



Research Article

**ANALYZING PANDEMIC POLICIES WITH THE PROCESS MODEL: COVID-19
EXPERIENCES AND ROADMAP FOR THE FUTURE**

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Abstract: As clearly demonstrated by the global outbreak of COVID-19, pandemics require rapid, well-coordinated, and adaptive responses, often necessitating the comprehensive reevaluation of existing policies and the swift introduction of new, evidence-based strategies across different sectors. Among all sectors, healthcare systems were especially strained, requiring immediate adjustments in terms of infrastructure capacity, workforce allocation, technological integration, and crisis management protocols to maintain service delivery and minimize disruption. In light of these complex and dynamic realities, this study seeks to explore the comprehensive effects of pandemic-related policies, with a particular emphasis on the lessons learned and potential frameworks for managing future health emergencies more effectively. Central to the analysis is the application of the “policy process model,” which serves as a theoretical framework to examine the different stages of policy development and execution. The study analyzes each step of this model namely, problem identification, policy formulation, policy adoption, implementation, and evaluation by applying them to the context of the COVID-19 response and its multidimensional impacts. Through this structured and analytical approach, the research aims to offer valuable insights for public health officials, policymakers, and institutional leaders. Health policy analysis is a crucial method that offers important insights into the future. This study describes the process encompassing the policies and practices that emerged from Turkey's perspective in combating the COVID-19 pandemic. In this context, it can be stated that Turkey's policy process for the COVID-19 pandemic was managed significantly more successfully due to its previous preparations, and that there are also lessons to be learned for the development of international collaborations in pharmaceuticals, vaccines, and other areas.

Keywords: Policy Analysis, Process Model, COVID-19, Health Policy

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1. Introduction

COVID-19, the cause of the SARS-CoV-2 virus, is a development that has been revealed; it can be particularly severe in at-risk groups. Wearing a mask, following social distancing guidelines, maintaining hygiene, and getting vaccinated are important to prevent infection [1]. The COVID-19 pandemic is an event that has profoundly affected health, the economy, and social life on a global scale. This outbreak has required governments to develop and implement emergency policies, fundamentally changed the daily lives of societies, and increased uncertainty about the future [2]. Therefore, this study aims to understand the policies Turkey has followed during the pandemic and to establish a strategic roadmap to respond more effectively to similar crises in the future.

During the COVID-19 pandemic, policy-making processes had to be shaped and implemented much more quickly than usual. Issues such as health policy, emergency interventions, quarantine measures, and vaccination strategies forced policymakers to make quick and effective decisions [3]. At this point, in addition to policy-making, the process of implementing the policies and evaluating their results should be addressed within the framework of a process model. This analytical model will serve as a roadmap that sheds light on past experiences and guides future policy-making processes, creating learning opportunities for policymakers, identifying effective policy strategies, and enabling a more prepared approach to similar crises in the future. The comprehensive assessment, which includes recommendations for future pandemics, is included in the roadmap for the future.

If we are to define the basic concepts that will help us understand the content of the study, we must first start with the concept of policy. Policy is generally defined as a relatively consistent plan of action created by a specific actor or group of actors when dealing with a particular issue [4]. Policies are government statements, and these statements generally include issues such as law, regulation, decisions, and similar matters regarding what should or should not be done [5]. Another concept, health policy, is defined by the World Health Organization as guidelines and strategies established by governments or health organizations with the aim of improving the health of individuals and communities [6]. Health policy analysis is a multidisciplinary approach that aims to explain the interaction between institutions, interests, and ideas in the public policy process. Understanding past policy successes and failures is valuable both retrospectively and prospectively in planning future policy implementations [7].

There are various methods used in health policy analysis [8]. The first method is the policy triangle. Walt and Gilson, the creators of the model, argued that using this model would enable policymakers and researchers to better understand health policy and plan for more effective implementation. This model provides a comprehensive approach by incorporating the concepts of context, process, and actors [9]. The second method is Kingdon's three-stream agenda-setting model. According to Kingdon, the agenda-setting stage of the policy process emerges as a result of the alignment and convergence of three independent, continuous streams (problem streams, policy streams, and politics streams) within an open policy window. These streams become policy windows at specific times and intersect. The three streams progress independently at the same time. At the point where they converge, the issue gains the potential to be seriously considered by policymakers. The convergence of these streams cannot be preplanned [10,11]. Another method is the six-step policy implementation method. First, defining the target audience and the problem is critical. Next, the step of identifying the policy or solution to be promoted is taken. In the third step, the context of the policy must be explained in detail. Fourth, conducting a stakeholder analysis helps to understand all stakeholders affected by the policy. The fifth step involves designing various political strategies. Finally, in the sixth step, political strategies are used to assess the political feasibility of policies. These steps help to effectively carry out applied political analysis [12].

