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Policy, Timing, and Impact: An Evidence-Informed Analysis of Iran's Response to the Pre-Vaccine Phase of the COVID-19 Pandemic

Hamid Bohloli [1], Zeinolabedin Abbasi Nowdeh[2], Hosein Gerivani[2], Amir Ali Bohloli[3]

[1] Faculty of Management, the University of Tehran (UT), Tehran, Iran
[2] School of Public Health, Tehran University of Medical Sciences (TUMS), Tehran, Iran
[3] Institute of Neuroscience, University of Edinburgh, Edinburgh, United Kingdom

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ABSTRACT

Introduction: This study comprehensively analyses the Iranian government's policy interventions in response to the COVID-19 pandemic during the pre-vaccine period, from the initial outbreak to the establishment of the Operational Centre for National Headquarters to Combat Corona (OCNHCC). This study emphasizes the pivotal role of policy timing and intensity. This demonstrates a discernable relationship between policy interventions and their consequences, as evidenced by the COVID-19 incidence (Outcome) and mortality rates (impact).

Methods: This study employs a mixed-methods approach, combining qualitative content analysis of media policy news and quantitative data on COVID-19 incidence and deaths to evaluate Iran's time management interventions during the pre-vaccine phase of the pandemic. Using a quasi-experimental design, the study assesses the effectiveness of national COVID-19 policies by comparing various intervention periods. The analysis includes an extensive review of 71,237 news reports and a detailed examination of 316 policy actions, (numerical N1 to N209 clickable in Appendix 3), culminating in a comprehensive assessment of policy impacts on public health outcomes and policy efficacy.

Results: The study highlights that Iran's response to COVID-19 was initially insufficient, leading to widespread transmission. However, implementing measures such as social distancing and localized restrictions resulted in notable reductions in infection rates. These gains were often reversed because of premature easing of restrictions or non-compliance. The study emphasizes the importance of evidence-informed approaches in understanding the outcome and impact of health policies.

Conclusion: This research plays a crucial role in augmenting the understanding of the possible correlation between policy interventions and their subsequent consequences, using COVID-19 incidence and mortality rates as key indicators. The deductions derived from this research can augment our comprehension of the robust and frail aspects of the policy reaction, thereby empowering us to develop the guidelines to ameliorate forthcoming strategies to tackle pandemics.

Keywords: COVID-19 Pandemic, Coronavirus, Policy, Outcome, Impact, Health Politics, Iranian government, Timing of Intervention

1. Introduction:

The emergence and rapid propagation of SARS-CoV-2, the causative agent of Coronavirus Disease identified in 2019 (COVID-19), profoundly unsettled global society. Despite advancements in medical insight and healthcare institutions, the emergence of COVID-19 revealed significant vulnerabilities in health security worldwide. In previous decades, considerable emphasis was placed on managing non-communicable diseases, thus resulting in a lack of preparedness for communicable ailments, particularly epidemics. Additionally, the critical dialogues and perspectives associated with Health Reform, underpinned by neoliberalist principles, have ostensibly devalued the centrality and prioritization of the Primary Health Care (PHC) approach within numerous geopolitical contexts [1-4].

The COVID-19 crisis unparalleled in its scale and severity in recent history, has presented unforeseen challenges to contemporary human society. It is worth noting that societies were largely unprepared to combat a pandemic of this magnitude, as there had been no comparable outbreak in the preceding century. The most proximate historical antecedent that can be inferred is the influenza epidemic of 1918, colloquially known as the Spanish Flu. However, our primary sources of knowledge about this event are confined to the tombstones of the casualties, serving as tacit testimonials of the devastating tragedy. Consequently, there is a lack of living memory regarding this pandemic.

Intriguingly, this public health crisis did not correspond directly to the indicators of societal advancement. Despite being affluent nations, the United Kingdom, Italy, and the United States suffered sustained damage, challenging the notion that socio-economic prosperity would act as a protective shield. Additionally, several developing nations, such as Iran, experienced profound adversities, leading to significant mortalities. The COVID-19 pandemic has been a global catastrophe of unprecedented proportions, with over 765 million confirmed cases and nearly seven million fatalities worldwide, according to data provided by the World Health Organization until the official cessation of the global emergency status on May 5, 2023 [5]. Concurrently, at least 186 nations implemented diverse a variety of restrictions to impede the virus's rapid transmission and avert an overburdening of healthcare infrastructures, with 82 countries contemplating strict lockdowns and quarantines [6].

The governmental strategies in response to the COVID-19 outbreak varied significantly in terms of the characteristics and intensity of policy interventions, the enforcement rate, and their subsequent efficacy in curbing the transmission of the SARS-CoV-2 virus [7]. The discourse surrounding the effectiveness of universal mask usage as a preventive measure against disease transmission has evolved over time, albeit with varied perspectives among the scientific community, thereby leading to disparate policies across nations. Certain countries mandated the obligatory use of face masks, even in international scenarios (e.g., France, Italy, Serbia, Spain, and Turkey). In contrast, others refrained from imposing such regulations in any setting (e.g., Belarus, Iceland, Norway, and Sweden) [8].

It is imperative to highlight that the body of evidence amassed concerning COVID-19 in this brief period is unparalleled concerning a single subject matter. This extensive accumulation of knowledge, characterized by uncertainty and rapidly evolving situations, compelled policymakers to seek expert scientific assistance for the collection, comprehension, and interpretation of information (8). Consequently, the era of the COVID-19 pandemic furnished an optimal opportunity for fostering an information exchange mechanism in decision-making processes and enhancing the emphasis on evidence-based policy formulation.

The response to the COVID-19 pandemic has been a global challenge, with various strategies impacting the incidence and fatality rates. In the context of Iran, while there is a scarcity of studies directly paralleling our analysis of policy impact on COVID-19 statistics, existing literature offers insights into broader pandemic management and response effectiveness. Notably, the significance of independent healthcare information networks is underscored, emphasizing the need for transparency and the separation of health policies from political and religious influences to garner public trust and cooperation [9].

Management challenges specific to Iran have been documented, particularly highlighting inadequate policymaking, planning, and the provision of protective equipment as pivotal struggles in the nation's pandemic response [10]. The literature collectively stresses the importance of timely responses to public health crises. Strategies for crisis management are suggested to be most effective when they embody multi-level governance, integrating supranational, national, regional, and urban policies to enhance health safety promptly [11]. The establishment of a crisis management team is advocated to manage pandemic-induced strenuous situations and to facilitate critical and timely decisions [12].

The translation of emerging research into policy and practice is pivotal, and it becomes even more critical in the context of emergent threats like COVID-19 [13]. The role of time is further explored by Ferrari (2020), who suggests monitoring time-dependent laboratory parameters to predict the progression and severity of the disease [14]. Similarly, Gil Loewenthal (2020) emphasizes the crucial timing of social distancing measures to mitigate mortality [15], a sentiment echoed by Wells et al. (2021) through their "real-time anticipatory response framework" [16].

Innovative approaches such as those proposed by Long et al. (2021) demonstrate the utility of deep learning techniques in identifying and predicting time-varying parameters of the disease [17]. The economic implications of policy response timing are examined in different contexts, with City Eldeep and Chahir Zaki (2022) focusing on Egypt's policy measures and their timing [18]. Furthermore, Haber et al. (2021) delve into the complexities of evaluating the impact of COVID-19 policies, addressing both timing and intervention intricacies [19]. Lastly, Elitzur et al. (2021) provide compelling evidence that the timing of policy implementation can dramatically influence the spread of COVID-19, where a delay of a week could nearly triple the infected population [20].

Given vaccination's crucial role in managing and mitigating COVID-19, the timeline of the SARS-CoV-2 pandemic can be dichotomized into pre-vaccine and post-vaccine phases In the critical pre-vaccine phase of the SARS-CoV-2 pandemic, effective crisis control interventions were paramount. These interventions, broadly categorized as 'GI (4T + LES) + NPIs', warrant further elaboration for clarity. 'GI' refers to Governance Interventions, representing the overarching strategies adopted by authorities. Within this, '4T' encompasses four key pillars: Time Management (timely response to the evolving situation), Diagnostic Testing (identifying cases), Contact Tracing and Isolation (controlling the spread), and Therapeutic Measures (treatment protocols). The 'LES' component stands for Logistic, Economic, and Security interventions, addressing the broader support systems necessary for implementing health strategies effectively. Additionally, 'NPIs' or Non-Pharmacological Interventions include measures like social distancing, mask-wearing, and public hygiene campaigns. These components, when synergized, form a comprehensive framework to combat the pandemic. The efficacy of these interventions is greatly influenced by their adaptation to the unique sociocultural contexts of individual countries, as discussed in our previous work (21). This approach underscores the multi-dimensional nature of pandemic management, beyond mere medical solutions."

2. The Wordwide Experiences in the Pre-Vaccine of COVID-19 Era

Examining the experiences of prosperous countries in controlling COVID-19 shows that the main factor contributing to their success was diligent attention to interventions, particularly prioritizing effective time management. Of course, the speed and quality of decision-making and their timely implementation play a crucial role in the effectiveness of interventions.

Time management interventions aim to reduce the Basic reproduction number (Ro) by preventing virus access to the host by reducing exposure to the virus, thereby decreasing virus transmission and allowing for health system rehabilitation and services delivery. Numerous studies have indicated that the effectiveness of these interventions is closely tied to their adaptation to the cultural background and social dynamics of communities. Due to their previous experiences with infectious disease epidemics, time management interventions were well accepted in China. For example, on January 7, 2020; when the Chinese authorities first learned of the new virus on January 7, 2020, they promptly implemented a range of measures. These included the quarantine of cities, homes, and infected areas, isolation and disinfection of public places and traffic restrictions A central committee to respond to this issue was also formed. They also put the mobilisation of all government and hospital facilities, an extension of the New Year holidays, traffic control and strengthening of health education on the agenda [21]. South Korea adopted stringent measures to combat the pandemic, including government-imposed quarantine and curfew laws in selected provinces and cities. Closing schools and universities, preventing gatherings, using electronic maps to identify infected people and informing them about their traffic, allocating additional funds and increasing the level of warnings were among the effective measures of this country [21-25].

Hong Kong epitomizes another exemplary instance of effective disease control in the context of the COVID-19 pandemic. Essential strategies implemented in this region included strict regulations and penalty imposition for quarantine non-compliance. The Hong Kong government undertook measures such as providing financial relief to citizens impacted by business closures, offering low-interest loans to large-scale enterprises, and ensuring equitable distribution. Enforcing the compulsory use of masks in enclosed environments was also mandated [25]. Japan, despite having a significant elderly demographic considered vulnerable to the virus, managed to maintain a relatively low COVID-19 mortality rate. Initiatives like regulation of operational hours for businesses and offices, granting subsidies to employees for home-based child care, and delegating authority to local governments by the central administration were deemed adequate. The closure of educational institutions and restrictions on public gatherings were instituted based on guidelines provided by the Japanese Ministry of Health. Augmenting diagnostic testing for COVID-19 was also prioritized [26].

In the absence of a viable vaccine, the lessons gleaned from the past two years emphasize the importance of managing the COVID-19 epidemic; conscientiously disrupting disease transmission chains, and curbing viral spread by minimizing contact and maximizing physical distancing between suspected cases and healthy individuals [27]. These measures formed the cornerstone of policy formulation. Nonetheless, while instrumental in preserving numerous lives, these restrictions induced significant social and economic repercussions. World Bank data suggests that the COVID-19 era witnessed the most severe global economic recession since World War II, culminating in widespread unemployment and impoverishment [28]. The global economy contracted by an estimated range of 1.62 to 5.45 percent during this period, with a notable decline of 28.67 percent in the contributions of large economies [29]. Consequently, the timeline and modality of easing restrictions emerged as a pivotal challenge for governments globally, necessitating a delicate equilibrium between health, societal, and economic considerations [28].

3. Study Purpose

This study is primarily aimed at exploring and scrutinising the interventions implemented by the Iranian government to address and manage the COVID-19 crisis in the pre-vaccine era, spanning nine months, with particular emphasis on time management strategies. Iran's Ministry of Health and Medical Education (MOH&ME) should be directly responsible for managing COVID-19 during these nine months. As such, the Ministry's leadership, including the Minister and his administrative team, should be directly accountable for all policies pertaining to the COVID-19 control process.

This study distinctively contributes to the body of knowledge on pandemic management by employing a quasi-experimental approach, a methodological innovation in the field of public health policy research. By scrutinizing the Iranian government's time management strategies during the pre-vaccine era of the COVID-19 pandemic, this research offers a unique perspective on the efficacy of non-pharmacological interventions in a

national crisis context. Our methodology, which juxtaposes various periods of governmental interventions, allows for a nuanced analysis of policy effectiveness. The integration of extensive data sources, ranging from national news agencies to ministry reports, further bolsters the robustness of our analysis. The study's findings are expected to be instrumental in shaping future health policies and emergency responses, providing invaluable insights for governments and health organizations worldwide.

Governmental interventions centred on time management and non-pharmacological behavioural approaches have been instrumental in managing the successive waves of the COVID-19 virus worldwide. This research endeavours to scrutinise these specific interventions in the context of the Iranian government's time management strategies for COVID-19 crisis management based on the policy impact process. To achieve this objective, a concerted effort was made to compile all policy interventions by the MOH&ME from the onset of the COVID-19 outbreak in Iran until the establishment of the multi-sectoral" Operational Centre for National Headquarters to Combat Corona (OCNHCC).[i]

This research was undertaken to elucidate the correlation between policy intervention and outcome (rate of new infections) and impact (COVID-19-related mortality) in Iran. The ultimate goal was to evaluate the ramifications of the national intervention policy in controlling COVID-19 within the country. The study focuses on the statistics pertaining to new cases of COVID-19 as a reflection of policy outcomes, followed by the calculation of COVID-19-related mortality as a manifestation of the impacts of these policy interventions.

The resultant data were transposed into a figureical format, enabling the measurement of the relationship between each policy and trends in infection rates and mortality. The findings were then presented to a panel of experts for further analysis. Preliminary data analysis suggests a direct correlation between the successful formulation of intervention policies, the accurate and actual implementation of these policies, and the resultant infection and mortality rates.

4. Research Methods

The present study is a descriptive, exploratory, and analytical investigation that employs a quasi-experimental approach to evaluate the government's time management interventions to curb the COVID-19 pandemic in Iran. The quasi-experimental approach, is a research strategy that, while not featuring the random assignment of true experiments, applies scientific rigor to explore cause-and-effect relationships in a practical context. This methodology is particularly suited to evaluate the government's time management interventions during the COVID-19 pandemic in Iran, as it allows us to infer the potential impacts of these policies without the feasibility of conducting randomized controlled trials. Extending this foundation, we incorporate a mixed-methods approach, combining qualitative content analysis of media policy news with quantitative data analysis of COVID-19 incidence and deaths. This combination effectively extends our quasi-experimental design, enabling a comprehensive assessment of policy impacts from both a qualitative and quantitative perspective. Our study emulates experimental design by comparing the outcomes of different periods with varying levels of government interventions, allowing us to infer the potential impacts of these policies on the course of the COVID-19 pandemic in Iran.

In this study, we ask: How effective were Iran's policy responses in the pre-vaccine phase of the COVID-19 pandemic regarding timing and impact? To answer this, we explore the specific policies Iran implemented during this critical period. Our approach combines quantitative data analysis with qualitative content analysis to understand these policies' influence on the pandemic's trajectory and outcomes in Iran. This comprehensive assessment aims to directly link our methods to the heart of these inquiries, laying the groundwork for the subsequent findings.

This study undertakes an examination of policy interventions, delineating a timeline that commences with the initial detection of SARS-CoV-2 in China in the latter part of December 2019 and concludes with the formation of the OCNHCC in the final quarter of October 2020 in Iran.

In this study, we first measured the incidence of COVID-19 (new infectious cases based on official reports with a positive PCR test as the policy outcome) in relation to policy interventions. This choice is because after a population has been exposed to SARS-CoV-2, disease incidence rates are the first available data for the detecting of outcome of policies made to control the COVID-19 pandemic.

In addressing the complexity of SARS-CoV-2 pathogenesis, our study contends with the intricate web of confounding variables influencing each stage of COVID-19 progression, from exposure to recovery or death. Notably, these variables are markedly divergent in nature and impact at different stages. For the exposure and incidence stage, confounding variables primarily encompass factors related to virus transmission dynamics and population-level exposure (e.g., social distancing policies, population density), which are comparatively more straightforward to quantify and model [30].
Conversely, hospitalization and mortality stages are influenced by a far more complex and individual-specific array of factors including, patients' health background [31], healthcare system capacity [32-34], treatment quality [35,36], and socio-economic variables [37-41], making the assessment of these stages more multifaceted. This complexity is further emphasized by identifying independent risk factors for hospitalization in a meta-analysis study in Colorado, including age ≥65 years, male gender, obesity, hypertension, chronic hypoxemic respiratory failure requiring oxygen, arrhythmia, metabolic syndrome, and opioid use [31]. This study referred more confounding medical comorbidities include cardiovascular diseases [42-44] hyperlipidemia [45-47], chronic respiratory disease [48-51], smoking [52] diabetes [45,46,53-59] , and race [60-62]. Acknowledging the challenges in accurately measuring mortality rates, such as variations in reporting standards and time lags between policy interventions and observable mortality effects, our study

underscores the relative clarity that incidence data provides in the early evaluation of policy effectiveness. Incidence rates offer more immediate and, in some contexts, less confounded feedback on the success of containment and mitigation strategies, as opposed to mortality rates which, though critical, may reflect the outcomes of interventions with inherent time delays. Therefore, while mortality trends are undoubtedly a crucial measure of the pandemic's impact, and we provided them, our focus on disease incidence as a policy outcome metric is predicated on its relative immediacy and fewer confounding variables, providing a more direct evaluation of policy interventions' effectiveness in real-time."

Initially, it was imperative to delineate the rationale and provenance underpinning our data analysis. Within the context of government policies, particularly those emanating from the Ministry of Health and Medical Education, we discerned that dissemination predominantly occurred through written publications via news agencies. Consequently, our examination of policies of COVID-19 in this framework relied primarily on sources derived from news agencies, with ISNA being the most comprehensive in its coverage. Conversely, official statistics of COVID-19 cases and fatalities were disseminated by the Ministry of Health via the Webda website, serving as our principal point of reference. Moreover, we found it requisite to scrutinize widely circulated newspapers, cataloged within Mag Iran, which featured a dedicated section encompassing autonomous political news and interviews with key policy stakeholders. The rational foundation of our research, therefore, was forged through the triangulation of these three primary sources. Data validated through the triangulation model entered the analysis process (Figure 1).

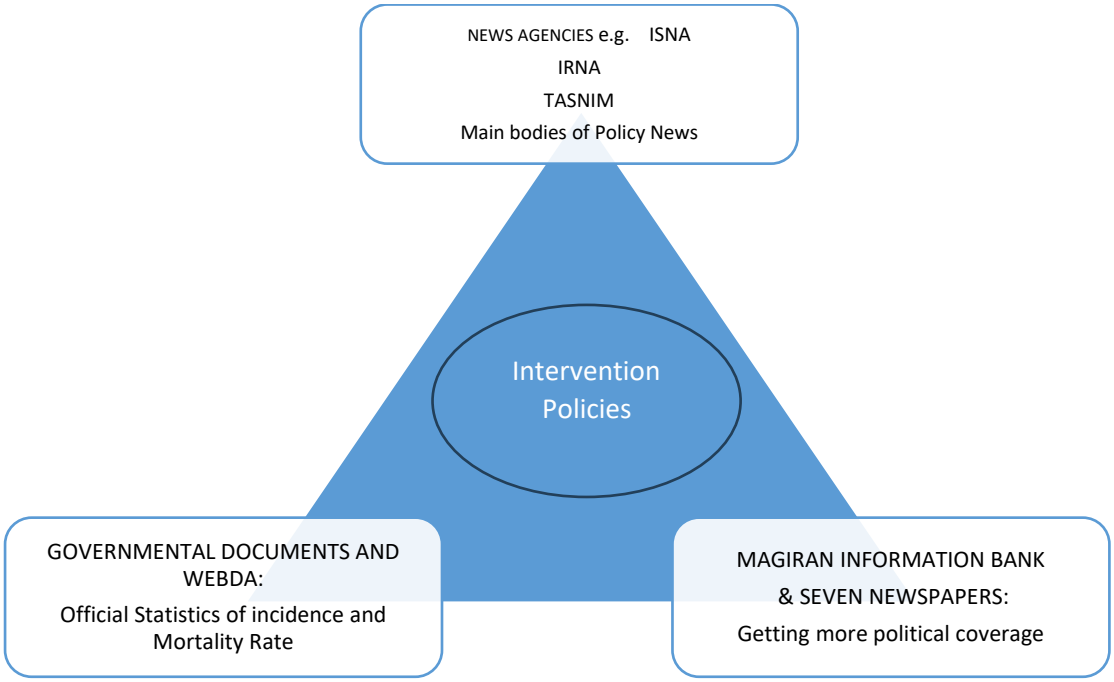


Figure 1: Triangulation of exploratory data enrichment.

