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Healthy Policy Analysis

The Impact of COVID-19 on Healthcare Utilization in Turkey

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ABSTRACT

Objectives: This study investigates the impact of the COVID-19 pandemic on healthcare utilization in Turkey.

Methods: We utilized individual-level data derived from Turkish Statistical Institute's annual surveys between 2014 and 2022 and estimated probit regression models.

Results: We find that COVID-19 pandemic reduced healthcare utilization by 11.8% after taking into account a large set of background variables. Although our study finds that the elderly and those with health problems are more likely to use healthcare services under normal circumstances, the COVID-19 pandemic has caused notable drops in the healthcare utilization among the elderly (−6.5%) and those with health problems (−3.8%). Although those without health insurance had lower utilization of healthcare services before the pandemic, during the pandemic they were not particularly hit.

Conclusion: We conclude that the pandemic did not lower the healthcare utilization in Turkey because of the supply constraints. Also, the evidence points to the reduced demand due to the fear of contagion rather than financial concerns.

Keywords: COVID-19, elderly, health insurance, healthcare utilization, patients with preexisting conditions.

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Introduction

The COVID-19 pandemic has strained global healthcare systems, particularly by prioritizing COVID-19 cases over other healthcare needs.[1,2] This focus has led to disruptions in services for noncommunicable diseases,[3] contributing to unmet healthcare needs. Challenges such as high workloads, exposure risks of healthcare staff,[4] and staff shortages[5] have further affected healthcare capacity, exacerbated by a lack of hospital bed capacity.[6] These supply-side disruptions could affect people's access to healthcare services.

To address these constraints, countries, including the United States and some Organization for Economic Co-operation and Development countries, rapidly adopted telemedicine solutions.[7,8] Telehealth has helped restore healthcare utilization, especially for nonurgent concerns.[9] On the demand side, people became reluctant to seek routine healthcare because of virus exposure fears.[10,11]

Economic downturn from the pandemic led to financial strain.[12] In many countries, individuals lost their jobs or faced financial uncertainties, which could have affected their ability to access healthcare services.[13,14] This could be particularly impactful among individuals who do not have healthcare insurance.[15,16] It is known that individuals without health insurance often use healthcare services less,[15,16] potentially delaying their care because of concerns about out-of-pocket costs.[17,18] However, the pandemic have exacerbated the difficulties of uninsured individuals even further.[19] Studies from Jordan and Colombia highlight the economic burden on COVID-19 patients, especially for those using intensive care unit.[20,21] Thus, we aim at investigating the role of the COVID-19 pandemic on the individual's healthcare utilization by insurance status.

During the COVID-19 pandemic, several countries experienced a sharp reduction in healthcare utilization, including China,[22] India,[23] Italy,[24] South Korea,[25] Spain,[26] Taiwan,[10] the United Kingdom,[27] and the United States.[28] However, after the initial shock, some countries developed ways to deal with health system strain over time. Thus, some countries increased utilization rates to around normal activity.[29]

Multiple pandemic-related factors could affect healthcare utilization, especially among the elderly and those with preexisting conditions because the COVID-19 is known to cause more deaths among the elderly and those with comorbidities.[30] Studies found that elderly and those with comorbidities were particularly negatively affected from the pandemic.[31,32]

This study examines the impact of the COVID-19 pandemic on healthcare utilization in Turkey using a data set covering pre-pandemic (2014-2019), pandemic (2020-2021), and postpandemic (2022) years. Turkey's healthcare reforms between 2003 and 2013 make it a meaningful case study. These reforms were successful in improving patient's satisfaction with healthcare services[33,34] and reducing inequalities.[35,36]

Although previous studies in Turkey focused on early months and small data sets from a few hospitals.[37,38] To the author's knowledge, none of them addressed the case of uninsured

individuals. This is the first nationally representative analysis, including the uninsured.

Background of Turkey's Response to the COVID-19 Pandemic

With the first COVID-19 case seen on March 11, 2020, Turkey introduced strict lockdown measures, such as closure of all levels of schools.[39] Several nonpharmaceutical measures were implemented. The use of facial masks became mandatory,[40] which last for almost 2 years.

The first lockdown commenced on April 10, 2020, encompassing 30 metropolitan areas along with Zonguldak (the province with large prevalence of lung diseases). During this period, the public was instructed to leave their homes only for specific reasons, such as essential grocery shopping or work-related travel for those with special permissions. From April 10 until June 1, 2020, a series of lockdowns were enforced on weekends, national holidays, and religious holidays. However, it is worth noting that when these lockdowns were communicated to the public, it was not explicitly conveyed that individuals visiting hospitals were exempt from these restrictions, which could reduce demand for healthcare.

From the perspective of this study, it is especially important that in Turkey, people aged 65 years or above and those with chronic health conditions had been subject to continuous lockdown for 2 months.[41] During May and June, there was some relaxation of these tough measures for these groups.[42,43] But, in these circulars, it was not specified clearly what should the elderly and those with preexisting health conditions do if they had a healthcare need. Thus, we think this way of communicating the pandemic could particularly reduce the healthcare demand of the elderly and those with preexisting health conditions.

Another important policy is that COVID-19 testing and treatment was provided for free even for people without health insurance,[44] whereas non-COVID related healthcare was provided with the usual copayments for the insured and full cost to be paid by the patient for the uninsured.

Turkey started operating large-scale public hospitals known as "city hospitals" from 2017.[45] Although the efficiency of these hospitals are discussed,[46] they could have improved the number of hospital beds before the pandemic, which could increase the supply of healthcare services (see Fig. 1 for the supply of healthcare inputs).

Many public hospitals were declared as pandemic hospitals, and they provided healthcare services only to the COVID-19 patients,[47] which could be a supply-side barrier.