Finally, the methodology of this study is determined by Sabatier's five-stage process model, which is widely used. The process model is a framework consisting of five basic steps that divide the policy-making process into stages, each with a specific function. The key points of each stage of the process model are as follows: definition of the policy problem, policy formulation, policy acceptance, policy implementation, and evaluation. The process model helps to understand and analyze the complexity of policy-making [13]. Each stage highlights a specific aspect of the policy-making process and makes the policy-making process more manageable and understandable.

The aim of this study is to analyze Turkey's COVID-19 pandemic policies within the framework of Sabatier's five-stage process model, in order to evaluate their effectiveness, identify strengths and weaknesses, and derive lessons for the future. The study also aims to contribute to the development of

evidence-based strategies that will enhance preparedness and resilience in the face of future health crises. This study addresses the following research questions:

- 1- How were pandemic-related policies in Turkey shaped within the framework of Sabatier's process model?
- 2- To what extent were these policies effective in controlling the spread of COVID-19, reducing mortality rates, and increasing vaccination coverage?
- 3- What strengths and weaknesses can be identified in Turkey's pandemic response when compared to other countries?
- 4- How can the roadmap developed as a result of this study guide policymakers in the more effective management of future pandemics?

2. Material and Methods

2.1. Data collection and analysis

This study employed a document analysis based on Sabatier's process model. Data were obtained from official institution reports, national and international publications, scientific articles, and documents related to COVID-19. A holistic assessment was conducted by comparing information obtained from different sources. The process model forms the methodological basis of the study by providing a fundamental theoretical framework for examining pandemic policies. The study uses Sabatier's process model to conduct a retrospective analysis of pandemic policies and evaluate existing information. This methodological approach was chosen to ensure the study's integrity and reliability. Sabatier's five-stage process model strengthens the analysis of pandemic policies by increasing the integrity of the research and the accuracy of the data.

2.2. Process analysis

The process model, which includes the stages of identification, formulation, acceptance, implementation, and evaluation pandemic policies, is applied within the framework of Sabatier's five-stage process model. Sabatier's five-stage process model provides a detailed framework for understanding, analyzing, and evaluating health policy development processes, thereby examining health policy processes in detail [13].

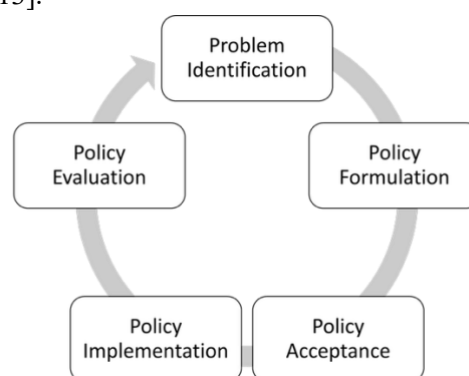


Figure 1. Sabatier's five-stage process model

The identification phase forms the starting point for pandemic policies, and in this phase, the problems encountered and their effects are defined in detail. Then, the formulation phase begins, in which solution proposals are developed for the identified problems, various alternative solutions are evaluated, and discussions are held on which policies may be effective.

During the policy acceptance phase, the policies that have been developed are formally adopted and the adoption process begins. Policymakers strive to ensure that their policies are consistent with the

existing legal framework and obtain approval from relevant stakeholders. In the context of pandemic policies, legal regulations are enacted and policies are formally announced during this phase.

The implementation phase is the stage at which accepted policies are put into practice in the real world. During this phase, resources are allocated, inter-agency cooperation is established, and the process is closely monitored. Finally, the successes or failures of the implemented policies are evaluated. In the evaluation phase, policymakers analyze whether the policies have achieved their objectives and delivered the expected results. In the context of pandemic policies, this phase assesses whether the outbreak is under control and how the health situation in the community has changed.

In conclusion, Sabatier's five-step process model offers the potential to systematize the management of pandemic policies and provide effective guidance to policymakers. This model contributes to the effective development and implementation of pandemic policies by providing an important framework for understanding and managing policy processes step by step.

