pISSN 2005-811X
eISSN 2586-0860

www.cdc.go.kr

주간 건강과 질병

PUBLIC HEALTH WEEKLY REPORT, PHWR

Vol. 13, No. 36, 2020

CONTENTS

질병관리본부

COVID-19 Special Issue 1

Coronavirus Disease-19 (COVID-19) 6-month outbreak infection report as of July 19, 2020, in the Republic of Korea

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Abstract

This is a 6 months report on the Coronavirus Disease-19 (COVID-19) situation in the Republic of Korea based on the confirmed cases reported through the Integrated System to Korea Centers for Disease Control and Prevention according to the INFECTIOUS DISEASE CONTROL AND PREVENTION ACT and based on the epidemiological investigation by central and local health authorities.

As of July 19, 2020, there were 13,745 confirmed cases of COVID-19, and including 295 deaths. Confirmed cases were reported in all 17 provinces/cities in Korea, with the highest number of cases from Daegu, Seoul, Gyeonggi and Gyeongbuk Province. The results indicated that, by gender, women accounted for a slightly higher proportion (55.8%) of total confirmed cases than men.

The main infectious paths confirmed by epidemiological investigations showed several major clusters related to COVID-19. Of the total cases, the proportion of imported cases was 14.9%; 37.9% were Shincheonji (and related); 27.2% are small clusters and contacts of confirmed cases (other than Shincheonji); and 8.6% are currently under investigation as per infection route surveys.

Keywords: 2019 Novel Coronavirus (2019-nCoV), Coronavirus Disease-19 (COVID-19), Outbreaks, Epidemiological monitoring, Epidemiological investigation, Social distancing, Enhanced social distancing, Distancing in daily life

Introduction

Coronavirus disease 2019 (COVID-19), which started in Wuhan, China and was first announced on December 31, 2019, has infected 14,043,176 people worldwide as of July 19, 2020. In South Korea, the first case was reported on January 20, 2020, and 13,745 cumulative cases have been documented as of July 19, 2020. The South Korean government is currently maintaining the highest crisis alert level (level 4) for COVID-19, and the entire government is focused on the response to COVID-19 through the operations of the Central Disaster and Safety Countermeasure Headquarters headed by the Prime Minister.

South Korea's COVID-19 response in the past 6 months can be classified into a first phase, which mainly involved imported cases, a second phase when a large community outbreak associated with the Shincheonji religious group and other outbreaks prompted strong social distancing measures, and the current third phase where occasional community outbreaks and sporadic cases are being reported under a more relaxed set of social distancing guidelines.

This report presents an analysis of the current situation and the major aspects of the nation's response to COVID-19 as South Korea enters month 6 of the COVID-19 response. COVID-19 case data reported from hospitals are subject to change after

an epidemiological investigation to confirm the route of transmission, and the statistics by region can differ from the COVID-19 situation reports issued by local governments as the statistics are based on the address of the reporting agency. The data presented should be interpreted with those caveats in mind.

Result

Trends in major characteristics of cases over time

The COVID-19 case trends in South Korea can be divided into the following three phases according to the major characteristics of cases and the response.

The first phase (January 20 to February 17) was characterized by sporadic individual cases that were imported, mainly from China. The total number of cases in the first phase was 30, among which 17 (56.7%) were imported cases. After the first reported case in South Korea, the government raised the crisis alert level from level 2 to 3. Starting on February 4, special border screening measures for inbound travelers from China were put in place.

The second phase (February 18 to May 5) started with a mass cluster outbreak associated with the Shincheonji religious group in Daegu and Gyeongbuk Province and continued with community outbreaks in hospitals, religious institutions, and public facilities throughout the entire country. The total number of cases in the second phase was 10,774, with an average number of cases per day of 138.13. With the spread of community outbreaks, the crisis alert level was adjusted from level 3 to level 4 on February 23, and social distancing measures were put in place on February 29. Despite these efforts, cases continued to emerge, which prompted a strengthened social distancing policy on March 22. The number of cases started to decrease as

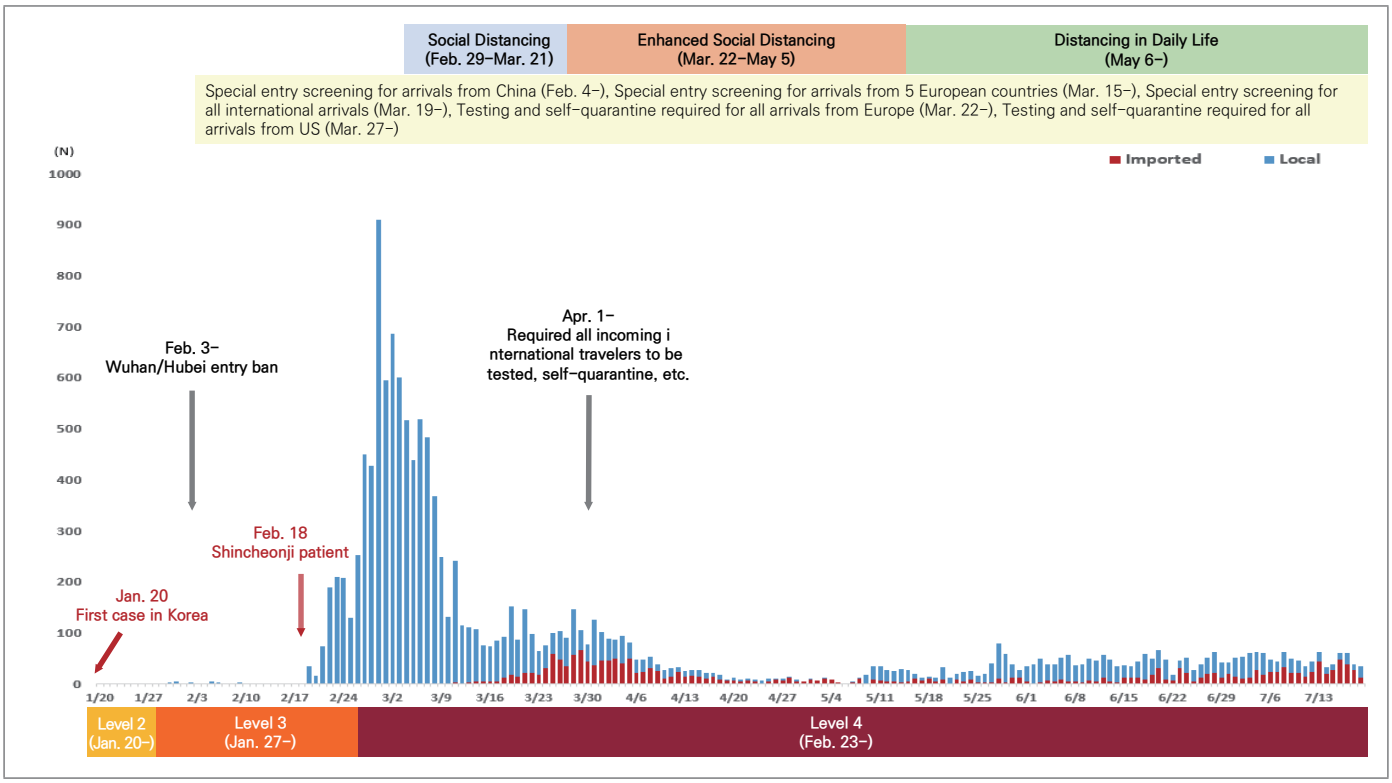

Figure 1. Local situation and response progression since the first local case 6 month ago

Table 1. Main characteristics of outbreaks

	Jan. 20 – Feb. 17 Imported cases	Feb. 18 – May 5 Large-scale clusters, enhanced social distancing	May 6 – Present Distancing in daily life, local clusters, sporadic cases
Confirmed cases	30 cases over 1 month	10,774 cases over 3 months	2,941 cases over 6 months
Daily average	1.03 (min 0 – max 5)	138.13 (min 2 – max 909)	39.21 (min 2 – max 79)
Gender (M : F)	No difference (53.3 : 46.7)	Female ratio is higher (40.5 : 59.5)	Male ratio is higher (57.6 : 42.4)
Proportion of imported cases	56.7% (17/30 cases)	10.1% (1,085/10,774 cases)	32.1% (943/2,941 cases)
Deaths (Fatalities)	1 case (3.3%)	273 cases (2.5%)	21 cases (0.7%)
Characteristics of outbreaks	• Individual-level, people coming from overseas, sporadic Individual cases	• Shincheonji Church, many women and younger individuals	• Itaewon, Coupang, etc. (mass facilities) → religious facilities, small gatherings, sales, etc. (middle-aged and elderly)
Major responses	• **(Jan. 27)** Crisis alert level 2 → level 3 • **(Feb. 4–)** Special entry screening for arrivals from China	• **(Feb. 23–)** Crisis alert level 3 → level 4 • **(Feb. 23–)** Social Distancing • **(Mar. 22–)** Enhanced Social Distancing • **(Apr. 1–)** Strengthened management of incoming international travelers	• **(May 6–)** Distancing in daily life • **(May 29)** Strengthened measures for Seoul metropolitan area • **(June 2)** Designated high-risk facilities • **(Late June)** Designated high-risk countries that require strengthened infectious disease control and prevention

new community outbreaks were prevented. To respond to the increasing number of imported cases since April, management of all incoming travelers was also strengthened on April 1.

The third phase (May 6 to present) began with relaxing the social distancing measures while maintaining the crisis alert level 4. A cluster of cases that began in entertainment venues in Seoul in early May spread to adjacent regions. Due to cases in crowded and enclosed places forming a chain of infections, sporadic cases continue to occur until now. Various groups have been associated with infection clusters, such as nightclubs, large logistics centers, religious groups, and door-to-door sales, in the Seoul metropolitan area and the Chungcheong and Honam areas. Imported case numbers have increasedas well. As of July 19, the average number of cases per day in the third phase was 39.21. The government implemented stronger quarantine measures in the Seoul metropolitan area on May 29, and on June 2, asked citizens to abide by social distancing measures by designating high-risk facilities. Starting in late June, the government also designated countries for which border screening measures would be strengthened to respond to increased numbers of imported cases from Asia (other than China) and other regions (Figure 1, Table 1).

Characteristics of cases by sex, age, and region

There were more female cases (55.8%) than males, and the overall incidence rate (per 100,000) was 26.5. In terms of age,

Table 2. The number of confirmed/deceased cases and the incidence rate

	January 20, 2020 – July 19, 2020					
	Confirmed cases				Deaths	
	Total (n, %)	Domestic cases (n, %)	Imported cases (n, %)	Incidence rate (n, per 0.1M population)	Total (n, %)	Fatality rate
Gender						
Male	6,070 (44.2)	4,809 (41.1)	1,261 (61.7)	23.5	155 (52.5)	2.6
Female	7,675 (55.8)	6,891 (58.9)	784 (38.3)	29.5	140 (47.5)	1.8
Age group (yrs)						
≤9	237 (1.7)	175 (1.5)	62 (3.0)	5.7	–	–
10–19	762 (5.5)	604 (5.2)	158 (7.7)	15.4	–	–
20–29	3,531 (25.7)	2,751 (23.5)	780 (38.1)	51.9	–	–
30–39	1,684 (12.3)	1,192 (10.2)	492 (24.1)	23.9	2 (0.7)	0.1
40–49	1,817 (13.2)	1,540 (13.2)	277 (13.5)	21.7	3 (1.0)	0.2
50–59	2,435 (17.7)	2,266 (19.4)	169 (8.3)	28.1	16 (5.4)	0.7
60–69	1,787 (13.0)	1,697 (14.5)	90 (4.4)	28.2	41 (13.9)	2.3
70–79	911 (6.6)	899 (7.7)	12 (0.6)	25.3	86 (29.2)	9.4
≥80	581 (4.2)	576 (4.9)	5 (0.2)	30.6	147 (49.8)	25.3
Region						
Seoul	1,474 (10.7)	1,151 (9.8)	323 (15.8)	15.1	10 (3.4)	0.7
Busan	157 (1.1)	119 (1.0)	38 (1.9)	4.6	3 (1.0)	1.9
Daegu	6,932 (50.4)	6,880 (58.8)	52 (2.5)	284.5	190 (64.4)	2.7
Incheon	370 (2.7)	296 (2.5)	74 (3.6)	12.5	2 (0.7)	0.5
Gwangju	186 (1.4)	165 (1.4)	21 (1.0)	12.8	1 (0.3)	0.5
Daejeon	166 (1.2)	147 (1.3)	19 (0.9)	11.3	2 (0.7)	1.2
Ulsan	57 (0.4)	34 (0.3)	23 (1.1)	5.0	1 (0.3)	1.8
Sejong	50 (0.4)	45 (0.4)	5 (0.2)	14.6	–	–
Gyeonggi	1,433 (10.4)	1,074 (9.2)	359 (17.6)	10.8	29 (9.8)	2.0
Gangwon	72 (0.5)	51 (0.4)	21 (1.0)	4.7	3 (1.0)	4.2
Chungbuk	71 (0.5)	56 (0.5)	15 (0.7)	4.4	–	–
Chungnam	185 (1.3)	159 (1.4)	26 (1.3)	8.7	–	–
Jeonbuk	38 (0.3)	18 (0.2)	20 (1.0)	2.1	–	–
Jeonnam	33 (0.2)	16 (0.1)	17 (0.8)	1.8	–	–
Gyeongbuk	1,393 (10.1)	1,369 (11.7)	24 (1.2)	52.3	54 (18.3)	3.9
Gyeongnam	153 (1.1)	110 (0.9)	43 (2.1)	4.6	–	–
JeJu	25 (0.2)	10 (0.1)	15 (0.7)	3.7	–	–
Airport Screening	950 (6.9)	–	950 (46.5)	–	–	–
Nationality						
Korean	12,916 (94.0)	11,516 (98.4)	1,400 (68.5)	–	–	–
Foreigner	829 (6.0)	184 (1.6)	645 (31.5)	–	–	–
Total	**13,745 (100.0)**	**11,700 (100.0)**	**2,045 (100.0)**	**26.5**	**295 (100.0)**	**2.1**

Table 3. Regional distribution and epidemiological links of confirmed cases

Region	Total	Imported cases	Domestic cases				
			Shincheonji Chuch cases (and related)	Small clusters	Contacts of confirmed cases	Others	Under investigation
Seoul	1,474	323	8	872	60	77	134
Busan	157	38	12	58	18	11	20
Daegu	6,932	52	4,511	699	917	13	740
Incheon	370	74	2	263	10	9	12
Gwangju	186	21	9	143	3	6	4
Daejeon	166	19	2	100	22	5	18
Ulsan	57	23	16	4	3	9	2
Sejong	50	5	1	40	3	0	1
Gyeonggi	1,433	359	29	809	69	79	88
Gangwon	72	21	17	26	–	4	4
Chungbuk	71	15	6	29	8	2	11
Chungnam	185	26	–	142	4	4	9
Jeonbuk	38	20	1	12	–	4	1
Jeonnam	33	17	1	9	2	2	2
Gyeongbuk	1,393	24	566	478	192	3	130
Gyeongnam	153	43	32	50	6	9	13
JeJu	25	15	–	5	–	5	–
Airport Screening	950	950	–	0	–	0	–
Total	**13,745 (100.0%)**	**2,045 (14.9%)**	**5,213 (37.9%)**	**3,739 (27.2%)**	**1,317 (9.6%)**	**242 (1.8%)**	**1,189 (8.6%)**

those in their 20s accounted for the highest proportion of cases (25.7%), followed by those in their 50s (17.7%). Many cases were identified in Daegu, Gyeongbuk Province, and the Seoul metropolitan area, with 50.4% of cases in Daegu, 10.7% in Seoul, 10.4% in Gyeonggi Province, and 10.1% in Gyeongbuk Province. The incidence rate (per 100,000) by region was 284.5 in Daegu, 52.3 in Gyeongbuk Province, 15.1 in Seoul, 14.6 in Sejong, and 12.8 in Gwangju.

Among fatalities, there were more males (52.5%) than females, and the overall fatality rate was 2.1%. The vast majority (92.9%) of all deaths occurred in patients olderthan 60, and the fatality rate increased with age. The fatality rate in those aged 80 or above was 25.3%. Furthermore, 64.4% of all deaths occurred in Daegu, 18.3% in Gyeongbuk Province, and 9.8% in Gyeonggi Province (Table 2).

Case characteristics by infection route

Epidemiological investigations in the past 6 months revealed that the main routes of transmission were the Shincheonji religious group (37.9%), community outbreaks (27.2%), imported cases (14.9%), contacts with infected individuals (9.6%), and pending investigation (8.6%).

In South Korea, Shincheonji-related cluster infections were reported from week 8, in the second phase of the outbreak, to week 16. Almost all (97.4%) of the Shincheonji-related cases

Table 4. Regional distribution and epidemiological links of imported cases

	Total	Nationality	
		Korean	Foreigner
China	19	12	7
Asia (excluding China)	785	353	432
Americas	696	563	133
Europe	514	451	63
Africa	27	17	10
Oceania	4	4	–
Total	**2,045 (100.0%)**	**1,400 (68.5%)**	**643 (31.5%)**

occurred in Daegu and Gyeongbuk Province. Most of the small and large community outbreaks at businesses, religious facilities, public facilities, hospitals, and care facilities that continued in the third phase occurred in the Seoul metropolitan area (43.1%) and Daegu and Gyeongbuk Province (31.5%) (Table 3).

Imported cases have been steadily reported ever since the first case was imported from China in the first phase of the outbreak. From week 13 to week 17 in the second phase, many imported cases were from the Americas and Europe, but starting in week 25 in the third phase, the number of imported cases from Asia (other than China) has been increasing. Recently, the number of foreigners who test positive after arrival has been increasing, with 31.5% of all imported cases of foreign nationality. Since stronger border screening measures were implemented, the proportion of positive cases identified during the screening process has increased. The number of cases diagnosed positive during a 14-day quarantine after entering the country was highest in Gyeonggi Province, followed by Seoul (Table 4, Figure 2).

Status of release from isolation

As of July 19, 2020, among 13,745 COVID-19 cases, 12,556

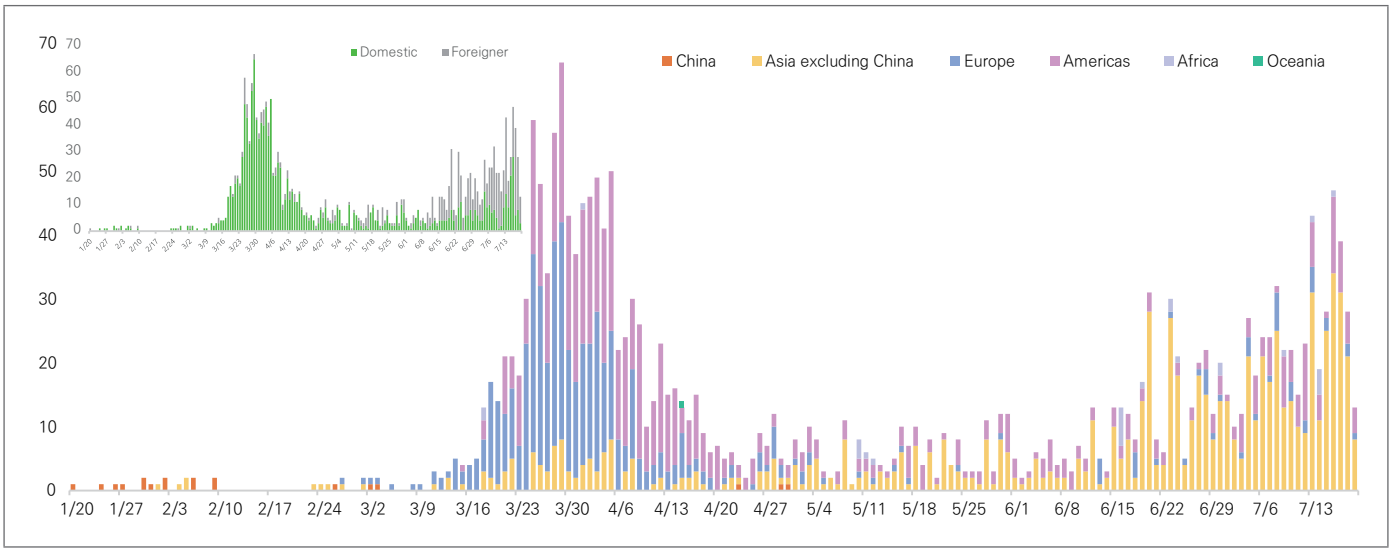

Figure 2. Imported confirmed cases status

Figure 3. Total confirmed cases and case statuses

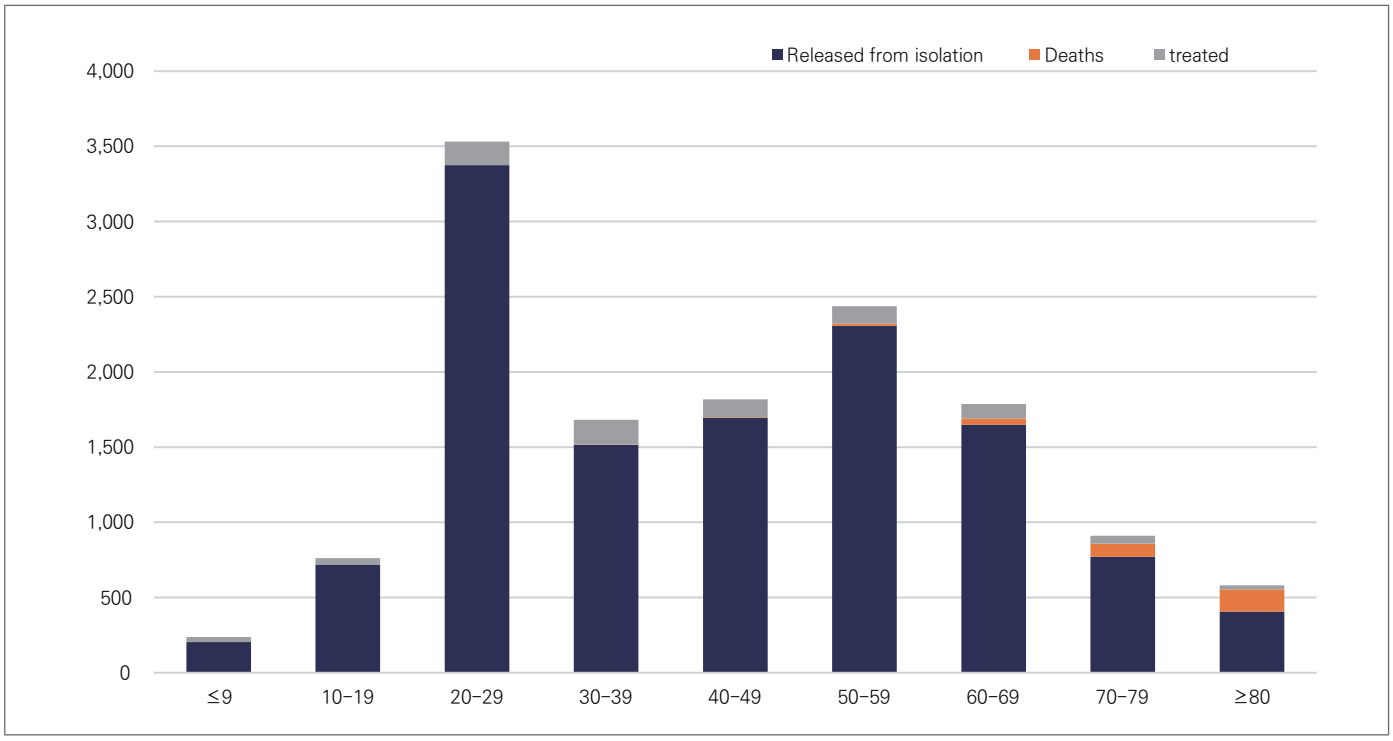

Figure 4. The distribution of case status by age group

(91.3%) had been released from isolation. Other than the 295 fatalities (2.1%), 894 (6.6%) were receiving treatment (Figure 3, Figure 4).

Conclusion

Since the first case in South Korea was reported on January 20, 2020, a total of 13,745 cases have been reported as of July 19, 2020. This report presents an analysis of the situation in South Korea and shares the results of the country's response as it enters month 6 of the COVID-19 outbreak (based on data available as of July 19).

Although community outbreaks are decreasing, small-scale community outbreaks associated with door-to-door sales and care facilities in the Seoul metropolitan area and the Honam area continue to be reported. In order to prevent community outbreaks, it is necessary to abide by the applicablequarantine policies such as limiting the visits associated with door-to-door sales. Moreover, both policies requiring social distancing and aculture of social distancing should be established and normalized, and education and public awareness campaigns should be regularly provided to promote preventive measures such as proper mask wearing and handwashing and to establish social norms.

Moreover, since the number of imported cases has been increasing recently, it is necessary to establish an effective response strategy for combattingthe COVID-19 outbreak in South Korea that includes more intensive management of incoming travelers by country based on an assessment of risk in each country.

① What was previously known?

Since COVID-19 was first reported in China in January 2020, new cases have continued to be reported, both in South Korea and around the world.

② What is newly learned?

In the past 6 months (January 20 to July 19) a total of 13,745 COVID-19 cases have occurred in South Korea, among whom 295 died. We categorized the COVID-19 situation and response in South Korea into three phases and identified increasing or decreasing trendsin community outbreaks and imported cases by phase.

③ Implications?

The Korea Centers for Disease Control and Prevention,based on the COVID-19 case reports from hospitals made according to the infectious disease prevention law and epidemiological investigations by central and local epidemiological investigation teams, is sharing this analysis of COVID-19 case trends and response results in the past 6 months in order for the data to be used to establish effective response strategies and quarantine measures.

This article has been translated from the Public Health Weekly Report (PHWR) volume 13, Number 30, 2020.

COVID-19 Special Issue 2

Coronavirus Disease-19 (COVID-19) 3-month outbreak infection report as of July 31, 2020, in the Republic of Korea

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[1]Case and Contact Management Task Force, Central Disease Control Headquarters

Abstract

This 3-month report (May 1, 2020 to July 31, 2020) on the Coronavirus Disease-19 (COVID-19) situation in the Republic of Korea was conducted by the disease management division of the Korea Centers for Disease Control and Prevention (KCDC). This report was based on the number of confirmed cases reported through the integrated system in accordance with Article 11 of the 「Infectious Disease Prevention and Management Act」 and on epidemiological investigations conducted by central and local health authorities.

By July 31, 2020, there were 14,305 confirmed cases of COVID-19; including 301 deaths. Confirmed cases were reported in all 17 provinces and provinces and cities in Korea, with the highest number of cases recorded in the provinces of Gyeonggi and Gyeongbuk and in the cities of Daegu and Seoul. The majority of these cases were from cluster outbreaks.

The major cluster outbreaks confirmed by epidemiological investigation over a 3-month period included nightclubs, religious gatherings (e.g., SMR churches), logistics centers (e.g., Coupang), door-to-door sales gatherings, exercise facilities (e.g., Yangcheon sports facility), church facilities (e.g., Lord Glory Church, Wangsung church) and residential facilities (e.g., Uijeongbu apartment).

Keywords: 2019 Novel Coronavirus (2019-nCoV), Coronavirus Disease-19 (COVID-19), Outbreaks, Epidemiological monitoring, Epidemiological investigation, Distancing in daily life

Introduction

Coronavirus disease 2019 (COVID-19) has infected 17,106,007 people worldwide as of July 31, 2020. In South Korea, the first case was reported on January 20, 2020, and 14,305 people were infected as of July 31, 2020. South Korea has maintained a crisis alert level 4 since February 23, 2020, and the entire government is focused on the response through the operations of the Central Disaster and Safety Countermeasure Headquarters headed by the Prime Minister.

This report presents an analysis of the characteristics of cases in major community outbreaks, excluding imported cases, since social distancing measures were relaxed on May 6, after which community outbreaks and sporadic cases have continued to be reported. COVID-19 case data reported from hospitals are subject to change after an epidemiological investigation to confirm the route of transmission, and the statistics by region can differ from the COVID-19 situation reports issued by local governments as the statistics are based on the address of the reporting agency. The data presented should be interpreted with these caveats in mind.

Table 1. The number of confirmed/deceased cases and the incidence rate

	January 20, 2020 – July 31, 2020					
	Confirmed cases				Deaths	
	Total (n, %)	Domestic cases (n, %)	Imported cases (n, %)	Incidence rate (n, per 0.1M population)	Total (n, %)	Fatality rate
Gender						
Male	6,463 (45.2)	4,911 (41.2)	1,552 (64.8)	25.0	160 (53.2)	2.5
Female	7,842 (54.8)	6,998 (58.8)	844 (35.2)	30.2	141 (46.8)	1.8
Age group (yrs)						
≤9	246 (1.7)	176 (1.5)	70 (2.9)	5.9	–	–
10–19	782 (5.5)	609 (5.1)	173 (7.2)	15.8	–	–
20–29	3,620 (25.3)	2,779 (23.3)	841 (35.1)	53.2	–	–
30–39	1,810 (12.6)	1,211 (10.2)	599 (25.0)	25.7	2 (0.7)	0.1
40–49	1,930 (13.5)	1,565 (13.1)	365 (15.2)	23.0	3 (1.0)	0.2
50–59	2,519 (17.6)	2,296 (19.3)	223 (9.3)	29.1	16 (5.3)	0.6
60–69	1,853 (13.0)	1,749 (14.7)	104 (4.4)	29.2	41 (13.6)	2.2
70–79	947 (6.6)	931 (7.8)	16 (0.7)	26.3	90 (29.9)	9.5
≥80	598 (4.2)	593 (5.0)	5 (0.2)	31.5	149 (49.5)	24.9
Region						
Seoul	1,600 (11.2)	1,260 (10.6)	340 (14.2)	16.4	11 (3.7)	0.7
Busan	171 (1.2)	130 (1.1)	41 (1.7)	5.0	3 (1.0)	1.8
Daegu	6,940 (48.5)	6,881 (57.8)	59 (2.5)	284.8	191 (63.5)	2.8
Incheon	383 (2.7)	303 (2.5)	80 (3.3)	13.0	2 (0.7)	0.5
Gwangju	204 (1.4)	179 (1.5)	25 (1.0)	14.0	2 (0.7)	1.0
Daejeon	166 (1.2)	147 (1.2)	19 (0.8)	11.3	2 (0.7)	1.2
Ulsan	59 (0.4)	34 (0.3)	25 (1.0)	5.1	1 (0.3)	1.7
Sejong	50 (0.3)	45 (0.4)	5 (0.2)	14.6	–	–
Gyeonggi	1,546 (10.8)	1,137 (9.6)	409 (17.1)	11.7	31 (10.3)	2.0
Gangwon	74 (0.5)	53 (0.4)	21 (0.9)	4.8	3 (1.0)	4.1
Chungbuk	73 (0.5)	56 (0.5)	17 (0.7)	4.6	–	–
Chungnam	190 (1.3)	159 (1.3)	31 (1.3)	9.0	1 (0.3)	0.5
Jeonbuk	39 (0.3)	18 (0.2)	21 (0.9)	2.1	–	–
Jeonnam	38 (0.3)	17 (0.1)	21 (0.9)	2.0	–	–
Gyeongbuk	1,401 (9.8)	1,369 (11.5)	32 (1.3)	52.6	54 (17.9)	3.9
Gyeongnam	159 (1.1)	110 (0.9)	49 (2.1)	4.7	–	–
JeJu	26 (0.2)	11 (0.1)	15 (0.6)	3.9	–	–
Airport Screening	1,186 (8.3)	–	1,186 (49.5)	–	–	–
Total	**14,305 (100.0)**	**11,909 (100.0)**	**2,396 (100.0)**	**27.6**	**301 (100.0)**	**2.1**

Result

Characteristics of cases and fatalities by sex, age, and region

There were more female cases (54.8%) than males, and the overall incidence rate (per 100,000) was 27.6. In terms of age, those in their 20s accounted for the highest proportion of cases (25.3%), followed by those in their 50s (17.6%). Many cases were identified in Daegu, Gyeongbuk Province, and the Seoul metropolitan area, with 48.5% of cases in Daegu, 11.2% in Seoul, 10.8% in Gyeonggi Province, and 9.8% in Gyeongbuk Province. The incidence rate (per 100,000) by region was 284.8 in Daegu, 52.6 in Gyeongbuk Province, 16.4 in Seoul, 14.6 in Sejong, and 14.0 in Gwangju.

