COVID-19 Special Report

Outbreak report of COVID-19 during designation of class 1 infectious disease in the Republic of Korea (January 20, 2020–April 24, 2022)

Seonhee Ahn, Jinhwa Jang, Shin Young Park, Sungchan Yang, Boyeong Ryu, Eunjeong Shin, Na-Young Kim, HyunJu Lee, Dong Hwi Kim, Myeongsu Yoo, Jonggul Lee, Taeyoung Kim, Ae Ri Kang, Seo Hyun Kim, Seong-Sun Kim, Donghyok Kwon*
Data Analysis Team, Epidemiological Investigation and Analysis Task Force, Central Disease Control Headquarters, Korea Disease Control and Prevention Agency (KDCA)

Abstract

As the number of confirmed cases of coronavirus disease 2019 (COVID-19) around the world peaked in 2022 and has continued to decline, several countries have eased prevention and control measures against COVID-19. In the Republic of Korea, COVID-19 had been designated as class 1 infectious disease from January 20, 2020 to April 24, 2022. In consideration of high vaccination rate, introduction of therapeutic agents and the characteristics of variants, COVID-19 has been reclassified to class 2 infectious disease since April 25, 2022.

Korea Disease Control and Prevention Agency (KDCA) analyzed the characteristics of COVID-19 outbreaks during designation of class 1 infectious disease in the Republic of Korea.

In total, there were 16,929,564 COVID-19 confirmed cases, including 31,828 imported cases during this period. The incidence rate was 32,785 per 100,000 population and the maximum number of confirmed cases per day was 621,177. Severe and critical cases were 22,137 and the case fatality rate was 0.14% with 23,045 death cases. Among all the cases, 9,084,961 (53.8%) occurred in the Seoul metropolitan area (Seoul, Incheon and Gyeonggi Province) and 7,812,775 (46.2%) occured in areas outside the Seoul metropolitan area. Among the confirmed cases, 4,117,327 (24.3%) were 18 or under 18 years old, 9,812,940 (58.0%) were between 19-59 years old and 2,999,299 (17.7%) were 60 or over 60 years old.

Through the lessons learned from pharmacological and non-pharmacological interventions and public health measures for the COVID-19 pandemic, Korean government should prepare for the next COVID-19 resurgence will be caused by new variants or waning of acquired immunity as time passed.

Keywords: Coronavirus disease 2019 (COVID-19), Incidence rate, Case fatality rate

Introduction

Since the index case in Wuhan, Hubei Province, China, in late December 2019, coronavirus disease 2019 (COVID-19) has affected 500 million people and caused more than six million deaths worldwide, as of April 24, 2022 [1]. In response to the continued decline in the number of confirmed COVID-19 cases following a peak in the COVID-19 incidence in 2022, countries worldwide have eased their prevention and control measures. The United States began to ease the restrictions in February 2022 following a peak in the COVID-19 incidence, with some of its states lifting the vaccine passport system and face mask mandates. The United Kingdom has also removed the vaccine passport system and social distancing and face mask mandates

after experiencing a peak in the number of confirmed cases and deaths in the country. New Zealand lowered the alert level from red to yellow and lifted the indoor capacity and social distancing restrictions in April 2022. As shown here, countries worldwide are beginning to ease their COVID-19 prevention and control measures based on their respective backgrounds and evidence after the Omicron variant wave [2]. Since the first confirmed COVID-19 case in the country on January 20, 2020 (entry from Wuhan, China), the Republic of Korea (ROK) designated and managed COVID-19 as a class 1 infectious disease in accordance with the Infectious Disease Control and Prevention Act and then reclassified COVID-19 as a class 2 infectious disease on April 25, 2022, based on the subsiding outbreak; stronger response measures, such as high vaccination rate, and availability of oral therapeutics, and Omicron variant features.

This study aimed to discuss the details of COVID-19 cases and present the distinct features of each wave during the period in which COVID-19 was designated as a class 1 infectious disease (January 20, 2020–April 24, 2022). The analysis was performed based on the COVID-19 case data reported by healthcare institutions and local public health centers through Korea Disease Control and Prevention Agency (KDCA) COVID-19 information management system per Article 11 of the Infectious Disease Control and Prevention Act; the details can be revised according to the results of subsequent epidemiological investigations.

Results

1. COVID-19 outbreak during the period in which it was designated as a class 1 infectious disease (January 20, 2020–April 24, 2022)

During the period in which COVID-19 was designated as a class 1 infectious disease from January 20, 2020, to April 24, 2022, a total of 16,929,564 cases of COVID-19 were confirmed in