3. Findings

3.1. COVID-19 Pandemic

COVID-19 is a disease triggered by a coronavirus called SARS-CoV-2. The World Health Organization (WHO) first learned of this new virus on December 31, 2019, through reports of viral pneumonia cases in Wuhan, China. The most common symptoms of COVID-19 include fever, chills, and sore throat. Less common symptoms include muscle aches, severe fatigue, runny or stuffy nose, headache, sore eyes, dizziness, new and persistent cough, chest pain, shortness of breath, hoarseness, heavy arms/legs, numbness/tingling, nausea, vomiting, abdominal pain or diarrhea, loss of appetite, loss or change in sense of taste or smell, and difficulty sleeping. Symptoms of severe COVID-19 requiring urgent medical attention include difficulty breathing or inability to speak in complete sentences, especially while at rest, confusion, drowsiness, or loss of consciousness, persistent chest pain or pressure, cold or clammy skin, or a pale or bluish skin color, and loss of speech or movement [1].

Table 1. COVID-19 Pandemic in Numbers (May 11, 2025).

Country	Number of Cases	Number of Deaths	Number of Vaccinations
World	772,138,818	7,095,903	5,645,247,500
Turkey	17,004,713	101,419	57,941,052
China	99,381,761	122,398	1,318,026,800
United States of America	103,436,829	1,223,553	270,227,170
India	45,044,786	533,665	1,027,438,900
France	39,038,973	168,162	54,677,680
Germany	38,437,864	174,979	64,876,300
Brazil	37,725,166	702,820	189,643,420
Republic of Korea	34,571,873	35,934	44,764,956
Japan	33,803,572	74,694	104,740,060
Italy	26,968,605	198,523	50,936,720
United Kingdom	25,045,765	232,112	53,806,964
Russian Federation	24,901,467	404,290	89,081,600

Source: [16,17].

The first case of COVID-19 in Turkey was detected on March 11, 2020 [14]. Due to previous pandemics, Turkey has been conducting the necessary studies since 2004. These studies have been helpful in determining what needs to be done in the current COVID-19 pandemic [15]. Since December 31, 2019, there have been a total of 772,138,818 confirmed cases and 7,095,903 deaths. A total of 13,724,514,000 vaccines have been administered. The number of people who have received at least one

dose of the vaccine is 5,645,247,500. The details of the situation in Turkey are as follows: 17,004,713 confirmed cases and 101,419 deaths have been reported. A total of 152,543,340 vaccines have been administered, and the number of people who have received at least one dose of the vaccine is 57,941,052 [16,17]. Table 1 shows the total number of confirmed cases, deaths, and people who have received at least one dose of the vaccine, based on data obtained from the World Health Organization and Our World In Data websites as of May 11, 2025.

3.2. Identification Pandemic Policies

In the first stage of process analysis, the identified problem usually attracts the attention of the government and other public actors. At this stage, public actors assess the seriousness of the problem and seek an effective solution [18]. This search for a solution usually focuses on problems that arise in critical areas such as health, economy, or security.

Public actors analyze the situation in collaboration with scientists, experts, and other stakeholders, depending on the nature of the problem. Factors such as the scope of the problem, its potential effects, and the risk of spread are evaluated. At this stage, especially in cases such as health crises, the government develops solution strategies that include measures such as controlling the outbreak, strengthening health infrastructure, and informing the public. This stage, in which the problem is identified, represents the beginning of a solution process led by the government. Public actors strive to develop effective policies and strategies based on scientific data, expert opinions, and the needs of the community. In this process, important elements such as transparency, communication, and public participation play a critical role in developing robust and sustainable solutions.

At the end of 2019, cases of pneumonia with unknown cause were reported in Wuhan, Hubei Province, China. In early January 2020, a novel coronavirus, not previously identified in humans, was discovered. Initially called 2019-nCoV, this virus was later named COVID-19 and rapidly spread from China to countries around the world within a few months [19]. The World Health Organization (WHO) announced COVID-19 as a global pandemic on March 11, 2020, the same day the first case was confirmed in Turkey [14].

Turkey's efforts prior to the COVID-19 pandemic have also been helpful in its fight against the virus. The National Pandemic Influenza Preparedness Plan [20], developed by the Ministry of Health's General Directorate of Public Health in 2019, provides a detailed assessment of the activities to be carried out, the levels of prevalence, and the forms of intervention in the event of such an outbreak. This plan includes an intervention scenario shaped by information obtained from previous similar outbreak experiences. The document stands out as a risk management guide that includes preparedness and risk reduction processes [21].