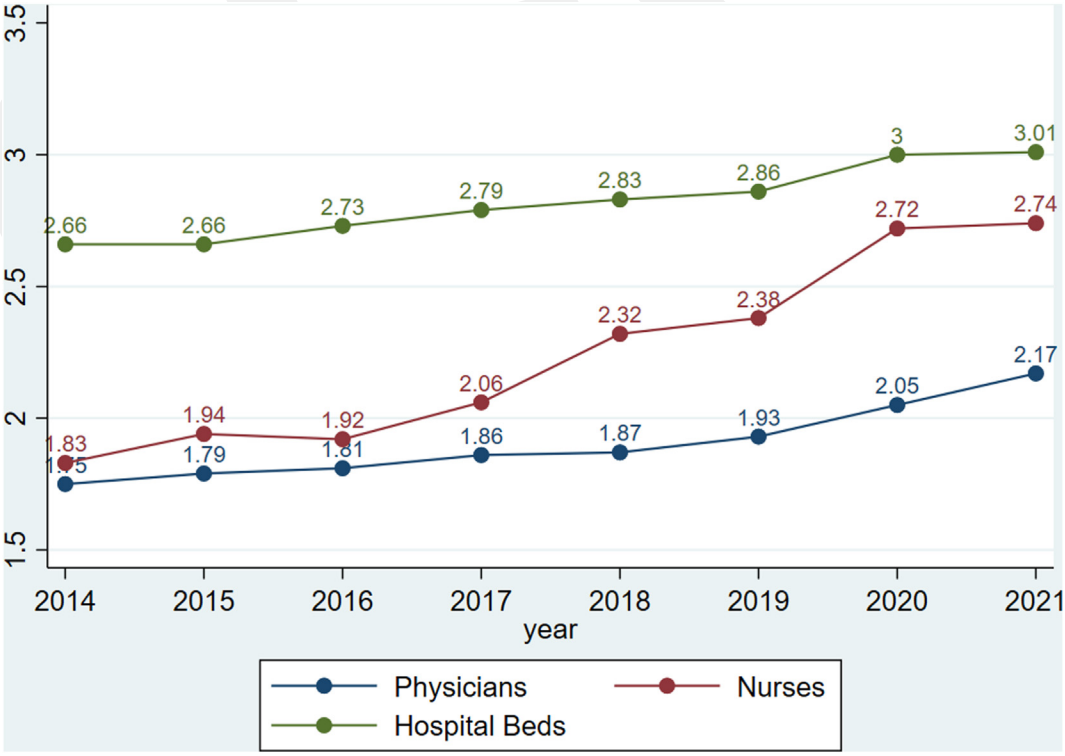
With the vaccination of many people through a free vaccination program regardless of the person's immigration and health insurance status from August 2021 onward,[48] the pandemic lost its severity in Turkey, and almost all pandemic-related restrictions were removed the end of 2021.[49,50]

Fig. 1 presents the number of physicians, nurses, and hospital beds per 1000 inhabitants to provide a context about the prevailing health inputs during the pandemic. For all the years, all 3 healthcare inputs has been on the rise, although it is a mild increase. The sharpest increase is observed for the nurses. Moreover, even in the pandemic years (2020 and 2021), there was not a drop in the number of physicians and nurses per capita. Thus, we can conclude that the healthcare inputs were not particularly scarce during the pandemic in Turkey.

Methods

The regression models, denoted as model 1 and 2 are designed to explore changes in healthcare utilization during the pandemic

Figure 1. Healthcare inputs per 1000 inhabitants over time.



while considering the potential moderating effects of age and preexisting health conditions.

$$HCU_{i,t} = \alpha_0 + \alpha_1 Pan_t + \alpha_2 Elder_{it} + \alpha_3 Pan_t * Elder_{it} + \beta X_{i,t} + u_{i,t} \ldots\ldots \quad [1]$$

$$HCU_{i,t} = \alpha_0 + \alpha_1 Pan_t + \alpha_2 HC_{it} + \alpha_3 Pan_t * HC_{it} + \beta X_{i,t} + u_{i,t} \ldots\ldots\ldots \quad [2]$$

The dependent variable, denoted as "*HCU*," represents a dummy variable indicating whether individual "*i*" visited a healthcare institution in year "*t*". The variable "*Pan*" is a dummy variable that takes on a value of 1 for the years 2020, 2021, and 2022—corresponding to the pandemic period—and 0 otherwise. We also introduce the variable "*Elder*", a dummy variable that takes the value 1 for individuals aged 65 and above and 0 otherwise. Additionally, the variable "HC_{it}" captures whether an individual has a preexisting health condition. Inclusion of the vector "*X*" is necessary because it consists of control variables, such as gender, household income bracket, educational attainment, marital status, and subjective health assessment. These control variables help to account for potential confounding effects.

By incorporating interaction terms, our models enable us to explore whether the pandemic's influence on healthcare utilization differs based on age and health conditions.

For checking whether the impact of the pandemic differed based on health insurance status, we run versions of the following model:

$$HCU_{i,t} = \alpha_0 + \alpha_1 Pan_t + \alpha_2 Insurance_{i,t} + \alpha_3 Pan_t * Insurance_{i,t} + \beta X_{i,t} + u_{i,t} \ldots\ldots\ldots \quad [3]$$

in which the variable "*Insurance*" is a vector that represents the insurance status of the person with 3 potential values ("insured," "with greencard," or "no insurance").

We used logistic regression models to estimate the binary healthcare utilization dummy variable, which is the dependent variable in our analysis.

We also utilized people's reports of various issues with healthcare system to identify the source of change in healthcare utilization.

Data

The Life Satisfaction Survey (LSS) conducted by Turkish Statistical Institute is utilized in this study. The LSS is a cross-sectional survey and representative of adult population (aged 18+ years) in Turkey. This survey has been implemented through face to face interviews until 2020. In 2020 onward, the survey was conducted with the computer-assisted telephone interview method to minimize in-person contact, which is a necessity during the pandemic. The LSS covers a wide range of topics, including utilization of healthcare services, insurance status, and subjective health assessment.

The following question is used to measure the healthcare utilization: "Did you utilize healthcare services by seeking assistance from a healthcare institution in the survey year?" The response categories are "Yes" and "No."

Elderly are those who are 65 years or above in the survey, and those who have a preexisting health condition are determined by a question that is worded as follows: "In the last year, I have had a serious health problem." Those who agreed with this statement are given 1 and those who did not mark this statement are given 0.

Respondents' insurance status is determined with the following question "When you fall ill and require treatment, medications, etc, through which channel do you usually cover your expenses?" Response categories are "Social security institution 4A," "Social Security Institution 4B," "Social Security Institution 4C," "General Health Insurance," "Bank's Trusts," "Private Health Insurance," "pay out of pocket," and "others"

Respondents are surveyed about healthcare service issues, including organizational problems such as scheduling difficulties and waiting times. Scheduling problems are assessed with the question: "Do you commonly encounter difficulties when attempting to schedule appointments for visiting healthcare institutions and/or medical examinations?" Waiting time issues are measured with the question: "Are there any issues with waiting in queues for medical examinations and/or analyses in the healthcare institutions"

The survey includes questions about healthcare costs. One question asks if respondents find healthcare expenses too high and the other about concerns regarding medication pricing in relation to treatment costs. These questions help assess the impact of economic factors on healthcare demand during the pandemic.