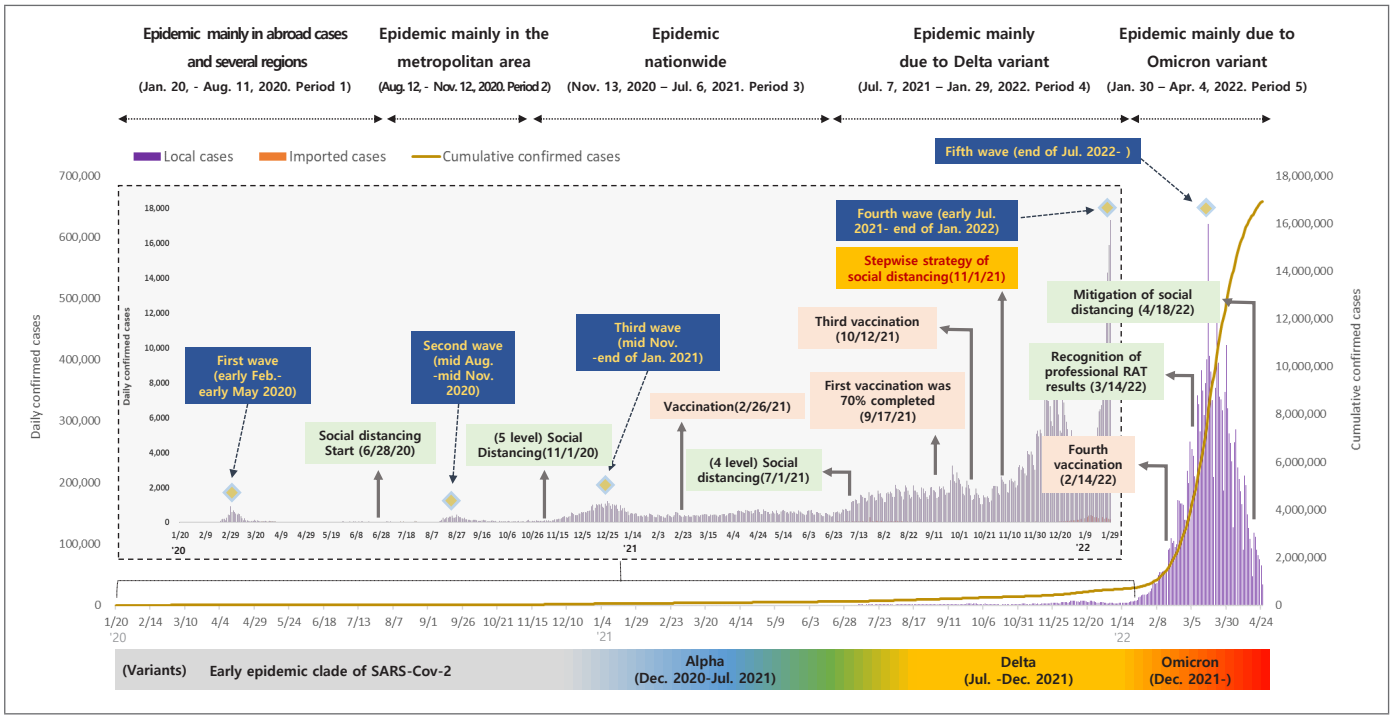

Figure 1. Daily confirmed cases of COVID-19 from January 20, 2020 to April 24, 2022 (Data as of January 20, 2020 – April 25, 2022, 0:00)

the ROK. This accounts for 32.8% of the total population of the country (32,785 per 100,000 population), with a daily incidence rate of 20,471.1 cases and a minimum of 1 and a maximum of 621,177 persons being affected.

The proportion of female patients (n=8,961,439; 52.9%) was higher than that of male patients (n=7,968,125, 47.1%). In terms of age, patients aged 19-59 years were most commonly affected (n=9,812,940, 58.0%), followed by those aged ≤18 years (n=4,117,327, 24.3%) and those aged ≥60 years (n=2,999,297, 17.7%).

Among the COVID-19 patients, 16,512,915 (97.5%) were Korean nationals, while 416,649 (2.5%) were foreign nationals. A total of 16,897,736 cases (99.8%) originated within the country, while 31,828 cases (0.2%) were transmitted from other countries. Among the domestic cases, 9,084,961 (53.8%) occurred in the Seoul metropolitan area (Seoul, Incheon, and Gyeonggi), while 7,812,775 (46.2%) occurred in non-Seoul metropolitan areas. In terms of city and province, the highest number of cases occurred in Gyeonggi (n=4,641,202, 27.5%), followed by Seoul (n=3,427,693, 20.3%), Busan (n=1,037,050, 6.1%), and Incheon (n=1,016,066, 6.0%).

The severity of COVID-19 cases and incidence of severe cases were assessed and calculated by monitoring the incidence of severe and critical cases (using at least one of the following criteria: high-flow oxygen, noninvasive mechanical ventilation, invasive mechanical ventilation, extracorporeal membrane oxygenation, or continuous renal replacement therapy) and investigating the reported COVID-19 deaths (including postmortem confirmation of COVID-19). A total of 22,137 severe/critical cases and 23,045 deaths occurred, with a cumulative case fatality rate (percentage of deaths among COVID-19-confirmed patients) of 0.14%.

The Korean government implemented social distancing on June 28, 2020, and has flexibly adjusted and reorganized the social distancing restrictions in response to the gravity of the outbreak and the prevention and control capacities. Since the initiation of COVID-19 vaccination on February 26, 2021, 70% of the population received the first dose by September 17, 2021. A gradual return to normal life was initiated on November 1, 2021. Thereafter, a series of measures were implemented to establish a routine infection control system, including the implementation of a self-reported epidemiological survey on February 7, 2022, acceptance of professionally performed rapid antigen test results on March 14, 2022, and removal of social distancing mandate on April 18, 2022, and COVID-19 was reclassified as a class 2 infectious disease on April 25, 2022.

The COVID-19 waves during the period in which it was designated as a class 1 infectious disease were classified into five waves based on their distinct features and patterns, and the number and characteristics of confirmed cases for each wave were analyzed.

2. Characteristics of the period 1 (1st wave, January 20, 2020–August 11, 2020): Transmission from abroad and Daegu/Gyeongbuk and Seoul metropolitan areas

The 1st wave involved transmission from abroad, Daegu/Gyeongbuk, and Seoul metropolitan areas and was triggered by a mass outbreak at a religious facility in the Daegu/Gyeongbuk region after the first patient with confirmed COVID-19 entered the country from Wuhan, China. This wave lasted from January 20, 2020, to August 11, 2020, and a series of mass outbreaks at religious, entertainment, publicly used facilities were reported.

A total of 14,660 patients were confirmed with COVID-19 during the 1st wave, with daily average were 71.5 cases (range 1-909). The patient population comprised 6,688 male (45.6%) and 7,972 female (54.4%), and the aged distribution of the patients was ≤18 years (n=791, 5.4%), 19-59 years (n=10,380,

70.8%), and ≥60 years (n=3,489, 23.8%). The patient population consisted of 13,576 (92.6%) Korean nationals and 1,084 (7.4%) foreign nationals. Among the reported COVID-19 cases, 12,086 (82.4%) were domestically transmitted, while 2,574 (17.6%) were transmitted from abroad. In terms of region, 2,844 cases (23.5%) occurred in the Seoul metropolitan area, while 9,242 cases (76.5%) occurred in non-Seoul metropolitan areas, of which 6,881 (56.9%) cases were reported in Daegu, 1,374 (11.4%) in Gyeongbuk, 1,335 (11.0%) in Seoul, and 1,201 (9.9%) in Gyeonggi. A total of 375 severe/critical cases and 308 deaths were reported, with a case fatality rate of 2.10%.

3. Characteristics of the period 2 (2nd wave, August 12, 2020– November 12, 2020): Seoul metropolitan area

The 2nd wave was triggered by religious facilities and a mass gathering event in the Seoul metropolitan area, with the infection rapidly spreading through publicly used facilities, Sales briefing related outbreaks, and family and social gatherings. The 2nd wave lasted from August 12, 2020, to November 12, 2020.