There are a number of stakeholders involved in the formulation of policies established in the context of combating COVID-19, primarily the Presidency. Among these actors, the Scientific Advisory Board plays a prominent role in other stages of the process model. Established on January 10, 2020, this Scientific Advisory Board occupies an important position in the process of dealing with the COVID-19 pandemic in Turkey [22]. The fact that this step was taken before the first case emerged in Turkey is seen as a reflection of the fact that the measures taken were pre-planned and based on scientific evidence. The Scientific Advisory Board made a significant contribution to the process by publishing the 2019 n-Cov Disease Guide on January 14, 2020 [23].

Given the evolution of COVID-19 and changing conditions, it is important for the Scientific Advisory Board to provide policy recommendations based on continuously updated information and international developments. This helps the government, the healthcare system, and other stakeholders optimize the measures taken. The Scientific Advisory Board assesses the course of the pandemic, shapes the measures to be taken, and develops strategies for various scenarios with a focus on public health.

Similar identification processes were observed in other countries. Germany recorded its first COVID-19 case on January 27, 2020, and swiftly implemented border closures, school and business shutdowns, mask mandates, and social distancing measures. A phased reopening began in April, but restrictions were reintroduced through the “emergency brake” mechanism when cases exceeded the threshold of 50 per 100,000. Rising infections led to a partial lockdown in November 2020 and a full lockdown in December. By mid-2021, around 37% of the population was fully vaccinated and 55% had received at least one dose, allowing restrictions to be eased. South Korea reported its first cases in January 2020 and quickly adopted a comprehensive strategy of mass testing, aggressive contact tracing, and rapid isolation, which helped keep businesses open and reduced infections, although new waves emerged toward the end of the year [29]. In addition to national efforts, the World Health Organization (WHO) played a central role in coordinating the global response. WHO provided countries with early technical guidance, including case definitions, laboratory testing protocols, infection prevention and control measures, and risk communication strategies. It also facilitated the distribution of diagnostic kits and personal protective equipment, while emphasizing the importance of transparent reporting and international collaboration to slow the spread of the virus [61].

3.3. Formulation of Pandemic Policies

Policy formulation involves creating a bunch of alternative policies and figuring out different ways to deal with the problem. Subsequently, a process begins in which each approach is shaped by specific policy instruments. The design of legislative and regulatory measures for each alternative, careful calculation of the impact each will have on which segment and how, and advance prediction of when these impacts will occur are the fundamental elements of this process [24]. However, policy formulation is not always a direct result of a law, executive order, or administrative rule. Policymakers may refuse to take a positive stance on a particular issue or may disagree on what kind of action plan to follow [1]. In other words, policy formulation involves developing proposed action plans for solving a specific problem. Policy options are continuously reviewed as part of the policy process, defended, and regularly evaluated according to valid standards for policy acceptance. Important policy actors analyze the formulation stage of the policy process in detail because they seek information and opinions that will help them achieve their goals [25].

The formulation of pandemic policies is a complex and multi-layered process. This process necessitates an approach in which various actors collaborate and a broad perspective is taken into account. When classifying pandemic policy actors at the national and international levels, governments emerge as the primary national actors and key determinants in shaping pandemic policies. Other national actors include ministries, scientific advisory boards and health experts, local governments, non-governmental organizations, economic stakeholders, the media, and the general public. Among these, the influence of scientific advisory boards on the decision-making process is particularly noteworthy [26].

Key international organizations involved in pandemic response include WHO, IMF, the World Bank, GAVI, CEPI, the Red Cross and Red Crescent movement, human rights groups, and global development agencies. These bodies offer technical and financial assistance to manage pandemics. For example, CEPI and GAVI partnered with WHO to launch the COVAX initiative aimed at developing and fairly distributing COVID-19 vaccines. The IMF also provided financial tools to support countries in maintaining economic stability during the pandemic [27-29].

Within the framework of the National Pandemic Influenza Preparedness Plan, which was created to ensure effective response to pandemic situations, a series of coordination and responsibilities have been determined, primarily by the Ministry of Health's General Directorate of Public Health. The formulation process includes public information, and the National Pandemic Influenza Preparedness

Plan details how units such as the Presidency Communication Center and the Ministry of Health Communication Center will be utilized. Additionally, the posters and public service announcements to be used in this information dissemination process have been pre-determined and prepared [20].

