Kakao
COVID-19 Report

November 2020

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Part 1.

Life during COVID-19,
as seen through Kakao data

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Life during COVID-19, as seen through Kakao data

The unforeseeable future.

Completely oblivious to what lies ahead. The entire world is in the midst of a global pandemic and we are no longer able to live life as we did before.

COVID-19 has penetrated deeply into our lives, and all so abruptly. In the face of this unprecedented crisis, we maintain our social wellness by embracing 'digital' elements.

With the aim to foster to a better world, Kakao strives to make meaningful connections for individuals, societies and beyond. Amidst the pandemic, we continue our endeavors to keep our society "on-tact".

We join collective efforts to understand and address the daily challenges posed by COVID-19 by analyzing the data from our services. We present our research and findings here, in the *Kakao COVID-19 Report*.

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Kakao COVID-19 Report, Part 1

Purposes of the Kakao COVID-19 Report
To understand the impact of COVID-19 on our daily lives.
To share data that support people in taking steps to address risks and challenges.

Goals of the Kakao COVID-19 Report

The two goals of the *Kakao COVID-19 Report* are as follows: First, with data from Kakao services that are used on the daily, we identify the changes in our lives due to COVID-19. Second, we examine the "new normal," so that our findings may contribute in developing future plans that effectively respond to risks and challenges.

Data Analysis and Methodology

- The *Kakao COVID-19 Report* analyzes data retrieved from multiple Kakao community and lifestyle services, including Kakao Talk , news, search, media·content, mobility, e-commerce, fintech, artificial intelligence and social impact.
- Methodology: The data are presented in the form of a graph to show proportional data or percentages (%), in order to illustrate the changes that occurred before and after COVID-19. The data were retrieved from (either the first week or the entire month of) January to June 2020 and for some analyses, to September 2020. Some data were excluded.
- Example: The graph below shows that the number of users increased by 50% on the fourth week of April, compared to the number of users in the first week of January 2020. On the y-axis, values above zero (0) represent an increase in frequency, whereas values below zero (0) represent a decrease in frequency.

Kakao COVID-19 Report, Part 1

Part 1 contains an overview of the *Kakao COVID-19 Report*.

With the onset of COVID-19, Korea is experiencing unprecedented social changes such as remote work and online education.
"Contactless" has become the norm in our everyday lives, transforming the ways in which individuals and our society communicate.

Increase in digital communication

People now communicate more through digital platforms, since offline communication has become less feasible. In late June, the number of messages sent through Kakao Talk increased by approximately 30%, compared to early January. The volume of messages exchanged through Kakao Talk increased greatly when the social distancing guideline in the Seoul metropolitan area was raised to Level 2 on August 16, and the upward trend has continued to this day. The number of Kakao Talk messages sent in the second week of September, when the social distancing guideline was raised again to Level 2, the number of Kakao Talk messages sent further increased by around 10% compared to the second week of August.
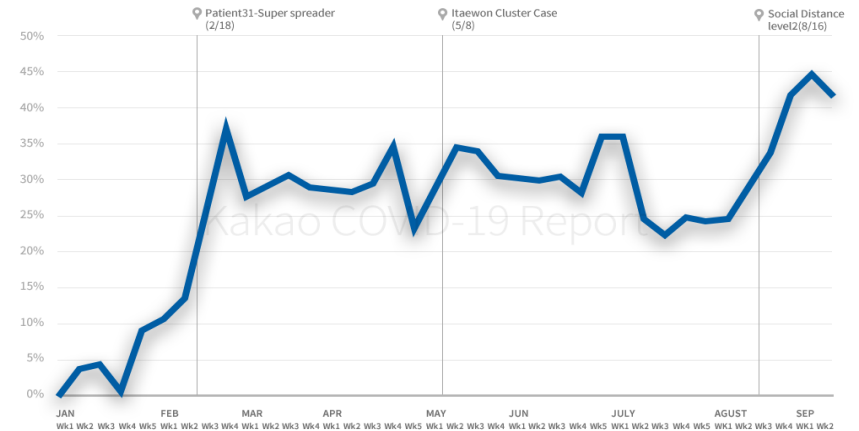
[Figure 1-1] Kakao Talk message exchange (Weekly, Jan. 1, 2020 to Sep. 13, 2020)

Diversified digital communication channels

Communication channels and methods have also been diversified. Digital communication using Voice Calls and Open Chats has also increased. Public digital communication tools, such as Open Chats, is being used for more than simple daily communication. These tools are now used to acquire information.

For example, Open Chats have been used to exchange information about COVID-19 on a regional and global scale. For instance, a cartographer who mapped the spread of coronavirus ran an Open Chat room that provided information to foreigners living in Korea and abroad. An elementary school in Gyeonggi-do, a province in South Korea, used an Open Chat room to communicate with students and parents. A local government in Seoul held a town hall using Open Chats. Open Chats are also widely used for various subjects, including the arts, culture and home entertainment.

Increase in multimedia communication

Social distancing and other contactless practices have now become the social norm. This has created major changes in the way we communicate. Personal communication, or one-on-one communication, has now expanded to communication with the masses.

While in the past, communication mostly happened through text, we now see an increase in communication using multimedia. Since February which was when a super-spreading incident occurred in South Korea, users spent 40% more time communicating through Voice Call than compared to a year ago.

[Figure 1-2] Open Chat exchange (Weekly, Jan. 1, 2020 to Jun. 30, 2020)
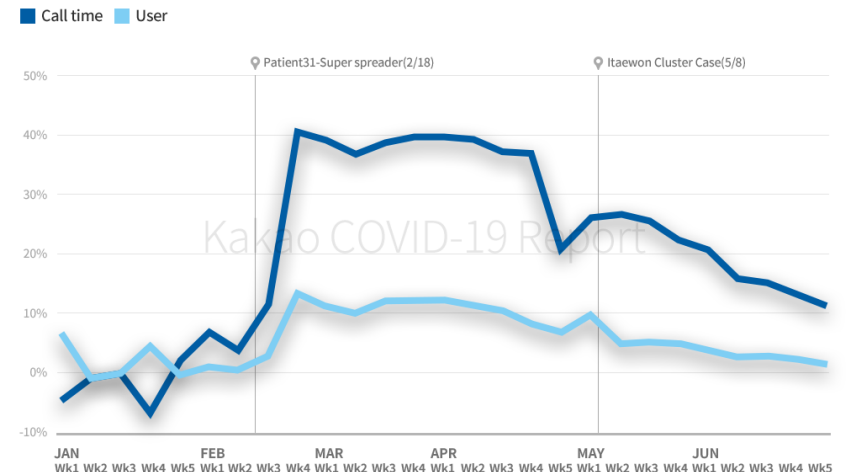
[Figure 1-3] Kakao Talk Voice Call time and users (Weekly, Jan. 1, 2020 to Jun. 30, 2020)

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Optimized digital tools to fit users' needs

In order to respond immediately to times of crisis, digital tools such as messengers, map services and smart assistants, were optimized to acquire accurate information quickly.

Let's look at the Korean government's face mask rationing system as an example. In March, when South Korea was experiencing the first wave of COVID-19, the top priority in every household and company was to "secure plenty of masks". Aligning with the South Korean government's face mask rationing policy, Kakao Map introduced a service on March 10 that provided information on where face masks were sold, as well as the stocks of each provider.

As soon as the feature was launched, the number of users who searched "rationed face masks" in Kakao Map exploded.

[Reference: Kakao and Kakao Mobility, as introduced in Private Sector Companies in the Fight Against *COVID-19 Report* by the International Transport Forum (ITF), OECD]
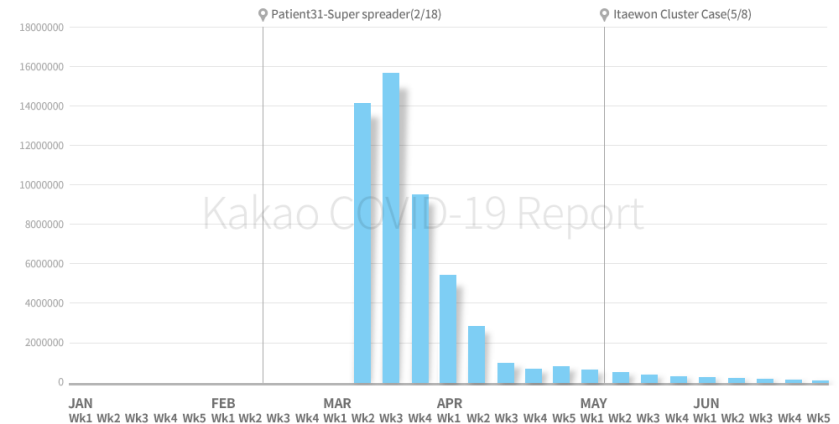
[Figure 1-4] Search input for "rationed face masks" in Kakao Map (Weekly, Jan. 1, 2020 to Jun. 30, 2020)

Smart use of digital tools while 'staying-at-home'

As more people refrained from venturing out of the home, the 'stay-at-home' lifestyle has become the new norm. Since people have no choice but to stay at home, they came up with many creative and entertaining ways to make the most of it, and these methods mostly involve the use of digital tools.

They have started to fill their newfound time at home with music, webtoons, web novels, movies, drama and social services (such as Kakao Brunch, Kakao Story, online cafes and blogs). More and more people, from all age groups, have started to enjoy online content that

range from education to at-home workouts. The use of digital devices that utilize augmented reality (AR) and virtual reality (VR) has also increased as more users consume various contents at home.

The usage of AI assistants has greatly increased as more and more people stay at home and opt for a contactless lifestyle. The use of Hey Kakao, an AI speaker that includes Kakao's AI platform 'Kakao i', has increased due to these changes in peoples' lives.

[Figure 1-5] Users and utterances made to Hey Kakao on education/childcare content (Weekly, Jan. 1, 2020 to Jun. 30, 2020)

[Figure 1-6] Trend in active users of Hey Kakao (Weekly, Jan. 1, 2020 to Jun. 30, 2020)
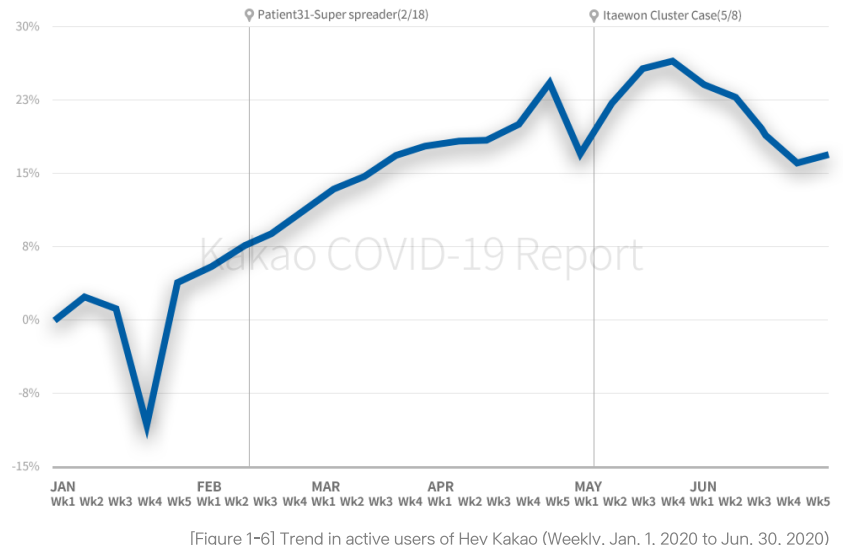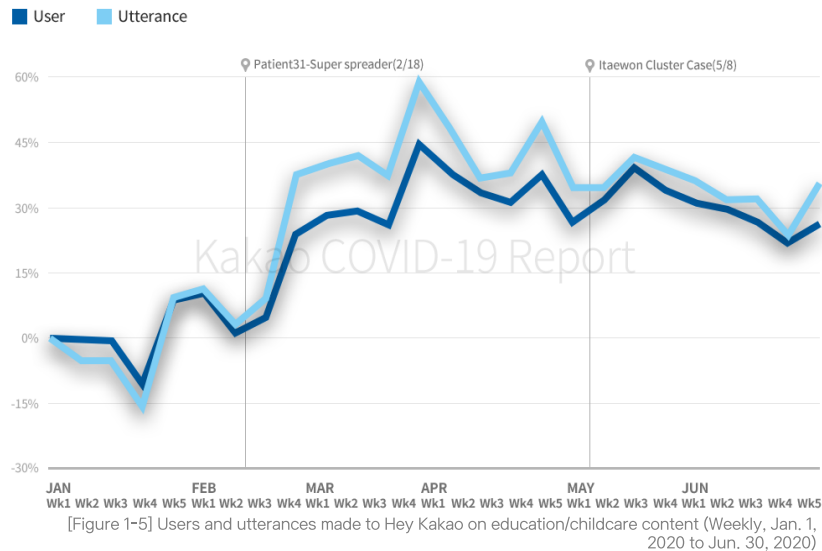
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Strong demand for bicycles during COVID-19

Less people are using public transportation during the COVID-19 pandemic, in order to reduce any contact with people they don't know. In short, they are trying to avoid public transportation, and this has resulted in an increased demand for bicycles.

Not only do bicycles minimize contact with strangers, but they are also a healthy form of leisure allowing release from the stuffiness of working from home. The increase in bicycle riders has led to an increased use of Kakao Map's bike route service. Compared to the beginning of 2020, the number of users has increased by 81%, while the number of service use has increased by 181%.
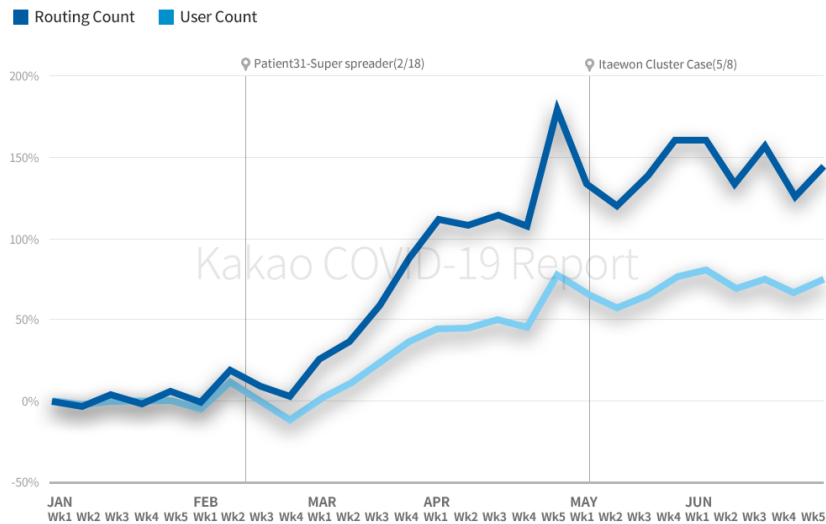
[Figure 1-7] Users/usage of Kakao Map's bike route search feature (Weekly, Jan. 1, 2020 to Jun. 30, 2020)

Showing how much you care, digitally

Offline correspondence has decreased drastically due to increased social distancing measures. Luckily, South Korea's advanced distribution and delivery systems and stable e-commerce services have allowed us to procure our daily necessities and groceries with ease. However, this does not mean that we do not have anything to worry about. Since social distancing is encouraged, we can no longer meet people face-to-face and express our feelings.

Fortunately, we have been able to express our concerns and feelings through digital means. Monetary gifts that are given when someone dies, which is customary practice in Korea, are now sent through digital money transfer. Compared to the previous weekend, 166.5% more monetary wedding gifts were sent via Kakao Pay on the third weekend of August, which included August 23, the day the social distancing guideline was raised to Level 2. Because gatherings were limited to 50 people or less, those who were not able to attend the wedding sent their congratulations through Kakao Pay.

Transfer of monetary gifts to express condolences for deaths increased 35%, and overall transfer of money increased by 10%. We can now show how much we care through digital means.
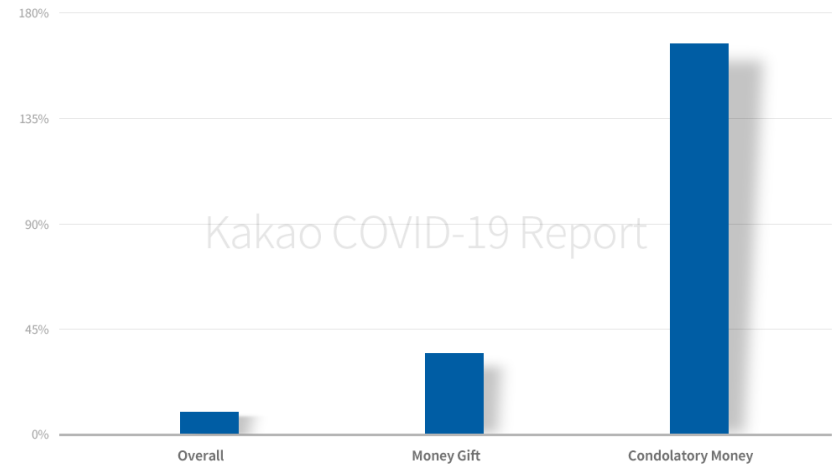
[Figure 1-8] Monetary gift transfer using Kakao Pay before and after social distancing guidelines were raised to Level 2. (Increase in third week of August compared to the second week of August)

Part 2.

Finding solace
in digital tools

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Due to the spread of the coronavirus, social distancing has become one of the most important measures we can take to protect ourselves from infection. As part of the social distancing measures, many companies encourage employees to work from home and students are participating in distance learning from home. Weekends are also spent at home to protect ourselves and others from the virus. Therefore, we asked the following questions.

Q.
How has spending more time at home affected how you consume media content?
A.

Analysis results

① Customer's consumption has shifted from one-time use to continuous usage. For example, the number of people who use Melon once or twice a week decreased, while the number of people who use Melon six to seven times a week increased.

② Overall, service usage in the morning has decreased, while service usage in the afternoon has increased.

③ Digital prosumers that are active on social media, have shown more activity. Users' content creation has also increased. The majority of content posted on social media platforms are about COVID-19.

[Prosumer: Consumers who also produce products/services.]

Therefore, since people refrain from going outside and spend more time at home, they show more interest in consuming and producing digital content. Although people are isolated from the offline environment and are confined to their homes, they have found solace in digital activities.
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Kakao analyzed the current situation and found the following results.

[Data has been converted to percentage (%) to clearly represent changes that occurred before and after COVID-19 (January 2020). However, absolute values were used for Figures 2-3 to 2-8, to accurately display changes per hour. Details of the analysis are provided at the end of this document.]

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Creating an at-home playlist

Digital music streaming per capita on Melon steadily increased from February to the end of May 2020. Streaming per capita increased up to 22% at the end of May, compared to the first week of January. Streaming decreased slightly in June, when social distancing restrictions were relaxed and continues to decrease slowly as of September 2020.
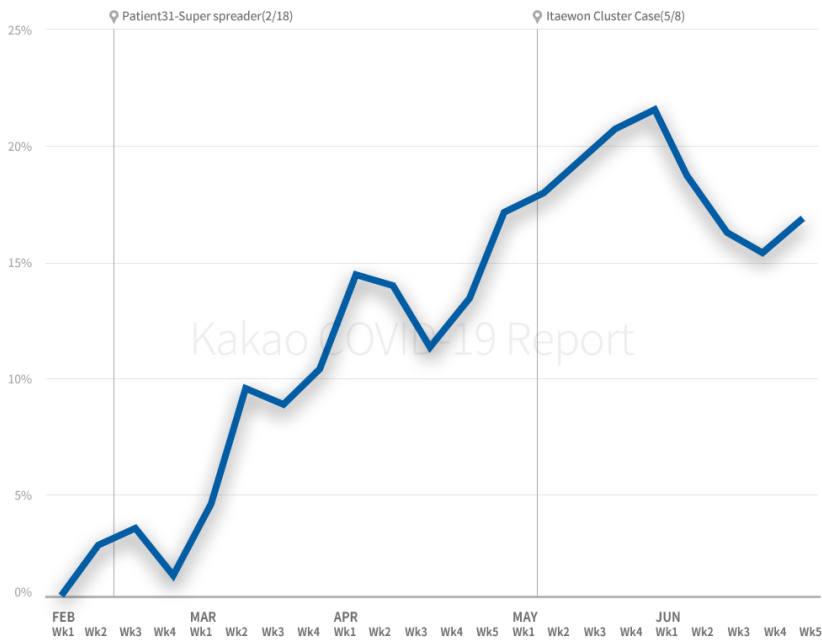
[Figure 2-1] Average streaming per capita through Melon (Weekly, Feb. 2020 to June 2020)

Kakao COVID-19 Report, Part 2

With the increase in streaming, the number of users who consume music daily has also increased. The number of users who consume music once or twice a week has decreased over time, while those who consume music throughout the week has increased. Listening to music has become a new routine in life during COVID-19.
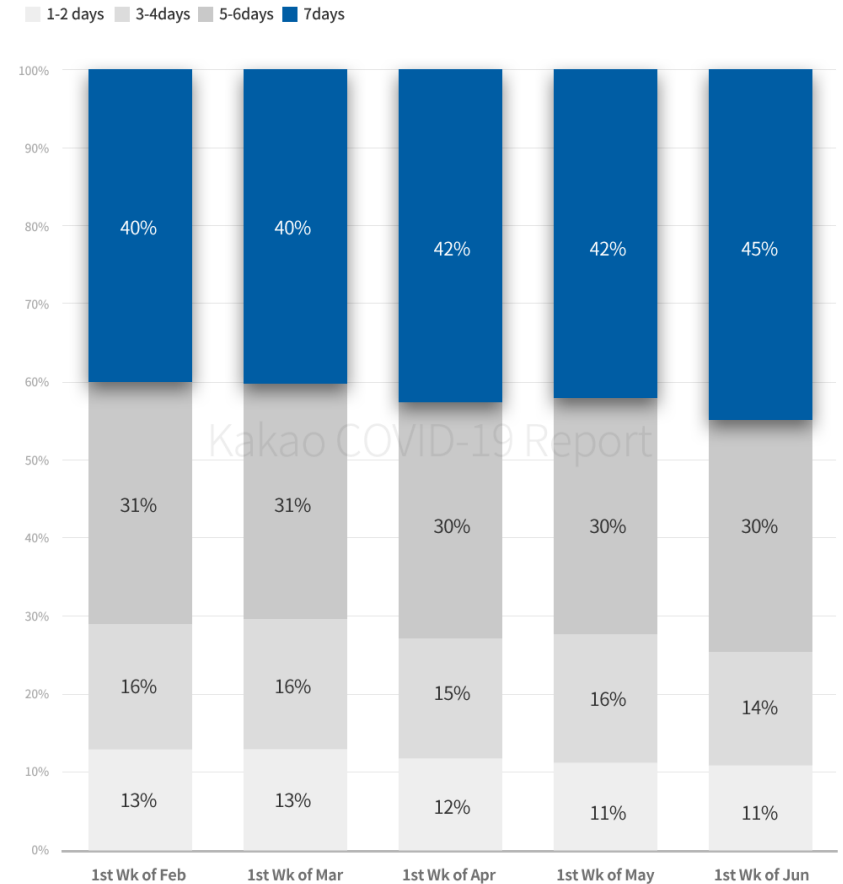
[Figure 2-2] Melon's monthly users' service usage per week (1st week of each month, Feb. 2020 to Jun. 2020)

A shift in when music is consumed

A COVID-19 super spreader was detected on February 18, 2020. COVID-19 had become a reality. The South Korean government advised people to refrain from traveling to work or school. People who stayed at home started to create a new way of life with music. Figure 2-3 shows when in the day people listened to music in February to June of 2020.

There are two major differences when comparing the number of streaming service users from February and June, and that of March to May. One, the number of users who use the service between 8 to 9 in the morning, when they usually go to work or school, continuously increased in March to June. The number of users who listen to music on the go decreased in March, as more people resorted to remote working and remote learning. And it then steadily increased as more people returned to work and school.

Two, the number of users who listen to music between 9 and 10, when they are usually busy preparing to start the day at work or school, decreased momentarily in February and June, but increased steadily in March to May.

There isn't a single reason that explains the differences in consumption between the two time periods, from March to May and February and June. However, it is fair to say that the change in mobility patterns caused by COVID-19 is one of the biggest factors.

■ 1st Wk of Feb   ■ 1st Wk of Mar   ■ 1st Wk of Apr   ■ 1st Wk of May   ■ 1st Wk of Jun

AM 00 01 02 03 04 05 06 07 08 09 10 11 PM 12 13 14 15 16 17 18 19 20 21 22 23 24
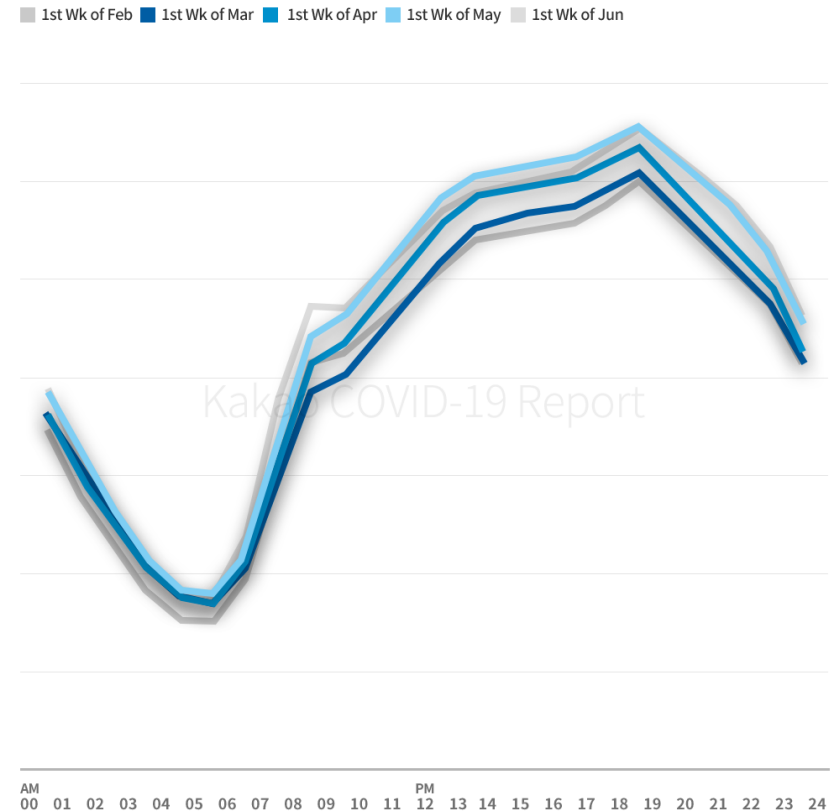
[Figure 2-3] Melon's monthly users' service usage per hour (First week of each month, Feb. 2020 to Jun. 2020)

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8 a.m. is no longer the most popular time t0 listen to music

Figure 3 may not clearly describe the differences in music consumption by time period. We studied the music consumption patterns of individuals in their teens to early 20s (15 to 24 years old) to get a more accurate picture of how COVID-19 affected music consumption hours. (Refer to Figure 2-4) We took this approach because we assumed that their daily lives had changed drastically once they were not able to physically go to school.

