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Turkey's response to COVID-19 pandemic: strategy and key actions

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Abstract: COVID-19 emerged at the end of 2019 in Wuhan, China, and spread rapidly around the world causing many deaths. Due to the intercontinental escalation in the epidemic, while WHO declared a pandemic on March 11, 2020, our country's first case was diagnosed. Before this, the MoH established the Operations Center against possible risks regarding the Pandemic Influenza Preparedness Plan on January 10, 2020 and formed the Scientific Committee, which has a critical importance in epidemic management. National and Provincial Pandemic Coordination Boards were established within the scope of this plan. Fast, effective and frequently updated decisions were implemented. The epidemic was kept under control by stopping mutual flights to countries with cases, intermittent curfews, transportation restrictions, closure of schools, filiation, social isolation, use of PPE, social media communication, and intensive work of healthcare workers. Softwares were developed for analysis and data reporting, case and contact tracing. Various mobile applications were developed providing a safe social life in social areas and enabling filiation teams to intervene in the necessary areas in the fastest way and to record data instantly in the system. Prior to normalization process, "COVID-19 Epidemic Management and Working Guide" was prepared including epidemic measures for social life, institutions, organizations, and businesses. Variants of concern, recommended by WHO to be monitored, led to an increase in the number of cases around the world. In our country, the number of laboratories and tests were expanded to monitor variant viruses. Vaccination activities continue in line with the National Vaccine Administration Strategy. In the fight against pandemic, it will be possible to maintain and increase our country's acquisitions so far, owing to the strong health infrastructure both in terms of manpower and institutions, free health care, success in the production of PPE and medical devices, and finally, rapid acceleration of the vaccination.

Key words: COVID-19, Turkey, pandemics, prevention, vaccines

1. Introduction

The COVID-19 pandemic, which caused 175.847.347 confirmed cases and 3.807.276 deaths worldwide as of June 15, 2021, has become the most significant health problem of the 21st century¹. First reported in Wuhan, China on December 31 2019, the virus spread slowly to Europe and the rest of the world, causing devastating consequences. The World Health Organization (WHO) announced the new type of corona virus epidemic that emerged in China on January 30, 2020 as an "international public health emergency" and stated that this new virus poses a high risk for countries especially with health systems that are considered vulnerable, and a pandemic was declared in March 11, 2020² (Figure). It has been understood that the virus can affect all age groups and genders, spreads rapidly, causes serious complications and death; especially people

over the age of 65 and those with comorbidities such as hypertension, diabetes, chronic obstructive pulmonary diseases (COPD), malignancy, and immunodeficiency are included in the risk group [1,2]. Healthcare workers are in the riskiest group due to increased exposure to the agent. Also, people in communal living areas such as schools, military quarters, refugee camps, nursing homes and prisons are also in the group that can be most affected by the outbreak [3]. Every individual in the society has been affected by the COVID-19 outbreak, and the disease has had negative effects not only medically but also psychologically, socially, and economically. As the disease spread all over the world, it seriously affected the ordinary course in many fields such as education, health, economy, and international relations. Governments follow different ways and methods in the fight against the epidemic

¹ World Health Organization (2021). WHO Coronavirus (COVID-19) Dashboard [online]. Website <https://covid19.who.int/> [accessed 15 June 2021]

² World Health Organization (2021). WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. Website <https://covid19.who.int/> [accessed 15 June 2021]