A total of 13,280 patients were confirmed to have COVID-19 during the 2nd wave, with a daily average rate of 221 and daily range of 38-441. Of the total patient population, 6,394 were male (48.1%) and 6,886 were female (51.9%); the age distribution of patients was ≤18 years (n=1,082, 8.1%), 19-59 years (n=7,809, 58.8%), and ≥60 years (n=4,389, 33.0%). The patient population consisted of 12,129 (91.3%) Korean nationals and 1,151 (8.7%) foreign nationals. Among the total cases, 11,820 (89.0%) were transmitted domestically, while 1,460 (11.0%) were transmitted from abroad. In terms of region, 9,166 cases (77.5%) occurred in the Seoul metropolitan area, while 2,654 cases (22.5%) occurred in non-Seoul metropolitan areas, of which 4,679 (39.9%) were reported in Seoul, 3,839 (32.5%) in Gyeonggi, 648 (5.5%) in Incheon and 436 (3.7%) in Chungnam. A total of 575 severe/critical cases and 221 deaths were reported, with a case fatality rate of 1.66%.

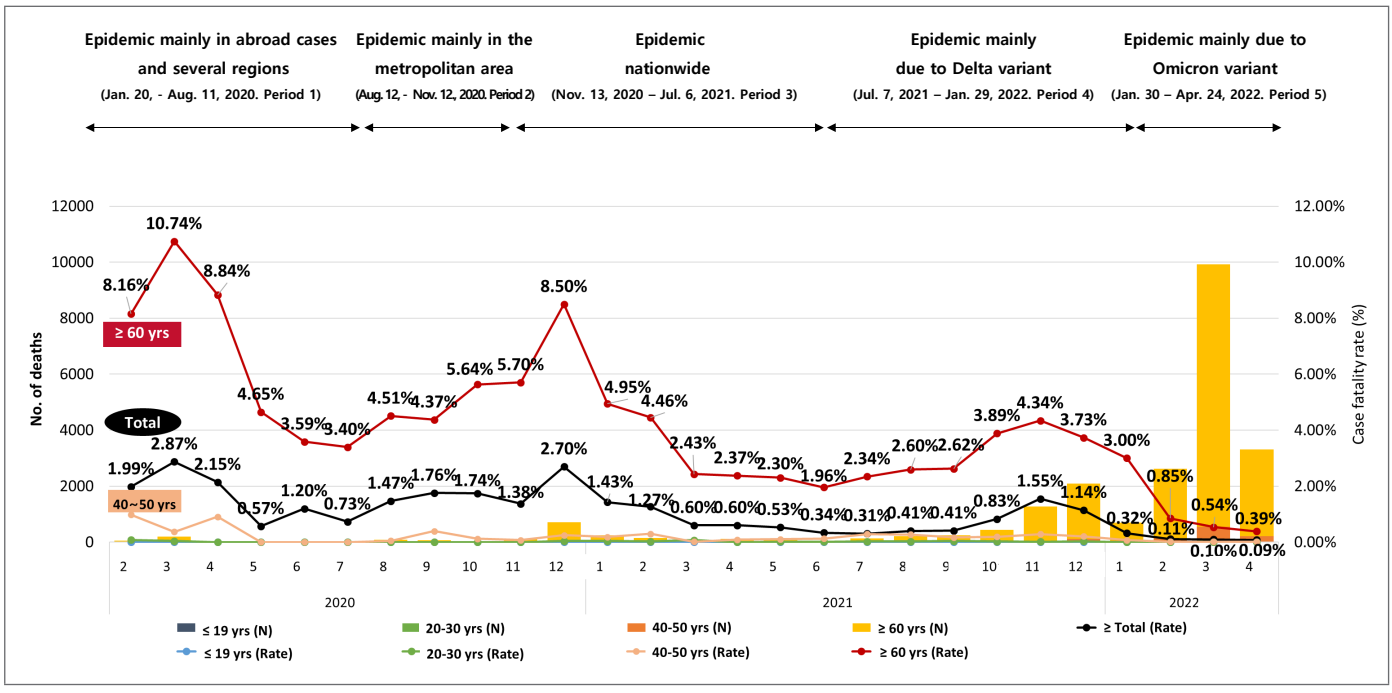

Figure 2. Monthly deaths and case fatality rate of COVID-19 from January 20, 2020 to April 24, 2022
(Data: January 20, 2020 - April 25, 2022, 0:00, Monitoring of clinical progress: as of May 7, 2022)

4. Characteristics of the period 3 (3rd wave, November 13, 2020–July 6, 2021): Nationwide spread

The 3rd wave was due to a nationwide spread of COVID-19 after the advent of the Alpha, Epsilon, and Delta variants. The wave lasted from November 13, 2020, to July 6, 2021, and occurred nationwide primarily through correctional facilities, hospitals, long-term care facilities, and religious facilities.

A total of 133,600 patients were confirmed of having COVID-19 during the 3rd wave, with a daily average rate of 566.1 and daily range of 191-1,240. Of the total patient population, 68,448 were male (51.2%) and 65,152 were female (48.8%); the age distribution of patients was ≤18 years (n=15,412, 11.5%), 19-59 years (n=86,415, 64.7%), and ≥60 years (n=31,773, 23.8%). The patient population consisted of 123,278 (92.3%) Korean nationals and 10,322 (7.7%) foreign nationals; among the cases reported, 127,358 (95.3%) were transmitted domestically, while