In February 2020, users in their teens to early twenties displayed high level of music consumption at 8 a.m., which is when they usually go to school. Consumption levels declined slightly after 8 a.m., then rebounded in the afternoon. However, these trends changed from March to May. There was no high consumption at 8 a.m. between March and May, as was present in February and June. Instead, there was a steady increase in March to May, without a specific high point of consumption. The reduced amount of travel outside the home affected when users consume music.
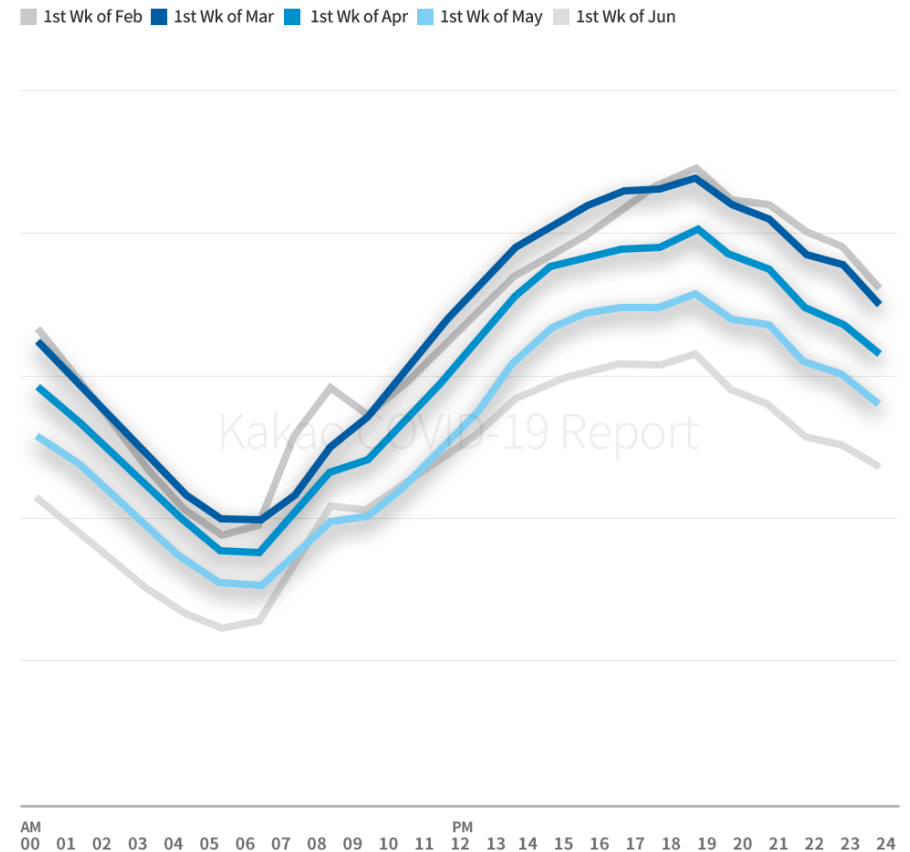
[Figure 2-4] Melon's monthly users' service usage by the hour
(Age group 15 to 24, first week of each month, Feb. 2020 to Jun. 2020)

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Less music in the morning, more in the afternoon

Kakao conducted another analysis to gain more insight on how COVID-19 affected music consumption. **We looked at the music streaming user data per hour from March 2018, 2019 and 2020.** In March of 2018 and 2019, streaming was at its heights at 8 a.m., and then decreased at 9 a.m. However, March 2020 displayed a very different user pattern compared to the previous two years. At 9 a.m., the streaming service was used at a similar rate in all three years.

However, there was a major difference in how much the streaming service was used in the afternoon. Users used the streaming service more between 2 p.m. and 7 p.m. in 2020 compared to the afternoons of the previous years.

■ March 2018　■ March 2019　■ March 2020

AM
00　01　02　03　04　05　06　07　08　09　10　11　PM 12　13　14　15　16　17　18　19　20　21　22　23　24
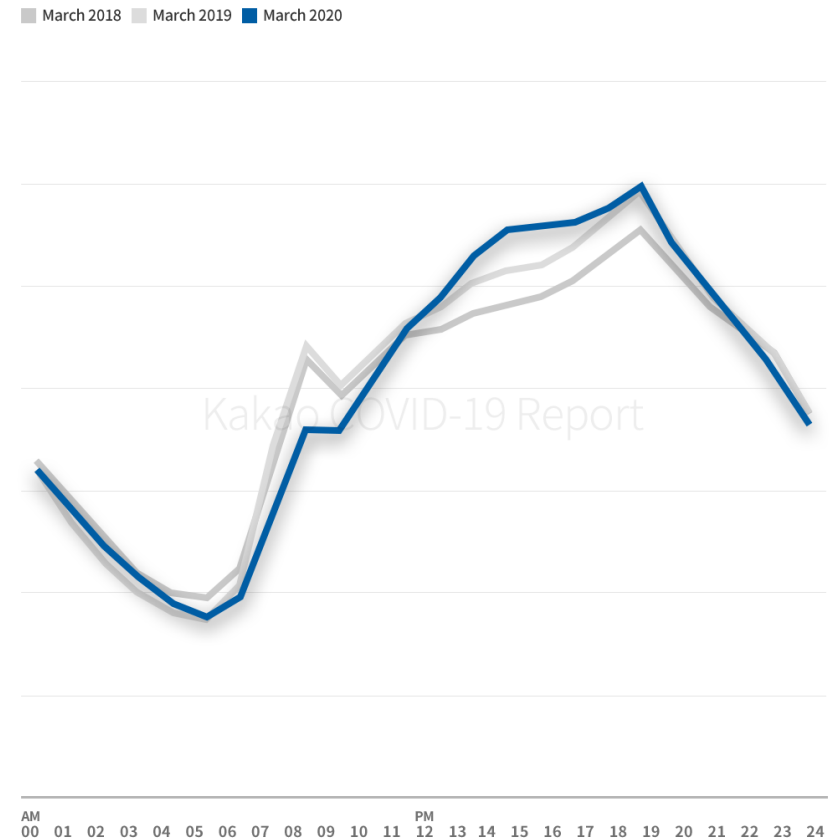
[Figure 2-5] Melon usage by the hour in March over the past three years (Mar. 2018, 2019 and 2020)

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Kakao COVID-19 Report, Part 2

The same trend can be observed for content usage on Kakao Page, in which content consumption decreased in the morning and increased in the afternoon. We compared the number of people who visited Kakao Page by the hour in March and April of 2019 and 2020. In March and April of 2019, the number of Kakao Page users increased in the early morning and decreased as the day progressed. However, data from March and April of 2020 showed that the usage of Kakao Page decreased in the early morning and increased in the afternoon.

Jan 2019   Mar 2019   Apr 2019   ■ Mar 2020   ■ Apr 2020

AM
00 01 02 03 04 05 06 07 08 09 10 11 PM 12 13 14 15 16 17 18 19 20 21 22 23 24
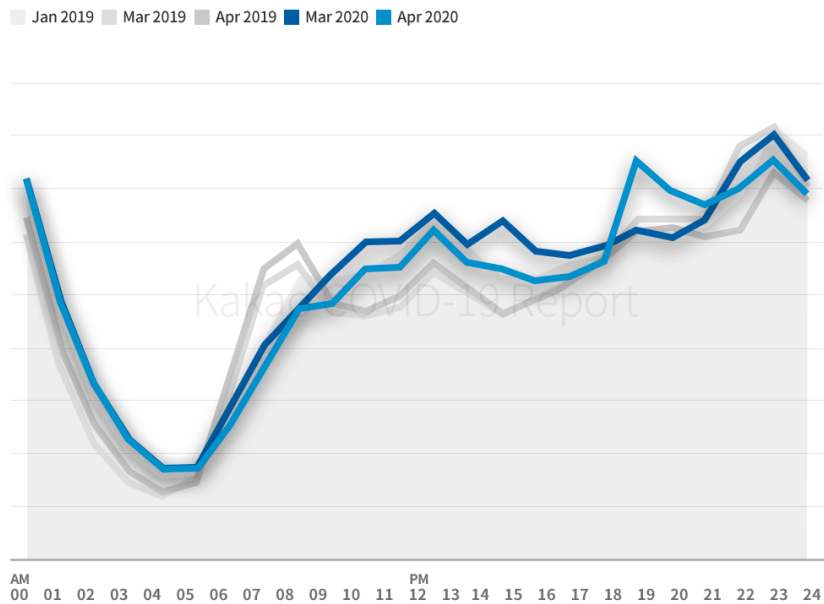
[Figure 2-6] Kakao Page visitors by the hour (January, March and April of 2019, and March and April of 2020)

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Upward trend in afternoon usage also seen in AI services

The upward trend of increased usage in the afternoon was also seen in Hey Kakao. We tracked the hourly user data of Hey Kakao by looking into the number of utterances (Refer to Figure 2-7). The number of utterances represents the number of times users said a command into Kakao Mini, the AI speaker. The number of utterances made to Hey Kakao during the daytime was noticeably higher in March, April and May (in blue colors) than January, February and June. We also saw a decrease in the usage of Hey Kakao in June, when social distancing restrictions were relaxed, with a decrease continuing into September.
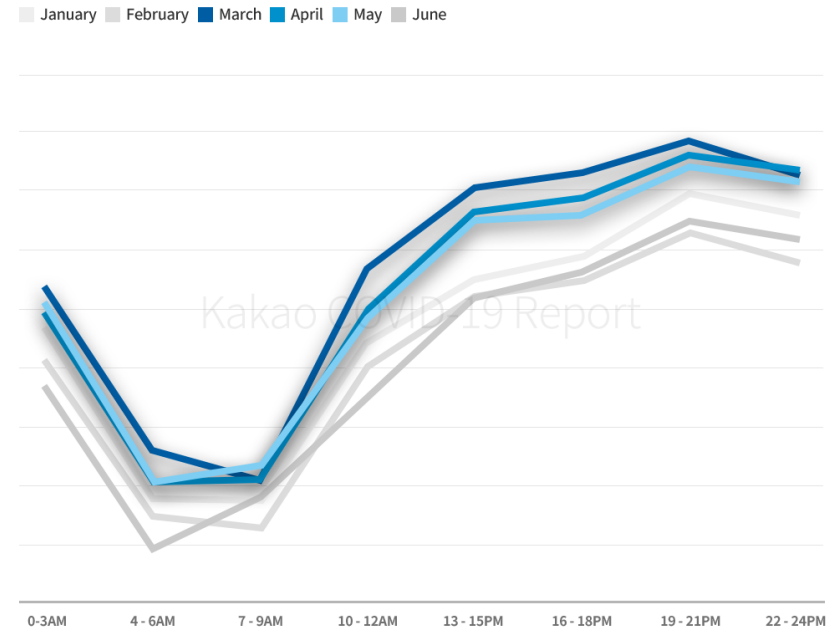
[Figure 2-7] Usage of Hey Kakao by the hour per month (No. of utterances, Jan. 2020 to Jun. 2020)

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Increase in alarms set during the daytime with AI speakers

Figure 2-8 shows alarms that were set at specific hours of the day using Hey Kakao on March and May of 2019 and 2020 respectively. **Less alarms were set for morning hours, while more alarms were set for afternoon hours in March and May of 2020 compared to the same period in 2019.** There is no simple reason to describe the outcome. The need for alarms may have increased because people were waking up later than before or were at home more in the afternoon. However, we know for sure that COVID-19 definitely affected the time alarms were set using AI speakers.

More active digital prosumers and music consumption

Let's take a look at data from several of Kakao's social media services. First, we will look at Brunch. More people have uploaded content on Brunch since the beginning of COVID-19. Uploads increased up to 52% on the second week of May, compared to early January. The number of writers have continued to increase steadily since May 2020.

March 2019 May 2019 March 2020 May 2020

[Figure 2-8] Alarms set at each hour of the day using Hey Kakao (Mar. and May of 2019 and 2020)
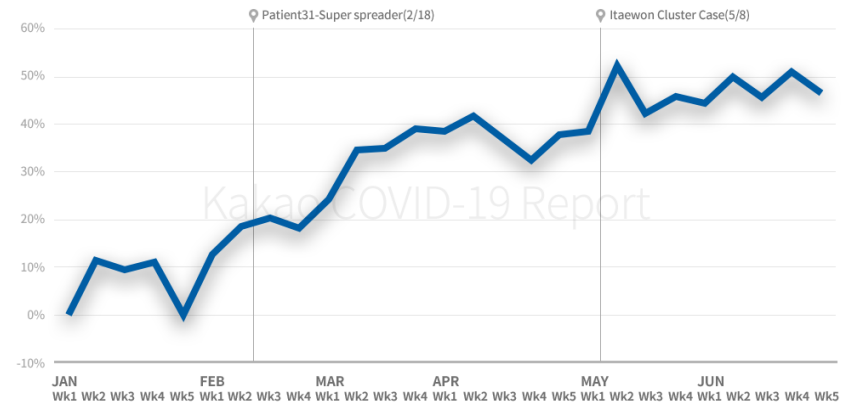
[Figure 2-9] Content writers in Brunch (Weekly, Feb. 2020 to Jun. 2020)

We decided to analyze hashtags to understand the content writers were uploading onto Brunch while they were experiencing COVID-19. Figure 2-10 is a word cloud made up of words that were frequently used in tags attached to Brunch postings that were uploaded during the second quarter of 2020. The most frequently used tags included words that were related to COVID-19, such as work-from-home, face masks and coronavirus. COVID-19 is imbedded in almost every digital prosumers' content as we live our lives during COVID-19.

[Figure 2-10] Word cloud of words that frequent tags in Brunch postings (Apr. to Jun., 2020)

Kakao COVID-19 Report, Part 2

The number of people who posted content on Daum Cafe has increased remarkably since the pandemic started. The number of writers posting on Daum Cafe in May increased by more than 20% compared to that of early January, and it has risen steadily as of September.

Since February, we can see that users are consuming music more actively through Melon. There are three criteria users rely on when selecting music to stream on Melon. Users use the Melon Charts (this method is no longer supported as of the date this analysis was made), playlists and search to find music. We took a look at how each method was used between February and June of 2020. Since music consumption increased in February, more and more users are transitioning into more active ways to find music, such as using search or playlists (DJ playlist, For U), rather than relying on charts.
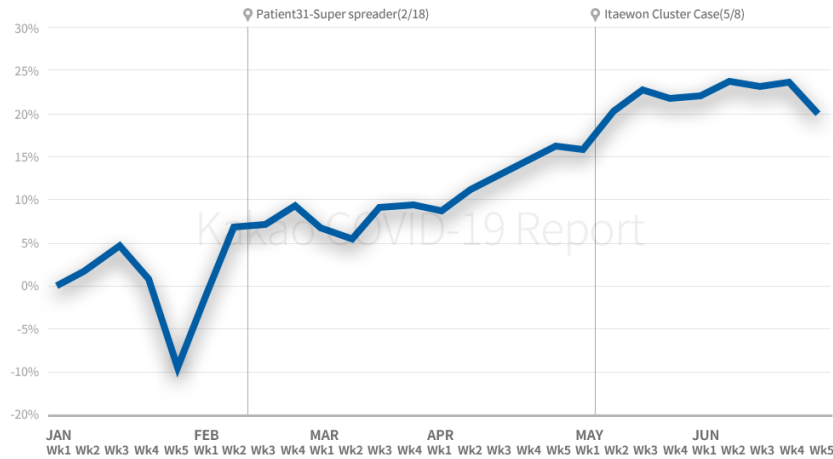
[Figure 2-11] Content writers in Daum Cafe (Weekly, Feb. 2020 to Jun. 2020)
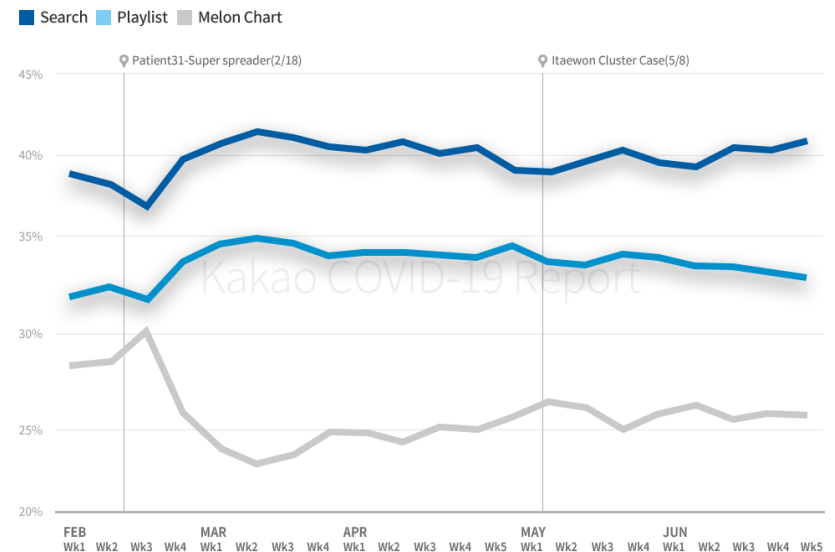
[Figure 2-12] Methods used to select music streamed with Melon (Weekly, Feb. 2020 to Jun. 2020)

Part 3

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How life changed
by staying at home

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Home, the new base camp during COVID-19

People have made many changes in their lives due to COVID-19. They stay at home more and don't go out as much as they used to. People no longer leave the house to eat out or have fun and they limit themselves to hobbies that can be enjoyed indoors. More people are talking about staying at home, since that is where they spend most of their time.
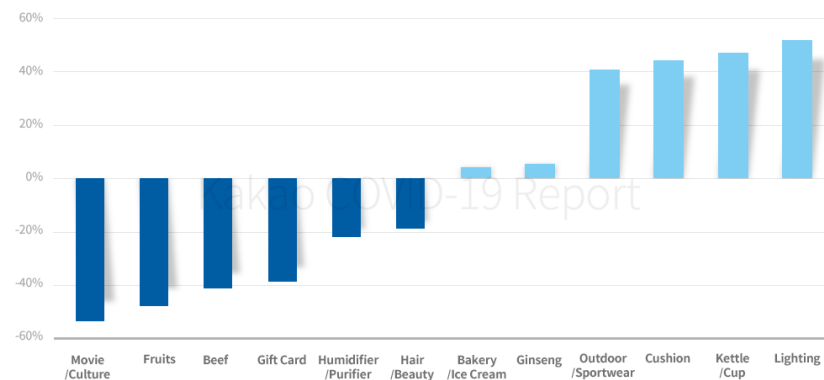
Part 3 of the *Kakao COVID-19 Report* is about how our lives have changed as our homes have transformed into our base camps during COVID-19.

Life at home, as seen with KakaoTalk Gift

Kakao Talk Gift ("Gift") is a feature in Kakao Talk that allows users to send gifts to friends and to themselves. User's e-commerce purchase history is also included in the Kakao Talk Gift data. Therefore, Kakao Talk Gift data can be used as an index to measure e-commerce spending for 'myself' and 'others'.

Let's first look into how the Kakao Talk Gift transaction rate has changed in January and March of 2020 (Refer to Figure -31). Transactions in categories such as movie/culture (-54%), gift card (-39%), hair/beauty (-19%), humidifier/purifier (-22%) decreased in March compared to January of 2020. Meanwhile, transactions in sportswear (40%), cushions (44%) and other products that ease life at home have increased. Notice that more kitchenware, such as kettles/cups (47%), and home decoration items, including lighting (51%), are sold than before.

Now, let's dig deeper. We expanded our analysis to comprise the data of June of this year to see which products people bought as they became accustomed to staying at home. We were able to identify new purchasing trends that resulted from people spending more time at home. People made efforts to make their newfound time more enjoyable and they also made efforts to change the indoor spaces they were spending so much time in.

We saw a great increase of Kakao Talk Gift purchases in product categories such as kitchenware and pet goods, as well as more purchasing of DIY kits and home decor items. In terms of monthly sales, sales of board games and puzzles in April increased 716% compared to early January. Sales of gardening products increased 224% in April and fitness equipment increased 218% in May compared to the beginning of 2020.

The increase in demand for home fitness was evident by the increased demand for the Kakao VX's Smart Home Workout service.

[Figure 3-1] Product categories that displayed the biggest fluctuation in sales before and after COVID-19
(Transaction in KakaoTalk Gift, Jan. and Mar. 2020)

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Kakao COVID-19 Report, Part 3

Trend 1: Home decoration

- Home decor, living room/kitchen and gardening products

(Home decor) Sales of home decor products skyrocketed in the early stages of the COVID-19 pandemic. In March 2020, sales through Kakao Talk Gift increased by 46% compared to January of the same year. Sales slowed gradually but have maintained an upward trend compared to the beginning of the year.

(Living room/kitchen products) Living room and kitchen products also saw a massive increase in sales. Sales of living room/kitchen products escalated in February, and increased up to 53% in March. Kakao Talk Gift sales in these categories are greater than in 2019.
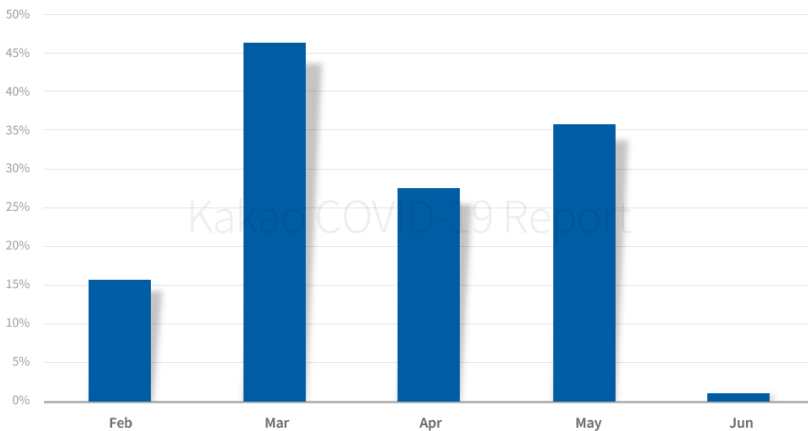
[Figure 3-2] Home decor product sales through Kakao Talk Gift (As of Jan. 2020)
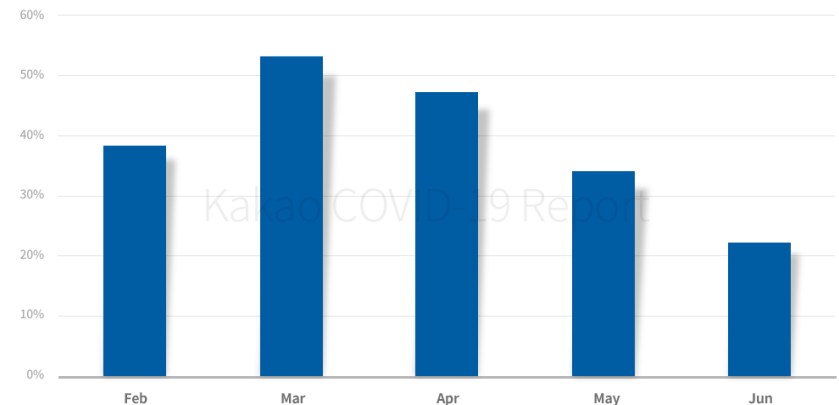
[Figure 3-3] Living room/kitchen product sales through Kakao Talk Gift (As of Jan. 2020)

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(Gardening products) Gardening is the product category in Kakao Talk Gift to have seen the largest increase in sales during COVID-19. Sales of gardening products started to rise in February, exceeded 100% in March, and reached 218% in April. The upward trend, where sales increased by 100% compared to the beginning of the year, continued until June.

Trend 2: Adding fun to staying at home

- Board games/puzzles, DIY kits, pet supplies, fitness equipment

(Board games/puzzles) Sales of board games and puzzles peaked during COVID-19. Kakao Talk Gift sales of board games and puzzles increased 643% in March, and by 716% in April, compared to the beginning of 2020.
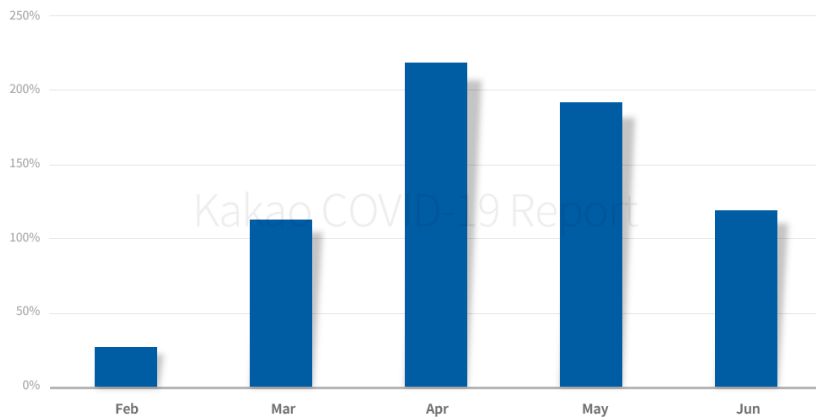
[Figure 3-4] Gardening product sales through Kakao Talk Gift (As of Jan. 2020)
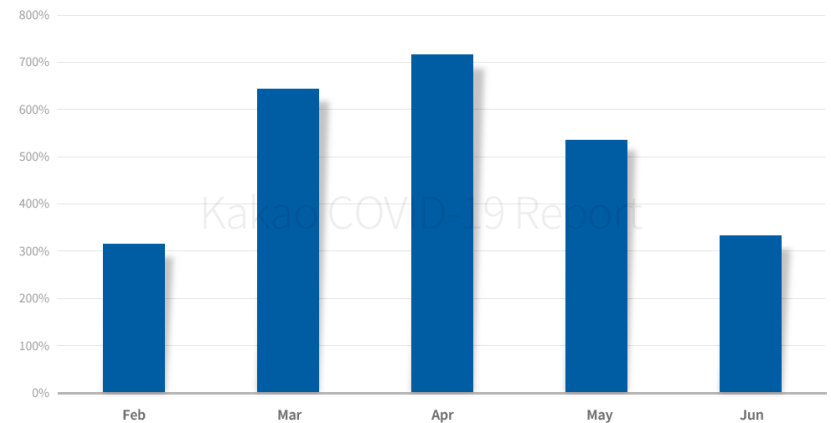
[Figure 3-5] Board game/puzzle sales through Kakao Talk Gift (As of Jan. 2020)

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(DIY kits) Sales of DIY kits boomed during COVID-19. Sales in DIY kits increased steadily in Kakao Talk Gifts. The uptick in sales slowly decreased in April, but like the home decor products, have maintained a continuous upward trend compared to January.