To identify policy interventions, it was necessary first to review all publicly announced intervention policies published in the media and pass them through a filtration model to extract data related to the policy outcome and impact process. For this purpose, we extracted relevant news reports during the specified 9-month period from Iranian Student News Agency ISNA. ISNA is a news agency that covers all media fields and, according to the Alexa ranking, holds the highest rank among Iranian news agencies for its comprehensive coverage across all news sectors (Introduction of the most visited sites in the world and Iran / ISNA is ranked first in news coverage in the country 8/18/2021). We employed keywords such as pandemic, corona, and COVID in various forms of Persian script. The number of news reports related to the COVID-19 pandemic was 71,237, all of which were analysed based on a multi-stage filtering process. At this stage, the title and lead of the news were initially examined based on predetermined criteria. These criteria included:

1- The news should be related to Iran.
2- It should express an intervention, action, or policy related to corona management.
3- The intervention, action, or policy should be nationally significant.

After examining the headlines and leads of news articles, 1355 reports from ISNA were subjected to a full-text review again based on above mentioned criteria. Additionally, to enrich our dataset, we deliberately scrutinized 27 news articles containing operational policies in response to the COVID-19 disease, extracted from news websites such as IRNA[ii], ILNA[iii], IRIB[iv], Jamaran News[v], Eqtesadnagar[vi], Fars News[vii], Hamshahri Online[viii], Entekhab[ix], Khabar Online[x], Ebtekar News[xi], Khorasan News[xii], Aftab News[xiii], Shafaqna[xiv], Shabestan[xv], Pana,[xvi] and BBC Persian[xvii] to fill the Gap of ISNAIn the full-text analysis, thematic figures aligned with the research objectives were incorporated into the daily news collection form[xviii] by the research team. Subsequently, after a more detailed inspection, interventions proposed during a week[xix] were summarized in a few sentences

representing the intended intervention, action, or policy and were incorporated into the weekly information collection form[xx]. Recognizing the importance of paying attention to all interventions and their proper timing, we also randomly reviewed news featured in the country's two major government news agencies, Tasnim[xxi] and ILNA. Moreover, during this research process, to enrich the exploratory data and enhance the reliability of the research, we reevaluated the intervention titles using the MagIran[xxii] database which covers prominent national newspapers such as Etemad[xxiii], Iran[xxiv], Jam Jam[xxv], Donya-e-Eqtesad[xxvi], Resalat[xxvii], Sharq[xxviii], Farhikhtegan[xxix], and Kayhan[xxx]. The reason for the diversity in selecting newspapers was to ensure that news coverage considered Iran's various political tendencies. The culmination of our rigorous analysis yielded a total of 316 policy actions extracted from the full-text news articles. (Figure 2).

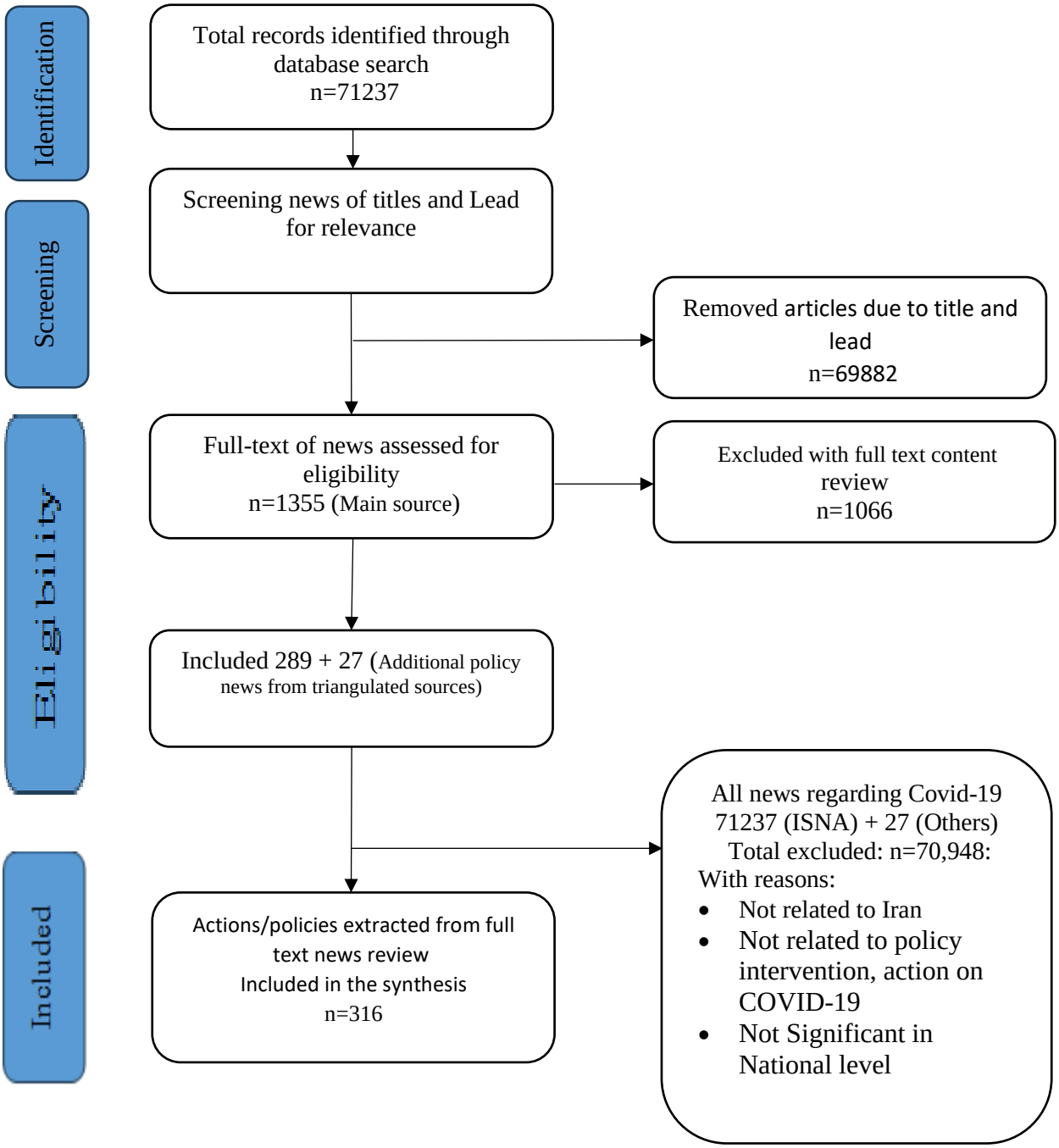


Figure 2: Multi-Stage Filteration and data classification process.

In the process of identifying and categorizing policy interventions, our study undertook a rigorous and comprehensive review of available policy intervention news and official statements for COVID-19 containment. The analysis process began with an exhaustive review of 71,237 news reports, meticulously selecting these reports based on criteria prioritizing direct relevance to Iran's COVID-19 management, clear description of specific interventions, actions, or policies, and national significance. This initial stage led to the identification of 1,355 key policy reports by excluding 70948 irrelevant policy news over two stages. To ensure comprehensiveness, our dataset was further supplemented with 27 additional news articles focusing

on practical policy implementations. All policy news generated or analyzed in this study, are drawn from 209 media links, serving as the primary news resources. These links, referenced throughout the article to support our findings and discussion, are meticulously linked in Appendix 3, forming a body of evidence-based policy analysis. Each link, from N1 to N209, is provided as a clickable resource in the supplementary files, ensuring easy access and transparency of the data underpinning our analysis.

Ultimately, the data entered in the weekly information form was used to draw intervention-statistical Figures. This study faced limitations in verifying the declared policy interventions because it was complex to ascertain whether an announced intervention had been implemented. Given that the outcomes of the interventions were not recorded in any governmental database, such execution-related information was not readily available. Additionally, it was essential to know whether the applied interventions were fully executed in all target areas. To mitigate this limitation, we reviewed relevant media reports concerning practical interventions concurrent with examining government policy news.

Given that political interventions are most often carried out collectively, estimating the individual effects of each policy's interventions using existing tools and methods is unattainable. Our study determines the cumulative result and impact of all these interventions during a specific period. The outcome of such policies can be gauged by reviewing the number of new confirmed disease case occurrences. The mortality statistics from COVID-19 indicate the final impact of intervention policies. We collected national daily statistics on COVID-19 occurrences and deaths from the Health Ministry's web portal[xxxi] and calculated the weekly averages. It was expected that as diagnostic capabilities increased, the data quality would improve over time, reducing the share of undetected cases. The use of a weekly average in this research is because National Headquarters to Combat Corona (NHCC)" meetings[xxxii] for the adoption and announcement of intervention policies against COVID-19 were conducted weekly.

5. Findings and Discussion:

In this section, we initially examine the utilization of time management interventions to tackle the spread of COVID-19 in Iran, divided into several sections and consecutive time intervals. Due to the substantial change in conditions or the type and method of implementing broad political interventions, these periods have been separated. Each period's implemented interventions are explained, and their outcomes and effects are discussed. Ultimately, the interventions and results related to each period are summarized in a corresponding Figure. A combined and final Figure of all periods is presented at the end of the paper. Based on conducted studies, the disease incubation period (i.e., when an individual is exposed to the virus but still shows no symptoms of COVID-19) is three to ten days. From the onset of symptoms to potential death, it is 2-4 weeks with an average of 2.5 weeks. Supporting this average, a range of studies have demonstrated survival times post-infection, with Loewenthal (2020) noting an expected time from infection to fatality of approximately 25.75 days, and additional research reporting median survival times from seven days up to 29 days in various contexts [15,63-71]. There is only one pre-print report from Rafsanjan, Iran, indicating that the median in-hospital survival time for COVID-19 patients was 17 days. [72] These studies collectively reinforce our use of a 2.5-week period from symptom onset to potential death, offering a broad perspective on the progression of COVID-19."We considered the average time to symptom onset to be one week given the average young population and the possible death duration from infection to death overall to be four weeks to cover the majority of potential deaths. Previous studies have demonstrated a direct relationship between an increase in the death rate with age [73]. Therefore, the incidence (outcome) and mortality rate (impact) of interventions for controlling COVID-19 will be observable one week and four weeks later, respectively [74]. For this reason, in the Figures presented in this article, to synchronize the timing of the incidence and death curves (to cover the disease incubation period), they have been shifted to the left of the Figure by one week and four weeks, respectively.

6. The COVID-19 Pandemic in Iran

The first confirmed case of COVID-19 in Iran was reported on February 19, 2020[xxxiii] [75]. Considering there were several weeks' gaps between the virus's arrival and its identification in all countries, it is likely that it had been circulating in some Iranian cities for a few weeks before its recognition [76]. We will elaborate further on this matter in subsequent figures.

The identification and official announcement of the first infection cases in Iran led to the closure of schools, universities, and kindergartens. Intra-city travel restrictions were imposed, and screenings were initiated at the entrances of targeted cities. Furthermore, public education and recommendations for home quarantine were emphasized [25].

Throughout the initial months of combating COVID-19, the Iranian government undertook various preventative and control measures to curb the spread of the disease and lessen the pressure on the healthcare system [76]. Despite these efforts, the trend of infection and mortality was ascending. Many studies emphasized that "if these interventions are accompanied by public awareness and adherence to hygiene principles, they can significantly impact reducing infection, hospitalization, and deaths from COVID-19" [77,78].

Another study suggested that "under these circumstances, the efficacy of government measures to combat the COVID-19 crisis requires constant examination and reinforcement more than ever" [27]. However, the evaluation of policy processes and the impact of a policy that could play a significant role in policy targeting and modification was never conducted in Iran. Thus, the current study could be considered the first in Iran.

6.1. FROM THE IDENTIFICATION OF THE NOVEL SARS-CoV-2 IN CHINA TO THE IDENTIFICATION OF THE FIRST CASES IN IRAN:

Following the announcement of identifying the novel SARS-CoV-2 in Hubei Province, China, in December 2019[xxxiv], various governments expressed concern over

the new virus. As the virus rapidly spread to multiple countries, public sensitivity also heightened. As depicted in Figure 4, measures to prevent the importation of SARS-CoV-2 into Iran were implemented from mid-January 2020[xxxv]. These measures included controlling entry points into the country, such as screening incoming passengers from China for symptoms of SARS-CoV-2 infection N4, N5. These screenings were conducted by untrained airport staff without appropriate facilities, leading to criticism from the MOH&ME due to the low quality and superficial nature of these actions N6. The head of the Center for Communicable Diseases Management at the MOH&ME, in an interview with ISNA on January 24, 2020, said: "Fortunately, we have not had any suspicious or positive cases of this mysterious virus in the country so far." He also confirmed the continuation of Iran-China flights. N5.

After identifying SARS-CoV-2 in Hubei Province, China, in December 2019, within a few weeks (by the end of January 2020)[xxxvi], Iran initiated interventions to prevent the transmission of COVID-19 into the country. As Figure 6 demonstrates, interventions began in late January 2020 with symptom control through temperature screenings of incoming passengers N7. Additionally, the Iranian government announced a prohibition on the entry of food items carried by passengers from China and other countries affected by SARS-CoV-2 in Southeast Asia on January 26, 2020[xxxvii]. During the last week of January 2020, the temperature measurement method was used to identify and control incoming passengers to Iran, aiming to identify and isolate symptomatic cases. Acceptance of passengers from China was conditional upon the possession of a health card. Other actions implemented by the Iranian government during this week (31st January 2020)[xxxviii] included suspending flights to and from China N7-N12.

During this week (the last week of January 2020), Iranian tourist cities such as Hamedan and Kermanshah hosted foreign tourists for a cultural event titled "Magnificent Iran" N13. During this time, passengers from China and Germany exhibiting suspicious symptoms of COVID-19 were admitted to Iranian hospitals, although the test results, as announced by the MOH&ME, N14-N16, were negative. On January 29, 2020, COVID-19 cases were reported in the UAE, and other unconfirmed cases were reported in Iraqi Kurdistan, Pakistan, and Saudi Arabia N17, N18. At this time, Iran's Minister of Health announced the impossibility of guaranteeing the prevention of the entry of the SARS-CoV-2 virus into the country, emphasizing the need for public education N19.

Simultaneously with the health minister's warning in the last week of January 2020[xxxix], rapid response teams were activated in Iran to combat the disease, and a particular COVID-19 patient care unit was set up in Kermanshah Province, bordering Iraqi Kurdistan (N20, N21). January 30, 2020[xl], was a significant day for controlling SARS-CoV-2 worldwide. On this day, the World Health Organization (WHO) declared the outbreak of the novel coronavirus a Public Health Emergency of International Concern (PHEIC) [79]. The WHO's emergency situation announcement was disseminated in Iranian media N22. At the end of the week, on January 31, 2020[xli], Iran announced the suspension of flights from China to Iran N23, although this was not effectively implemented[xlii].

Following the announcement of a global emergency and from the first week of February 2020[xliii], public education on the prevention of COVID-19 disease began through informational messages, mass media, and instruction in schools N25-N28. The 190-call system[xliv] was also activated for infectious disease counselling N29. It was announced that week that incoming passengers to Iran would be checked for disease symptoms, and incoming passengers from China would be quarantined N30-N34. Moreover, with the announcement of a list of hospitals accepting COVID-19 patients in capital hospitals and provincial centres, preparations were made for the reception of potential COVID-19 patients N35, N36. That week, despite advice that masks were not necessary for protection[xlv], the demand for them in the market increased, which led to a significant rise in the price of masks N37-N39.

Until the third week of February 2020, despite conflicting news regarding COVID-19 cases in some Iranian cities, Iranian authorities, relying on reports from the MOH&ME, continued to deny the presence of COVID-19 in Iran N41-N44. However, the official denial ended with the definitive deaths of two COVID-19 cases in the city of Qom, confirmed by positive COVID-19 tests on February 19, 2020[xlvi], and the outbreak of COVID-19 in Iran was officially announced on that date N40.

Until the official announcement of the death of two patients with COVID-19 in the city of Qom by the MOH&ME, controlling land, air, and sea borders, as well as disseminating information and providing nationwide education on COVID-19 prevention, were the main actions being taken in Iran since the discovery of SARS-CoV-2 in China. Before the announcement of the disease outbreak in Iran, life continued as usual, with no restrictions imposed on any activities or jobs. Based on Figure 3, official mortality data related to COVID-19 shows that the disease has been present in Iran since at least early February 2020[xlvii]. However, given that the average interval between exposure to SARS-CoV-2 and death is approximately four weeks [80,81], the exposure to the disease-causing agent in cases that resulted in death in early February 2020 in Iran would have occurred, on average, four weeks prior to death. Therefore, in our opinion, this virus has been present in Iran since at least early February 2020. Unofficial reports of suspicious deaths from universities in the country also confirm this N41-N44.

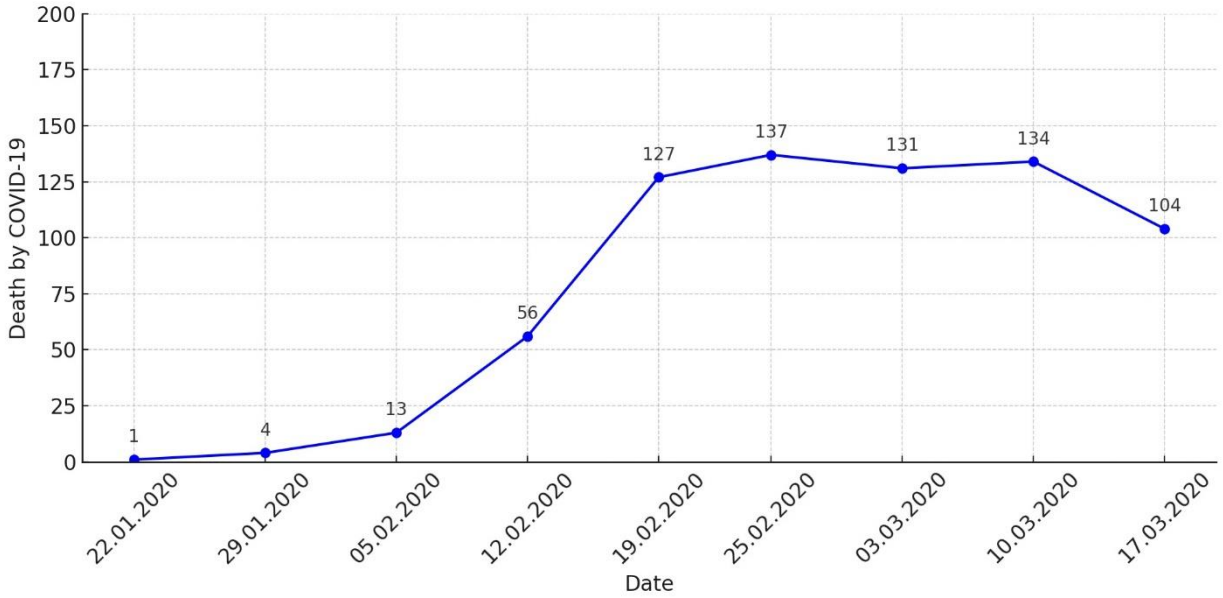


Figure 3: Mortality statistics from COVID-19 disease based on exposure time to SARS-COV-2 virus in January, February, and March 2020.