Among fatalities, there were more males (53.2%) than females, and the overall fatality rate was 2.1%. The vast majority (93.0%) of all deaths occurred in patients older than 60, and the fatality rate increased with age. The fatality rate in those aged 80 or above was 24.9%. Furthermore, 63.5% of all deaths occurred in Daegu, 17.9% in Gyeongbuk Province, and 10.3% in Gyeonggi Province (Table 1).

Case characteristics in various major community outbreaks

Since social distancing measures were relaxed on May 6, small and large community outbreaks and sporadic cases have continued to be reported. The characteristics of the major community outbreaks in the past 3 months are as follows (Figure 1, Table 2, Table 3, Table 4).

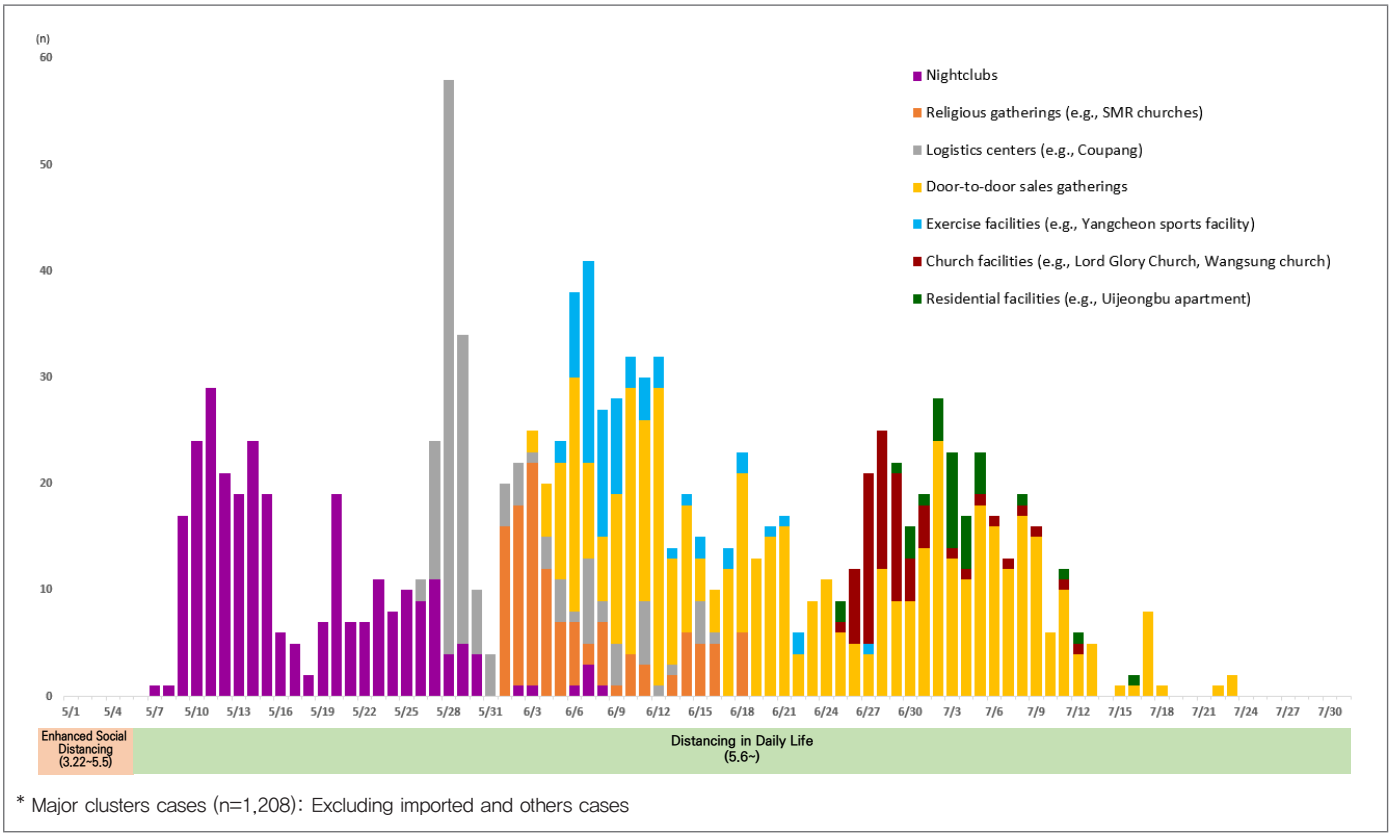

Figure 1. The progression of major cluster outbreak from May 1 to July 31, 2020

Table 2. Case status and the distribution by age and gender of the major clusters (3-month period)

	May 1, 2020 – July 31, 2020							
	Major clusters Total (n, %)	Nightclubs (n, %)	Religious gatherings: SMR churches (n, %)	Logistics centers: Coupang (n, %)	Door-to-door sales gatherings (n, %)	Exercise facilities: Yangcheon sports facility (n, %)	Church facilities * (n, %)	Residential facilities: Uijeongbu apartment (n, %)
Gender								
Male	605 (50.1)	205 (74.0)	50 (42.0)	71 (46.7)	184 (37.7)	38 (52.1)	33 (50.0)	24 (72.7)
Female	603 (49.9)	72 (26.0)	69 (58.0)	81 (53.3)	304 (62.3)	35 (47.9)	33 (50.0)	9 (27.3)
Age group (yrs)								
≤9	24 (2.0)	5 (1.8)	1 (0.8)	6 (3.9)	11 (2.3)	–	1 (1.5)	–
10-19	64 (5.3)	35 (12.6)	3 (2.5)	13 (8.6)	9 (1.8)	2 (2.7)	1 (1.5)	1 (3.0)
20-29	234 (19.4)	122 (44.0)	6 (5.0)	28 (18.4)	41 (8.4)	6 (8.2)	24 (36.4)	7 (21.2)
30-39	131 (10.8)	36 (13.0)	3 (2.5)	35 (23.0)	26 (5.3)	3 (4.1)	24 (36.4)	4 (12.1)
40-49	111 (9.2)	23 (8.3)	11 (9.2)	24 (15.8)	40 (8.2)	9 (12.3)	3 (4.5)	1 (3.0)
50-59	230 (19.0)	23 (8.3)	37 (31.1)	28 (18.4)	104 (21.3)	30 (41.1)	4 (6.1)	4 (12.1)
60-69	267 (22.1)	27 (9.7)	44 (37.0)	13 (8.6)	148 (30.3)	13 (17.8)	7 (10.6)	15 (45.5)
70-79	107 (8.9)	5 (1.8)	12 (10.1)	–	83 (17.0)	4 (5.5)	2 (3.0)	1 (3.0)
≥80	40 (3.3)	1 (0.4)	2 (1.7)	5 (3.3)	26 (5.3)	6 (8.2)	–	–
Total	**1,208 (100.0)**	**277 (100.0)**	**119 (100.0)**	**152 (100.0)**	**488 (100.0)**	**73 (100.0)**	**66 (100.0)**	**33 (100.0)**
Mean (yrs)	47.4	33.1	55.9	39.2	56.4	54.6	35.4	49.8
Median (min-max)	51 (1 – 95)	27 (1 – 84)	59 (7 – 88)	37 (1 – 90)	60 (1 – 95)	57 (11 – 87)	30 (3 – 79)	59 (16 – 74)

* Church facilities: Lord Glory church, Wangsung church

A. Nightclubs (Seoul metropolitan area)

This community outbreak resulted in many positive cases associated with a nightclub in Seoul. The majority (74.0%) of infected cases were male, and almost half (44.0%) of infected cases were in their 20s. The cases associated with this outbreak were spread out throughout the country, but 91% were in the Seoul metropolitan area, with 50.2% in Seoul, 21.3% in Gyeonggi Province, and 19.5% in Incheon. The average age of infected cases was 33.1, and no deaths resulted from this community outbreak.

B. Small religious groups (Seoul metropolitan area)

This series of cases resulted in infections through small religious group meetings such as bible study groups and clergy meetings in Incheon, Seoul, and Gyeonggi Province. More than half (58.0%) of those who tested positive were female, and most were in their 60s (37.0%). Associated cases were only found in the Seoul metropolitan area, with 47.9% in Incheon, 31.1% in Seoul, and 21.0% in Gyeonggi Province. The average age of the infected cases was 55.9 years, and one death was associated with this community outbreak.

Table 3. Case status and the distribution by region of the major clusters (3-month period)

	May 1, 2020 – July 31, 2020							
	Major clusters Total (n, %)	Nightclubs (n, %)	Religious gatherings: SMR churches (n, %)	Logistics centers: Coupang (n, %)	Door-to-door sales gatherings (n, %)	Exercise facilities: Yangcheon sports facility (n, %)	Church facilities * (n, %)	Residential facilities: Uijeongbu apartment (n, %)
Region								
Seoul	415 (34.4)	139 (50.2)	37 (31.1)	24 (15.8)	130 (26.6)	44 (60.3)	31 (47.0)	10 (30.3)
Busan	4 (0.3)	4 (1.4)	–	–	–	–	–	–
Daegu	2 (0.2)	2 (0.7)	–	–	–	–	–	–
Incheon	205 (17.0)	54 (19.5)	57 (47.9)	61 (40.1)	32 (6.6)	1 (1.4)	–	–
Gwangju	140 (11.6)	–	–	–	140 (28.7)	–	–	–
Daejeon	57 (4.7)	1 (0.4)	–	–	56 (11.5)	–	–	–
Ulsan	–	–	–	–	–	–	–	–
Sejong	2 (0.2)	–	–	–	2 (0.4)	–	–	–
Gyeonggi	329 (27.2)	59 (21.3)	25 (21.0)	67 (44.1)	93 (19.1)	28 (38.3)	35 (53.0)	22 (66.7)
Gangwon	7 (0.6)	2 (0.7)	–	–	4 (0.8)	–	–	1 (3.0)
Chungbuk	9 (0.7)	9 (3.2)	–	–	–	–	–	–
Chungnam	19 (1.6)	1 (0.4)	–	–	18 (3.7)	–	–	–
Jeonbuk	7 (0.6)	2 (0.7)	–	–	5 (1.0)	–	–	–
Jeonnam	8 (0.7)	–	–	–	8 (1.6)	–	–	–
Gyeongbuk	1 (0.1)	1 (0.4)	–	–	–	–	–	–
Gyeongnam	2 (0.2)	2 (0.7)	–	–	–	–	–	–
JeJu	1 (0.1)	1 (0.4)	–	–	–	–	–	–
Total	1,208 (100.0)	277 (100.0)	119 (100.0)	152 (100.0)	488 (100.0)	73 (100.0)	66 (100.0)	33 (100.0)

* Church facilities: Lord Glory church, Wangsung church

C. Large logistics center (Seoul metropolitan area)

Many cases were associated with a large logistics center in Gyeonggi Province. Slightly more than half (53.3%) of the associated positive cases were female, and most of them were in their 30s (23.0%). Associated cases were only identified in the Seoul metropolitan area, with 44.1% in Gyeonggi Province, 40.1% in Incheon, and 15.8% in Seoul. The average age of the infected cases was 39.2 years, and one death was associated with this community outbreak.

D. Door-to-door sales meetings (Seoul metropolitan area, Gwangju, Daejeon)

A chain of infections started from a door-to-door sales meeting and spread to other small groups. In this chain, 62.3%

Table 4. Death status and the distribution by age and gender of the major clusters (3–month period)

	May 1, 2020 – July 31, 2020							
	Major clusters Total (n)	Nightclubs (n)	Religious gatherings: SMR churches (n)	Logistics centers: Coupang (n)	Door–to–door sales gatherings (n)	Exercise facilities: Yangcheon sports facility (n)	Church facilities (n)	Residential facilities: Uijeongbu apartment (n)
Gender								
Male	3	–	–	–	2	1	–	–
Female	7	–	1	1	5	–	–	–
Age group (yrs) *								
60–69	1	–	–	–	1	–	–	–
70–79	5	–	1	–	4	–	–	–
≥80	4	–	–	1	2	1	–	–
Total	10	–	1	1	7	1	–	–
Fatality rate	0.8	–	0.8	0.7	1.4	1.4	–	–

* No deaths under the age of 60

of the associated cases were female, and most were in their 60s (30.3%). Most cases were in the Seoul metropolitan area and the Chungcheong and Honam areas. Specifically, 28.7% of positive cases associated with this outbreak were in Gwangju, 26.6% in Seoul, 19.1% in Gyeonggi Province, and 11.5% in Daejeon. The average age of the cases in this outbreak was 56.4 years, and seven deaths occurred (fatality rate, 1.4%), all of whom were over 60 years of age.

E. Fitness facility (Seoul metropolitan area)

A cluster of cases occurred at a table tennis court in Seoul. Slightly more than half (52.1%) of the positive cases were male, and most were in their 50s (41.1%). Cases were only identified in the Seoul metropolitan area, with 60.3% in Seoul, 38.3% in Gyeonggi Province, and 1.4% in Incheon. The average age of cases was 54.6 years, and one death was associated with this community outbreak.

F. Religious facilities (Seoul, Gyeonggi Province)

Many cases were associated with two religious facilities in Seoul and in Gyeonggi Province. The sex ratio was even, and 36.4% were in their 20s and 30s, respectively. Associated cases were only identified in Gyeonggi Province (53.0%) and Seoul (47.0%). The average age of cases was 35.4 years, and no deaths were associated with this community outbreak.

G. Residential facilities (Seoul, Gyeonggi Province)

Many cases were identified in an apartment complex in Gyeonggi, of whom 72.7% were male, and most were in their 60s (45.5%). Associated cases were distributed in three regions with 66.7% in Gyeonggi Province, 30.3% in Seoul, and 3.0% in Gangwon. The average age of cases was 49.8 years, and no deaths were associated with this community outbreak.

Conclusion

In South Korea, the first case of COVID-19 was reported on January 20, 2020, and 14,305 people were infected as of July 31, 2020. This report presents an analysis of the characteristics of cases in major community outbreaks, excluding imported cases, in the most recent 3 months.

Since social distancing measures were relaxed after the holidays in early May, small and large community outbreaks centered around door-to-door sales, religious facilities, and public facilities have continued to be reported, mainly in the Seoul metropolitan area and the Honam area. Since small outbreaks continue to occur in South Korea, in order to prevent infections, it is important to abide by the quarantine policies.

To spend a safe summer holiday as August begins, it is important to always wear a mask indoors; to remain in rest stops, restaurants, and cafes for as short a time as possible and to refraining from conversation when eating; to wash one's hands frequently; and to maintain social distancing measures. When fever or respiratory symptoms are present, one should not travel—instead, one should remain at home. If symptoms deteriorate, one should contact a hotline or a community health center. Crowded indoor spaces, crowded tourist locations, and popular times to visit indoor establishments should be avoided, as should any activities that involve exhaling respiratory droplets or physical contact.

It is important to abide by quarantine measures in daily life in order to prevent community outbreaks. More active quarantine measures should be established for high-risk locations and facilities.

① What was previously known?

Since COVID-19 was first reported in China on January 2020, new cases have continued to be reported, both in South Korea and around the world.

② What is newly learned?

A of 14,305 COVID-19 cases have been reported in South Korea as of July 31, among whom 301 died. This report analyzed the characteristics of major community outbreaks that occurred after social distancing measures were relaxed in early May, and groups that require stronger quarantine measures in the community were identified.

③ Implications?

The Central Disease Control Headquarters, based on the COVID-19 case reports from hospitals made according to the infectious disease prevention law and epidemiological investigations by central and local epidemiological investigation teams, is sharing this analysis of trends in major community outbreaks of COVID-19 and response results in the past 3 months in order for the data to be used to establish effective response strategies and quarantine measures.

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This article has been translated from the Public Health Weekly Report (PHWR) volume 13, Number 32, 2020.

COVID-19 Special Issue 3

Introduction of the 9-1st Edition of the COVID-19 Response Guidelines

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Abstract

Due to the rapid global spread of coronavirus disease 2019(COVID-19), many countries adopted various strategies and developed interim guidelines to reduce the transmission of severe acute respiratory syndrome coronavirus 2(SARS-CoV-2), the strain of coronavirus that cause COVID-19. Likewise, Korea revised its guidelines based on trend in patient outbreaks, related policy changes, resource storage status, and scientific evidence. However, SARS-CoV-2 is a new strain of coronavirus that had not been previously identified in humans. Accurate information about the virus was unavailable, and no effective vaccine or treatment, so continuous management and response preparation were necessary.

This article presented the interim set of guidelines for staff at local and state health departments based on what was known about COVID-10. One major revision was the case definition, which was formulated on current available information and revised as new information was gathered. For example, COVID-19's timeline and spread was traced from the Huanan seafood market to the province of Hubei to mainland China and finally, to nations outside of China.

The guidelines included response systems for COVID-19 control, case definitions, reporting systems for COVID-19 cases, epidemiological investigations, response management for patients under investigation (PUI), and for confirmed and suspected cases, as well as death, laboratory, environmental and resource management. The guideline's appendix and frequently asked questions(FAQs) provided additional information needed to respond to COVID-19 in the field.

This article recommended that, to defeat COVID-19, countries must make a concerted and determined approach to prepare and, respond.

Keywords : COVID-19, response guideline

Introduction

Patients with pneumonia from an unknown cause were first identified in Wuhan, China in December 2019, after which a new coronavirus was isolated in China on January 7, confirming the emergence of a novel coronavirus disease. Starting in Thailand on January 13, patients with the novel coronavirus were reported in countries outside of China, including Japan and South Korea, through travel. The World Health Organization (WHO) declared an Public Health Emergency of International Concern (PHEIC) on January 30. The WHO named this novel coronavirus disease, which was first reported in Wuhan, China, as coronavirus disease 2019 (COVID-19) on January 11, and the International Committee on Taxonomy of Viruses named the novel coronavirus as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In South Korea, the disease has been referred to as coronavirus disease-19 (corona19) since February 12. As COVID-19 spread rapidly in other countries, the WHO declared

it to be a pandemic on March 11. Currently (as of Aug. 31 10 AM CET) 25,085,685 cases have been reported from 216 countries and regions, with 843,927 deaths (WHO webpage).

Since the first case was reported in South Korea on January 20, 2020, the spread of COVID-19 led to the announcement of crisis alert level 4 and the implementation of social distancing measures. As of midnight on Aug. 31, 19,947 cases have been reported, including 324 deaths. Sporadic infections in the community have been regularly reported.

The Korea Centers for Disease Control and Prevention distributed a document entitled "Information on the response procedure to pneumonia from unknown cause in Wuhan, China (for local governments)" on January 4 when the government recognized the cluster of pneumonia cases with no known cause in Wuhan, China. The guidelines have been continuously revised according to case trends, changes in policy, and changes in the response situation both domestically and internationally.

This article presents the main changes in the guidelines so far and the main content of the "COVID-19 response guidelines (9-1st edition) (for local governments)."

Result

History of establishment and revisions to the guidelines

Table 1. Major revision of case definition(1st–4th edition)

	Suspected case	Patient under investigation(PUI)
1st (Jan. 4)	· A person who develops **a fever or severe respiratory symptoms** (e.g., pneumonia) within 14 days of visiting the Huanan seafood market	· A person who develops **a fever or respiratory symptoms** (e.g., cough, shortness of breath, etc.) within 14 days of visiting the **Huanan seafood market** · A person who develops **a fever or severe respiratory symptoms** (e.g., pneumonia) within 14 days of visiting **Wuhan**
2nd (Jan. 8)	· A person who develops **pneumonia or symptoms of suspected pneumonia** (e.g., shortness of breath with fever) within 14 days of visiting the Huanan seafood market	· A person who develops **a fever or respiratory symptoms** (e.g., cough etc.) within 14 days of visiting the **Huanan seafood market** · A person who develops **pneumonia or symptoms of suspected pneumonia** (e.g., shortness of breath with fever) within 14 days of visiting **Wuhan**
3rd (Jan. 17)	· A person who develops pneumonia or **symptoms of suspected pneumonia** (e.g., shortness of breath with fever) within 14 days of visiting Wuhan · A person who develops the following symptoms within 14 days of contact with a confirmed case during the confirmed case's symptomatic period – **a fever or respiratory symptoms** (e.g., cough etc.), pneumonia or **symptoms of suspected pneumonia** (e.g., shortness of breath with fever)	· A person who develops **a fever or respiratory symptoms** (e.g., cough etc.) within 14 days of visiting Wuhan
4th (Jan. 27)	· A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of visiting Hubei province	· A person who develops **pneumonia** within 14 days of visiting **Mainland China**

From the 1st edition (published on January 4) to the 4th edition (published on January 28), the main content of the guideline was case definitions for reporting and response. The case definitions were updated according to changing epidemiological information. The epidemiological relationships of suspected cases and PUI (patient under investigation) were expanded from initial visits to the Huanan Seafood Market to Wuhan, and eventually Hubei Province and China as a whole.

After the crisis alert level was raised to level 3 ("Orange") in South Korea and the WHO announced an Public Health Emergency of International Concern (PHEIC), guidelines regarding testing, isolation, release from isolation, and contact tracing were included in the 5th edition (published on February 6)

Definitions of PUI were re-added to the 6th edition (published on February 19) in order to detect cases early, so the population eligible for testing expanded. Specific guidelines on patients who require hospitalization and evidence for infectious disease control measures and disinfection were clarified as well.

In the 7th edition (published on March 2), details on epidemiological investigations, release from isolation, and the

Table 2. Major revision of case definition(5th–8th edition)

	Suspected case	Patient under investigation(PUI)
5th (Feb. 6)	· A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of visiting Mainland China · A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of contact with a confirmed case during the confirmed case's symptomatic period · A person who is suspected of having COVID-19, according to a physician's judgement	-
6th (Feb. 19)	· A person who develops **a fever or respiratory symptoms** (e.g., cough, sore throat, etc.) within 14 days of visiting Mainland China (including HongKong, Macau) · A person who has unknown pneumonia that requires hospitalization according to a physician's judgement	· A person who develops a fever or respiratory symptoms (e.g., cough, etc.) within 14 days of visiting countries, territories or areas with reported COVID-19 cases · A person who is suspected of having COVID-19, according to a physician's judgement
7th (Mar. 2)	· A person who develops a fever or respiratory symptoms (e.g., cough, shortness of breath, etc.) within 14 days of contact with a confirmed case during the confirmed case's symptomatic period	· A person who is suspected of having COVID-19 (unknown pneumonia etc.), according to a physician's judgement. · A person who develops a fever or respiratory symptoms (e.g., coughing, shortness of breath, etc.) within 14 days of visiting countries with local transmissions of COVID-19 · A person who develops a fever or respiratory symptoms (e.g., cough, shortness of breath, etc.) within 14 days and is epidemiologically related to domestic COVID-19 outbreaks
8th (May 18)	· A person who develops symptoms within 14 days of contact with a confirmed case during the confirmed case's symptomatic period · Main symptoms: fever, cough, shortness of breath, chill, myalgia, headache, sore throat, loss of taste/smell sense, or pneumonia etc.	· A person who is suspected of having COVID-19, according to a physician's judgement · A person who develops symptoms within 14 days of overseas travel · A person who develops symptoms within 14 days and is epidemiologically related to domestic COVID-19 outbreaks

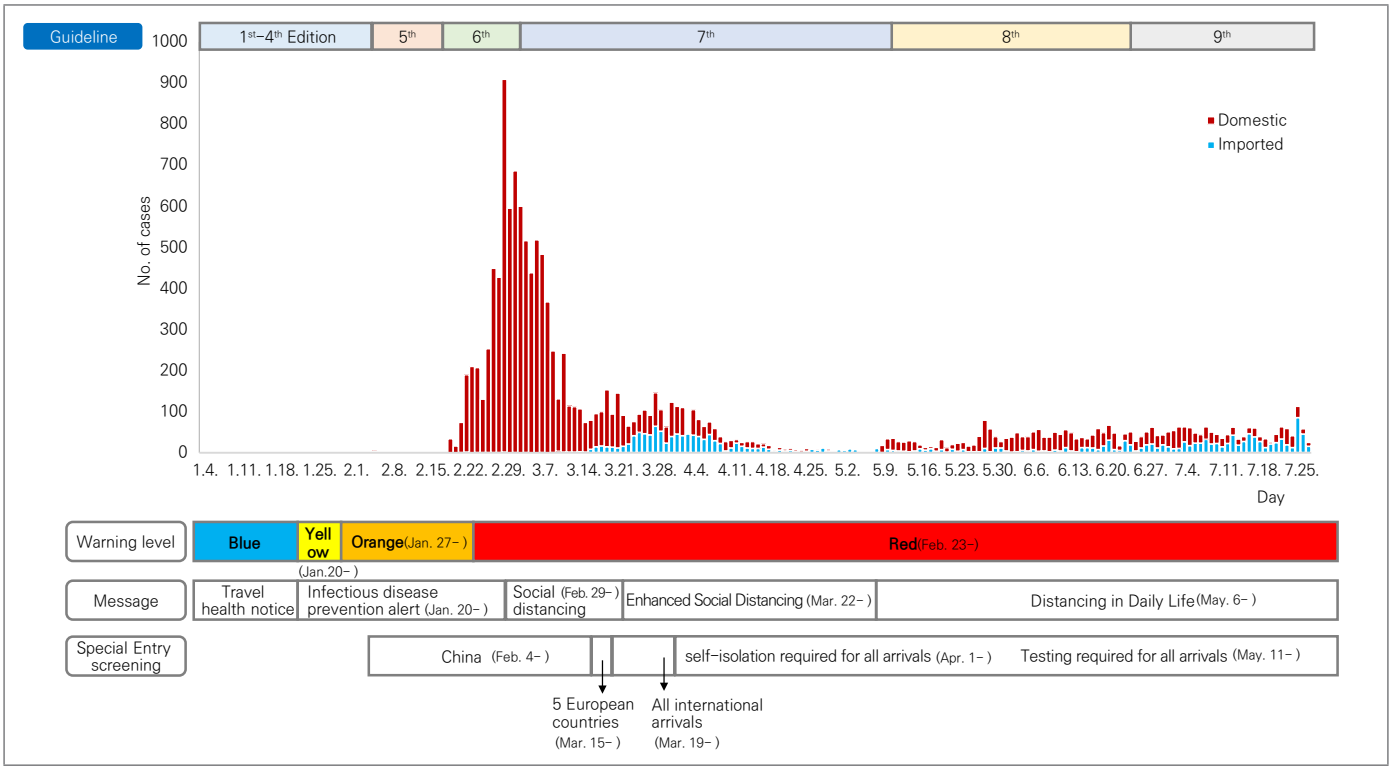

Figure 1. COVID-19 in South Korea (–July 27, 2020)

isolation period were specified after the crisis alert level was raised to level 4 (“Red”), and principles regarding strengthening the management of confirmed cases and the protocol to be followed after death were added. The guideline for release from isolation was updated in the 7-1st edition (published on March 6), according to which asymptomatic positive cases are released from isolation 3 weeks after a positive test result if clinical improvements are observed without additional testing requirements. Criteria and implementation guidelines regarding the range and method of isolation in communal facilities (cohort isolation) were added to the 7-2nd edition (published on March 12), and the previous guideline regarding release from isolation upon clinical improvement without testing was removed. Instead, the testing requirement for contacts of confirmed cases before release was expanded to include co-residents (family members living together) in the 7-3rd edition (published on March 15). A self-management mobile application was added to the methods of monitoring individuals in isolation in the 7-4th edition (published on April 2), and guidelines for managing PUI in the screening process were also added. In the same edition, the definition of contacts was expanded from those in contact 1 day before the onset of symptoms to contacts within 2 days before symptom onset, and guidelines to manage at a port of entry(POE) were strengthened.

The range of clinical symptoms expanded to include loss of taste and smell in the 8th edition(published on May 11), and monitoring guidelines were strengthened for community outbreak situations. The testing requirement for contacts of confirmed cases before release was expanded from coresidents and medical staff to include residents and workers of residential care facilities and students and teachers.

Guidelines for release from isolation based on clinical progress were added to the release guidelines based on testing in the 9th edition (published on June 25), and the process for transfers was improved in order to ensure efficient supply of hospital beds when the number of cases spikes. Moreover, the testing requirements for contacts of confirmed cases before release were expanded to those over the age of 65, and a new clause was added, allowing a caretaker to be isolated with children, those with mobility issues, and those with mental health issues.

Main content

The Korea Centers for Disease Control and Prevention designated COVID-19 as a "Class 1 infectious diseases-emerging infectious disease syndrome" for its response and is updating its guidelines after professional consultation from related academic and other professional groups based on the national and international literature, guidelines, epidemiological data, and response process according to policy directions.

The main content of the current 9-1st edition of the COVID-19 response guidelines is as follows.

A. Response system

In order to prevent the spread of infectious disease through the early detection of cases, rapid epidemiological investigations, and management of patients and contacts, central organizations such as the Central Disaster and Safety Countermeasure Headquarters (Prime Minister), Central Disaster Management Headquarters (Ministry of Health and Welfare), Central Disease Control Headquarters (Korea Centers for Disease Control and Prevention), and the Pan-government Countermeasures Support Headquarters (Ministry of Interior and Safety) were established, and each organization is executing its specific tasks. Local governments have also organized rapid response teams and patient management teams in preparation for cases while performing tasks such as situation evaluation, epidemiological investigations, field control, and management of local medical personnel and resources.

B. Definition of cases and person with suspected exposure to an infectious diseases

Case definitions are written according to the results of epidemiological investigations, and the scale of the outbreak in South Korea, and the legal definition of a person with suspected exposure to an infectious diseases is also included.

Cases refer to those with a confirmed infection of the pathogen responsible for the disease based on testing regardless of clinical symptoms. Suspected cases are those who experience clinical symptoms of COVID-19 within 14 days of contacting a case. PUI refer to cases with clinical symptoms of COVID-19 who have an epidemiological relationship based on a doctor's opinion, a history of overseas travel, or a community outbreak. The main clinical symptoms are fever, coughs, difficulty breathing, chills, muscle aches, sore throat, loss of smell and taste, and pneumonia. A person with suspected exposure to an infectious diseases is defined as those who have or are suspected to have come into contact with patients, probable cases, and those who have the pathogen or those who are suspected to be infected due to risk exposure from staying or transferring through areas managed under the quarantine law.

C. National Infectious Diseases Reporting System (NIDS)

According to law infected cases should be reported by the medical institution that first identified the patient through this system based on the case definition criteria (test results, contact with cases, clinical symptoms, and epidemiological relationships). The initial report form includes infection-related information such as personal information, date of symptom onset, date of testing, and hospitalization; hospitalization information; and suspected infection region, which is additionally confirmed by local health centers. PUI not included in the current law are also checked through data reported in the current system.

D. Management of port of entry (POE)

The need to strengthen the management of entries from abroad increased as cases of COVID-19 spread throughout the world, including Europe and the United States. In the process of entry, symptomatic persons and asymptomatic persons are handled after they are checked for a fever and they submit health status questionnaires. Symptomatic persons are tested while they are temporarily quarantined at the quarantine office. Asymptomatic persons and those who test negative are isolated for 14 days at home or at isolation facilities after downloading a mobile monitoring application. All entries should be tested within 3 days of entry.