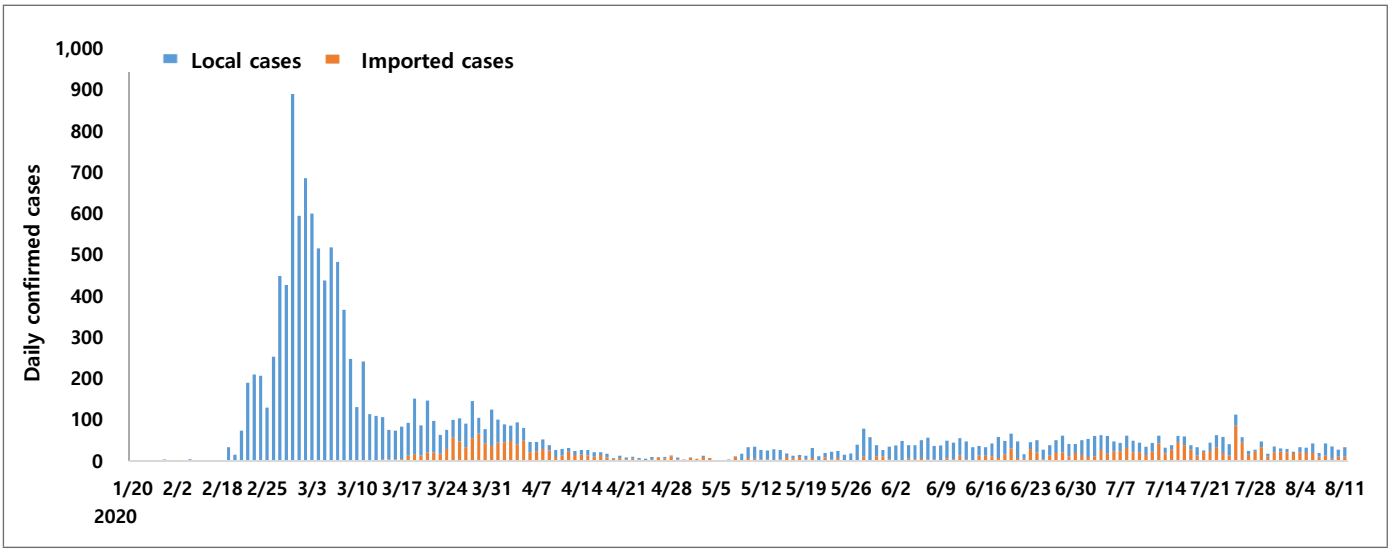

Figure 3. Daily confirmed cases of COVID-19, period 1 (January 20, – August 11, 2020)

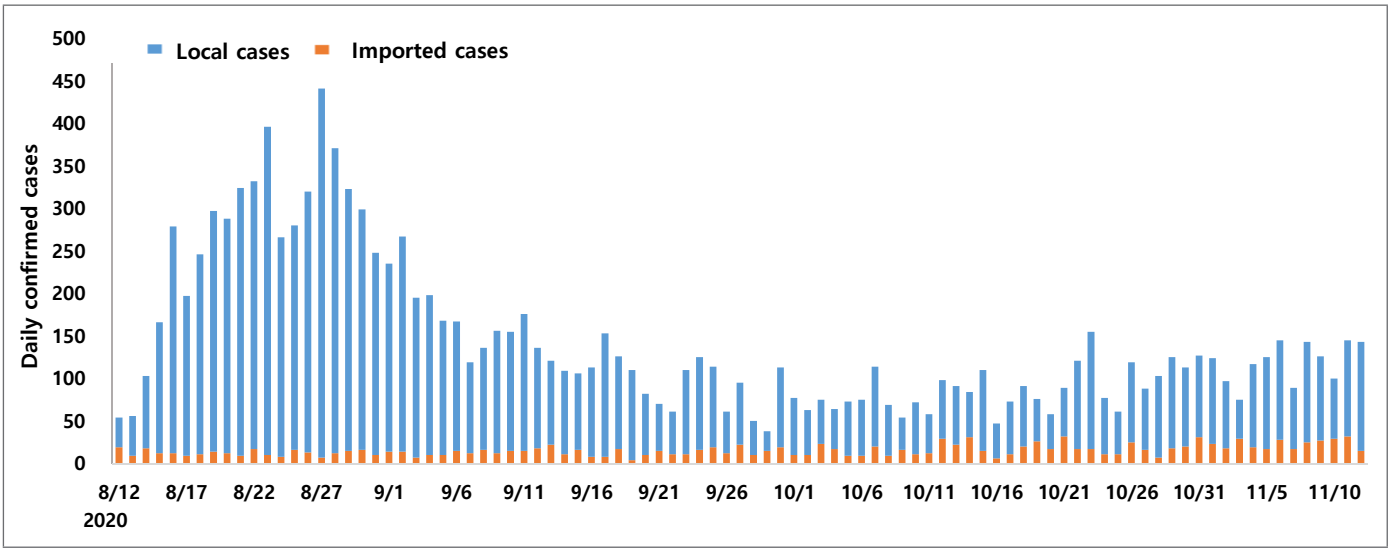

Figure 4. Daily confirmed cases of COVID-19, period 2 (August 12, – November 12, 2020)

6,242 (4.7%) were transmitted from abroad. In terms of region, 88,698 cases (69.6%) occurred in the Seoul metropolitan area, while 38,660 cases (30.4%) occurred in non-Seoul metropolitan areas, of which 44,642 (35.1%) were reported in Seoul, 38,449 (30.2%) in Gyeonggi, 5,607 (4.4%) in Incheon, and 5,566 (4.4%) in Busan. A total of 3,188 severe/critical cases and 1,556 deaths were reported, with a case fatality rate of 1.16%.

5. Characteristics of the period 4 (4th wave, July 7, 2021–January 29, 2022): Delta variant

The 4th wave was driven by the spread of the Delta variant, and small- to-moderate-level outbreaks continuously occurred at various places, including hospitals and long-term care facilities, publicly used facilities, religious facilities, and workplaces. The 4th wave lasted from July 7, 2021, to January 29, 2022. During this period, the 1st dose vaccination rate reached 70% (September 17, 2021); the proportion of older patients (≤60 years) reduced, while the number of patients aged ≤18 years with confirmed COVID-19 who were not included in the vaccination campaign increased significantly, with several outbreaks at educational facilities, such as schools, kindergartens, and daycare centers.

A total of 649,534 patients were confirmed of having COVID-19 during the 4th wave, with a daily average rate of 3,137.8 and daily range of 1,049-17,509. Of the total patient population, 337,749 were male (52.0%) and 311,785 were female (48.0%); the age distribution of patients was ≤18 years (n=134,353, 20.7%), 19-59 years (n=387,351, 59.6%), and ≥60 years (n=127,830, 19.7%). The patient population consisted of 589,023 (90.7%) Korean nationals and 60,511 (9.3%) foreign nationals; among the cases reported, 634,973 (97.8%) were transmitted domestically, while 4,561 (2.2%) were transmitted from abroad. In terms of region, 455,184 cases (71.7%) occurred in the Seoul metropolitan area, while 179,789 cases (28.3%) occurred in non-Seoul metropolitan areas, of which 213,816 (33.7%) were reported in Seoul, 199,996 (31.5%) in Gyeonggi, 41,327 (6.5%) in Incheon, and 26,025 (4.1%) in Busan. A total of 9,130 severe/critical cases and 5,061 deaths were reported, with a case fatality rate of 0.78%.