3.4. Acceptance of Pandemic Policies

Turkey's preparations and various measures taken in advance to combat the pandemic have led to its epidemic control policy being characterized as a “precautionary policy” [21]. After the first COVID-19 case was detected in Turkey on March 11, 2020, the measures and recommendations set by the Ministry of Health are listed below.

According to a press release issued by the Presidency of Religious Affairs on March 15, 2020, it was decided that pilgrims returning from Umrah would undergo a detailed health check by doctors and health personnel appointed by the Ministry of Health and would be informed that they should not leave their homes for 14 days and should not receive guests. It was also stated that those suspected of being infected would be referred to the hospital for necessary tests [30]. Initially, it was decided to implement a 14-day home isolation period, but subsequently, all returning citizens were placed under quarantine for 14 days in student dormitories in Ankara and Konya, further strengthening the measures [21].

According to the circular published on March 17, 2020, the activities of public rest and entertainment venues have been temporarily suspended. These venues include theaters, cinemas, concert halls, wedding halls, cafes, casinos, coffee houses, and many other places. Additionally, general assemblies of civil society organizations and meetings that bring people together in large groups have been postponed, and the activities of condolence houses have been suspended [31].

According to the letter from the General Directorate of Health Services dated March 19, 2020, the inspection plans established for the purpose of conducting and finalizing compliance inspections with health regulations have been postponed for the first six-month period of routine inspections of the Ministry of Health, universities, private, and other public health service providers during the COVID-19 pandemic, as deemed appropriate by the Ministry within the scope of measures taken to combat the pandemic [32].

According to the letter dated March 20, 2020, patients must be accepted and treated in Ministry of Health, state and foundation university, and private health institutions until their COVID-19 diagnosis is confirmed. Hospitals with third-level adult intensive care beds were designated as pandemic hospitals, and if needed, second-level intensive care units will also be organized to serve as pandemic hospitals [31].

On March 21, 2020, the Interior Ministry announced the temporary closure of barbers, hairdressers, and beauty salons starting at 6 p.m [34]. On March 21, 2020, those over 65 and with chronic conditions were restricted from going outside and using public transport [35]. In the context of COVID-19 measures, restaurants and cafes only offered takeout service, and seating areas were removed [36].

On March 23, 2020, Health Minister Fahrettin Koca stated in an informational message that the number of people infected with the virus was increasing and used the phrase “Life Fits in the Home” [37]. Subsequently, “Hayat Eve Sığar” was turned into an application, and personalized “Hayat Eve Sığar” (HES) codes were created to indicate whether an individual was in a risk group [38].

According to the circular dated March 24, 2020, it is stated that the working hours of markets in all provinces will be between 09:00 and 21:00, and the number of customers inside the market will be regulated to be one-tenth of the area. Markets will announce the maximum number of customers and will not allow new customers to enter while this number of customers is present. It has been announced that public transportation vehicles operating within cities and between cities will accept passengers at 50% of the passenger capacity specified in their licenses, and that the seating arrangement of passengers inside the vehicles will be organized in a way that prevents contact between them [39].

On March 26, 2023, the ministry sent an additional circular to the governors of 81 provinces as part of COVID-19 measures. These circular states that meetings of metropolitan municipalities, provincial municipalities, district municipalities, town municipalities, and local administrative unions scheduled for April, May, and June will be postponed, and that in cases of necessity, extraordinary meetings may be held provided that the necessary health precautions are taken [40].

The circular dated March 27, 2020 states that all markets selling non-essential items such as clothing, bags, decorative items, and toys in social markets and similar places will be temporarily suspended [41]. In an additional circular issued on the same date, the ministry prohibited activities such as picnicking, fishing, sports, and walking in coastal, recreational, and picnic areas on weekends, effective March 28-29, 2020, on the grounds that such gatherings could weaken basic measures to combat the virus and pose a risk. It is noted that these measures may be extended to weekdays depending on the situation in provinces and districts [42].