E. Epidemiological investigations

According to the law on infectious disease prevention and control, the community health center that first identifies the case carries out contact tracing with the guidance of the city or province rapid response team after notifying the case. Close contacts of cases, such as family members, coresidents should first be isolated at home. When there is exposure at hospitals or

Table 3. Change in the Isolation Release Criteria for the Confirmed Cases

Previous release (Edition 8-1)	Latest release (Edition 9)
【Standards for isolation release of asymptomatic confirmed cases】 ① Two consecutive negative results from PCR tests taken at least 24 hours apart, on the 7th day after the case was confirmed ② If the result of the PCR test is positive on the 7th day after the case was confirmed, the next test date should be 7 days after the last test(i.e. 14 days from the confirmed date) → If the result is positive, the next test date should be determined by medical staff → Two consecutive negative PCR results at least 24 hours apart	【Standards for isolation release of asymptomatic confirmed cases】 Must meet ONE of the following conditions: ① Symptom based: 10 days have passed since the case was confirmed, and no clinical symptoms during this period ② Test based: 7 days have passed since the case was confirmed, and two consecutive negative PCR test results(after the 7 days) at least 24 hours apart
【Standards for isolation release of symptomatic confirmed cases】 Must meet BOTH of the following criteria, after at least 7 days since onset of illness 1) Not taking antipyretic, no fever and improvement of clinical symptoms, AND 2) Two consecutive negative PCR results at least 24 hours apart	【Standards for isolation release of symptomatic confirmed cases】 Must meet ONE of the following conditions: ① Symptom based : 10 days have passed since onset of illness, and for at least 72 hours after, meet BOTH of the following criteria: 1) No fever without antipyretic 2) Improvement of clinical symptoms ② Test based: 7 days have passed since the onset of illness, AND no fever without antipyretic and improvement of clinical symptoms, AND afterwards, two consecutive negative PCR test results at least 24 hours apart

* Polymerase chain reaction (PCR)

communal facilities, a risk exposure situation evaluation should be carried out, and when necessary, epidemics control officers can investigate the case's detailed routes of movement and plan to test every contact according to the applicable regulations. Epidemiological investigations of hospitals or communal facilities can result in temporary closure, disinfection, investigation and classification of contacts, and management and monitoring of contacts based on the city or province epidemics control officer's or epidemiological investigator's investigation of the case's activities in the 14 days before symptom onset and assessment of the risk level.

F. Responses to confirmed cases, suspected cases, and PUI

The main responses include monitoring of isolated persons, isolation and hospitalization, release from isolation, and the procedure to follow if the case tests positive again on PCR after release from isolation.

- Suspected cases must undergo 14 days of isolation from the contact date even if the test results are negative.

- For PUI, international travel records are checked through systems at screening centers, and an examination and test are conducted after understanding the individual's history of international and domestic travel, contact with cases, and clinical symptoms through history-taking.

- When hospitalization of cases is required, the severity of the case and hospital bed capacity should be checked before hospitalization. When hospitalization is not required or when a hospitalized patient meets the discharge criteria, treatment can continue at a residential treatment center. At these centers, attending medical staff monitor symptoms twice a day.

Starting in the 9th edition, clinical symptom-based criteria for release from isolation were added to the existing testing-based criteria, so release from isolation is possible when either clinical progress occurs according to the responsible doctor's discretion or the testing criteria are met.

- When a doctor decides that a patient can be transferred to another hospital or ward, or to a residential treatment center, based on the patient's status, inpatient treatment notice should be re-issued. If the patient refuses, fees (out-of-pocket and required items not covered by national health insurance) that are incurred from the day after the re-issuing of inpatient treatment notice is not covered as isolation hospitalization fees and need to be paid by the patient.

- Contacts of cases must isolate at home if no COVID-19 symptoms are present and are released from isolation 14 days after the date of contact with the case. Even if the initial test result is negative, isolation at home and active monitoring continue for 14 days. Those who work in medical facilities, live or work in social welfare residential facilities, students and teachers, coresidents of cases, and those who are older than 65 need to be tested on the 13th day of isolation to confirm negative results before being released from isolation at noon on the 14th day.

G. Management of deaths

In order to prevent spread of theinfection, information about immediate and effective management of the bodies of deceased individuals who were confirmed to have COVID-19 should be given, along with funeral support. The protocol for the deceased with COVID-19 is cremation, and support is provided for management of the body and the funeral after discussion with the family. The local government covers funeral-related costs for COVID-19 related death according to the infectious disease prevention and control law.

H. Management of laboratory testing

Sample collection for confirmatory testing is conducted in a dedicated space at screening centers or separated from other spaces in the hospital. A sample is collected from the upper respiratory tract, and when cough and sputum present, a sample is also collected from the lower respiratory tract. The collected sample is placed in a medium for virus transportation and sent to a designated testing facility with the infectious disease testing request form. The institution that requested the test is notified of the results, and the hospital that receives the test results inputs and reports the results through the national infectious disease reporting system.

I. Management of the environment

Information about the immediate and appropriate disinfection of communal facilities, public facilities, and other spaces occupied (lived in) by the patient is provided. Disinfectants approved and registered with the Ministry of Environment should be selected, and information about the amount to use, directions for use, and precautions for each product should be given so that users can follow the appropriate protocols. Appropriate disinfection involves first, adequate ventilation so that pathogens in the air can be expelled, second, cleaning the walls within arm's reach and all frequently-touched surfaces with a cloth(fabric, etc) wet with the prepared disinfectant, leave it for 10 minutes at least, and then wipe it with a cloth dampened with clean water. The method of spraying the disinfectant should not be applied to the disinfection of surfaces, because it increases the risk of generation and inhalation of infectious aerosols, and its disinfecting effect is insufficient due to the unclear scope of contact between the disinfectant and applied surfaces. Spraying of disinfectant is not recommended since the risk of inhaling pathogen-containing aerosols increases and the contact range is not clear. Personal protective equipment should be worn according to the appropriate precautions, the locations where disinfection is carried out should be adequately ventilated, and the criteria for reopening a disinfected facility for use should be determined taking into account the characteristics of each type of disinfectant used, the purposes of the facility.

J. Management of resources

When cases are identified, hospital beds should be allocated and managed according to the local situation after evaluating the severity of the case and whether the patient falls into high-risk categories such as those with pre-existing diseases. City and provincial patient management teams should take stock of public hospitals, negative pressure rooms in private hospitals, private rooms, equipment for intensive care, and personnel, and should manage resources so that the high-risk population according to severity criteria are prioritized for the allocation of hospital beds.

In appendices and a FAQ, further information that is useful in practice when responding to COVID-19 is provided.

Conclusion

COVID-19 is the third pandemic that has occurred in the 21st century, after the novel influenza in 2009 and MERS in 2015. Although much remains to be learned about this virus, it poses a significant threat to public health, as cases have continued to be reported from many countries around the world and the fatality rate is high among older individuals. Experts are predicting that as countries are starting to relax travel bans and trade expands, the possibility of are surgence of cases is high. Concerns

continue as effective vaccines or treatments do not exist or are in the developmental stages and natural antibody formation is not effective.

In South Korea, the intense social distancing measures put in place on March 22 were relaxed on May 6, but small cluster outbreaks and infections in the community have continued to be reported. Spread by asymptomatic cases is of concern. Despite the proactive preparation after MERS, which included the deployment of a rapid testing system, a response preparation plan, stockpiling medical resources, and simulation training, there are limits to the degree to which it is possible prepare for a new infectious disease, of which the characteristics are not clearly known. A more detailed response system in anticipation of the post-COVID-19 era is necessary.

The effective management of quarantine so far can be contributed to multisectoral cooperation, the dedication of medical staff, the efforts of local government officers, and the civic culture of the population. However, in order to respond to the ongoing pandemic, worldwide efforts are required. The COVID-19 response guidelines in South Korea have been updated rapidly according to policy directions, resource stockpile status, and domestic and international research results and guidelines. The guidelines will continue to be updated rapidly, in an evidence-based manner, according to changing knowledge regarding the characteristics of SARS-CoV-2, the epidemiological characteristics of COVID-19, and vaccine and treatment development.

① **What was previously known?**

COVID-19 spread from Huanan Seafood Market in Hubei Province, China to the entire world, resulting in an ongoing pandemic.

② **What is newly learned?**

South Korea government policies have been updated according to the situation around the world. The guidelines have been updated according to the resource stockpile status and domestic and international research results. The main updates over time are presented in this article.

③ **Implications?**

South Korea's COVID-19 response guidelines have been updated to respond to COVID-19 in a timely manner and have been translated and utilized by other countries.

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This article has been translated from the Public Health Weekly Report (PHWR) volume 13, Number 32, 2020.

역학 · 관리보고서 1

코로나19와 심혈관질환

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초 록

중국 우한에서 시작된 코로나19로 유래 없는 감염자 및 사망자가 속출하고 있다. 일반적으로 감염에 취약한 면역저하자뿐 아니라 고령자, 심혈관질환자, 폐질환자에서 감염과 사망이 높지만 젊고 건강했던 사람도 예외 없이 감염이 되고, 빠른 속도로 전파되고 있는 양상이다. 다양한 치료방법에 대하여 연구가 되고 있지만 아직 뚜렷한 효과를 보여준 치료제가 없고, 백신 또한 개발 중이지만 아직 불분명한 상황이다.

이에 코로나19에 취약한 고혈압 환자 및 심혈관질환에 대하여 몇 가지 이슈를 간략하게 정리하고, 아울러 심혈관질환자가 코로나19 사태를 슬기롭게 극복할 수 있는 요령에 대하여 요약하고자 한다.

주요 검색어 : 코로나19, 심혈관질환, 고혈압

들어가는 말

의학 역사에서 기생충을 비롯한 감염성질환이 거의 정복되었다고 믿을 즈음 21세기 들어 심각한 바이러스감염으로 전 세계가 때 아닌 공황에 빠져 있다. 2002년 중국에서 시작된 사스(SARS, 중증급성호흡기증후군)를 시작으로 2009년에는 변이를 일으킨 돼지 유래 인플루엔자(신종플루)가 유행하여 국내에서만 약 75만 명의 확진자가 나올 정도로 전 세계적 유행이 되었고, 2012년 중동 사우디아라비아에서 처음 발견된 메르스(MERS, 중동호흡기증후군)가 2015년 우리나라에도 상륙하여 많은 환자가 감염되지는 않았으나 치사율이 높았다(총 186명의 환자 발생, 38명 사망)[1]. 2019년 12월 중국 후베이성 우한시에서 원인불명의 폐렴이 발병하고 원인으로 사스와 메르스를 일으킨 바이러스와 유사한 사스-코로나바이러스-2 (SARS-CoV-2)가 알려지면서 명명된 코로나바이러스감염증-19(코로나19, COVID-19)로 전 세계 수많은 확진자와 사망자가 이어지고 있으며(2020년 8월 24일 현재 확진자/사망자 집계 : 세계 2,330만 명 이상/80만 명 이상, 국내 17,665명/309명) 세계보건기구(WHO)도 유래 없는 전 세계 유행에 대하여 팬데믹(pandemic)을 선언하였다[2].

코로나19는 일반적으로 감염에 취약한 면역저하자뿐 아니라 고령자, 심혈관질환자, 폐질환자에서 감염과 사망이 높지만 젊고 건강했던 사람도 예외 없이 감염이 되고, 빠른 속도로 전파되고 있는 양상이다. 전 세계적으로 다양한 치료방법에 대하여 연구가 되고 있지만 아직 뚜렷한 효과를 보여준 치료제가 없고, 백신 또한 개발 중이지만 아직 불분명한 상황이다. 이에 코로나19에 취약한 고혈압 환자 및 심혈관질환에 대하여 관련성과 몇 가지 이슈를 간략하게 정리하고, 아울러 심혈관질환자가 코로나19 사태를 슬기롭게 극복할 수 있는 요령에 대하여 요약하고자 한다.

몸 말

1. 코로나19와 심혈관질환

코로나19를 일으키는 SARS-CoV-2는 사스와 메르스의 원인 바이러스와 유사하고, 야생 박쥐에서 나와 중간 숙주를 거쳐 사람에게 전파된다고 알려져 있다. 사람사이에는 기침이나 재채기를 할 때 생긴 비말(침방울)이나 코로나19바이러스에 오염된 물건을 접촉하여 전파된다고 한다. 주로는 호흡기 감염으로 발열, 기침, 호흡곤란 및 폐렴으로 나타나지만 다양한 전신 증상(구토, 설사, 두통 등)을 동반할 수도 있으며, 심장질환으로 나타나기도 한다. 확진자 중에 사망률은 나라마다 매우 다른데, 전 세계적으로 대략 4% 전후인데 반하여 우리나라는 2% 정도로 낮은 편이다. 동반질환의 유무가 사망률과 관련이 높은데 특히 당뇨병, 고혈압, 암, 심혈관질환 및 폐질환을 가지고 있던 환자들에서 높은 것으로 보고되었다[3]. 동반질환, 특히 고혈압이나 심혈관질환자는 바이러스감염 자체에 취약하기도 하고, 감염 후 심장에 손상을 주는 등 사망이 높다. 코로나19를 보고한 세계 여러 나라의 내용을 보면 많게는 절반이상의 확진자가 심혈관질환을 가지고 있었고, 3분의 1정도는 고혈압 환자로 나타났다. 왜 고혈압이나 심혈관질환자가 코로나19에 잘 걸리고 사망이 높은지는 정확하게 규명된 바는 없으나, 이런 동반질환자 대부분이 고령이고 면역기능저하가 일부 있을 것으로 추정하고 있다.

2. 코로나19와 심장 손상

코로나19는 절반이상이 호흡기감염으로 나타나지만 적지 않는 환자들에서 심장 손상이 나타나는 것으로 보고되고 있다[3]. 중국 우한시 초기 환자들부터 이후 여러 보고를 보면 심장을 이루는 근육, 즉 심근세포가 손상을 받으면 혈액 중에 심근효소(표지자)가 상승하는데 코로나19 확진자 중 많은 경우에 증가된 것으로 나타나 환자마다 정도에 차이가 있지만 코로나19가 심장에 손상을 일으킨다는 것을 알게 되었다. 코로나바이러스가 어떻게 심장에 손상을 주는지 그 기전에 대하여는 여러 설명이 있다. 바이러스 자체가 심근세포에 들어가 세포를 죽이고 염증을 일으키거나(치명적인 심근염), 바이러스 감염 후 온 몸에 염증 반응이 나타나고 호흡곤란이나 저산소증 등 중증 감염으로 진행하면 2차적으로 심장에 무리를 준다는 것이다. 따라서 기저 심질환이 있는 환자에서 코로나바이러스 감염은 치명적일 수 있다.

3. 혈압약과 코로나19

코로나바이러스(SARS-CoV-2)가 세포에 들어가 증식을 해서 살아남는데 세포에 들어가려면 세포 표면에 안지오텐신전환효소-2(ACE2)라는 것에 붙어서 들어가게 된다. 평소에 이 ACE2는 몸 안의 호르몬 균형을 이루어주는 역할을 하고 최근에는 바이러스감염 후 심한 폐손상을 막아 주는 좋은 효과가 있다고 알려졌다. 하지만 일부 혈압약(안지오텐신전환효소억제제 및 안지오텐신수용체차단제)이 ACE2를 증가시킬 수 있으므로 증가된 ACE2로 인해 바이러스가 더 많이 세포에 들어갈 수 있게 되고, 결국 "혈압약 복용으로 코로나19에 취약해지는 것이 아닌 가" 하는 의문이 제기되었다[그림1][4].

코로나19 바이러스(SARS-CoV-2)는 세포 표면에 있는 수용체(ACE2)에 붙어서 세포 안으로 들어가 증식을 한다. 한편 혈압약 중에 안지오텐신전환효소억제제(ACE inhibitors)와 안지오텐신수용체차단제(ARBs)는 ACE2를 증가시키므로 코로나19에 취약할 수 있다는 가설이 제기되었다. 하지만 ACE2는 평소에 세포를 보호하는 작용을 하므로 ACE2 증가가 오히려 폐손상을 줄인다는 연구결과가 있다[4].

그러나 국내외 여러 조사에서 특정 혈압약 복용이 코로나19에 더 취약하지는 않으며, 사망에도 관련이 없다고 하였다. 이런 임상논문을 근거로 여러 나라의 학회에서 일관되게 코로나19 예방을 목적으로 혈압약을 중단하지 말고 유지할 것을 권고하고 있다. 대한고혈압학회는 "안지오텐신전환효소 증가가 고혈압 환자에서 어떤 영향을 주는지에 대한 임상적 근거가 부족하므로, 효과가 증명되고 올바른 적응증에 사용된 안지오텐신전환효소억제제와 안지오텐신수용체차단제를 타 계열의 약제로 교체할 필요는 없으며, 또한 고혈압약 사용으로 얻는 이득이 중단 및 변경에 따른 위험도 보다 크기 때문에 고혈압 환자에서 본 성분의 약제를 변경 및 중단하지 말고 지속적으로 복용할 것을 권고"하였다[5].

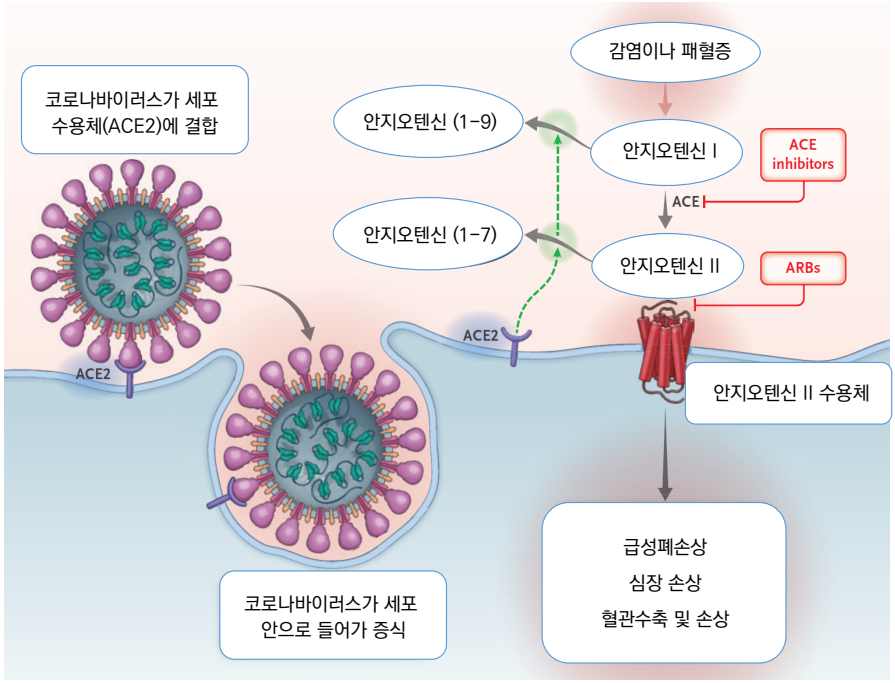

그림 1. 코로나바이러스(SARS-CoV-2)와 레닌-안지오텐신-알도스테론계

(출처 : Vaduganathan M et. al. N Engl J Med 2020;382:1653-1659.)

4. 고혈압 환자의 코로나19 슬기롭게 극복하기

코로나19에 취약한 고혈압 및 심혈관질환자가 어떻게 하는 것이 잘 극복하는 방법일까? 가장 좋은 방법은 역시 예방에 있다. 고혈압은 심혈관질환의 주요 위험 인자이고, 전 세계 사망요인 중 1위이다. 대부분의 나라에서 성인 3명 중 한 명이 고혈압 환자일 정도로 높은 유병률을 보이고 우리나라의 경우 국민건강영양조사자료에 따르면 2016년부터 고혈압 환자가 천백만 명을 넘은 것으로 조사되어 가히 "국민병"이라 할 만하다. 고혈압은 치료하지 않을 경우 대부분 아무런 증상 없이 심장과 혈관에 상처를 주고, 죽상동맥경화라는 과정을 거쳐 뇌졸중, 급성심근경색 및 사망에도 이르게 되므로 "소리없는 살인자(silent killer)"라고 불린다. 반면 고혈압은 잘 관리하고 적절하게 조절하면 심뇌혈관질환의 발병 및 그로 인한 사망의 위험이 줄어든다는 것을 반세기에 걸친 관찰과 연구로 알게 되었다. 결국 고혈압 관리는 심혈관질환을 예방하고 사망을 줄이는 것이 코로나19에도 같이 적용된다고 볼 수 있다.

가. 올바른 혈압 측정과 가정혈압

고혈압의 진단은 어느 질병보다 쉽다. 즉, 의료기관에서 측정하여 진단이 되지만 특별한 시약이나 혈액, 또는 영상이 필요하지 않기에 매우 단순하며 주변에서 흔히 볼 수 있는 자동혈압계로 측정하면 자신의 혈압을 알고, 또 고혈압을 의심해 볼 수 있다. 다만 혈압은 측정하는 자세나 장소, 신체 상태, 주변 상황 및 측정 방법에 따라 다를 수 있기 때문에 표준화된 혈압측정이 필요하다. 대한고혈압학회에서는 가정에서 혈압측정 시 주의할 점과 추천 방법에 대해 제시하고 있다. 그 내용을 요약하면 아침에 기상 후 소변을 보고 책상이나 식탁 앞에서 의자에 앉아 등을 기대고 5분 정도 안정한 후 팔에 감는 혈압계의 커프가 심장 높이에 올 수 있도록 위치하고 재는 것이 정확한 가정혈압 측정방법이다. 경우에 따라 취침 전에도 혈압을 측정하도록 권장하기도 한다. 가정에서 측정한 수축기혈압 135mmHg 이상 또는 이완기혈압 85mmHg 이상을 고혈압이라 한다[6].

한편 진료실이 아닌 곳, 대표적으로 가정에서 혈압을 측정하면 진료실에서 측정한 혈압과 다른 경우를 가려낼 수 있다. 진료실 혈압은 140/90mmHg 이상으로 고혈압 또는 조절이 되지 않는 고혈압으로 나오는데, 가정에서는 135/85mmHg 미만으로 나오는 경우가 있어 이를 "백의(白衣)고혈압(white-coat hypertension)" 또는 "백의현상"이라 한다. 이는 진료실에서 의사의 흰 가운(백의) 앞에서 유독 긴장을 하여 나타나는 것으로, 의사뿐 아니라 환자도 인지하고 있어야 제대로 진료를 받을 수 있다. 이와는 반대로 진료실 혈압은 140/90mmHg 미만으로 고혈압이 아니거나 조절이 잘 되는 고혈압으로 나오지만, 가정혈압이 135/85mmHg 이상으로 나오는 경우를 "가면(假面)고혈압(masked hypertension)"이라고 하며, 이 또한 의사와 환자가 제대로 알고 있어야 적절한 혈압관리에 도움이 된다.

지난 5월에는 세계고혈압의 날(5월 17일)을 맞아 혈압관리의 기본인 올바른 혈압측정의 중요성을 알리고 이를 통한 적극적인 고혈압 치료와 관리를 독려하고자 세계고혈압학회에서 2017년부터 추진하고 있는 세계최대 공공 혈압측정 캠페인 '5월은 혈압측정의 달(MMM, May Measurement Month, 홈페이지 www.maymeasure.com)'을 국내에 소개하고 '생명을 지키는 가장 쉬운 방법, 혈압을 측정하세요'라는 슬로건과 함께 '5월은 혈압측정의 달(K-MMM20)' 캠페인을 진행하였다. 올해는 코로나19로 현장에서 혈압측정 행사를 하지 못하고 유튜브, 페이스북, 인스타그램 등 SNS와 블로그를 활용한 온라인 캠페인을 6월까지 진행하였으며, 고혈압의 위험성과 혈압 측정을 통한 혈압 관리의 중요성을 알림으로써 고혈압의 인지율, 치료율 및 조절률을 올려 궁극적으로는 심뇌혈관질환 발생을 예방하고 그에 따른 사망률을 낮추고자 하는 목표를 가지고 있다. 올해는 특히 고혈압의 인지율과 치료율이 가장 낮은 30~40대 젊은 층을 겨냥하여 "젊은 고혈압을 찾아라"라는 주제로 대한고혈압학회가 주관하고 질병관리본부 및 국민건강보험공단, 대한심장학회 등이 공동주최하며 세계고혈압학회가 후원하였다.

나. 슬기로운 고혈압 환자 되기

고혈압 환자는 당뇨병, 고콜레스테롤혈증 등 다른 심뇌혈관질환 위험인자를 함께 가지고 있는 경우가 많고 또한 이것이 심뇌혈관질환 위험을 보다 증가시키는 것으로 잘 알려져 있다. 성인에서 이러한 만성질환의 증가는 평균수명의 증가 등 우리나라의 빠른 인구 고령화 및 신체활동 부족, 식생활 변화 등 생활습관 역시 원인이 되는 것으로 추정된다. 결국 올바른 생활습관으로 고혈압 관리를 잘하고, 가정혈압측정 등 평소 혈압에 대한 관심과 관리를 유지하는 것이 심혈관질환 예방에 가장 좋은 방법이 되는 것이다. 질병관리본부에서는 건강한 생활습관을 위해 "심뇌혈관질환 예방관리를 위한 9대 생활수칙"을 권장하고 있다. 하지만 무엇보다도 코로나19를 예방하기 위한 행동수칙을 잘 준수하는 것이 필요할 것이다[그림2].

▣ 심뇌혈관질환 예방관리를 위한 9대 생활수칙

① 담배는 반드시 끊기

② 술은 하루에 한 두잔 이하로 줄이기

③ 음식은 싱겁게 골고루 먹고 채소와 생선을 충분히 섭취하기

④ 가능한 한 매일 30분 이상 적절한 운동하기

⑤ 적정 체중과 허리둘레를 유지하기

⑥ 스트레스를 줄이고 즐거운 마음으로 생활하기

⑦ 정기적으로 혈압, 혈당, 콜레스테롤을 측정하기

⑧ 고혈압, 당뇨병, 이상지질혈증(고지혈증) 꾸준한 치료받기

⑨ 뇌졸중, 심근경색 응급 증상을 숙지하고 발생 즉시 병원가기

그림 2. 질병관리본부에서 권고하는 코로나19 예방 행동수칙

맺는 말

코로나19가 장기화되면서 정치, 경제, 사회, 문화 및 교육 등 전 세계가 공황상태이다. 고령자, 고혈압 환자 및 심혈관질환자들이 감염에 취약하고 사망률이 높으므로 평소 정부가 권고하는 생활수칙을 잘 지켜 코로나19를 예방하는 것이 가장 중요하고, 올바른 생활습관과 혈압측정을 통하여 꾸준하게 혈압을 관리하는 것이 코로나19를 이겨내는 슬기로운 방법이 될 것이다.

① 이전에 알려진 내용은?

고혈압은 전 세계 주요 사망원인 중 하나이고 주된 심혈관질환 위험인자이다. 고혈압은 고령에서 많다.

② 새로이 알게 된 내용은?

코로나19 확진자 중에 고혈압 및 심혈관질환자가 많고, 이들에서 사망이 많다. 코로나바이러스가 세포에 들어갈 때 필요한 안지오텐신전환효소-2(ACE2)를 일부 혈압약이 증가시키기 때문에 바이러스감염에 더 취약하다는 우려가 있었으나 국내외 여러 임상 논문에서 혈압약과 코로나19 감염이 관련이 없는 것으로 보고가 되었다.

③ 시사점은?

코로나19에 취약한 고령, 고혈압 및 심혈관질환자들은 일반적인 마스크, 손위생 등 위생관리와 사회적 거리두기 등의 정부 권고에 잘 따르는 것이 코로나19를 예방하는 가장 좋은 방법이다. 그리고 고혈압 및 심혈관질환에 대한 관리를 꾸준하게 받고 건강한 생활습관을 유지하는 것이 코로나19를 극복하는 슬기로운 방법이다.

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Abstract

Summary of the Relationship between COVID-19 and Cardiovascular Disease

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Worldwide, the coronavirus disease 2019 (COVID-19) spread rapidly after it was initially reported in Wuhan, China, in late December 2019. COVID-19 exponentially increased morbidity and mortality as it quickly became a global pandemic affecting more than 200 countries/regions. Studies found that the presence of underlying cardiovascular disease, including hypertension in patients with COVID-19, is associated with high mortality. However, several medications used for the treatment of COVID-19 were found to have uncertain safety and efficacy. The aim of this report was to briefly summarize the relationship between COVID-19 and cardiovascular disease and to recommend methods of maintaining good health during the COVID-19 period.

Keywords: COVID-19, Cardiovascular disease, Hypertension

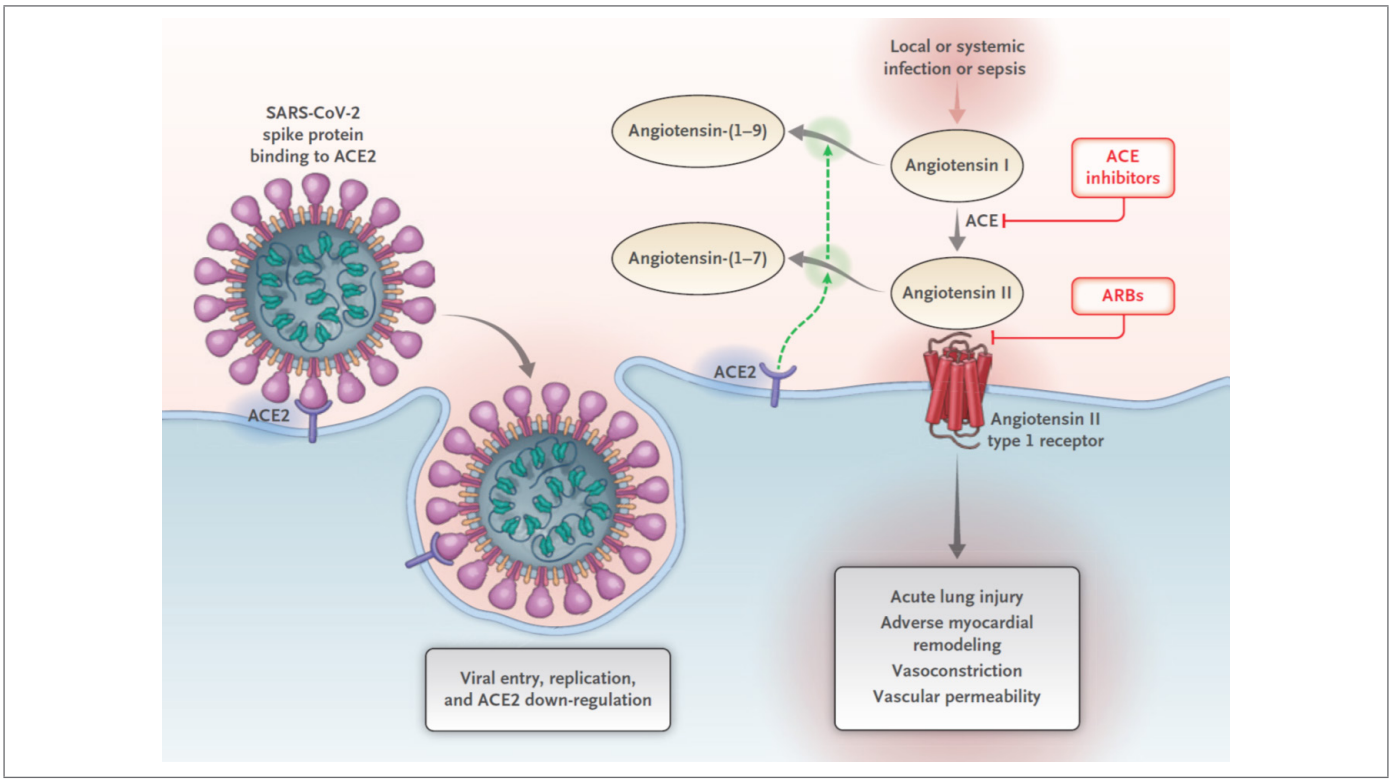

Figure 1. Interaction between SARS–CoV–2 and the Renin – Angiotensin – Aldosterone System.

Shown is the initial entry of severe acute respiratory syndrome coronavirus 2 (SARS–CoV–2) into cells, primarily type II pneumocytes, after binding to its functional receptor, angiotensin–converting enzyme 2 (ACE2). After endocytosis of the viral complex, surface ACE2 is further down–regulated, resulting in unopposed angiotensin II accumulation.

Local activation of the renin – angiotensin – aldosterone system may mediate lung injury responses to viral insults. ACE denotes angiotensin–converting enzyme, and ARB angiotensin–receptor blocker.

(Ref: *N Engl J Med* 2020;382:1653–1659.)