The following variables were used as background variables: gender, age, last completed education level (primary school or below, secondary education or equivalent, high school or equivalent, and tertiary education), marital status (never married, married, divorced/separated, and widowed), total household income measured in 5 brackets, and a subjective health assessment (5-point Likert scale).

Results

To explore the impact of the COVID-19 pandemic, in Fig. 2, we provide how average healthcare utilization changes over time. The blue line shows the utilization rates for an average person, whereas the red line and green line show the healthcare utilization rates for the elderly and those who had a serious health problem in the previous year. All 3 lines show a clear drop in 2020 that persists in 2021 and 2022. When we compare these 3 groups with each other, those with health problems and the elderly had consistently higher utilization rates before the pandemic. In year 2020, the utilization rate for those with serious health problem fell to from 96% to 92%.

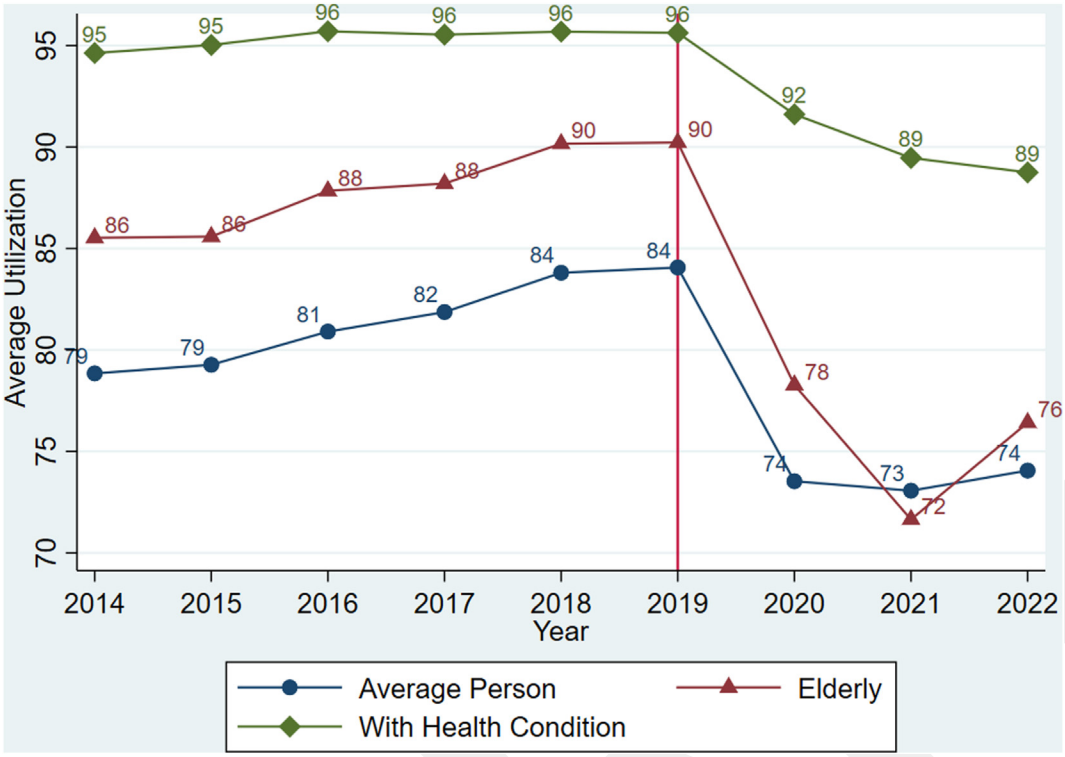
To explore the COVID-19 pandemic's potential differential impact by health insurance, Fig. 3, we provide a healthcare utilization by insurance status. It is evident that individuals with health insurance use healthcare services a lot more compared with both greencard holders and those without health insurance before the pandemic. Again, in all insurance status, there are marked reductions in the year 2020, and utilization rates do not recover in 2021 and 2022 regardless of insurance status.

To clarify whether the drop shown in Figs. 2 and 3 is statistically significant or not, we conducted regression analysis. We utilized probit models because the dependent variable is the healthcare utilization dummy variable. Table 1 reports marginal effects of probit model estimates. To see whether the pandemic affects healthcare utilization, Model 1 shows the coefficient of pandemic dummy variable. The rest of the coefficients (background controls) are provided in Appendix Table 1 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2024.101000.

In all the models, subjective health assessment is negatively associated with healthcare utilization. This is in line with our theoretical expectation that people with good health are less in need of healthcare services. According to model 1, the COVID-19 pandemic caused an 11.8% decrease in healthcare utilization rates. This effect is statistically significant at the 1% significance level.

Model 2 reports that the coefficient of elderly dummy variable being positive and statistically significant at 1% significance level.

Figure 2. Average healthcare utilization over time.



This shows that the elderly are more likely to use healthcare services. However, the interaction of the pandemic dummy variable with elderly dummy variable is negative, suggesting that the elderly were 6.5% less likely to use healthcare services during the pandemic.

Model 3 differentiates the impact of the pandemic on a typical person and whether a person with a health problem is more severely affected by the pandemic in terms of healthcare utilization. The results of this model shows that during the pandemic, a typical person is 11.3% less likely to use healthcare services. The marginal effect of "having a health condition" is 0.206, which implies that those with a preexisting health condition are 20.6% more likely to utilize healthcare services normally. This large and significant coefficient is reassuring because those with preexisting health conditions are more in need of healthcare services compared with healthy individuals. The interaction term of the pandemic and those with preexisting health conditions is negative and statistically significant. This indicates that those with preexisting health conditions have reduced their healthcare utilization 3.8% more than a typical person during the pandemic. That is, the pandemic particularly hit those with preexisting health conditions.