(Pet goods) Kakao Talk Gifts sales for pet goods also increased by 37% in March, compared to early January, recording an average increase of 30% during the coronavirus pandemic.
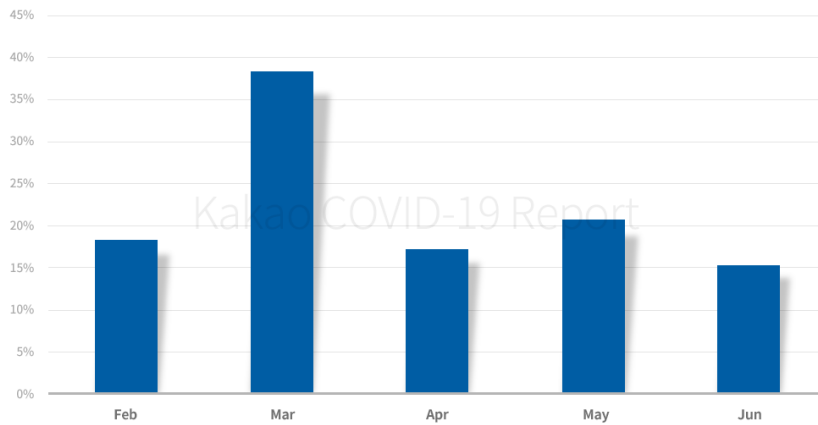
[Figure 3-6] DIY kit sales through Kakao Talk Gift (As of Jan. 2020)
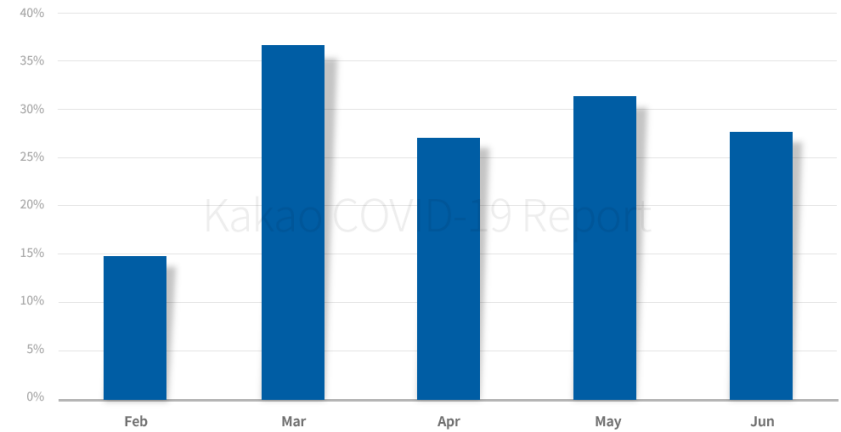
[Figure 3-7] Pet product sales through Kakao Talk Gift (As of Jan. 2020)

kakao

(Fitness equipment) Sales of fitness equipment also increased during COVID-19. When compared to January of 2020, fitness equipment sales increased 131% in February, 153% in March, 155% in April and 224% in May.
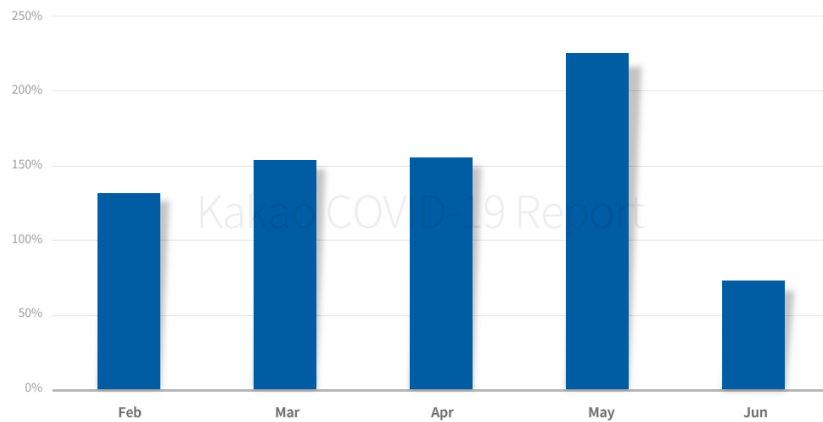
[Figure 3-8] Fitness equipment sales through Kakao Talk Gift (As of Jan. 2020)

Daily workouts from your home

COVID-19 has made it difficult for people to gather together due to the fear of community infection. Working out at gyms is no exception. As a result, the number of people who go to gyms have decreased since the COVID-19 outbreak. However, people still wanted to work out and maintain their physical wellbeing, which translated into a rise of interest in at-home workouts, where people learn and train at home. Figure 3-8 shows the number of people who, in 2020, used Kakao VX's Smart Home Workout, a workout service Kakao launched in September 2019. Kakao VX is a company that utilizes IT technology to provide a fun and healthy virtual experience. With the ongoing coronavirus pandemic, Kakao VX continues to see an increase in users (as of September 2020).

Let's take another look at how Kakao VX's Smart Home Workout users have increased, this time, per month. We see a sharp increase in the number of users after May 6, when the social distancing restrictions were relaxed.
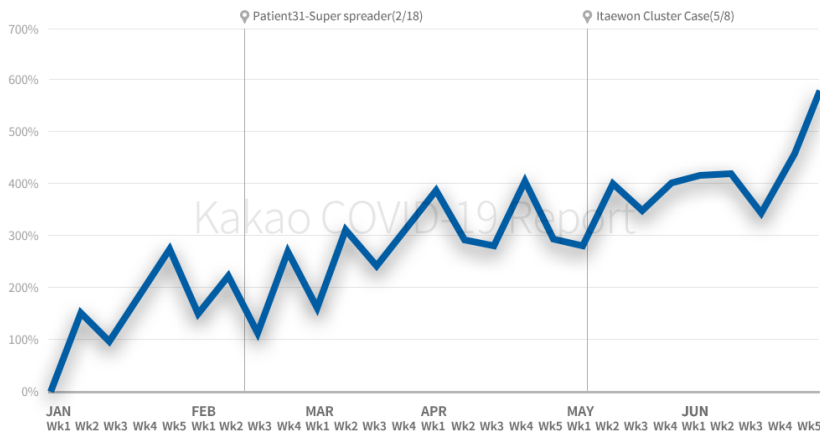
[Figure 3-9] Kakao VX Smart Home Workout service users (Weekly, Jan. 2020 to Jun. 2020)
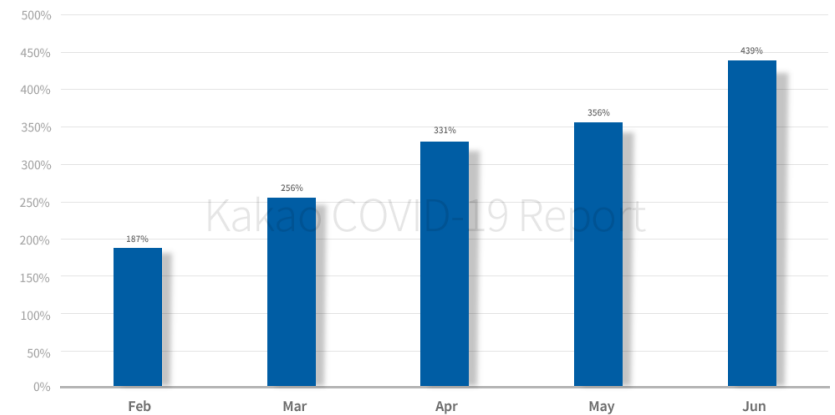
[Figure 3-10] Kakao VX Smart Home Workout users by the month (Jan. 2020 to Jun. 2020)

kakao

Increase in at-home workout completion rates

The daily average workout time of Smart Home Workout users in 2020 was 400 seconds, or six to seven minutes a day. The workout completion rate in April of 2020 was 51%, which is a great increase from the average 20% recorded in 2019. "Workout completion rate" is the term used to describe the ratio of those who completed the Smart Home Workout. The increase in the workout completion rate shows that at-home workouts have now become a part of our daily lives during COVID-19.

■ Workout Completion Rate   ■ Average Workout Time
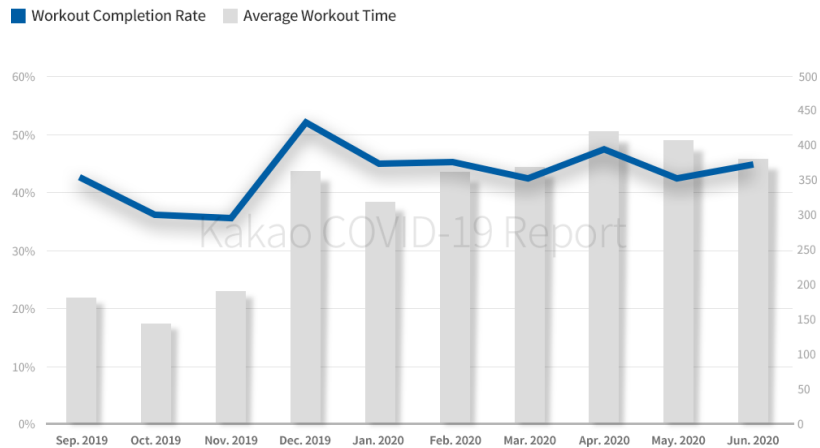
[Figure 3-11] Kakao VX Smart Home Workout completion rate by the month (Jan. 2020 to Jun. 2020)

kakao

Part 4.

So many cars on the road
during COVID-19

COVID-19 has spread at an alarming rate since the first case was confirmed in South Korea on January 19, 2020. The virus spread rapidly, with numbers in South Korea reaching more than one hundred newly confirmed COVID-19 cases by February 21, 2020.

On February 29, 2020, the South Korean government issued a social distancing measure throughout the nation. The main idea of social distancing is to minimize contact with other people. This signified that people had to avoid contact with other people while on the move.

The pandemic forced people to change the way they move around. Let's take a look at the data and see how people moved from one place to another during these unprecedented times. The results of the analysis showed that people used their personal vehicles more and used public transportation less. The changes in transportation brought on by COVID-19 has created demands for changes in existing transportation policies.

Sharp decrease in mobility, followed by a steady recovery

Let's first take a look at Kakao T Taxi operations (Refer to Figure 4-1). Kakao T Taxi's weekly operations fluctuated parallel to the COVID-19 case trends until mid-February. However, in the first week of March, operations decreased by 38% than in the first week of January. The number of Kakao T Taxi's operation was lowest at the end of February (Data from January to the end of June was used for this analysis). Kakao T Taxi operations made a rebound in March, and slowly recovered starting in April. The number of operations plunged dropped suddenly in May, due to the mass spread in Itaewon, and recovered gradually.
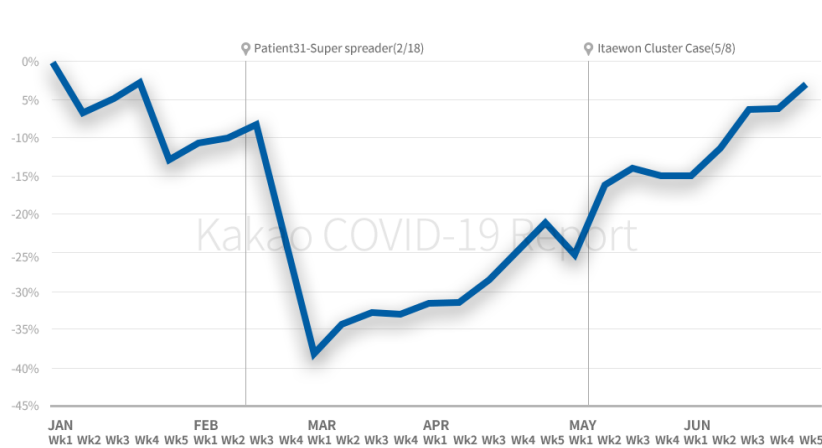
Figure 4-2 illustrates Kakao T Driver's weekly usage, with January as the reference point. There was a sharp decrease in Kakao T Driver usage between the end of February and early March due to the coronavirus. However, usage of Kakao T Driver made a recovery in March. Like Kakao T Taxis, Kakao T Driver also saw a sudden plunge in May due to the mass virus spread in Itaewon, and thus creating a graph that resembles a roller coaster.

[Figure 4-1] Kakao T Taxi's weekly operations (Completed drives, Jan. 2020 to Jun. 2020)
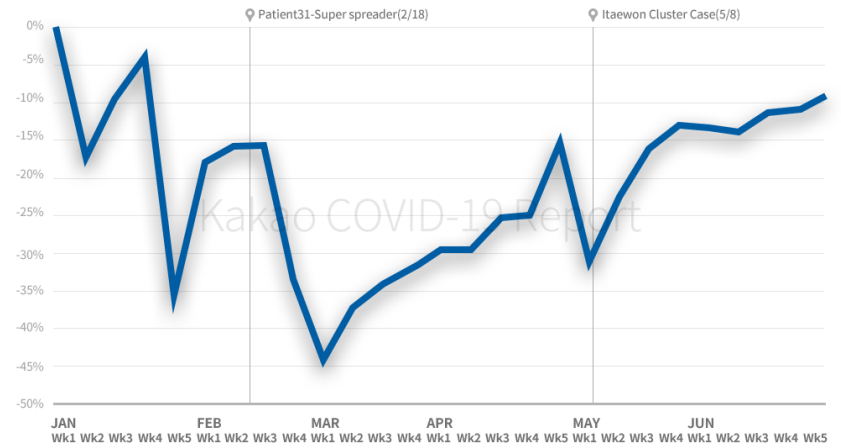
[Figure 4-2] Kakao T Driver's weekly operations (Completed drives, Jan. 2020 to Jun. 2020)

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Kakao COVID-19 Report, Part 4

Kakao Map's public transportation route feature demonstrated a similar user pattern. The number of users and usage of Kakao Map's public transportation route feature increased in January 2020, but slowly started to decrease in the last week of January. In the last week of February, the number of users decreased 30% and usage of the feature decreased 45%, compared to the end of 2019.

In contrast to our early assumption that people would walk rather than use public transportation during COVID-19, the number of users and usage of Kakao Map's walking route feature plunged 40% and 60% respectively in the second week of January. The number of users and usage of the walking route feature both decreased until the end of February. Users and service usage increased slowly after March, but was unable to recover to those of pre-COVID levels by the end of June.
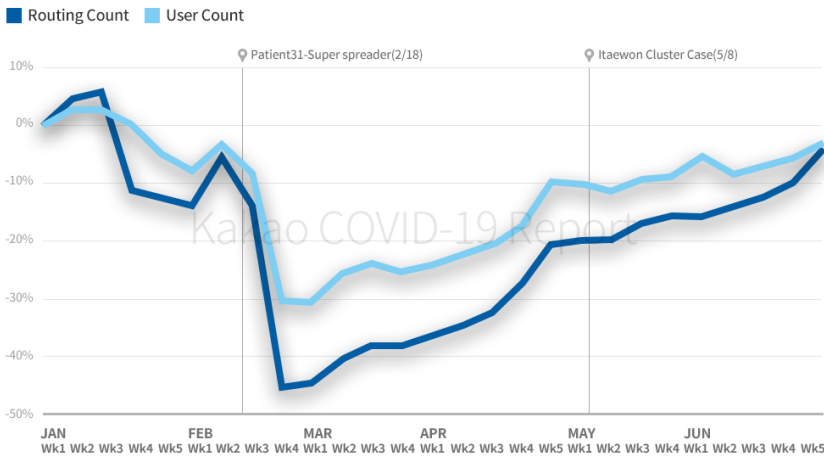
[Figure 4-3] Weekly users/usage of Kakao Map's public transportation route feature (Jan. 2020 to Jun. 2020)
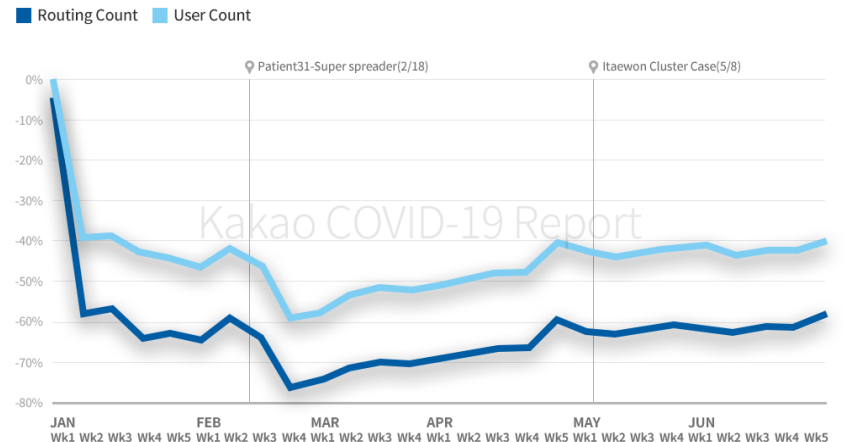
[Figure 4-4] Weekly users/usage of Kakao Map's walking route feature (Jan. 2020 to Jun. 2020)

Higher demand for car navigation

There was higher demand for Kakao Navi, Kakao's car navigation service, demonstrating a stark contrast to other mobility services. Like most mobility services, Kakao Navi saw a plunge in usage at the beginning of the pandemic, but made a quick recovery. Usage of Kakao Navi rapidly increased during the holidays that spanned from the end of April to early May, and even recorded a higher percentage of usage in May when compared to May 2019.

Let's take a closer look at the distance users traveled using Kakao Navi, Kakao's car navigation service. We compared users' average travel distance through Kakao Navi and Kakao T Taxi to get a better understanding of user behavior. Compared to 2019, the distance users traveled using Kakao T Taxi decreased drastically, decreasing 6.2% in March, 12.2% in April, 13.2% in May and 13.6% in June.

However, the distance traveled with Kakao Navi did not decrease as much as Kakao T Taxi. The distance traveled decreased by 7.7% in March and slowly recovered in April and May, with a decline of 4% in April, 3.1% in May and 5.6% in June. Consulting firm, KPMG predicted that demand for automobiles would increase due to COVID-19. Their prediction appears to be accurate, because cars have now become the most important medium of mobility in the age of COVID.

[Figure 4-5] Kakao Navi's weekly usage (Completed drives, Jan. 2020 to Jun. 2020)

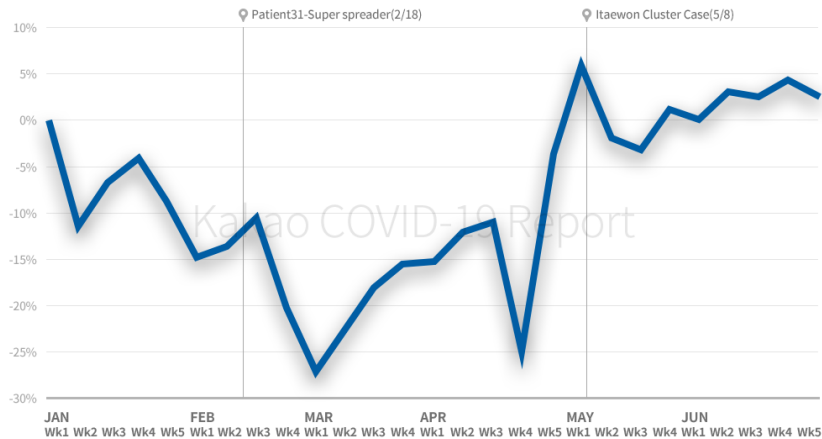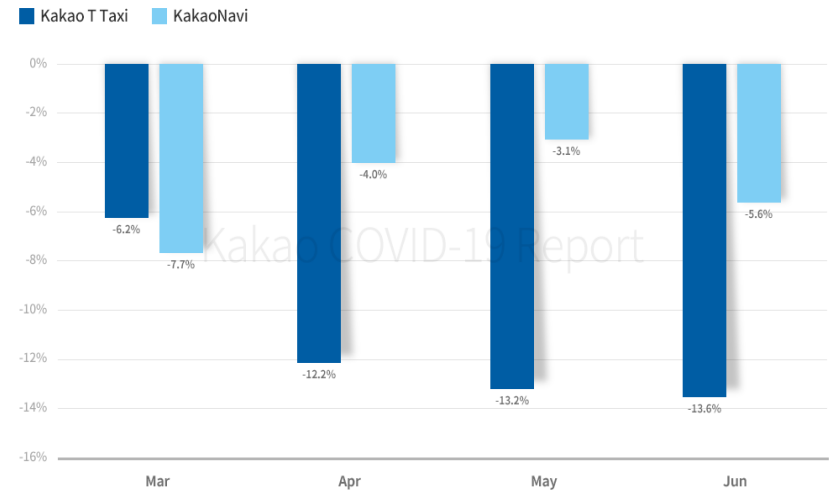[Figure 4-6] Average distanced traveled using mobility services since the COVID-19 outbreak. (Completed drives, March to June, 2019 vs. March to June, 2020)

Kakao COVID-19 Report, Part 4

Now, let's take a look at user data of Kakao Map's car route feature. Data shows that the number of users and usage of the car route feature decreased only by a little in late February. It's also interesting that the frequency the feature usage rose sharply, compared to the number of users using the feature. This shows that usage per user has increased after the pandemic started.

No major changes were detected in the number of users or usage in Kakao Map's bike route feature in January. However, noticeable shifts were seen as the COVID-19 pandemic continued. The number of people using Kakao Map's bike route feature steadily increased from the first week of March. Usage of the Kakao Map bike route feature showed a steep rise in the first week of March, and by early April, its usage recorded an increase of 100% compared to the beginning of the year.

[Figure 4-7] Weekly users/usage of Kakao Map's car route feature (Jan. 2020 to Jun. 2020)
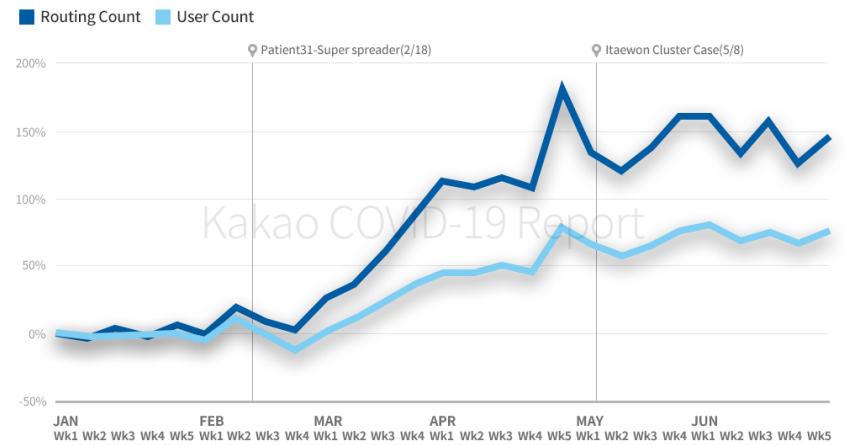
[Figure 4-8] Weekly users/usage of Kakao Map's bike route feature (Jan. 2020 to Jun. 2020)

Commuting during COVID-19, as seen with Kakao Taxi data

1. Morning commute hours: Taxi calls increased after getting off from work at home

Compared to 2019, calls for taxis in the morning commute hours of March 2020 decreased by 34% at 7 a.m., 46% at 8 a.m., and 24% at 9 a.m. However, the number of taxi calls increased in June, when the number of COVID-19 cases reduced and most companies had their employees return to their work sites.

2. Evening commute hours: Demands for taxis, sensitive to social distancing policies

Unlike the morning commute hours, calls for taxis during the evening commute hours started to decrease as early as February and recovered in May. This is because people call taxis during the evening hours, not only to commute back home, but to meet up with friends. The number of Taxi calls had decreased in February, after the Patient 31 was announced a super-spreader. However, when social distancing regulations were relaxed in May, calls during evening commute hours recovered at a faster rate than morning commute hour calls.

[Figure 4-9] Calls for Kakao T taxis during morning commute hours (Feb. to Jun. 2019 vs. Feb. to Jun. 2020)
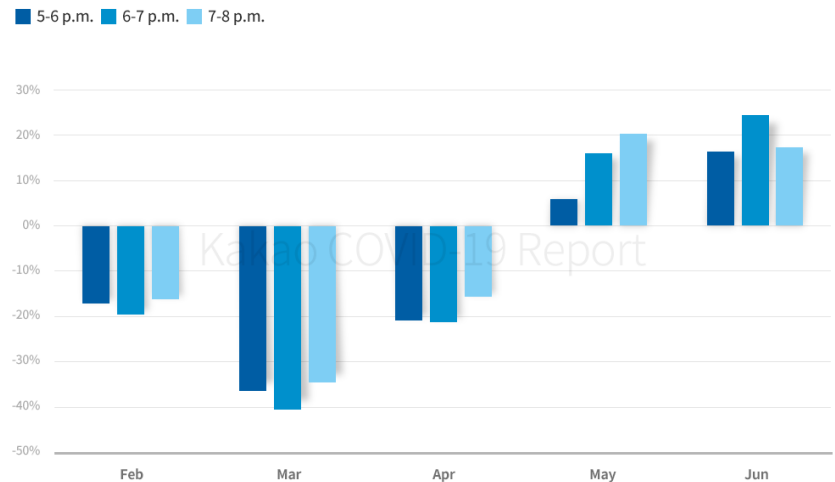
[Figure 4-10] Calls for Kakao T taxis during evening commute hours (Feb. to Jun. 2019 vs. Feb. to Jun. 2020)

Part 5.

_____

Finding directions to toy stores
instead of theme parks

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In Part 5, we will see how our mobility patterns have changed during our travels and daily lives. These results were derived by analyzing user data of navigation and map search services. One word sums up the mobility patterns during our travels and in our daily lives after COVID-19, "safety". More now than in the past, people travel to nearby travel destinations and relatively safer rural regions to reduce the risk of catching COVID-19. Furthermore, people refrain from visiting highly-condensed locations in their daily lives.

Here, we will look at how people have traveled during COVID-19.
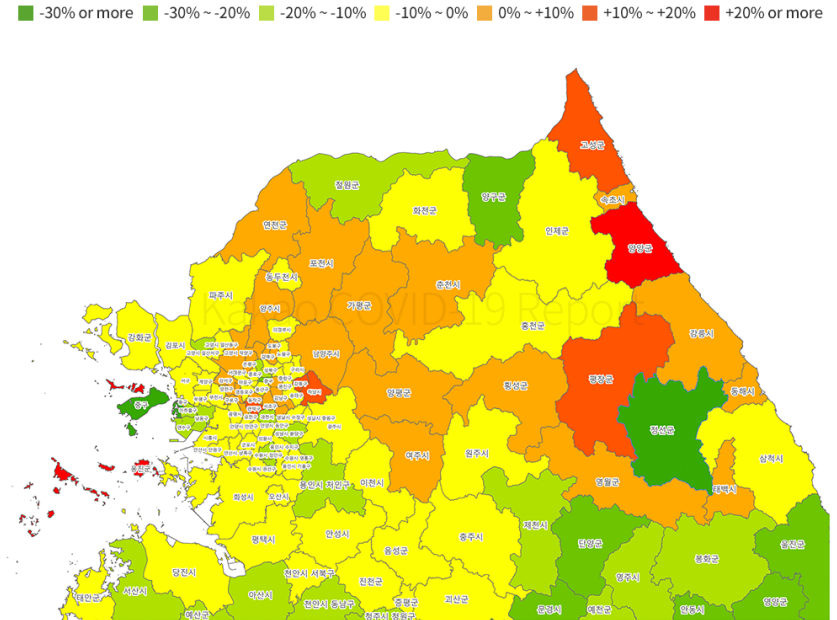
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More travel to nearby, safer rural locations

Due to the spread of the coronavirus, more people are staying at home (refer to *Kakao COVID-19 Report* Part 3) and moving less (refer to *Kakao COVID-19 Report* Part 4). However, this does not mean that people are cooped up at home all the time.

Though our analysis does not comprise the data of the departures and destinations of the people living in all regions of Korea, we analyzed the travel patterns of people who departed from Seoul. Figure 5-1 illustrates the frequently visited destinations of cars that left Seoul from February to June of 2019 and 2020, using Kakao Navi data.

Cars that left Seoul traveled more to regions neighboring the Seoul metropolitan area, including Yangyang, Pyeongchang, Goseong and Hanam. Trips to these destinations increased by 10% compared to the previous year. It appears that people have a newfound appreciation for nature and the aforementioned regions these specific places are well-known for their fresh air, mountains, forests and beaches.

On the other hand, the number of cars that set Jung-gu in Incheon and Jeongseon in Gangwon-do as their destination dropped by more than 30%. Jung-gu is home to Incheon International Airport and Jeongseon is where Gangwon Land Casino is located. Trips to these two destinations have decreased due to restrictions imposed after COVID-19. Nowadays, less people go to Jung-gu due to strict restrictions on international travel. Fewer go to Jeongseon as the Gangwon Land Casino has been closed temporarily in respect of measures limiting mass gatherings.

Legend: -30% or more | -30% ~ -20% | -20% ~ -10% | -10% ~ 0% | 0% ~ +10% | +10% ~ +20% | +20% or more

[Figure 5-1] Destinations most frequently visited by travelers from Seoul. (Feb. to Jun. 2019 vs. Feb. to Jun. 2020)

kakao

Increase in map service search for medical facilities

We also looked into the types of destinations that were searched on Kakao Map.