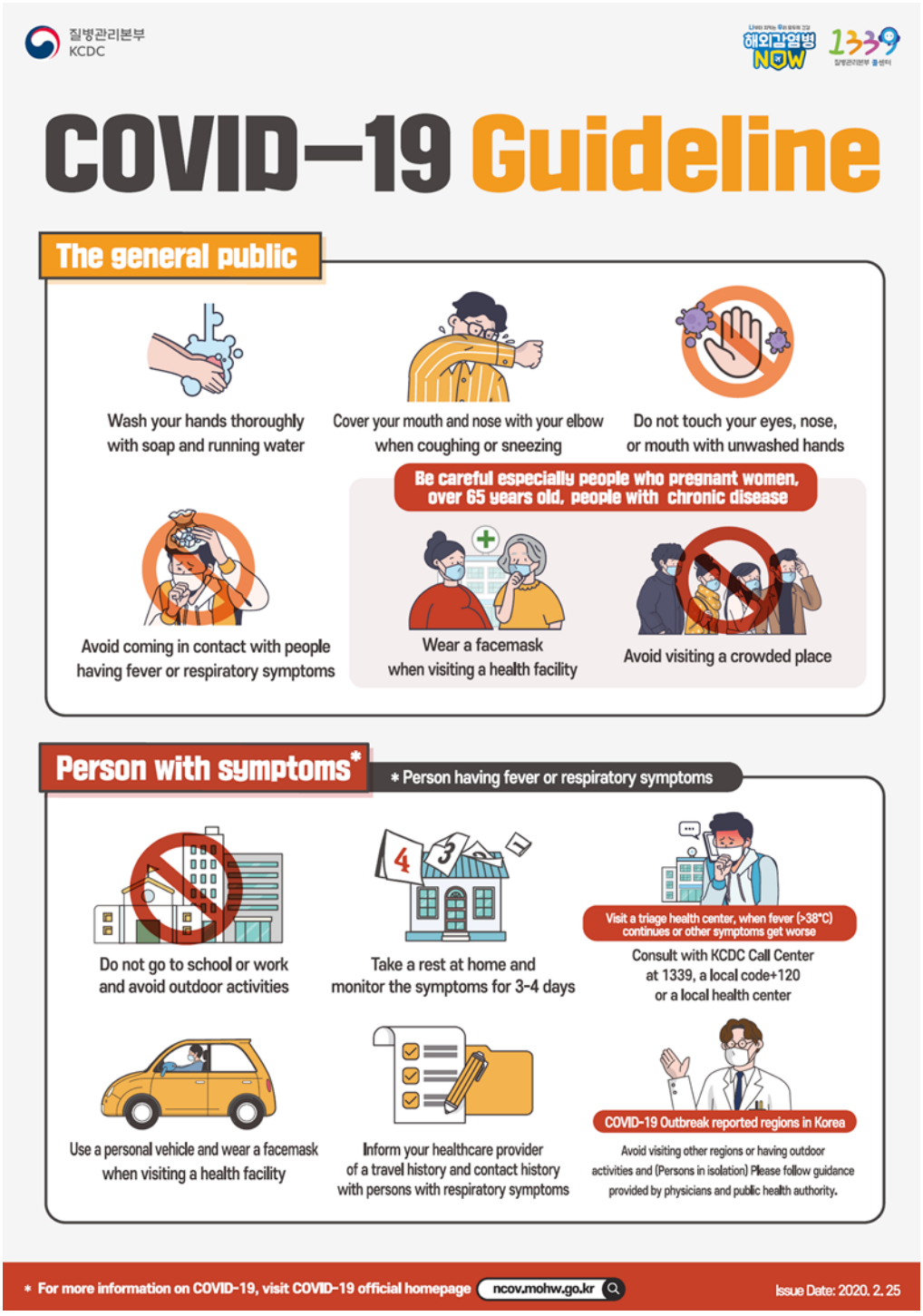

Figure 2. Coronavirus disease 2019 (COVID-19) Guidelines

역학 · 관리보고서 2

모바일 앱을 활용한 지역사회 노인 건강증진 프로그램의 효과: 신속 문헌고찰

질병관리본부 질병예방센터 만성질환예방과 **송금주, 정여진, 하 진***

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초 록

노년층의 스마트폰 보유 및 사용률이 증가함에 따라, 건강관리를 돕는 도구로 모바일 앱을 활용하는 사례가 증가하고 있고, 최근에는 당뇨병이나 고혈압 관리에 모바일 앱이 효과적인 중재라는 임상적 근거도 확인되었다. 이 연구에서는 신속 문헌고찰 방법론을 적용하여, 지역사회에 거주하는 비교적 건강한 노인의 생활습관(신체활동, 식생활, 복약순응도 등) 개선에 모바일 앱이 효과적인지를 살펴보았다. 문헌 검색 결과, 신체활동 개선 프로그램 관련 기존 체계적 문헌고찰 1편이 확인되었고, 모바일 앱을 통해 신체활동량 및 비활동적 시간, 체력을 포함한 신체활동 수준이 개선되는 경향을 보였다. 다만 포함된 연구 수의 부족과 프로그램 특성의 차이 등으로 인해 그 효과가 통계적으로 유의하지는 않았다. 향후 관련 프로그램의 효과 및 사용자 수용성 관련 국내 근거의 축적이 필요하다.

주요 검색어 : 모바일 앱, 건강증진, 노인, 체계적 문헌고찰

들어가는 말

인구 고령화에 따른 질병부담을 억제하기 위해 전 세계적으로 건강한 고령화(healthy aging)를 강조하고 있으며, 이를 위해 최근 10년 간 모바일 앱과 같은 정보통신기술을 활용하여 생활습관을 개선하고 만성질환을 예방·관리하려는 시도들이 계속되고 있다. 우리나라는 정보통신기술이 발전한 국가 중 하나로, 이를 활용하여 건강증진 및 만성질환 예방·관리 서비스를 제공할 수 있는 토대는 충분하다고 할 수 있다. 방송통신위원회의 자료에 따르면, 2010년도 3.8%이었던 우리나라 국민의 스마트폰 보유율은 폭발적으로 증가하여 2019년도 기준 91.1%를 기록하고 있다[1,2]. 이러한 보유율의 증가는 고령층에서도 나타나는데, 60대의 경우 2016년 60.3%에서 2019년 85.4%, 70대 이상은 2016년 17.6%에서 2019년 39.7%로 증가하였다[2,3]. 스마트폰 이용 빈도도 크게 증가하여 60대에서는 76.2%, 70대 이상에서는 29.2%가 주 5일 이상 스마트폰을 사용하고 있다[2]. 특히 우리 국민의 건강관리 앱 사용이 최근 크게 증가하고 있는 것으로 나타났는데, 2017년에서 2019년까지의 건강관리 앱 사용시간 증가율이 570%로, 조사 대상국 12개국 중 1위를 차지하고 있다[4]. 이러한 추세에 따라 정부 차원에서도 지역사회 주민의 건강증진을 위한 모바일 헬스케어 사업을 추진 중이며[5], 일부 지자체에서는 활동추적기(activity tracker) 기능을 가진 앱을 활용하여 주민의 걷기 실천율을 증가시키기 위한 프로그램을 시행하고 있다[6].

최근 들어 모바일 앱의 효과를 검증하기 위한 메타분석들이 출간되기 시작하는 추세로, 일부 만성질환 관리에 있어서는 유의한 효과가 있음을 보고하고 있다. 당뇨병과 고혈압 관리를 위한 모바일 앱 프로그램의 임상적 효과를 종합한 메타분석 연구[7]에 따르면, 프로그램 참여자의 당화혈색소가 비참여자보다 0.49 더 감소하였고, 수축기 혈압과 확장기 혈압은 0.17씩 더 감소함을 확인하였다. 모바일 앱은 임상뿐만 아니라 지역사회 주민을 대상으로 하는 건강증진 프로그램에서도 활발히 사용되고 있어, 본 연구에서는 비교적 건강한 노인들을 대상으로 한 모바일 앱

프로그램의 생활습관(신체활동, 식생활, 복약순응도) 개선 효과를 종합적·체계적으로 검토하였다.

몸 말

1. 연구 방법

연구의 핵심질문은 "모바일 앱을 활용한 노인 건강증진 프로그램은 효과적인가?" 이며, 신속 문헌고찰(rapid literature review) 방법론[8]에 따라 기존 체계적 문헌고찰 및 메타분석 연구 결과를 고찰하였다. 지역사회에 거주하며 비교적 건강한 노인을 대상으로 한 연구, 무작위배정 비교임상시험(randomized controlled trial) 연구, 추적관찰 후 생활습관(신체활동, 식생활, 복약순응도 등) 변화를 보고한 연구를 포함하였으며, 특정 질환을 예방·관리하기 위한 중재 연구, 다른 형태의 정보통신기술(예, 웹사이트, 전화, 문자 제공 등)을 사용한 연구는 포함하지 않았다.

문헌 데이터베이스는 국외 2개(PubMed, Health Systems Evidence), 국내 1개(KoreaMed)를 사용하였으며, 검색어는 mobile application, smartphone, older adults, systematic review, meta-analysis를 조합하여 검색하였다. 영어, 한국어로 출판된 문헌만 선정하였으며, 출판연도는 제한을 두지 않았다.

최종 선택된 체계적 문헌고찰의 비뚤림 위험(risk of bias) 평가는 AMSTAR(A MeaSurement Tool to Assess systematic Reviews)[9]를 사용하였다. AMSTAR는 총 11개 항목으로 구성된 체크리스트이며, 해당 문헌이 각 항목을 충족하면 1점을 부여하여 총 11점을 받게 된다. 총점 0~3점이면 "낮음", 4~7점이면 "중등도", 8~11점은 "높음"으로 문헌의 질을 평가할 수 있다.

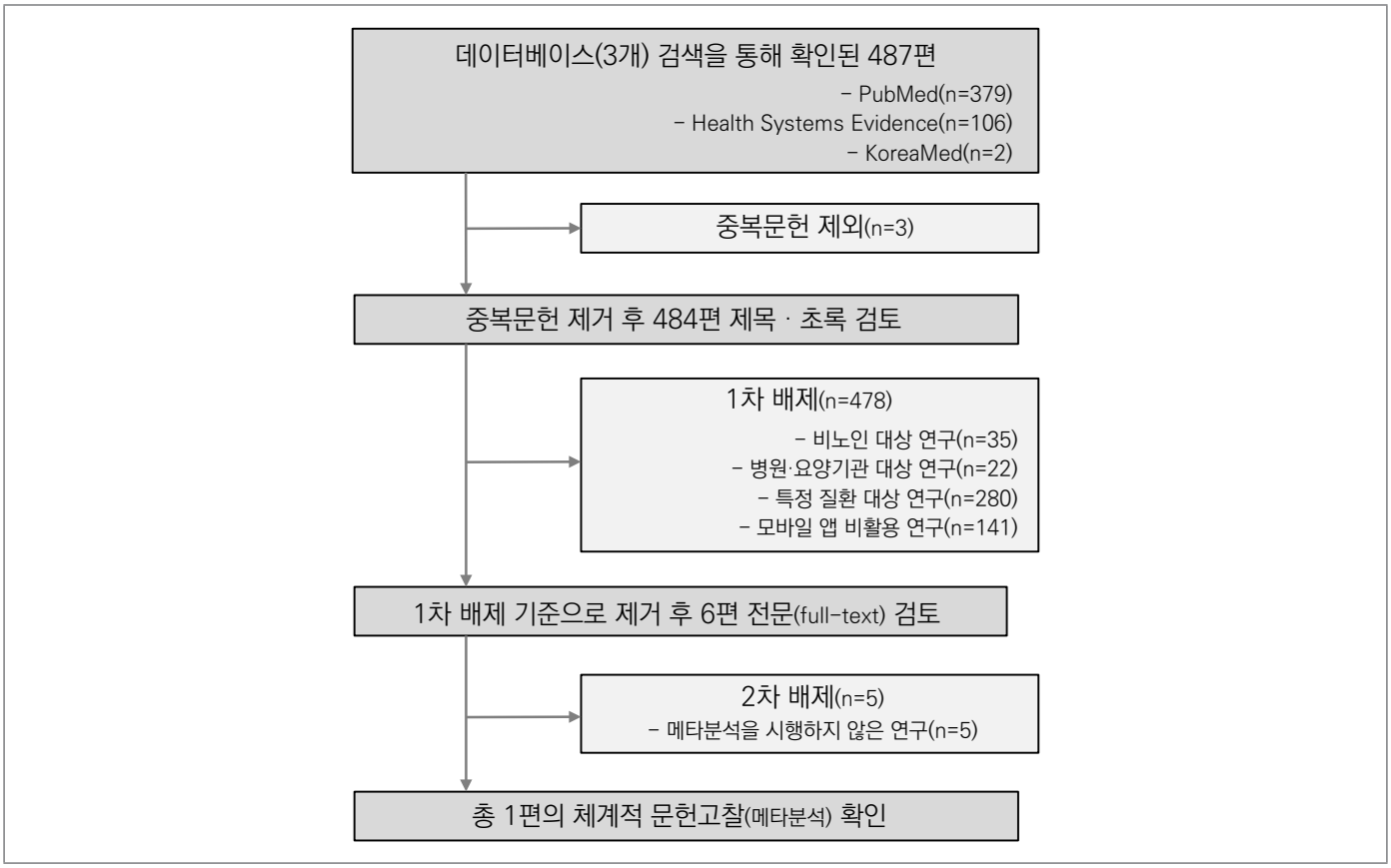

그림 1. 문헌선정 흐름도

표 1. 체계적 문헌고찰의 질 평가(AMSTAR* 적용)

AMSTAR 평가항목	Yerrakalva *et al.* (2019)[10]
1. 체계적 문헌고찰의 연구질문과 포함기준에 연구대상자, 중재, 대조군, 결과변수가 포함되었는가?	예
2. 체계적 문헌고찰을 위한 계획이 '사전에' 수립되었는가?	예
3. 특정 연구설계를 체계적 문헌고찰에 포함한 이유를 설명하고 있는가?	예
4. 포괄적인 문헌검색을 하였는가?	예
5. 문헌 선택을 2명 이상의 연구진이 수행하였는가?	예
6. 자료추출을 2명 이상의 연구진이 수행하였는가?	예
7. 배제된 연구 목록과 사유를 제시하였는가?	아니오
8. 포함된 연구의 특성이 제시되었는가?	예
9. 적절한 방법으로 포함된 연구의 질을 평가하였는가?	예
10. 포함된 연구들의 연구비 출처를 제시하였는가?	예
11. 메타분석의 경우, 포함된 연구들의 결과를 적절한 방법으로 합성하였는가?	예
점수	**10/11**

* A MeaSurement Tool to Assess systematic Reviews[9]

2. 연구 결과

문헌 검색 전략에 따라 3개의 데이터베이스에서 검색된 연구 수는 총 487편이었으며, 중복문헌 3편을 제외한 후, 해당 문헌의 제목 및 초록을 검토하여 핵심질문에 부합하지 않는 연구나 연구대상이 맞지 않는 연구(n=478)를 일차적으로 제외하였고, 남은 6편의 연구는 전문(full-text)을 확인하여 메타분석 결과가 보고된 1편[10]을 최종 선정하였다(그림 1).

최종 선정된 문헌은 신체활동 수준 개선 효과를 종합하여 보고한 연구이며, 기타 생활습관(식생활, 복약순응도 등)과 관련한 체계적 문헌고찰(메타분석)은 아직 보고되지 않은 것으로 확인되었다.

선정된 체계적 문헌고찰에 대한 AMSTAR 평가 결과는 표 1에 제시하였다. 해당 문헌은 배제 연구목록과 사유를 제시하지 않은 점을 제외하면, 모든 항목에 대한 정보를 제시하고 있어, 우수한 질을 가진 체계적 문헌고찰로 평가할 수 있다[11].

선택 문헌의 일반적 특성은 표 2에 제시하였다. 포함된 개별 연구 수는 5편이며, 총 참여자 수는 426명이나, 개별 연구별로는 19명에서 263명으로 참여자 수의 차이가 있었다. 참여자 평균 연령은 모든 개별 연구가 60세 이상이었다. 포함된 개별 연구 모두 앱을 활용하여 신체활동 수준을 개선시키고자 하였으며, 세부적으로는 앱을 웨어러블 디바이스[12,15] 또는 보수계[13], 혈압·혈당 측정기[16]와 연동하여 사용하였다[16]. 앱을 통해 주로 제공한 콘텐츠는 일일 걸음 수 등의 활동 기록이었으며, 참여자의 목표 설정 및 달성에 따른 맞춤형 메시지를 제공하고 있었다. 특히, 3편의 연구[12,14,15]가 '앱 활용'이라는 요소 이외에, 그룹 교육이나 전문가 상담, 소셜 네트워크 형성 기회 제공 등을 통해 복합 프로그램의 성격을 보였다. 프로그램 기간은 2개월에서 6개월로 다양했으나, 3편의 연구[14,15,16]가 3개월 동안 수행된 프로그램이었다. 추적관찰 기간도 3개월에서 12개월로 차이가 있으나, 다수의 연구가 비교적 단기간, 즉 3개월[14,15,16]의 프로그램 지속 효과를 보았다. 프로그램의 효과는 일일 신체활동량(걸음

표 2. 선택문헌(Yerrakalva *et al*. 2019)의 특성

포함 연구 수	5	
대상자 수	426	
평균 연령(세)	61.5~75	
개별 프로그램 특성	Ache(2015) [12]	웨어러블 디바이스(Fitbit)와 연동된 앱 제공 · 일일 걸음 수, 소모 열량, 활동적 시간, 수면 시간, 음식 섭취, 체중 추이 확인 가능 · 목표 설정 및 맞춤형 메시지 제공 · 소셜 네트워크 서비스 제공 · 그룹 교육 실시(첫 4주간 주 1회, 이후 5개월 간 월 1회)
	Bickmore(2013) [13]	앱이 설치된 테블릿 PC 제공, 앱은 보수계(pedometer)와 연동하여 사용 · 일일 걸음 수 추이 확인 가능 · 목표 설정, 방해요인 파악, 목표 수정이 가능하며, 운동 팁 제공
	Silveira(2013) [14]	근력-균형 운동을 유도하기 위한 앱이 설치된 테블릿 PC(iPad) 제공 · 운동 비디오 제공 · 목표 달성 단계별로 응원, 축하 메시지 제공 · 소셜 네트워크 서비스 제공
	Lyons(2017) [15]	웨어러블 디바이스(UP24 Jawbone)와 연동된 앱 제공 · 일일 걸음수, 심박수, 수면, 음식 섭취, 체중 추이 확인 가능 · 진행 상황, 목표 설정 등과 관련한 맞춤형 정보 제공 · 매주 1회 전화 상담 실시
	Knight (2014) [16]	혈압 및 혈당 측정기와 연동된 앱 제공 · 만보계로 일일 걸음 수를 측정하여 앱에 직접 입력, 추이 확인 가능 · 특정 강도의 신체활동 처방
프로그램 〈추적관찰〉 기간 (개월)	Ache(2015)[12]	6〈6〉
	Bickmore(2013)[13]	2〈12〉
	Silveira(2013)[14]	3〈3〉
	Lyons(2017)[15]	3〈3〉
	Knight(2014)[16]	3〈3〉
결과지표	Ache(2015)[12]	신체활동 수행 시간(분/일), 비활동적 시간(%/일)
	Bickmore(2013)[13]	신체활동(걸음 수/일)
	Silveira(2013)[14]	체력(미터/초)
	Lyons(2017)[15]	신체활동 수행 시간(분/일, 걸음 수/일), 비활동적 시간(앉아있는 시간/일), 체력(6분 걷기, 미터)
	Knight(2014)[16]	체력(최대산소섭취량)
연구수행 국가	Ache(2015)[12]	캐나다
	Bickmore(2013)[13]	미국
	Silveira(2013)[14]	스위스
	Lyons(2017)[15]	미국
	Knight(2014)[16]	캐나다

수, 시간)[12,13,15]과 일일 비활동 시간[12,15], 체력(걷기 속도, 최대산소섭취량)[14,16]으로 측정하였다. 포함된 개별 연구는 각각 캐나다[12,16], 미국[13,15], 스위스[14]에서 수행되었다.

개별 연구 5편의 결과를 종합한 결과, 앱을 활용한 프로그램에 참여한 노인이 참여하지 않은 노인에 비해 신체활동 수준이 개선되는 경향을 보였으나(standardized mean difference, SMD=0.18), 통계적인 유의성은 없었고(95% 신뢰구간, −0.03~0.39), 문헌 간의 이질성을 나타내는 I^2 값이 54.0%로

표 3. 앱을 활용한 신체활동 개선 프로그램의 효과

결과 지표	포함 연구 수	표준화 평균 차 (standardized mean difference)	95% 신뢰구간	이질성(I^2,%)
전체	5	0.18	−0.03~0.39	54.0
하위군 분석				
– 일일 걸음 수(단기간*)	3	506	−80~1,092	80.5
– 일일 걸음 수(장기간**)	2	752.7	−147~1,652	78
– 비활동(단기간)	2	−0.49	−1.02~0.03	0
– 체력(단기간)	3	0.31	−0.09~0.70	0

* 3개월 미만, ** 6개월 이상

높았다(표 3). 결과지표별로 하위군 분석을 실시하였을 때, 단기간(3개월 미만) 및 장기간(6개월 이상) 프로그램 모두에서 일일 걸음 수가 증가하는 경향을 보였으나 통계적으로 유의하지 않았고, 이질성이 80.5%, 78%로 높았다. 또한 프로그램 참여자는 비참여자에 비해 비활동 수준(SMD=−0.49)과 체력 수준(SMD=−0.49)이 개선되는 경향을 보였고 이질성은 없었으나(0%), 통계적 유의성에는 도달하지 못하였다.

맺는 말

기존 체계적 문헌고찰 1편을 검토한 결과, 지역사회에 거주하는 비교적 건강한 노인을 대상으로 모바일 앱을 활용한 프로그램을 실시하였을 때, 신체활동량 및 비활동적 시간, 체력을 포함한 신체활동 수준이 개선되는 경향을 보였으나 통계적으로 유의하지는 않았다. 또한 일일 걸음 수 관련 효과추정치 간의 이질성이 매우 높았는데, 이는 프로그램들 간의 강도 차이에 기인한 것으로 해석할 수 있다. 즉, 그룹 교육이나 전화 상담이 추가된 프로그램[12, 15]이 앱만 활용한 프로그램[13]보다 일일 걸음 수 증가 효과가 컸다. 결과지표가 달라 프로그램의 효과를 평가하지는 못했으나, 사회적 지지를 형성할 수 있는 기회(소셜 네트워크 서비스)를 제공한 2편의 연구[12,14]에서도 통계적으로 유의한 효과를 보고하였다. 향후 우리나라 지역사회에서 앱을 활용한 신체활동 증진프로그램을 시행할 때, 단순히 앱만 활용한 프로그램보다, 신체활동 수준을 개선하는 데 필요한 지식을 제공하고 사회적 지지 요소를 포함한 복합 프로그램으로 기획하는 것이 바람직할 것이다. 다만, 선정된 체계적 문헌고찰에 포함된 개별 연구의 수가 적어, 향후 관련 연구가 축적되면 효과의 방향 또는 강도가 변할 수 있는 가능성이 있고, 북미와 유럽의 연구만 대상으로 하여, 그 결과가 우리나라에도 동일하게 나타날 것이라고 확신할 수는 없다. 향후 우리나라 지역사회 노인을 대상으로 한 연구가 필요한 시점이며, 프로그램의 효과뿐만 아니라 모바일 앱에 대한 사용자 수용성 등에 대한 검증이 필요하다.

① 이전에 알려진 내용은?

모바일 앱은 제2형 당뇨병 및 고혈압 환자의 자가 관리를 도와 혈당과 혈압 조절에 유의한 임상적 효과가 있다고 보고하고 있다.

② 새로이 알게 된 내용은?

기존에 출간된 체계적 문헌고찰에 대한 검토를 통해, 지역사회 거주 노인을 대상으로 모바일 앱 프로그램을 활용했을 때, 신체활동량 및 비활동적 시간, 체력 개선에 도움이 되는 경향을 확인할 수 있었다. 다만, 포함된 연구의 수가 적고 프로그램 구성 요소의 차이 등으로 인해 통계적으로 유의하지는 않았다.

③ 시사점은?

향후 우리나라 지역사회 노인을 대상으로 하여, 모바일 앱 프로그램의 생활습관 개선 효과와 모바일 앱에 대한 사용자 수용성 등을 평가할 수 있는 연구가 필요한 시점이다.

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Abstract

The Effect of Mobile Health Application Intervention among Community-dwelling Older Adults : A Rapid Literature Review

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As smartphone ownership and use among Korean older adults has increased, mobile applications (apps) have been widely used to alter their lifestyle. Recent studies reported that apps are effective tools for managing blood glucose and blood pressure in clinical settings. This study was conducted to review whether mobile health app interventions are effective at improving health behaviors (physical activity, diet, medication adherence etc.) among community-dwelling and relatively healthy older adults using a rapid literature review method. One systematic review study regarding physical activity was identified. The study reported an improved trend of physical activity, sedentary time, and fitness; however, the findings were not statistically significant due to the small number of studies included and the heterogeneity of program characteristics. Further evidence on the effects of the intervention and user acceptability in Korean older adults is warranted.

Keywords : Mobile applications, Health promotion, Aging, Systematic review

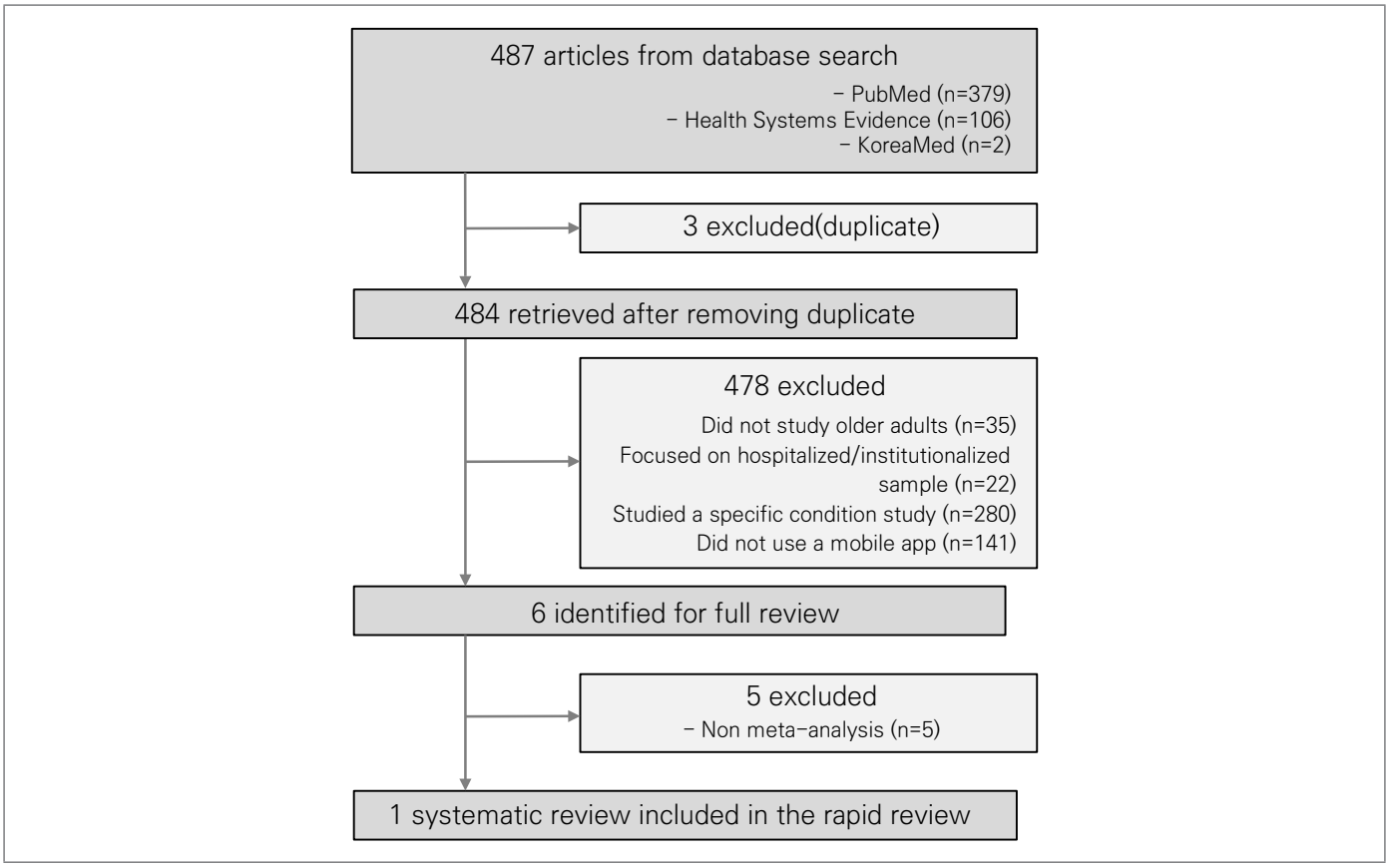

Figure 1. PRISMA flow chart of study selection

Table 1. The results of the quality of assessment of systematic reviews selected using AMSTAR

AMSTAR* Question	Yerrakalva et al. (2019)
1. Did the research questions and inclusion criteria for the review include the components of patient/population, intervention, comparison, and outcomes (PICO)?	Yes
2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	Yes
3. Did the review authors explain their selection of the study designs for inclusion in the review?	Yes
4. Did the review authors use a comprehensive literature search strategy?	Yes
5. Did the review authors perform study selection in duplicate?	Yes
6. Did the review authors perform data extraction in duplicate?	Yes
7. Did the review authors provide a list of excluded studies and justify the exclusions?	No
8. Did the review authors describe the included studies in adequate detail?	Yes
9. Did the review authors use a satisfactory technique for assessing the risk of bias in individual studies that were included in the review?	Yes
10. Did the review authors report on the sources of funding for the studies included in the review?	Yes
11. If meta-analysis were perform did the review authors use appropriate methods for statistical combination of results?	Yes
Total	10/11

* A MeaSurement Tool to Assess systematic Reviews[9]

Table 2. Characteristics of the systematic review selected

Number of studies included	5	
Number of participants of individual studies	426	
Average age of participants	61.5—75	
Characteristics of program	Ache (2015) [12]	App syncs with wearable device (Fitbit) · Provides daily steps, calorie expenditure, amount of active and sleep time, food consumption, weight tracking · Allows goal setting and provide tailored messages · Provides social network forums · Conducts 9 group education sessions (during 6 months)
	Bickmore (2013) [13]	App syncs with pedometer · Provides daily steps · Allows goal setting, identifying barriers, and modifying goals · Provides exercise tips
	Silveira (2013) [14]	App for strength–balance training plans · Provides exercise videos · Provides praise/reward messages · Provide social network forums
	Lyons (2017) [15]	App syncs with wearable device (UP24 Jawbone) · Provides daily steps, heart rate, sleep, food consumption, weight tracking · Provides tailored messages regarding to progress, goal setting · Conduct weekly telephone counseling
	Knight (2014) [16]	App syncs with blood pressure and blood glucose monitors · Provides a trend of daily steps that are manually input from a pedometer · Provides physical activity prescriptions
Duration of program [Follow-up] (month)	Ache (2015)[12]	6[6]
	Bickmore (2013)[13]	2[12]
	Silveira (2013)[14]	3[3]
	Lyons (2017)[15]	3[3]
	Knight (2014)[16]	3[3]
Outcomes	Ache (2015)[12]	Physical activity (minutes/day), sedentary time (%/day, time/day)
	Bickmore (2013)[13]	Physical activity (steps/day)
	Silveira (2013)[14]	Fitness (fastest gait, meter/second)
	Lyons (2017)[15]	Physical activity (minutes/day, steps/day), sedentary time (sitting time/day), fitness (6-minutes walking, meter)
	Knight (2014)[16]	Fitness (VO_{2max})
Country of study conducted	Ache (2015)[12]	Canada
	Bickmore (2013)[13]	United States
	Silveira (2013)[14]	Switzerland
	Lyons (2017)[15]	United States
	Knight (2014)[16]	Canada

Table 3. The effect of mobile app interventions for physical activity improvement

Outcome	Number of studies included	Standardized mean difference	95% confidence interval	Heterogeneity (I^2,%)
Overall	5	0.18	−0.03—0.39	54.0
Subgroup analysis				
− Daily steps (short term*)	3	506	−80—1,092	80.5
− Daily steps (long term**)	2	752.7	−147—1,652	78
− Sedentary time (short term)	2	−0.49	−1.02—0.03	0
− Fitness (short term)	3	0.31	−0.09—0.70	0

* less than 3 months, ** more than 6 months

만성질환 통계

고혈압, 당뇨병, 고콜레스테롤혈증 인지율, 2016~2018

◈ 만 30세 이상의 고혈압, 당뇨병, 고콜레스테롤혈증 인지율은 각각 69.1%, 71.5%, 60.1%로 나타났으며, 특히 30~40대에서 인지율이 낮았음. 30대의 경우 해당질환 환자 10명 중 고혈압은 2.0명(19.8%), 당뇨병은 3.3명(33.6%), 고콜레스테롤혈증은 1.8명(18.0%)만이 질환을 인지하고 있었음(그림 1).