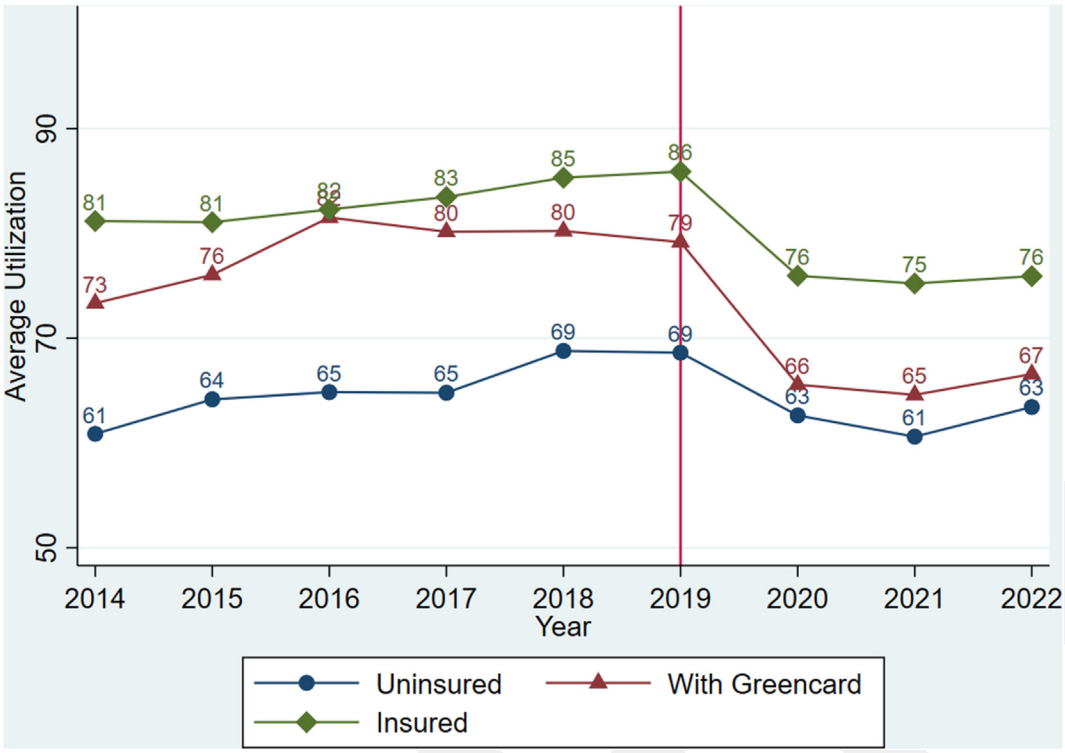
Model 4 reports the differential impact of the pandemic depending on the health insurance status. The pandemic dummy shows that an average person is 11.3% less likely to use healthcare services during the pandemic. The greencard and uninsured dummy variable shows that, compared with an insured person (who are insured from the Social Security Institution), greencard holders are 3.6% and the uninsured 12.2% less likely to use healthcare services. The interaction term greencard with the pandemic dummy is not statistically significant. That suggests that the greencard holders were not specifically affected during the pandemic. The interaction term of the pandemic dummy with the uninsured dummy shows that during the pandemic, the uninsured were 6.1% more likely to use healthcare services. That is, the pandemic did not have a negative impact on the uninsured in Turkey.

To determine whether the decrease in healthcare service utilization during the pandemic is influenced by supply-side or demand-side factors, this section examines healthcare-related issues over time. Fig. 4A illustrates the prevalence of difficulties in scheduling appointments among the average population, individuals with underlying health conditions, and the elderly. In 2020, all 3 groups reported a notable decline in appointment scheduling issues, signaling a reduction in the demand for healthcare services. However, in 2021 and 2022, the prevalence of appointment scheduling problems nearly doubled. This indicates that, as the postponed demand returned to normal levels in 2021, challenges with appointment scheduling resurfaced.

The prevalence of appointment scheduling difficulties, categorized by insurance status, is displayed in Appendix Fig. 1 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2024.101000. Notably, there is substantial overlap in the reported issue of appointment scheduling across various insurance categories, with a significant decrease observed in 2020. This further supports the interpretation that the decline in reported issues was primarily a consequence of reduced demand for healthcare during the pandemic.

Moving to Fig. 4B, it presents the prevalence of reported issues related to waiting times for examinations, considering the same 3 demographic groups as in Fig. 4A. The trends in reported waiting time problems is closely parallel to those observed in Fig. 4A. In 2020, there was a drop in reported waiting time issues, aligning with the reduced demand for healthcare during the pandemic.

Figure 3. Average healthcare utilization over time by insurance status.



Once again, in 2021 and 2022, we see the prevalence of reported waiting time problems surpassing prepandemic levels, indicating that the healthcare demand was deferred during 2020.

Appendix Fig. 2 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2024.101000 provides insight into the prevalence of reported waiting time problems based on insurance status. Notably, there is not big divergences in reported issue of waiting time across various insurance categories, with a significant decrease observed in 2020 for all insurance statuses. This decrease in reported waiting time issues can be attributed to the reduced demand for healthcare services during the pandemic.