With data retrieved from Kakao Map, we categorized and compared the top 100 destinations in the second half of 2019 (third week of October) and in the first half of 2020 (fourth week of February). Compared to the second half of 2019, searches for community and medical facilities increased, while searches for sports/leisure and education facilities decreased. Destinations related to transportation were the most searched in both 2019 and 2020.
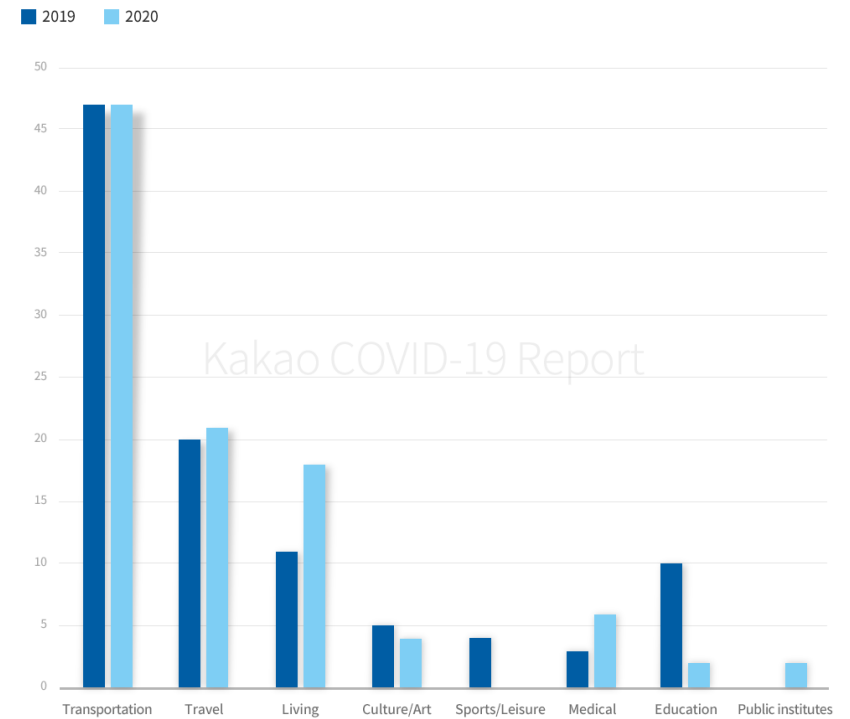
[Figure 5-2] Categories of the top 100 destinations searched on Kakao Map
(Third week of October 2019 vs. Fourth week of February, 2020)

Foreigners: Less travel to Incheon International Airport, more to Gimpo Airport

Where have foreigners in Korea traveled to during COVID-19?

 Let's use the data from Kakao T Taxi's foreign language versions to see where foreigners in Korea have been going to during COVID-19 (Refer to Figure 5-3). One noticeable change is that trips to Incheon International Airport have decreased since March as overseas travel has been impacted by the virus. The number of foreigners using subway Line 6 to Itaewon Station which was the most frequently visited station in March and April, dropped drastically after a cluster of COVID-19 cases were reported there in May. Trips to train stations, such as Seoul Station, where people can take domestic express trains, as well as to Gimpo Airport's domestic terminal and to Jeju International Airport increased in May and June. These figures show that the demand for domestic travel has increased amongst foreigners in Korea.

Rank	January	February	March	April	May	June
1	Incheon Int'l Airport (Term. 1)	Incheon Int'l Airport (Term. 1)	Itaewon Station	Itaewon Station	Seoul Station	Seoul Station
2	Seoul Station	Itaewon Station	Gwangju Bus Terminal	Gwangju Bus Terminal	Gwangju Bus Terminal	Gwangju Bus Terminal
3	Gwangju Bus Terminal	Seoul Station	Incheon Int'l Airport (Term. 1)	Seoul Station	Daejeon Station	Daejeon Station
4	Itaewon Station	Gwangju Bus Terminal	Seoul Station	Daejeon Station	Busan Station	Jeju Int'l Airport
5	Jeju Int'l Airport	Daejeon Station	Daejeon Station	Suseo Station	Jeju Int'l Airport	Kimpo Domestic Airport
6	Daejeon Station	Hongik University Station	Hongik University Station	Hongik University Station	Dongdaegu Station	Dongdaegu Station
7	Busan Station	Incheon Int'l Airport	Ansan Station	Gangnam Station	Kimpo Domestic Airport	Busan Station
8	Gimhae International Airport	Jeju Int'l Airport	Gangnam Finance Center	Kimpo Domestic Airport	Suseo Station	Suseo Station
9	Dongdaegu Station	Busan Station	Jeju Int'l Airport	Ansan Station	Ansan Station	Ansan Station
10	Incheon Int'l Airport (Term. 2)	Incheon Int'l Airport (Term. 2)	Gangnam Station	Suwon Station	Itaewon Station	Suwon Station

[Figure 5-3] Destinations of Kakao T Taxi's foreign language version users (Jan. 2020 to Jun. 2020)

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Car movement patterns affected by social distancing

Destination searches made on Kakao Navi have been grouped into categories to see where people have driven to during COVID-19. We compared February to June of 2020 during COVID-19, with the same months in 2019 for an accurate comparison.
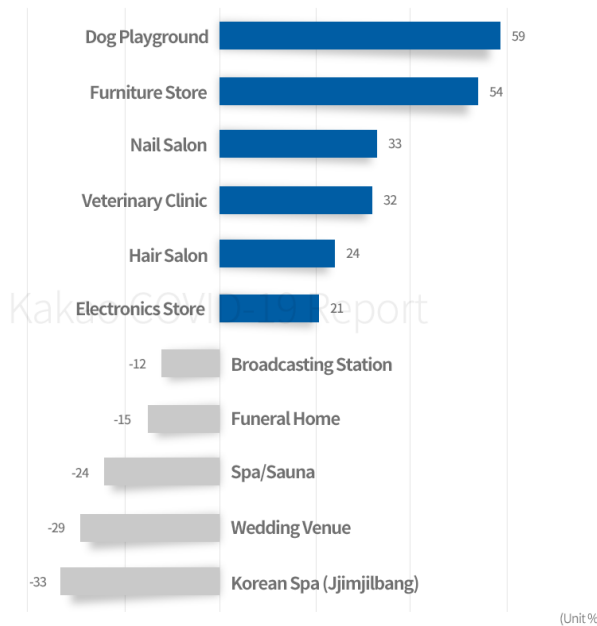
Visits to outdoor facilities, such as trails, golf courses and drive-in theaters, increased, while visits to highly-populated indoor facilities, such as fitness centers, traditional Korean spas and movie theaters, decreased. While people still went to indoor facilities for shopping, they avoided densely populated department stores and large shopping malls, and instead went to nearby stores, such as neighborhood convenience stores and variety stores.

In terms of public education facilities, people made less visits to universities and K to 12 schools and made more visits to private academic institutions and study rooms in 2020, compared to 2019. Visits to postpartum care centers and senior care facilities decreased, while visits to plastic surgeons and dermatologists increased.

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## 1. Daily life: More visits to dog playgrounds/furniture stores, less visits to saunas and wedding halls

Visits to small but heavily populated indoor facilities, including traditional Korean spas (-33%), wedding venues (-29%), spas/saunas (-24%) and funeral homes (-15%), have decreased. Meanwhile, as people spend prolonged periods of time at home, visits to furniture stores (54%) and electronics stores (21%) have increased greatly. People have also made more frequent visits to places that provide personal care to customers, including nail salons (33%) and hair salons (24%).

2. Shopping: More visits to convenience stores, less visits to duty-free shops

Trips to densely populated locations, including department stores (-16%), shopping malls (-13%), superstores (-5%) and outlets (-5%) have decreased. Visits to duty free shops (-65%), where people go to before traveling overseas, have dropped drastically. On the other hand, visits to conveniences stores (41%), variety stores (32%) and supermarkets (30%) have increased.

(Unit %)

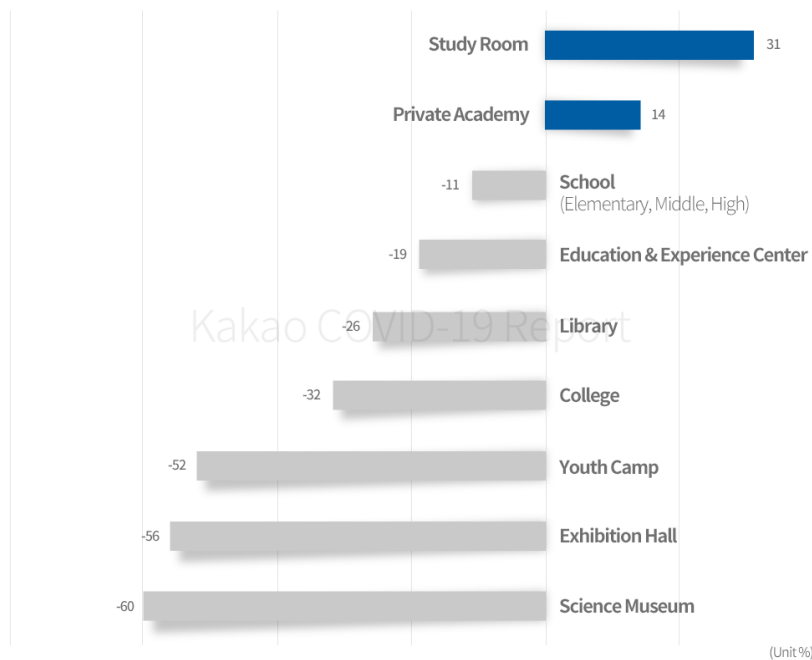[Figure 5-4] Kakao Navi destinations before and after COVID-19: Home and Life
(Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

(Unit %)
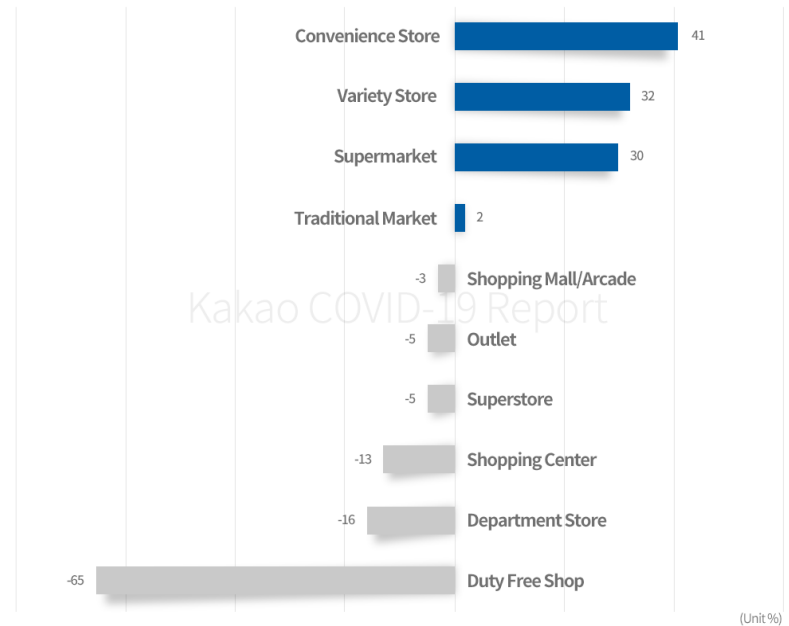
[Figure 5-5] Kakao Navi destinations before and after COVID-19: Shopping
(Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

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3. Education: More visits to study rooms/private academic institutions, less visits to schools
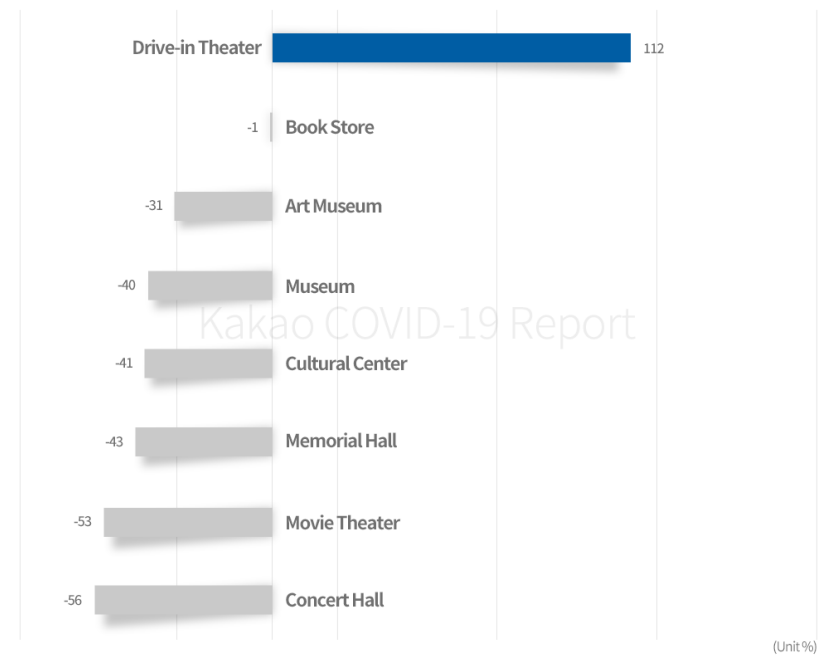
Trips to all types of schools, such as K-12 schools, colleges and universities, have decreased, as well as visits to locations that serve as supplementary educational resources, including science museums (-60%) and exhibition halls (-56%). On the other hand, trips by car to private academic institutions (14%) and study rooms (31%) increased.

Study Room — 31
Private Academy — 14
School (Elementary, Middle, High) — -11
Education & Experience Center — -19
Library — -26
College — -32
Youth Camp — -52
Exhibition Hall — -56
Science Museum — -60

(Unit %)

[Figure 5-6] Kakao Navi destinations before and after COVID-19: Education (Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

4. Arts & culture: More visits to drive-in theaters, less visits to indoor facilities

Visits to indoor arts and culture facilities, including concert halls (-56%), memorial halls (-43%), cultural centers (-41%) and museums (-40%), have dropped dramatically. When it comes to movie theaters, visits to indoor movie theaters also dropped 53%, while outdoor drive-in theaters where people watch movies in the comfort of own cars, have thrived, with visits increasing by 112%.
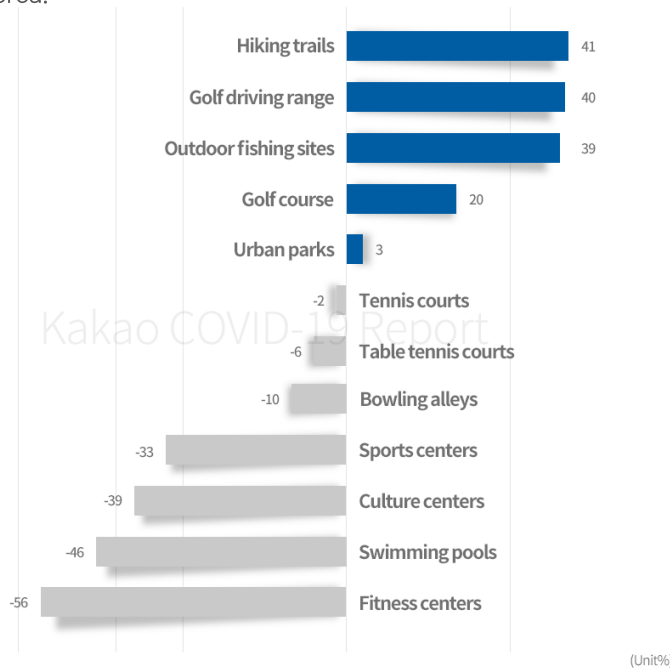

Drive-in Theater — 112
Book Store — -1
Art Museum — -31
Museum — -40
Cultural Center — -41
Memorial Hall — -43
Movie Theater — -53
Concert Hall — -56

(Unit %)

[Figure 5-7] Kakao Navi destinations before and after COVID-19: Arts & Culture (Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

5-1. Sports & leisure: More visits to trails and golf ranges, less visits to indoor facilities
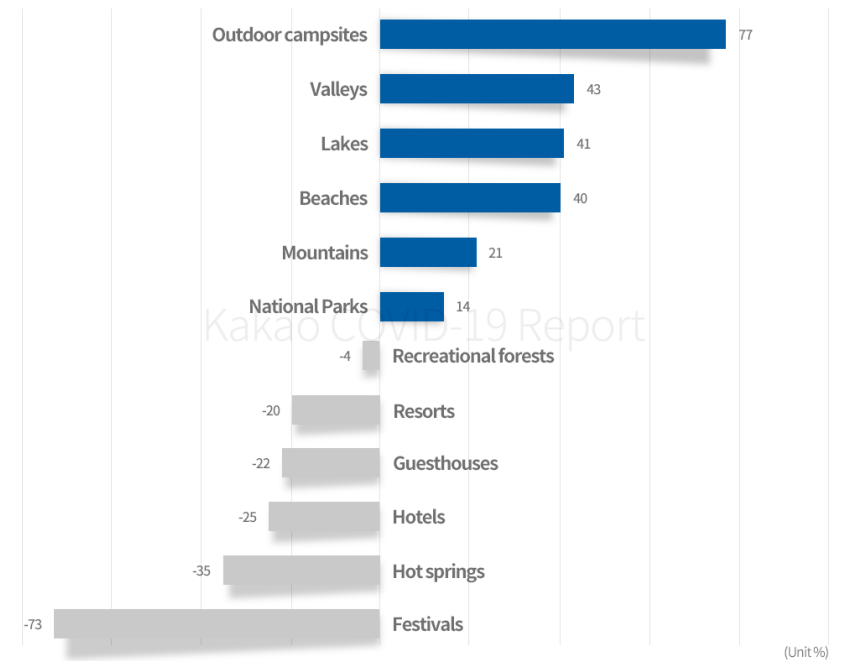
Visits to most indoor sports facilities, including fitness centers (-56%), swimming pools (-46%), culture centers (-39%) and sports centers (-33%), have decreased drastically. On the other hand, popularity of outdoor sports have soared, with visits to golf courses increasing by 20% and visits to golf driving ranges increasing by 40%. The inability to travel abroad is seen as a reason for the increase in people using golf facilities located in Korea.

Destination	Value
Hiking trails	41
Golf driving range	40
Outdoor fishing sites	39
Golf course	20
Urban parks	3
Tennis courts	-2
Table tennis courts	-6
Bowling alleys	-10
Sports centers	-33
Culture centers	-39
Swimming pools	-46
Fitness centers	-56

(Unit %)

[Figure 5-8] Kakao Navi destinations before and after COVID-19: Sports & Leisure (Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

5-2. Sports & leisure: More visits to camping sites/valleys, less visits to festivals/lodging facilities

Visits to lodging facilities, including hotels (-25%), guest houses (-22%) and resorts (-20%) have decreased. Trips to campsites, where people can enjoy outdoor activities, increased by 77%, while trips to valleys (43%), lakes (41%) and beaches (40%) increased as well.

Destination	Value
Outdoor campsites	77
Valleys	43
Lakes	41
Beaches	40
Mountains	21
National Parks	14
Recreational forests	-4
Resorts	-20
Guesthouses	-22
Hotels	-25
Hot springs	-35
Festivals	-73

(Unit %)

[Figure 5-9] Kakao Navi destinations before and after COVID-19: Sports & Leisure (Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

6. Parenting: More visits to toy stores, less visits to theme parks

Visits to kids play areas (-55%), aquariums (-54%), zoos (-43%) and theme parks (-37%) decreased sharply, while visits to toy stores (62%) and baby and nursery goods stores (50%) have greatly increased. As daycare centers and kindergartens have temporarily closed, children are spending more time at home. This has prompted parents to make more trips to toy stores in order to provide their children with toys to play with at home.


(Unit %)
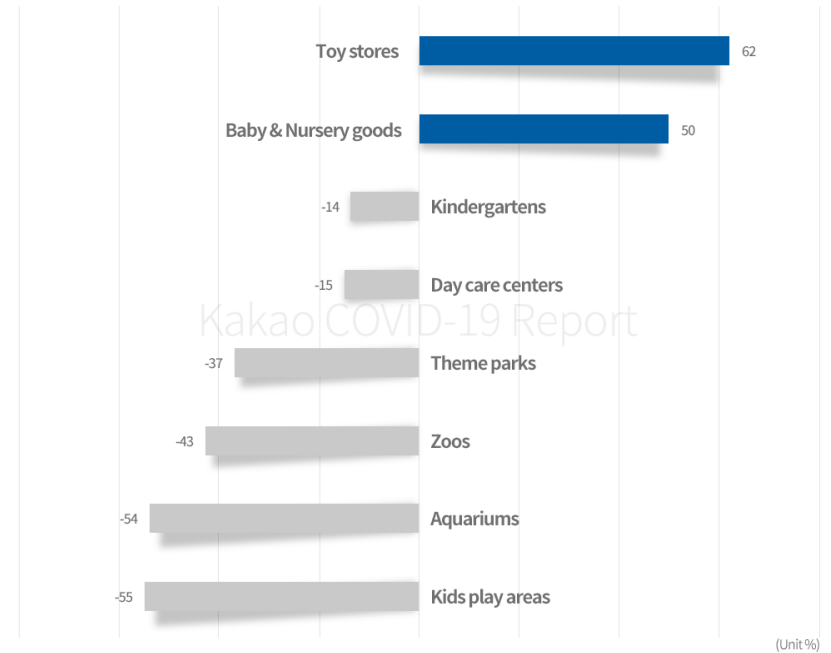
[Figure 5-10] Kakao Navi destinations before and after COVID-19: Parenting
(Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

7. Medical care & health: More visits to pharmacies/plastic surgeons, less visits to postpartum centers/senior care facilities

Visits to medical care centers have decreased in general, due to concerns of spreading COVID-19. There was a steep decrease in visits to centers occupied by people with weak immune systems, such as postpartum centers (-25%) and senior care facilities (-23%). Heightened caution paid to hand hygiene and mask-wearing also resulted in a decrease in visits to eye, nose and throat (ENT) clinics (-15%), where patients with respiratory-related symptoms are treated.

We also saw a drastic rise in visits to pharmacies (53%), where people went to buy masks. More people visited plastic surgeons (30%), dermatologists (27%) and ophthalmologists (18%) than before, as well as mental health clinics (17%), assumably due to the coronavirus blues.

(Unit %)
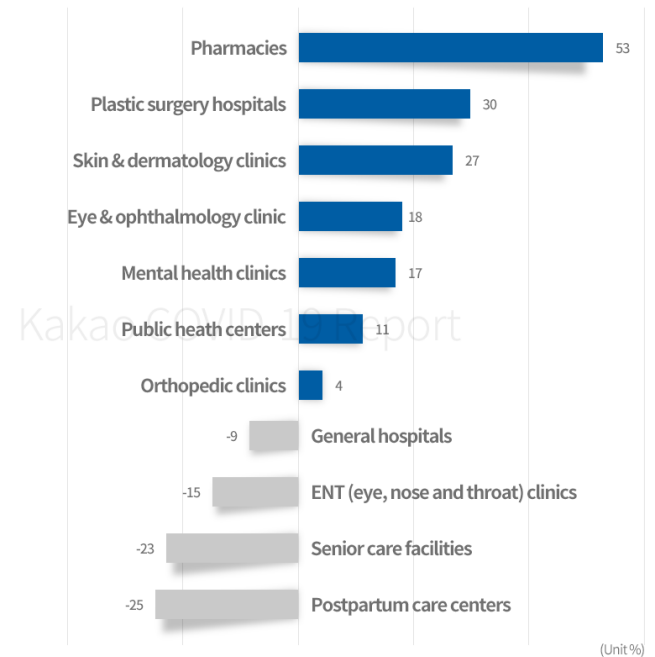
[Figure 5-11] Kakao Navi destinations before and after COVID-19: Medical care & health (Feb. To Jun. 2019 vs. Feb. to Jun. 2020)

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Part 6.

More searches for pharmacy
and games, less for weight loss

Kakao COVID-19 Report, Part 6

Search volumes and patterns are often analyzed to predict social interests and daily trends. Kakao offers Kakao Data Trends to provide users with clear data on search words that are trending on Kakao's many services.

Kakao operates many search services, including Kakao Talk (# Search) and Daum (mobile and PC versions). In Part 6, we will take a look at search data from # Search, Daum mobile search and Daum PC search to identify the various interests people have today. In order to pinpoint data that are specific to today's life with COVID-19, we compared the volume and patterns of searches in March of 2019 and 2020.

Let's take a look at how interests have changed before and after the pandemic by analyzing search volumes and search users according to 14 categories.

[14 categories]
Health, games, arts/culture, education, news/magazines, books, broadcasting, life/hobbies, shopping, sports/leisure, travel, music, cars, investment.