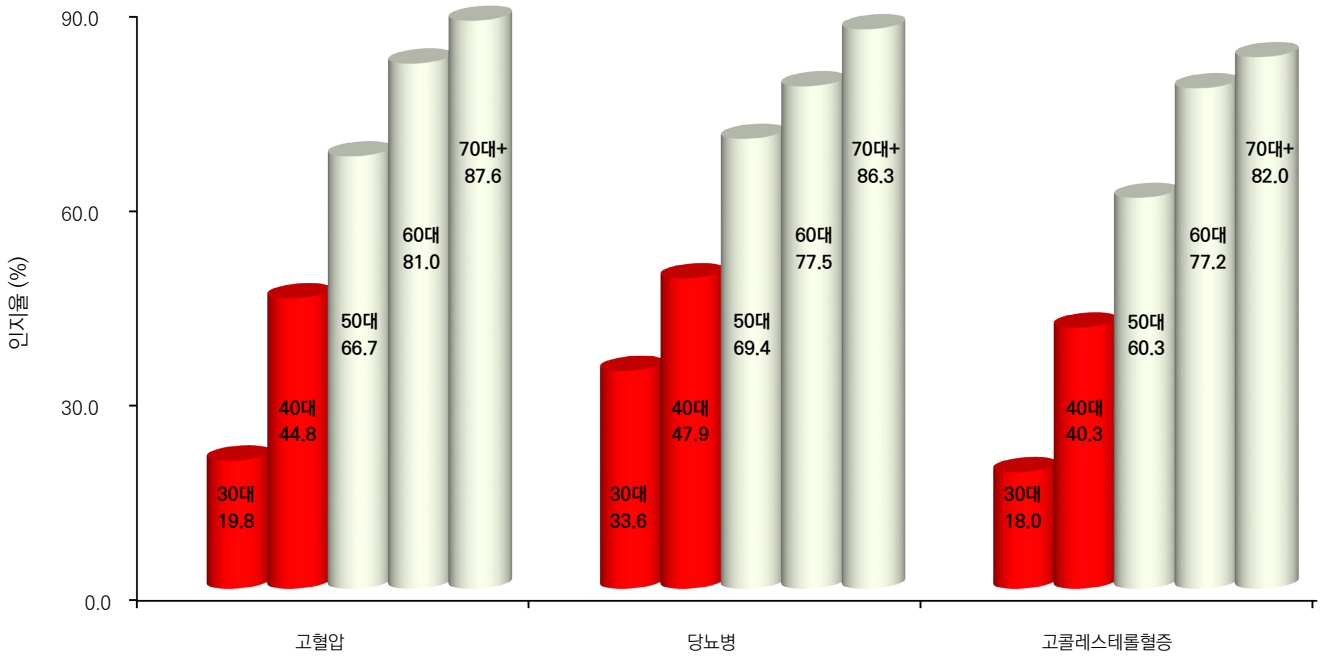

그림 1. 연령대별 고혈압, 당뇨병, 고콜레스테롤혈증 인지율, 2016~2018

* 고혈압 인지율 : 고혈압 유병자 중 의사로부터 고혈압 진단을 받은 분율, 만 30세 이상
† 당뇨병 인지율 : 당뇨병 유병자 중 의사로부터 당뇨병 진단을 받은 분율, 만 30세 이상
‡ 고콜레스테롤혈증 인지율 : 고콜레스테롤혈증 유병자 중 의사로부터 고콜레스테롤혈증 진단을 받은 분율, 만 30세 이상

자료원: 국민건강통계 2018, 질병관리본부
작성부서: 질병관리본부 질병예방센터 만성질환예방과

Noncommunicable Disease (NCD) Statistics

Percentages of awareness in hypertension, diabetes and hypercholesterolemia among Korean adults aged ≥ 30 years, 2016–2018

◈ According to Korea Health Statistics 2016–2018, among Korean adults aged ≥ 30 years, the awareness percentages of hypertension, diabetes and hypercholesterolemia are 68.3%, 71.5% and 60.1%, respectively. Especially, the percentages of awareness of hypertension, diabetes and hypercholesterolemia in 30–40s are lower, compared to other aged groups. Among those 30s age group who have hypertension, diabetes and hypercholesterolemia, 2.0 of 10 (19.8%), 3.3 of 10 (33.6%), 1.8 of 10 (18.0%) people are formally diagnosed of their hypertension, diabetes, hypercholesterolemia, respectively (Figure 1).

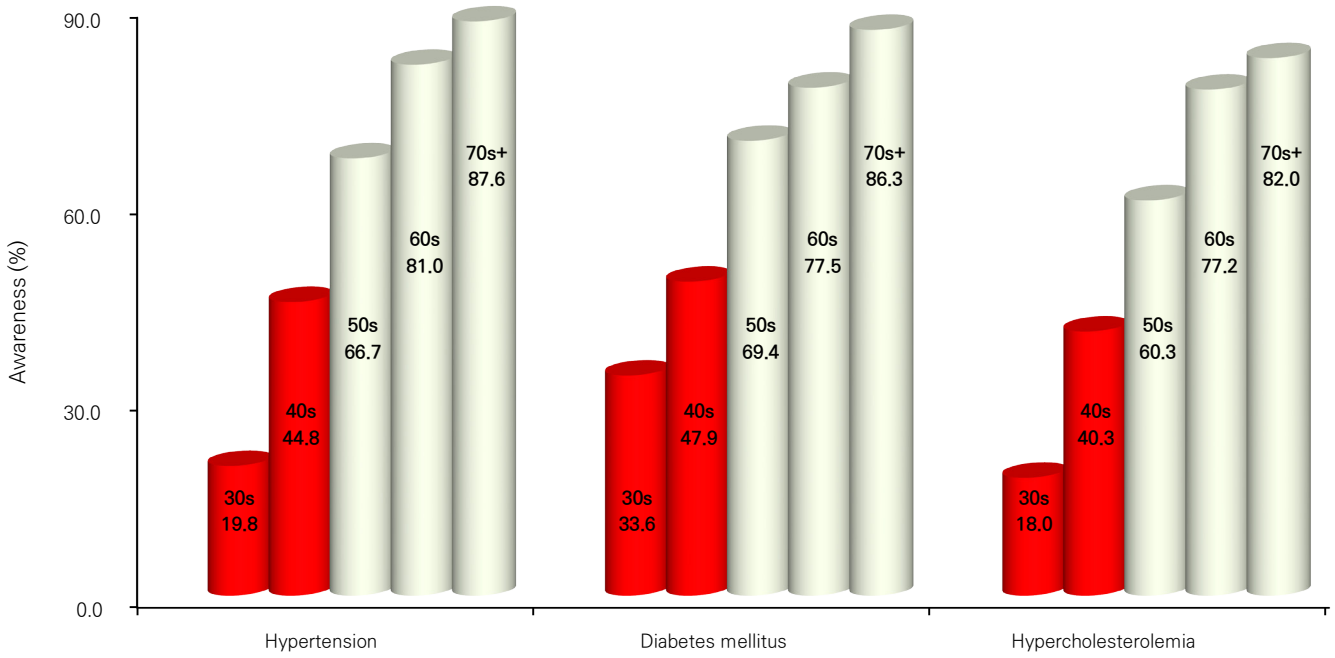

Figure 1. Percentages of awareness in hypertension, diabetes and hypercholesterolemia according to Korean adults aged ≥ 30 years, 2016–2018

* Percentage of hypertension awareness: percentage of people formally recognized of hypertension by a doctor, among those who have hypertension and are 30 years of age and over

† Percentage of diabetes awareness: percentage of people formally recognized of diabetes by a doctor, among those who have diabetes and are 30 years of age and over

‡ Percentage of hypercholesterolemia awareness: percentage of people formally recognized of hypercholesterolemia by a doctor, among those who have hypercholesterolemia and are 30 years of age and over

Source: Korea Health Statistics 2018, Korea National Health and Nutrition Examination Survey, http://knhanes.cdc.go.kr/

Reported by: Division of Chronic Disease Prevention, Korea Centers for Disease Control and Prevention

1.1 환자감시 : 전수감시 감염병 주간 발생 현황 (35주차)

표 1. 2020년 35주차 보고 현황(2020. 8. 29. 기준)*

단위 : 보고환자수†

감염병†	금주	2020년 누계	5년간 주별 평균§	연간현황					금주 해외유입현황 : 국가명(신고수)
				2019	2018	2017	2016	2015	
제2급감염병									
결핵	461	13,948	538	23,821	26,433	28,161	30,892	32,181	
수두	296	25,054	684	82,868	96,467	80,092	54,060	46,330	
홍역	0	7	0	194	15	7	18	7	
콜레라	0	0	0	1	2	5	4	0	
장티푸스	10	85	3	94	213	128	121	121	
파라티푸스	14	114	2	55	47	73	56	44	
세균성이질	1	47	3	151	191	112	113	88	
장출혈성대장균감염증	13	310	3	146	121	138	104	71	
A형간염	51	2,458	148	17,598	2,437	4,419	4,679	1,804	
백일해	0	116	11	496	980	318	129	205	
유행성이하선염	151	7,494	286	15,967	19,237	16,924	17,057	23,448	
풍진	0	2	0	8	0	7	11	11	
수막구균 감염증	0	6	0	16	14	17	6	6	
폐렴구균 감염증	1	263	3	526	670	523	441	228	
한센병	0	3	0	4					
성홍열	18	2,079	150	7,562	15,777	22,838	11,911	7,002	
반코마이신내성황색 포도알균(VRSA) 감염증	0	2	–	3	0	0	–	–	
카바페넴내성장내세균 속균종(CRE) 감염증	180	10,697	–	15,369	11,954	5,717	–	–	
E형간염	6	56	–	–	–	–	–	–	
제3급감염병									
파상풍	0	23	1	31	31	34	24	22	
B형간염	4	228	5	389	392	391	359	155	
일본뇌염	0	0	1	34	17	9	28	40	
C형간염	103	7,790	193	9,810	10,811	6,396	–	–	
말라리아	6	313	22	559	576	515	673	699	
레지오넬라증	7	246	5	501	305	198	128	45	
비브리오패혈증	8	39	3	42	47	46	56	37	
발진열	0	11	0	14	16	18	18	15	
쯔쯔가무시증	10	440	34	4,005	6,668	10,528	11,105	9,513	
렙토스피라증	3	56	3	138	118	103	117	104	
브루셀라증	0	5	0	1	5	6	4	5	
신증후군출혈열	2	110	6	399	433	531	575	384	
후천성면역결핍증(AIDS)	15	506	21	1,005	989	1,008	1,060	1,018	
크로이츠펠트–야콥병(CJD)	0	41	1	53	53	36	42	33	
뎅기열	0	43	9	273	159	171	313	255	
큐열	1	58	2	162	163	96	81	27	
라임병	0	6	1	23	23	31	27	9	
유비저	0	1	0	8	2	2	4	4	
치쿤구니야열	0	0	0	16	3	5	10	2	
중증열성혈소판감소 증후군(SFTS)	5	130	6	223	259	272	165	79	
지카바이러스감염증	0	0	–	3	3	11	16	–	

* 2020년 통계는 변동가능한 잠정통계이며, 2020년 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(2015~2019년)의 해당 주의 신고 건수와 이전 2주, 이후 2주 동안의 신고 건수(총 29주) 평균임

표 2. 지역별 보고 현황(2020. 8. 29. 기준)(35주차)*

단위 : 보고환자수†

지역	제2급감염병											
	결핵			수두			홍역			콜레라		
	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡
전국	461	13,948	19,403	296	25,054	44,943	0	7	41	0	0	0
서울	83	2,445	3,552	14	2,903	4,946	0	2	6	0	0	0
부산	28	925	1,362	29	1,375	2,580	0	0	2	0	0	0
대구	22	668	911	12	1,243	2,426	0	0	2	0	0	0
인천	28	736	1,020	15	1,274	2,224	0	0	2	0	0	0
광주	8	356	481	13	1,176	1,452	0	0	0	0	0	0
대전	8	303	429	11	803	1,219	0	0	5	0	0	0
울산	7	256	405	5	514	1,406	0	0	1	0	0	0
세종	3	56	60	5	214	12,646	0	0	14	0	0	0
경기	97	2,959	4,162	87	6,483	1,227	0	3	1	0	0	0
강원	14	590	822	9	741	1,139	0	0	0	0	0	0
충북	24	417	593	9	952	1,650	0	0	1	0	0	0
충남	21	723	903	9	894	1,886	0	0	1	0	0	0
전북	24	578	753	8	989	1,863	0	0	2	0	0	0
전남	23	735	1,017	12	977	2,391	0	1	2	0	0	0
경북	39	1,070	1,408	19	1,377	4,238	0	0	2	0	0	0
경남	25	942	1,284	27	2,554	1,194	0	1	0	0	0	0
제주	7	189	241	12	585	456	0	0	0	0	0	0

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‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2020. 8. 29. 기준)(35주차)***

단위 : 보고환자수†

지역	제2급감염병											
	장티푸스			파라티푸스			세균성이질			장출혈성대장균감염증		
	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†
전국	10	85	104	14	114	37	1	47	92	13	310	83
서울	0	9	21	0	10	7	0	9	23	0	23	12
부산	0	6	9	2	38	5	0	4	5	1	8	3
대구	1	4	3	5	15	2	0	0	5	0	5	3
인천	1	9	6	0	2	2	0	4	8	2	10	7
광주	1	3	1	2	3	2	0	3	3	0	16	12
대전	0	2	5	0	0	1	0	1	2	0	7	1
울산	0	1	3	0	0	0	0	2	1	0	8	3
세종	0	0	23	0	0	7	0	0	17	0	1	14
경기	4	25	2	1	16	2	0	15	2	1	142	4
강원	1	3	3	0	5	1	0	0	2	0	5	3
충북	0	0	5	0	1	0	0	0	6	0	3	3
충남	0	4	2	0	3	2	1	3	2	3	8	2
전북	0	1	4	1	2	2	0	0	4	0	3	5
전남	0	3	4	2	10	1	0	2	5	1	17	4
경북	0	3	9	0	2	2	0	1	6	2	18	3
경남	2	11	3	1	6	1	0	3	1	2	23	3
제주	0	1	1	0	1	0	0	0	0	1	13	1

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‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2020. 8. 29. 기준)(35주차)***

단위 : 보고환자수†

지역	제2급감염병											
	A형간염			백일해			유행성이하선염			풍진		
	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†
전국	51	2,458	4,707	0	116	262	151	7,494	12,960	0	2	3
서울	4	445	889	0	14	32	5	912	1,330	0	0	1
부산	1	69	181	0	6	25	12	403	814	0	1	0
대구	2	60	73	0	5	7	4	293	450	0	0	0
인천	6	255	321	0	5	16	4	378	570	0	0	0
광주	3	51	78	0	10	12	11	288	686	0	0	0
대전	1	101	484	0	7	5	2	201	313	0	0	0
울산	0	28	33	0	2	7	10	210	438	0	0	0
세종	0	14	1,435	0	0	40	1	45	3,358	0	0	1
경기	16	805	84	0	17	3	37	2,217	401	0	1	0
강원	1	67	229	0	0	7	2	239	286	0	0	0
충북	5	95	355	0	0	5	2	232	497	0	0	0
충남	4	137	165	0	4	5	12	344	857	0	0	0
전북	4	141	97	0	2	11	9	327	622	0	0	1
전남	3	42	81	0	20	18	4	291	642	0	0	0
경북	0	74	101	0	9	61	10	362	1,473	0	0	0
경남	1	56	23	0	14	4	20	622	171	0	0	0
제주	0	18	78	0	1	4	6	130	52	0	0	0

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‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2020. 8. 29. 기준)(35주차)***

단위 : 보고환자수†

지역	제2급감염병						제3급감염병					
	수막구균 감염증			성홍열			파상풍			B형간염		
	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡
전국	0	6	9	18	2,079	9,161	0	23	20	4	228	226
서울	0	1	2	1	287	1,215	0	2	2	0	38	39
부산	0	1	1	1	124	651	0	2	2	0	11	16
대구	0	0	1	0	42	332	0	1	1	0	7	7
인천	0	1	1	3	109	426	0	0	0	0	15	12
광주	0	0	0	0	234	430	0	1	1	0	4	5
대전	0	0	0	1	82	344	0	0	1	0	11	9
울산	0	0	0	0	77	406	0	0	0	0	6	5
세종	0	0	2	0	11	2,670	0	1	2	0	2	54
경기	0	2	1	3	541	145	0	2	1	0	60	7
강원	0	0	0	3	43	163	0	1	0	0	6	8
충북	0	0	0	0	24	408	0	2	1	0	5	13
충남	0	0	0	1	69	308	0	6	1	2	10	12
전북	0	0	0	0	55	350	0	3	3	0	10	11
전남	0	0	0	0	90	468	0	1	3	1	10	13
경북	0	1	1	1	78	696	0	1	2	0	9	13
경남	0	0	0	2	160	100	0	0	0	0	22	2
제주	0	0	0	2	53	49	0	0	0	1	2	0

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‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2020. 8. 29. 기준)(35주차)***

단위 : 보고환자수†

지역	제3급감염병											
	일본뇌염			말라리아			레지오넬라증			비브리오패혈증		
	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†
전국	0	0	2	6	313	477	7	246	142	8	39	20
서울	0	0	1	0	49	64	0	61	40	0	5	3
부산	0	0	0	0	2	5	0	13	8	1	5	1
대구	0	0	1	0	3	6	0	7	5	0	0	0
인천	0	0	0	1	41	69	2	14	12	0	0	2
광주	0	0	0	0	4	4	0	7	2	0	0	0
대전	0	0	0	0	3	3	2	6	1	0	0	0
울산	0	0	0	0	3	3	1	2	2	0	0	1
세종	0	0	0	0	0	276	0	0	32	0	0	3
경기	0	0	0	4	179	15	1	61	6	1	4	0
강원	0	0	0	0	12	4	0	4	6	0	1	0
충북	0	0	0	0	4	6	0	14	5	0	0	1
충남	0	0	0	1	5	3	0	4	3	2	8	1
전북	0	0	0	0	2	3	0	8	4	1	2	4
전남	0	0	0	0	1	5	0	11	10	3	8	0
경북	0	0	0	0	2	7	0	10	4	0	1	3
경남	0	0	0	0	3	3	0	10	2	0	5	1
제주	0	0	0	0	0	1	1	14	0	0	0	0

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‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2020. 8. 29. 기준)(35주차)***

단위 : 보고환자수†

지역	제3급감염병											
	발진열			쯔쯔가무시증			렙토스피라증			브루셀라증		
	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡
전국	0	11	8	10	440	823	3	56	40	0	5	1
서울	0	1	1	0	6	38	0	1	2	0	1	1
부산	0	0	1	0	22	29	0	3	2	0	0	0
대구	0	1	0	0	1	7	1	2	0	0	0	0
인천	0	7	1	0	6	15	0	2	0	0	0	0
광주	0	0	1	0	4	18	0	0	1	0	0	0
대전	0	0	0	0	11	20	0	3	1	0	0	0
울산	0	0	0	0	11	18	0	0	1	0	0	0
세종	0	0	1	0	4	79	0	3	7	0	0	0
경기	0	2	0	1	33	22	0	7	3	0	0	0
강원	0	0	0	0	4	15	1	2	2	0	0	0
충북	0	0	1	0	6	81	1	5	6	0	0	0
충남	0	0	0	2	48	76	0	7	3	0	0	0
전북	0	0	1	0	61	201	0	7	5	0	3	0
전남	0	0	0	4	117	54	0	8	3	0	1	0
경북	0	0	1	1	14	138	0	4	3	0	0	0
경남	0	0	0	1	80	9	0	2	1	0	0	0
제주	0	0	0	1	12	3	0	0	0	0	0	0

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‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2020. 8. 29. 기준)(35주차)***

단위 : 보고환자수†

지역	제3급감염병											
	신증후군출혈열			크로이츠펠트-야콥병(CJD)			뎅기열			큐열		
	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†	금주	2020년 누계	5년 누계 평균†
전국	2	110	192	0	41	31	0	43	146	1	58	72
서울	0	4	8	0	9	8	0	14	47	0	1	4
부산	0	0	6	0	5	2	0	5	9	0	1	1
대구	0	2	2	0	3	1	0	2	8	0	0	2
인천	0	2	3	0	3	1	0	2	7	0	1	1
광주	0	1	2	0	2	0	0	0	1	1	2	3
대전	0	1	3	0	1	1	0	0	3	0	2	2
울산	0	0	1	0	2	0	0	1	3	0	0	2
세종	0	0	49	0	0	7	0	0	40	0	0	9
경기	1	17	8	0	7	2	0	13	3	0	10	0
강원	0	11	12	0	0	1	0	0	2	0	0	17
충북	0	6	22	0	0	1	0	0	4	0	10	9
충남	0	7	17	0	1	1	0	2	3	0	9	4
전북	0	21	29	0	2	1	0	0	3	0	4	8
전남	1	21	19	0	1	3	0	1	4	0	14	4
경북	0	11	10	0	2	2	0	1	7	0	0	6
경남	0	3	1	0	3	0	0	1	2	0	4	0
제주	0	3	0	0	0	0	0	1	0	0	0	0

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† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

표 2. *(계속)* **지역별 보고 현황(2020. 8. 29. 기준)(35주차)***

단위 : 보고환자수†

지역	제3급감염병								
	라임병			중증열성혈소판감소증후군(SFTS)			지카바이러스감염증		
	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡	금주	2020년 누계	5년 누계 평균‡
전국	0	6	11	5	130	107	0	0	–
서울	0	3	5	0	3	3	0	0	–
부산	0	0	0	0	0	1	0	0	–
대구	0	0	0	0	10	2	0	0	–
인천	0	0	1	0	3	1	0	0	–
광주	0	0	0	0	0	0	0	0	–
대전	0	0	0	0	1	2	0	0	–
울산	0	0	0	0	5	2	0	0	–
세종	0	0	2	0	1	14	0	0	–
경기	0	0	0	0	16	15	0	0	–
강원	0	2	0	0	16	2	0	0	–
충북	0	0	1	0	2	12	0	0	–
충남	0	1	1	1	11	6	0	0	–
전북	0	0	0	1	8	10	0	0	–
전남	0	0	1	0	6	16	0	0	–
경북	0	0	0	2	18	12	0	0	–
경남	0	0	0	0	21	9	0	0	–
제주	0	0	0	1	9	0	0	0	–

* 2020년 통계는 변동가능한 잠정통계임
† 각 감염병별로 규정된 신고범위(환자, 의사환자, 병원체보유자)의 모든 신고건을 포함함
‡ 최근 5년(2015~2019년)의 1주부터 해당 주까지 누계의 평균임

1.2 환자감시 : 표본감시 감염병 주간 발생 현황 (35주차)

1. 인플루엔자 주간 발생 현황(35주차, 2020. 8. 29. 기준)

- 2020년도 제35주 인플루엔자 표본감시(전국 200개 표본감시기관) 결과, 의사환자분율은 외래환자 1,000명당 2.0명으로 지난주(2.1명) 대비 감소

※ 2019-2020절기 유행기준은 잠정치 5.9명(/1,000)

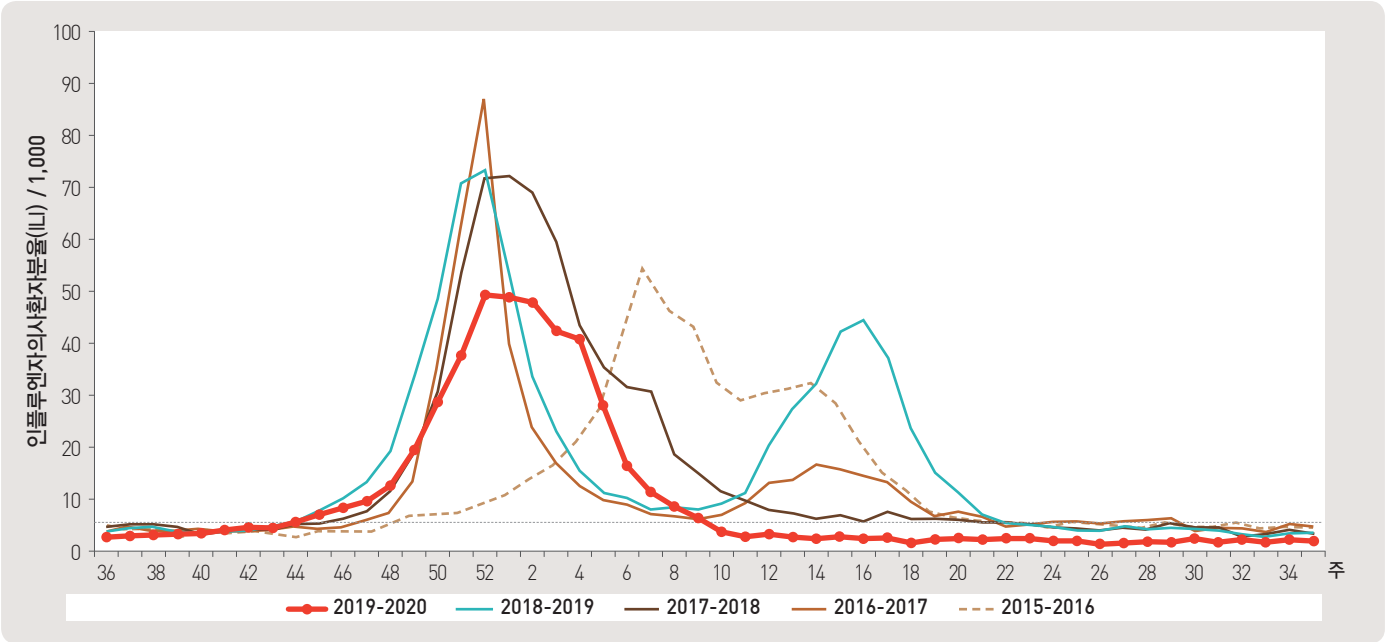


그림 1. 외래 환자 1,000명당 인플루엔자 의사환자 발생 현황

2. 수족구 발생 주간 현황(35주차, 2020. 8. 29. 기준)

- 2020년도 제35주차 수족구병 표본감시(전국 97개 의료기관) 결과, 의사환자 분율은 외래환자 1,000명당 1.2명으로 전주(1.1명) 대비 증가

※ 수족구병은 2009년 6월 법정감염병으로 지정되어 표본감시체계로 운영

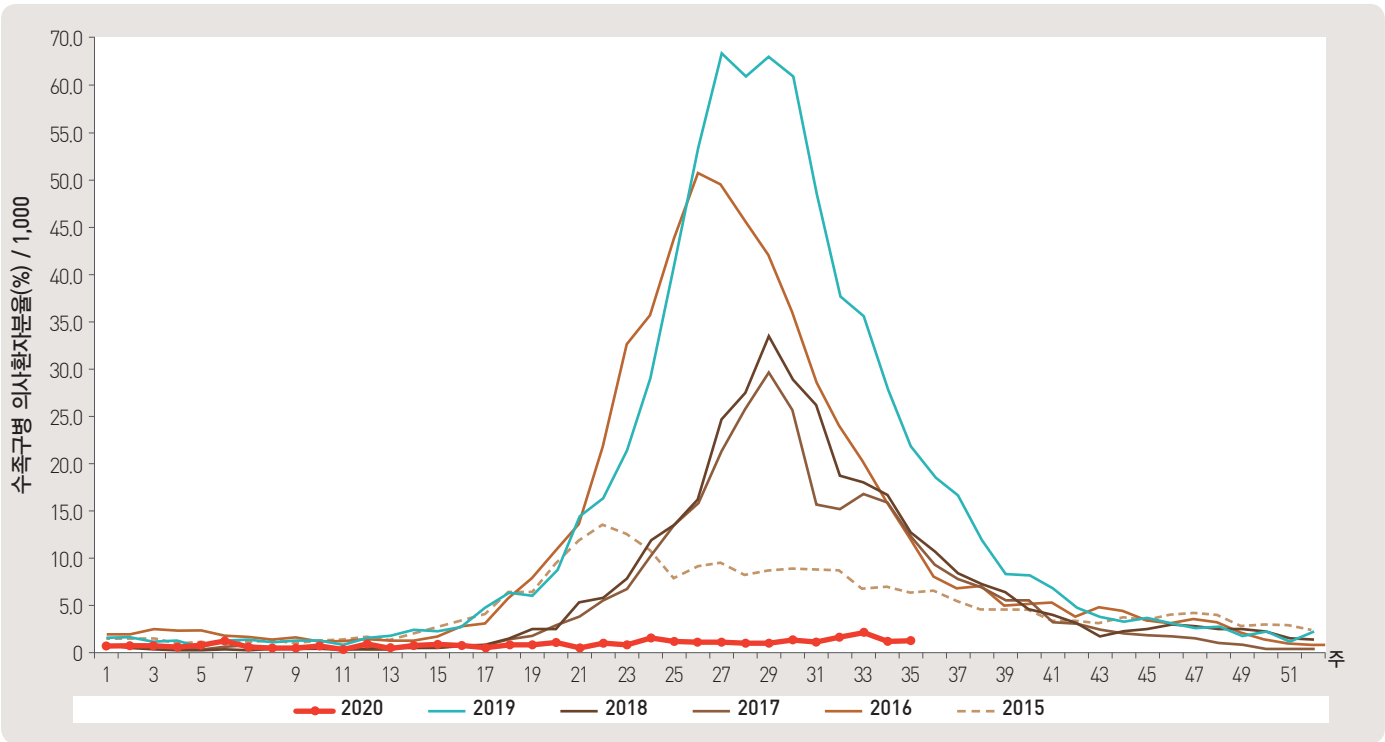


그림 2. 외래 환자 1,000명당 수족구 발생 현황

3. 안과 감염병 주간 발생 현황(35주차, 2020. 8. 29. 기준)

- 2020년도 제35주차 유행성각결막염 표본감시(전국 90개 의료기관) 결과, 외래환자 1,000명당 분율은 10.6명으로 전주 9.2명 대비 증가
- 동기간 급성출혈성결막염의 환자 분율은 0.5명으로 전주 0.7명 대비 감소