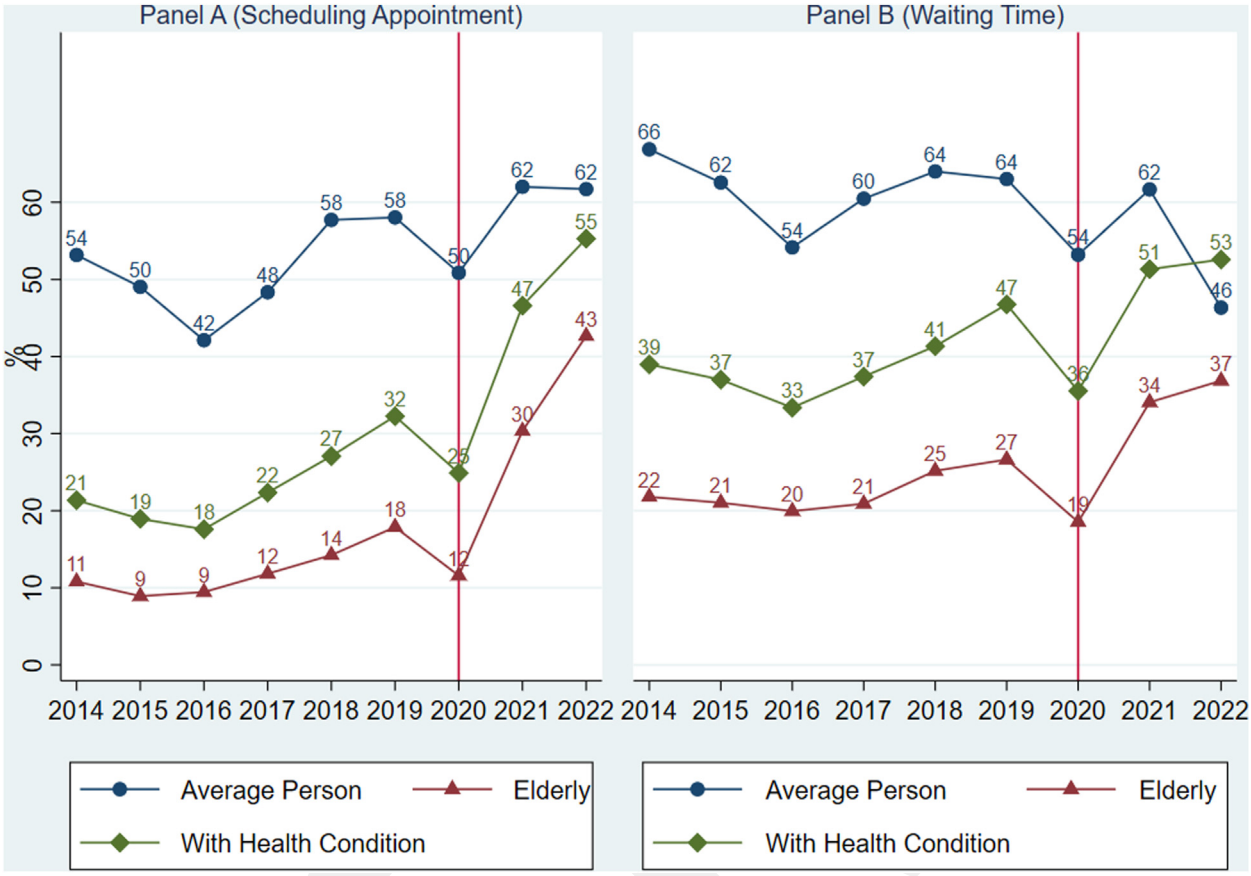
Because the pandemic had economic repercussions in Turkey, it is possible that the reduction in demand can be due to cost concerns. This section reports individuals' expressions of financial hardships concerning healthcare services. Fig. 5A illustrates the proportion of people reporting challenges related to the expenses associated with healthcare visits, categorized by their insurance status. Interestingly, both the insured and greencard holders

Table 1. Healthcare service utilization probit regression results, marginal effects.

Variables	(1)	(2)	(3)	(4)
Subjective health	−.055* (0.00)	−.055* (0.00)	−.034* (0.00)	−.057* (0.00)
Pandemic dummy	−.118* (0.01)	−.105* (0.01)	−.113* (0.01)	−.113* (0.01)
Elderly		.053* (0.01)		
Pandemic† Elderly		−.065* (0.01)		
Have health condition			.206* (0.01)	
Pandemic† Health Condition			−.038‡ (0.02)	
Greencard (ref: Insured)				−.036* (0.01)
Uninsured				−.122* (0.01)
Pandemic† Greencard				−.022 (0.01)
Pandemic† Uninsured				.061* (0.02)
Pseudo R-squared	0.034	0.034	0.034	0.034
n	40 733	40 733	40 733	40 733

Notes. Robust standard errors are given in parentheses, *$P < .01$, †$P < .1$, ‡$P < .05$.
All models control for age, gender, household income, marital status (categories: never married, married, widowed, and divorced), education level (categories: primary school or less, secondary school or equivalent, high school or equivalent, and university or more), and subjective health assessment.

Figure 4. Organizational issues. A) Scheduling appointment and B) Waiting time



exhibited remarkably similar percentages, whereas those without insurance stand out as the group reporting the highest incidence of cost-related issues. In 2020, there is a decline in the percentage of individuals reporting difficulties affording healthcare visits across all 3 categories. However, as we move into 2021 and 2022, there is a modest resurgence in such reports.

Appendix Fig. 3 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2024.101000 presents the prevalence of issues regarding the cost of visiting healthcare institutions for the average person, elderly individuals, and those with underlying health conditions. In 2020, there is a small drop in the percentage of people reporting financial challenges related to healthcare visits across all 3 demographic categories. However, as we progress into 2021 and 2022, the rates come back to prepandemic levels.

In Fig. 5B, we provide the percentage of individuals who have reported issues related to the costs of medication and drugs, categorized by their insurance status. Notably, in 2020, there was a decline in the percentage of respondents reporting difficulties in affording medication costs across all 3 categories. However, in 2021 and 2022, there is a modest increase in the number of individuals reporting such challenges.

Appendix Fig. 4 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2024.101000 shows a more detailed breakdown of the prevalence of concerns related to medication and drug expenses among different demographical categories. Once again, we observe a decrease in the percentage of individuals reporting these issues in 2020 for all 3 categories. Nevertheless, as we move forward into 2021 and 2022, there is a slight increase in the number of reports.