6.2. FROM THE DISCOVERY OF THE FIRST SARS-CoV-2 INFECTED CASES TO THE WIDESPREAD OUTBREAK OF COVID-19 IN THE COUNTRY:

The entry of COVID-19 into Iran was announced on February 19, 2020[xlviii], with the positive test results of two patients hospitalized in Qom, who passed away on the same day N40. The NHCC was established on February 20, 2020[xlix] following this event. The Minister of Health was appointed by the president N48 as the head of this Headquarters. Only two days later, on February 21, 2020[l], 13 more patients were confirmed in Qom, Tehran, Gilan, and Markazi provinces[li] N49, N50. However, the Islamic Consultative Assembly (Iranian Parliament)[lii] elections were simultaneously held in all cities and villages across the country N51.

Immediately after the announcement of the identification of two patients on February 19, 2020[liii], in Qom, and following the identification of cases in several cities, including Tehran, Rasht, and Arak N49, N50, interventions such as fever screening of incoming passengers[liv], closure of educational centres, and public gathering places were carried out on February 20 to 26, 2020[lv]. Also, the disinfection of public transport centres and vehicles began on February 20 to 26, 2020[lvi] N52-N60. However, the officials of Iran's Ministry of Health disagreed with the quarantine of the city of Qom, which led to criticisms from some media and parliamentary representatives. N61-N63[lvii]. Nevertheless, identifying other cases after 48 hours showed that this virus is spreading in different cities in Iran. Only 15 days later, on March 5, 2020[lviii] 3513 confirmed cases of COVID-19 were identified in all 31 provinces of the country. (Figure 4) N68. In the five provinces of Tehran, Qom, Gilan, Isfahan, and Markazi, the highest cases of COVID-19 infection were identified, and in the five provinces of Kohgiluyeh and Boyer-Ahmad, North Khorasan, Bushehr, Yazd, and Chaharmahal and Bakhtiari, less than ten infection cases were identified during this period (March 5, 2020) (See Figure 4).

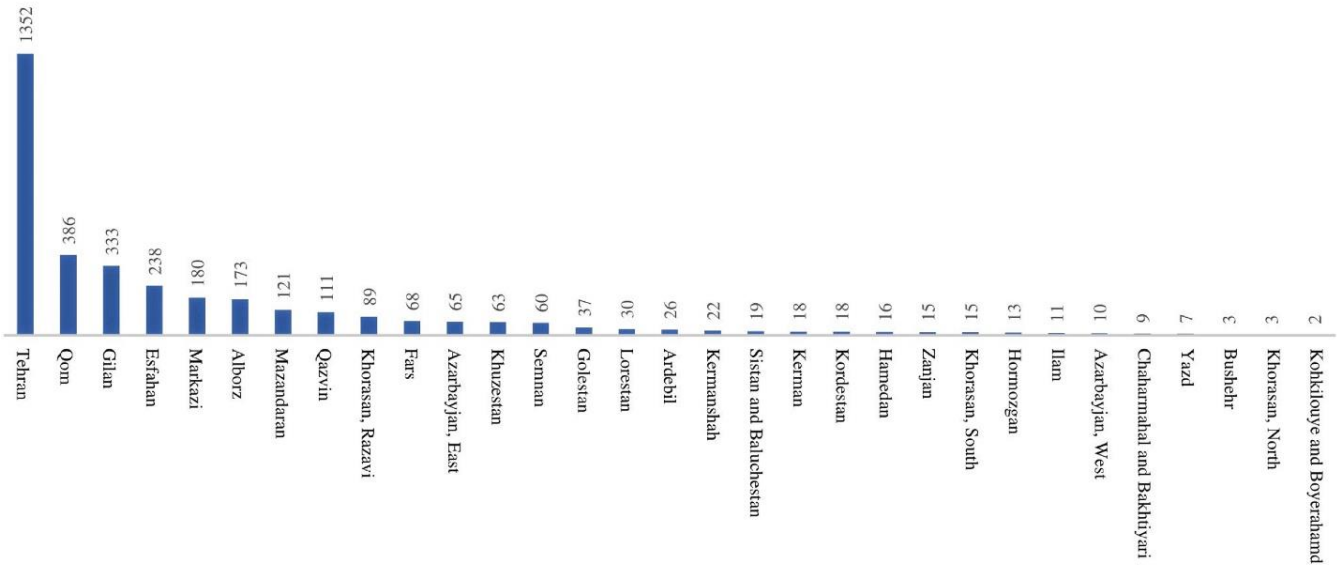


Figure 4: The number of infected cases broken down by province from the beginning of case identification until March 5, 2020 (N68).

6.3. FROM THE NATIONWIDE IDENTIFICATION OF SARS-COV-2 TO THE IMPLEMENTATION OF SOCIAL DISTANCING IN IRAN: 22.01.2020-21.04.2020

After the official confirmation of SARS-CoV-2 (COVID-19) cases, daily statistics of infected individuals and deaths related to this disease were reported. The data indicate that from mid-February 2020[lix] to the end of March 2020[lx], the number of COVID-19 infections had increased, reaching a weekly average of 2979 based on the daily infection index (Figure 6)[lxi]. Despite the continuous increase in infection cases, except for the first two weeks during which death cases rose from 56 to 138, the death rate followed a decreasing trend, reaching 88 deaths at the end of this period when the infection cases peaked.

During this period, time management interventions were gradually implemented to delay the further spread of the virus. The most significant of these included controlling the country's entry points, restricting or controlling the entry of travellers into some provinces[lxii], closure of educational centres, suspension of public spaces and gatherings such as mosques, libraries, cultural and recreational centres, conventions, cultural and religious programs, reception halls, and sports clubs. Furthermore, widespread disinfection of centres and public transportation, limiting the number of employees and reducing office hours, and imposing restrictions on most professions like restaurants and shopping arcades were implemented (Figure 6) N70-N87.

Despite these interventions and restrictions, patient statistics primarily increased due to the gradual improvement in the capacity and quality of disease detection and infection diagnosis, considering the number of laboratories and tests conducted, which increased weekly. This led to more reliable reporting of new cases N88-N90.

Screening and identifying patients through COVID-19 infection tests have been identified as some of the most effective methods of controlling the spread of the virus, and it is an active strategy for time management in preventing the disease. As more individuals get tested, and infected individuals are identified sooner, suppressing the spread of COVID-19 becomes more feasible. This is because it enables the control of contacts among infected individuals and isolates infected people, slowing down the infection transmission cycle [82].

The testing for SARS-CoV-2 in Iran commenced on February 19[lxiii], 2020 (N90)[lxiv]. At the onset of the pandemic, diagnostic equipment for COVID-19 in Iran was limited to the Tehran University of Medical Sciences and the Pasteur Institute[lxv] (Razia Malmir et al., 2020). The number of tests conducted in the initial days was less than a thousand. At that time, influenza tests were initially conducted for symptomatic patients, and if the initial test were negative, the SARS-CoV-2 test would be performed N90.

The limited availability of SARS-CoV-2 diagnostic kits and laboratories in Iran during the initial weeks of the SARS-CoV-2 outbreak resulted in longer response times for test results. Gradually, to expedite the identification of cases, more kits were imported into the country, and the operational laboratories were increased. This led to a remarkable rise in the number of daily SARS-CoV-2 tests N90 (Figure 5). Notably, the result of a lung CT scan was also utilized as an effective tool in diagnosing disease cases [84].

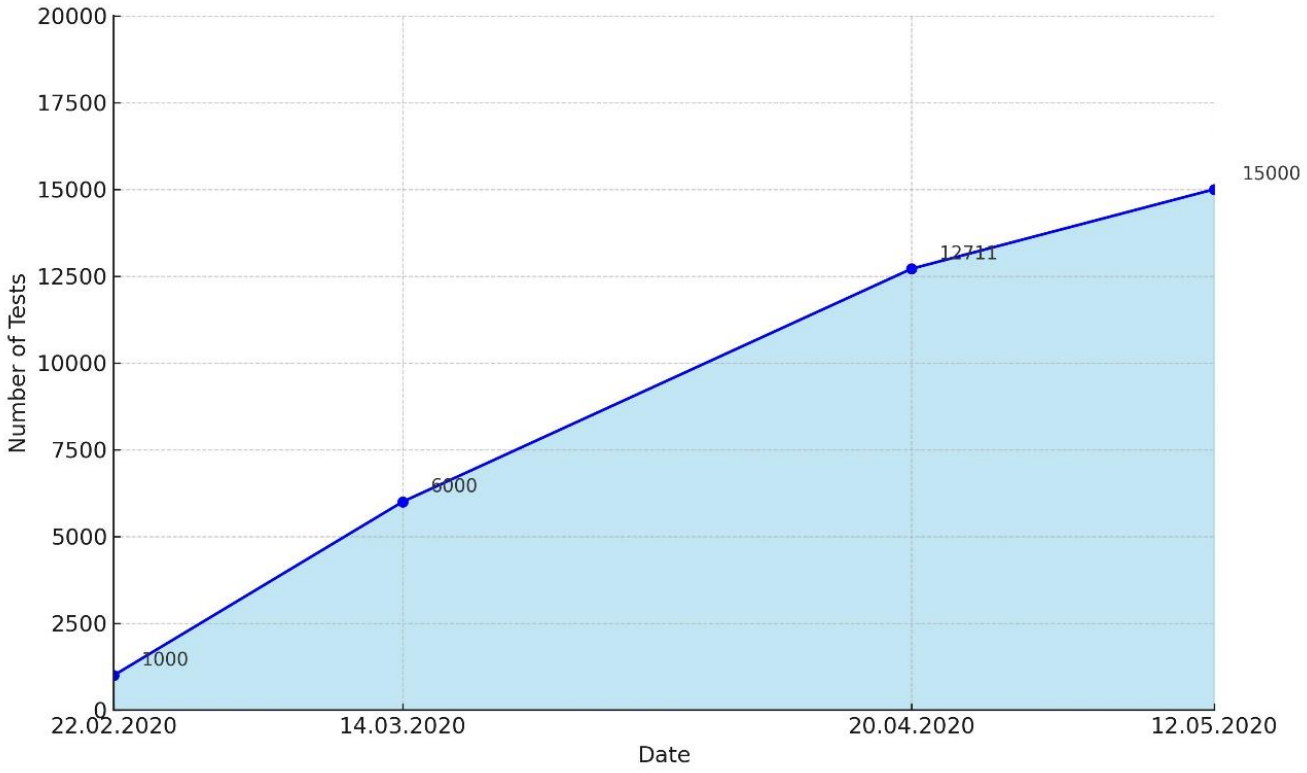


Figure 5: The number of daily COVID-19 tests from mid-February 2020 to mid-May 2020

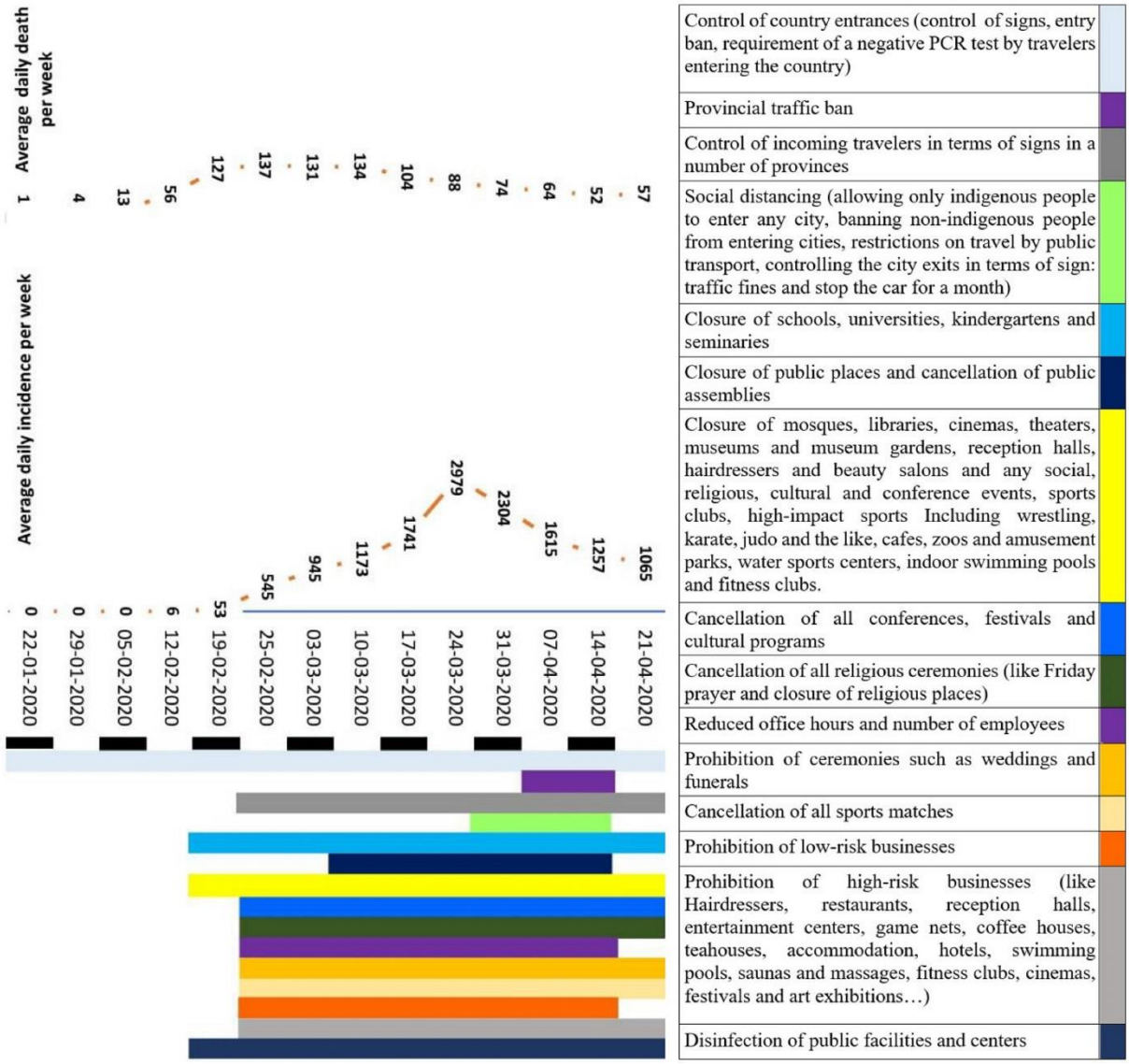


Figure 6: The interventions implemented and the incidence and mortality rates from COVID-19 from the identification of the first case to the initiation of social distancing plans

The Iranian New Year holidays (from mid-February to late March) have traditionally been associated with extensive travels to the furthest parts of the country. This custom carried considerable concerns regarding the spread and transmission of the disease. Therefore, interventions began to prevent its adverse effects on the control of the COVID-19 outbreak. From the fourth week of March 2020[lxvi], all professions were closed except for essential service providers such as supermarkets, bakeries, butcher shops, fruit shops, pharmacies, and others N92[lxvii]. Screening of incoming travellers to some provinces and cities with the highest SARS-CoV-2 contamination and preventing the departure of symptomatic individuals and the return of non-natives, disinfection of vehicles and passages in many cities with the help of military forces N94-N100 were carried out [85]. The MOH&ME's spokesperson referred to these measures as the third level of quarantine. It stated that the fourth level, military governance, is not feasible nor desirable in our country N101.

From the first week of April 2020[lxviii], the social distancing plan was implemented[lxix] in addition to the previous measures [85]. In this plan, only locals were allowed to enter cities, restrictions were imposed on public transportation, and people at city exits were strictly monitored for disease symptoms N102-N105. Inter-provincial traffic was banned[lxx] from the second week of April[lxxi] N106. Despite these measures, the NHCC did not approve the proposal to shut down Tehran's metro and public transportation N108[lxxii]. The continuation of these interventions for three more weeks as part of the social distancing plan led to a downward trend in the number of infected individuals, so the weekly average of daily infected patients decreased from 2979 to 1257. Consistent with the decrease in infection cases, the COVID-19 death statistics decreased from 88 to 57 daily deaths (Figure 6). A crucial aspect of Figure 6 is that the peak of deaths occurred before the peak of cases. This unusual timing of the peak in deaths before the peak in cases can be attributed to the limited diagnostic capacity in Iran during the early stages of the pandemic. Due to the scarcity of tests, only individuals with severe symptoms were able to receive diagnosis, and these cases were more likely to result in fatalities. As diagnostic capacity gradually improved, more cases, including those with milder or asymptomatic presentations, were identified. This led to a surge in reported cases, but also to a decline in the number of deaths as more individuals received timely diagnosis and care.

6.4. FROM REDUCING SOCIAL DISTANCING RESTRICTIONS TO LOCAL DECISION-MAKING POLICY FOR MANAGING COVID-19 IN IRAN: APRIL 21, 2020 - JUNE 16, 2020

With the decline in the number of infected people, the restrictions of the social distancing plan gradually decreased[lxxiii] from mid-April 2020[lxxiv], N113-N117. From the end of the third week of April 2020, inter-provincial travel bans and closures of public places and gatherings were lifted, and office operations returned to normal N113, N119-N121. Furthermore, some occupations, especially low-risk ones[lxxv], were announced to be unhindered across the country N115 (Despite the loosening of restrictions, the number of infections still fell by 15 percent). From the end of April and the first week of May 2020[lxxvi], religious places and programs only returned to normal in "white" cities[lxxvii], but holy shrines remained closed. Also, during this week, screening incoming passengers to the provinces for disease symptoms was stopped N122-N124 (A 21 percent increase in the number of infections compared to the previous week). On the first day of May 2020[lxxviii], the Deputy Minister of Health declared the most important national strategy for dealing with the COVID-19 crisis to be "activating the screening and identification of suspected and infected individuals before entering hospitals and home quarantine" N125.

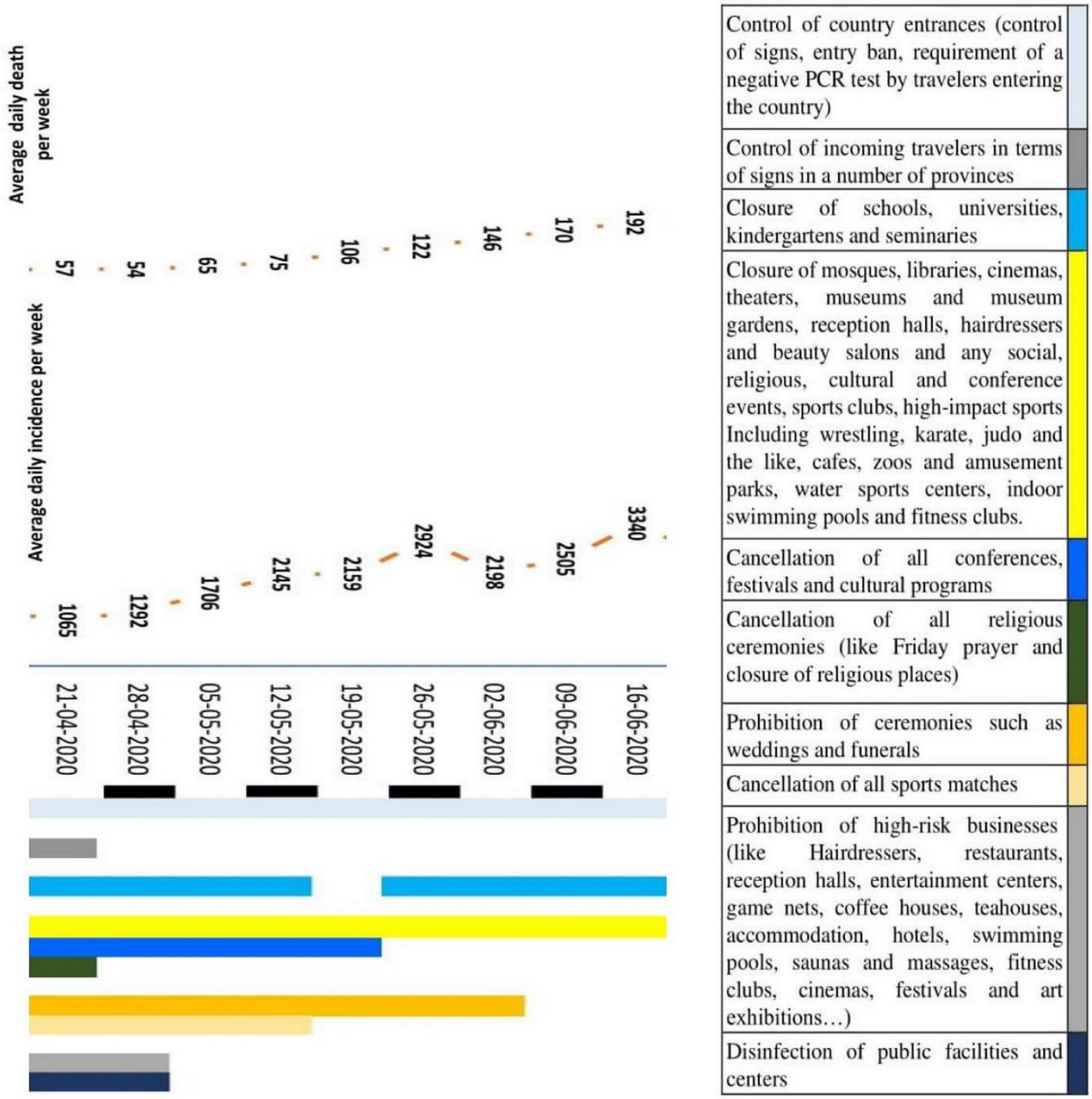


Figure 7: Interventions, Infection Rates, and Mortality from COVID-19 from the Time of Limited Easing of Social Distancing Restrictions to the Implementation of Local Decision-Making Policy.