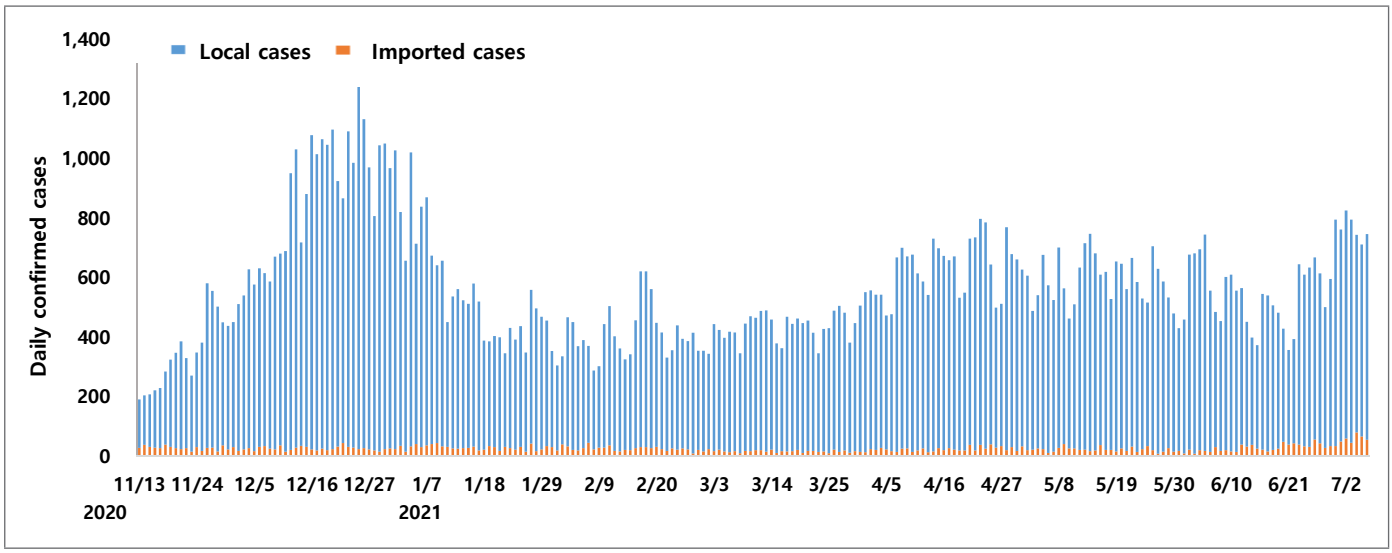

Figure 5. Daily confirmed cases of COVID-19, period 3 (November 13, 2020 – July 6, 2021)

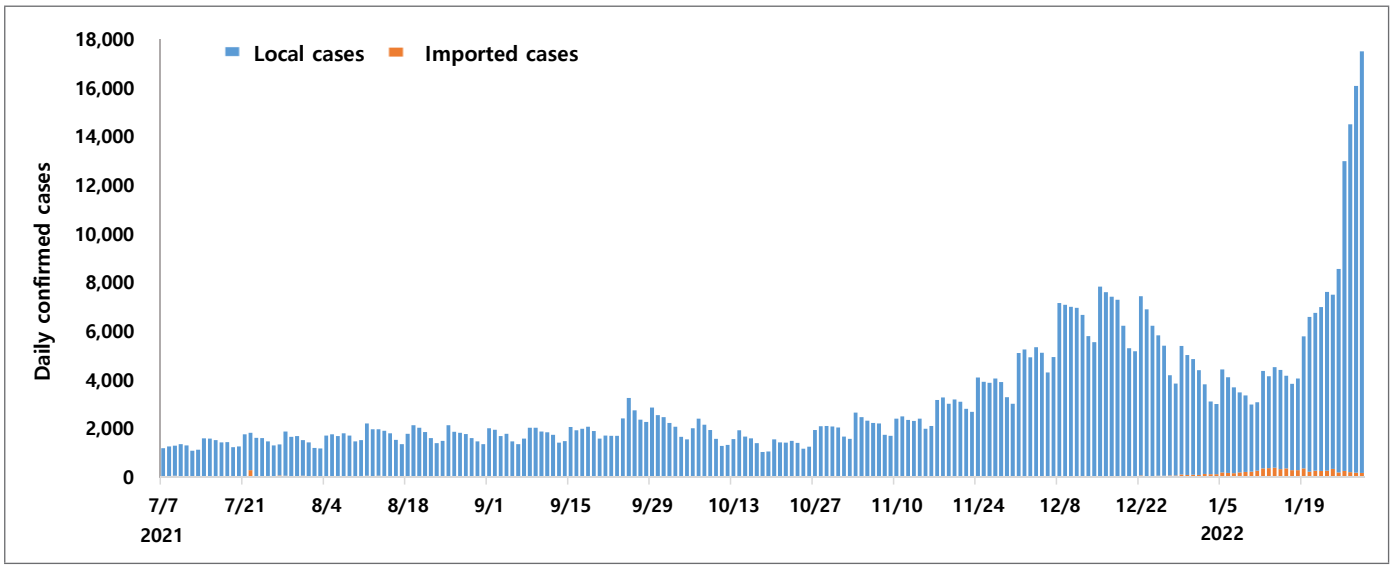

Figure 6. Daily confirmed cases of COVID-19, period 4 (July 7, 2021 – January 29, 2022)

