕구 오송읍 오송생명2로 187 오송보건의료행정타운
TEL. (043) 219-2955, 2958, 2959 FAX. (043) 219-2969