Following the easing of restrictions, in the second week of May 2020[lxxix], the prohibition on high-risk jobs such as hairdressers, restaurants, and others was lifted, and the disinfection of public transport and centres was also discontinued N127, N128. Moreover, activities in mosques and the holding of Friday prayers[lxxx] resumed in 132 cities with low-risk conditions N129. With the continuation of these relaxations, there was a 32% increase in patient numbers compared to the previous week. The following week (the third week of May 2020), the Night of Destiny ceremony[lxxxi] was held with the announcement of the need to observe approved protocols N130.

With the reduction of social distancing restrictions, as expected, infection rates increased, and over four weeks,

daily cases doubled, rising from 1065 to 2145. The recorded deaths also proportionally increased from 57 to 75 (see Figure 7).

In the third and fourth weeks of May 2020[lxxxii], the easing of COVID-19 restrictions took on a more extensive form. Permission was granted for the reopening of schools, religious and historical sites, museums, open-day pools, individual and non-group sports clubs in the country, all government employees' return to their workplaces, and the holding of ceremonies such as Quds Day[lxxxiii] only on Friday prayer venues of cities with white coronavirus status[lxxxiv], and Eid al-Fitr[lxxxv] prayer, among others N131-N141. The effects of these eased restrictions were evident in the growth of infection statistics, and within two weeks, cases increased from 2145 to 2924. In these two weeks, COVID-19-related deaths significantly increased from 75 to 122 (see Figure 7).

With the continuation of the gradual lifting of COVID-19 restrictions, in the third week of June 2020, an average of 3340 daily cases were recorded in the country, which was the highest infection rate to date. By this week, in addition to the previously lifted restrictions, halls, coffee shops, tourist tours, and kindergartens reopened. Also, limited-capacity exhibitions N142 were held. The effects of this relaxation on increasing the number of infections are clearly shown in Figure 7. Two months after the start of easing social distancing plan restrictions in mid-April 2020, daily infection rates rose from 1065 to 3340 (more than a 3.1-fold increase), and daily deaths from COVID-19 also rose from 57 to 194 deaths (more than a 3.4-fold increase).

6.5. FROM THE INITIATION OF CITY COLOUR-CODING DECISION-MAKING TO THE NEAR-COMPLETE REMOVAL OF COVID-19 SOCIAL RESTRICTIONS IN IRAN: JUNE 16, 2020 - AUGUST 25, 2020

With the surge in statistics, requests for shutdowns in seven provinces were received from local governors at the beginning of the fourth week of June 2020[lxxxvi]. The NHCC approved this request, and some control restrictions were implemented for incoming and outgoing travellers in certain provinces N143, N144. From the middle of the first week of July 2020[lxxxvii], the NHCC announced and implemented weekly restrictions. The basis for decisions regarding commercial activities was the city categorization based on the colour ranking announced by NHCC. To this end, at the end of each week, the statistical conditions of various counties were analyzed, and each county was categorized into white, yellow, orange, and red groups. In white cities, all four occupational groups were allowed to operate. In yellow cities, groups one, two, and three, and in orange cities, groups one and two, and in red cities, only the first group of occupations were allowed to operate N150 (For details on occupational groups, refer to Appendix 1).

In the second week of July 2020[lxxxviii], the President agreed to delegate the decision-making authority regarding the increase or decrease of coronavirus restrictions to Provincial Coronavirus Taskforces (PCT) N151. To this end, at the end of each week, local authorities would decide on restrictions in different cities based on the number of infections and deaths due to COVID-19 in each city. The prohibition or activation of each job category in each city was performed by the PCT and approved by the NHCC's specialized committees N145-N149.

As seen in Figure 8, from the fourth week of June to the last week of July 2020[lxxxix], the weekly average number of infections had small fluctuations and was approximately 2500 cases. Despite the stability in daily infection rates, the daily death toll from COVID-19 declined, decreasing from 214 deaths to 125. During this period, the organization of conferences, festivals, cultural programs, and ceremonies like weddings and funerals were prohibited N152-N158. Also, wearing masks in crowded environments, public transport, and government offices was made mandatory N144, N159-161 [85]. The government's subsidy for mask production led to lower prices and greater public access to masks N162. However, activities such as national employment examinations and doctoral student admission exams N163-N165, holding Friday prayers in cities with white, yellow, and orange statuses, and organizing Eid al-Adha prayers [xc]in some cities led to significant gatherings across the country N166-N168. Based on provincial requests, some local centres and offices were permitted to close N149, N169. A multi-layered monitoring system[xci] was implemented over trade unions to ensure the observance of health protocols, which had the power to seal violating units for one month N170 [85].

As a crucial point in this stage should clarify that the temporary decline in COVID-19 cases during this stage from June to August 2020 can be attributed to several factors, including the high compliance rate with health protocols, the mandatory use of masks, and the prohibition of gatherings and ceremonies. However, this decline was short-lived, and the relaxation of restrictions ultimately led to a surge in cases in September 2020.

However, it is crucial to acknowledge the limitations in attributing the decline or increase in COVID-19 cases solely to the aforementioned factors. The interplay of various elements, including public behavior, other concurrent public health measures, and the intrinsic dynamics of the COVID-19 pandemic, contributes to the complexity of isolating the impact of specific policies. While this study focuses on the role of certain governmental measures, it is important to recognize that both the decline and subsequent surge in cases are the result of a multi-dimensional response. Factors such as the high compliance rate with health protocols and the mandatory use of masks are not only outcomes of these policies but are also shaped by broader societal dynamics like public trust and the efficiency of policy implementation. For example, public trust in government, influenced by the rationalization and transparency of policies, can significantly affect compliance rates. Similarly, the operational capacities of both the government and private sectors play a critical role in the implementation of measures like mask distribution. Nonetheless, isolating the effect of individual policies remains a challenging aspect of pandemic analysis, and this study acknowledges the complex interplay between policy decisions and societal factors in shaping the pandemic's trajectory."

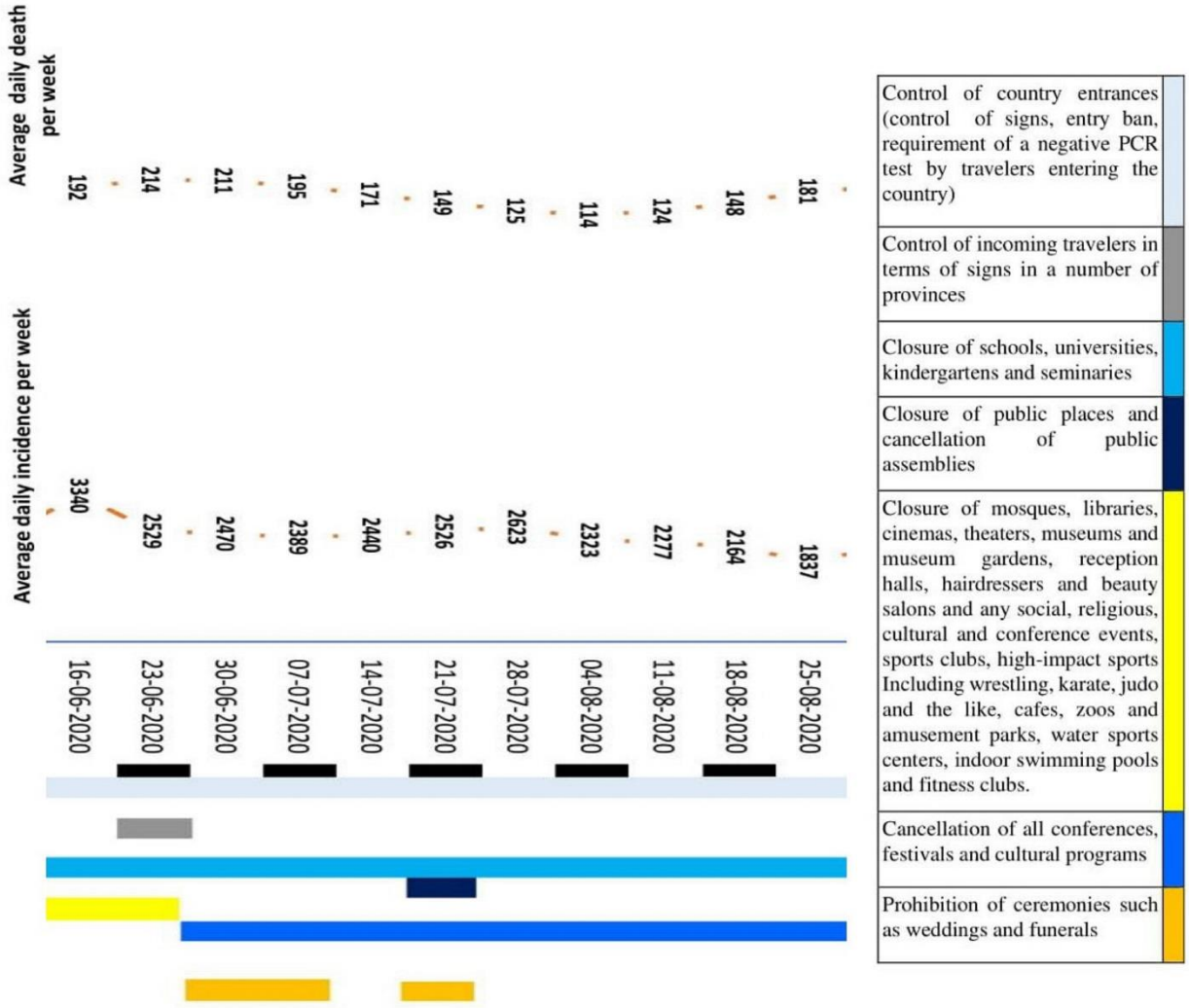


Figure 8: Implemented Interventions and COVID-19 Infection and Mortality Statistics from the Beginning of Decision-Making Based on City Color Coding to the Near Complete Removal of COVID-19 Social Gathering Restrictions in Iran.

On the 23rd of July 2020[xcii], the President of Iran announced the design of two major policies in the NHCC to combat the second wave of COVID-19 outbreak. The first policy was the mandatory use of masks in public indoor and high-risk areas, including business places, with strict supervision over implementing these guidelines. The second policy centred on prohibiting gatherings, assemblies, celebrations, mourning ceremonies, and parties N171.

From the end of July 2020 to the fourth week of August 2020[xciii], the average number of daily infected cases decreased, dropping from 2623 to 1837. Contrary to this trend, daily registered death cases increased from 125 to 181 (Figure 8). During this period, the COVID-19 restrictions in Tehran were lifted N172, N173. However, the implementation of the Tehran traffic plan during this time, as well as the nationwide exam and the commencement of the first ten days of Muharram[xciv], occurred against social distancing in the third and fourth weeks of August 2020 [xcv] N174-N176 [85]. One of the reasons for the decrease in infection cases during this month is the high compliance rate with health protocols during this period. Data from the MOH&ME show that this month, compliance with protocols in the country stayed above 80% N177. We recognize that the survey-based approach to measuring health protocol compliance has some limitations. For example, it is possible that some participants may have over-reported their compliance with health protocols. Additionally, the survey data may not be fully representative of the Iranian population as a whole.

6.6. FROM THE NEAR-TOTAL REMOVAL OF COVID-19 SOCIAL GATHERING RESTRICTIONS TO THE ESTABLISHMENT OF THE OCNHCC: AUGUST 25, 2020, TO OCTOBER 27, 2020

The last week of August 2020[xcvi], they have coincided with the end of Muharram 1442 AH[xcvii]. During this time, significant gatherings were generated by the Tasu'a and Ashura[xcviii] commemoration ceremonies, making the observance of social distancing principles nearly impossible. However, measures such as reducing the days and duration of ceremonies, holding ceremonies outdoors, and prohibiting hospitality were considered, even though there needed to be more capacity to monitor their implementation N175, N178, N179. In the first week of September 2020[xcix], the weekly average of daily COVID-19 cases increased from 1837 the previous week to 2147 (the COVID-19 death count also increased from 181 to 192). This trend of increasing infection numbers continued sharply until the end of October 2020[c], reaching 8407 cases (a 457 percent increase compared to the weekly average of daily cases in the last week of August 2020[ci]). During the same period, the weekly average of daily COVID-19 deaths increased significantly from 181 to 457 cases. (See Figure 9)."

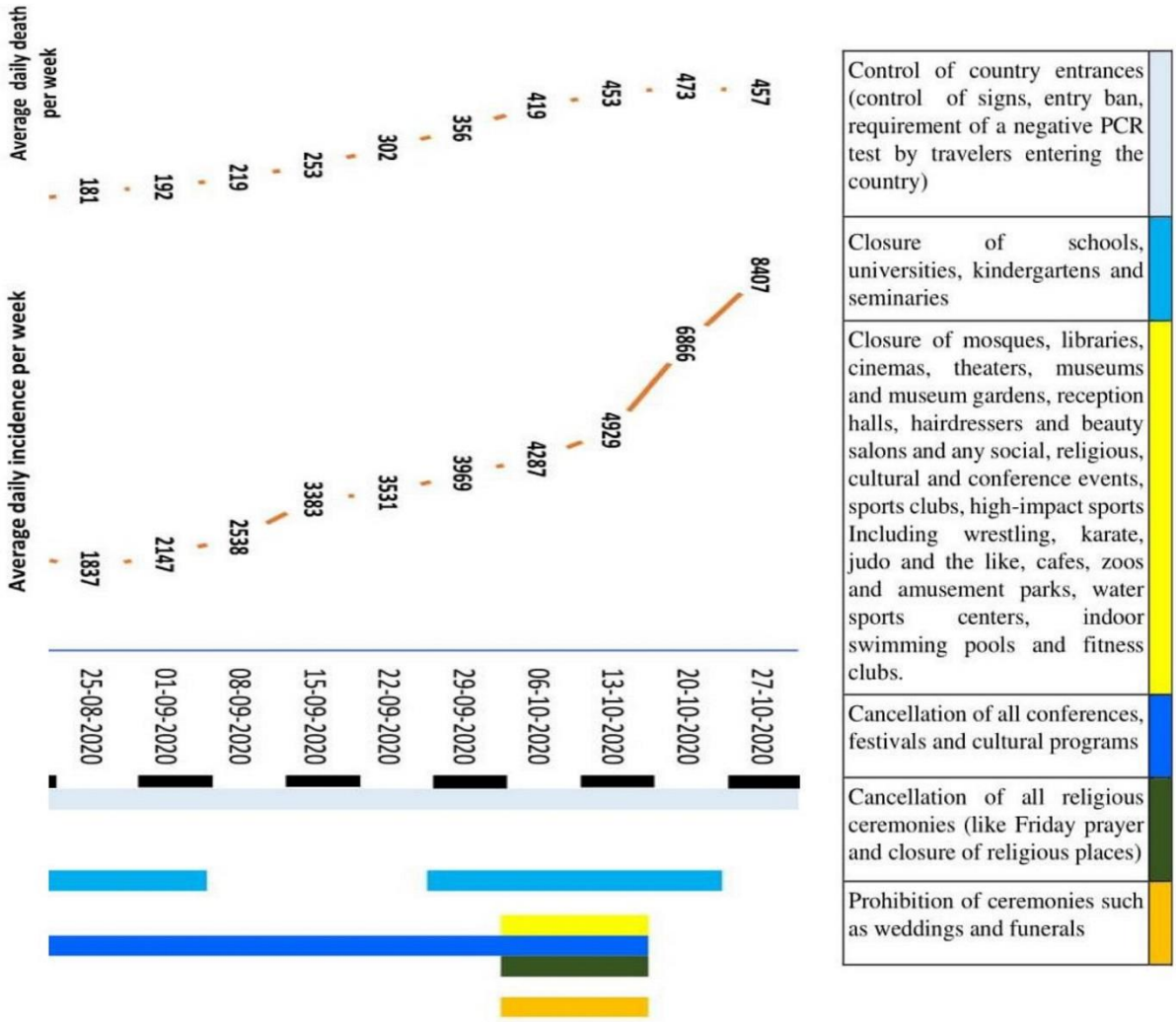


Figure 9: Interventions and Statistics of Infection and Death from COVID-19, from the Reduction of Social Distancing to the Establishment of the NHCC.

The aforementioned increase occurred following the relaxation of restrictions implemented to combat COVID-19. From the start of the second week of September [cii]until the end of September 2020[ciii], schools began to operate emphasizing non-compulsory physical attendance, and some universities resumed their in-person educational activities N181-N183. During this period, the weekly average of daily confirmed COVID-19 cases increased from 2538 to 3969, an upsurge of 56%. The reopening of schools and universities emphasized shortened classroom attendance N182. Nevertheless, families protested this decision, and many parents prevented their children from attending schools and universities N184-N188. It's worth mentioning that since the beginning of the educational center closures, remote and online learning options had been provided for students N189.

Following the continued upward trend of infection cases, in-person education in schools and universities was canceled in most provinces during the first week of October 2020[civ] N190-N192. In the second and third weeks of October 2020[cv], COVID-19 restrictions were intensified, and the NHCC announced the closure of congregation centers including universities, schools, seminaries, mosques, cinemas, cultural centers, sports clubs, and recreational facilities across the country N193-N198. Additionally, high-risk businesses such as beauty salons and cafes were restricted N199, and religious programs, wedding ceremonies, and funeral gatherings were also banned N198, N199. Beyond these measures, from the third week of October 2020[cvi], the mandatory use of masks in office environments and crowded spaces was emphasized N202, N203. Despite these interventions, the number of daily cases continued to increase.

In response to this increase, the Deputy Minister of Health elaborated on the government's new strategy for combating the COVID-19 crisis on October 11, 2020[cvii]. He enumerated four solutions: "intensifying supervision, enforcing laws and fining violators regarding compliance with protocols," "conducting many tests," "tracing, tracking, and isolating individuals with positive tests," and "education and awareness" as the main strategies N204. Following the announcement of new government strategies for combating the COVID-19 pandemic, new restrictions focusing on mandatory policies were enacted in the fourth week of October 2020[cviii]. These mandatory policies included the obligation to wear masks outside homes in Tehran, fining individuals who violated this rule, fining infected individuals moving around the city, stricter control over occupational units, and fining offending units N204-N206. Despite the proclamation of these restrictions, the number of identified patients within the last two weeks of October[cix] increased from 4929 to 8407, a more than 70% rise. With the severe increase in

infection cases, deaths from COVID-19 increased from 453 to 475 in the third week of October [cx]and then decreased to 457 in the fourth week[cxi]. The Minister of Health, responding to the daily increase in infection numbers on October 18, 2020[cxii], considered the lack of crackdown on lawbreakers as the major flaw in COVID-19 management N207.