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#1. Health: More searches for 'pharmacies', less for 'weight loss'

The number of users who searched for health or hospital-related information increased from the previous year. The number of users who searched for health-related information in # Search, Daum mobile search and Daum PC search increased by 139%, 156% and 35% respectively. Users who searched for hospital-related information in # Search, Daum mobile search and Daum PC search increased by 249%, 152% and 25%. The number of users who searched the word "pharmacy" via mobile search increased by 1354%. Meanwhile, users who searched for information on weight loss via mobile or PC search decreased by 68% and 88% respectively. A similar trend can be seen in terms of search volume.
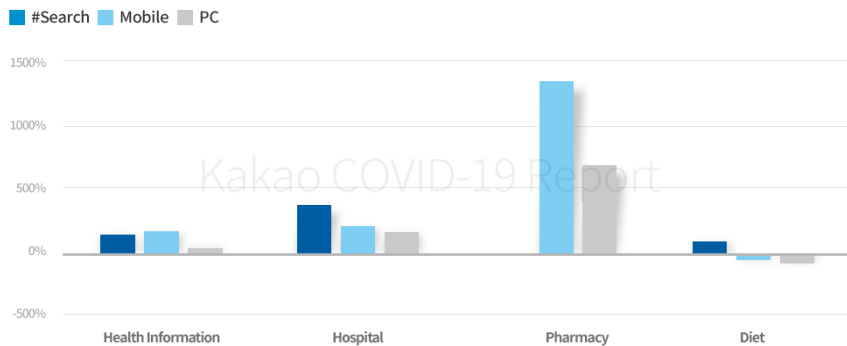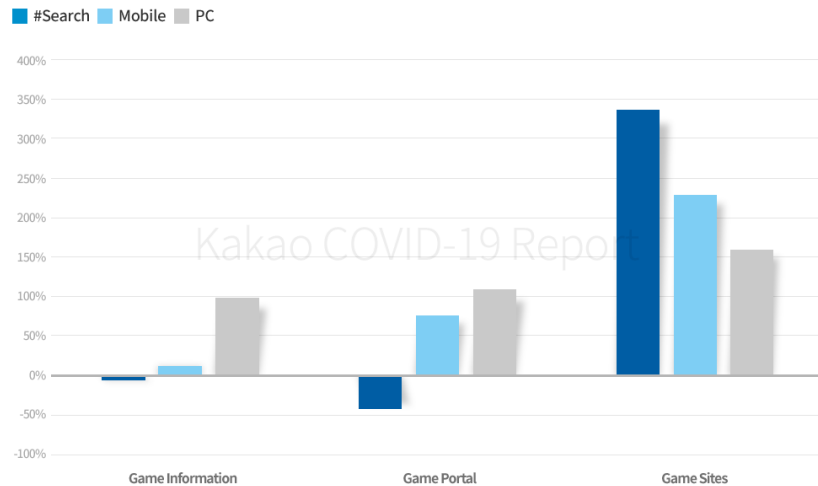

[Figure 6-1-1] Number of users searching for health content (Mar. 2019 vs. Mar. 2020)
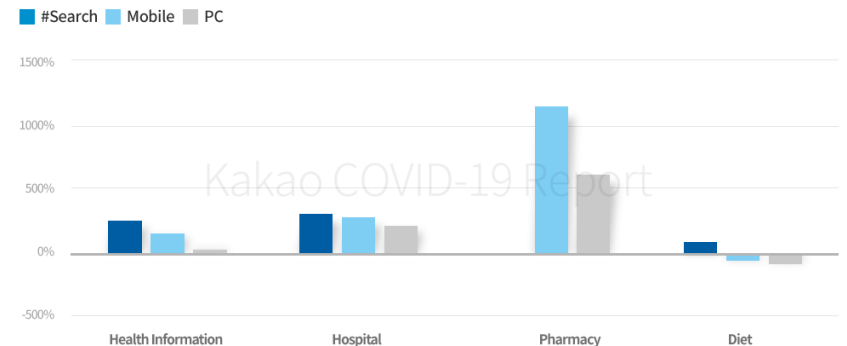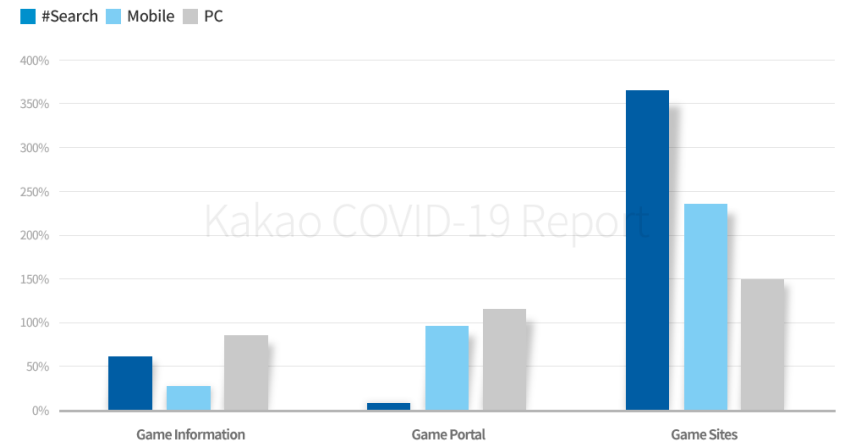

[Figure 6-1-2] Volume of search queries on health (Mar. 2019 vs. Mar. 2020)

kakao

#2. Games: More searches for gaming websites

While we saw a decline in the number of users who made gaming-related searches, the number of users who searched for gaming websites increased by 335% in # Search, 229% in Daum mobile search and 160% in Daum PC search. The increase in searches made on # Search for gaming websites is extremely noticeable in the COVID-19 period.
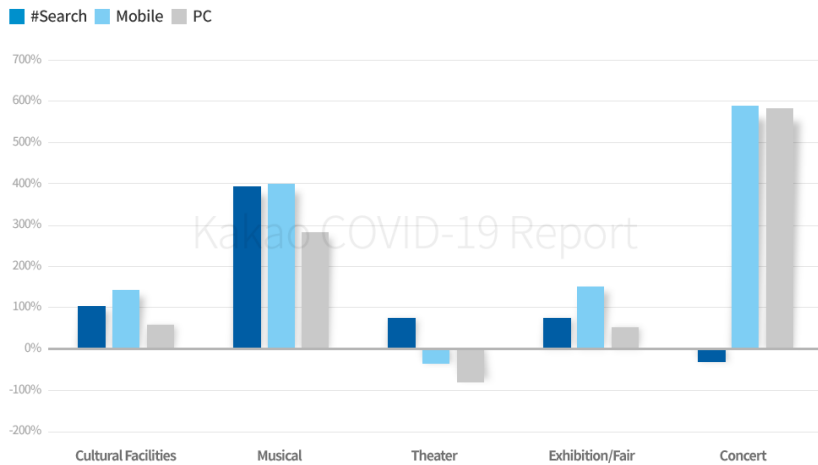

[Figure 6-2-1] Number of users searching for gaming content (Mar. 2019 vs. Mar. 2020)
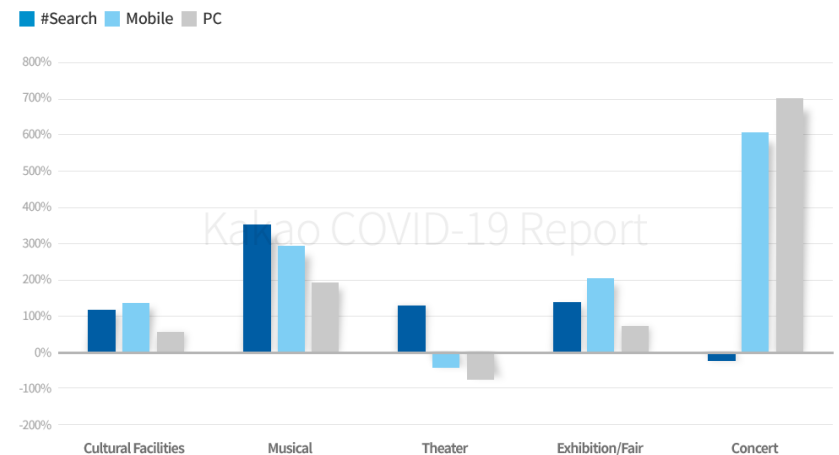

[Figure 6-2-2] Volume of search queries on gaming (Mar. 2019 vs. Mar. 2020)

#3. Performing arts: Increase in searches for musicals/concerts, decrease in searches for plays

While the number of users who searched for plays decreased, searches for musicals (# Search 393%, Daum mobile search 402% and Daum PC search 284%) and concerts (# Search -31%, Daum mobile search 589% and Daum PC search 586%) increased greatly. Our analysis shows that searches for musicals and concerts increased because more and more people searched for whether or not the musicals and concerts were canceled due to COVID-19.

[Figure 6-3-1] Number of users searching for performing arts content (Mar. 2019 vs. Mar. 2020)
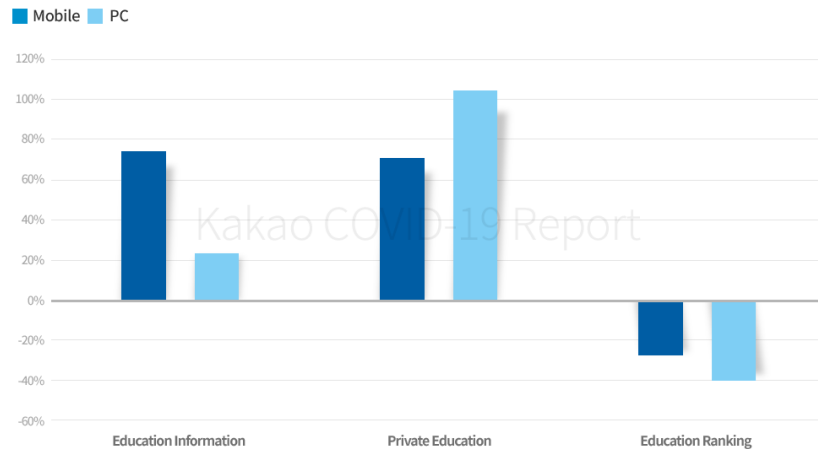

[Figure 6-3-2] Volume of search queries on performing arts (Mar. 2019 vs. Mar. 2020)
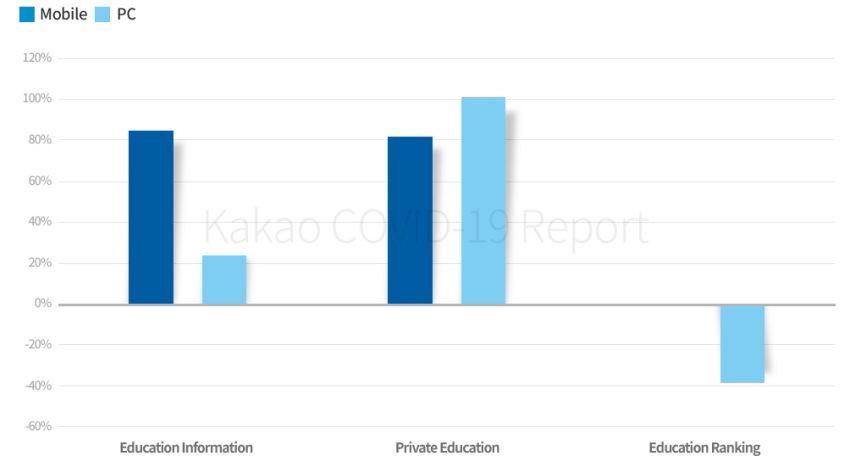
#4. Education: Increase in searches for educational information and private education

The number of users searching for general information on schools such as the first and last days of school, increased (# Search 526%, Daum mobile search 74%, Daum PC search 23%), as did the number of users entering queries for private education (# Search 147%, Daum mobile search 71%, Daum PC search 104%). On the other hand, the number of users searching school and university rankings decreased (Daum mobile search -28%, Daum PC search -41%). Similar trends were also observed in terms of search volume for this category.
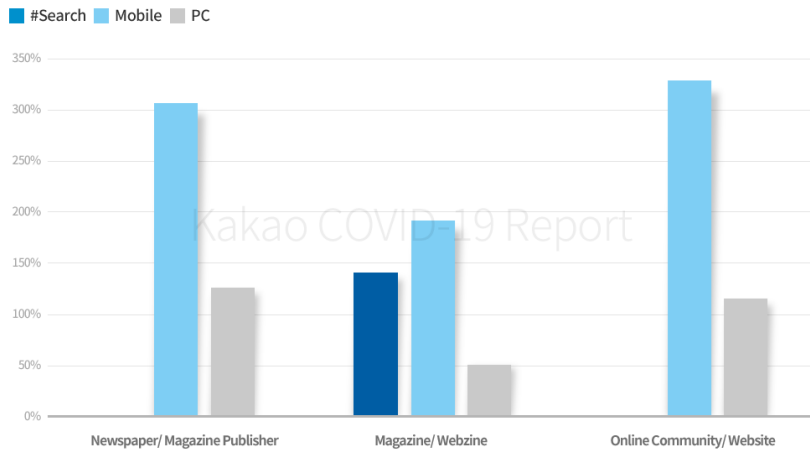

[Figure 6-4-1] Number of users searching for education content (Mar. 2019 vs. Mar. 2020)

[Figure 6-4-2] Volume of search queries on education (Mar. 2019 vs. Mar. 2020)

kakao

#5. News/magazine: Increase in search users and search volume for news content

In March 2020, more users searched news and magazine content compared to March 2019. The number of users who conducted a mobile search for news services, including news curation, increased by 329%. The volume of searches made on mobile platforms for newspapers/magazines (308%) and communities (345%) also increased.

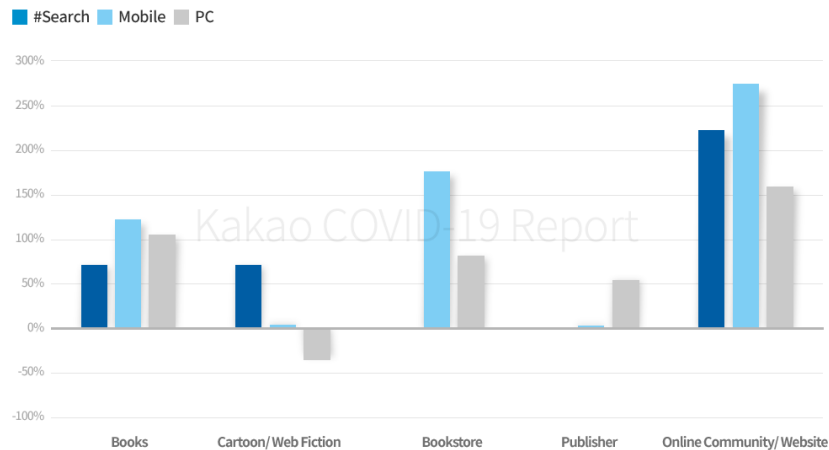[Figure 6-5-1] Number of users searching for news/magazine content (Mar. 2019 vs. Mar. 2020)
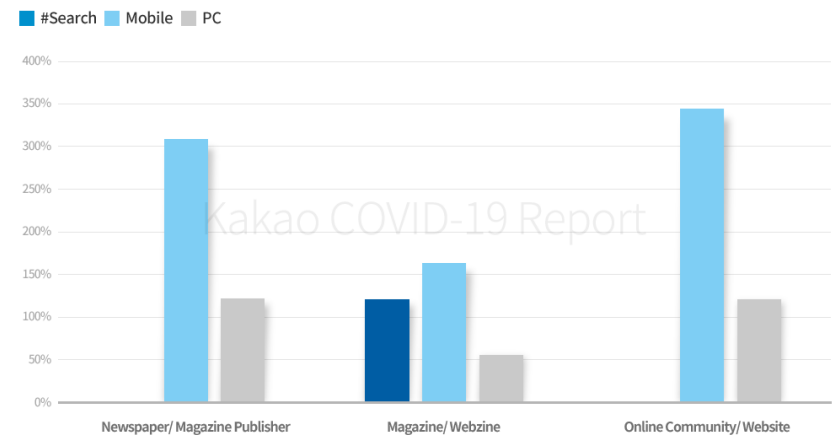
[Figure 6-5-2] Volume of search queries on news/magazines (Mar. 2019 vs. Mar. 2020)

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## #6. Books: More searches for books, bookstores and online communities

We saw an overall increase in users who searched for books (# Search 71%, Daum mobile search 122%, Daum PC search 105%), bookstores (Daum mobile search 176%, Daum PC search 82%) and online communities/websites (# Search 222%, Daum mobile search 274%, Daum PC search 159%). The online communities and websites mentioned in this analysis refer to platforms such as Daum Webtoons. Meanwhile, the number of users searching for cartoons and web novels (genres include romance novels and fan fictions) decreased, showing a stark contrast to other searches in the book category. Similar trends were also observed for search volume in this category. The amount of searches made

on Daum PC search in the cartoon/web novel category reduced by 50% during COVID-19, compared to the year before. Our analysis shows that people decided to pick up a good book they could enjoy at home to respect social distancing measures. More users also searched and purchased books through online bookstores.

[Figure 6-6-1] Number of users searching for book content (Mar. 2019 vs. Mar. 2020)
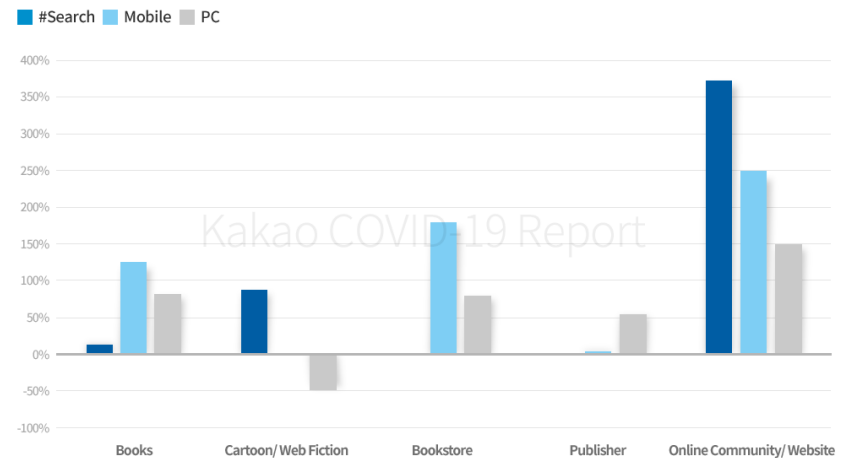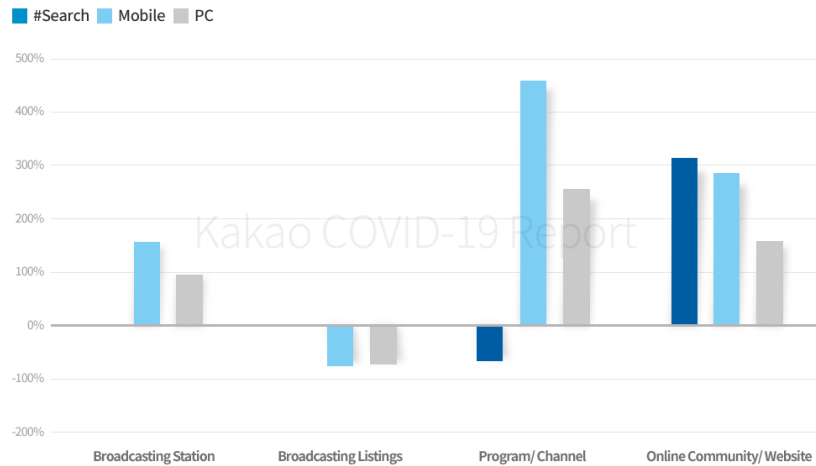

[Figure 6-6-2] Volume of search queries on books (Mar. 2019 vs. Mar. 2020)

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Kakao COVID-19 Report, Part 6

#7. Broadcasting: More searches for programs, channels and community information

In the broadcasting category, there was a noticeable change in the number of users who searched for communities/websites such as Afreeca TV and YouTube (# Search 314%, Daum mobile search 287% and Daum PC search 161%) and programs/channels (Daum mobile search 468% and Daum PC search 241%) There was a decrease in the number of users who searched for programs/channels with # Search by 84%, as well as the number of users who searched for broadcasting listings (Daum mobile search -76%, Daum PC search -72%). Searches for broadcasting listings decreased because people watched less real-time TV and more

uploaded videos. This is evident seeing the increase in searches for online communities and websites such as Afreeca TV and YouTube.

#Search Mobile PC

[Figure 6-7-1] Number of users searching for broadcasting content (Mar. 2019 vs. Mar. 2020)
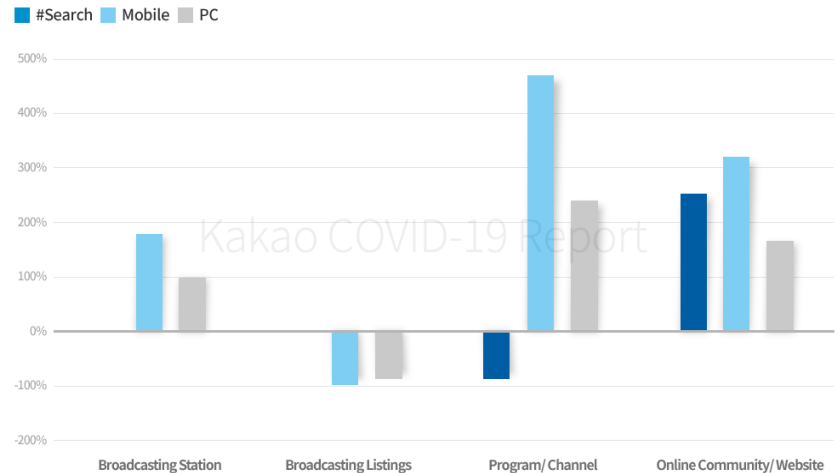
[Figure 6-7-2] Volume of search queries on broadcasting (Mar. 2019 vs. Mar. 2020)

#8. Living/hobbies: Massive increase in users using # Search to search fortune / dream interpretations

The most visible change in the living and hobbies category is an exponential leap, or a 2098% increase in the number of users who searched for fortune readings/dream interpretations on # Search. The volume of searches for living and hobbies on # Search increased throughout the entire category, including living information (573%), fortune readings/dream interpretation (419%), home decoration (694%), hobbies (753%) and online communities, (433%) such as mom cafes.
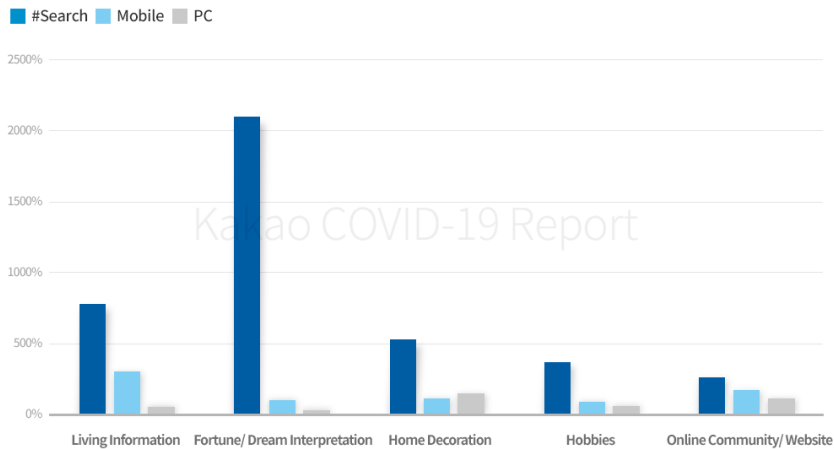
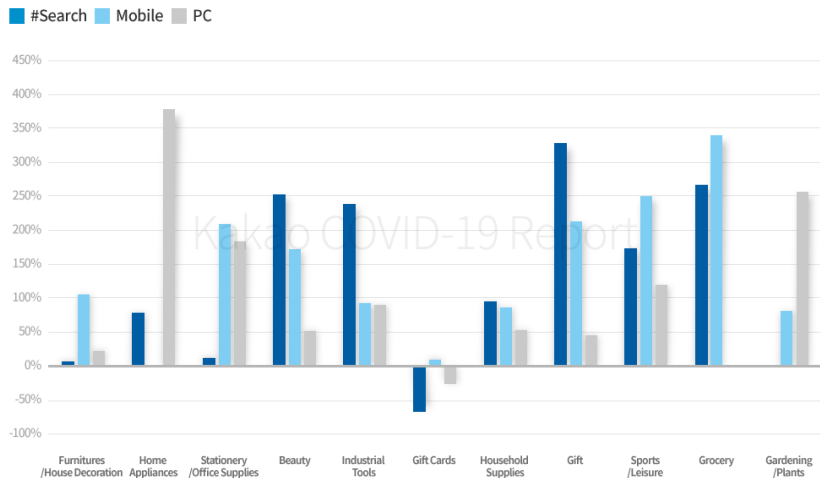[Figure 6-8-1] Number of users searching for living/hobbies content (Mar. 2019 vs. Mar. 2020)
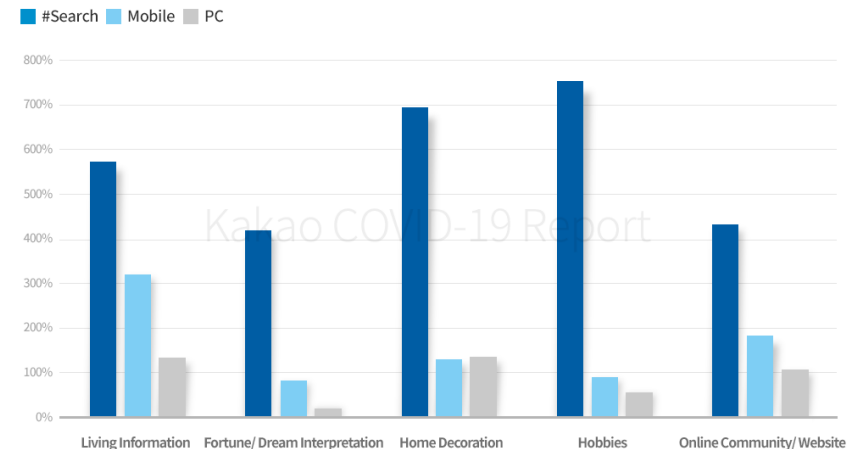
[Figure 6-8-2] Volume of search queries on living/hobbies (Mar. 2019 vs. Mar. 2020)
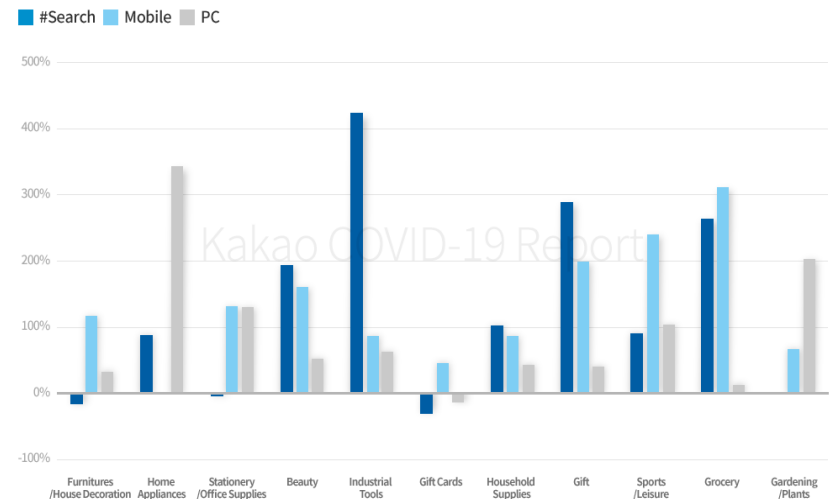
#9. Shopping: More searches for shopping, less for gift cards

For shopping-related searches, the greatest increase in the number of search users was detected in the gift (# Search 328%, Daum mobile search 212%, Daum PC search 45%), sports/leisure (# Search 174%, Daum mobile search 251%, Daum PC search 119%) and groceries (# Search 266%, Daum mobile search 339%, Daum PC search 2%) categories. What's interesting is that the number of users who searched for home appliances through the Daum PC version increased by an exponential 378%. This is presumably because consumers spent more time at home during the pandemic and used the money they would usually spend on travels on new purchase.

Meanwhile, the number of users who searched for gift cards decreased (# Search -67%, Daum mobile search 10%, Daum PC search -26%) compared to the previous year. Another interesting fact is that searches made on # Search for industrial tools increased significantly, with 239% more search users and 424% more search volume. This upward trend is most likely linked to the popularity of DIY goods. (Refer to "*Kakao COVID-19 Report* Part 3")

[Figure 6-9-1] Number of users searching for shopping content (Mar. 2019 vs. Mar. 2020)
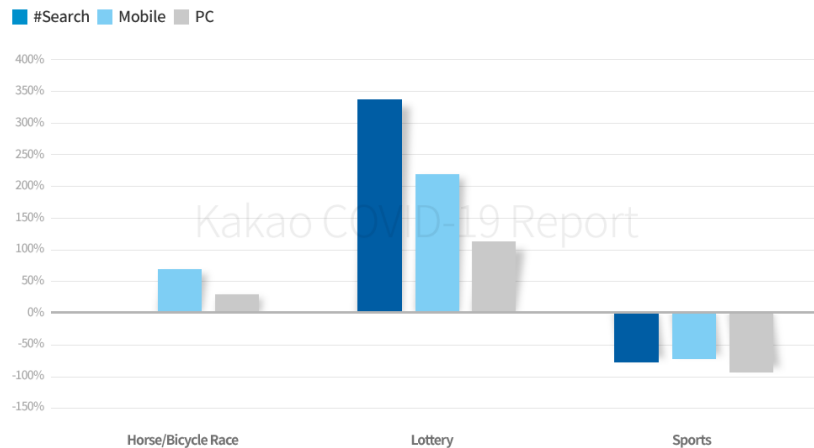

[Figure 6-9-2] Volume of search queries on shopping (Mar. 2019 vs. Mar. 2020)
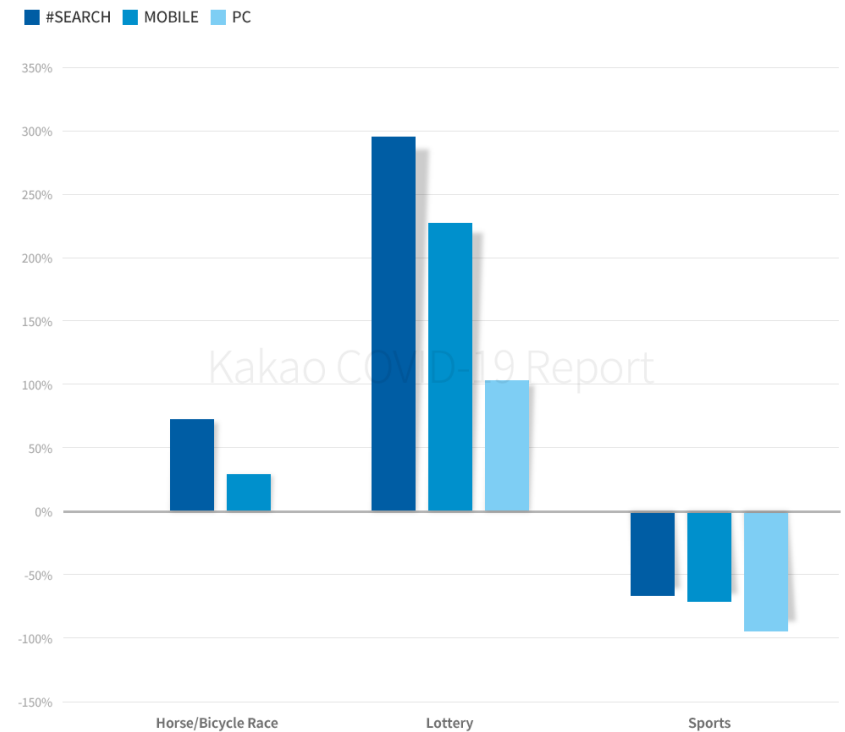
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#10. Sports/leisure: More searches for lotteries, less for sports

For sports and leisure-related searches, there was a steep increase in searches for lotteries (# Search 339%, Daum mobile search 221%, Daum PC search 114%) and horse/bicycle racing (Daum mobile search 71%, Daum PC search 32%), while the number of users searching for sporting games (# Search -79%, Daum mobile search -72%, Daum PC search -94%) decreased. The number of users searching for lotteries increased significantly, with a 339% increase in # Search and a 221% increase in Daum mobile search. The same trend was observed in search volume, where searches for entertainment sports content, such as horse and bicycle racing and lotteries, increased, whereas the search volume of sports events decreased.