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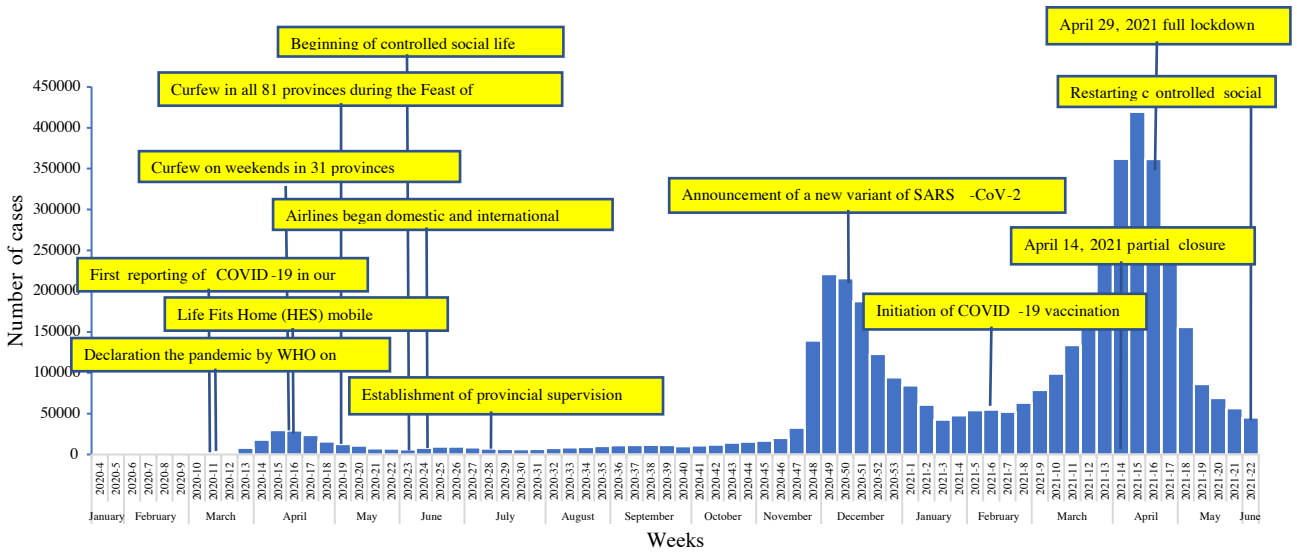


Figure. Weekly distribution of number of cases, Turkey, March 2020–June 2021.

depending on their capacities, social structures, economic levels, and political systems [4].

2. Implemented measures and policy responses to COVID-19

The National Influenza Pandemic Preparedness Plan was prepared by the Ministry of Health (MoH) for the influenza pandemic and put into effect with the Presidential Circular No. 2019/5 published in the Official Gazette on April 13, 2019 far before the COVID pandemic. In this circular, Pandemic Provincial Preparedness and Activity Plans were defined, and the plans were requested to be prepared accordingly. After emergence of the COVID-19 disease and declaration of the pandemic, because the underlying virus that causes the disease is a respiratory virus, this plan was also used for control studies of the COVID-19 pandemic.

Since the moment COVID-19 cases first appeared in China, Republic of Turkey Ministry of Health began closely to monitor the developments related to the disease, and has constituted an Operations Center and Scientific Committee, which is of critical importance in fight against the COVID-19, to prevent possible risks before WHO declared an “international public health emergency”. The Scientific Committee, consisting of scientists from different specialties and representatives of the MoH, who are competent in their fields, have national and international experience, held its first meeting on January 22, 2020, “COVID-19 Risk Assessment” was made and “COVID-19 Guideline and Case Report Form” was prepared. The “2019-nCoV Disease Guideline”, prepared in line with the studies of the Scientific Committee, was published on the official website of the MoH on January 24,

2020. The guideline included general information about the virus and disease, case definition and management, contact tracing, infection control and isolation, patient care and treatment, and information about precautions to be taken by those who travel to countries with cases, which are intended for health care workers. The guideline has been updated many times and finally been divided into separate guidelines for specific purposes depending on the updates of WHO, new information and developments obtained at national and international level. In addition, published and visual materials, videos, answers to “Frequently Asked Questions” were prepared on many different topics related to the disease and shared on the same website for healthcare professionals and the public. Up-to-date guidelines on this subject, both visual and written materials, can be accessed on <https://covid19.saglik.gov.tr/> website. Healthcare workers were trained on topics such as general information about the disease, use of personal protective equipment, sampling, treatment, triage, patient and contact tracing, and presentations on these topics were prepared and shared on the website of the MoH.