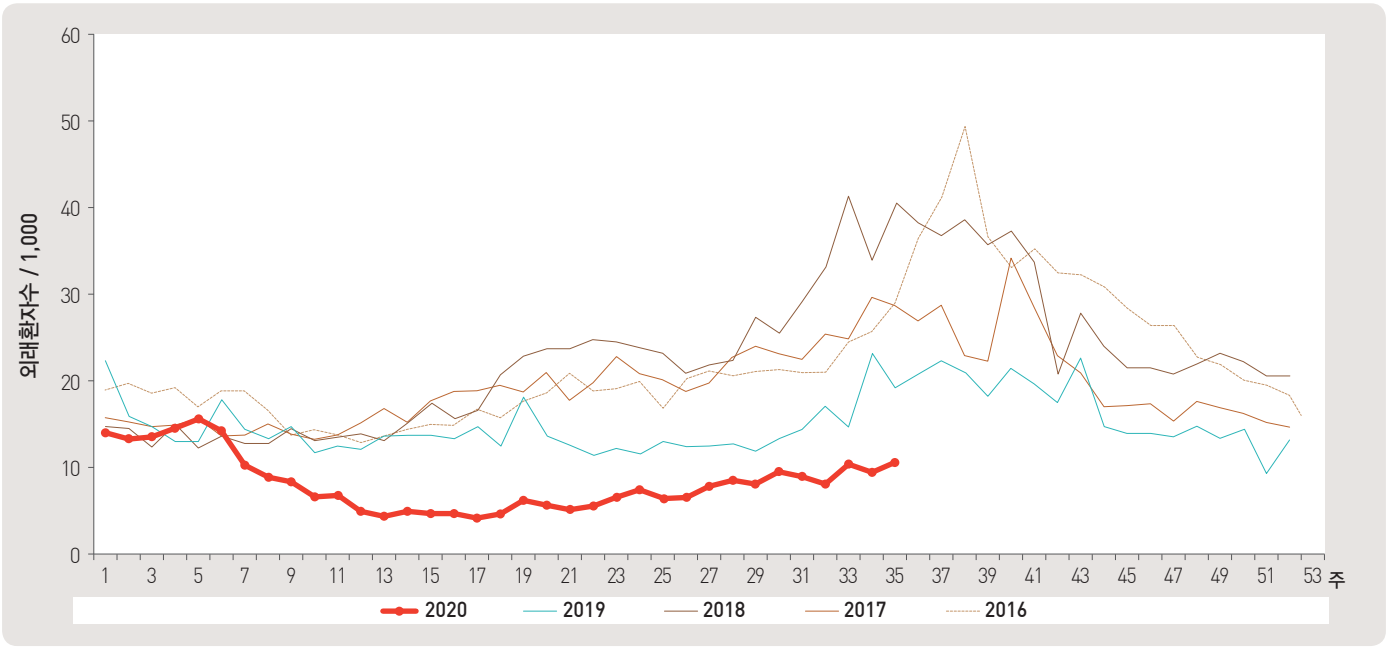


그림 3. 외래 환자 1,000명당 유행성각결막염 발생 현황

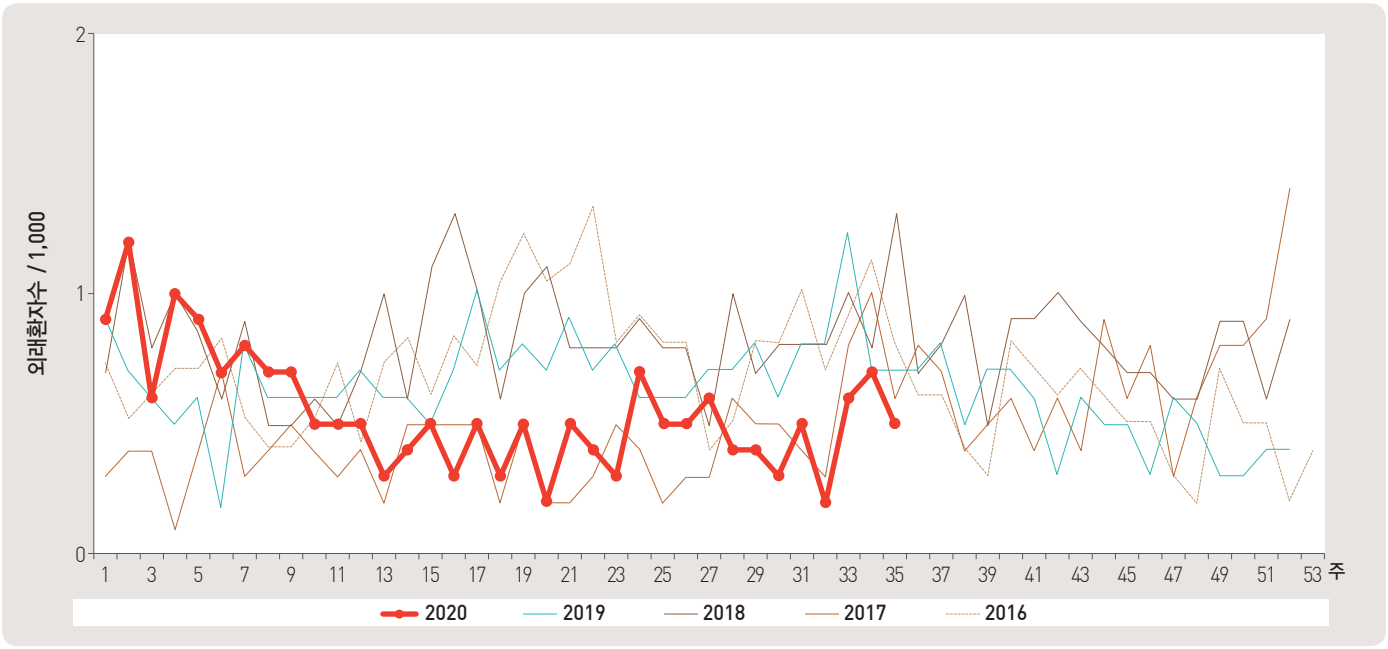


그림 4. 외래 환자 1,000명당 급성출혈성결막염 발생 현황

4. 성매개감염병 주간 발생 현황(35주차, 2020. 8. 29. 기준)

• 2020년도 제35주 성매개감염병 표본감시기관(전국 보건소 및 의료기관 590개 참여)에서 신고기관 당 첨규콘딜롬 4.7건, 사람유두종바이러스 감염증 3.2건, 성기단순포진 2.3건, 클라미디아감염증 1.7건, 임질 1.3건, 1기 매독 0.0건, 2기 매독 0.0건, 선천성 매독 0.0건 발생을 신고함.

* 제35주차 신고의료기관 수 : 임질 6개, 클라미디아감염증 17개, 성기단순포진 18개, 첨규콘딜롬 11개, 사람유두종바이러스 감염증 13개, 1기 매독 0개, 2기 매독 0개, 선천성 매독 0개
** 2020.1.1. 일부터 사람유두종바이러스 감염증이 표본감시에 신설되었으며, 매독이 전수감시에서 표본감시로 변경됨

단위 : 신고수/신고기관 수

임질			클라미디아 감염증			성기단순포진			첨규콘딜롬		
금주	2020년 누적	최근 5년 누적 평균§	금주	2020년 누적	최근 5년 누적 평균§	금주	2020년 누적	최근 5년 누적 평균§	금주	2020년 누적	최근 5년 누적 평균§
1.3	7.7	9.9	1.7	22.4	31.4	2.3	32.4	40.1	4.7	19.6	23.0

사람유두종바이러스감염증			매독								
			1기			2기			선천성		
금주	2020년 누적	최근 5년 누적 평균§	금주	2020년 누적	최근 5년 누적 평균§	금주	2020년 누적	최근 5년 누적 평균§	금주	2020년 누적	최근 5년 누적 평균§
3.2	61.0	61.0	0.0	3.2	3.2	0.0	3.7	3.7	0.0	1.5	1.5

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

1.3 수인성 및 식품매개 감염병 집단발생 주간 현황 (35주차)

▣ 수인성 및 식품매개 감염병 집단발생 주간 현황(35주차, 2020. 8. 29. 기준)

• 2020년도 제35주에 집단발생이 1건(사례수 9명)이 발생하였으며 누적발생건수는 154건(사례수 1,937명)이 발생함.

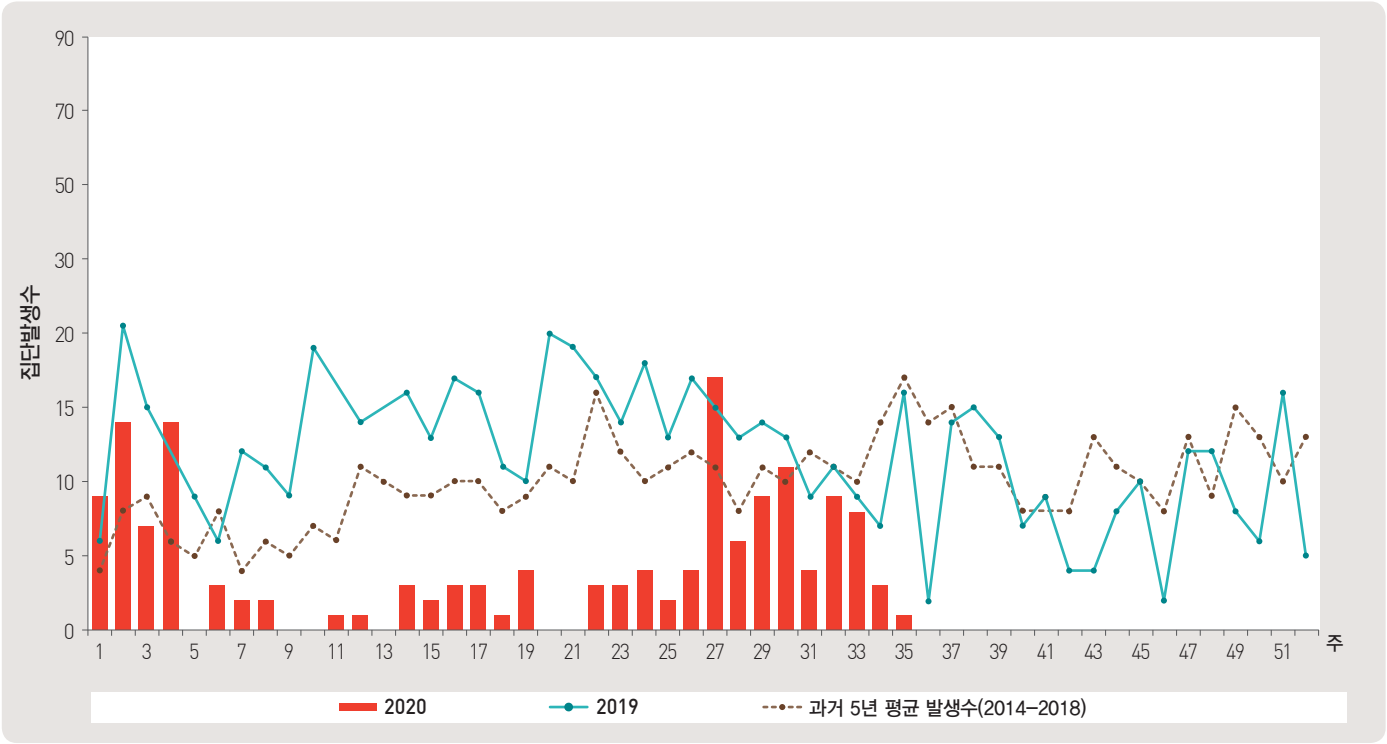


그림 5. 수인성 및 식품매개 감염병 집단발생 현황

2.1 병원체감시 : 인플루엔자 및 호흡기바이러스 주간 감시 현황(35주차)

1. 인플루엔자 바이러스 주간 현황(35주차, 2020. 8. 29. 기준)

- 2020년도 제35주에 전국 52개 감시사업 참여의료기관에서 의뢰된 호흡기검체 71건 중 양성 없음.

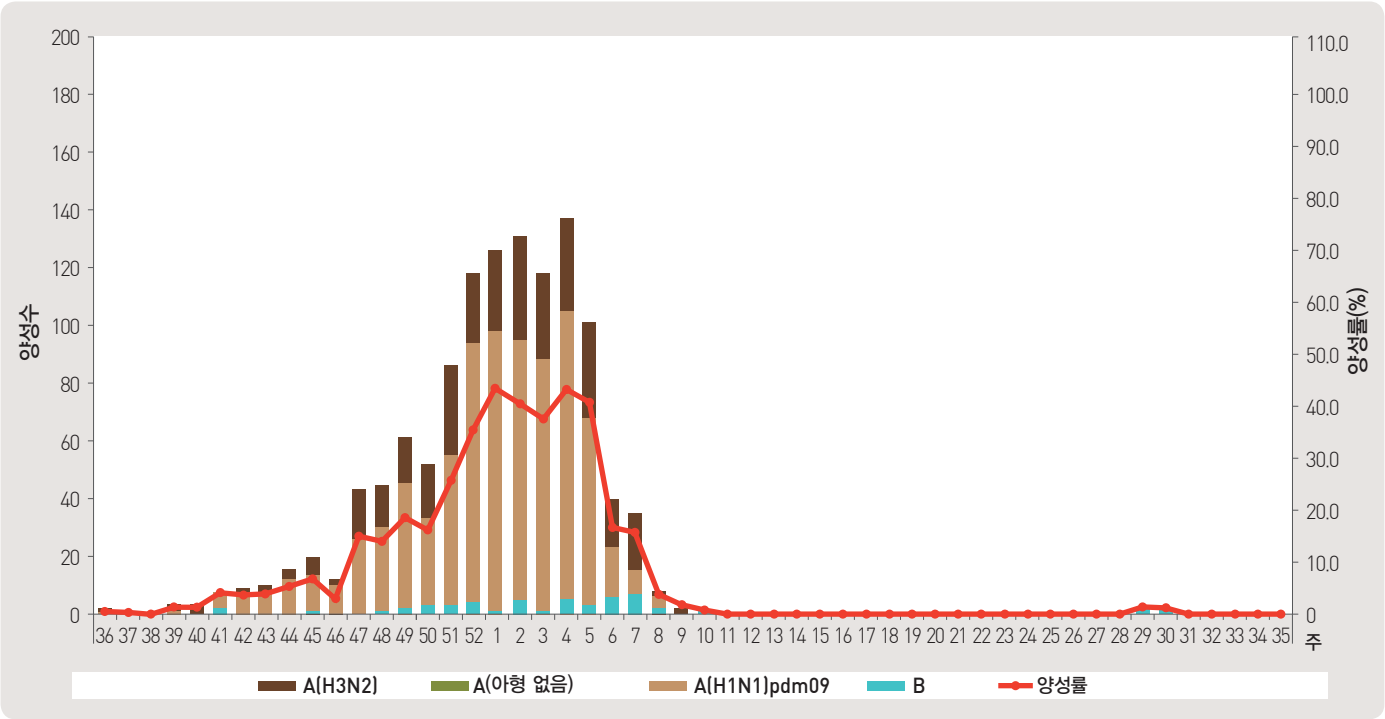


그림 6. 인플루엔자 바이러스 검출 현황

2. 호흡기 바이러스 주간 현황(35주차, 2020. 8. 29. 기준)

- 2020년도 제35주 호흡기 검체에 대한 유전자 검사결과 49.3%의 호흡기 바이러스가 검출되었음.
  (최근 4주 평균 66개의 호흡기 검체에 대한 유전자 검사결과를 나타내고 있음)

※ 주별통계는 잠정통계이므로 변동가능

2020 (주)	주별		검출률 (%)							
	검체 건수	검출률 (%)	아데노 바이러스	파라 인플루엔자 바이러스	호흡기 세포융합 바이러스	인플루엔자 바이러스	코로나 바이러스	리노 바이러스	보카 바이러스	메타뉴모 바이러스
32	65	41.5	3.1	0.0	1.5	0.0	0.0	35.4	1.5	0.0
33	73	42.5	4.1	0.0	0.0	0.0	0.0	31.5	6.8	0.0
34	56	39.3	8.9	0.0	0.0	0.0	0.0	30.4	0.0	0.0
35	71	49.3	2.8	0.0	1.4	0.0	0.0	40.8	4.2	0.0
Cum.※	265	43.4	4.5	0.0	0.8	0.0	0.0	34.7	3.4	0.0
2019 Cum.∀	12,151	60.2	8.0	6.4	3.9	14.0	2.9	17.2	2.8	5.0

※ 4주 누적 : 2020년 8월 2일 – 2020년 8월 29일 검출률임 (지난 4주간 평균 66개의 검체에서 검출된 수의 평균).
∀ 2019년 누적 : 2018년 12월 30일 – 2019년 12월 28일 검출률임.

▶ 자세히 보기 : 질병관리본부 → 질병·건강 → 주간 질병감시정보

2.2 병원체감시 : 급성설사질환 바이러스 및 세균 주간 감시 현황 (34주차)

▣ 급성설사질환 바이러스 및 세균 주간 검출 현황(34주차, 2020. 8. 22. 기준)

- 2019년도 제34주 실험실 표본감시(17개 시·도 보건환경연구원 및 70개 의료기관) 급성설사질환 유발 바이러스 검출 건수는 2건(7.4%), 세균 검출 건수는 22건(23.4%) 이었음.

◆ 급성설사질환 바이러스

주		검체수	검출 건수(검출률, %)					
			노로바이러스	그룹 A 로타바이러스	장내 아데노바이러스	아스트로바이러스	사포바이러스	합계
2020	31	52	4 (7.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (8.3)
	32	47	1 (2.1)	1 (2.1)	1 (2.1)	0 (0.0)	0 (0.0)	3 (6.4)
	33	48	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	34	27	2 (7.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (7.4)
2020년 누적		1,467	214 (14.6)	33 (2.2)	13 (0.9)	15 (1.0)	4 (0.3)	279 (19.0)

* 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
2020	31	174	3 (1.7)	11 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)	7 (4.0)	2 (1.1)	0 (0.0)	3 (1.7)	26 (14.9)
	32	207	4 (1.9)	18 (8.7)	0 (0.0)	0 (0.0)	0 (0.0)	7 (3.4)	8 (3.9)	2 (1.0)	5 (2.4)	44 (21.3)
	33	197	6 (3.0)	15 (7.6)	0 (0.0)	0 (0.0)	0 (0.0)	5 (2.5)	5 (2.5)	3 (1.5)	3 (1.5)	37 (18.8)
	34	94	3 (3.2)	12 (12.8)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.1)	3 (3.2)	0 (0.0)	2 (2.1)	22 (23.4)
2020년 누적		6,274	157 (2.5)	269 (4.3)	2 (0.03)	2 (0.03)	0 (0.0)	133 (2.1)	152 (2.4)	96 (1.5)	124 (2.0)	951 (15.2)

* 2020년 실험실 감시체계 참여기관(69개 의료기관)

▶ 자세히 보기 : 질병관리본부 → 질병·건강 → 주간 질병감시정보

2.3 병원체감시 : 엔테로바이러스 주간 감시 현황 (34주차)

▣ 엔테로바이러스 주간 검출 현황(34주차, 2020. 8. 22. 기준)

- 2020년도 제34주 실험실 표본감시(17개 시·도 보건환경연구원, 전국 59개 참여병원) 결과, 엔테로바이러스 검출률 0.0%(0건 양성/9검체), 2020년 누적 양성률 4.5%(15건 양성/336검체)임.

  – 무균성수막염 0건(2020년 누적 4건), 수족구병 및 포진성구협염 0건(2020년 누적 4건), 합병증 동반 수족구 0건(2020년 누적 0건), 기타 0건(2020년 누적 7건)임.

◆ 무균성수막염

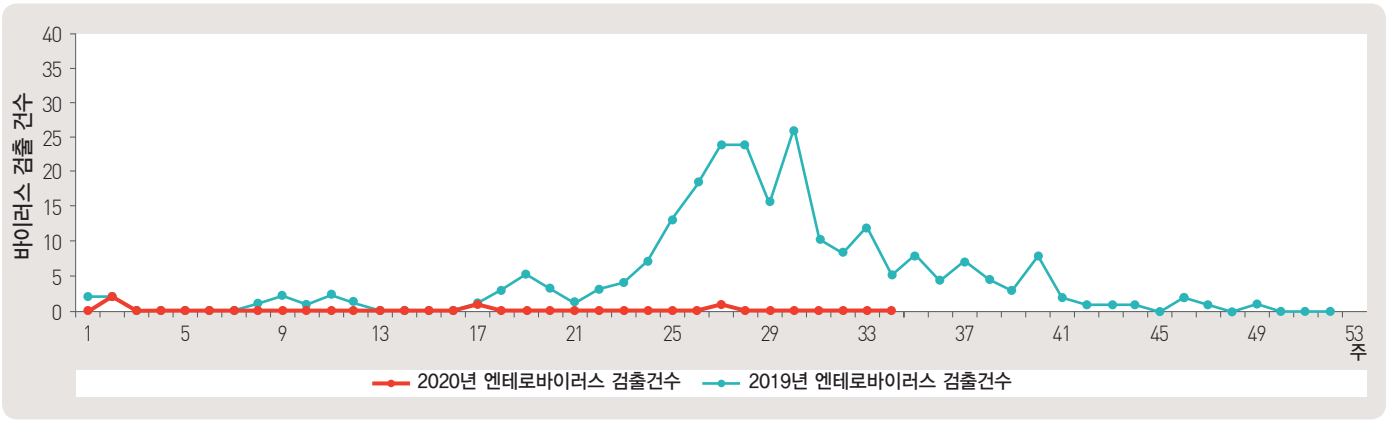


그림 7. 무균성수막염 바이러스 검출수

◆ 수족구병 및 포진성구협염

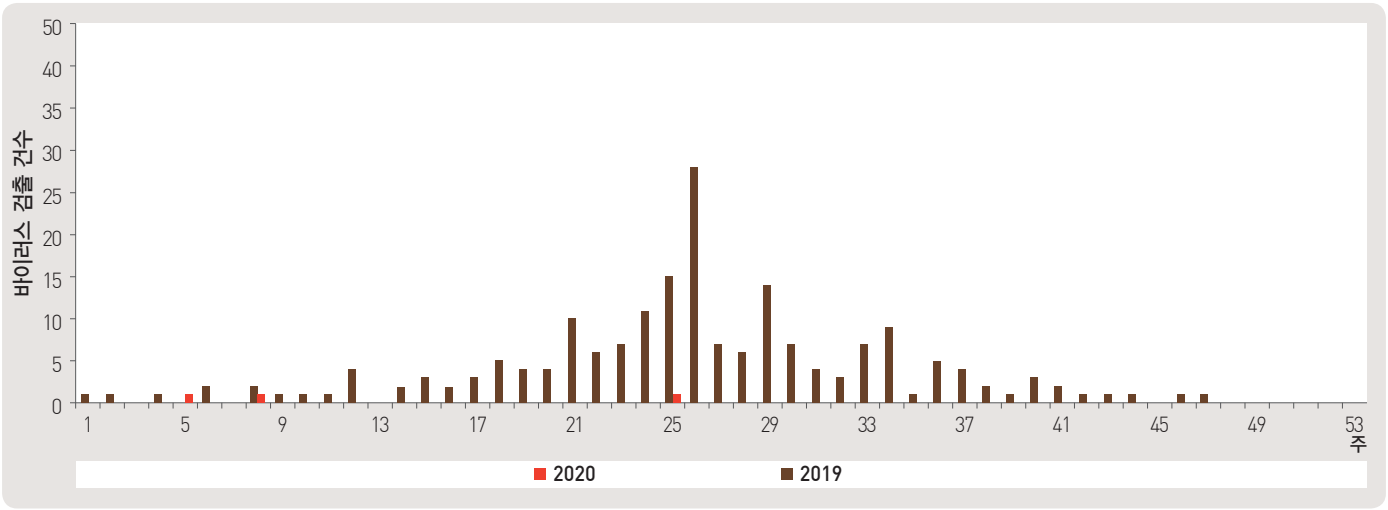


그림 8. 수족구 및 포진성구협염 바이러스 검출수

◆ 합병증 동반 수족구

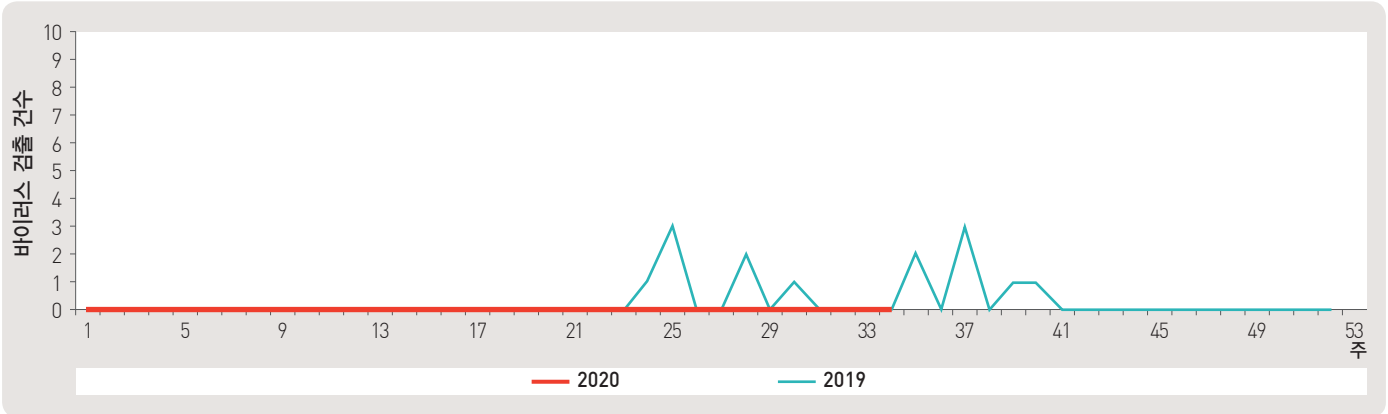


그림 9. 합병증 동반 수족구 바이러스 검출수

3.1 매개체감시 / 말라리아 매개모기 주간 감시현황 (34주차)

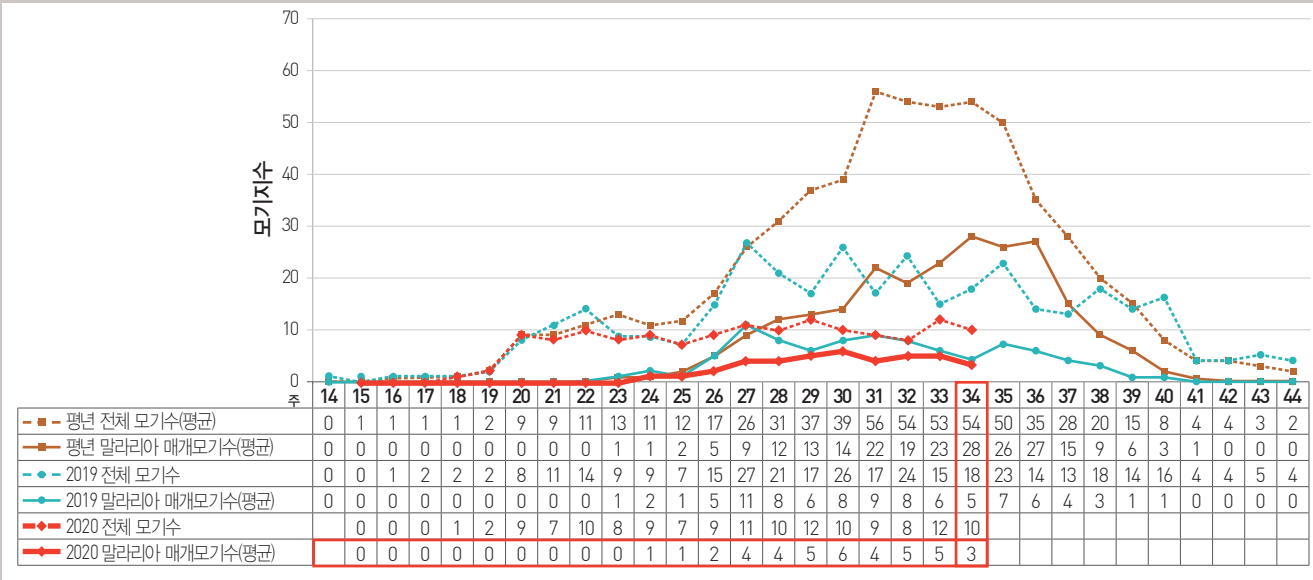
▣ 말라리아 매개모기 주간 검출 현황(34주차, 2020. 8. 22. 기준)

- 2020년도 제34주 말라리아 매개모기 주간 발생현황(3개 시·도, 총 51개 채집지점)
  - 전체모기 : 평균 10개체로 평년 54개체 대비 44개체(81.5%) 감소, 전년 18개체 대비 8개체(44.4%) 감소
  - 말라리아 매개모기 : 평균 3개체로 평년 28개체 대비 25개체(89.3%) 감소, 전년 5개체 대비 2개체(40.0%) 감소

※ 모기수 산출법 : 1주일간 유문등에 채집된 모기의 평균수(개체수/트랩/일)

(사유: 파주 4개지점- 보건소의 현안업무대응(코로나-19)으로 인해 채집모기를 보건환경연구원으로 미송부, 연천 군부대1- 채집기 고장으로 인한 미채집, 연천 군부대2- 채집담당자의 코로나-19관련 격리로 미채집)

※ 누락된 파주 34주차 채집 결과는 추후 보고자료에 추가하여 작성 후 보고예정



주	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 모기수(평균)	0	1	1	1	1	2	9	9	11	13	11	12	17	26	31	37	39	56	54	53	54	50	35	28	20	15	8	4	4	3	2
평년 말라리아 매개모기수(평균)	0	0	0	0	0	0	0	0	0	1	1	2	5	9	12	13	14	22	19	23	28	26	27	15	9	6	3	1	0	0	0
2019 전체 모기수	0	0	1	2	2	2	8	11	14	9	9	7	15	27	21	17	26	17	24	15	18	23	14	13	18	14	16	4	4	5	4
2019 말라리아 매개모기수(평균)	0	0	0	0	0	0	0	0	0	1	2	1	5	11	8	6	8	9	8	6	5	7	6	4	3	1	1	0	0	0	0
2020 전체 모기수		0	0	0	1	2	9	7	10	8	9	7	9	11	10	12	10	9	8	12	10										
2020 말라리아 매개모기수(평균)		0	0	0	0	0	0	0	0	0	1	1	2	4	4	5	6	4	5	5	3										

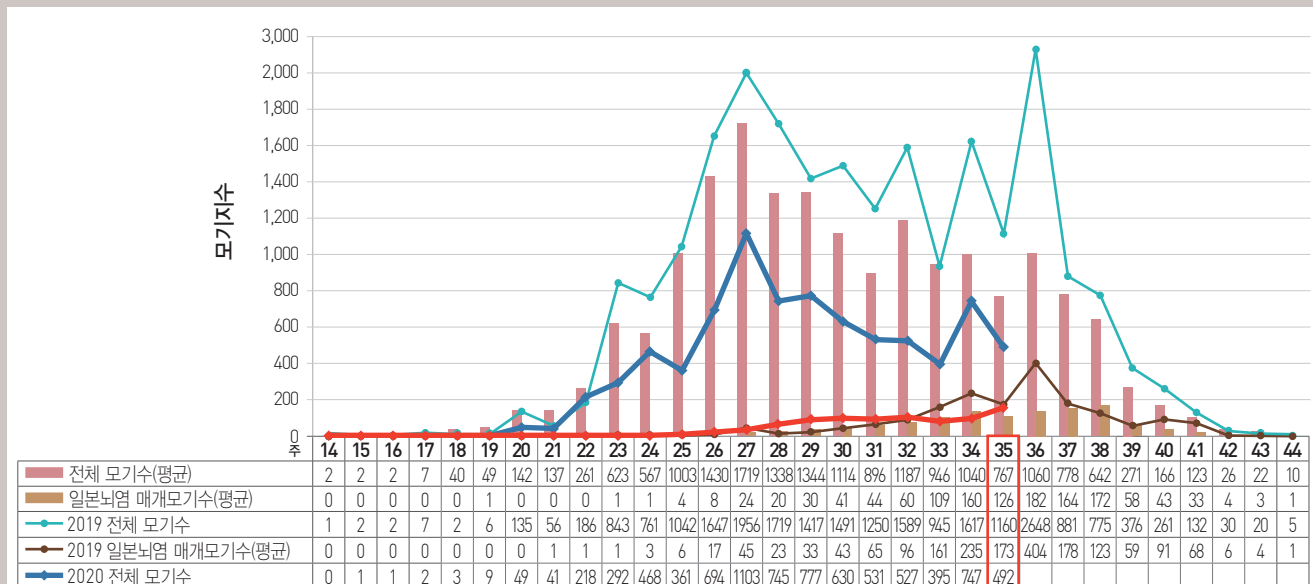
그림 10. 말라리아 매개모기 검출수

3.2 매개체감시 / 일본뇌염 매개모기 주간 감시현황 (35주차)