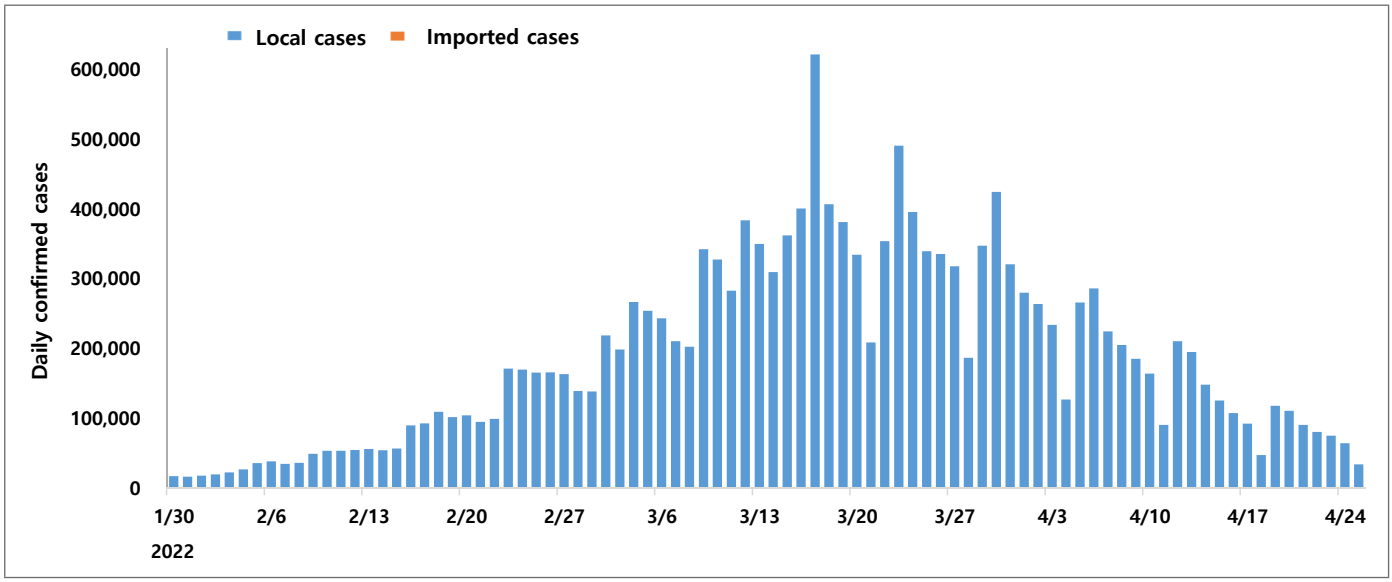

Figure 7. Daily confirmed cases of COVID-19, period 5 (January 30, – April 24, 2022)

6. Characteristics of the period 5 (5th wave, January 30, 2022–April 24, 2022): Omicron variant

The 5th wave was predominantly caused by the spread of the Omicron variant, which is known to have a two-fold higher transmissibility than the Delta variant [3], and it lasted from January 30, 2022, to April 24, 2022 (a day before reclassifying COVID-19 as a class 2 infectious disease). Compared with the early days of the COVID-19 outbreak, this period of the 5th wave was marked by a high vaccination rate and distribution of oral therapeutics, along with eased infection control measures (such as lifting the social distancing mandate) and transitioning from testing, tracing, and treatment to intensive surveillance of high-risk groups and infection vulnerable populations and transition to normal healthcare system [4].