In line with the Pandemic Influenza Preparedness Plan, the National Pandemic Coordination Board, Provincial Pandemic Boards, and, with a 24/7 working principle, the MoH Operations Center, and provincial operation centers were established.

Deputy ministers of the relevant ministries, Turkish Kızılay (Red Crescent), Disaster and Emergency Management Presidency, representatives of the Council of Higher Education and representatives from relevant units of the MoH attend the meetings of the National Pandemic Coordination Board, which is chaired by the

Deputy Minister of Health. By virtue of these boards, it was ensured that different ministries work in coordination both at the central and provincial level, and coordination in response to the outbreak was carried out at the highest level. Fast, effective, and frequently updated decisions were implemented during the fight against the COVID-19 pandemic in our country. In the early period, initial studies were started by monitoring the disease in the countries where it was seen, and in this duration, early precautions were taken and entry of the disease into our country was delayed. In this context; scanning passengers from all nationalities with thermal cameras on flights arriving from China and Far East Asian Countries has started, and later this application has covered all international flights. In order to prevent the entry and spread of the virus in our country, mutual flights and passenger entries to our country with countries where the disease is common have been stopped at all border gates.

The course of the outbreak started rapidly with the identification of the first positive case in Turkey on March 11, 2020, and its effect still continues as it does all over the world (Figure). A series of measures have been implemented in order to stop the spread of disease in the community, to reduce human movements and related contamination (Figure). In this context, a curfew was imposed on those over the age of 65 and those with chronic diseases on March 21, 2020, and those under the age of 20 on April 3, 2020, and the restriction was limited to certain hours in the oncoming periods. In thirty-one cities, where the majority of cases were seen, restrictions have been imposed on city entrances and exits. In these provinces, curfews have been implemented on weekends since April 11, 2020, except for designated sectors. Later, the curfew was implemented in all 81 provinces including the time of the Feast of Ramadan (Figure). Afterwards, the days and hours within the scope of the curfew has been updated in different ways according to the increment and decrements in the number of cases and still continued to be applied. Education and training in primary, secondary and high schools were suspended. The education and training continued remotely with the online platforms created. General assemblies of non-governmental organizations (associations, foundations) and all kinds of meetings and activities of non-governmental organizations that bring people together, including trainings, have been postponed. Public officials in the health-risk group were deemed to be on administrative leave. Congregational prayers, including Friday prayers, have been suspended in mosques. All kinds of scientific, cultural, artistic and similar meetings or activities to be held indoors and outdoors at the national and international level have been postponed. Seasides, promenade and historical ruins, picnic areas, sports, hiking, fishing, etc. activities have been prohibited on weekends.

Restrictions have been introduced for restaurants to only offer takeaway service. The activities of barber shops, beauty salons/centers, hairdressers, etc. have also been suspended. Sports activities have been decided to be held without an audience. Since penitentiary institutions, which are among the communal living areas, are risky in terms of COVID-19 transmission, special restrictions have been made in these areas in order to prevent the transmission of the disease. The staff working in areas where risky groups live together, such as penitentiary institutions, elderly caring homes, and nursing homes, started to work in 14-day shifts, and a PCR test was applied before each shift to prevent case increments in these areas. In April 2020, 25 thousand people in 59 countries, mostly Turkish citizens, were evacuated, accommodated in university dormitories with a total capacity of 26 thousand people in 62 provinces for 14 days, and then leaved for their homes. In addition, people who returned to our country after pilgrimage and umrah were likewise hosted in dormitories, and the entry of the disease into our country was delayed.