[Figure 6-10-1] Number of users searching for sports content (Mar. 2019 vs. Mar. 2020)
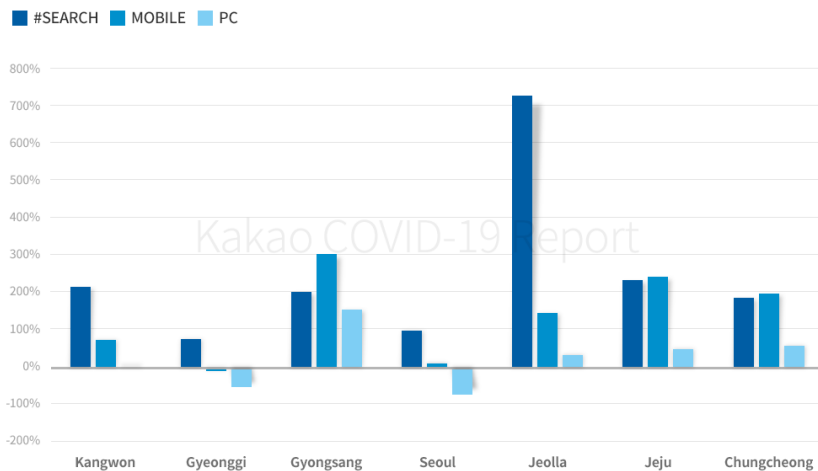

[Figure 6-10-2] Volume of search queries on sports (Mar. 2019 vs. Mar. 2020)
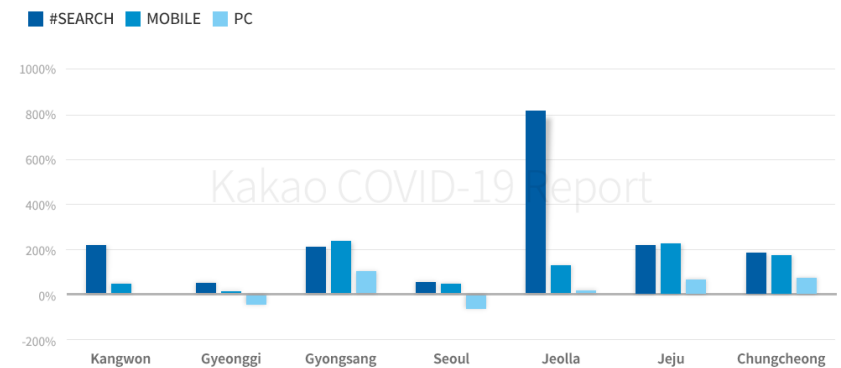
kakao

#11-1. Travel (domestic): Less searches for travel to the metropolitan area, more to non-urban areas

There was a visible decline in the number of users who searched for travel information on the metropolitan area, which includes Seoul and Gyeonggi-do. Users who searched for non-metropolitan areas increased, with an 183% increase in searches for Chungcheong-do and an 727% increase for Jeolla-do (in # Search). Searches for Jeolla-do saw the greatest increase in terms of both the number of users (727%) and search volume (814%). This demonstrates that more people preferred to travel to non-metropolitan areas that are less populated and closer to nature.

[Figure 6-11-1] Number of users searching for domestic travel content (Mar. 2019 vs. Mar. 2020)
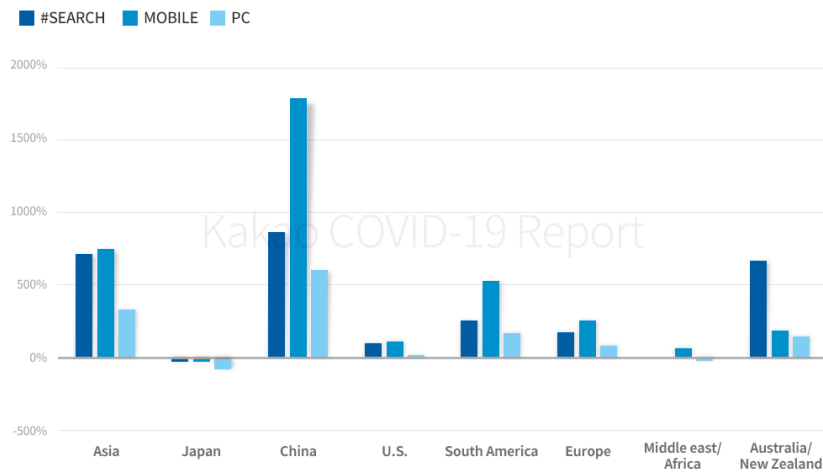

[Figure 6-11-2] Volume of search queries on domestic travel (Mar. 2019 vs. Mar. 2020)
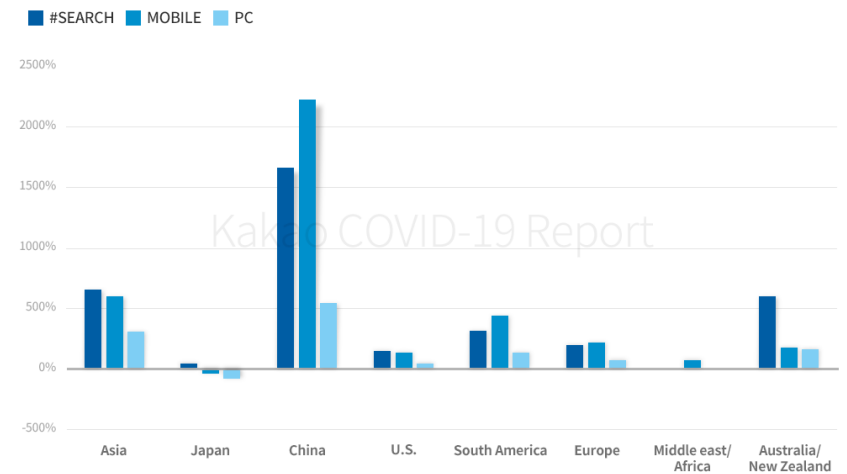
#11-2. Travel (international): More searches for China

COVID-19 indeed had an impact on searches related to international travel. There was an exponential leap in the number of users who searched for China (# Search 866%, Daum mobile search 1791%, Daum PC search 603%), while there was a slight decrease in the number of users who searched for Japan (# Search -22%, Daum mobile search -17%, Daum PC search -70%).

[Figure 6-11-3] Number of users searching for international travel content (Mar. 2019 vs. Mar. 2020)
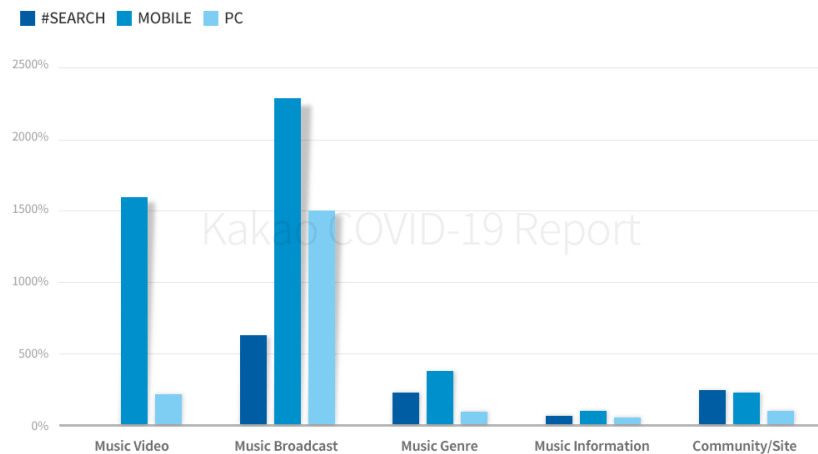

[Figure 6-11-4] Volume of search queries on international travel (Mar. 2019 vs. Mar. 2020)

#12. Music: More searches for music broadcasts, music videos

There was a greater increase in the number of users who searched for music videos (Daum mobile search 1594%, Daum PC search 222%) and music broadcasts (# Search 623%, Daum mobile search 2301%, Daum PC search 1512%), than the number of users who searched for music genres (# Search 229, Daum mobile search 385%, Daum PC search 96%) and music information (# Search 66%, Daum mobile search 97%, Daum PC search 51%). The volume of mobile searches for music videos increased by 1933%. While the volume of PC searches was minimal in the other categories, for music broadcasts, it increased by a great 1531%.

[Figure 6-12-1] Number of users searching for music content (Mar. 2019 vs. Mar. 2020)
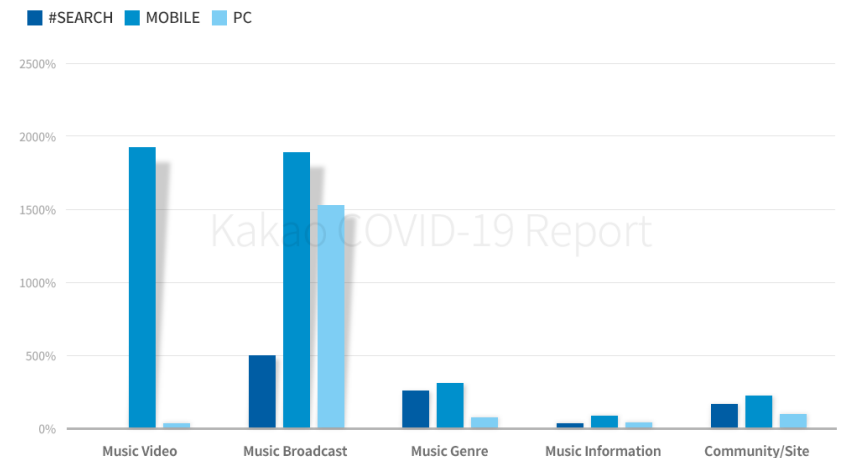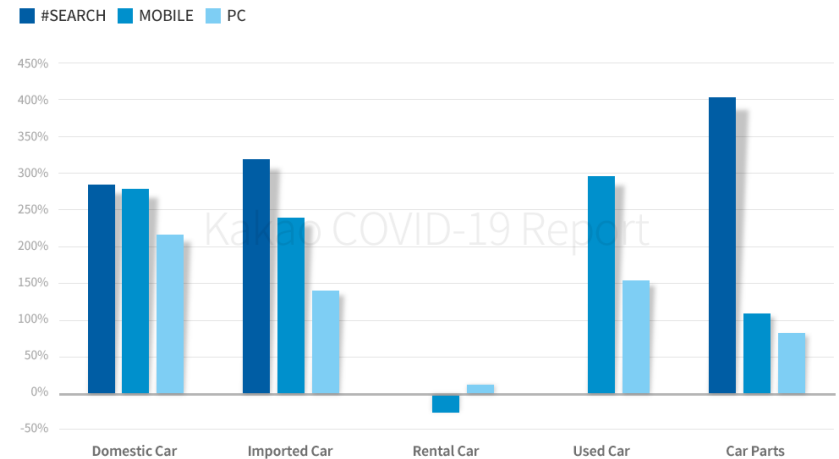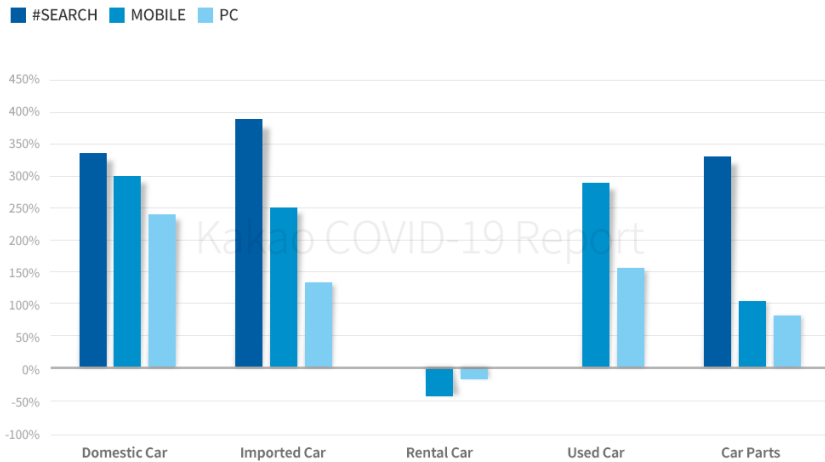

[Figure 6-12-2] Volume of search queries on music (Mar. 2019 vs. Mar. 2020)

kakao

#13. Automobiles: More searches for car purchase and accessories, less for rental cars

In regards to searches for cars, there was a greater yearly increase in the number of users who searched for domestic cars (# Search 337%, Daum mobile search 298%, Daum PC search 240%), imported cars (# Search 390%, Daum mobile search 249%, Daum PC search 133%) and used (Daum mobile search 290%, Daum PC search 157%) than the previous year. The number of users who used # Search to search for car accessories also increased (331%). Meanwhile, the number of users who searched for rental cars decreased in both mobile search (-43%) and PC search (-15%).

People's awareness on safety grew during COVID-19, and this has resulted in a rise in demand for personal automobiles that ensure personal safety and prevent contact with others in comparison to public transportation.

[Figure 6-13-2] Volume of search queries on automobiles(Mar. 2019 vs. Mar. 2020)

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#14-1. Investment (financial products): More searches for credit cards, less mobile searches for loans

In regards to searches for financial products, both the number of search users and the search volume made on # Search, increased by 132% and 425% respectively for searches on loans. On the other hand, mobile searches (search users -39%, search volume -7%) and PC searches (search users -6%, search volume 13%) for loans decreased slightly.
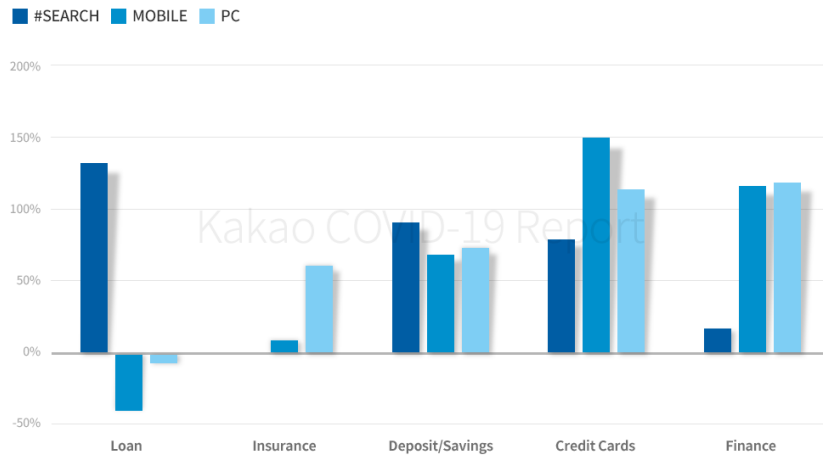
[Figure 6-14-1] Number of users searching for financial products (Mar. 2019 vs. Mar. 2020)
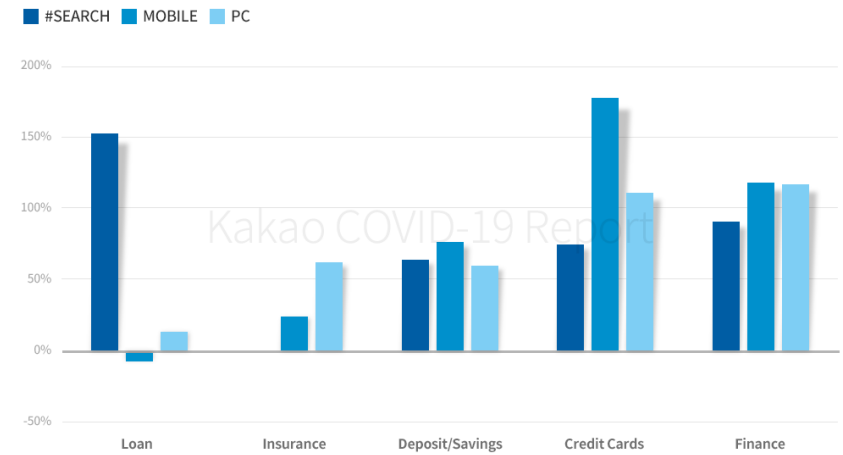
[Figure 6-14-2] Volume of search queries on financial products (Mar. 2019 vs. Mar. 2020)

kakao

#14-2. Investments (real-estate): Increase in search for transactions, fueled by high interest in real-estate

For real-estate, both the number of users (# Search 253%, Daum mobile search 375%, Daum PC search 236%) and the search volume
 (# Search 425%, Daum mobile search 330%, Daum PC search 185%) for real-estate transactions have increased. The number of users who searched for real-estate information (# Search 65%, Daum mobile search 165%, Daum PC search 85%) and relevant online communities and websites (Daum mobile search 36%, Daum PC search 108%) such as the online registry, increased. However, there were not as many users who searched for real-estate transactions.
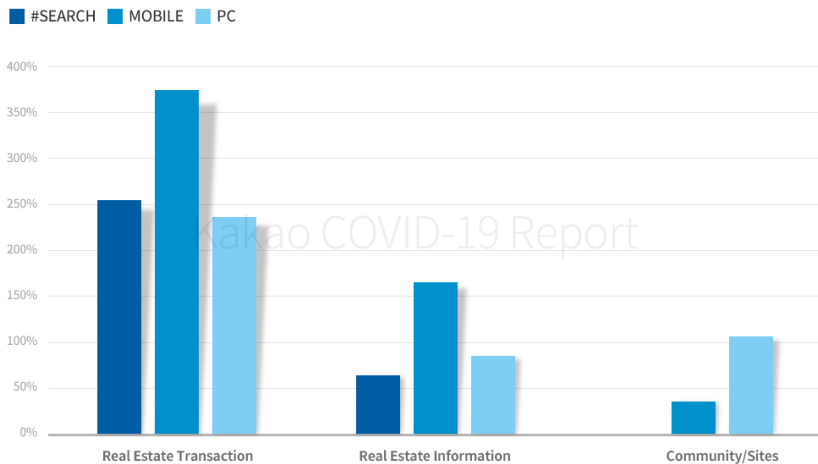
[Figure 6-14-3] Number of users searching for real-estate content (Mar. 2019 vs. Mar. 2020)
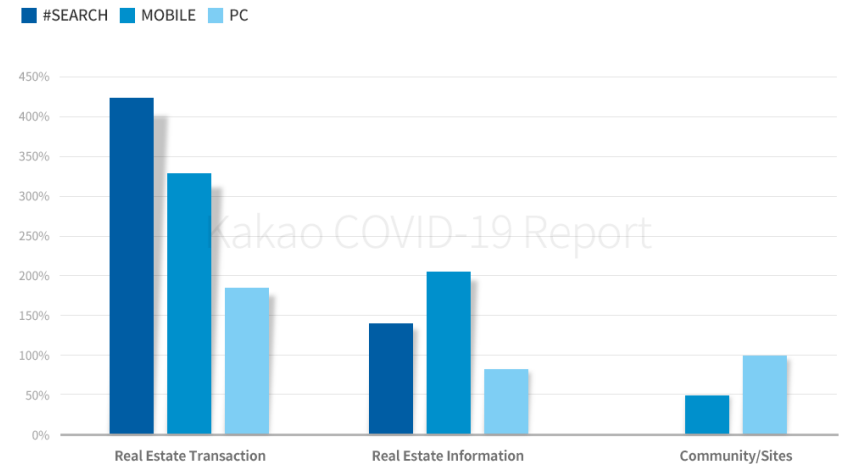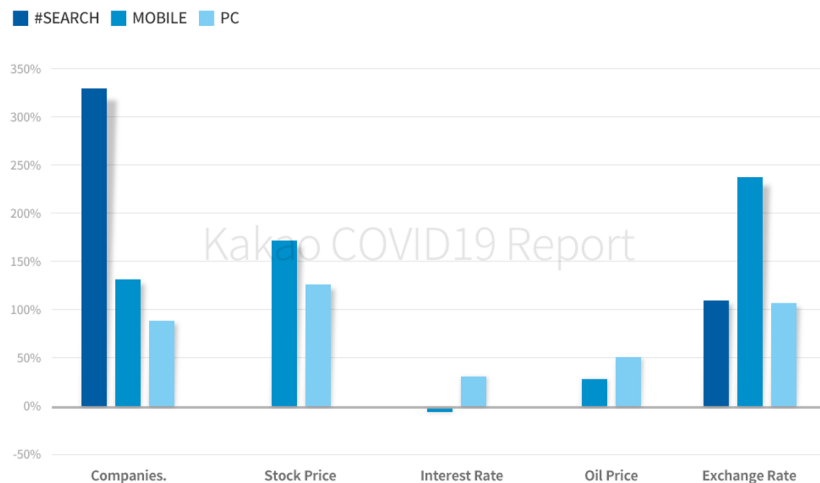

[Figure 6-14-4] Volume of search queries on real-estate (Mar. 2019 vs. Mar. 2020)

#14-3. Investments (transaction information): More searches for companies, stock price and exchange rate

The number of users who searched for information on companies (# Search 330%, Daum mobile search 132%, Daum PC search 89%), stock prices (Daum mobile search 172%, Daum PC search 127%) and exchange rates (# Search 110%, Daum mobile search 238%, Daum PC search 108%) increased. However, the number of users who searched for information on oil prices (Daum mobile search 29%, Daum PC search 51%) and interest rates (Daum mobile search -4%, Daum PC search 32%) did not fluctuate as much. As the data above shows, people were more interested in companies, stock prices and exchange rates than interest rates and oil prices. The number of search users and the search volume demonstrated below support our analysis.

[Figure 6-14-5] Number of users searching for transaction information content (Mar. 2019 vs. Mar. 2020)
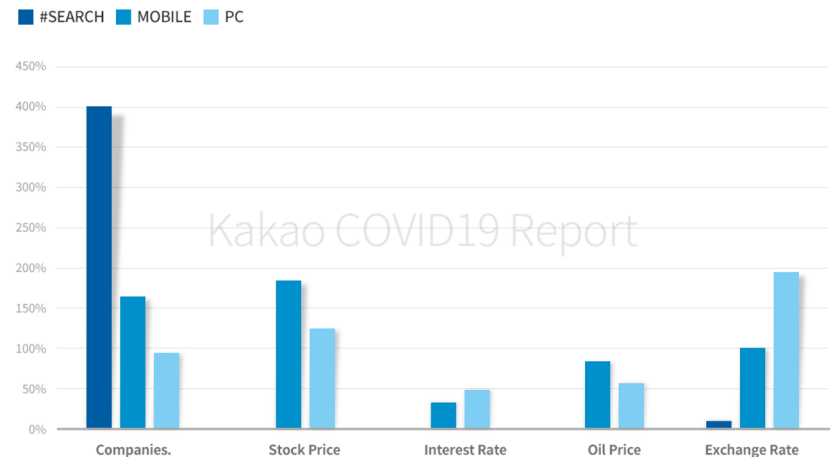
[Figure 6-14-6] Volume of search queries on transaction information (Mar. 2019 vs. Mar. 2020)

Part 7.

How interested are
people in COVID-19?

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Kakao COVID-19 Report, Part 7

People have made various COVID-19-related searches as our daily lives have undergone great changes. They search for all kinds of relevant keywords about COVID-19, such as testing sites and government-issued relief funds to get accurate information. They also search for face masks, hand sanitizers and other personal protective equipment (PPE) to purchase online. People spend a large amount of time online in collecting and sharing information on COVID-19.

In Part 7, we will talk about the level of interest people have for information on COVID-19 and PPEs.

Let's begin by observing how interested people were in the news during COVID-19.
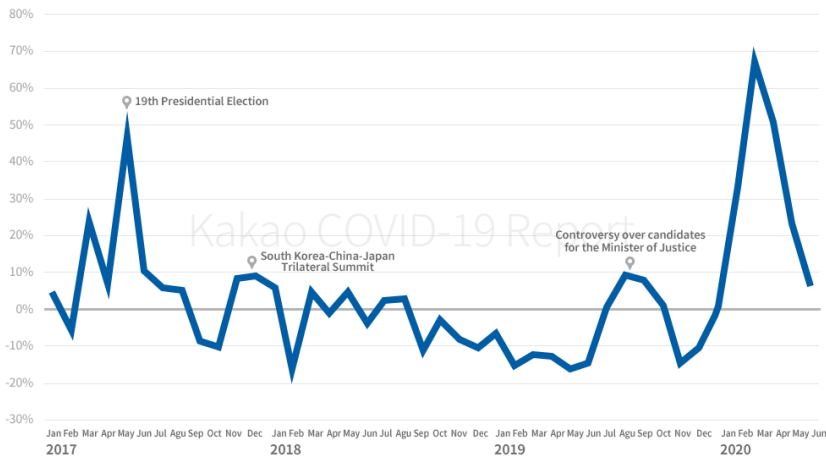
kakao

More news viewers during COVID-19 than the presidential election

Prior to 2020, the highest number of weekly views on Daum News was recorded in May 2017, during South Korea's 19th presidential election. COVID-19 broke this record. Using the first week of January 2020 as reference, the number of views on Daum News increased by 29% in February and 67% in March of 2020. News consumption patterns returned to the annual average after April 2020.
[Reference] The South Korea-China-Japan Trilateral Summit marked on Figure 7-1 was the first summit to be held by the three countries since negotiations were suspended after the ASEAN Plus Three summit on November 2017.