Following the severe increase in infections and deaths caused by COVID-19, upon Ayatollah Khamenei, Iran's Supreme Leader's order, OCNHCC[cxiii] was established on October 28, 2020[cxiv]. The formation of this headquarters aimed to utilize all capacities within the country, including government and private, military and law enforcement forces, and non-governmental organizations, to combat the coronavirus. This OCNHCC became the central focus for overseeing the implementation of all declared decisions of the National Corona Response Team. The establishment of this OCNHCC aimed to address a shortcoming to which President Rouhani referred at the time of the OCNHCC ' inception: "One of the significant issues that we previously had as a flaw was that many important and good decisions were approved and communicated here, but in execution, they were either not properly implemented, not precisely implemented, or not implemented at all." N1

Figure 10 illustrates the extent to which the public adheres to health protocols. As seen from around mid-August 2020, there has been a declining trend in the public's adherence to these protocols. Adherence dropped from 81% (early August 2020) in less than two months to 42% (late September 2020). With the government's announcement of increased COVID-19 restrictions in October and the first week of November 2020, compliance with health protocols approached 80% within five weeks. Examining this Figure with the adopted policies indicates that the government's commitment to implementing COVID-19 restrictions, typically followed by a surge in infection rates, increases public compliance with health protocols. Conversely, relaxing restrictions results in reduced compliance. Therefore, there's a clear correlation between the announcement of restrictions and the level of protocol adherence.

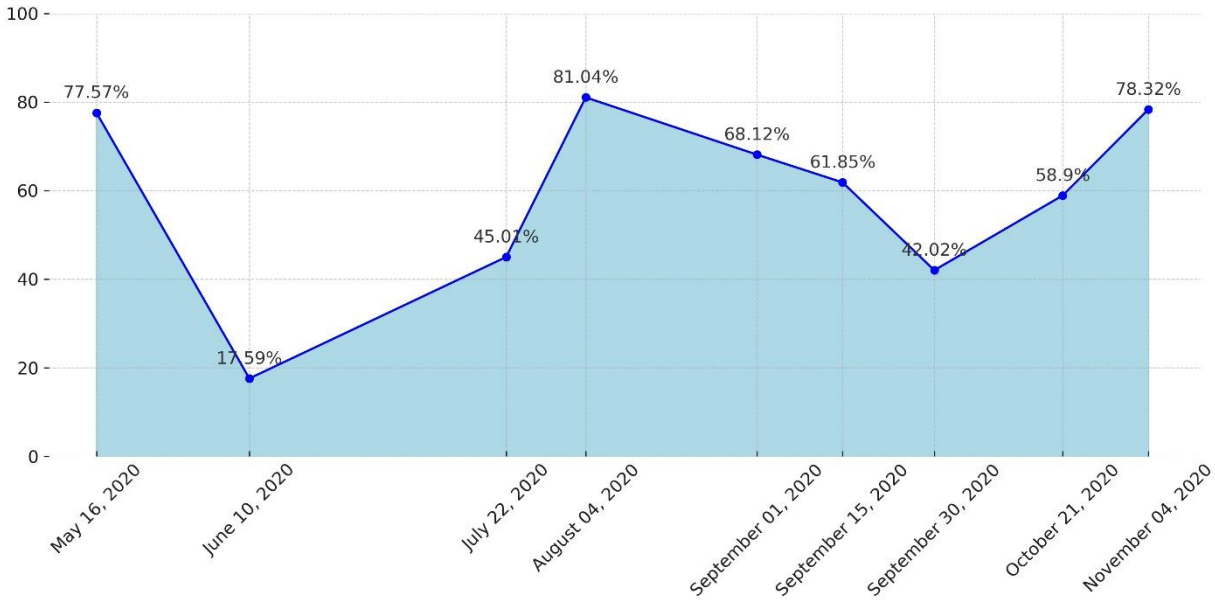


Figure 10: The process of compliance with health protocols for Combating COVID-19 in Iran N177

One of the key aspects of our study is the analysis of public compliance with health protocols, which we measured using data published by the Ministry of Health and Medical Education (MOH&ME). The MOH&ME collects this data through a variety of methods, including surveys, observational studies, and administrative records. For the specific period of time that we studied (July to November 2020), the MOH&ME was using a survey-based approach to measure health protocol compliance.

We recognize that the survey-based approach to measuring health protocol compliance has some limitations. For example, it is possible that some participants may have over-reported their compliance with health protocols. Additionally, the survey data may not be fully representative of the Iranian population as a whole.

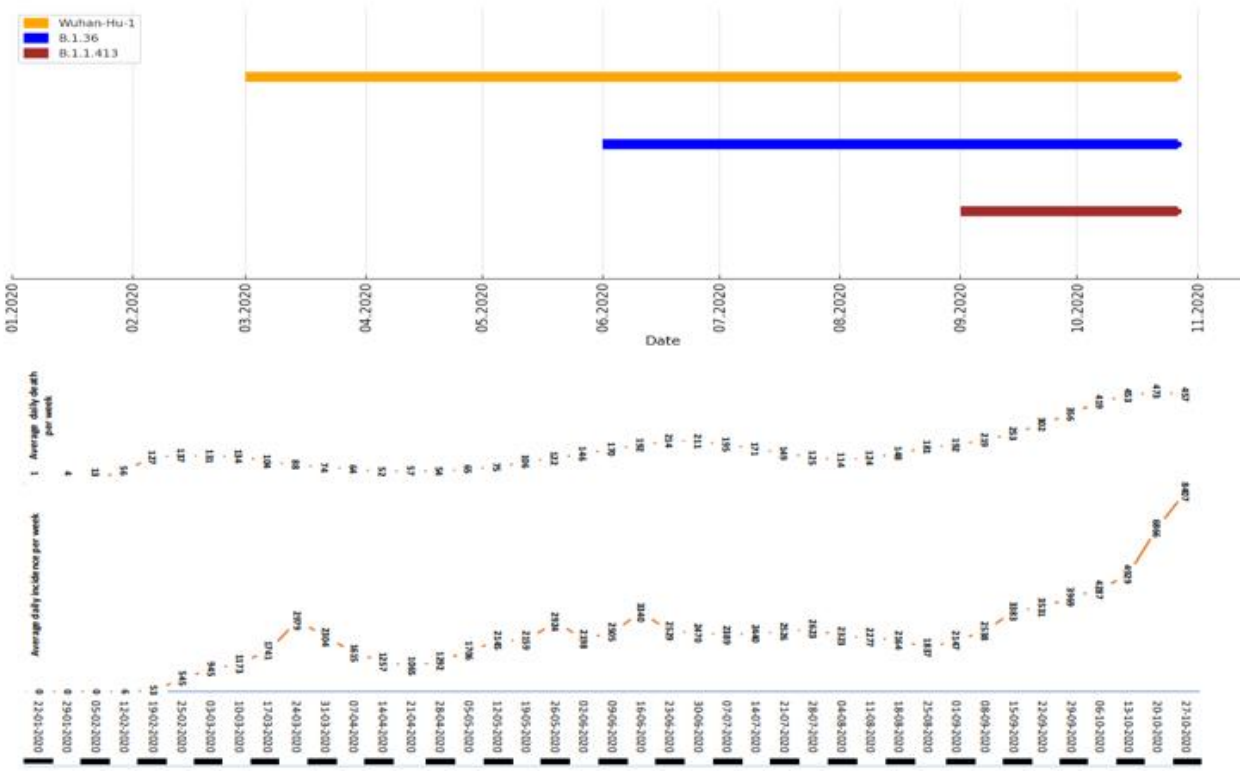
6.7. VARIATIONS OF COVID-19 CIRCULATING IRAN FROM JANUARY 22, 2020 TO OCTOBER 27, 2020

We have further expanded our discussion to address the emergence of new SARS-CoV-2 variants within our study period. Variants such as B.1.1.413 and B.1.36, identified in our research, presented unique challenges due to their distinct characteristics such as increased transmissibility or potential impact on disease severity. Our analysis includes a temporal correlation between these variants' emergence and observed trends in COVID-19 case incidence and mortality. We postulate that these variants may have influenced the observed effectiveness of policy interventions.

The emergence of new COVID-19 variants has significantly impacted the trajectory of the pandemic. Understanding the characteristics and impact of these variants is crucial for effective pandemic control strategies. As the virus continues to evolve, it is essential

to remain vigilant and adapt public health measures accordingly.

During our 9-month study period in Iran, three different SARS-CoV-2 variants were identified: the original Wuhan strain (Wuhan-Hu-1) in spring 2020, the B.1.36 variant in summer 2020 that traveled from China to Europe and then to Iran, and the B.1.1.413 variant in autumn 2020 [91], common in some Western countries, Australia, Canada, and later found in Iran. Despite new variants emerging, previous strains continued contributing to COVID-19 infections and deaths. No extensive sequencing study in Iran during the COVID-19 crisis has analyzed the prevalence of these variants on a national scale, necessitating the use of cumulative statistics. This variety of strains is considered a confounding variable in our analysis, requiring further investigation. We have shown the emergence of these variants in correlation with COVID-19 incidence and mortality rates in Figure 10. The Figure 10 elucidates this point by visually representing the timeline of variant prevalence alongside infection and mortality data, providing a clearer understanding of the pandemic's evolving landscape and the necessity for policy agility in response to such biological factors. This highlights the complexity and evolution of the virus in relation to governmental policies N 208.



.**Figure 11:** The Variants of COVID-19 in Iran (N208)

In our comprehensive analysis of Iran's COVID-19 policy interventions during the pre-vaccine phase, we identified a possible correlation between the timing of policy implementation and the subsequent changes in infection and mortality rates. Although the potential impact of the other confounding variables cannot be ignored. The data reveal that prompt policy interventions, particularly in early stages, were associated with significant reductions in new infection rates and mortality. Conversely, delays in policy enactment often corresponded with spikes in COVID-19 cases and increased death tolls. These findings underscore the critical importance of timely policy actions in pandemic management and demonstrate the potential consequences of delayed responses. This direct relationship between policy timing and pandemic trends highlights the value of evidence-informed decision-making in public health crises.

7. Summary of Findings

In our findings, we meticulously analyzed the COVID-19 policy interventions implemented in Iran, observing their evolution and corresponding impacts on infection and mortality rates. Our study reveals a complex interplay between policy implementation, public compliance, and the dynamic nature of the pandemic, evidenced by fluctuating infection rates and varying degrees of success in managing the spread of the virus. The analysis indicates that periods of increased restrictions generally corresponded with a decrease in infection rates, while easing of measures often led to a resurgence. This correlation underscores the critical importance of timely and effective policy interventions, as well as the challenges faced in balancing public health with other societal needs during the pandemic.

The COVID-19 pandemic represents an optimal opportunity for integrating scientific knowledge into decision-making processes and increased emphasis on evidence-based policymaking. "The COVID-19 pandemic additionally stressed the importance of the expeditious use of the best available scientific evidence to guide governments and practitioners in their emergency response" [92]. Throughout this period, most governments have specifically focused on science and evidence to shape preventive and therapeutic

interventions and broader initiatives beyond the health sector. Countries that designed their interventional policies for COVID-19 control based on evidence and continually adjusted them in light of new evidence were more successful during this stressful period and suffered less damage. However, some countries adopted policies based on ideological foundations and group interests, significantly damaging the country and its people.

During the COVID-19 crisis, considering the experiences of other countries, especially China, it was expected that time management interventions, particularly in the initial stages of the disease and before the widespread dissemination of the SARS-CoV-2 virus, would be one of the most vital governmental interventions for dealing with this crisis in Iran. Regrettably, this was not the case. The most crucial time management intervention, which should have been implemented at the onset of the disease, was the establishment of extensive restrictions on intra-city and inter-city travel and the immediate cessation of flights to China; unfortunately, these actions were not taken appropriately. In Iran, within the time management framework and to prevent the transmission of SARS-CoV-2, control interventions at the country's entry points began in the fourth week of January 2020.[cxv] Controlling land, air, and sea sources and widespread public education on COVID-19 prevention were the initial steps in Iran, from identifying the COVID-19-causing virus in China until the official confirmation of the disease's presence in Iran on February 19, 2020.[cxvi]

Immediately after the confirmation of the SARS-Cov-2 virus, restrictions on gatherings and the closure of public places and congregations such as schools and universities, mosques, libraries, sports halls, and places with similar applications, as well as disinfection of public places and public transportation, primarily began locally. However, significant criticism was raised about the lack of quarantine in some cities, especially the holy city of Qom, which hosts many religious leaders and is one of the traditional power bases of the government.

Only 15 days after identifying the first case of COVID-19 in Iran, additional cases were identified in the city of Qom and subsequently throughout all provinces of the country, thus turning every province into a hotspot for the disease. With the countrywide spread of the disease, in addition to prior interventions, the entrance of travellers was forbidden or controlled in certain provinces, the number of employees and office hours were reduced, and restrictions were imposed on most occupations, such as restaurants and shopping malls. However, the trend of increasing infection rates continued, and by the last week of March 2020[cxvii], the weekly average daily infection rate reached 2,979 cases. At the beginning of the Iranian New Year, there were significant concerns about the spread of the disease due to extensive travel to far-flung areas, leading to more severe restrictions. New constraints included the closure of all trades except essential supplies, screening incoming passengers to certain provinces and cities with the highest SARS-CoV-2 contamination, and preventing symptomatic individuals from exiting and non-natives from returning. These restrictions and public concerns resulted in a 71% reduction in travel during the national holiday of Nowruz 2020[cxviii] compared to the previous year.

From the first week of April 2020[cxix], the implementation of a social distancing plan, which incorporates a degree of quarantine, was initiated. In this plan, only native individuals were allowed into cities, restrictions were applied to public transportation, and people leaving cities were closely monitored for disease symptoms. After one-week, inter-provincial travel was also banned. These measures led to a roughly 57% decrease in infections in less than a month (from the last week of March to the third week of April 2020[cxx]). Subsequently, with the weekly easing of restrictions, infections increased nearly 2.7 times over six weeks (from the third week of April to the last week of May 2020[cxxi]), rising from 1,065 cases to 2,924 cases. As the lifting of COVID-19 restrictions continued, by the third week of June 2020[cxxii], an average of 3,340 daily cases were recorded, representing the highest infection rate to that date. The president agreed in the second week of July 2020[cxxiii] to delegate decision-making authority regarding increasing or decreasing COVID-19 restrictions to PCT. From the end of June to the end of July 2020[cxxiv], restrictions such as the prohibition of conferences, festivals, and cultural events such as weddings and funerals were enforced, and the use of masks in crowded places, public transportation, and government offices was made mandatory. Government subsidies for mask production led to a decrease in mask prices and increased public access. Supervision was also applied to trade units to enforce health protocols. The weekly average daily infections remained relatively constant during this period, at around 2,500 cases.

From the last week of July[cxxv] to the beginning of the fourth week of August 2020[cxxvi], COVID-19 restrictions continued following the colour-coding of cities. During this period, the infection rate showed a downward trend. The decrease in infection can be attributed to the high compliance rate with hygiene protocols. Data published by MOH&ME indicate that protocol compliance stayed below 80% this month. The average daily number of infected cases decreased from 2623 to 1837.

We recognize that the survey-based approach to measuring health protocol compliance has some limitations. For example, it is possible that some participants may have over-reported their compliance with health protocols. Additionally, the survey data may not be fully representative of the Iranian population as a whole.

The last week of August 2020[cxxvii] they have coincided with the end of Muharram 1442. At this time, Husseini mourning ceremonies led to significant gatherings that made social distancing practically impossible. In the first week of September 2020[cxxviii], the weekly average of daily COVID-19 infections rose from 1837 the previous week to 2147 cases. From the beginning of the second week of September[cxxix] until the end of September 2020[cxxx], schools started operating with an emphasis on non-compulsory attendance, and some universities also resumed in-person instruction. During this time, the weekly average of confirmed daily COVID-19 cases increased from 2538 to 3969, a rise of 56 percent. As a result of the increasing trend in infection cases, in-person instruction in schools and universities was cancelled in most provinces in the first week of October 2020.

In the second and third weeks of October 2020[cxxxi], restrictions to counteract COVID-19 were intensified. The NHCC announced closures of congregating centres and also imposed restrictions on high-risk businesses like beauty salons and cafes. Furthermore, from the third week of October 2020, the mandatory use of masks in office environments and crowded spaces was strongly emphasized. Despite these interventions, the daily number of infected people continued to increase. In the fourth week of October 2020[cxxxii], new restrictions were approved, focusing on mandatory policies. Among these compulsory measures were mandatory mask usage starting from home entrances in Tehran, fines for non-compliance, fines for people with COVID-19 moving around the city, stricter supervision over trade units, and fines for violating units. Despite the imposition of these restrictions, the number of identified patients within the last two weeks of October[cxxxiii] increased from 4929 to 8407, a surge of over 70%.

To interpret the observed escalation in COVID-19 cases during this period, it is crucial to consider the preceding context of governmental policy shifts. Initially, a broad relaxation of restrictions, marked notably by significant gatherings during Tasua and Ashura and the reopening of educational institutions, coincided with a marked decline in public adherence to health protocols, as evidenced by the drop from 81% compliance in early August to just 42% by late September. This trend suggests a public perception influenced by governmental cues, interpreting the easing of restrictions as a diminishment of COVID-19 risks. The subsequent reintroduction of stricter measures in October, while initially met with increased cases, eventually led to a resurgence in protocol compliance, nearing 80%. This pattern underscores a correlation between the government's policy announcements and public health behavior, highlighting the time-sensitive nature of societal adaptation to changing health directives. Thus, the initial case surge can be attributed to the lag in behavioral adjustment following policy relaxations, affirming the intricate interplay between governmental actions and public health responses.

In response to the sharp increase in the number of infected individuals and the rising death toll due to COVID-19, the OCNHCC was established on October 28, 2020[cxxxiv]. The OCNHCC became the centre for overseeing the implementation of all national decrees to combat the coronavirus.

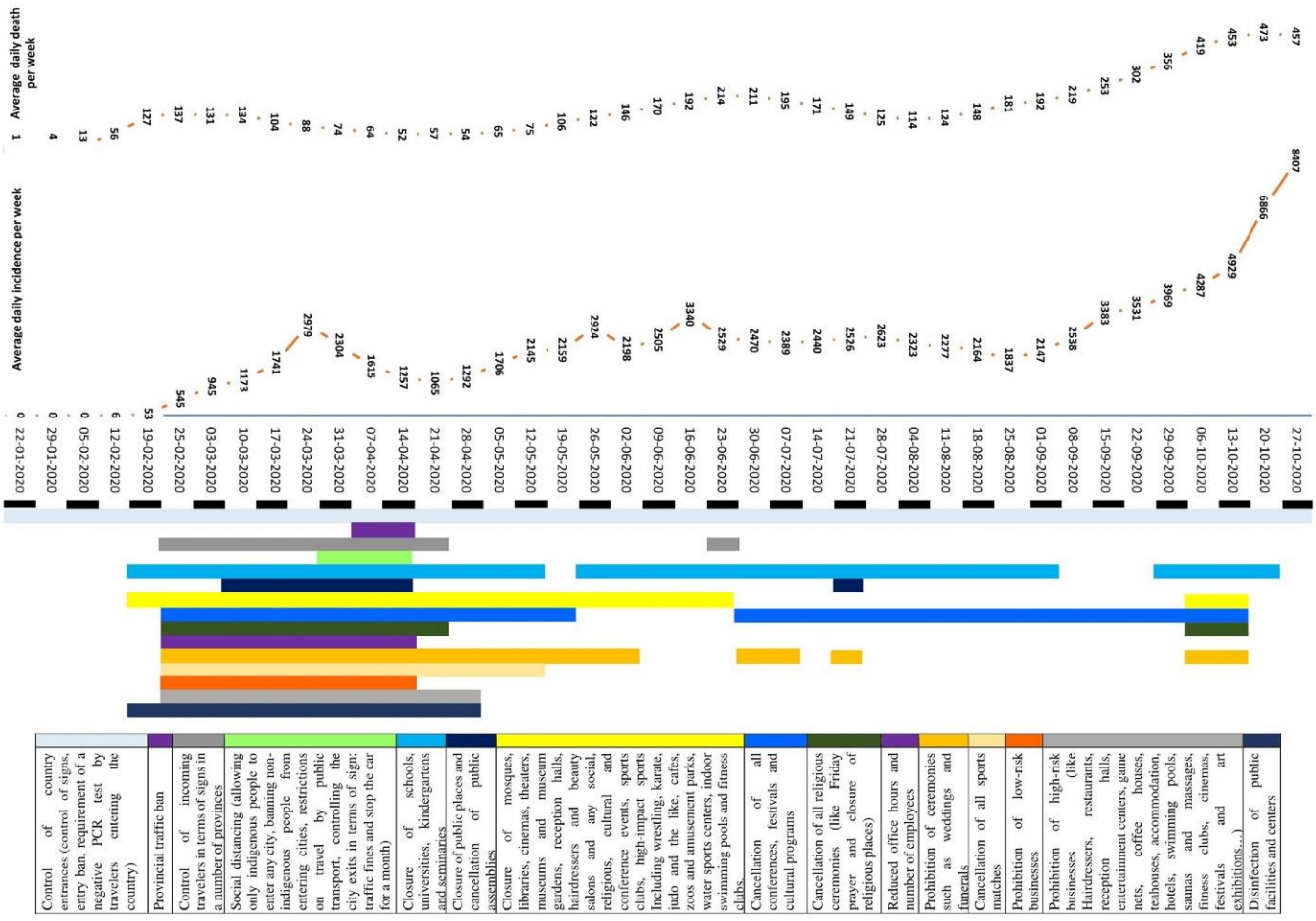


Figure 12: Interventions by the Iranian government's time management to combat the COVID-19 pandemic and its effects on related disease and mortality indices (from the beginning of the pandemic until the end of October 2020).