In the fight against COVID-19 disease, healthcare workers need to be protected with appropriate equipment during patient follow-up and filiation studies. Preparations for personal protective equipment (PPE) were promptly made and distributed. PPE, such as gloves, masks, aprons, and glasses/face protectors, are produced in our country and free access was provided for public. In order to be prepared for the pandemic within the scope of the pandemic influenza plan, the MoH already had a stock of PPE, and scarcity, which was seen in many countries at the beginning of the pandemic, was not seen in our country. In addition, PPE has been sent to some countries that were in need. Also, within the scope of humanitarian aid and solidarity, donations or necessary permits were given for their transportation to 159 countries and 12 international organizations in terms of PPE, diagnostic kits, drugs, ventilators and similar materials.

Filiation teams have been established in the provinces under the organization of the Provincial Health Directorates. The teams generally consist of 2–3 people including a physician, dentist, nurse, midwife, health officer, administrative personnel, etc. The number of teams differed according to the need in the course of the pandemic and reached up to 23,096 teams during peak periods. These teams were provided with both personnel and vehicle support from time to time by different ministries and institutions (Directorate General of Student Loans and Dormitories, Municipalities, Presidency of Religious Affairs, HAVAŞ, Faculties of Medicine, Ministry of National Education, Ministry of Internal Affairs, etc.). Filiation activities include seeking the source of the agent and its contacts, and taking protection and control measures, which include treatment and isolation. It is

very important to do a filiation study in the presence of an infectious disease. The goal is to detect the causative agent and the source at an early stage and prevent the spread of the disease [5].

Contact tracing constitutes a significant part of the operations carried out in the field. Isolation measures and clinical follow-ups of the contacts identified by the filiation teams were carried out at home. The follow-up process at home is carried out by family physicians and Provincial Health Directorates in the form of follow-up calls. Individuals identified as a contact are reported to their registered family physician, and their status is questioned by phone calls on a daily basis by family physicians and Provincial Health Directorates alternately for 14 days. Individuals who do not show any symptoms at the end of 14 days are dropped from follow-up and their isolation is ended [6]. In case of a symptom emergence in the contacts, they are visited by the filiation teams and respiratory tract samples are taken at their homes. Follow-up and treatment of people with COVID-19 are carried out at home or in the hospital depending on the clinical condition of the patient. Necessary drugs to the patients to be treated at home have been provided by the filiation teams free of charge. Similarly, the patients who are at home are followed up alternately by family physicians and Provincial Health directorates during their isolation period, and home visits are made when necessary. If a problem is detected during this visit, a referral to the hospital is provided.

In the COVID-19 Pandemic, the MoH has developed the Public Health Management System “Case Tracking Module” in order to keep track of all cases, contact tracing, hospitalization and follow-up processes, and all the studies have been carried out on contacts, on a person-based basis. In this context, the people who have entered the country from abroad, people who are considered to be in contact with positive cases at home or in designated areas during the isolation period, and patients who apply to the hospital and are registered as possible cases are followed-up and monitored through this module.

Screens for the tracking of COVID-19 were created on the “Statistics and Causal Analysis in Health” (SINA), digital platform that analyzes the data transmitted from health service providers to the MoH and allows it to be reported in full detail. Access to this platform was granted to both Ministry and provincial administrators. This platform enables us to conduct detailed analysis on different data such as the rate of progression of the outbreak, filiation monitoring, hospital capacity and treatment processes.

There were no disruptions in any health services during the pandemic. Between March 1, 2020 and March 1, 2021, a total of 48 healthcare facilities, including 3 PPP Hospital Campuses, 25 new hospital buildings and 11 additional buildings started healthcare services. According

to the data for the same period of the previous year, the number of health facilities providing services is increased by 55%. During the pandemic period, adult intensive care bed capacity of public hospitals was increased by 51%. A total number of 6395 increase was achieved in the number of intensive care beds, which consists of 6120 beds for adults, 107 beds for children and 168 beds for newborns. As a result of new hospitals, additional buildings and bed increase requests due to the pandemic, the total bed capacity has been increased by 8.2% (11,792) as of March 1, 2020, reaching 155,545 beds. By purchasing 5673 ventilators, the total capacity was increased by 42%; the number of nasal high flow oxygen devices was increased from 216 to 1847, and the total capacity was increased by approximately 700%. Domestic production of ventilators was carried out with public-private partnership under the leadership of the MoH, and their use was ensured in our country and support was provided to countries in need. The laboratory capacity to run the SARS-CoV-2 RNA PCR test has been expanded to all 81 provinces. While the number of laboratories where PCR could be performed before the pandemic was 73, it has been increased to 482 as of June 2021. [7]