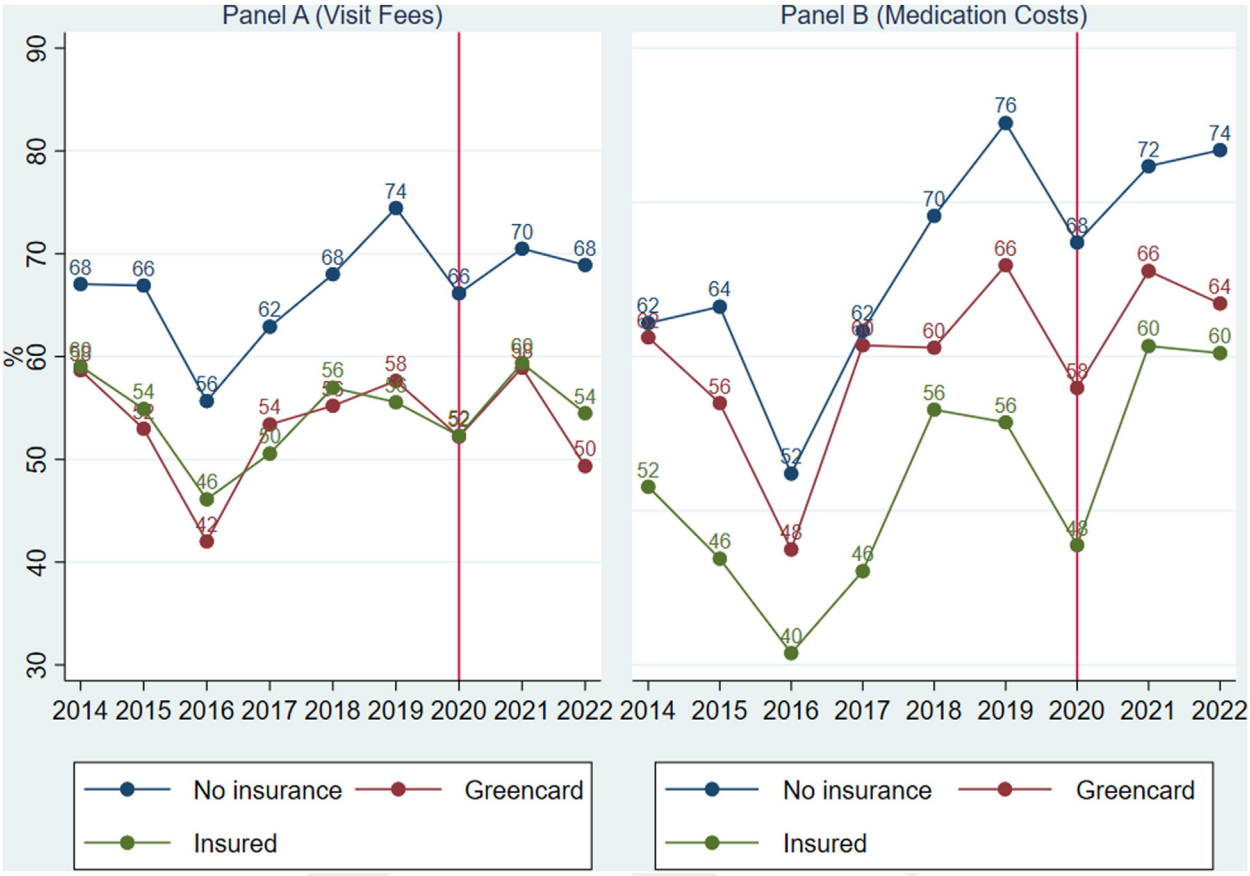
Discussion

Overall, our results show that COVID-19 caused a reduction of 11.8% in healthcare utilization for an average person in Turkey. However, this experience is not specific to Turkey. Many other studies also report drop in healthcare utilization during the COVID-19 pandemic, including China,[22] India,[23] Italy,[24] South Korea,[25] Spain,[26] Taiwan,[10] the United Kingdom,[27] and the United States.[28]

Moreover, the elderly population experienced an additional 6.5% decline in healthcare utilization, consistent with findings in other studies.[31,32] This decline appears to be driven by shifts in demand rather than supply constraints because issues related to waiting times and appointment scheduling decreased during the pandemic. The reluctance of the elderly to seek healthcare services, likely influenced by the fear of contracting the virus, could have further contributed to this trend.

Those with health problems are expected to be more in need of healthcare services compared with an average person.[51] Thus, our results show that during the COVID-19 pandemic, they experienced a 3.8% higher reduction in healthcare service utilization compared with an average person in Turkey. Again, this is found in other studies. Those with a chronic illness experienced significantly more appointment cancellations in the United Kingdom[32]

Figure 5. Issues on cost of healthcare services by health insurance status.



An important finding was that those without health insurance and greencard were not particularly hit by the pandemic in terms of healthcare utilization. Moreover, we observe lower percentage problems with regard to costs of healthcare services during the pandemic even among the uninsured. The pandemic not affecting the uninsured's healthcare utilization particularly concurs with less issues being reported with regard to healthcare costs during 2020. This is interesting because there were existing healthcare inequalities even before the pandemic,[36] and it is shown that the COVID-19 pandemic exacerbated existing inequalities in healthcare access, particularly in countries where many people rely on private health insurance, such as the United States.[19] This can be attributed to the fiscal policy measures that the government took to support the economy in 2020[52] and also many COVID-19-related healthcare provisions to be provided free of charge.[44] Because problem reporting increased in 2021 and 2022, we can derive that the financial repercussion of the pandemic was felt in 2021 and 2022.

Interestingly, our analysis shows that the healthcare utilization in Turkey did not return back to its levels before the pandemic even in 2022. Similar trends were observed in the United Kingdom[27] and Taiwan.[10]

Our research indicates the need to consider issues of healthcare access during health crises, Given the sustained impact on healthcare utilization even in 2022, it is imperative to invest in and strengthen virtual healthcare infrastructure. Telemedicine emerged as a valuable tool during the pandemic, and continued support for virtual healthcare services can mitigate access issues. Given the additional challenges faced by the elderly and those with preexisting health conditions, targeted outreach and communication strategies are essential. Governments and healthcare agencies should focus on educating the elderly about the safety measures in place and the importance of regular healthcare visits.

It is worth noting that the extent to which people reported fewer issues with the healthcare system during the pandemic may have varied by region. Some patients, especially those requiring in-person appointments in areas with strained healthcare resources, may have faced challenges. A limitation of our study is the focus on the overall impact in Turkey, lacking detailed regional analysis because of the data set. Moreover, the data set does not allow observing which diagnostic criteria the highest reductions are observed in, which would be useful for planning healthcare utilization in future pandemics.

Conclusion

This study investigates the role of the COVID-19 pandemic in healthcare utilization of individuals in Turkey. After taking into account a large set of background controls, we find that the COVID-19 pandemic reduced healthcare utilization of an average person by 11.8%. This decrease is even more pronounced for the elderly and those with preexisting health conditions. Uninsured individuals did not experience a significant negative impact by the pandemic in terms of healthcare utilization. Moreover, there was a

reduction in the issues reported by scheduling an appointment, waiting times, and cost aspects of healthcare services. These results show that, for Turkey, there was no scarcity of supply of healthcare services, rather people seemed to reduce their demand, and the reduction was also not related to economic considerations. Fear of contagion may be driving the reduced healthcare demand during the pandemic.

In the event of a new health crisis, policymakers should take into account the impact of their measures on healthcare utilization of fragile groups and ensure that they do not exacerbate the existing challenges faced by elderly and individuals with preexisting health conditions.

Author Disclosures

Author disclosure forms can be accessed below in the Supplemental Material section.

Supplemental Material

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.vhri.2024.101000.