8. Exploring the Limitations, Potential Biases and Future Directions

The limitations of this study are rooted in the inherent complexities of public health policy implementation assessment. This study's robust analysis of over 70,000 media policy reports in public health policy implementation is an innovative advancement. Despite its significance, we acknowledge challenges such as potential discrepancies in governmental records and media narratives, introducing biases. Verifying policy actualization was complex, especially due to opaque governmental data. Discrepancies between policy

announcements and their execution, and reliance on self-reported survey data for health protocol compliance, could lead to overestimations, not fully reflecting Iran's diverse demographic and geographic profile. These limitations highlight the need for more sophisticated future research methodologies, possibly leveraging technology for real-time policy adherence tracking, providing a more nuanced understanding of policy intervention efficacy and public compliance. Such advanced approaches promise to enhance evidence-based responses in ongoing and future public health crises. Moreover, conducting comparative analyses with nations under similar socio-political conditions might yield more profound insights into the effectiveness of diverse policy strategies during pandemic scenarios."

9. Conclusion

An examination of Iran's COVID-19 pandemic response prior to vaccine availability reveals a complex interplay between implemented policies and epidemiological outcomes. Travel curbs, health regulations, and public awareness initiatives were among the strategies employed. While correlations exist between policy timing, type, and infection/mortality trends, establishing direct causation proves challenging. The initial response exhibited potential shortcomings, with delays in critical measures, such as China flight restrictions, possibly contributing to viral dissemination. Subsequent actions, including social distancing and localized controls, demonstrated efficacy in curbing infections. However, premature relaxations often negated these gains, underscoring the policy implementation timing and intensity as pivotal factors. Enforcing public health mandates proved multifaceted, with adherence varying across the population. Although a general association between stricter enforcement and reduced infections exists, causality remains uncertain. Fluctuating infection patterns post-restriction easing highlight the interplay of multiple influences beyond policy decisions.

The findings suggest a potential association between policy implementation and epidemiological trajectories but refrain from definitive causal claims. Rigorous data interpretation and further research are essential to comprehensively understand the pandemic's evolution in Iran.

References

1. Pauline Barnett PB. Neoliberalism: What it is, how it affects health and what to do about it. *The New Zealand medical journal*. 2020;133(1512):76-84. Accessed June 12, 2023. https://www.researchgate.net/publication/340436503_Neoliberalism_What_it_is_how_it_affects_health_and_what_to_do_about_it
2. Vicente Navarro. WHAT WE MEAN BY SOCIAL DETERMINANTS OF HEALTH. *International Journal of Health Services*. 2009;39(3):423-441. Accessed July 18, 2023. http://www.jstor.org/stable/45131149
3. Hamid Bohloli. Health Sovereignty: A Historical and Political Analysis of Primary Healthcare Development and Idea Transfer in Iran and the Global Context. *Globalization and Health*. 2023. doi:10.21203/rs.3.rs-2881250/v1
4. Baum F, Freeman T, Sanders D, Labonté R, Lawless A, Javanparast S. Comprehensive primary health care under neo-liberalism in Australia. *Soc Sci Med*. 2016;168:43-52. doi:10.1016/j.socscimed.2016.09.005
5. UN News. WHO chief declares end to COVID-19 as a global health emergency. Published May 6, 2023. Accessed May 19, 2023. https://news.un.org/en/story/2023/05/1136367
6. Henrietta Fore. *Don't Let Children Be the Hidden Victims of COVID-19 Pandemic. UNISEF*. 2020. https://www.unicef.org/press-releases/dont-let-children-be-hidden-victims-covid-19-pandemic
7. Rachelle N Binny, Michael G Baker, Shaun C Hendy, et al. Early intervention is the key to success in COVID-19 control. *Royal Society open science*. 2021;8(11):210488. doi:10.1098/rsos.210488
8. European Observatory on Health Systems, Policies, Gemma A Williams, Sara M Ulla Díez, Josep Figueras, Suzy Lessof. Translating evidence into policy during the COVID-19 pandemic: bridging science and policy (and politics). *Eurohealth*. 2020;26(2):29-33. https://apps.who.int/iris/handle/10665/336293
9. Ghotbi N. The COVID-19 Pandemic Response and Its Impact on Post-Corona Health Emergency and Disaster Risk Management in Iran. *Sustainability*. 2022;14(22):14858. doi:10.3390/su142214858
10. Farahmandnia H, Molavi-Taleghani Y, Pourvakhshoori N, Ziapour A, Abdolahi M. Experiences and Challenges of Nursing Managers' Preparedness for Timing Response to COVID-19 Pandemic: A Qualitative Study in Iran. *Africa Journal of Nursing and Midwifery*. 2022;24(3):14 pages. doi:10.25159/2520-5293/12419
11. Anttiroiko A-V. Successful Government Responses to the Pandemic. *International Journal of E-Planning Research*. 2021;10(2):1-17. doi:10.4018/IJEPR.20210401.oa1
12. Coccia M. Pandemic Prevention: Lessons from COVID-19. *Encyclopedia*. 2021;1(2):433-444. doi:10.3390/encyclopedia1020036
13. G. A. Williams, S. M. Ulla Diez, J. Figueras, S. Lessof. Translating evidence into policy during the COVID-19 pandemic: bridging science and policy (and politics). (Special Issue: COVID-19 health system response.): 01 Jan 2020-Vol. 26, Iss: 2, pp;26(2).
14. Davide Ferrari, Andrea Seveso, Eleonora Sabetta, et al. Role of time-normalized laboratory findings in predicting COVID-19 outcome. *Diagnosis*. 2020;7(4):387-394. doi:10.1515/dx-2020-0095
15. Loewenthal G, Abadi S, Avram O, et al. *COVID-19 Pandemic-Related Lockdown: Response Time Is More Important Than Its Strictness*. 2020.
16. Wells, Emily M. and Cummings, Christopher L. and Klasa, Kasia and Trump, Benjamin D. and Cegan, Jeffrey C. and Linkov, Igor. Real-time Anticipatory Response to COVID-19: A Novel Methodological Approach. In: Linkov, Igor and Keenan, Jesse M. and Trump, Benjamin D., ed. *COVID-19: Systemic Risk and Resilience*. Springer International Publishing; 2021:35-59.
17. Jie Long, A. Q. M. Khaliq, K. M. Furati. Identification and prediction of time-varying parameters of COVID-19 model: a data-driven deep learning approach. *International Journal of Computer Mathematics*.

2021;98(8):1617-1632. doi:10.1080/00207160.2021.1929942
18. City Eldeep, Chahir Zaki. COVID-19 Impact and Policy Response: A General Equilibrium Approach for Egypt. *Review of Middle East Economics and Finance*. 2022;18(3):139-170. doi:10.1515/rmeef-2022-0004
19. Haber NA, Clarke-Deelder E, Salomon JA, Feller A, Stuart EA. Impact Evaluation of Coronavirus Disease 2019 Policy: A Guide to Common Design Issues. *Am J Epidemiol*. 2021;190(11):2474-2486. doi:10.1093/aje/kwab185
20. Elitzur M, Kaplan S, Ivezić Ž, Zilberman D. The impact of policy timing on the spread of COVID-19. *Infect Dis Model*. 2021;6:942-954. doi:10.1016/j.idm.2021.07.005
21. David L Heymann, Nahoko Shindo. COVID-19: what is next for public health? *The Lancet*. 2020;395(10224):542-545. doi:10.1016/S0140-6736(20)30374-3
22. World Health Organization. Report of the WHO-China joint mission on coronavirus disease 2019 (COVID-19). *WHO*. https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf
23. World Health Organization. *Global Surveillance for COVID-19 Caused by Human Infection with COVID-19 Virus: Interim Guidance, 20 March 2020*. https://apps.who.int/iris/handle/10665/331506.
24. Jonathan Chun-Hei Cheung, Lap Tin Ho, Justin Vincent Cheng, Esther Yin Kwan Cham, Koon Ngai Lam. *Staff Safety During Emergency Airway Management for COVID-19 in Hong Kong. The Lancet. Respiratory medicine*. 2020;8.
25. Mohammad Meskarpour-Amiri, Lida Shams, Taha Nasiri. Identifying and Categorizing the Dimensions of Iran's Health System Response to the Covid-19 Pandemic. *Journal-Mil-Med*. 2020;22(2):108-114. doi:10.30491/JMM.22.2.108
26. KyodoNews. *Japan Adopts Basic Policy to Fight Coronavirus Outbreak. KyodoNews World Services Section*. 2020.
27. hamid sajadi. Assessing the Strategies of the Iranian Crisis Management System in Response to the Covid-19 Threats. *Research Letter of Political Science*. 2020;15(4):189-215. doi:10.22034/ipsa.2020.421
28. World Bank. *COVID-19 to Plunge Global Economy into Worst Recession Since World War II*. World Bank Group Washington, DC. 2020.
29. Parag Verma, Ankur Dumka, Anuj Bhardwaj, Alaknanda Ashok, Mukesh Chandra Kestwal, Praveen Kumar. A Statistical Analysis of Impact of COVID19 on the Global Economy and Stock Index Returns. *SN Computer Science*. 2021;2(1):27. doi:10.1007/s42979-020-00410-w
30. Hamid Bohloli, Hamid Reza Jamshidi, Ali Ebraze, Fahimeh Rabbani Khah. Combining government, non-pharmaceutical interventions and vaccination in optimal control COVID-19. *International Journal of Healthcare Management*. 2022:1-9. doi:10.1080/20479700.2022.2071803
31. Vahey GM, McDonald E, Marshall K, et al. Risk factors for hospitalization among persons with COVID-19-Colorado. *PLOS ONE*. 2021;16(9):e0256917. doi:10.1371/journal.pone.0256917
32. Cuadros DF, Gutierrez JD, Moreno CM, et al. *Impact of Healthcare Capacity Disparities on the COVID-19 Vaccination Coverage in the United States: A Cross-Sectional Study*. 2022.
33. Koning ER de, Boogers MJ, Beeres SL, Kramer ID, Dannenberg WJ, Schalij MJ. Managing Hospital Capacity: Achievements and Lessons from the COVID-19 Pandemic. *Prehosp Disaster Med*. 2022;37(5):600-608. doi:10.1017/S1049023X22001169
34. Winkelmann J, Webb E, Williams GA, Hernández-Quevedo C, Maier CB, Panteli D. European countries' responses in ensuring sufficient physical infrastructure and workforce capacity during the first COVID-19 wavethe first COVID-19 wave.: 10.1016/j.healthpol.2021.06.015. Epub 2021 Jul 9. PMID: 34311982; PMCID: PMC9187509. *Health Policy*. 2022;126(5). doi:10.1016/j.healthpol.2021.06.015
35. Rhee C. Deconstructing improvements and hospital variation in COVID-19 mortality rates during the early pandemic wave: the effects of wave evolution and advances in testing, treatment, and hospital care quality. *BMJ Qual Saf*. 2022;31(3):168-171. doi:10.1136/bmjqs-2021-013809
36. Arenas M, Piqué B, Torres-Royo L, et al. Treatment of COVID-19 pneumonia with low-dose radiotherapy plus standard of care versus standard of care alone in frail patients : The SEOR-GICOR IPACOVID comparative cohort trial. *Strahlenther Onkol*. 2023;199(9):847-856. doi:10.1007/s00066-023-02067-9
37. Gabriela Drummond Marques da Silva , Anelise Andrade de Souza, Mônica Silva Monteiro de Castro, Wanessa Debôrtoli de Miranda, Leticia Lemos Jardim, Rômulo Paes de Sousa. Influence of socioeconomic inequality on the distribution of COVID-19 hospitalizations and deaths in Brazilian municipalities, 2020: an ecological study. *Epidemiology and Health Services*. 2023;32(1). doi:10.1590/S2237-96222023000100021
38. Kotov EA, Goncharov RR, Kulchitsky YV, Molodtsova VA, Nikitin BV. Spatial Modelling of Key Regional- Level Factors of Covid-19 Mortality In Russia. *GES*. 2022;15(2):71-83. doi:10.24057/2071-9388-2021-076
39. Schippers MC, Ioannidis JPA, Joffe AR. Aggressive measures, rising inequalities, and mass formation during the COVID-19 crisis: An overview and proposed way forward. *Front Public Health*. 2022;10:950965. doi:10.3389/fpubh.2022.950965
40. Kaim A, Saban M. Dynamic Trends in Sociodemographic Disparities and COVID-19 Morbidity and Mortality-A Nationwide Study during Two Years of a Pandemic. *Healthcare (Basel)*. 2023;11(7). doi:10.3390/healthcare11070933
41. Saeed, Nemati., Elnaz, Saeedi., Sepideh, Abdi., Ali, Qandian., Esmaeil, Kalhor., Samin, Moradi., Narges, Joshang., Anita, Eftekharzadeh., Masoud, Hatamzadeh, Khanghahi., Pedram, Fattahi., Mojtaba, Vand, Rajabpour., Hamid, Reza, Najari. (Decomposition of socioeconomic inequality in COVID-19 mortality in Iran: A retrospective cohort study. *Health & Social Care in The Community*. 2021. doi:10.1111/HSC.13627
42. Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) - United States, February 12-March 16, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(12):343-346. doi:10.15585/mmwr.mm6912e2
43. Yang J, Zheng Y, Gou X, et al. Prevalence of comorbidities and its effects in patients infected with SARS-CoV-2: a systematic review and meta-analysis. *Int J*

Infect Dis. 2020;94:91-95. doi:10.1016/j.ijid.2020.03.017
44. Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease 2019 - United States, February 12-March 28, 2020. *MMWR Morb Mortal Wkly Rep*. 2020;69(13):382-386. doi:10.15585/mmwr.mm6913e2
45. Polverino F, Stern DA, Ruocco G, et al. Comorbidities, Cardiovascular Therapies, and COVID-19 Mortality: A Nationwide, Italian Observational Study (ItaliCO). *Front Cardiovasc Med*. 2020;7:585866. doi:10.3389/fcvm.2020.585866
46. Alali AS, Alshehri AO, Assiri A, et al. Demographics, comorbidities, and outcomes among young and middle-aged COVID-19 patients in Saudi Arabia. *Saudi Pharm J*. 2021;29(8):833-842. doi:10.1016/j.jsps.2021.06.005
47. Williamson EJ, Walker AJ, Bhaskaran K, et al. Factors associated with COVID-19-related death using OpenSAFELY. *Nature*. 2020;584(7821):430-436. doi:10.1038/s41586-020-2521-4
48. ISNA News Agency. *ISNA News Agency*. Published August 18, 2021. Accessed May 25, 2023. https://www.isna.ir.
49. Chen R, Liang W, Jiang M, et al. Risk Factors of Fatal Outcome in Hospitalized Subjects With Coronavirus Disease 2019 From a Nationwide Analysis in China. *Chest*. 2020;158(1):97-105. doi:10.1016/j.chest.2020.04.010
50. Little P. Non-steroidal anti-inflammatory drugs and covid-19. *BMJ*. 2020;368:m1185. doi:10.1136/bmj.m1185
51. Wang L, Foer D, Bates DW, Boyce JA, Zhou L. Risk factors for hospitalization, intensive care, and mortality among patients with asthma and COVID-19. *J Allergy Clin Immunol*. 2020;146(4):808-812. doi:10.1016/j.jaci.2020.07.018
52. Colaneri M, Novelli V, Cutti S, et al. The experience of the health care workers of a severely hit SARS-CoV-2 referral Hospital in Italy: incidence, clinical course and modifiable risk factors for COVID-19 infection. *J Public Health (Oxf)*. 2021;43(1):26-34. doi:10.1093/pubmed/fdaa195
53. Petrilli CM, Jones SA, Yang J, et al. Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: prospective cohort study. *BMJ*. 2020;369:m1966. doi:10.1136/bmj.m1966
54. van Gerwen M, Alsen M, Little C, et al. Risk factors and outcomes of COVID-19 in New York City; a retrospective cohort study. *J Med Virol*. 2021;93(2):907-915. doi:10.1002/jmv.26337
55. Holshue ML, DeBolt C, Lindquist S, et al. First Case of 2019 Novel Coronavirus in the United States. *N Engl J Med*. 2020;382(10):929-936. doi:10.1056/NEJMoa2001191
56. Ebinger JE, Achamallah N, Ji H, et al. Pre-existing traits associated with Covid-19 illness severity. *PLOS ONE*. 2020;15(7):e0236240. doi:10.1371/journal.pone.0236240
57. Suleyman G, Fadel RA, Malette KM, et al. Clinical Characteristics and Morbidity Associated With Coronavirus Disease 2019 in a Series of Patients in Metropolitan Detroit. *JAMA Netw Open*. 2020;3(6):e2012270. doi:10.1001/jamanetworkopen.2020.12270
58. Alamri F, Alsofayan Y, AlRuthia Y, et al. Predictors of Hospitalization Among Older Adults with COVID-19 in Saudi Arabia: A Cross-Sectional Study of a Nationally Representative Sample. *Risk Manag Healthc Policy*. 2021;14:875-886. doi:10.2147/RMHP.S294786
59. Bergman J, Ballin M, Nordström A, Nordström P. Risk factors for COVID-19 diagnosis, hospitalization, and subsequent all-cause mortality in Sweden: a nationwide study. *Eur J Epidemiol*. 2021;36(3):287-298. doi:10.1007/s10654-021-00732-w
60. Price-Haywood EG, Burton J, Fort D, Seoane L. Hospitalization and Mortality among Black Patients and White Patients with Covid-19. *N Engl J Med*. 2020;382(26):2534-2543. doi:10.1056/NEJMsa2011686
61. Patel AP, Paranjpe MD, Kathiresan NP, Rivas MA, Khera AV. Race, socioeconomic deprivation, and hospitalization for COVID-19 in English participants of a national biobank. *Int J Equity Health*. 2020;19(1):114. doi:10.1186/s12939-020-01227-y
62. Yancy CW. COVID-19 and African Americans. *JAMA*. 2020;323(19):1891-1892. doi:10.1001/jama.2020.6548
63. Hillyar CR, Nibber A, Jones CE, Jones MG. Fatality Rate and Survival Time of Laboratory-Confirmed COVID-19 for Patients in England During the First Wave of SARS-CoV-2 Infection: A Modelling Study. *Cureus*. 2021;13(8):e16899. doi:10.7759/cureus.16899
64. Olowe OA, Adeagbo O, Olaitan PB, et al. Time-to-survival from COVID-19 disease and its associated factors in Osun State, Nigeria. *Infect Disord Drug Targets*. 2023. doi:10.2174/1871526523666230613122108
65. Mimkes J, Janssen R. *Positive Rates Predict Death Rates of Covid-19 Locally and Worldwide 13 Days Ahead*. 2020.
66. Mollazehi M, Mollazehi M, Abdel-Salam A-SG. *Modeling Survival Time to Recovery from COVID-19: A Case Study on Singapore*. 2020.
67. YAVUZ M, SEZEROL MA. The vaccination characteristics and mortal causes analysis of COVID-19 deaths at a district level. *Journal of Medicine and Palliative Care*. 2023;4(2):145-150. doi:10.47582/jompac.1255788
68. DeNucci G, Wilkinson T, Sverdloff C, et al. Inhaled nebulised unfractionated heparin (UFH) for the treatment of hospitalised patients with COVID-19: A randomised controlled pilot study. *Pulm Pharmacol Ther*. 2023;80:102212. doi:10.1016/j.pupt.2023.102212
69. Boka A, Tadesse A, W/Yohannes G, Hussein K. Survival status and predictors of mortality among COVID-19 patients admitted to intensive care units at COVID-19 centers in Addis Ababa, Ethiopia: a retrospective study. *Ann Med Surg (Lond)*. 2023;85(6):2368-2378. doi:10.1097/MS9.0000000000000803
70. Shams F, Abbas A, Khan W, Khan US, Nawaz R. A death, infection, and recovery (DIR) model to forecast the COVID-19 spread. *Comput Methods Programs Biomed Update*. 2022;2:100047. doi:10.1016/j.cmpbup.2021.100047
71. Sun Y-J, Feng Y-J, Chen J, Li B, Luo Z-C, Wang P-X. Clinical Features of Fatalities in Patients With COVID-19. *Disaster Med Public Health Prep*. 2021;15(2):e9-e11. doi:10.1017/dmp.2020.235
72. Hosseini MM, Majidpour F, Ahmadinia H, Mortazavi SM, Mosavifard SM, Rezaeian M. *Characteristics and Subgroup Analysis of Risk Factors Associated with in-Hospital Mortality Among COVID-19 Patients: A Retrospective Cohort Study*. 2022.

73. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet*. 2020;395(10229):1054-1062. doi:10.1016/S0140-6736(20)30566-3
74. Verity R, Okell LC, Dorigatti I, et al. Estimates of the severity of coronavirus disease 2019: a model-based analysis. *Lancet Infect Dis*. 2020;20(6):669-677. doi:10.1016/S1473-3099(20)30243-7
75. Pooya Parvizi, Milad Jalilian, Hana Parvizi, Sara Amiri, Hamidreza Mohammad Doust. The COVID-19 Pandemic: Data Analysis, Impacts and Future Considerations. *Iran-J-Med-Microbiol*. 2021;15(1):1-17. doi:10.30699/ijmm.15.1.1
76. Ali Akbar Haq Dost, Ehsan Mustafavi, Nilofer Pikri, Senate Faulty, Hamid Sharifi. Trend of the COVID-19 Pandemic in IRAN. *ijhp*. 2020;4(1):14-19. http://ijhp.ir/article-1-183-en.html
77. Jefferson T, Dooley L, Ferroni E, et al. Physical interventions to interrupt or reduce the spread of respiratory viruses. *Cochrane Database Syst Rev*. 2023;1(1):CD006207. doi:10.1002/14651858.CD006207.pub6
78. Burch Jane HJ. What are the effects of multimodal campaigns to improve hand hygiene of healthcare workers? *Cochrane Clinical Answers*. 2020. doi:10.1002/cca.2686
79. Note from the editors: World Health Organization declares novel coronavirus (2019-nCoV) sixth public health emergency of international concern. *Euro Surveill*. 2020;25(5). doi:10.2807/1560-7917.ES.2020.25.5.200131e
80. Verity R, Okell LC, Dorigatti I, et al. Estimates of the severity of coronavirus disease 2019: a model-based analysis. *Lancet Infect Dis*. 2020;20(6):669-677. doi:10.1016/S1473-3099(20)30243-7
81. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet*. 2020;395(10229):1054-1062. doi:10.1016/S0140-6736(20)30566-3
82. Cohen K, Leshem A. Suppressing the impact of the COVID-19 pandemic using controlled testing and isolation. *Scientific Reports*. 2021;11(1):6279. doi:10.1038/s41598-021-85458-1
83. Razia Malmir, Ali Maher, Rahela Taghiani, Mohammad Saleh Safari. COVID-19 Crisis Management: Reengineering the Health Care System in Iran. *jmciri*. 2020;38(1):11-18. http://jmciri.ir/article-1-2978-en.html
84. National Institute of Health Research Around Iran. *Can a CT Scan of the Lungs of Patients with Suspected Coronary Artery Disease Be Used as a Reliable Diagnostic Test? National Institute of Health Research Around Iran*. 2021. https://nih.tums.ac.ir/Item/790
85. Deputy for Government Affairs. *Collection of Approvals of the National Corona Headquarters*; 2020. http://imed.ir/userfiles/files/23/15994659006533380 0.pdf.
86. Mohammad Ismail Jasbi A, Ansari. Jomeh prayers and its role in governing society. *Journal of Applied Sociology*. 1997:71-88.
87. Mohammad Mehdi Masoudi. Ghadr night. *Health Science*. 2005;10(2-1 (36-35)):199-210. https://www.sid.ir/fa/journal/ViewPaper.aspx?id=544 40
88. Mohammad Rajabi, Reza Dost Dar. Goals and characteristics of "Quds Day" in Imam Khomeini's political thought. *Islamic Insight and Education*. 1400;18(57 #r001611):9-29. https://www.sid.ir/fa/journal/ViewPaper.aspx?id=570 548
89. Mahmud Khalegh verdi. Jihad with the soul is the highest example of "Qurban. *Zaer*. 2017;24(255):64-65.
90. Hamid Bohloli. National Headquarters for Combating Coronavirus. *Shargh*. Published 2020:1. Accessed October 6, 2023. https://www.sharghdaily.com/fa/tiny/news-810336.
91. Fattahi Z, Mohseni M, Beheshtian M, et al. Disease Waves of SARS-CoV-2 in Iran Closely Mirror Global Pandemic Trends. *Arch Iran Med*. 2022;25(8):508-522. doi:10.34172/aim.2022.83
92. World Health Organization, *EVIDENCE POLICY IMPACT: WHO Guide for Evidence-Informed Decision-Making;* 2021.

Appendix 1

Abbreviation	
COVID-19	Coronavirus Disease Identified in 2019
OCNHCC	Operational Centre for National Headquarters to Combat Corona
NHCC	National Headquarters to Combat Corona
GI	Government Intervention
4T	4 (Timing, Testing, Tracing, Treatment
NPIs	Non-Pharmaceutical Interventions
LES	Logistic, Economic and Security Interventions
Ro	Basic Reproduction Number
MOH&ME	Ministry of Health and Medical Education
PCR	Polymerase Chain Reaction
ISNA	The Iranian Student News Agency
IRNA	The Islamic Republic News Agency
BBC	The British Broadcasting Corporation
PANA	Pupils Association News Agency
WHO	World Health Organization
PHEIC	Public Health Emergency of International Concern

Appendix 2

Table 1: Guide for categorizing occupations referred to in creating restrictions based on color coding of cities in managing the confrontation with COVID-19, (N209)

Occupational Group	Occupations Placed in the Group	Permission to Operate
Group One	1- Factories and production workshops, industrial and mining centers, agriculture, fisheries, slaughterhouses, public warehouses and cold storage	Allowed to operate in all counties, even in **Red** conditions
	2- Infrastructure and vital centers, water supply and distribution centers, electricity, gas, waste management, sewage and air conditioning and purification activities, refineries and fuel stations	
	3- Interurban public transportation of goods and passengers including rail, air, road and sea.	
	4- Car rental without a driver, public parking	
	5- Military, law enforcement, and security centers	
	6- Grocery stores, chain stores, supermarkets, fruit shops and greengrocers, fruit and vegetable squares	
	7- Production, storage, distribution and sale of protein products and related services	
	8- Dairy and bakery product production and supply centers (bakery products production)	
	9- Health, treatment, emergency and state and private ambulance supply centers and similar occupations	
	10- Pharmacies, veterinary centers and stores, drug distribution, herbal and traditional medicine and seed	
	11- Food and ready-to-eat food production, cooking and preparation centers, and only take-away (including all cold, hot, drinkable, ice cream and juice, dried fruits, pastry and similar occupations)	
	12- 12- Communication operators services, electronic services and postal activities	
	13- Internet service companies (including internet providers, online stores and internet-based service companies)	
	14- Print and online media and similar occupations	
	15- 15- Elderly care service centers, disabled, war veterans, rehabilitation and care centers and rest homes	

	16- Repair shops for various vehicles, household appliances, electrical, electronic, computer, installation, all technical services and car wash	
	17- Stores of various parts, spare parts, electrical, electronic, hunting, agricultural and installation accessories and other necessary production requirements	
	18- Stores of various building materials such as plaster, cement, ceramics, pipes and fittings), steel products (iron and aluminum) and specialized passages such as tires, spare parts, hardware, computer (except clothing, bags, shoes and mobile) and hardware	
	19- Industrial and construction workshops (such as welding and turning and the like)	
	20- LithoFigurey, typing and duplication and related technical offices, advertising offices, paper and cardboard sellers	
	21- Dry cleaners	
	22- Medical glasses sales centers	
	23- Sale of decorative and natural flowers and plants	
	24- Safety and fire-fighting equipment stores	
	25- Car Cinema / Car Theater	
	26- Accommodation centers (including hotels, motels, guesthouses, pensions and similar occupations)	
	27- Chemical materials stores with industrial and agricultural uses	
	28- Activities of national teams and affiliated leagues in various fields	
	29- Food and necessities for domestic animals, veterinary necessities and equipment	

Group Two	1- Gardens and recreational centers	Authorized to operate in cities with **Orange** status
	2- Covered passages and enclosed markets, large shopping and sales centers, and temporary markets (daily and local markets)	
	3- Sales of various types of vehicles, motorcycles, and bicycles	
	4- Vehicle registration centers	
	5- Men's and women's beauty salons	
	6- Cosmetics and hygiene product sales centers	
	7- Carpet and rug sales centers, floor coverings, home appliances, mattresses, blankets and bed covers, towels and bed sheets, curtain fabrics, furniture and related supplies (office-home), chandeliers and lights, cabinets, doors and windows, air conditioning units, handicrafts, interior building decorations	
	8- Gift sales centers, toys and amusement items, stationery, utensils (ceramic, crystal, plastic, glassware, melamine), stationery, books and magazines, cultural and educational products, engineering and surveying equipment	
	9- Apparel sales centers, including bags and shoes, leather and leather crafts, knitting and sewing supplies	
	10- PhotoFigurey studios and film recording services	
	11- Real estate consulting agencies	
	12- Food preparation, distribution, and cooking centers, cafés accepting customers (including all categories of cold, hot, beverages, ice cream, fruit juices, nuts, pastries)	
	13- Disposable utensils	
	14- Ornamental bird and fish sellers	
	15- Hunting and fishing tools and equipment	

	16- Fitness and sports equipment and supplies stores	
	17- Sellers of gold, jewelry, silver, precious stones, trinkets, and watches	
	18- Building, industrial and automotive paints	
	19- Rental supplies including utensils, chairs, tables, and other necessities	
	20- Hardware and fittings, locks, keys, and weighing tools	
	21- Sales of second-hand goods and brokerage	
	22- Driving schools	

Group Three	1- Reception halls	Authorized to operate in cities with **Yellow** status
	2- Indoor pools and sports clubs	
	3- Teahouses and coffee houses without tobacco offerings (these venues are closed throughout all hours of the day and night)	
	4- Music and language schools with a maximum of 10 attendees	
	5- Museums, cinemas, theaters	
	6- Kindergartens	

Group Four	1- Zoos and game cities	Authorized to operate in cities with **Blue** status
	2- Water recreation centers	
	3- Game-nets	

Appendix 3

The selected sources of relevant policy evidences from the media for the purpose of right-wing validation

N1- https://www.president.ir/fa/118001
N2- https://irna.ir/xjxmd6
N3- https://www.bbc.com/persian/iran-features-51815296
N4- https://www.isna.ir/news/98110302167/
N5- https://www.isna.ir/news/98110201420/
N6- https://www.isna.ir/news/98110705455/
N7- https://www.isna.ir/news/98112216431/
N8- https://www.isna.ir/news/98110603741/
N9- https://www.isna.ir/news/98110704829/
N10- https://www.isna.ir/news/98112216431/
N11- https://www.isna.ir/news/98111107430/
N12- https://www.isna.ir/news/98111107432/
N13- https://www.isna.ir/news/98110503347/
N14- https://www.isna.ir/news/98110705086/
N15- https://www.isna.ir/news/98110806036/
N16- https://www.isna.ir/news/98111107243/
N17- https://www.isna.ir/news/98110906385/
N18- https://www.isna.ir/news/98110906580/
N19- https://www.isna.ir/news/98110805818/
N20- https://www.isna.ir/news/98110805689/
N21- https://www.isna.ir/news/98111107138/
N22- https://www.isna.ir/news/98111107102/
N23- https://www.isna.ir/news/98111107430/
N24- https://www.isna.ir/news/98111511123/
N25- https://www.isna.ir/news/98111207764/
N26- https://www.isna.ir/news/98111308719/
N27- https://www.isna.ir/news/98111410142/
N28- https://www.isna.ir/news/98112216431/
N29- https://www.isna.ir/news/98111208401/
N30- https://www.isna.ir/news/98111309396/
N31- https://www.isna.ir/news/98111308826/
N32- https://www.isna.ir/news/98112518442/
N33- https://www.isna.ir/news/98110704627/

N34- https://www.isna.ir/news/98110705310/
N35- https://www.isna.ir/news/98111611939/
N36- https://www.isna.ir/news/98111208376/
N37- https://www.isna.ir/news/98111107169/
N38- https://www.isna.ir/news/98111207686/
N39- https://www.isna.ir/news/98111913704/
N40- https://www.isna.ir/news/98113022881/
N41- https://www.isna.ir/news/98111207585/
N42- https://www.isna.ir/news/98111309286/
N43- https://www.isna.ir/news/98112316758/
N44- https://www.isna.ir/news/98112316877/
N45- https://www.isna.ir/news/98111510396/
N46- https://www.isna.ir/news/98111207686/
N47- https://www.isna.ir/news/99040403081/
N48- https://www.isna.ir/news/98120100192/
N49- https://www.isna.ir/news/98120100232/
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N51- https://www.isna.ir/news/98120200501/
N52- https://www.isna.ir/news/98113022952/
N53- https://www.isna.ir/news/98120100328/
N54- https://www.isna.ir/news/98120100353/
N55- https://www.isna.ir/news/98120200499/
N56- https://www.isna.ir/news/98120201544/
N57- https://www.isna.ir/news/98120302424/
N58- https://www.isna.ir/news/98120302419/
N59- https://www.isna.ir/news/98120302457/
N60- https://www.isna.ir/news/98120403260/
N61-http://shabestan.ir/detail/News/898203
N62-https://www.khabaronline.ir/amp/1360048/
N63- http://fdn.ir/47806
N64- https://hamshahrionline.ir/x69GL
N65- https://entekhab.ir/002E8e
N66- https://irna.ir/xjxmTQ
N67- https://khabaronline.ir/news/1357183
N68- https://www.isna.ir/news/98121512162/
N69- http://fna.ir/dfju4c
N70- https://www.isna.ir/news/98120504029/
N71- https://www.isna.ir/news/98120906959/
N72- https://www.isna.ir/news/98120806653/
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N74- https://www.isna.ir/news/98120906992/
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N83- https://www.isna.ir/news/98121612439/
N84- https://www.isna.ir/news/98121612635/
N85- https://www.isna.ir/news/98122015515/
N86- https://www.isna.ir/news/98122418281/
N87- https://www.isna.ir/news/98122922412
N88- https://www.isna.ir/news/98120806521/
N89- https://www.isna.ir/news/98122217260
N90- https://irna.ir/xjxyTr
N91- https://www.isna.ir/news/99010100210/
N92- https://www.isna.ir/news/98122922499/
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N108- https://www.isna.ir/news/99011005096/
N109- https://www.isna.ir/news/99013118254/
N110- http://www.ebtekarnews.com/?newsid=155925
N111- http://www.khorasannews.com/newspaper/page/20350/1/693259/0
N112- http://www.eghtesadnegar.ir/fa/tiny/news-11664
N113- https://www.isna.ir/news/99021308968/
N114- https://www.isna.ir/news/99013118751/
N115- https://www.isna.ir/news/99012917256/
N116- https://www.isna.ir/news/99012716240/
N117- https://www.isna.ir/news/99012615524/
N118- https://www.isna.ir/news/99020100167/
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N125- https://www.isna.ir/news/99021108093/
N126- https://www.iribnews.ir/00Buh8
N127- https://www.isna.ir/news/99022215714/
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N136- https://www.isna.ir/news/99030100594/
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N163- https://www.isna.ir/news/99050906718/
N164- https://www.isna.ir/news/99042317174/

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N185- https://www.isna.ir/news/99061712276/
N186- https://www.ilna.news/fa/tiny/news-962665
N187- http://pana.ir/news/1120252
N188- https://www.jamaran.news/fa/tiny/news-1467905
N189- https://www.isna.ir/news/98122821855/
N190- https://www.isna.ir/news/99070907004/
N191- https://www.isna.ir/news/99071208435/
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N193- https://www.isna.ir/news/99071209124/
N194- https://www.isna.ir/news/99071813396/
N195- https://www.irna.ir/xjBxPY
N196- https://www.isna.ir/news/99071309525/
N197- https://www.isna.ir/news/99072317405/
N198- https://www.iribnews.ir/00C12e
N199- https://www.isna.ir/news/99071712861/
N200- https://www.isna.ir/news/99071511645/
N201- https://www.isna.ir/news/99071208493/
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N205- https://www.isna.ir/news/99071913649/
N206- https://www.isna.ir/news/99071913828/
N207- https://www.isna.ir/news/99072719827/
N208- https://www.irna.ir/news/84571436
N209- https://www.isna.ir/news/1400012010207/

Declarations

I confirm that this manuscript submitted to a Medical Research Archives journal is an original and the manuscript, or substantial parts of it, is not under consideration by any other journal.

Ethics approval and consent to participate: Not Applicable

Consent for publication: Not applicable

Availability of data and materials:

- The datasets generated and/or analysed during the current study are publicly available on the Ministry of Health and Medical Education of Iran's website repository, [http://www.webda.ir]. All policy news items can be accessed from various media websites as follows and addressed in the footnote of the article.

- IRNA news Agency, Available from https://www.irna.ir/
- ILNA (Iranian Labour News Agency), Available from https://www.ilna.ir/en/
- IRIB news Agency (Seda and Sima), Available from https://www.iribnews.ir/
- Available from https://www.jamaran.news/
- Available from http://www.eghtesadnegar.ir/
- Available from https://www.farsnews.ir/
- Available from https://www.hamshahrionline.ir
- Available from https://www.entekhab.ir
- Available from https://www.khabaronline.ir

- Available from https://ebtekarnews.com/
- Available from http://khorasannews.com/
- Available from https://aftabnews.ir/
- Available from https://fa.shafaqna.com/
- Available from http://shabestan.ir/
- Available from https://www.pana.ir/
- Available from https://www.bbc.com/persian
- Tasnim News Agency, Available from http://www.tasnimnews.com/
- MagIran Information Bank of the Country's Publications, Available from https://www.magiran.com/
- Etemad Newspapaer, Available from http://www.etemadnewspaper.ir/
- Iran Newspaper, Available from https://irannewspaper.ir/
- JameJam Newspaper, Available from https://www.jamejamdaily.ir/
- Donya_e_Eghtesad Newspaper, Available from https://donya-e-eqtesad.com/
- Resalat Newspaper, Available from https://resalat-news.com/
- Shargh Newspaper, Available from https://www.sharghdaily.com/
- Farhikhteghan Newspaper, Available from http://fdn.ir
- Kayhan Newspaper, Available from http://www.kayhan.ir/

- The datasets during and/or analysed during the current study still are available from the corresponding author on reasonable request.
- All policy news generated or analyzed in this study, are drawn from 209 media links, serving as the primary news resources. These links, referenced throughout the article to support our findings and discussion, are meticulously detailed in Appendix 3. Each link, from N1 to N209, is provided as a clickable resource in the supplementary files, ensuring easy access and transparency of the data underpinning our analysis.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

HB designed and supervised the study, conceptualized the methodology, created visualizations, managed the project, analyzed data, and wrote the original draft in Persian. Additionally, HB reviewed the relevant literature, prepared the English draft, edited all content and figures, and reviewed, edited, and submitted the final draft. ZAN assisted in project administration, reviewed the literature, collected and analyzed data, and created visualizations. ZAN also translated figures, wrote the original draft in Persian, and reviewed and commented on the final draft. HG collected data, contributed to writing the initial draft in Persian, translated figures, and read and confirmed the final draft. AAB reviewed and revised the English draft, edited all content, reviewed the latest literature, and edited the final draft. All authors have read and approved the final version of the manuscript.