Making the most of the opportunities offered by informatics and technology during the struggle against the pandemic, the MoH launched “Hayat Eve Sığar-Life Fits Home” (HES) mobile application which indicates the COVID-19 risk status of the person and the surrounding area (Figure). HES has been developed to provide a safe social life to citizens in all social areas such as workplaces, restaurants, transportation vehicles, taxis, public events such as weddings, and institution visits. In September 2020, it has become a requirement to query the HES code in urban public transportation and accommodation facilities. Later, the scope of the application was expanded and the query was required during entering to shopping malls, public institutions and before traveling by any public transportation. At the same time, the Filiation and Isolation Tracking System (FITAS) application was put into practice for the use of filiation teams reaching the cases and their contacts. The aim of the application was to help track the cases and the people they come in contact with, to monitor their health status regularly, and to support social isolation. The mobile application enabled the filiation teams to be guided from the center to intervene in the required areas in the fastest way, and the data was recorded in the system instantaneously.

In addition, the Mental Health Support System (RUHSAD), a mobile application, has been implemented in order to reduce the mental and social burden and to protect and support mental health of the healthcare personnel, who are an important workforce in the pandemic. More than 3 thousand healthcare workers and

their relatives received service during the pandemic [7].

As part of the fight against COVID-19, on March 30, 2020, psychosocial support lines to provide psychosocial support services were activated in all 81 provinces. In this context, 2283 MoH personnel, consisting of adult and child-adolescent psychiatrists, psychologists, social workers and child development specialists, provided service.

The Social Sciences Board, consisting of academic members in the fields of sociology, psychology, communication, public health, psychiatry, history of medicine, and sociology of religion, has been established for the purpose of researching the psychological and sociological effects of restrictions on society and providing support to public health studies.

In mid-May 2020, with the daily decrease in the number of cases, it was announced that the pandemic was under control and the restrictions began to be gradually eased and ceased to be in effect. The normalization course plan to cover the months of May, June and July was announced by the Presidency and regulations were made in this direction. "COVID-19 Outbreak Management and Working Guide" concerning the outbreak measures for social life, institutions, organizations, and businesses was prepared and shared with relevant parties (Figure). As of June 1, 2020, many businesses whose activities have been stopped were allowed to start their activities at specified hours and on the condition of complying with the measures in the guides. Airline companies have started domestic and international flights on the condition of complying with the measures taken against the pandemic (Figure). The entrance and exits to our country by land, air and seaway has been rearranged with the published circular. Symptom inquiry has been started for people entering the country. Fee paid test centers were established for international departures and expanded to international airports. As of July 2020, businesses such as cinemas, theaters, performance centers and wedding halls have started to serve in accordance with the determined rules.

It was decided to establish Neighborhood Supervision Teams within the constitution of the Provincial/District Outbreak Control Centers, which are under the coordination of governors/district governors, in order to determine whether the cases and contacts subject to home isolation comply with the isolation, hygiene, mask and distance rules, as well as the measures determined for all business lines and living spaces during the normalization period (Figure). Simultaneous inspections were carried out many times in this period on different dates determined. The goal was to maintain a controlled life by reducing the risk of contamination in all areas with these inspections.