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REFERENCES

1. Hempel S, Burke R, Hochman M, et al. Allocation of scarce resources in a pandemic: rapid systematic review update of strategies for policymakers. *J Clin Epidemiol*. 2021;139:255–263.
2. Moon RC, Brown H, Rosenthal N. Healthcare resource utilization of patients with COVID-19 visiting US hospitals. *Value Health*. 2022;25(5):751–760.
3. Kaye AD, Okeagu CN, Pham AD, et al. Economic impact of COVID-19 pandemic on health care facilities and systems: international perspectives. *Best Pract Res Clin Anaesthesiol*. 2021;35(3):293–306.
4. Matsuo T, Kobayashi D, Taki F, et al. Prevalence of health care worker burnout during the coronavirus disease 2019 (COVID-19) pandemic in Japan. *JAMA Netw Open*. 2020;3(8):e2017271.
5. Schug C, Geiser F, Hiebel N, et al. Sick leave and intention to quit the job among nursing staff in German hospitals during the COVID-19 pandemic. *Int J Environ Res Public Health*. 2022;19(4):1947.
6. Elmer D, Endrei D, Németh N, et al. Changes in the number of physicians and hospital bed capacity in Europe. *Value Health Reg Issues*. 2022;32:102–108.
7. Cantor JH, McBain RK, Pera MF, Bravata DM, Whaley CM. Who is (and is not) receiving telemedicine care during the COVID-19 pandemic. *Am J Prev Med*. 2021;61(3):434–438.
8. OECD. The COVID-19 pandemic and the future of telemedicine. https://www.oecd.org/publications/the-covid-19-pandemic-and-the-future-of-telemedicine-ac8b0a27-en.htm#:~:text=The%20use%20of%20telemedicine%20was,promote%20the%20use%20of%20telemedicine; Published 2023. Accessed August 8, 2023.
9. Snoswell CL, Smith AC, Page M, Scuffham P, Caffery LJ. Quantifying the societal benefits from telehealth: productivity and reduced travel. *Value Health Reg Issues*. 2022;28:61–66.
10. Tsai Y-Y, Yang T-T. Measuring voluntary responses in healthcare utilization during the COVID-19 pandemic: evidence from Taiwan. *PLOS ONE*. 2022;17(12):e0271810.
11. Aslan E. Evaluation of the impact of the COVID-19 pandemic on health services access: a cross-sectional study. *Turk Klin J Health Sci*. 2022;7:534–543.
12. The World Bank. World development report 2022: finance for an equitable recovery. https://www.worldbank.org/en/publication/wdr2022#:~:text=The%20Report%20includes%20in%2Ddepth,to%20finance%20green%20and%20sustainable. Accessed September 4, 2023.
13. McNamee P, Ternent L, Hussein J. Barriers in accessing maternal healthcare: evidence from low-and middle-income countries. *Expert Rev Pharmacoecon Outcomes Res*. 2009;9(1):41–48.
14. International Labour Organization. Social health protection. An ILO strategy towards universal access health care. https://www.ilo.org/secsoc/information-resources/publications-and-tools/policy-papers/WCMS_SECSOC_5956/lang–en/index.htm#:~:text=The%20affordability%20of%20health%20care,protection%20reform%20a%20political%20priority; Publication 2008. Accessed August 14, 2023.
15. Winetrobe H, Rice E, Rhoades H, Milburn N. Health insurance coverage and healthcare utilization among homeless young adults in Venice, CA. *J Public Health*. 2016;38(1):147–155.
16. Aron-Dine A, Einav L, Finkelstein A. The rand health insurance experiment, three decades later. *J Econ Perspect*. 2013;27(1):197–222.
17. Finkelstein A, Taubman S, Wright B, et al. The Oregon health insurance experiment: evidence from the first year. *Q J Econ*. 2012;127(3):1057–1106.
18. American Cancer Society. Cancer prevention & early detection facts & figures. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/cancer-prevention-and-early-detection-facts-and-figures/cancer-prevention-and-early-detection-facts-and-figures-2007.pdf; Published 2007. Accessed September 14, 2023.
19. Khatana SAM, Groeneveld PW. Health disparities and the coronavirus disease 2019 (COVID-19) pandemic in the USA. *J Gen Intern Med*. 2020;35(8):2431–2432.
20. Altawalbeh SM, Alshogran OY, Al-Sawalha NA, Al-Saleem MM. Clinical outcomes and direct medical expenditures associated with Intensive Care Unit admission for inpatients with COVID-19 in Jordan: a retrospective cohort study. *Value Health Reg Issues*. 2023;33:76–82.
21. Alvis-Zakzuk NJ, Flórez-Tanus Á, Díaz-Jiménez D, et al. How expensive are hospitalizations by COVID-19? Evidence from Colombia. *Value Health Reg Issues*. 2022;31:127–133.
22. Xiao H, Dai X, Wagenaar BH, et al. The impact of the COVID-19 pandemic on health services utilization in China: time-series analyses for 2016-2020. *The Lancet Reg Health–West Pac*. 2021;9.
23. Johari A. India's focus on coronavirus leave TB and HIV patients adrift. Scroll. https://scroll.in/article/958400/invisible-crisis-tb-and-hiv-patients-left-adrift-in-indias-focus-on-coronavirus; Published 2020. Accessed September 3, 2023.
24. Lazzerini M, Barbi E, Apicella A, Marchetti F, Cardinale F, Trobia G. Delayed access or provision of care in Italy resulting from fear of COVID-19. *The Lancet Child Adolesc Health*. 2020;4(5):e10–e11.
25. Park Y-T, Choi Y. Changes in inpatient healthcare utilization at public hospitals during the Covid-19 pandemic. *Public Health Aff*. 2022;6(1):e8.
26. Amador M, Matias-Guiu X, Sancho-Pardo G, et al. Impact of the COVID-19 pandemic on the care of cancer patients in Spain. *ESMO Open*. 2021;6(3):100157.
27. Howarth A, Munro M, Theodorou A, Mills PR. Trends in healthcare utilisation during COVID-19: a longitudinal study from the UK. *BMJ Open*. 2021;11(7):e048151.
28. Birkmeyer JD, Barnato A, Birkmeyer N, Bessler R, Skinner J. The impact of the COVID-19 pandemic on hospital admissions in the United States: study examines trends in US hospital admissions during the COVID-19 pandemic. *Health Aff*. 2020;39(11):2010–2017.
29. Deml MJ, Minnema J, Dubois J, et al. The impact of the COVID-19 pandemic on the continuity of care for at-risk patients in Swiss primary care settings: a mixed-methods study. *Soc Sci Med*. 2022;298:114858.
30. Atkins JL, Masoli JA, Delgado J, et al. Preexisting comorbidities predicting COVID-19 and mortality in the UK Biobank community cohort. *J Gerontol S A*. 2020;75(11):2224–2230.