Sharp increase in COVID-19 information searches through Hey Kakao

Let's now take a look at how people used Hey Kakao, a service that provides information from Kakao Talk, Melon and other Kakao services, as well as major news content, through its AI speakers, to find information on COVID-19. The number of users who asked Hey Kakao about "coronavirus", "confirmed cases", "masks", "disinfection", "infection" and "symptoms" escalated after a super-spreader patient was detected on the fourth week of February. By the first week of March, the number of user utterances made to Hey Kakao about COVID-19 increased 2382% compared to the first week of January. The same trend was observed for news consumption with Hey Kakao, where utterances about COVID-19 keywords gradually decreased after April, as the pandemic prolonged.
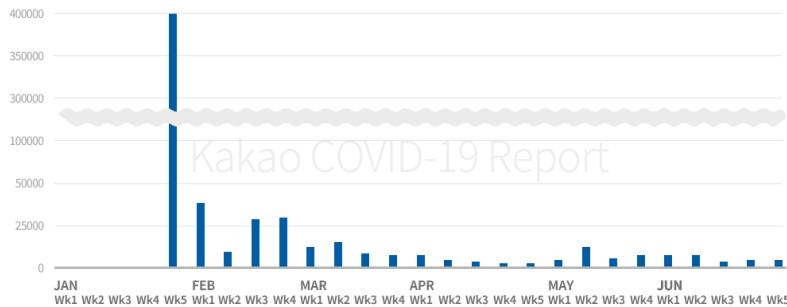

[Figure 7-1] Monthly views on Daum News since 2017 (Jan. 2017 to Jun. 2020)
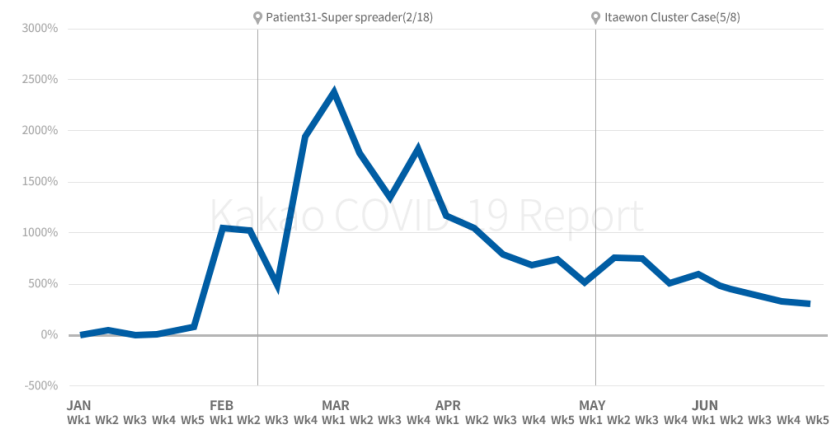
[Figure 7-2] Number of users who used Hey Kakao to ask about COVID-19keywords (Jan. 2020 to Jun. 2020)

kakao

KakaoMap used to find information on COVID-19

In response to the spread of COVID-19, the Korea Disease Control and Prevention Agency (KDCA) released detailed information on the movement of confirmed cases. The government also initiated the face mask rationing program, which further emphasized the importance of being informed about the virus. We took a closer look at COVID-19-related information that users searched for on Kakao Map.

Since testing sites is at the front lines of COVID-19 prevention, we first analyzed the number of times COVID-19 testing sites were searched on Kakao Map. The first testing site was erected at the end of January, when South Korea had its first confirmed case of COVID-19. South Korea now has 596 testing site throughout the country. The highest number of searches, approximately 400,000 searches for "testing sites" on Kakao Map was recorded on the fifth week of January, when the first testing site became available. Since then, the average number of searches for testing sites dropped to below 50,000 per week, and has maintained that level at the time we analyzed the data (end of June 2020).

We then analyzed searches for the emergency coronavirus relief fund, which was the most popular issue in May. Applications for the Emergency Coronavirus Relief Fund was accepted through online and offline channels and payment for the funds was first determined on March 30. The South Korean government announced details for a second supplementary budget bill on April 16 after the 21st general election, then accepted applications starting on May 11 and started payments on May 13.

Following searches then shifted onto find stores where users could spend the relief funds. If we look at the volume of searches on Kakao Map that are related to the Emergency Coronavirus Relief Fund, there were 112 searches during the second week of April, when the detailed plan was announced. The number of searches gradually increased and reached 450,000 searches by the end of May.
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[Figure 7-3] Volume of searches on Kakao Map for testing sites (Jan. 2020 to Jun. 2020)
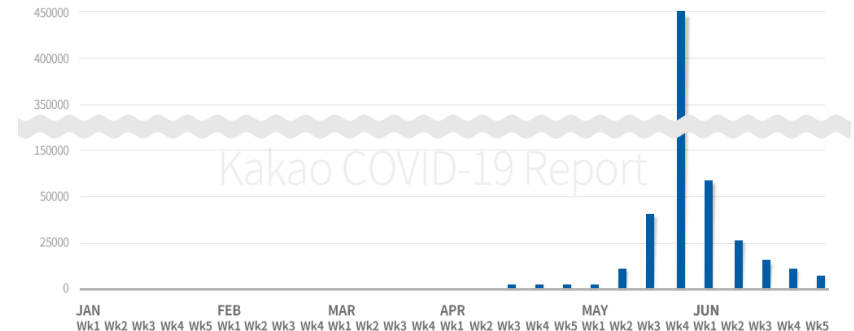
One of the most popular COVID-related keyword was "rationed face masks". When the Coronavirus started to spread in early February, people were told that face masks helped prevent Coronavirus infection. This resulted in a public frenzy to procure face masks. The South Korean government launched the face mask rationing initiative on March 9, then maintained a five-day rotation face mask distribution system until June 1, and allowed unrestricted purchasing of face masks on July 11.

More than 14 million searches related to rationed face masks or the face mask policy were made on Kakao Map on the second week of March, when the policy was put into effect, proving Korean's high level of interest in finding face masks. The search volume was highest during the third week of March, with 15.7 million searches and it started to decrease as the face mask rationing plan stabilized.
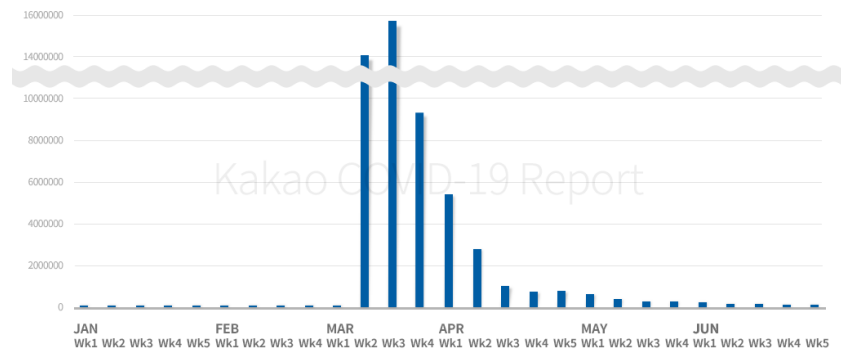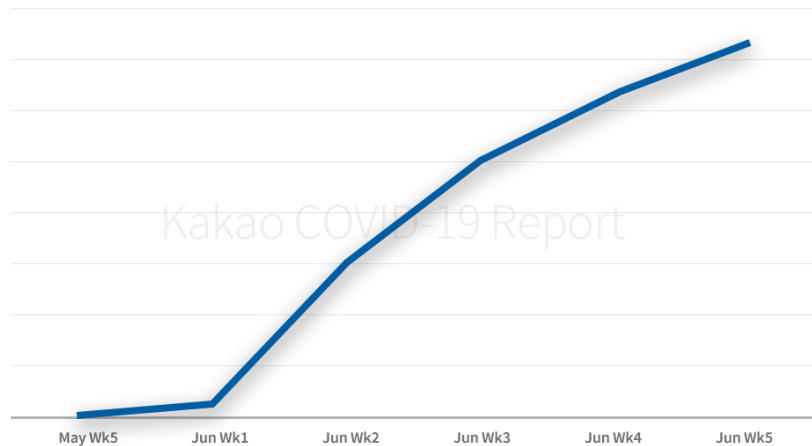

[Figure 7-5] Volume of searches on Kakao Map related to rationed face masks (Jan. 2020 to Jun. 2020)

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Kakao Talk Channel subscriptions about COVID-19

Kakao Talk Channels were also used to provide consistent information on COVID-19. Kakao Talk's Emergency Employment Fund Channel was launched on May 21 and had 14 subscribers by May 25. The Emergency Employment Fund Channel started to take off when hundreds of new subscribers subscribed on June 2. By the end of June, the channel recorded a total of 3,700 subscribers and is still steadily growing to this day.

The COVID-19 Map (COVID-19 Notification) Channel, which provides information on COVID-19 such as confirmed cases, raked in 100,000 new subscribers during the first week since its launch. An additional 10,000 users subscribed to the channel when the super-spreading case of Patient 31 was detected in Daegu. As of the end of June, there were a total of 95,000 subscribers subscribed to the COVID-19 Map Channel.

[Figure 7-6] No. of emergency employment fund channel subscribers (Jan. 2020 to Jun. 2020)
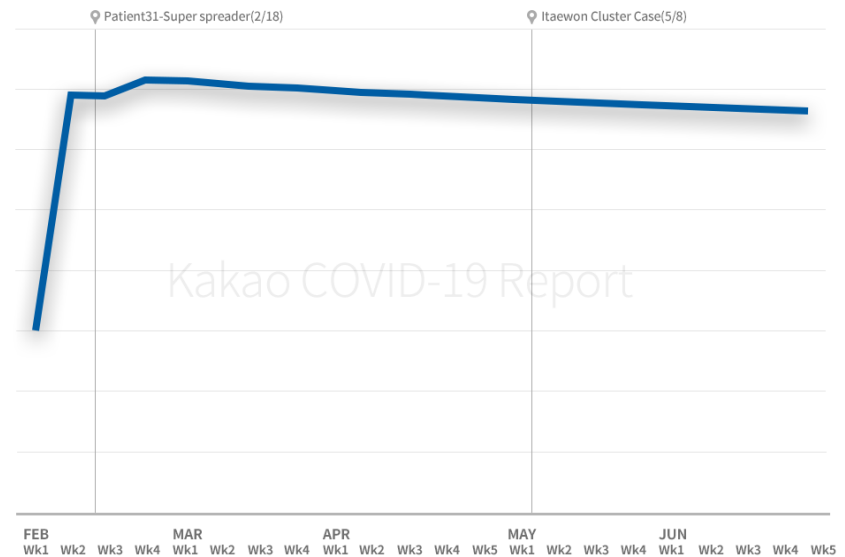
[Figure 7-7] No. of COVID-19 Map channel subscribers (Jan. 2020 to Jun. 2020)

Kakao COVID-19 Report, Part 7

The Korea Disease Control and Prevention Agency (KDCA) Channel had 300,000 subscribers as of January 1, 2020. However, 600,000 more users subscribed to the channel in February alone, resulting in 1 million subscribers total. The greatest number of users, of around 50,000 daily, was recorded to have subscribed to the channel when the numbers of new patients increased due to the super-spreading case of Patient 31.
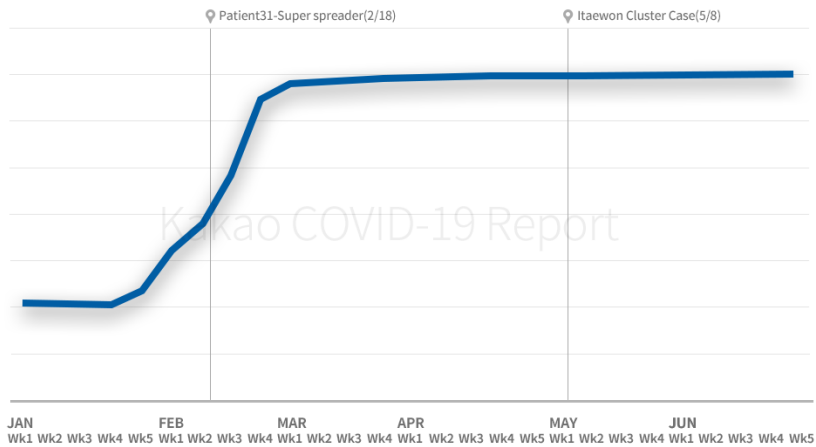
[Figure 7-8] Number of KDCA channel subscribers (Jan. 2020 to Jun. 2020)

Searching and purchasing PPE online

Personal protective equipment (PPE), including face masks and hand sanitizers, started to sell out and disappear from shelves in stores and pharmacies as the virus spread. People had no choice but to search and purchase necessities through the Internet. Let's look at data from Kakao Talk Gift, the online e-commerce channel, to learn more about the face mask and hand sanitizer situation during COVID-19. While the search volume for hand sanitizers was 100 searches at the most in 2019, during January and February 2020, searches for hand sanitizers recorded a monthly average of over 30,000.

Date	Mask	Hand Sanitizer
Jan. 2019	41,196	0
Feb. 2019	16,151	0
Mar. 2019	91,716	0
Apr. 2019	9,341	0
May. 2019	8,117	0
Jun. 2019	5,917	139
Jul. 2019	7,259	0
Agu. 2019	6,666	590
Sep. 2019	7,570	0
Oct. 2019	8,580	0
Nov. 2019	11,157	44
Dec. 2019	16,450	48
Jan. 2020	232,503	30,584
Feb. 2020	1,357,970	38,073
Mar. 2020	623,834	19,734
Apr. 2020	79,305	6,030
May. 2020	74,391	4,077
Jun. 2020	70,174	3,705

[Figure 7-9] Volume of searches made on Kakao Talk Gift for face masks / hand sanitizers
(Jan. 2019 to Jun. 2020)

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Part 8.
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Using AI in a
contactless society

kakao

Research shows that COVID-19 has rapidly brought about major changes in our daily lives. This change signifies that life has become more 'digitalized.' Online transactions and contactless communication are encouraged in order to prevent COVID-19 transmission. With the spread of COVID-19 in our society, we have become more accustomed to placing orders through an automated kiosk rather than speaking to a waiter in person. We have also resorted to shopping online as it is a safer alternative.

As we start to live a more "digital" life, we have started to communicate more with services that use artificial intelligence (AI) technology. For example, AI chatbots are being widely used in daily operations of industries and education. In Part 8 of the *Kakao COVID-19 Report*, we will take a look at how people have communicated with AI during the COVID-19 pandemic by analyzing data from Kakao's AI service, Hey Kakao.
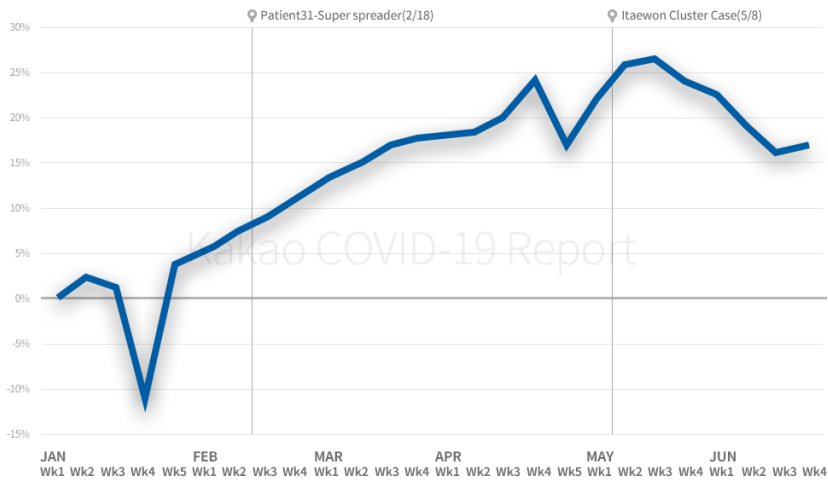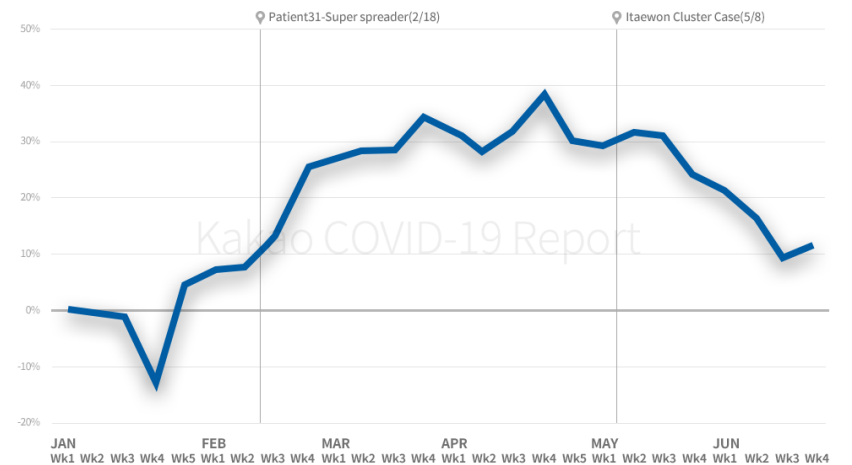
kakao

More Hey Kakao users due to the spread of COVID-19

This year, the number of Hey Kakao users rose in parallel with the spread of COVID-19. The number of users decreased temporarily at the end of January, during Lunar New Years, but increased alongside the number of confirmed COVID-19 cases. The number of users decreased again at the end of April, when COVID-19 seemed to stabilize, but then increased once more after May 8 when a cluster of COVID-19 cases was reported in Itaewon. The numbers dropped again when social distancing regulations were relaxed in June.

As the number of Hey Kakao users increased, so did the number of utterances (voice commands used to made a request through the Kakao Mini speaker) made to Hey Kakao. Compared to the first week of January, Hey Kakao service usage increased by 38% at the end of April. Increased usage was also observed when stricter social distancing policies were imposed at the end of February. Hey Kakao usage recorded a steady increase by over 20% compared to that of early January 2020, then decreased to 10% after the second week of June.

[Figure 8-1] Number of Hey Kakao users (Based on weekly utterances, Jan. 2020 to Jun. 2020)
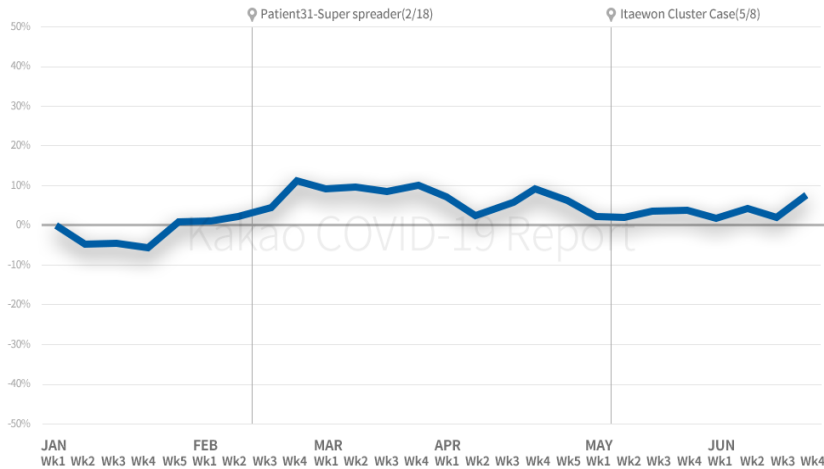

[Figure 8-2] Hey Kakao utterance volume (Based on weekly utterances, Jan. 2020 to Jun. 2020)

Increase in demand for education/parenting content in weekdays

One of the biggest changes to occur due to COVID-19 is people's increased interest in education and parenting. During COVID-19, individual (each person's) usage of Hey Kakao to find information on education and parenting showed an upward trend within 10% compared to early January. (Refer to Figure 8-3)

The per capita demand for content on education/parenting content on Hey Kakao did not fluctuate by a large percentage. However, the total number of utterances made increased due to the rise in the total number of users. The number of users and utterances increased by 24% and 38% respectively when the the super-spreading case of Patient 31 was detected in the fourth week of February and continued to increase.


[Figure 8-3] Voice commands to search education/parenting made by individuals on Hey Kakao (Jan. 2020 to Jun. 2020)
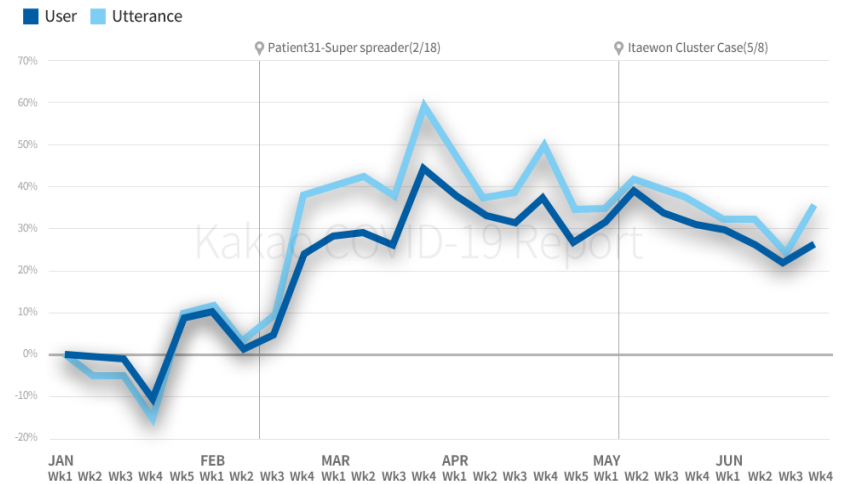
[Figure 8-4] Users/utterances of/in Hey Kakao to find education/parenting content (Jan. 2020 to Jun. 2020)

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Kakao COVID-19 Report, Part 8

We observed an increased demand for education/parenting content in March and compared the usage of Hey Kakao on the weekdays to its usage on the weekends. While the total number of Hey Kakao users were similar during the weekdays and the weekends, the number of utterances made per person was greater during the weekdays (Refer to Figure 8-5). The overall number of utterances made was also greater on the weekdays.
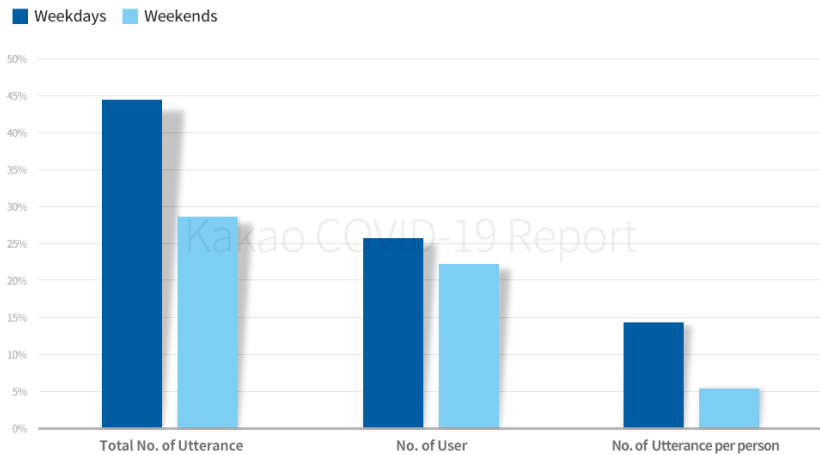

[Figure 8-5] Usage of Hey Kakao education/parenting content during the weekdays/weekend (Jan. 2020 vs. Mar. 2020)

kakao

"Hey Kakao, help me exercise"

As the pandemic continues and people spend more time at home, at-home workouts have gained more popularity. The number of utterances made to Hey Kakao for home workout content have increased during COVID-19. Overall usage of at-home workout content increased by around 50% during the last week of April.
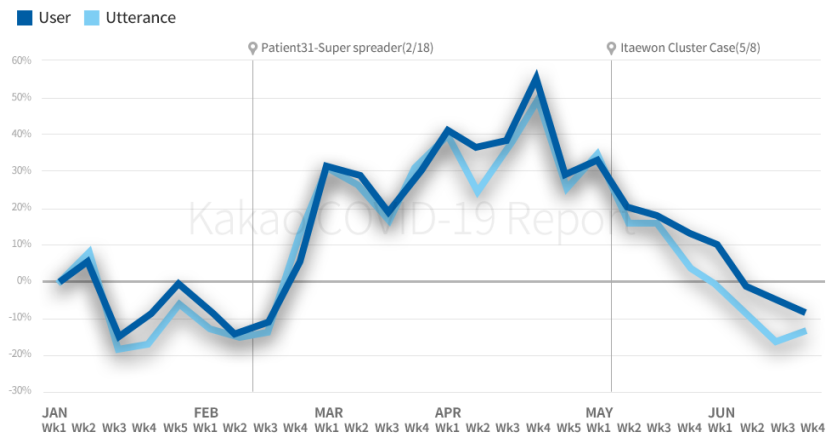
[Figure 8-6] User/utterances of at-home workout content on Hey Kakao (Jan. 2020 to Jun. 2020)

kakao

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Part 9.

Digital traces of a
contactless life

kakao

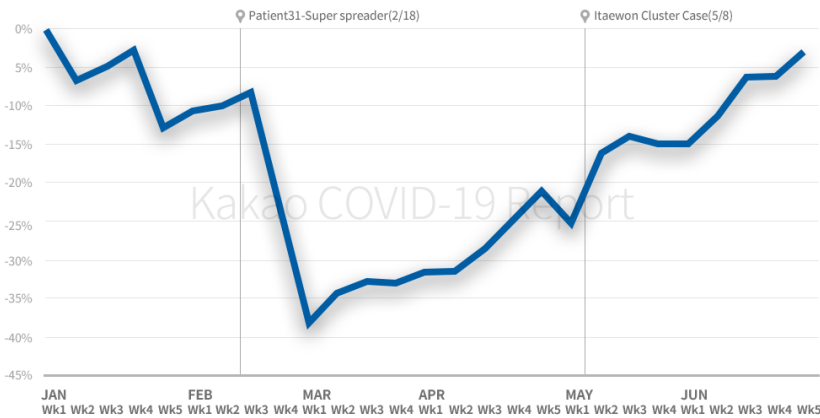Our lives have changed completely because of COVID-19. We have taken extreme care to minimize the time we spend face-to-face in order to reduce transmissions. We have changed the way we communicate and how we use digital services to maintain life despite minimum human contact. Part 9 of the *Kakao COVID-19 Report* presents the findings from our analysis of the consumption of Kakao services.

kakao

## # Restricted offline gatherings replaced by online care and compassion

People refrained from going outside as the number of COVID-19 cases increased. They didn't meet friends and held meetings virtually. These changes led to decreased demand in mobility services and the changes were represented in the usage data of related service platforms. The volume of Kakao T Taxi operations (a service which connects the supply of taxi services to the demand), decreased sharply after the super-spreading case of Patient 31 was detected in February. The volume of operations further decreased by 38% in the first week of March compared to early 2020.
[Reference] More details on mobility patterns and conditions are provided in Part 4 of the *Kakao COVID-19 Report*.

A decrease in offline gatherings also resulted in less people paying at restaurants. Since less people payed and split bills, the usage of Kakao Pay's "Going Dutch' feature, which is used to divide payments, decreased. The decrease in the usage of the 'Going Dutch' feature represents the contactless life we live during COVID-19. Usage of the 'Going Dutch' feature which had steadily increased since the second half of 2019, began to decrease in February 2020 and continued to decrease for three months until April. The usage of the 'Going Dutch' feature rebounded in May, after the social distancing restrictions were relaxed.