The circular dated March 29, 2020 states that citizens traveling by air must obtain a Travel Permit Certificate; those who need medical treatment, whose relatives have passed away, or who have a serious illness can obtain this certificate. It is added that those involved in the production and supply processes of basic human needs can also obtain travel permission with this certificate. It has been announced that a system will be established to share travel permit certificates issued with the permission of the governorate with Turkish Airlines, and that requests for travel permit certificates will be accepted through the 199-call center and the Ministry's E-Application system [43]. Another circular published on the same day stated that restrictions would be imposed on the operation of commercial taxis in Istanbul, Ankara, and Izmir based on the last digit of their license plates. It was stated that taxis with odd-numbered license plates would be allowed to operate on the first day, while those with even-numbered license plates would be allowed to operate on the following day, starting from March 30, 2020 [44].

On March 30, 2020, as the pandemic began to negatively affect low-income citizens, Turkey launched a national solidarity campaign called “Biz Bize Yeteriz Türkiye” (We Are Enough for Ourselves, Turkey) with the aim of providing economic support to those in need by identifying them through social assistance and solidarity foundations. The campaign brought together government agencies, civil society organizations, ministers, members of parliament, and philanthropic business leaders, resulting in significant participation and support [45].

On November 25, 2020, Health Minister Fahrettin Koca announced that 10 million doses of vaccine would be procured under an agreement with Sinovac. During the COVID-19 pandemic, Sinovac, Pfizer-BioNTech, and Sputnik V vaccines were used, with the first vaccination taking place on January 13, 2021. In June 2021, a decision was made to administer a third dose of the vaccine to those over 50 years of age and healthcare workers. In August 2021, the right to a fourth dose of the vaccine was granted for international travel, and in November 2021, a third dose of the vaccine began to be administered six months after the second dose for those who had received two doses of Pfizer-BioNTech. In December 2021, the waiting period for the third dose of the vaccine against the Omicron variant was reduced to three months [46].

On March 1, 2021, provinces were classified by risk level, and curfew rules were adjusted accordingly. Restrictions varied based on risk category, workplaces, events, and age groups. Normalization steps were linked to vaccination progress, and administrative penalties were announced for violations [47].

3.5. Implementation of Pandemic Policies

The implementation phase of pandemic policies involves ensuring that individuals, groups, or the public/private sector comply with the requirements of the policies [15]. The policies followed in Turkey's fight against the COVID-19 pandemic have been meticulously implemented and the process

has been carefully managed. When the first signs of the outbreak appeared, the measures and recommendations that had been determined were announced to the public to raise awareness. During this process, measures such as the designation of pandemic hospitals and the postponement of health legislation compliance audits were taken with the aim of making the health system sustainable.

The Turkish Ministry of Family, Labor, and Social Services has provided guidance on maintaining business continuity by creating a chart of measures that must be implemented in workplaces within the framework of the COVID-19 Pandemic Management and Action Plan. The recommendations outlined in the guide include: workplaces should develop action plans to prevent and mitigate COVID-19, and these plans should include measures to protect health, safety, and security during the processes of reopening, closing, and making changes to workplaces. The reopening process should be planned in advance, and potential health and safety risks should be carefully assessed and controlled. Additionally, activity plans and measures should be regularly monitored and updated in response to changes in local epidemiological trends, new COVID-19 cases, or situations of non-compliance. The relevant diagram is shown in Figure 1.

Measures taken to protect public health require active participation from the public. The adoption of basic rules by society—such as wearing masks in public spaces, adhering to social distancing guidelines, and complying with hygiene measures—plays a critical role in slowing the spread of the outbreak. In addition, following the vaccination schedule set by health authorities, participating in awareness campaigns, and complying with rules for public gatherings are also important. Adhering to government-imposed restrictions and recommendations requires individuals to act with a sense of responsibility. The public's compliance with these measures is effective in bringing the outbreak under control and safeguarding public health.



Figure 2. Pandemic Activity Plan Monitoring and Preparation Phase (Source [48]).

3.6. Evaluation of Pandemic Policies

The evaluation phase during the pandemic is a critical strategic step. This stage contributes to future decision-making by assessing the effectiveness of implemented policies and measures. The successes and failures of the policies carried out during the pandemic are taken into consideration. Factors such as the effectiveness of vaccination campaigns, the control of the disease's spread, and the high demand placed on the healthcare system are evaluated. This assessment will help determine more effective strategies for future outbreaks. In order to assess whether Turkey has been successful or unsuccessful in this regard, comparisons with other countries may be considered. Based on the data presented in the section titled "The COVID-19 Pandemic", case numbers, death rates, and vaccination rates (at least one dose) relative to the population have been compiled for various countries and are presented in Table 2.