31. Wong SYS, Zhang D, Sit RWS, et al. Impact of COVID-19 on loneliness, mental health, and health service utilisation: a prospective cohort study of older adults with multimorbidity in primary care. *Br J Gen Pract*. 2020;70(700):e817–e824.
32. Topriceanu C-C, Wong A, Moon JC, et al. Evaluating access to health and care services during lockdown by the COVID-19 survey in five UK national longitudinal studies. *BMJ Open*. 2021;11(3):e045813.
33. Ugur ZB, Tirgil A. Sağlıkta dönüşüm programı ve Kamunun sağlık Hizmetlerinden memnuniyeti. *Ombudsman Akad*. 2018;1:295–327.
34. Stokes J, Gurol–Urganci I, Hone T, Atun R. Effect of health system reforms in Turkey on user satisfaction. *J Glob Health*. 2015;5(2):020403.
35. Atun R, Aydın S, Chakraborty S, et al. Universal health coverage in Turkey: enhancement of equity. *Lancet*. 2013;382(9886):65–99.
36. Ugur Z, Tirgil A. Regional health disparities in the aftermath of health system reforms in Turkey. *J Health Syst Pol*. 2021;3(3):137–169.
37. Yıldız A, Bulut S. COVID-19 pandemi Döneminde sağlık Hizmetleri Kullanımının Değerlendirilmesi. *Turk Klin J Health Sci*. 2021;6(4):928–938.
38. Korku C. COVID-19 pandemisi ve öncesi dönemde hastaneye Yatışların Değerlendirilmesi. *Gümüşhane Univ Sağlık Bilimleri Derg*. 2023;12(1):12–20.
39. Ministry of Education, Bakan Selçuk, Koronavirüs'e Karşı Eğitim Alanında Alınan Tedbirleri Açıkladı. https://www.meb.gov.tr/bakan-selcuk-koronaviruse-karsi-egitim-alaninda-alinan-tedbirleri-acikladi/haber/20497/tr. Accessed August 5, 2023.
40. Ministry of the Internal Affairs. 81İl Valiliği'ne koronavirüs Tedbirleri Konulu ek genelge gönderildi. https://www.icisleri.gov.tr/81-il-valiligine-koronavirus-tedbirleri-konulu-ek-genelge-gonderildi-08-09-20. Accessed September 2, 2023.
41. Ministry of the Internal Affairs. 65 Yaş ve Üstü ile Kronik Rahatsızlığı Olanlara Sokağa Çıkma Yasağı Genelgesi. https://www.icisleri.gov.tr/65-yas-ve-ustu-ile-kronik-rahatsizligi-olanlara-sokaga-cikma-yasagi-genelgesi. Accessed August 31, 2023.
42. Ministry of the Internal Affairs. 65 yaş ve Üzeri/20 yaş altı/Kronik Rahatsızlığı bulunan kişilerin sokağa çıkma Kısıtlaması İstisnası Genelgesi. https://www.icisleri.gov.tr/65-yas-ve-uzeri20-yas-altikronik-rahatsizligi-bulunan-kisilerin-sokaga-cikma-kisitlamasi-istisnasi-genelgesi. Accessed August 30, 2023.
43. T.C. Antalya Valiliği. İl Umumi hıfzıssıhha kurulu 2020/48 Kararı-Coronavirüs (Covid-19) Salgınından Korumak ve Yayılmasını Engellemek İçin Alınması Gereken Tedbirler. http://www.antalya.gov.tr/il-umumi-hifzissihha-kurulu-202048-karari. Accessed August 30, 2023.
44. Turkish Ministry of Labor and Social Security. Bakan Selçuk: "PCR test Sonucuna Bakılmaksızın, Covid-19 tedavisi gören Hastalarımızın SUT Kapsamındaki sağlık Giderlerini Karşılıyor, pandemi bakım ücreti Ödüyoruz.". https://www.csgb.gov.tr/haberler/bakan-selcuk-pcr-test-sonucuna-bakilmaksizin-covid-19-tedavisi-goren-hastalarimizin-sut-kapsamindaki-saglik-giderlerini-karsiliyor-pandemi-bakim-ucreti-oduyoruz/. Accessed September 4, 2023.
45. Anadolu Agency. Türkiye'nin 20'nci sehir hastanesi hizmete açılıyor. https://www.aa.com.tr/tr/info/infografik/29974. Accessed September 3, 2023.
46. Yeşiltaş A. Sağlik Sektöründe Kamu Özel Ortakliği: Şehir Hastaneleri üzerine bir değerlendirme. *Uluslararası Sağlık Yönetimi Stratejileri Araştırma Derg*. 2020;6(1):15–28.
47. Demir E, Kılıç G. COVID-19 pandemisinde finansal durum: sosyal güvenlik kurumu uygulamalari. https://www.ttb.org.tr/kutuphane/covid19-rapor_6/covid19-rapor_6_Part13.pdf; Published 2020. Accessed September 12, 2023.
48. Ministry of Health. COVID-19 aşısı ulusal Uygulama Stratejisi. https://covid19asi.saglik.gov.tr/TR-77706/covid-19-asisi-ulusal-uygulama-stratejisi.html. Accessed September 10, 2023.
49. Resmi Gazete. Koronavirüs ile Mücadelede Kontrollü Normalleşme Süreci. Ministry of Internal Affairs. https://www.icisleri.gov.tr/koronavirus-ile-mucadelede-kontrollu-normallesme-sureci. Accessed September 19, 2023.
50. Ministry of Internal Affairs. 81 il Valiliğine Tam Kapanma Tedbirleri Genelgesi gönderildi. https://www.icisleri.gov.tr/81-il-valiligine-tam-kapanma-tedbirleri-genelgesi-gonderildi#:~:text=Hafta%20i%C3%A7i%20hafta%20sonu%20ayr%C4%B1m%C4%B1r. Accessed September 19, 2023.
51. Akerlof GA. The market for lemons: quality uncertainty and the market mechanism. *Q J Econ*. 1970;84(3):488–500.
52. Ministry of Treasury and Finance. Hazine ve maliye bakanı sayın Berat Albayrak Anadolu Ajansı özel Yayınında Gündeme yönelik Değerlendirmelerde bulundu. https://www.hmb.gov.tr/haberler/hazine-ve-maliye-bakani-sayin-berat-albayrak-anadolu-ajansi-ozel-yayininda-gundeme-yonelik-degerlendirmelerde-bulundu. Accessed September 12, 2023.