▣ 일본뇌염 매개모기 주간 검출 현황(35주차, 2020. 8. 29. 기준)

- 2020년 제35주 일본뇌염 매개모기 주간 발생현황 : 9개 시·도 보건환경연구원(총 9개 지점)
  - 전체모기 수 : 평균 492개체로 평년 767개체 대비 275개체(35.9%) 감소, 전년 1,160개체 대비 668개체(57.6%) 감소
  - 일본뇌염 매개모기(Japanese encephalitis vector, JEV) : 평균 157개체로 평년 126개체 대비 31개체(24.6%) 증가, 전년 173개체 대비 16개체(9.2%) 감소

※ 모기수 산출법 : 주 2회 유문등에 채집된 모기의 평균수(개체수/트랩/일)



주	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
전체 모기수(평균)	2	2	2	7	40	49	142	137	261	623	567	1003	1430	1719	1338	1344	1114	896	1187	946	1040	767	1060	778	642	271	166	123	26	22	10
일본뇌염 매개모기수(평균)	0	0	0	0	0	1	0	0	0	1	1	4	8	24	20	30	41	44	60	109	160	126	182	164	172	58	43	33	4	3	1
2019 전체 모기수	1	2	2	7	2	6	135	56	186	843	761	1042	1647	1956	1719	1417	1491	1250	1589	945	1617	1160	2648	881	775	376	261	132	30	20	5
2019 일본뇌염 매개모기수(평균)	0	0	0	0	0	0	0	1	1	1	3	6	17	45	23	33	43	65	96	161	235	173	404	178	123	59	91	68	6	4	1
2020 전체 모기수	0	1	1	2	3	9	49	41	218	292	468	361	694	1103	745	777	630	531	527	395	747	492									
2020 일본뇌염 매개모기수(평균)	0	0	0	1	0	0	1	0	0	0	2	10	24	37	61	92	99	92	107	82	94	157									

그림 11. 일본뇌염 매개모기 검출수

▶ 자세히 보기 : 질병관리본부 → 민원·정보공개 → 사전정보공개

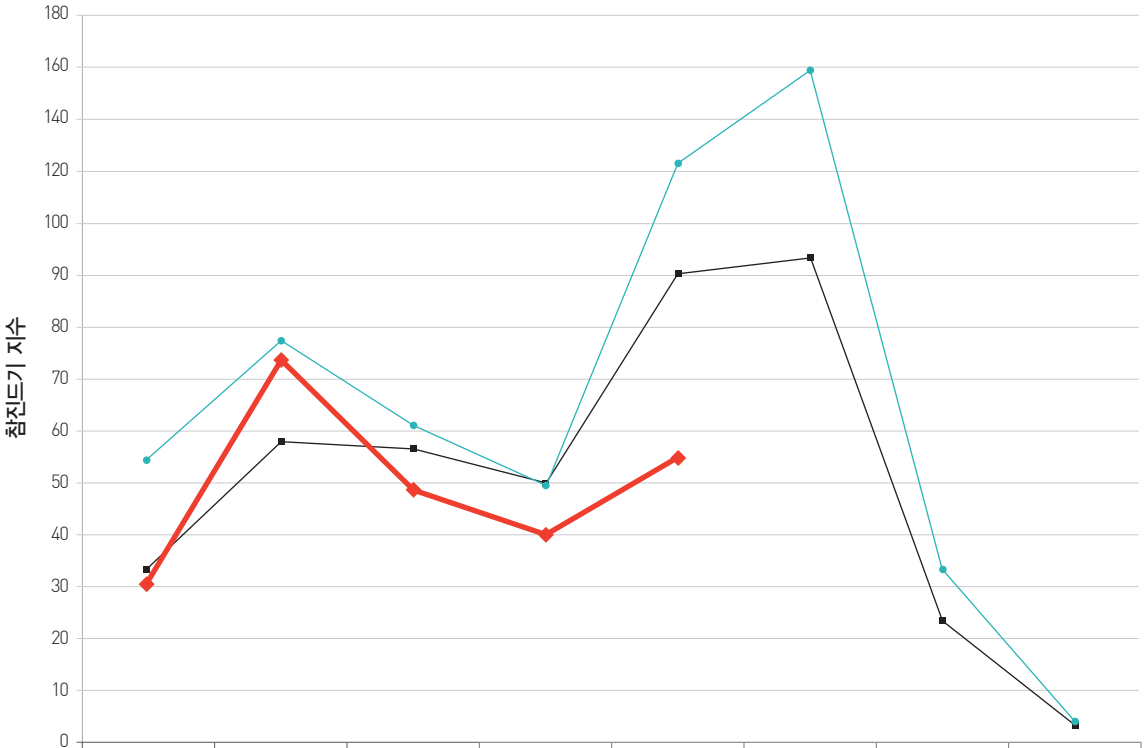
3.3 매개체감시 / 중증열성혈소판감소증후군(SFTS) 매개 참진드기 월간 감시현황 (34주차)

▣ 중증열성혈소판감소증후군 매개 참진드기 월간 발생 현황(34주차, 2020. 8. 22. 기준)

- 2020년 8월 중증열성혈소판감소증후군(SFTS) 매개 참진드기 월간 발생현황 : 11개 시·도(총 16개 지점)
  - SFTS 매개 참진드기 : 참진드기 지수(T.I.)가 55.9로 5년 평균(2015~2019) 동기간(90.4) 대비 38.2% 낮은 수준이며, 전년(2019) 동기간(123.0) 대비 54.6% 낮은 수준임.

*T.I.: Trap index (No. of chigger/trap)

※ 참진드기 산출법 : 1일간 트랩에 채집된 참진드기의 평균수(개체수/트랩/일)



월	4월	5월	6월	7월	8월	9월	10월	11월
2015-2019 참진드기 지수(평균)	33.2	58.0	56.7	49.9	90.4	93.5	23.6	3.1
2019 참진드기 지수	54.4	77.5	61.2	49.5	123.0	158.9	33.5	4.0
2020 참진드기 지수	30.4	74.8	48.7	36.3	55.9			

그림 12. 중증열성혈소판감소증후군 매개 참진드기 발생 수

▶ 자세히 보기 : 질병관리본부 → 민원·정보공개 → 사전정보공개

주요 통계 이해하기

〈통계표 1〉은 지난 5년간 발생한 법정감염병과 2018년 해당 주 발생현황을 비교한 표로, **금주 환자 수(Current week)는 2018년 해당 주의 신고건수**를 나타내며, **2018년 누계 환자수(Cum, 2018)는 2018년 1주부터 해당 주까지의 누계 건수**, 그리고 **5년 주 평균 환자수(5-year weekly average)는 지난 5년(2013-2017년) 해당 주의 신고건수와 이전 2주, 이후 2주의 신고건수(총 29주) 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) 2018년 12주의 5년 주 평균 환자수(5-year weekly average)는 2013년부터 2017년의 10주부터 28주까지의 신고 건수를 총 29주로 나눈 값으로 구해진다.

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

	10주	12주	12주 해당 주	14주	28주
2018년					
2017년	X1	X2	X3	X4	X5
2016년	X6	X7	X8	X9	X10
2015년	X11	X12	X13	X14	X15
2014년	X16	X17	X18	X19	X20
2013년	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 2018년 누계 환자수(Cum, 2018)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(2013-2017년) 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 29, 2020 (35th Week)*

Unit: No. of cases†

Classification of disease ‡	Current week	Cum. 2020	5-year weekly average	Total no. of cases by year					Imported cases of current week : Country (no. of cases)
				2019	2018	2017	2016	2015	
Category Ⅱ									
Tuberculosis	461	13,948	538	23,821	26,433	28,161	30,892	32,181	
Varicella	296	25,054	684	82,868	96,467	80,092	54,060	46,330	
Measles	0	7	0	194	15	7	18	7	
Cholera	0	0	0	1	2	5	4	0	
Typhoid fever	10	85	3	94	213	128	121	121	
Paratyphoid fever	14	114	2	55	47	73	56	44	
Shigellosis	1	47	3	151	191	112	113	88	
EHEC	13	310	3	146	121	138	104	71	
Viral hepatitis A	51	2,458	148	17,598	2,437	4,419	4,679	1,804	
Pertussis	0	116	11	496	980	318	129	205	
Mumps	151	7,494	286	15,967	19,237	16,924	17,057	23,448	
Rubella	0	2	0	8	0	7	11	11	
Meningococcal disease	0	6	0	16	14	17	6	6	
Pneumococcal disease	1	263	3	526	670	523	441	228	
Hansen's disease	0	3	0	4					
Scarlet fever	18	2,079	150	7,562	15,777	22,838	11,911	7,002	
VRSA	0	2	–	3	0	0	–	–	
CRE	180	10,697	–	15,369	11,954	5,717	–	–	
Viral hepatitis E	6	56	–	–	–	–	–	–	
Category Ⅲ									
Tetanus	0	23	1	31	31	34	24	22	
Viral hepatitis B	4	228	5	389	392	391	359	155	
Japanese encephalitis	0	0	1	34	17	9	28	40	
Viral hepatitis C	103	7,790	193	9,810	10,811	6,396	–	–	
Malaria	6	313	22	559	576	515	673	699	
Legionellosis	7	246	5	501	305	198	128	45	
Vibrio vulnificus sepsis	8	39	3	42	47	46	56	37	
Murine typhus	0	11	0	14	16	18	18	15	
Scrub typhus	10	440	34	4,005	6,668	10,528	11,105	9,513	
Leptospirosis	3	56	3	138	118	103	117	104	
Brucellosis	0	5	0	1	5	6	4	5	
HFRS	2	110	6	399	433	531	575	384	
HIV/AIDS	15	506	21	1,005	989	1,008	1,060	1,018	
CJD	0	41	1	53	53	36	42	33	
Dengue fever	0	43	9	273	159	171	313	255	
Q fever	1	58	2	162	163	96	81	27	
Lyme Borreliosis	0	6	1	23	23	31	27	9	
Melioidosis	0	1	0	8	2	2	4	4	
Chikungunya fever	0	0	0	16	3	5	10	2	
SFTS	5	130	6	223	259	272	165	79	
Zika virus infection	0	0	–	3	3	11	16	–	

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 2020 are provisional but the data from 2015 to 2019 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 29, 2020 (35th Week)*

Unit: No. of cases†

Reporting area	Diseases of Category II											
	Tuberculosis			Varicella			Measles			Cholera		
	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	461	13,948	19,403	296	25,054	44,943	0	7	41	0	0	0
Seoul	83	2,445	3,552	14	2,903	4,946	0	2	6	0	0	0
Busan	28	925	1,362	29	1,375	2,580	0	0	2	0	0	0
Daegu	22	668	911	12	1,243	2,426	0	0	2	0	0	0
Incheon	28	736	1,020	15	1,274	2,224	0	0	2	0	0	0
Gwangju	8	356	481	13	1,176	1,452	0	0	0	0	0	0
Daejeon	8	303	429	11	803	1,219	0	0	5	0	0	0
Ulsan	7	256	405	5	514	1,406	0	0	1	0	0	0
Sejong	3	56	60	5	214	12,646	0	0	14	0	0	0
Gyonggi	97	2,959	4,162	87	6,483	1,227	0	3	1	0	0	0
Gangwon	14	590	822	9	741	1,139	0	0	0	0	0	0
Chungbuk	24	417	593	9	952	1,650	0	0	1	0	0	0
Chungnam	21	723	903	9	894	1,886	0	0	1	0	0	0
Jeonbuk	24	578	753	8	989	1,863	0	0	2	0	0	0
Jeonnam	23	735	1,017	12	977	2,391	0	1	2	0	0	0
Gyeongbuk	39	1,070	1,408	19	1,377	4,238	0	0	2	0	0	0
Gyeongnam	25	942	1,284	27	2,554	1,194	0	1	0	0	0	0
Jeju	7	189	241	12	585	456	0	0	0	0	0	0

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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, weeks ending August 29, 2020 (35th Week)*

Unit: No. of cases†

Reporting area	Diseases of Category II											
	Typhoid fever			Paratyphoid fever			Shigellosis			Enterohemorrhagic *Escherichia coli*		
	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	10	85	104	14	114	37	1	47	92	13	310	83
Seoul	0	9	21	0	10	7	0	9	23	0	23	12
Busan	0	6	9	2	38	5	0	4	5	1	8	3
Daegu	1	4	3	5	15	2	0	0	5	0	5	3
Incheon	1	9	6	0	2	2	0	4	8	2	10	7
Gwangju	1	3	1	2	3	2	0	3	3	0	16	12
Daejeon	0	2	5	0	0	1	0	1	2	0	7	1
Ulsan	0	1	3	0	0	0	0	2	1	0	8	3
Sejong	0	0	23	0	0	7	0	0	17	0	1	14
Gyonggi	4	25	2	1	16	2	0	15	2	1	142	4
Gangwon	1	3	3	0	5	1	0	0	2	0	5	3
Chungbuk	0	0	5	0	1	0	0	0	6	0	3	3
Chungnam	0	4	2	0	3	2	1	3	2	3	8	2
Jeonbuk	0	1	4	1	2	2	0	0	4	0	3	5
Jeonnam	0	3	4	2	10	1	0	2	5	1	17	4
Gyeongbuk	0	3	9	0	2	2	0	1	6	2	18	3
Gyeongnam	2	11	3	1	6	1	0	3	1	2	23	3
Jeju	0	1	1	0	1	0	0	0	0	1	13	1

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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, weeks ending August 29, 2020 (35th Week)*

Unit: No. of cases†

Reporting area	Diseases of Category II											
	Viral hepatitis A			Pertussis			Mumps			Rubella		
	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	51	2,458	4,707	0	116	262	151	7,494	12,960	0	2	3
Seoul	4	445	889	0	14	32	5	912	1,330	0	0	1
Busan	1	69	181	0	6	25	12	403	814	0	1	0
Daegu	2	60	73	0	5	7	4	293	450	0	0	0
Incheon	6	255	321	0	5	16	4	378	570	0	0	0
Gwangju	3	51	78	0	10	12	11	288	686	0	0	0
Daejeon	1	101	484	0	7	5	2	201	313	0	0	0
Ulsan	0	28	33	0	2	7	10	210	438	0	0	0
Sejong	0	14	1,435	0	0	40	1	45	3,358	0	0	1
Gyonggi	16	805	84	0	17	3	37	2,217	401	0	1	0
Gangwon	1	67	229	0	0	7	2	239	286	0	0	0
Chungbuk	5	95	355	0	0	5	2	232	497	0	0	0
Chungnam	4	137	165	0	4	5	12	344	857	0	0	0
Jeonbuk	4	141	97	0	2	11	9	327	622	0	0	1
Jeonnam	3	42	81	0	20	18	4	291	642	0	0	0
Gyeongbuk	0	74	101	0	9	61	10	362	1,473	0	0	0
Gyeongnam	1	56	23	0	14	4	20	622	171	0	0	0
Jeju	0	18	78	0	1	4	6	130	52	0	0	0

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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, weeks ending August 29, 2020 (35th 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. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	0	6	9	18	2,079	9,161	0	23	20	4	228	226
Seoul	0	1	2	1	287	1,215	0	2	2	0	38	39
Busan	0	1	1	1	124	651	0	2	2	0	11	16
Daegu	0	0	1	0	42	332	0	1	1	0	7	7
Incheon	0	1	1	3	109	426	0	0	0	0	15	12
Gwangju	0	0	0	0	234	430	0	1	1	0	4	5
Daejeon	0	0	0	1	82	344	0	0	1	0	11	9
Ulsan	0	0	0	0	77	406	0	0	0	0	6	5
Sejong	0	0	2	0	11	2,670	0	1	2	0	2	54
Gyonggi	0	2	1	3	541	145	0	2	1	0	60	7
Gangwon	0	0	0	3	43	163	0	1	0	0	6	8
Chungbuk	0	0	0	0	24	408	0	2	1	0	5	13
Chungnam	0	0	0	1	69	308	0	6	1	2	10	12
Jeonbuk	0	0	0	0	55	350	0	3	3	0	10	11
Jeonnam	0	0	0	0	90	468	0	1	3	1	10	13
Gyeongbuk	0	1	1	1	78	696	0	1	2	0	9	13
Gyeongnam	0	0	0	2	160	100	0	0	0	0	22	2
Jeju	0	0	0	2	53	49	0	0	0	1	2	0

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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, weeks ending August 29, 2020 (35th Week)*

Unit: No. of cases†

Reporting area	Diseases of Category Ⅲ											
	Japanese encephalitis			Malaria			Legionellosis			*Vibrio vulnificus* sepsis		
	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	0	0	2	6	313	477	7	246	142	8	39	20
Seoul	0	0	1	0	49	64	0	61	40	0	5	3
Busan	0	0	0	0	2	5	0	13	8	1	5	1
Daegu	0	0	1	0	3	6	0	7	5	0	0	0
Incheon	0	0	0	1	41	69	2	14	12	0	0	2
Gwangju	0	0	0	0	4	4	0	7	2	0	0	0
Daejeon	0	0	0	0	3	3	2	6	1	0	0	0
Ulsan	0	0	0	0	3	3	1	2	2	0	0	1
Sejong	0	0	0	0	0	276	0	0	32	0	0	3
Gyonggi	0	0	0	4	179	15	1	61	6	1	4	0
Gangwon	0	0	0	0	12	4	0	4	6	0	1	0
Chungbuk	0	0	0	0	4	6	0	14	5	0	0	1
Chungnam	0	0	0	1	5	3	0	4	3	2	8	1
Jeonbuk	0	0	0	0	2	3	0	8	4	1	2	4
Jeonnam	0	0	0	0	1	5	0	11	10	3	8	0
Gyeongbuk	0	0	0	0	2	7	0	10	4	0	1	3
Gyeongnam	0	0	0	0	3	3	0	10	2	0	5	1
Jeju	0	0	0	0	0	1	1	14	0	0	0	0

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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, weeks ending August 29, 2020 (35th Week)*

Unit: No. of cases†

Reporting area	Diseases of Category Ⅲ											
	Murine typhus			Scrub typhus			Leptospirosis			Brucellosis		
	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	0	11	8	10	440	823	3	56	40	0	5	1
Seoul	0	1	1	0	6	38	0	1	2	0	1	1
Busan	0	0	1	0	22	29	0	3	2	0	0	0
Daegu	0	1	0	0	1	7	1	2	0	0	0	0
Incheon	0	7	1	0	6	15	0	2	0	0	0	0
Gwangju	0	0	1	0	4	18	0	0	1	0	0	0
Daejeon	0	0	0	0	11	20	0	3	1	0	0	0
Ulsan	0	0	0	0	11	18	0	0	1	0	0	0
Sejong	0	0	1	0	4	79	0	3	7	0	0	0
Gyonggi	0	2	0	1	33	22	0	7	3	0	0	0
Gangwon	0	0	0	0	4	15	1	2	2	0	0	0
Chungbuk	0	0	1	0	6	81	1	5	6	0	0	0
Chungnam	0	0	0	2	48	76	0	7	3	0	0	0
Jeonbuk	0	0	1	0	61	201	0	7	5	0	3	0
Jeonnam	0	0	0	4	117	54	0	8	3	0	1	0
Gyeongbuk	0	0	1	1	14	138	0	4	3	0	0	0
Gyeongnam	0	0	0	1	80	9	0	2	1	0	0	0
Jeju	0	0	0	1	12	3	0	0	0	0	0	0

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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, weeks ending August 29, 2020 (35th 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. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	2	110	192	0	41	31	0	43	146	1	58	72
Seoul	0	4	8	0	9	8	0	14	47	0	1	4
Busan	0	0	6	0	5	2	0	5	9	0	1	1
Daegu	0	2	2	0	3	1	0	2	8	0	0	2
Incheon	0	2	3	0	3	1	0	2	7	0	1	1
Gwangju	0	1	2	0	2	0	0	0	1	1	2	3
Daejeon	0	1	3	0	1	1	0	0	3	0	2	2
Ulsan	0	0	1	0	2	0	0	1	3	0	0	2
Sejong	0	0	49	0	0	7	0	0	40	0	0	9
Gyonggi	1	17	8	0	7	2	0	13	3	0	10	0
Gangwon	0	11	12	0	0	1	0	0	2	0	0	17
Chungbuk	0	6	22	0	0	1	0	0	4	0	10	9
Chungnam	0	7	17	0	1	1	0	2	3	0	9	4
Jeonbuk	0	21	29	0	2	1	0	0	3	0	4	8
Jeonnam	1	21	19	0	1	3	0	1	4	0	14	4
Gyeongbuk	0	11	10	0	2	2	0	1	7	0	0	6
Gyeongnam	0	3	1	0	3	0	0	1	2	0	4	0
Jeju	0	3	0	0	0	0	0	1	0	0	0	0

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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, weeks ending August 29, 2020 (35th Week)*

Unit: No. of cases†

Reporting area	Diseases of Category Ⅳ								
	Lyme Borreliosis			Severe fever with thrombocytopenia syndrome			Zika virus infection		
	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
Overall	0	6	11	5	130	107	0	0	–
Seoul	0	3	5	0	3	3	0	0	–
Busan	0	0	0	0	0	1	0	0	–
Daegu	0	0	0	0	10	2	0	0	–
Incheon	0	0	1	0	3	1	0	0	–
Gwangju	0	0	0	0	0	0	0	0	–
Daejeon	0	0	0	0	1	2	0	0	–
Ulsan	0	0	0	0	5	2	0	0	–
Sejong	0	0	2	0	1	14	0	0	–
Gyonggi	0	0	0	0	16	15	0	0	–
Gangwon	0	2	0	0	16	2	0	0	–
Chungbuk	0	0	1	0	2	12	0	0	–
Chungnam	0	1	1	1	11	6	0	0	–
Jeonbuk	0	0	0	1	8	10	0	0	–
Jeonnam	0	0	1	0	6	16	0	0	–
Gyeongbuk	0	0	0	2	18	12	0	0	–
Gyeongnam	0	0	0	0	21	9	0	0	–
Jeju	0	0	0	1	9	0	0	0	–

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

* The reported data for year 2019, 2020 are provisional but the data from 2014 to 2018 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 29, 2020 (35th Week)

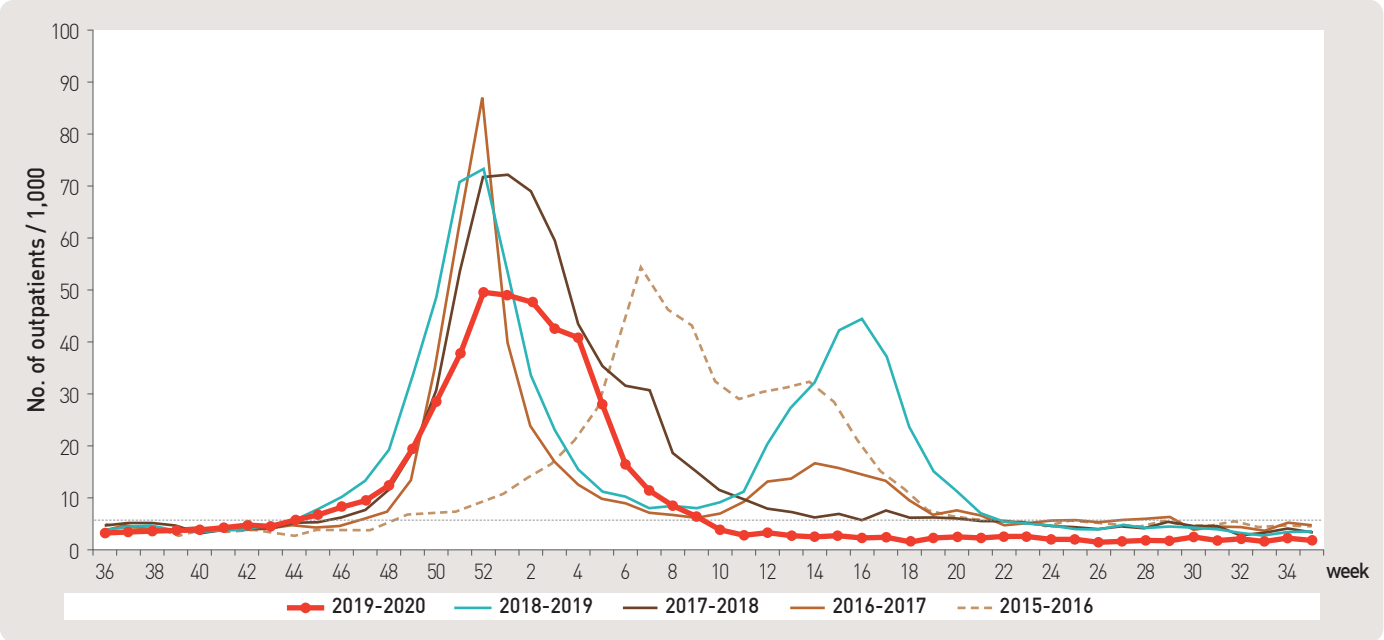


Figure 1. Weekly proportion of influenza-like illness per 1,000 outpatients, 2015-2016 to 2019-2020 flu seasons

2. Hand, Foot and Mouth Disease(HFMD), Republic of Korea, weeks ending August 29, 2020 (35th Week)

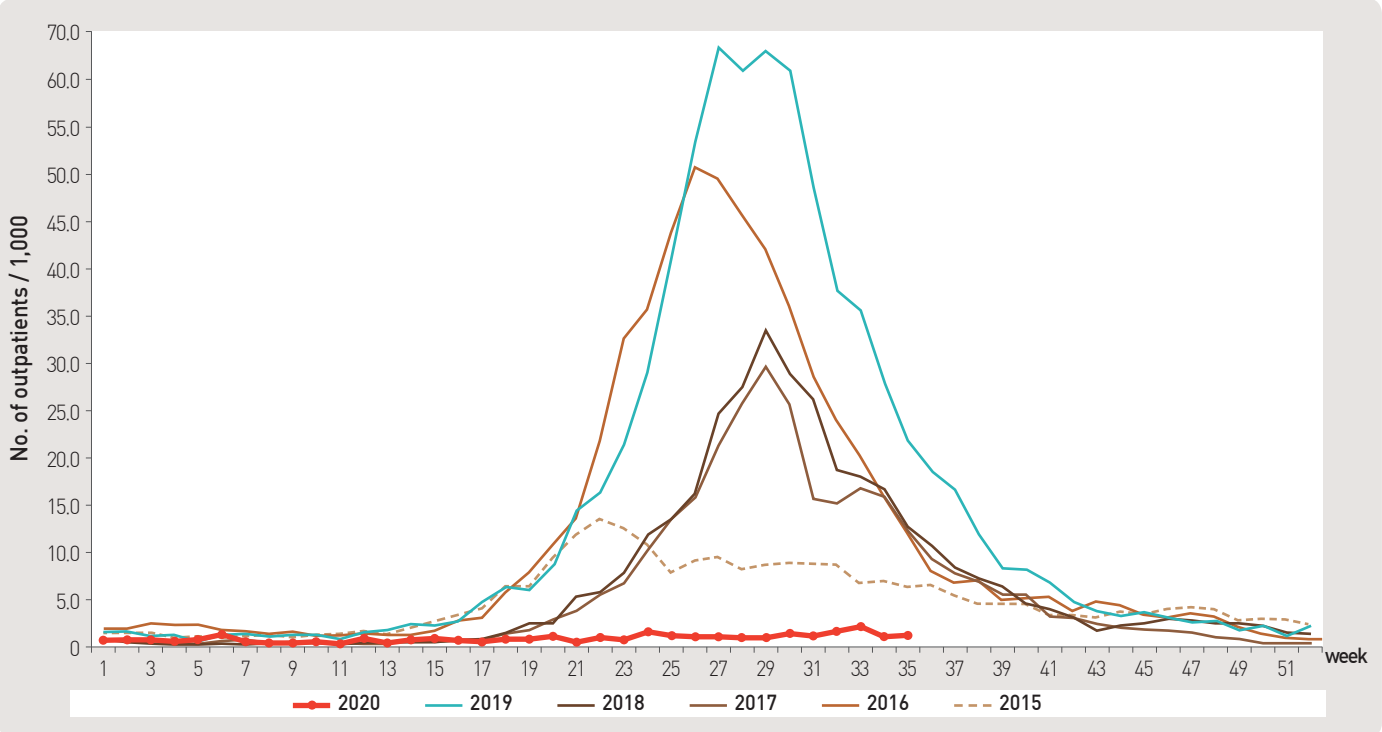


Figure 2. Weekly proportion of hand, foot and mouth disease per 1,000 outpatients, 2015-2020

3. Ophthalmologic infectious disease, Republic of Korea, weeks ending August 29, 2020 (35th Week)

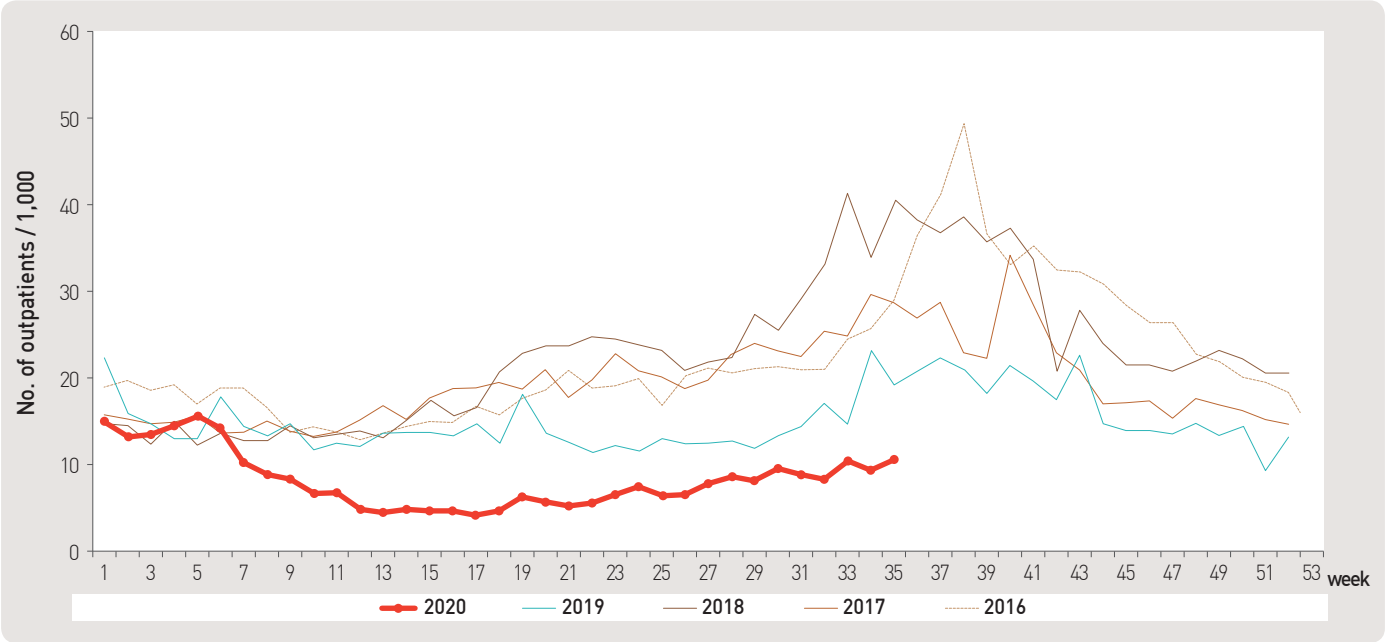


Figure 3. Weekly proportion of epidemic keratoconjunctivitis per 1,000 outpatients