Table 1. Epidemiological characteristics COVID-19 confirmed cases by period

Epidemic Period		The period of Class 1 infectious disease designation	Epidemic mainly in abroad cases and several regions	Epidemic mainly in the metropolitan area	Epidemic nationwide	Epidemic mainly due to Delta variant	Epidemic mainly due to Omicron variant
		(January 20, 2020 – April 24, 2022)	(January 20, – August 11, 2020)	(August 12, – November 12, 2020)	(November 13, 2020 – July 6, 2021)	(July 7, 2021 – January 29, 2022)	(January 30 – April 24, 2022)
		Total	Period 1 (1st wave)	Period 2 (2nd wave)	Period 3 (3rd wave)	Period 4 (4th wave)	Period 5 (5th wave)
Confirmed cases (n)		**16,929,564**	**14,660**	**13,280**	**133,600**	**649,534**	**16,118,490**
Sex	Male	7,968,125 (47.1%)	6,688 (45.6%)	6,394 (48.1%)	68,448 (51.2%)	337,749 (52.0%)	7,548,846 (46.8%)
	Female	8,961,439 (52.9%)	7,972 (54.4%)	6,886 (51.9%)	65,152 (48.8%)	311,785 (48.0%)	8,569,644 (53.2%)
Age group, yrs	0–18	4,117,327 (24.3%)	791 (5.4%)	1,082 (8.1%)	15,412 (11.5%)	134,353 (20.7%)	3,965,689 (24.6%)
	19–59	9,812,940 (58.0%)	10,380 (70.8%)	7,809 (58.8%)	86,415 (64.7%)	387,351 (59.6%)	9,320,985 (57.8%)
	60≤	2,999,299 (17.7%)	3,489 (23.8%)	4,389 (33.0%)	31,773 (23.8%)	127.830 (19.7%)	2,831,818 (17.6%)
Nationality	Korean	16,512,915 (97.5%)	13,576 (92.6%)	12,129 (91.3%)	123,278 (92.3%)	589,023 (90.7%)	15,774,909 (97.9%)
	Foreigner	416,649 (2.5%)	1,084 (7.4%)	1,151 (8.7%)	10,322 (7.7%)	60,511 (9.3%)	343,581 (2.1%)
Average confirmed cases by period (min – max)		20,471.1 (1 – 621,177)	71.5 (1 – 909)	142.8 (38 – 441)	566.1 (191 – 1,240)	3,137.8 (1,049 – 17,509)	187,424.3 (17,075 – 621,177)
Severe /critical cases (daily average)		22,137 (26.8)	375 (1.8)	575 (6.1)	3,188 (13.5)	9,130 (44.1)	8,869 (103.1)
Death cases (Case fatality rate)		23,045 (0.14%)	308 (2.10%)	221 (1.66%)	1,556 (1.16%)	5,061 (0.78%)	15,899 (0.10%)
Local cases		**16,897,736 (99.8%)**	**12,086 (82.4%)**	**11,820 (89.0%)**	**127,358 (95.3%)**	**634,973 (97.8%)**	**16,111,499 (99.9%)**
Seoul metropolitan area		**9,084,961 (53.8%)**	**2,844 (23.5%)**	**9,166 (77.5%)**	**88,698 (69.6%)**	**455,184 (71.7%)**	**8,529,069 (52.9%)**
Seoul		3,427,693 (20.3%)	1,335 (11.0%)	4,679 (39.6%)	44,642 (35.1%)	213,816 (33.7%)	3,163,221 (19.6%)
Incheon		1,016,066 (6.0%)	308 (2.5%)	648 (5.5%)	5,607 (4.4%)	41,372 (6.5%)	968,131 (6.0%)
Gyeonggi		4,641,202 (27.5%)	1,201 (9.9%)	3,839 (32.5%)	38,449 (30.2%)	199,996 (31.5%)	4,397,717 (27.3%)
Areas outside Seoul Metropolitan Area		**7,812,775 (46.2%)**	**9,242 (76.5%)**	**2,654 (22.5%)**	**38,660(30.4%)**	**179,789 (28.3%)**	**7,582,430 (47.1%)**
Busan		1,037,050 (6.1%)	145 (1.2%)	401 (3.4%)	5,566 (4.4%)	26,025 (4.1%)	1,004,913 (6.2%)
Daegu		692,376 (4.1%)	6,881 (56.9%)	228 (1.9%)	3,312 (2.6%)	20,212 (3.2%)	661,743 (4.1%)
Gwangju		491,247 (2.9%)	182 (1.5%)	282 (2.4%)	2,331 (1.8%)	10,854 (1.7%)	477,598 (3.0%)
Daejeon		469,966 (2.8%)	147 (1.2%)	265 (2.2%)	2,312 (1.8%)	12,832 (2.0%)	454,410 (2.8%)
Ulsan		347,432 (2.1%)	34 (0.3%)	86 (0.7%)	2,610 (2.0%)	5,617 (0.9%)	339,085 (2.1%)
Sejong		128,155 (0.8%)	45 (0.4%)	19 (0.2%)	482 (0.4%)	2,200 (0.3%)	125,409 (0.8%)
Gangwon		468,241 (2.8%)	53 (0.4%)	249 (2.1%)	3,186 (2.5%)	11,623 (1.8%)	453,130 (2.8%)
Chungbuk		509,984 (3.0%)	62 (0.5%)	94 (0.8%)	3,031 (2.4%)	11,044 (1.7%)	495,753 (3.1%)
Chungnam		658,258 (3.9%)	162 (1.3%)	436 (3.7%)	3,051 (2.4%)	19,257 (3.0%)	635,352 (3.9%)
Jeonbuk		546,270 (3.2%)	18 (0.1%)	105 (0.9%)	2,133 (1.7%)	11,346 (1.8%)	532,668 (3.3%)
Jeonnam		541,134 (3.2%)	18 (0.1%)	142 (1.2%)	1,411 (1.1%)	8,554 (1.3%)	531,009 (3.3%)
Gyeongbuk		692,979 (4.1%)	1,374 (11.4%)	146 (1.2%)	3,223 (2.5%)	15,211 (2.4%)	673,025 (4.2%)
Gyeongnam		1,011,827 (6.0%)	110 (0.9%)	171 (1.4%)	4,826 (3.8%)	21,131 (3.3%)	985,589 (6.1%)
Jeju		217,856 (1.3%)	11 (0.1%)	30 (0.3%)	1,186 (0.9%)	3,883 (0.6%)	212,746 (1.3%)

Epidemic Period	The period of Class 1 infectious disease designation (January 20, 2020 – April 24, 2022)	Epidemic mainly in abroad cases and several regions (January 20, – August 11, 2020)	Epidemic mainly in the metropolitan area (August 12, – November 12, 2020)	Epidemic nationwide (November 13, 2020 – July 6, 2021)	Epidemic mainly due to Delta variant (July 7, 2021 – January 29, 2022)	Epidemic mainly due to Omicron variant (January 30 – April 24, 2022)
	Total	Period 1 (1st wave)	Period 2 (2nd wave)	Period 3 (3rd wave)	Period 4 (4th wave)	Period 5 (5th wave)
Imported cases	31,828 (0.2%)	2,574 (17.6%)	1,460 (11.0%)	6,242 (4.7%)	14,561 (2.2%)	6,991 (<0.1%)
Characteristics of outbreaks	• Daegu · Gyeongbuk, Metropolitan area (Period 1, 2, 3) • A wide area of the entire society (Period 4) • The number of confirmed cases has risen sharply due to Omicron, quarantine system paradigm shift (Period 5)	• After the first confirmed case (imported case) on January 20, 2020, starting with the Daegu and Gyeongbuk epidemic related to long-term care facility, church and publicly used facilities	• A large number of small to medium sized cluster occurred due to religious facilities in the Seoul metropolitan area, large-scale urban gatherings, and publicly used facilities	• Large-scale spread of the epidemic nationwide from the center of the Seoul metropolitan area • Multiple occurrences in correctional facilities, medical institutions, religious facilities, etc. • Start of vaccination	• Continued occurrence of confirmed cases in Seoul metropolitan area • Changes in age of confirmed cases according to vaccination status • Delta → Omicron variant dominant	• The number of confirmed cases has risen sharply due to Omicron • 95.2% of the total confirmed cases occur in Period 5 • High occur in children and adolescents • The introduction of self-writing systems in epidemiological investigation

1) Data as of January 20, 2020 – April 25, 2022, 0:00
2) Monitoring of severe/critical and deaths: as of May 7, 2022

A total of 16,118,490 patients were confirmed of having COVID-19 during the 5th wave, accounting for 95.2% of the cumulative total. The daily average rate was 187,424.3, and the daily range was 17,075-621,177. Of the total patient population, 7,548,846 were male (46.8%) and 8,569,644 were female (53.2%); the age distribution of patients was ≤18 years (n=3,965,689, 24.6%), 19-59 years (n=9,320,985, 57.8%), and ≥60 years (n=2,831,816, 17.6%). The patient population consisted of 15,774,909 (97.9%) Korean nationals and 343,581 (2.1%) foreign nationals; among the cases reported, 16,111,499 (99.9%) were transmitted domestically, while 6,991 (< 0.1%) were transmitted from abroad. In terms of region, 8,529,069 cases (52.9%) occurred in the Seoul metropolitan area, while 7,582,430 cases (47.1%) occurred in non-Seoul metropolitan areas, of which 4,397,717 (27.3%) were reported in Gyeonggi, 3,163,221 (19.6%) in Seoul, 1,004,913 (6.2%) in Busan, and 985,589 (6.1%) in Gyeongnam. A total of 8,869 severe/critical cases and 15,899 deaths were reported, with a case fatality rate of 0.10%.