Table 2. Case, Death, and Vaccination Rates as a Percentage of the Population (%).

Country	Case Rate	Death Rate	Vaccination Rate
World	9.49	0.08	67
Turkey	19.84	0.11	69
China	7.01	0.01	90
United States	29.76	0.34	82
India	3.06	0.03	74
France	58.37	0.25	84
Germany	45.74	0.20	78
Brazil	16.94	0.31	87
Republic of Korea	65.77	0.06	88
Japan	27.44	0.05	83
Italy	44.45	0.32	85
United Kingdom	35.69	0.33	79
Russia	17.02	0.27	61

Source: [17,49]

According to Table 2 data, the Republic of Korea ranks first with a case rate of 65.77%, France ranks second with 58.37%, and Germany ranks third with 45.74%. The country with the lowest case rate is India at 3.06%. According to mortality rate data, the top three countries are the United States at 0.34%, the United Kingdom at 0.33%, and Italy at 0.32%. The country with the lowest mortality rate is China at 0.01%. Turkey ranks fifth among the countries mentioned above. According to data on the percentage of the population that has received at least one dose of the vaccine, China ranks first with 90%, followed by the Republic of Korea with 88% and Brazil with 87%. Turkey ranks third among the countries mentioned above in terms of the lowest vaccination rate.

When the effectiveness of Turkey's pandemic policies is evaluated based on case rates, it can be said that the preparedness efforts for epidemics that began in 2004 were effective and that the policies implemented with quick decisions were appropriate. The effectiveness of Turkey's pandemic policies can be evaluated not only in terms of the adequacy of its health systems and infrastructure but also in terms of the combination of efforts to prevent COVID-19 and the active participation of the public. When we look at the data of other countries, Turkey's case rate remained limited to 19.84% despite reaching 65.77% in other countries, which shows that the measures taken were effective and based on a correct policy understanding.

When looking at mortality rate data in the context of pandemic policy evaluation, Turkey ranks 5th. This may be due to many factors. These factors include healthcare infrastructure, demographic characteristics, health literacy, culture, public awareness, and access to healthcare services. Therefore, the factors that fully explain mortality rates are complex, and it is important to remember that this situation can be linked to many variables. In order to fully understand Turkey's mortality rates, detailed information is needed on the health status, ages, and previous COVID-19 infections of those who have died. However, if we make a general assessment, Turkey's mortality rate of 0.11% compared to 0.34% indicates that the policies implemented have been effective.

In the evaluation of pandemic policies, Turkey's low rate of administering at least one vaccine dose relative to its population compared to other countries may reflect various challenges encountered during the vaccination process. This situation may be due to difficulties in obtaining vaccines, logistical obstacles, lack of public confidence in vaccines, lack of information, or restrictions on access to vaccines. The global increase in demand and supply shortages for vaccines have made it difficult for many countries to procure vaccines. In this context, Turkey needs to make more efforts and accelerate its vaccination campaigns. Turkey's position near the bottom of the list of countries with at least one vaccine dose administered has led to assumptions that factors such as vaccine hesitancy or lack of sufficient public information may have contributed to this outcome. This necessitates health authorities developing effective communication strategies to increase public confidence in vaccines and raise awareness. It will be important for Turkey to review its vaccination strategies and develop new approaches to accelerate the vaccination process and reach more segments of the population. Increasing vaccination rates is considered a critical step toward achieving herd immunity and bringing the pandemic under control.

4. Roadmap for the Future

Research conducted to date and reports by scientists point to increasing risks of epidemics in a globalizing world and predict that these diseases could affect all societies. The source, timing, and form of epidemics cannot be predicted in advance. However, the effects of these epidemics will vary depending on the policies implemented [50]. In order to create an effective roadmap against possible pandemics in the future, increase the resilience of global health systems, and ensure that societies are prepared, various strategies must be adopted.

One of the key steps in creating an effective roadmap for future pandemics is to increase investment in science and technology [51]. This includes supporting research and development in areas such as biomedicine, virology, and epidemiology. High technology and innovative solutions can play a critical role in the faster identification, treatment, and development of vaccines for infectious diseases. Additionally, advanced technological infrastructure enables a more effective approach to pandemic management through tools such as big data analysis and artificial intelligence [52]. One of the critical elements for effectively combating future pandemics is global cooperation and coordination. Adopting a fair and equitable approach to the production and distribution of vaccines, medicines, and medical supplies is necessary to ensure access for everyone worldwide [53].