As a result of SARS-CoV-2 being an RNA virus and constantly changing, due to evolution and adaptation

processes of these viruses, mutations have been observed in the virus since the beginning of the pandemic. In this context, the WHO recommends that countries follow the virus under two separate headings as VOI (Variant of interest) and VOC (Variant of Concern). For this reason, analyzes are carried out to detect changes in the structure of the virus throughout the pandemic duration in our country. The variants that WHO recommends to be followed as variants of concern have caused a proven increase in the number of cases in the world due to their high infectiveness. Firstly, the situation was closely monitored after the announcement of the UK Variant (B.1.1.7) by the UK (Figure). In addition to UK Variant (B.1.1.7), following the WHO reporting of B.1.351 South African variant from South Africa and P.1 Brazilian variant as variant of concern (VOC); additional measures were needed to prevent the entry of variants into our country [8]. In this context, restrictions have been imposed on flights from the UK, South Africa, Denmark and Brazil. During the passport control of the passengers at the border gates, people who had been in the specified countries in the last 10 days were identified and isolated in places determined by the governorates. In addition, in the same period, people who wanted to enter our country were asked for the result of a negative SARS-CoV-2 PCR test performed within the last 72 hours, and those who could not show the test result were isolated at the addresses they declared to stay, and those who did not have a place to stay were isolated in places determined by the governorates. The isolation of these people was ended after a negative PCR test, and the treatment of the positive ones was continued in line with the COVID-19 guidelines of the MoH. Similar quarantine practices are carried out for people coming from India and surrounding countries to prevent the entry of the Indian variant (B.1.617.2) to our country, which has recently attracted the attention of the whole world.

In our country, laboratory tests for variant virus have been expanded to 180 laboratories in all 81 provinces as of December 2020, and routine testing has begun with multiplex Real Time PCR-based kits that can analyze SARS-CoV-2 and the UK variant. For the monitoring of South African, Brazilian and Indian variants, which are on the WHO's list of variants to be monitored, a multiplex Real Time PCR kit, which detects SARS-CoV-2 mutations, is routinely used for all samples in 10 Regional Public Health Laboratories and also in 6 stations in Istanbul.

The vaccination process for protection from SARS-CoV-2 and control of the outbreak started with healthcare professionals' vaccination on January 14, 2021, and the groups to be vaccinated against COVID-19 were determined and the schedule of vaccination of these groups was announced (Figure).

“AŞİLA” application has been developed by the MoH to be used during vaccination. This application ensures the execution of the entire process from vaccine logistics to the vaccination of the person. The application, which has a mobile infrastructure, provides ease of use by connecting to the other digital components of the National Health System, especially the Vaccine Tracking System and the public health management system. This application, which makes the vaccination process very fast and easy for the authorized physician by informing about the vaccine stock status, the person to be vaccinated, and appointment schedule. Vaccine units formed in private and public hospitals, especially in primary healthcare facilities, are also used for vaccine administration. Thus, our citizens are provided with widespread vaccination services and are given the right to choose a health facility. Since it is known that citizens with allergies or special conditions feel safer in hospitals, this widespread vaccination practice is thought to be beneficial for reducing vaccine hesitancy.

In the implementation strategy of the Ministry of Health COVID-19 Vaccine Informatory Platform, general priorities have been determined by evaluating the risks of exposure to disease, severity and transmission of the disease, and the negative impact of the disease on the process of social life, and it has been reported that vaccination practices will be carried out in four stages according to these priorities. In the first stage, healthcare workers, people over the age of 65 years, and adults living in collective and crowded places such as the elderly, the disabled and those staying in protection homes were vaccinated. In the second stage, people who work in critical jobs, in sectors necessary for the functioning of society, and in high-risk environments, and people aged 50 and over with at least one chronic disease were vaccinated. The third stage includes people under the age of 50 with at least one chronic disease, young adults, and those working in sectors and occupations not included in the first two groups. In the fourth and final stage, vaccination is planned for all individuals other than the first three groups³.