[Figure 9-1] Weekly taxi operations using Kakao T Taxi (Completed drives, Jan. 2020 to Jun. 2020)
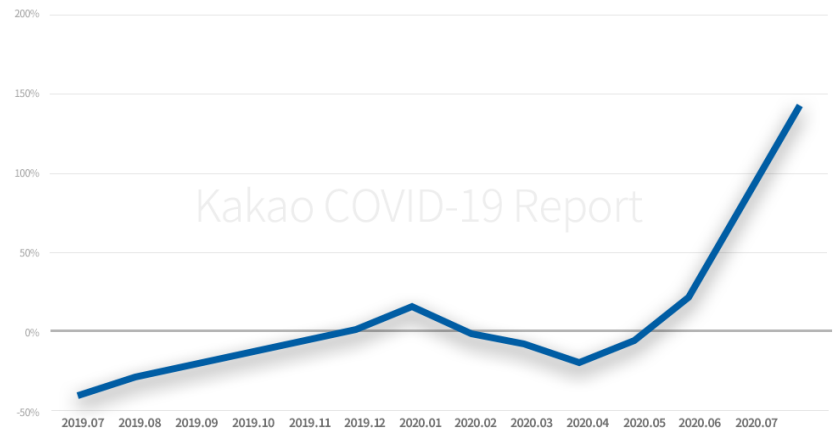
[Figure 9-2] Monthly use of Kakao Pay's "Going Dutch" feature (Jul. 2019 to Jul. 2020)

While gifting money on special occasions is customary in Korea, the usage of Kakao Pay's 'Money Gifts' feature fluctuated because of COVID-19. Usage of the Money Gifts feature depended on the occasion. Usage of the 'Wedding Money Gift' feature dropped immediately after the first wave of infections, as the number of weddings (an occasion that can be postponed) decreased in March and April. Since March, usage of the "Condolences Money Gift" increased by around 20 to 30%, compared to early January of 2020. Overall, usage frequency of the Kakao Pay "Wedding Money Gift" feature and the "Condolences Money Gift" feature showed an increase compared to early 2020. This demonstrates that people used digital services to show that they cared even though they were not able to be there in person.
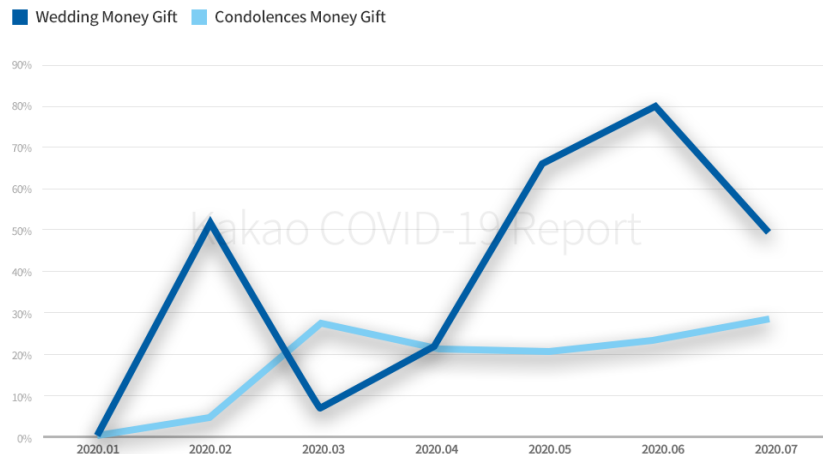
[Figure 9-3] Usage frequency of Kakao Pay's Money Gift feature (Monthly data, Jan. 2020 to Jul. 2020)
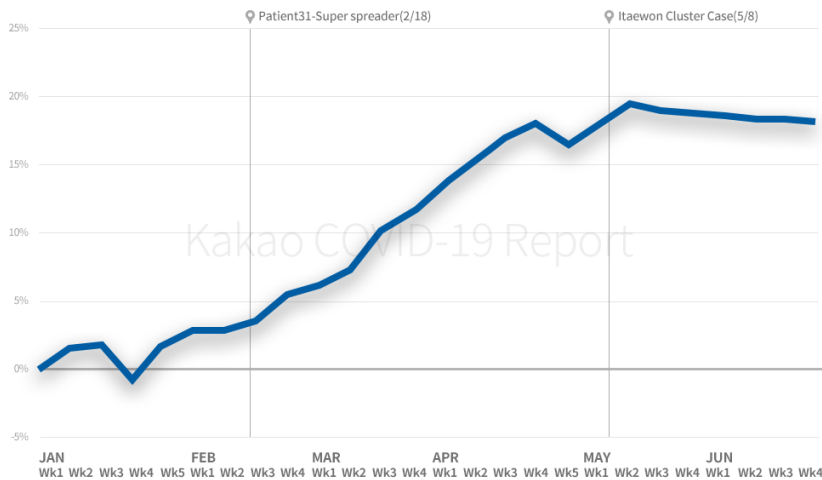
20% increase in Kakao Talk PC version users

- Taxi auto-pay increased from 27% to 35%
- "Study-from-home", Kakao Talk notification about educational information doubled from January

The decrease in offline gatherings led to an exponential surge in online communication (Refer to *Kakao COVID-19 Report*, Part 1). The increased number of Kakao Talk PC version users is another example of this trend. The number of users who accessed Kakao Talk through their personal computers remained stable in January before the pandemic started. The number of Kakao Talk PC version users increased by 6% by the end of February when the case of a super-spreading patient was detected, then rose steadily 20% by the second week of May when a cluster of COVID-19 cases was located in Itaewon.
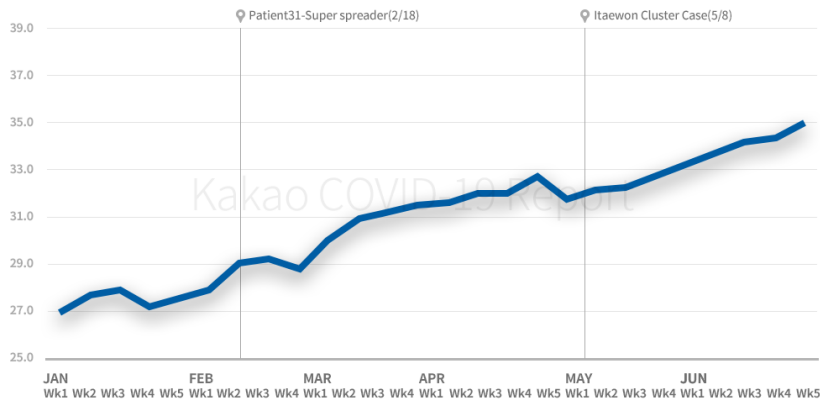
Since it became difficult to meet people face-to face, more people started to rely on voice and video multimedia communication tools. This can be observed from the increase in the combined call time that people spent talking with others on Kakao Talk's Voice Call and Video Call features. The total call time of Voice Call and Video Call combined did not fluctuate during January, before the first COVID-19 confirmed case in South Korea. This all changed with the super-spreading case of Patient 31. The combined call time of the call features greatly increased during the fourth week of February, when strict social distancing was advised. The combined call time increased by 59%, compared to the combined call time of early January.

[Figure 9-4] Number of Kakao Talk PC version users (Jan. 2020 to Jun. 2020)
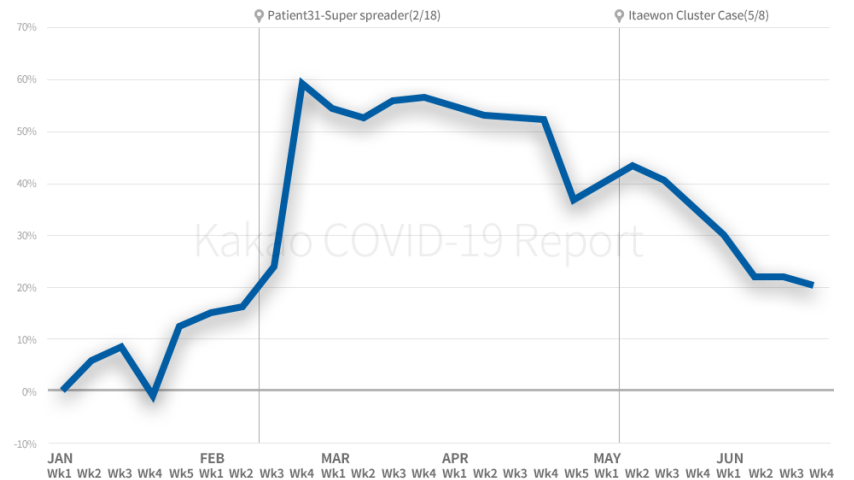
[Figure 9-5] Total call time of Voice Call + Video Call (Jan. 2020 to Jun. 2020)

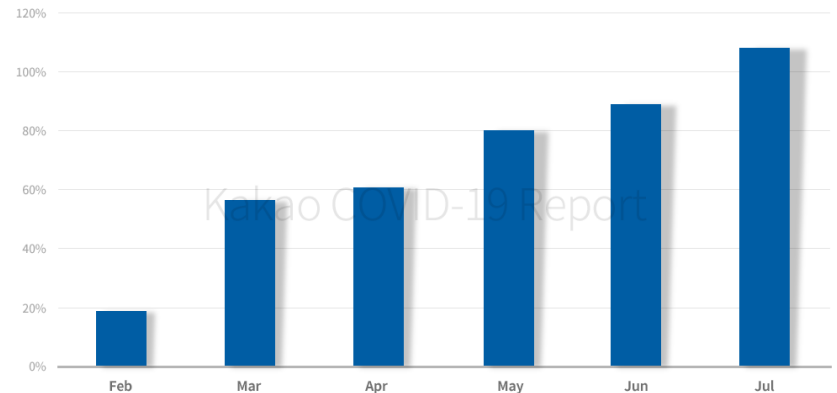**kakao**

As a preventive measure, people make efforts to avoid close contact, even when they are in close proximity with others. In restaurants and cafes, tables have been spaced apart and in supermarkets, plexiglass dividers have been installed in front of cashiers to separate them from customers. For taxi rides, the use of Kakao T Taxi features that allow drivers and passengers to avoid contact, increased. Passengers were able to register their credit card information into the Kakao T Taxi app to activate auto-pay, which they used to pay for their rides. Auto-pay usage stood at 27% on the first Thursday of 2020 (Jan. 2), but increased to 35% by the last Thursday of June (Jun. 25).

We used data on Kakao Talk notifications to learn about the demands for educational content during COVID-19. Companies that provide online courses or educational content can send information on course subscriptions or premium courses through Kakao Talk notifications. Data show that, during COVID-19 the amount of education-related Kakao Talk notifications sent to users started to increase in February 2020. Compared to January, 109% more Kakao Talk notifications were sent to users in July, so the number of transmitted notifications increased by a twofold.

[Figure 9-6] Kakao T Taxi auto-pay ratio (Thursdays of each week, Jan. 2020 to Jun. 2020)

[Figure 9-7] Education-related Kakao Talk notifications that were sent to users (Feb. 2020 to Jul. 2020)

Part 10.

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Chasing the
corona blues away with AI

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Strict social distancing, accompanied by corona blues

- Decrease in happiness, life satisfaction and positive sentiments
- Increase in negative sentiments and stress

We studied data from the "South Korean Happiness Index" to analyze the mental and emotional wellbeing of the Korean society during COVID-19.

The South Korean Happiness Index is a service available in Kakao Together's 'Hello' menu, provided in partnership with the Seoul National University Center for Happiness Studies. The index consists of a survey with ten questions about users' life satisfaction, positive and negative sentiments, stress factors etc... Responses for each question are marked on a scale of 0 to 10, with 0 being "strongly disagree" and 10 being "strongly agree".

There was no noticeable change in the happiness index before the social distancing regulations that were put into effect on March 21. The breaking point came at the end of March, when stricter social distancing rules were imposed. The happiness index which stood at 5.3 in early May, dropped to 5.1. Although the difference was not drastic, considering that the happiness index had maintained a stable level of 5.3 before the social distancing regulations, the decrease demonstrates how people started to experience emotional changes due to the enforced policies.
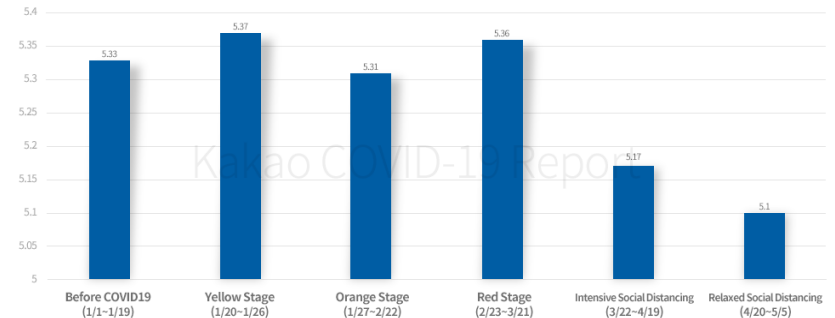
[Figure 10-1] Happiness index, retrieved from Kakao Together's 'Hello' (Jan. 2020 to May 2020)
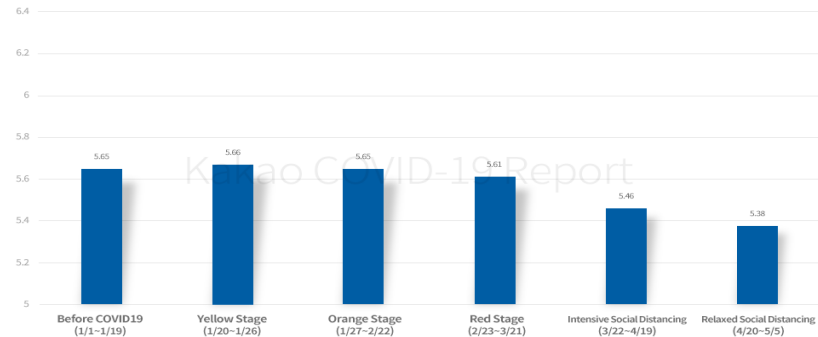
The life satisfaction index also started to decrease after strict social distancing measures were imposed.
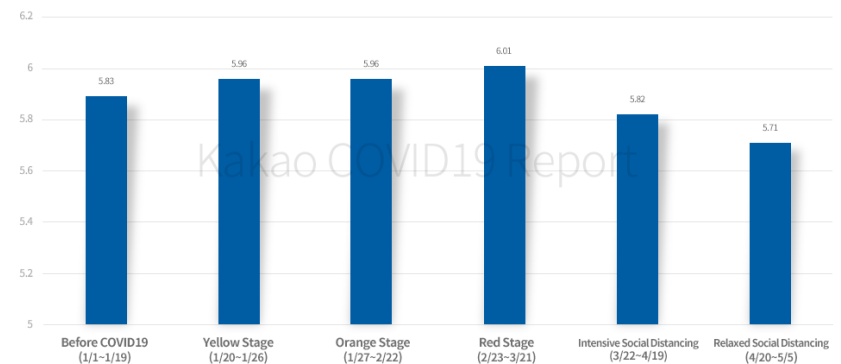
[Figure 10-2] Life satisfaction, retrieved from Kakao Together's 'Hello' (Jan. 2020 to May 2020)
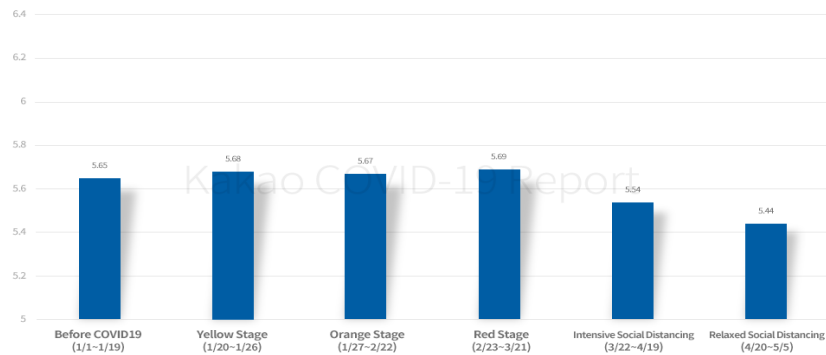
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The index that measures the meaning of life also decreased during the same period.

[Figure 10-3] The meaning of life, retrieved from Kakao Together's 'Hello' (Jan. 2020 to May 2020)

Respondent's positive sentiments decreased when social distancing policies were put into effect.

[Figure 10-4] Positive sentiments, retrieved from Kakao Together's "Hello" (Jan. 2020 to May 2020)

Meanwhile, negative sentiments increased during the same period.
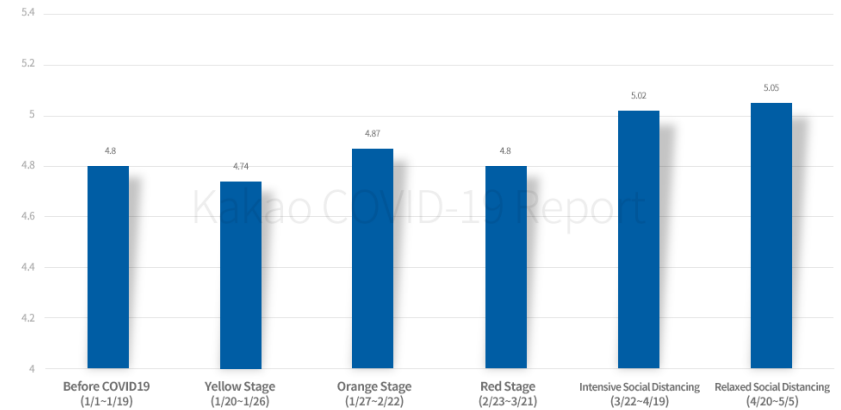
[Figure 10-5]Negative sentiments, retrieved from Kakao Together's 'Hello' (Jan. 2020 to May 2020)

The stress index demonstrated an increase as the COVID-19 outbreak began and the Orange Alert (third highest out of the four-tier alert system) was initiated in March. The stress index demonstrated a slight decrease when the highest Red Alert was put into effect, but increased again as the pandemic prolonged.
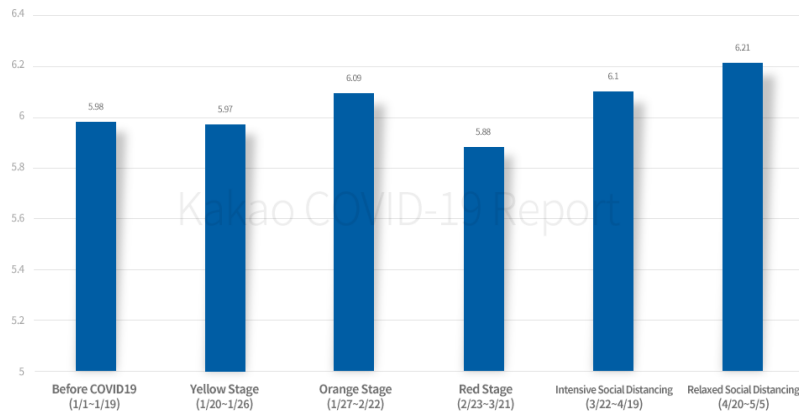
[Figure 10-6] Stress index, retrieved from Kakao Together's 'Hello' (Jan. 2020 to May 2020)

Different demands for mental healing during COVID-19

- Greater need to overcome anxiety from isolation, rather than emotional healing

Kakao Together offers meditation sounds on the "Mindfulness" menu. A unique keyword belongs to each meditation sound, allowing users to find the sound they want using the keyword. We were able to see which sounds the users listened to for emotional stability by analyzing the major keywords of the sounds played before and after COVID-19.

Data from the first half of 2019 (January to June) show that keywords that were searched on "Mindfulness" were related to the peace of mind, such as "mind-view" (23%) and "self-esteem" (8%), rather than being keywords about specific anxieties.

On the other hand, keywords that were searched during the first half of 2020 were very different from those of the previous year. The most popular keywords in 2020 were "relationship" (9%), "mind immunity" (8%) and 'anxiety' (7%), showing that users were looking for meditation sounds that could relieve anxiety that had built up inside them during isolation. Only 5% and 6% of users searched for meditation sounds with the keywords "acceptance" and "mind-view."
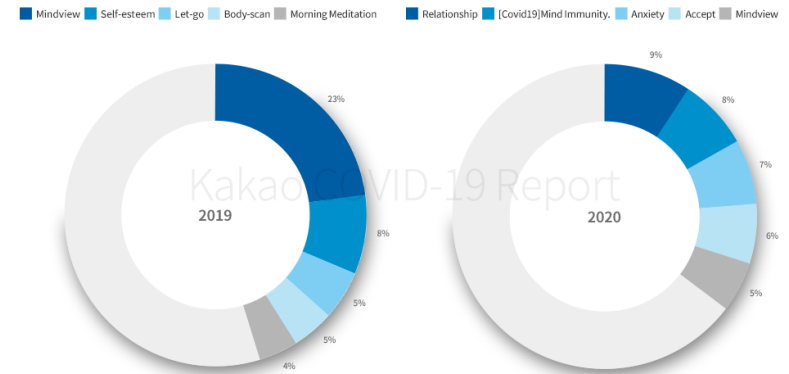

[Figure 10-7] Popular keywords in Kakao Together's "Mindfulness," 2019 (left) and 2020(right) (Jan, 2019 to Jun. 2019, Jan. 2020 to Jun. 2020)

Emotional healing with AI

- Demand for therapeutic sounds on Hey Kakao doubled than in early 2020

During COVID-19, meaningful changes have also occurred in the demand made through the AI service Hey Kakao for therapeutic sounds. The number of users who searched for therapeutic sounds via Hey Kakao decreased at the end of January compared to the beginning of the year. Users who searched for therapeutic sounds started to increase as COVID-19 cases rose in February, then shot up to 29% from that of early January in the fourth week of February, when COVID-19 cases erupted due to a super-spreading patient. The number of users increased again in March, to 40% compared to the beginning of the year, then increased exponentially to 145% at the end of April, when strict social distancing measures were extended.
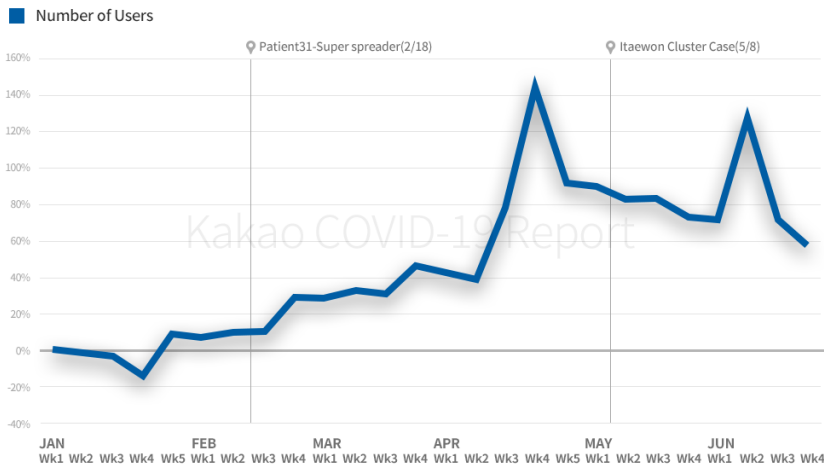

[Figure 10-8] Number of users who consumed healing sounds through Hey Kakao
(Weekly, Jan. 2020 to Jun. 2020)

Hey Kakao's therapeutic audio content were sent as Kakao Talk Plus Friends messages on April 22, to allow more users to experience therapeutic sounds.

Consoling each other through digital donations

Many people made donations to help overcome the COVID-19 pandemic. We observed the data from Kakao Together, Kakao's social contribution service and analyzed the changes in direct donations and supporting donations (donations made through supportive messages and comments) before and after COVID-19. Figure 9 demonstrates that donations from March of 2020 exceeded 2019.

[Reference: Special fundraising events were held on March (Centennial of the Korean Provisional Government) and December (year-end celebration) of 2019]
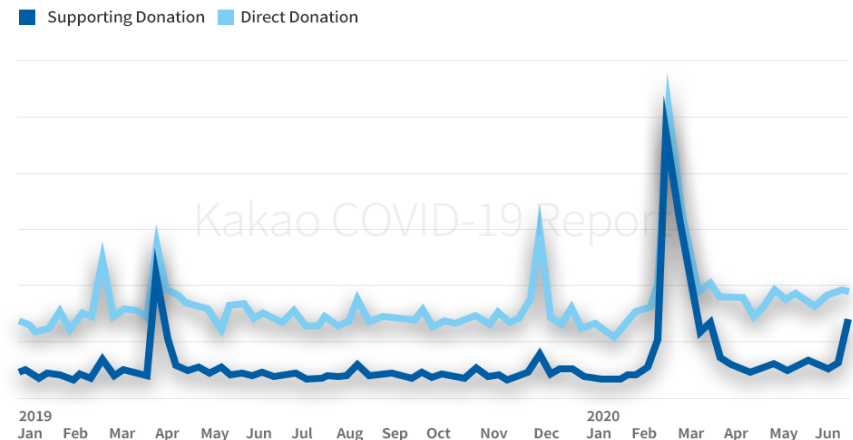
[Figure 10-9] Donations given through Kakao Together (Jan. 2019 to Jan. 2020)
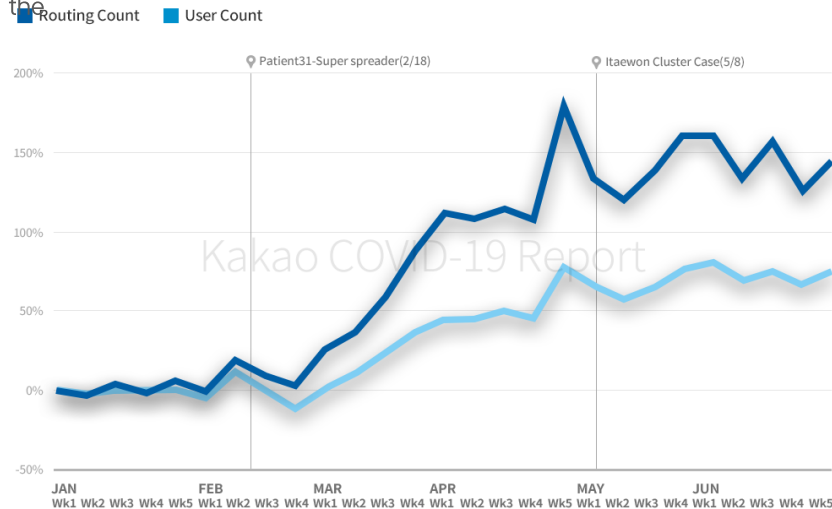
kakao

Data Analysis and Methodology

The *Kakao COVID-19 Report* analyzes data retrieved from multiple Kakao community and lifestyle services, including Kakao Talk, news, search, media·contents, mobility, e-commerce, fintech, artificial intelligence and social impact.

- Methodology: The data are presented in the form of a graph to show proportional data or percentages, (%) in order to illustrate the changes that occurred before and after COVID-19. The data were retrieved from (either the first week or the entire month of) January to June 2020 and for some analyses, to September 2020. Some data were excluded.

- Example: The graph below shows that the number of users increased by 50% on the fourth week of April, compared to the number of users in the

first week of January 2020. On the y-axis, values above zero (0) represent an increase in frequency, whereas values below zero (0) represent a decrease in frequency.

Kakao aims for the results of the *Kakao COVID-19 Report* to serve as a resouce in overcoming times of crisis. We hope that the implications of our data analyses will be used in building wise and resilient strategies or policies to navigate uncertainties and explore new business opportunities.

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■ Routing Count   ■ User Count

📍 Patient31-Super spreader(2/18)   📍 Itaewon Cluster Case(5/8)

Kakao COVID-19 Report

JAN Wk1 Wk2 Wk3 Wk4 Wk5 FEB Wk1 Wk2 Wk3 Wk4 MAR Wk1 Wk2 Wk3 Wk4 APR Wk1 Wk2 Wk3 Wk4 Wk5 MAY Wk1 Wk2 Wk3 Wk4 JUN Wk1 Wk2 Wk3 Wk4 Wk5

Epilogue

COVID-19 has rapidly permeated our daily lives. Time has passed and we are adjusting. However, responding to unexpected changes is never simple.

With the aim to foster a better world by making meaningful connections for individuals, individuals to the society and across societies, Kakao strives to contribute to collective efforts in overcoming the daily challenges posed to our society in the face of the COVID-19 crisis.

Based on Kakao's services, the *Kakao COVID-19 Report* utilizes data to understand how we have endeavored to maintain our daily lives in this new reality. It observes various aspects of the "new normal" in our lives caused by COVID-19.

Understanding the data that capture the circumstances of today and yesterday may be the starting point in addressing vulnerabilities and navigating crises for today and the future.

As we transition from the "new normal" into the "next normal," Kakao aspires for the implications of its data analyses to support people in building wise and resilient strategies or policies and exploring new business opportunities.

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Data and analysis used in the Kakao COVID-19 Report

[Data]

Indexes from the following Kakao services were used in the creation of the *Kakao COVID-19 Report* to identify how society was impacted by COVID-19.

Portal
Daum / Daum News / Daum Search

Communication
Kakao Talk / Kakao Story/ Daum Café / Tistory / Brunch

Content
Kakao Page / Kakao TV/ Melon

Commerce
Kakao Talk Gift / Kakao Talk Shopping

Healthcare
Kakao VX Smart Home Workout

Fintech
Kakao Pay

Mobility
Kakao T/ KakaoNavi / Kakao Map

Enterprise
Hey Kakao

Social impact
Kakao Together

[Analysis]

Data was converted to percentages (%) to clearly represent changes that occurred before and after COVID-19. The first week of January or the month of January was used as reference point for the analysis.

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