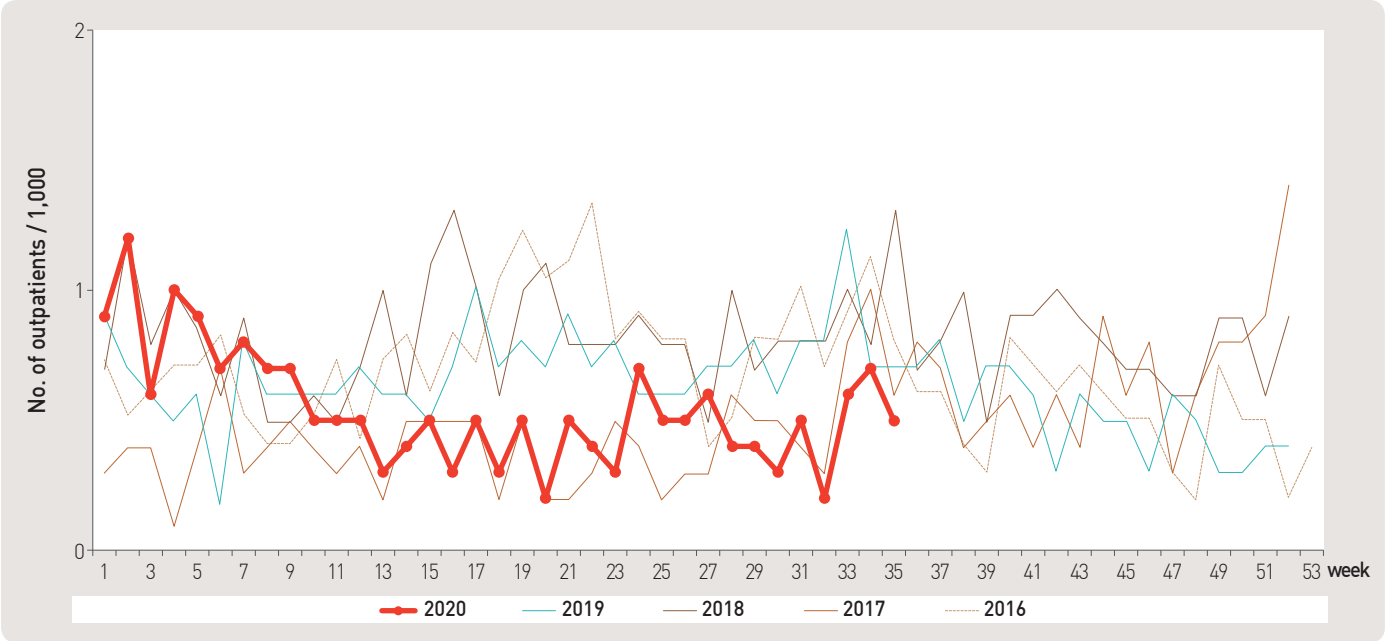


Figure 4. Weekly proportion of acute hemorrhagic conjunctivitis per 1,000 outpatients

4. Sexually Transmitted Diseases†, Republic of Korea, weeks ending August 29, 2020 (35th Week)

Unit: No. of cases/sentinels

Gonorrhea			Chlamydia			Genital herpes			Condyloma acuminata		
Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
1.3	7.7	9.9	1.7	22.4	31.4	2.3	32.4	40.1	4.7	19.6	23.0

Human Papilloma virus infection			Syphilis								
			Primary			Secondary			Congenital		
Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§	Current week	Cum. 2020	Cum. 5-year average§
3.2	61.0	61.0	0.0	3.2	3.2	0.0	3.7	3.7	0.0	1.5	1.5

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 29, 2020 (35th Week)

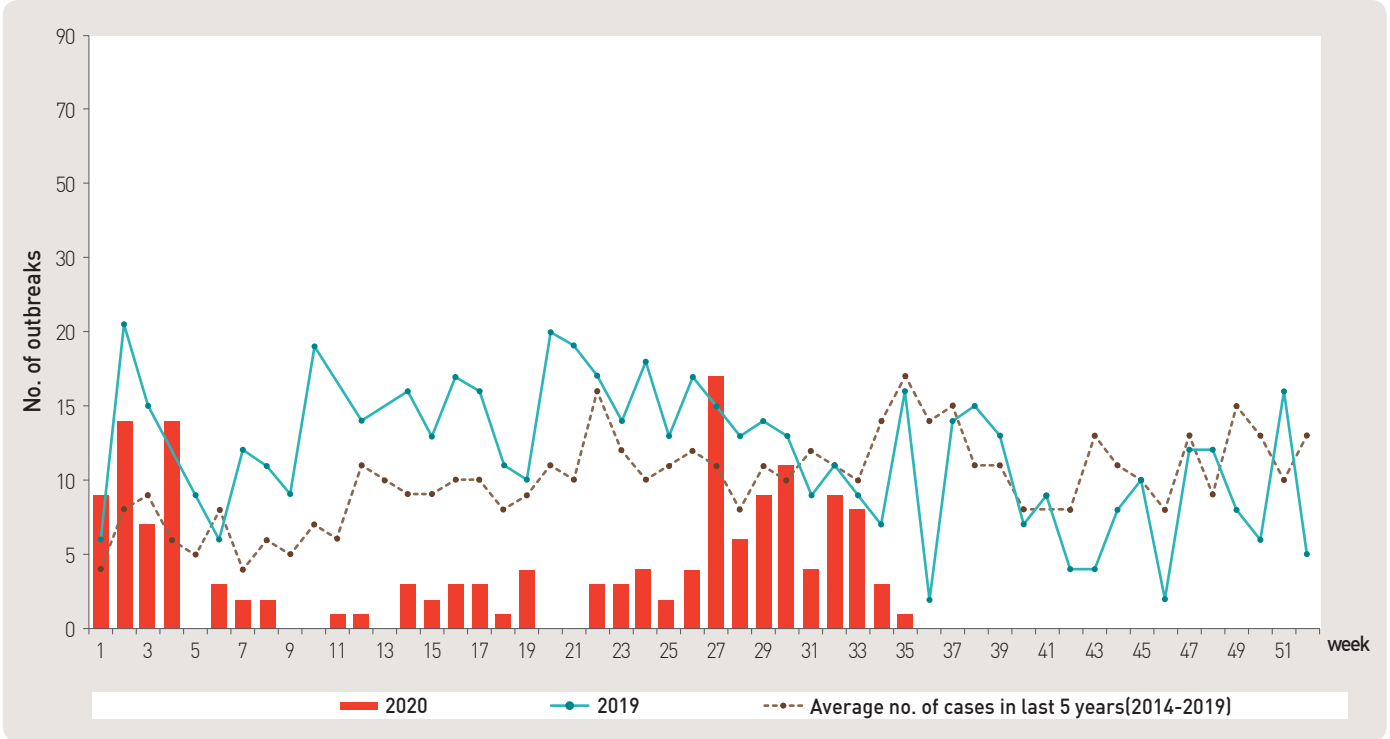


Figure 5. Number of waterborne and foodborne disease outbreaks reported by week, 2019–2020

1. Influenza viruses, Republic of Korea, weeks ending August 29, 2020 (35th Week)

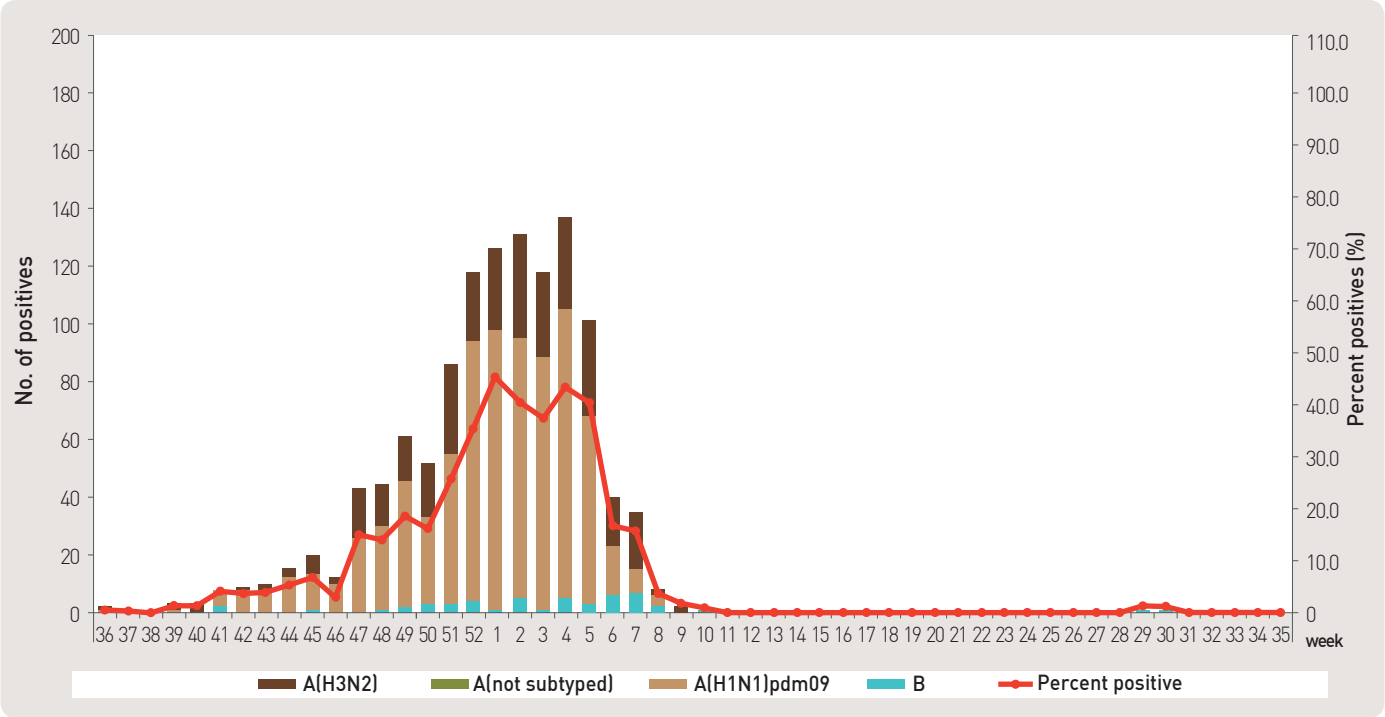


Figure 6. Number of specimens positive for influenza by subtype, 2019–2020 flu season

2. Respiratory viruses, Republic of Korea, weeks ending August 29, 2020 (35th Week)

2020 (week)	Weekly total		Detection rate (%)							
	No. of samples	Detection rate (%)	HAdV	HPIV	HRSV	IFV	HCoV	HRV	HBoV	HMPV
32	65	41.5	3.1	0.0	1.5	0.0	0.0	35.4	1.5	0.0
33	73	42.5	4.1	0.0	0.0	0.0	0.0	31.5	6.8	0.0
34	56	39.3	8.9	0.0	0.0	0.0	0.0	30.4	0.0	0.0
35	71	49.3	2.8	0.0	1.4	0.0	0.0	40.8	4.2	0.0
Cum.※	265	43.4	4.5	0.0	0.8	0.0	0.0	34.7	3.4	0.0
2019 Cum.∀	12,151	60.2	8.0	6.4	3.9	14.0	2.9	17.2	2.8	5.0

- 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 August 2, 2020 – August 29, 2020 (Average No. of detected cases is 66 last 4 weeks)

∀ 2019 Cum.: the rate of detected cases between December 30, 2018 – December 28, 2019

▣ Acute gastroenteritis-causing viruses and bacteria, Republic of Korea, weeks ending August 22, 2020 (34th week)

◆ Acute gastroenteritis-causing viruses

Week		No. of sample	No. of detection (Detection rate, %)					
			Norovirus	Group A Rotavirus	Enteric Adenovirus	Astrovirus	Sapovirus	Total
2020	31	52	4 (7.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (8.3)
	32	47	1 (2.1)	1 (2.1)	1 (2.1)	0 (0.0)	0 (0.0)	3 (6.4)
	33	48	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	34	27	2 (7.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (7.4)
Cum.		1,467	214 (14.6)	33 (2.2)	13 (0.9)	15 (1.0)	4 (0.3)	279 (19.0)

* 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
2020	31	174	3 (1.7)	11 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)	7 (4.0)	2 (1.1)	0 (0.0)	3 (1.7)	26 (14.9)
	32	207	4 (1.9)	18 (8.7)	0 (0.0)	0 (0.0)	0 (0.0)	7 (3.4)	8 (3.9)	2 (1.0)	5 (2.4)	44 (21.3)
	33	197	6 (3.0)	15 (7.6)	0 (0.0)	0 (0.0)	0 (0.0)	5 (2.5)	5 (2.5)	3 (1.5)	3 (1.5)	37 (18.8)
	34	94	3 (3.2)	12 (12.8)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.1)	3 (3.2)	0 (0.0)	2 (2.1)	22 (23.4)
Cum.		6,274	157 (2.5)	269 (4.3)	2 (0.03)	2 (0.03)	0 (0.0)	133 (2.1)	152 (2.4)	96 (1.5)	124 (2.0)	951 (15.2)

* 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 2018 (70 hospitals)

† Contains 3 *Listeria monocytogenes*

▣ Enterovirus, Republic of Korea, weeks ending August 22, 2020 (34th week)

◆ Aseptic meningitis

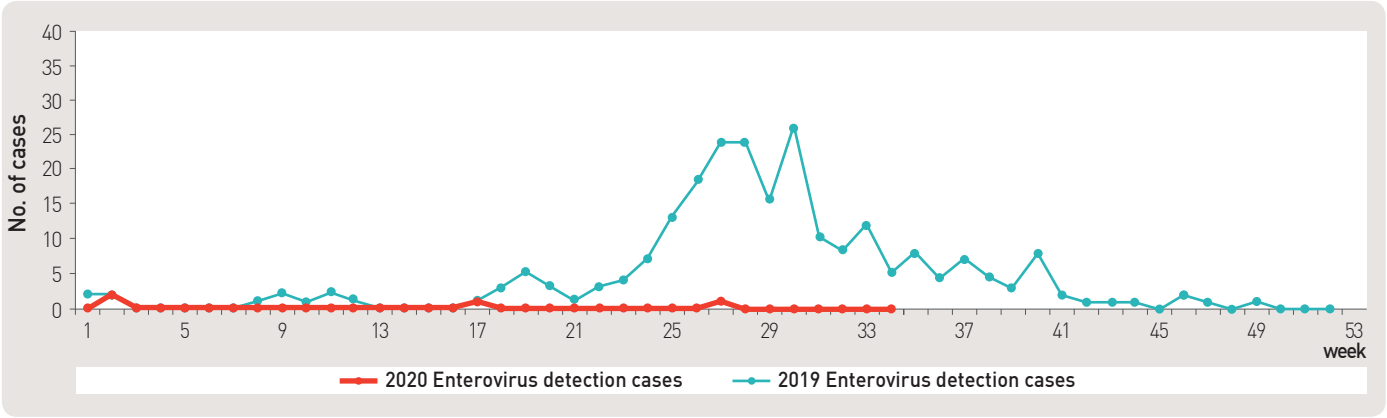


Figure 7. Detection cases of enterovirus in aseptic meningitis patients from 2019 to 2020

◆ HFMD and Herpangina

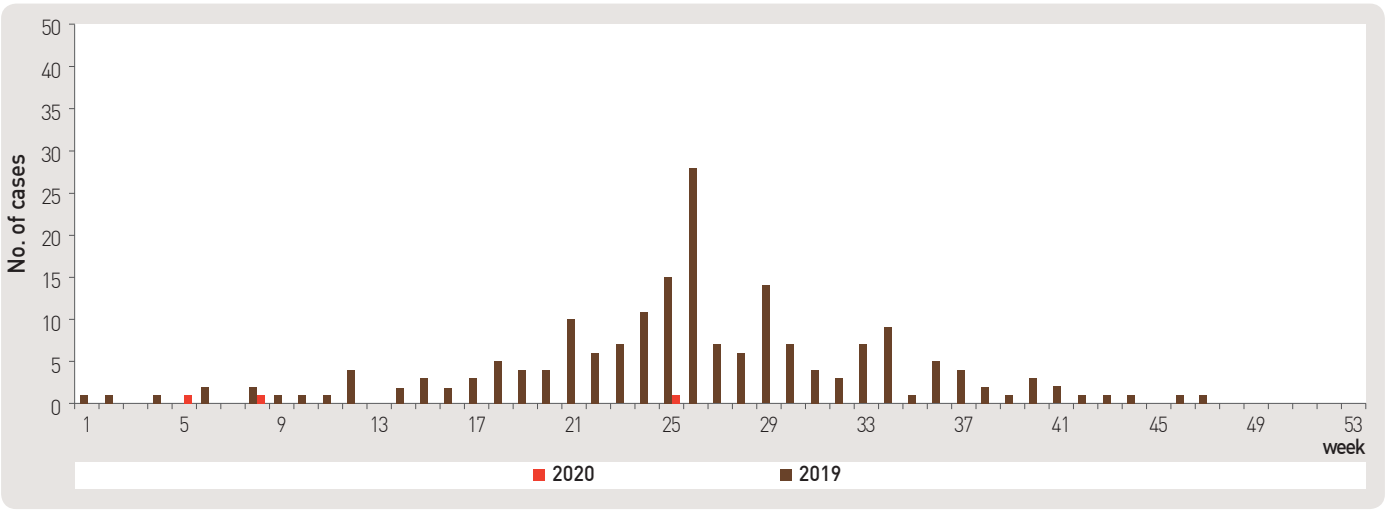


Figure 8. Detection cases of enterovirus in HFMD and herpangina patients from 2019 to 2020

◆ HFMD with Complications

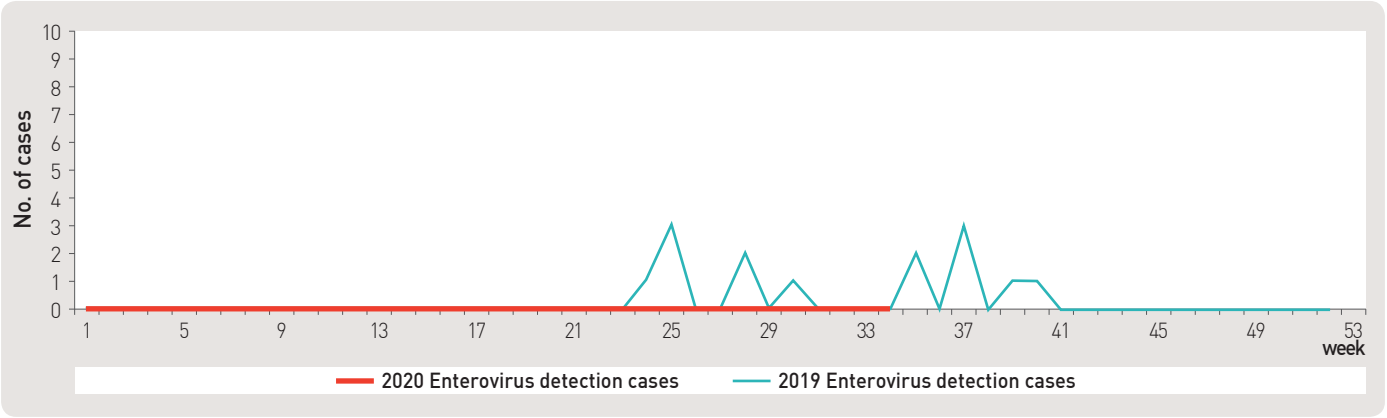
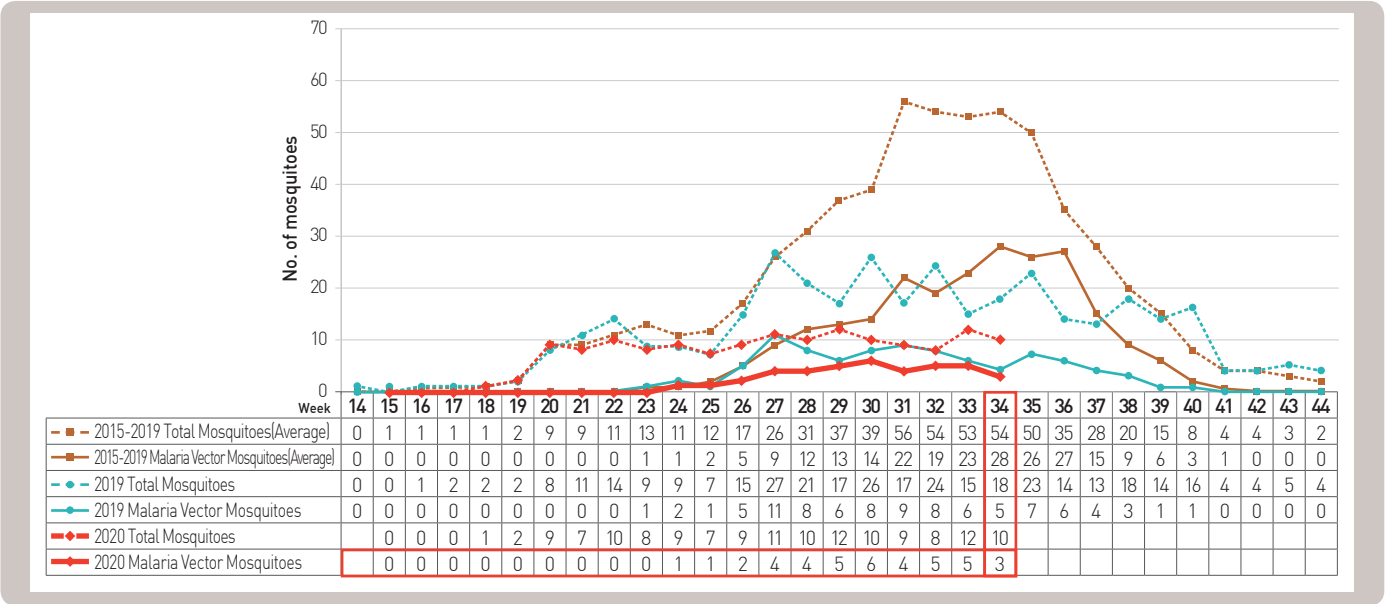


Figure 9. Detection cases of enterovirus in HFMD with complications patients from 2019 to 2020

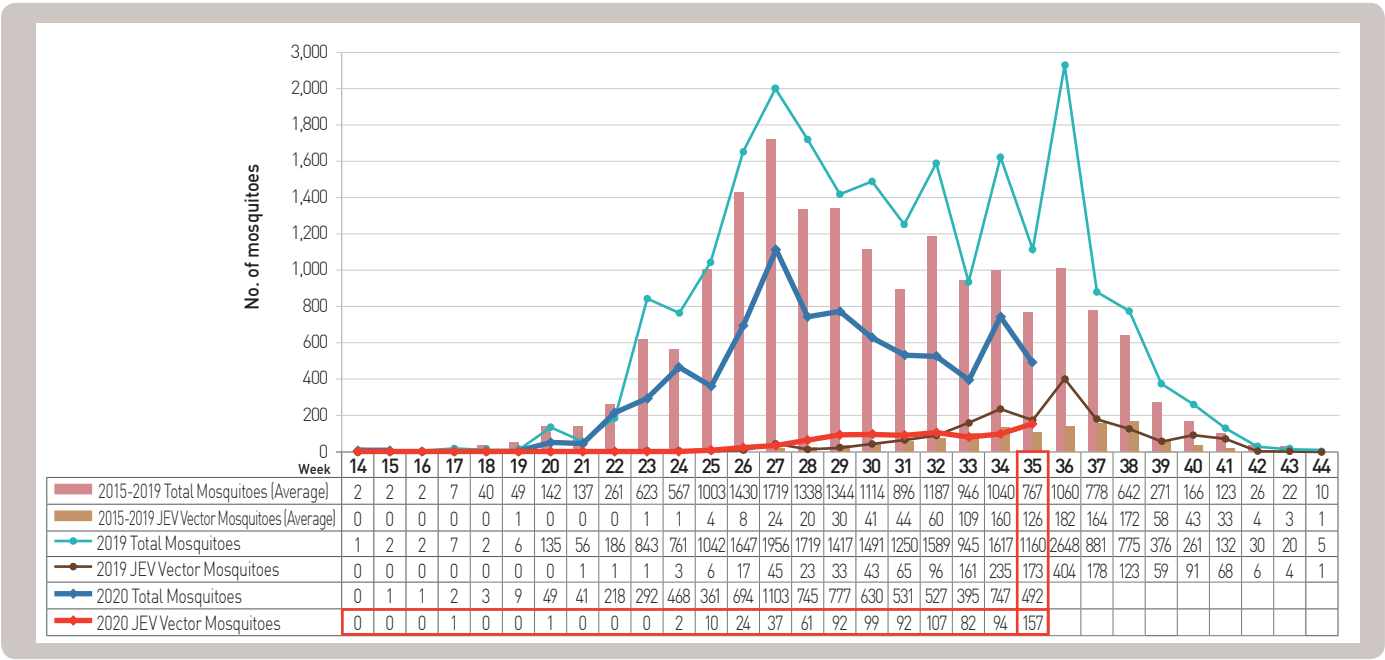
▣ Vector surveillance: Malaria vector mosquitoes, Republic of Korea, week ending August 22, 2020 (34th week)



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
2015-2019 Total Mosquitoes(Average)	0	1	1	1	1	2	9	9	11	13	11	12	17	26	31	37	39	56	54	53	54	50	35	28	20	15	8	4	4	3	2
2015-2019 Malaria Vector Mosquitoes(Average)	0	0	0	0	0	0	0	0	0	1	1	2	5	9	12	13	14	22	19	23	28	26	27	15	9	6	3	1	0	0	0
2019 Total Mosquitoes	0	0	1	2	2	2	8	11	14	9	9	7	15	27	21	17	26	17	24	15	18	23	14	13	18	14	16	4	4	5	4
2019 Malaria Vector Mosquitoes	0	0	0	0	0	0	0	0	0	1	2	1	5	11	8	6	8	9	8	6	5	7	6	4	3	1	1	0	0	0	0
2020 Total Mosquitoes		0	0	0	1	2	9	7	10	8	9	7	9	11	10	12	10	9	8	12	10										
2020 Malaria Vector Mosquitoes		0	0	0	0	0	0	0	0	0	1	1	2	4	4	5	6	4	5	5	3										

Figure 10. Weekly incidences of malaria vector mosquitoes in 2020

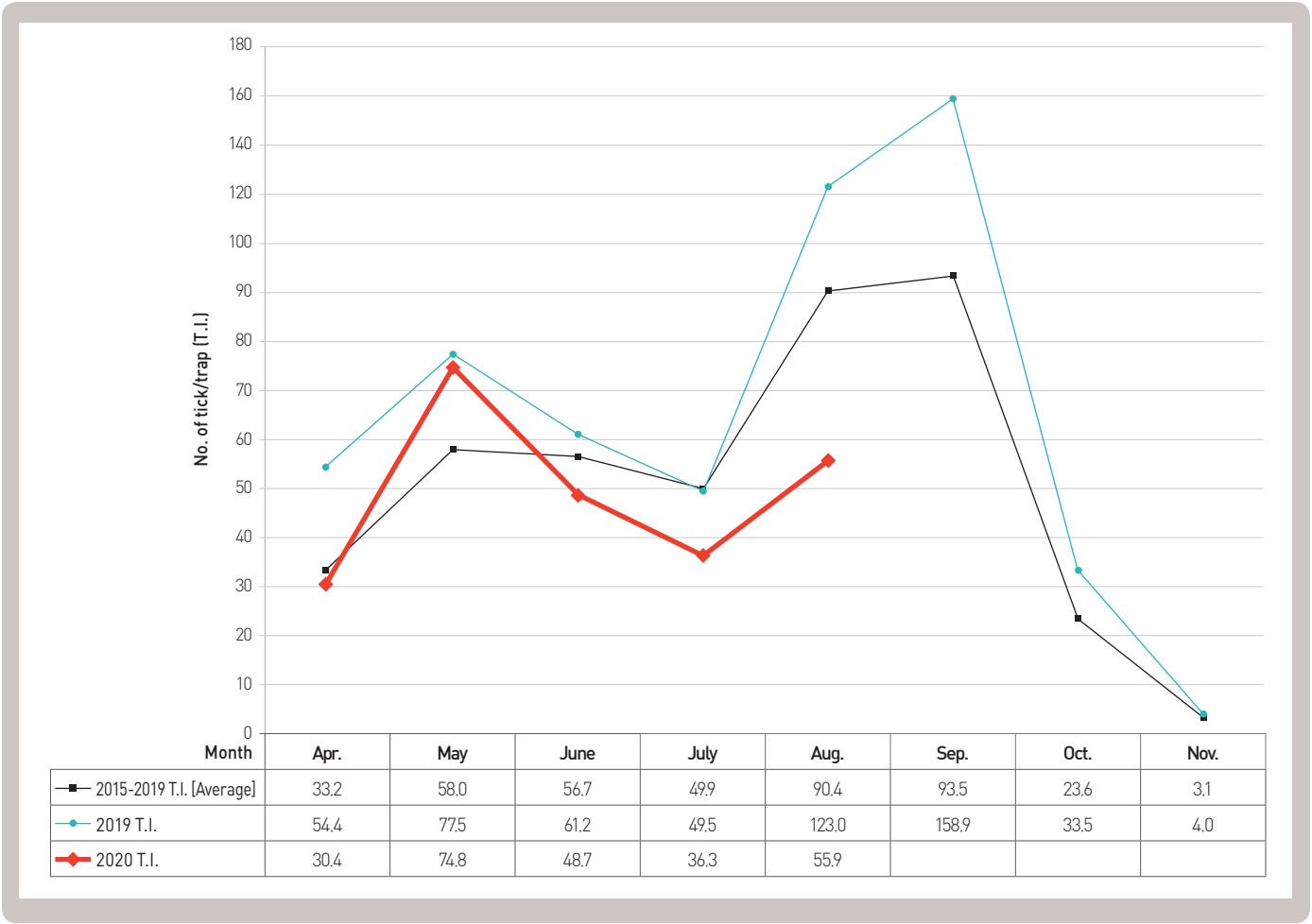
▣ Vector surveillance: Japanese encephalitis vector mosquitoes, Republic of Korea, week ending August 29, 2020 (35th Week)



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
2015-2019 Total Mosquitoes (Average)	2	2	2	7	40	49	142	137	261	623	567	1003	1430	1719	1338	1344	1114	896	1187	946	1040	767	1060	778	642	271	166	123	26	22	10
2015-2019 JEV Vector Mosquitoes (Average)	0	0	0	0	0	1	0	0	0	1	1	4	8	24	20	30	41	44	60	109	160	126	182	164	172	58	43	33	4	3	1
2019 Total Mosquitoes	1	2	2	7	2	6	135	56	186	843	761	1042	1647	1956	1719	1417	1491	1250	1589	945	1617	1160	2648	881	775	376	261	132	30	20	5
2019 JEV Vector Mosquitoes	0	0	0	0	0	0	0	1	1	1	3	6	17	45	23	33	43	65	96	161	235	173	404	178	123	59	91	68	6	4	1
2020 Total Mosquitoes	0	1	1	2	3	9	49	41	218	292	468	361	694	1103	745	777	630	531	527	395	747	492									
2020 JEV Vector Mosquitoes	0	0	0	1	0	0	1	0	0	0	2	10	24	37	61	92	99	92	107	82	94	157									

Figure 11. Weekly incidences of Japanese encephalitis vector mosquitoes in 2020

▣ Vector surveillance: Severe fever with thrombocytopenia syndrome vector ticks, Republic of Korea, week ending August 22, 2020 (34th week)



Month	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.
2015-2019 T.I. [Average]	33.2	58.0	56.7	49.9	90.4	93.5	23.6	3.1
2019 T.I.	54.4	77.5	61.2	49.5	123.0	158.9	33.5	4.0
2020 T.I.	30.4	74.8	48.7	36.3	55.9			

Figure 12. Monthly incidence of severe fever with thrombocytopenia syndrome vector ticks in 2020

About PHWR Disease Surveillance Statistics

The Public Health Weekly Report (PHWR) Disease Surveillance Statistics is prepared by the Korea Centers for Disease Control and Prevention (Korea CDC). 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 Centers for Disease Control and Prevention. 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 Korea CDC at the central level via corresponding jurisdictions(health centers, and health departments) during that week and accepted/approved by surveillance staff.
- Cum. 2018 – 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
2018			Current week		
2017	**X1**	**X2**	**X3**	**X4**	**X5**
2016	**X6**	X7	X8	X9	X10
2015	**X11**	X12	X13	X14	X15
2014	**X16**	X17	X18	X19	X20
2013	**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. 2018 and cum. 5-year average.

Contact Us

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발간등록번호 11-1351159-000002-03

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