At the beginning, the access was granted for Coronovac (Sinovac), and then Comirnaty (BioNTech) vaccines, with the conclusion of agreements, so, people had the opportunity to have one of the two vaccines in line with their preferences. In addition, domestic vaccine development studies continue rapidly in our country. There are several domestic vaccine studies in progress with one study in phase III. The plan is to increase vaccine

options of our country with the possible introduction of the domestic vaccines in the near future. For vaccination, people can make an appointment via the Central Physician Appointment System (MHRS), e-Pulse account or 182 hotline.

As of June 15, 2021, the total dose of vaccine administered in our country is 35.210.555, the number of people that received the 1st dose is 21.324.544, and the number of people received the 2nd dose is 13.886.011⁴.

Although there was a serious decline in the course of the epidemic as of March 2021, the desired levels could not be reached in some of our provinces. For this reason, it was decided to manage the outbreak on a provincial basis according to the criteria determined by the Scientific Committee. The provinces are divided into low, medium, high and very high-risk groups (Figure). The measures to be taken and the rules to be followed are determined according to these risk groups and monitored with the weekly number of cases per 100 thousand population⁵.

It has been determined that some of the new mutated variants of the SARS-CoV-2 virus transmit more rapidly and follow a more severe clinical course and are associated with the need for hospitalization and increased death rates. In line with this new information, it was necessary to take new measures in order to manage the risk posed by the outbreak in terms of public health and public order, to prevent the spread of variant viruses, and not to create an extra burden on the health system due to variants. By virtue of the decisions taken at the Presidential Cabinet meeting on April 13, 2021, partial closure measures were implemented as of April 14, 2021, and full lockdown measures were implemented as of April 29, 2021 (Figure).

As a result of the increase in social isolation with the measures taken during the partial and full lockdown period and the compliance of the individuals in the society, there has been a serious decrease in the number of daily cases. In this direction, considering the recommendations of the Scientific Committee and the developments in the course of the outbreak, a gradual normalization period has been started as of June 1, 2021. In order to ensure permanent normalization, it is extremely important to comply with the rules and measures that are to be followed for all areas of life, as well as the basic principles of the struggle against the outbreak, the rules of hygiene, mask and distance, and to carry out vaccination activities quickly in the gradual normalization process.

³ Ministry of Health COVID-19 Vaccine Informatory Platform [online].Website:<https://covid19asi.saglik.gov.tr/TR-77706/covid-19-asisi-ulusal-uygulama-stratejisi.html> [accessed 15 June 2021]

⁴ Ministry of Health COVID-19 Vaccine Informatory Platform [online].Website <https://covid19asi.saglik.gov.tr/> [accessed 15 June 2021]

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3. Conclusion

Each country has started to take its own measures immediately with the declaration of the COVID-19 disease as a worldwide pandemic. Turkey started to take precautions in the early period with the help of Pandemic Influenza National Preparedness Plan before the first case was seen, and, before the WHO's declaration of the pandemic, the Operations Center and the Scientific Committee were established.

Our main strategy in the fight against the pandemic has been to prevent the intense demand for healthcare services by reducing the incidence of cases with public health measures. After the detection of first case, many period-specific critical decisions were taken in terms of pandemic control and many implementations were put into action. The correct use of published, visual and social media in order to inform the society about the course of the pandemic and preventive measures has enabled

the implementation of the precautions. The success in the production of PPE and medical devices has ensured that there is no scarcity in the distribution and use of these kinds of equipment. In addition, since the health infrastructure of our country is strong in terms of both manpower and institutionally, there was no problem in the provision of healthcare services, and everyone could easily access. Also, everyone benefited from all health services provided concerning the pandemic free of charge.

The development and widespread use of the vaccine, which is one of the most important strategies in prevention, is an ideal intervention to control the pandemic. In our country, the aim is to reach the desired result in the epidemic rapidly, thanks to the vaccination practice that has gained momentum especially recently. This will ensure that our country's acquisitions so far in the struggle against the pandemic are maintained and increased.

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