In preparation for future pandemics, establishing early warning systems and developing rapid response processes are of great importance. These systems detect outbreaks in advance and enable swift implementation of necessary measures [54]. In this context, an international early warning and rapid response network should be established, and countries should integrate these systems within their own borders. This would enable the spread of epidemics to be controlled and prevent serious global impacts [55].

Strengthening public health infrastructure is necessary to create a more resilient health system against future pandemics. Increasing the capacity of health systems is a priority [56]. This includes

providing sufficient critical medical resources such as hospital beds, intensive care units, and ventilators, as well as training and employing health personnel. For example, during the COVID-19 pandemic, intensive care capacity was significantly increased in Germany. In 2020, the number of intensive care beds was increased by 12,000 to approximately 40,000, and 30,000 of these beds were equipped with ventilators. This increase was achieved by postponing planned and elective procedures [57]. Additionally, strong logistical planning and supply chain management are crucial for the effective distribution of medical supplies and minimizing logistical disruptions [58].

Increasing the economic resilience of societies is essential in order to be prepared for future pandemics. In this context, the OECD emphasizes the need to strengthen social safety nets and protect vulnerable groups, and that governments should develop targeted financial support mechanisms to enable rapid economic recovery from pandemics [59]. Effective social assistance programs for economically disadvantaged individuals and sectors enable the pandemic to be overcome more quickly. The World Bank states that expanding social assistance systems both protects household income and stimulates domestic demand in times of crisis [60]. Considering the potential for economic fluctuations to cross borders, global cooperation strategies should be developed. Bringing these strategies together will make societies more resilient to challenging periods such as pandemics and economic crises.

The use of digital health infrastructure, such as telemedicine and distance learning, has been better understood during the COVID-19 pandemic, as these digital health tools have played important roles in the pandemic process [61]. Telemedicine enables patients to communicate with healthcare professionals in a virtual environment through its capacity to provide remote healthcare services [62]. This helps control the increase in patients and reduce contact. Distance education, on the other hand, enables healthcare workers and individuals in the general public to access up-to-date information and training on the pandemic through online platforms [63].

Increasing vaccine production capacity is critical to preparing for future potential pandemics. Increasing vaccine production capacity ensures that effective vaccines can be developed and produced more quickly in response to new threats [64]. Increased investment in research and development can accelerate this process. The effective distribution of vaccines is also an important strategic element [27]. Rapid vaccination is essential to achieve herd immunity and ease the burden on the healthcare system. Equity-based strategies should prioritize high-risk groups and critical sector workers [65]. While increasing confidence in and access to vaccines is of vital importance, the rapid and widespread distribution of vaccines plays a decisive role in controlling outbreaks [66].

5. Conclusion

During the COVID-19 pandemic in Turkey, healthcare workers, ministries, civil society organizations, and the media played critical and coordinated roles in managing the crisis [67]. Türkiye has managed COVID-19 effectively and has regularly and reliably informed the national and international public through the decisions it has taken [68]. The main point to pay attention to is continuity and balance [69]. Nevertheless, policy analysis revealed that comprehensive and multifaceted strengthening of healthcare systems is crucial to combat future pandemics. Increasing vaccine production capacity and rapid distribution are crucial for achieving herd immunity. In addition, increased R&D investments will increase the effectiveness and speed of vaccine production. There should be equity-based policies that prioritize risk groups in terms of access to vaccines. Building public confidence in vaccines, effective advocacy, and awareness campaigns will increase the success of epidemic management. In this context, promoting global cooperation and coordination is emerging as a fundamental approach to mitigating the health, social, and economic impacts of pandemics. Vaccine strategies supported by interdisciplinary approaches and comprehensive policies will strengthen

society's resilience to future pandemics. The fundamental building blocks to consider in preparing for future pandemics are summarized in a holistic framework in the figure below.



Figure 3. Key Elements of a Roadmap for Future Pandemics

When drawing up a roadmap for the future, it is necessary to focus on strategies such as increasing investment in science and technology, strengthening global cooperation and coordination, developing early warning systems, strengthening health infrastructure, increasing economic resilience, promoting digital health applications, establishing strong logistics and supply chains, and increasing vaccine production capacity.

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This paper is exempt from the Institutional Ethics Committee review since it does not involve human subjects.

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