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Corresponding author information

Dr Hamid Bohloli, a physician and scholar, holds a Master's in Social Research and a PhD in Political Science and Public Policy from the School of Political Science, University of Manchester, UK. A thinker and theorist in the realm of public policy and Iranian social policies, he is renowned for his innovative theories on social energy, metric government, and Health sovereignty. As an academic, he has contributed to a range of publications, including "Public Policy, Social and Health Policy" and other scholarly articles in health politics research.

Dr. Bohloli's innovative approach has revolutionized the structure of Ministry of Health and Medical Education in Iran. He played a pivotal role in designing the Operational Centre for the National Headquarters to Combat Coronavirus and developing a published Sin-Wave Coronavirus Protection model to decrease incidence and mortality rates. Renowned globally for his influential insights on health policy, he has spearheaded the design and implementation of policy-making courses for policymakers in Iran and other Persian-speaking countries

Dr Bohloli holds a position as a Visiting Professor at the Faculty of Management, University of Tehran, offering his expertise as a consultant to policy-making centres in Europe and Iran including the Secretariat of the Supreme Council for Health and Food Security (SSCHF) in Iran. His contributions to global academia include numerous articles published in esteemed international journals. In his capacity as the focal point for the Sustainable Development Goals (SDGs) in Iran's health sector, he has prepared reports for the World Health Organization (WHO) and led the design of Iran's essential and national health indicators, further attesting to his significant contributions in the field.

[i] Simultaneously with the peak of the third wave of Coronavirus infection in Iran and by strong recomendation of Ayatollah Khamenei, the supreme leader of Iran, **OCNHCC** to deal with COVID-19 was formed on November 6, 2019 (15th of Aban, 1398). The establishment of this camp was aimed at using all the capacities in the country, both government and private, military and police forces, and non-governmental organizations, to deal with the coronavirus. This OCNHCC became the focus of monitoring the implementation of all the resolutions announced by NHCC to fight against Corona. The formation of this camp was to compensate for a shortcoming that President Rouhani pointed out when forming the camp: "One of the important issues that we had in the past as one of the shortcomings was that critical and good resolutions were approved and communicated here. It could be done, but it was not performed well, accurately, or at all (N1).
[ii] IRNA news Agency, Available from https://www.irna.ir/
[iii] ILNA (Iranian Labour News Agency), Available from https://www.ilna.ir/en/
[iv] IRIB news Agency (Seda and Sima), Available from https://www.iribnews.ir/
[v] Available from https://www.jamaran.news/
[vi] Available from http://www.eghtesadnegar.ir/
[vii] Available from https://www.farsnews.ir/
[viii] Available from https://www.hamshahrionline.ir
[ix] Available from https://www.entekhab.ir
[x] Available from https://www.khabaronline.ir
[xi]Available from https://ebtekarnews.com/
[xii]Available from http://khorasannews.com/
[xiii]Available from https://aftabnews.ir/
[xiv]Available from https://fa.shafaqna.com/
[xv]Available from http://shabestan.ir/
[xvi]Available from https://www.pana.ir/
[xvii]Available from https://www.bbc.com/persian
[xviii] This researcher-made form contains the date of publication of the news, the announcer of the news, the sentences related to the purpose of the research in the text of the news and the link to access that news.
[xix] In the solar calendar, a week starts on Saturday and ends on Friday.
[xx] This researcher-made form contained the time frame for announcing interventions (on a weekly basis) and the interventions announced in the week under review.
[xxi] Tasnim News Agency, Available from http://www.tasnimnews.com/
[xxii] MagIran, Information Bank of the Country's Publications, Available from https://www.magiran.com/
[xxiii] Etemad Newspapaer, Available from http://www.etemadnewspaper.ir/
[xxiv] Iran Newspaper, Available from https://irannewspaper.ir/
[xxv] JameJam Newspaper, Available from https://www.jamejamdaily.ir/
[xxvi] Donya_e_Eghtesad Newspaper, Available from https://donya-e-eqtesad.com/
[xxvii] Resalat Newspaper, Available from https://resalat-news.com/
[xxviii] Shargh Newspaper, Available from https://www.sharghdaily.com/
[xxix] Farhikhteghan Newspaper, Available from http://fdn.ir
[xxx] Kayhan Newspaper, Available from http://www.kayhan.ir/

[xxxi] http://www.webda.ir/
[xxxii] "NHCC" is an organization that was established in late February 2020 (early March 2020) following the spread of the Coronavirus in Iran with the approval of the Supreme National Security Council and the approval of the leader of Iran. All decisions regarding the necessary measures to deal with the COVID-19 disease, including the announcement of closures, were made in this headquarters (See news N2, N3 at the Appendix III).
[xxxiii] 30th Bahman 1398
[xxxiv] Azar 138
[xxxv] End of Day 1398
[xxxvi] 6th Bahman 1398
[xxxvii] Second week of Bahman 1398
[xxxviii] 11st Bahman 1398
[xxxix] 25th to 31st of Bahman, 1398
[xl] 10th of Bahman, 1398
[xli] 11th of Bahman, 1398
[xlii] In the wake of the widespread outbreak of this new virus, the Iranian government decided last Friday to halt flights between China and Iran. However, afterwards, flights between Iran and China, under the pretext of repatriating Iranian nationals, continued unabated until Wednesday, February 4th (15th Bahman). Yet, a video provided to ISNA appears to show that direct flights from China to Iran are ongoing, but without Chinese passengers. Although, an update has yet to be given regarding the status of other direct flights by this company to other Chinese cities and the transit flights of different airlines that are in doubt between Iran and China. According to the flight schedule of Imam Khomeini Airport City Company, on Wednesday, February 4th (15th Bahman), two flights were registered to the Chinese cities of "Wuhan" and "Guangzhou". The "Wuhan" flight took off at 8:07 am, and the second flight departed Tehran for Guangzhou at 9:10 pm. Furthermore, three incoming flights landed at Imam Khomeini Airport on Wednesday morning from the cities of Beijing, Shanghai, and Shenzhen, respectively, at 4:18 am, 4:36 am, and 4:53 am, all operated by Mahan Air (N24).
[xliii] The third week of Bahman 1398
[xliv] The 190-call system is based in the MOH&ME of Iran, to which reports and complaints about various health violations are reported. At the beginning of the COVID-19 in this system, the infectious disease consultation section of the 190-call system was launched to answer people's questions about COVID-19. In this way, the people and the health system employees could share their questions with the relevant experts around the clock (author).

[xlv] At the same time, in America, the United States Center for Disease Control evaluated hand washing as more effective than wearing a mask. It announced that wearing a mask is not recommended for Americans (N46).
[xlvi] 30th of Bahman, 1398
[xlvii] The Minister of Health of Iran announced five months after the start of the coronavirus epidemic in Iran: "Some people may say that the coronavirus was present in the country from November 2019 (Azar Mah 1398) for which I must say I have documents that I will present. All samples of respiratory diseases that occurred in October, November, and December (Aban, Azar and Day 1398) across the country, especially in Qom and Gilan, were examined with the PCR test at the Pasteur Institute and the School of Public Health at Tehran University of Medical Sciences. Only 4 cases out of those tested positive, which were after February 12, 2020 (Bahman 23rd in the Iranian calendar)"(N47).
[xlviii] 30th Bahman 1398
[xlix] 1st of Esfand, 1398
[l] 2nd of Esfand, 1398
[li] Seven people in Qom, four in Tehran, two in Gilan and one in Arak (N50)
[lii] Majleseh Shourayeh Eslami (In Persian)
[liii] 30th of Bahman, 1398
[liv] At first, in Iran, temperature measurement was done in airports, intercity bus terminals and train stations by an operator using electronic thermometers, which drew many criticisms from the media to how it was done (N64, N65).
[lv] 1st to 7th of Esfand, 1398: It gradually started from the second day of the month and has not occurred simultaneously in all cities and regions.
[lvi] It has been gradually carried out and has not happened simultaneously in all cities and regions.
[lvii] Officials from the MOH&ME disapproved the request to quarantine infected cities as the caretakers of public health. For example, at this time, one of the members of the NHCC of Iran's appointed by the Minister of MOH&ME referred to quarantine as a medieval practice, and the deputy of the MOH&ME expressed disbelief in the implementation of quarantine, calling it something from the time of World War I (N66, N67).
[lviii] 15th Esfand 1398
[lix] Late Bahman 1398
[lx] Early Farvardin 1399
[lxi] The weekly average index of daily infections is obtained by dividing the total number of people who tested positive for coronavirus per week by the number of days.

[lxii] Sometimes decisions related to banning the entry of passengers led to tensions. For example, in the first week of March 2020 (mid-March 2020), with the increase in the number of infected people in Mazandaran province (a touristic province between the mountains and the sea with pleasant weather), the National Corona Headquarters announced a ban on the entry of travellers to this province and all the communication routes of this province were blocked for vehicles except rescue, law enforcement vehicles and those carrying food and fuel. However, passengers travelled to this province due to the closure of educational centres. At first, travellers were prevented from entering this province. However, after a whole day, the communication routes of this province were reopened for travellers by the president's direct order. This action brought protests and strong reactions from the people in some cities of Mazandaran province; even a group of people from Amol city tried to block the entrance to this city, and finally, the police chief of this city, despite the national order to reopen, the entrance to the city He blocked this city with his responsibility (N69).
[lxiii] 30th Bahman 1398
[lxiv] In a video message dated March 20, 2020, the Minister of Health stated, "Regrettably, the diagnostic test kits were sent to us by the World Health Organization and other regions many weeks after the disease had already established itself in our country. My colleagues at the Pasteur Institute and Tehran University of Medical Sciences prepared the diagnostic kits while on the other hand, suspicious cases coming from other countries in the early days were also being tracked" (N91).
[lxv] From March 28, 2020, ninety laboratories in all thirty-one provinces of the country became capable of performing diagnostic tests on a daily basis [83] .
[lxvi] In the second week (5th - 12th) of Farvardin, 1399
[lxvii]The head of the Iranian Chamber of Guilds stated in an interview with ISNA on March 21, 2020 (01/02/1399): "Despite the president's order to the Minister of Interior on the first day of Farvardin for the closure of markets, malls, and commercial centres until April 3, 2020 (15 Farvardin 1399), field observations indicate the continued activity of these centres." (N93).
[lxviii] First week of Farvardin 1399
[lxix] The social distancing plan considered the following measures: allowing only locals to enter their city, banning non-natives from entering cities, closing all gathering centres, schools, and universities, running offices with one-third of employees, closing craft units except for essential service providers, banning any formal or informal ceremonies, imposing restrictions on travel by public transportation, controlling city exit points for symptoms, stopping and fining vehicles violating the coronavirus regulations for one month and sealing craft units violating coronavirus regulations for one month (N102, N103).
[lxx] In Iran, with the onset of the new solar Hijri year, there are official holidays for five days. During these holidays, many travels to different cities to visit relatives or see historical, pilgrimage, and recreational facilities. In the seventh session of the NHCC on 07/03/2020, a strategy was approved to warn and persuade people to reduce Nowruz (Iranian New Year) travels ([85]).
[lxxi] In the third week of Farvardin 1399
[lxxii] However, in a decision contrary to the goals of social distancing, the time interval between the movements of Tehran's intra-city trains increased. With the decision of the Tehran province Coronavirus committee to reduce the provision of public transportation services, the frequency of the Tehran-Karaj metro line increased to one hour, and the remaining metro lines also increased their train intervals to 15 minutes (N108).
[lxxiii] The results of an ISPA poll of people at this time regarding the prioritization of reopenings were as follows: 32.9% for commercial and shopping centres, 32.6% for religious places and shrines, 29.1% for gyms, swimming pools and stadiums, 21.2% for Friday and congregational prayers, 19% for parks and recreational centres, 15.6% for restaurants and cafes, 11.9% for beauty clinics and hairdressers, 7.4% for cinemas, theatres and concerts N109.
[lxxiv]The Last week of Farvardin to the first week of Ordibehesht 1399.
[lxxv] In Iran, occupations were divided into essential, low-risk, and high-risk while explaining the interventions for managing the COVID-19 disease. Essential occupational units provide people's necessary needs and are obliged to provide services. These units include people's necessities chain stores, supermarkets, fruit and vegetable stores, protein and dairy product sales centres, bakeries, fast

food preparation centres, fuel stations, building and vehicle technical services, health and treatment centres, veterinary centres, drug and food distribution, pharmacies and ambulance supply centres. High-risk occupational units refer to jobs that, due to the contact between occupational unit employees with customers or customers with each other or the type of space of the occupational unit, there is a high probability of transmission of the coronavirus. These jobs include men's and women's hairdressers, commercial complexes and covered central markets, driving schools, bathhouses, saunas and massages, exhibitions, recreational game centres and internet cafes, restaurants, receptions and ceremony halls, play centres, internet cafes, coffeehouses, teahouses, and terias, accommodations, hotels, swimming pools, saunas, massages, and bodybuilding and sports clubs. Other jobs were classified as low-risk occupations N110-N113.

[lxxvi] Ordibehesht 11, 1399 (May 1, 2020)

[lxxvii] In the formula of the Iranian MOH&ME, based on the population and the number of patients and the sick population whose corona test is positive, the colours of the cities were announced, and the necessary actions were taken according to each situation. Green: a region that has reported no new cases of COVID-19 in the past 28 days. Alternatively, we have at mostat most one positive case per 100,000 people.

White: A county is in a white (low-risk) situation if it meets both of the following conditions over the past two weeks: Condition 1: The average number of daily hospitalizations (per 100,000 population) in it should be a maximum of one, for example, in a county with a population of 200,000 people, there should be an average of two hospitalized patients per day on average. Condition 2: The average number of daily hospitalizations should be a maximum of one, meaning a maximum of 14 hospitalizations have occurred in the county over two weeks (including suspected and confirmed cases).

Yellow: One or more disease cases with PCR tests have been seen in the region, and the risk is expected. The number of new confirmed cases per 100,000 people should be 1 to 9.

Orange: The number of new confirmed cases with PCR tests should be 10 to 24 per 100,000 people, and the overall epidemic trend should rise.

Red: More than 25 cases per day per 100,000 population, and the rising epidemic trend. These colour codes and terminologies must be used correctly, and the necessary actions must be taken for each situation N126.

[lxxviii] The second week of Ordibehesht 1399 (April 2020)

[lxxix] Second week of Ordibehesht 1399

[lxxx] Muslims perform the Friday prayer weekly as a group in some religious places. The place of Friday prayer can be a mosque, mosque and other religious places ([86]).

[lxxxi] In Islam, three nights of the holy month of Ramadan (the 19th, 21st, 21st, and 23rd nights of Ramadan) are called Shab Qadr. On these nights, Muslims usually gather in religious places and worship God individually or in groups ([87].

[lxxxii] The third and fourth weeks of Ordibehesht 1399

[lxxxiii] The last Friday of Ramadan is known as Quds Day when people in some countries march and gather to support the Palestinian people ([88]).

[lxxxiv] Low-risk of contamination

[lxxxv] At noon on the day after the end of the holy month of Ramadan, Muslims usually gather in open spaces and perform the Eid al-Fitr prayer as a group. Usually, a place is considered for in every city, and everyone gathers there to hold prayers (author).

[lxxxvi] 13th to 19th of Tir, 1399

[lxxxvii] 1st to 7th of Tir, 1399

[lxxxviii] 8th to 14th of Tir, 1399

[lxxxix] 22nd to 28th of Tir, 1399

[xc] Eid al-Adha, or Feast of Sacrifice, is on the 10th of Dhu al-Hijjah and is one of the major Islamic holidays officially recognized in Iran. During this holiday, celebrations and religious ceremonies are held. Eid al-Adha prayer is conducted in religious places on this day ([89]).

[xci] The multi-layered monitoring system over trade unions was designed in such a way that, at first, public supervision took place through contact with system 190. In the next step, administrative supervision was carried out, centring around the MOH&ME. The one-week closure of violating units and the one-month sealing in case of repeated violations of not following coronavirus protocols were among the powers of the supervisory apparatuses N170.

[xcii] 2nd of Mordad 1399

[xciii] 29th of Tir, to 28th of Mordad, 1399

[xciv] The peak of Muharram mourning and mourning is done on the ninth day of Muharram, which is called Tasua, and the tenth day of Muharram, which is called Ashura. These two days are official holidays in Iran (author).

[xcv] 15th of Mordad to 28th of Mordad, 1399

[xcvi] 29th to 31st of Mordad, 1399

[xcvii] The first decade of Muharram (1st to 10th), the first month of the Hijri calendar. During these ten days, Muslims and especially Shiites mourn the martyrdom of Imam Hussain and his companions in the Karbala event by attending religious places and streets. (32) (33),

[xcviii] Two days of weekend holidays followed by two national holidays due to Taswa and Ashura, intercity travel increased significantly, which led to media criticism N180.

[xcix] 1st to 7th of Shahrivar, 1399

[c] 28th to 30th of Mehr, 1399

[ci] 29th to 31st of Mordad, 1399

[cii] 8th to 14th of Shahrivar, 1399

[ciii] 30th of Shahrivar, 1399

[civ] 1st to 7th of Mehr, 1399

[cv] 8th to 21st of Mehr, 1399

[cvi] 15th to 21st of Mehr, 1399

[cvii] 20th of Mehr, 1399.

[cviii] 22nd to 28th of Mehr, 1399

[cix] 15th to 28th of Mehr, 1399

[cx] 15th to 21st of Mehr, 1399
[cxi] 22nd to 28th of Mehr, 1399
[cxii] 27th of Mehr, 1399
[cxiii] The establishment of OCNHCC was in line with the urgent proposal on March 3, 2020, with the publication of the article "The National Operational Centre for Combat Corona " in the Shargh newspaper [90]. The impetus for proposing a COVID-19 command centre stemmed from the Health Ministry's incapability of controlling the wave of the COVID-19 pandemic, coupled with a severe surge in infections and the pandemic-induced fatalities in Iran. The need to establish a command-based operational centre pivoting around three axes: health, support, and security, was thus recommended. Following coordination with the author, this proposal was presented to the President by the Center for Strategic Studies of the Presidency. Ultimately, the approval and issuance of this directive took approximately nine months.
[cxiv] 6th of Aban, 1399.
[cxv] 24th to 30th of Dey, 1398
[cxvi] 30th of Bahman, 1398
[cxvii] 10th to 16th of Farvardin, 1399
[cxviii] Nowruz 1399
[cxix] 1st to 7th of Farvardin, 1399
[cxx] 10th of Farvardin, to 7th of Ordibehesht, 1399
[cxxi] 8th of Ordibehesht, to 19th of Khordad, 1399
[cxxii] 4th to 10th of Khordad, 1399
[cxxiii] 13th to 19th of Tir, 1399
[cxxiv] 10th to 12th of Mordad, 1399
[cxxv] 23rd to 29th of Mordad, 1399
[cxxvi] 2nd to 8th of Shahrivar, 1399
[cxxvii] 30th of Mordad to 5th of Shahrivar, 1399
[cxxviii] 6th to 12th of Shahrivar, 1399
[cxxix] 13th to 19th of Shahrivar, 1399
[cxxx] 21st to 30th of Shahrivar, 1399
[cxxxi] 8th to 21st of Mehr, 1399
[cxxxii] 22nd to 28th of Mehr, 1399
[cxxxiii] 15th to 21st to 28th of Mehr, 1399
[cxxxiv] 6th of Aban, 1399