Conclusion

The Korean government designated and managed COVID-19 as a class 1 infectious disease from January 20, 2020, to April 24, 2022. During this period, 16,929,564 cases of COVID-19 were confirmed, which accounts for 32.8% of the total Korean population. The daily average number of confirmed cases during this period was 20,471.1 (range: 1-621,177). Female individuals were more commonly affected during the 1st wave (54.4%), 2nd wave (51.9%), and 5th wave (53.2%), while male individuals were more commonly affected during the 3rd wave (51.2%) and 4th wave (52.0%). In terms of age, the proportion of COVID-19 patients aged ≤18 years increased continuously from the 1st wave to 5th wave (5.4% → 8.1% → 11.5% → 20.7% →

24.6%), while that of patients aged ≥60 years decreased (23.8% → 33.0% → 23.8% → 19.7% → 17.6%). During the 1st wave, 17.6% of the patients were foreign nationals (n=2,547), but the proportion of cases transmitted from other countries tended to decline with the waves (11.0% during the 2nd wave, 4.7% during the 3rd wave, 2.2% during the 4th wave, and <0.1% during the 5th wave). Among patients with domestically transmitted COVID-19, the majority were from the Daegu and Gyeongbuk regions (56.9% and 11.4%, respectively) during the 1st wave; 77.5% of the patients were from the Seoul metropolitan region during the 2nd wave, as the infection spread through a mass gathering event in Seoul. During the 3rd and 4th waves, 70% of the patients were from the Seoul metropolitan area, while 30% were from other areas. During the 5th wave, wherein the Omicron variant was the predominant strain, individuals were affected nationwide. The proportion of patients in the Seoul metropolitan area (52.9%) and that in other areas (47.1%) during the 5th wave were relatively similar compared with those during the 1st-4th waves.

Because the severity of the disease was unknown at the initial outbreak of COVID-19, the number of deaths after COVID-19 diagnosis were continuously monitored. During the period when COVID-19 was designated as class 1 infectious disease, the overall case fatality rate was 0.14%; the case fatality rate peaked in the 1st wave (2.10%) and began to decline with the initiation of vaccination programs in the 3rd wave. Furthermore, since the Omicron variant gradually became the predominant variant in the ROK, the fatality decreased drastically to approximately 0.10% in the 5th wave.

In response to the discovery of a novel virus in January 2020, the government developed a COVID-19 diagnostic test and aggressively performed screening tests, epidemiology studies of confirmed cases, and patient management. Furthermore, the government implemented pharmacological interventions, such as provision of vaccinations and use of therapeutic agents, and nonpharmacological interventions, such as social distancing, to halt the spread of the virus throughout the community and to prevent progression to severe cases. In response to the continuous emergence of new variants as the COVID-19 pandemic persists, the government has performed immediate situational assessments and established appropriate countermeasures based on the results. The recent advent of the highly transmissible Omicron variant triggered a mass epidemic in the communities, but the proportion of patients whose condition progressed to a severe condition after contracting COVID-19 declined owing to the interventions that have been implemented and the nature of the variant strain. As a result, the government was able to downgrade COVID-19 to a class 2 infectious disease. As the initial COVID-19 response measures were established based on the infection prevention and control system restructured since the 2015 Middle East Respiratory Syndrome epidemic, the experiences of COVID-19 response since January 20, 2020, will serve as valuable resources in shaping responses for a new COVID-19 variant, resurgence of COVID-19 as a result of the decline in immunity, and a novel pathogen outbreak in the future.

Conflict of Interest

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

Correspondence to: Donghyok Kwon
Data Analysis Team, Epidemiological Investigation and Analysis Task Force, Central Disease Control Headquarters, Disease Control and Prevention Agency (KDCA)
vethyok@korea.kr, 043-719-7730

Submitted: June 13, 2022; **Revised:** June 17, 2022; **Accepted:** June 20, 2022

① What is known previously?

Since the first case of COVID-19 reported in Wuhan, Hubei Province, China, on December 31, 2019, World Health Organization declared COVID-19 as a pandemic, which has the highest alert level, on March 11, 2020. In the Republic of Korea, a cumulative total of 705,900 patients (1,367 per 100,000 population) were diagnosed with COVID-19 during the two-year period since the first reported case in the country (January 20, 2020, to January 19, 2022), with 6,480 deaths (fatality rate: 0.92%).

② What new information is presented?

During the period in which COVID-19 was designated as a class 1 infectious disease in the Republic of Korea from January 20, 2020, to April 24, 2022, the cumulative number of confirmed cases was 16,929,564 (32,785 per 100,000 population), the number of severe/critical patients was 22,137, the number of deaths was 23,045, and the case fatality rate was 0.14%. This report presents the details and trends of COVID-19 cases and the characteristics of each COVID-19 wave during the period in which it was designated as a class 1 infectious disease.

③ What are implications?

The Central Disease Control Headquarters analyzed the details and characteristics of COVID-19 cases during the period in which it was designated as a class 1 infectious disease. The government should prepare for a new potential COVID-19 variant, resurgence as a result of decline in immunity, and the advent of a novel pathogen in the future based on these findings.

References

1. WHO. COVID-19 Weekly Epidemiological Update (Edition 89, published 27 April 2022) [Internet]. Available from: http://apps.who.int/iris/handle/10665/353609.
2. Central Disease Control Headquarters. COVID-19), Republic of. [Internet]. Available from: http://ncov.mohw.go.kr.
3. Disease Control and Prevention Agency. COVID-19 for healthcare providers. [Internet]. Available from: https://ncv.kdca.go.kr/hcp/page.do.
4. Central Disease Control Headquarters press release (2022. 4. 15.) Social distancing mandate lifted after 2 years and 1 month, adherence to daily infection control practices like hand washing, ventilation, and disinfection becomes more important (periodic briefs). Available from: https://www.kdca.go.kr/upload_comm/syview/doc.html?fn=165035573164900.pdf&rs=/upload_comm/docu/0015.

This article has been translated from the Public Health Weekly Report (PHWR) Volume 15, Number 25, 2022.