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The Future Effects of COVID-19 on the Health System: Applying the Futures Wheel Method

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Abstract

Background: Although the evidence emphasizes that COVID-9 incurs considerable primary effects on public economics and health, it is not so clear what the future effects of this pandemic might be. This study aims to identify the primary and future effects of COVID-19 on the health system.

Methods: Futures Wheel (FW) method was used to find the primary and future effects of COVID-19 on eight important dimensions of the health system, including the six building blocks. To gather relevant information, PubMed, SCOPUS, Web of Knowledge, and other sources were searched to find potential studies reporting the potential effects of COVID-19 on the health system. Following that, an expert panel with nine participants to depict the findings was held.

Results: Fifty-four studies met the inclusion criteria. The participants reached a consensus on nineteen main primary effects of COVID-19 that could impose 26 main future effects with specific risk opportunities on different dimensions of the health system. Workforce, stewardship and health policy, and infrastructure and hospital capacity dimensions were the most affected by COVID-19 in both the primary and future timeframe. Most of the signals of COVID-19-related opportunities could stem from health technologies and research systems, and service delivery dimensions.

Conclusion: COVID-19 comes with considerable risks, especially for the health system governance and workforce dimensions. There are some opportunities to improve the resilience of the health system by using digital health platforms, promoting health literacy of the population, and also adopting inclusive health policy-making processes.

Keywords: COVID-19, Primary effects, Health System, Futures Wheel, Iran

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Introduction

This is the first time during the contemporary history of mankind that a health crisis imposes such a huge effect on the global economy in almost all countries. The first case infected with the new coronavirus was approved in China in the last days of 2019. Due to the complex interactions between countries -resulting from the economic developments in recent decades- the Coronavirus Disease-2019 (1) rapidly spread country by country (2). Today, no country in the world has been untouched by the consequences of COVID-19.

One of the differences between this crisis and other shocks experienced in the past is the changes it brought

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↑What is "already known" in this topic:
COVID-19 pandemic imposing huge short and long term consequences on health system. There are seldom evidence to showed a comprehensive list effects of the COVID-19 on health system.

→What this article adds:
In this study we applied a Futures Wheel method to show effects of COVID-19 on different dimensions of health system. Despite considerable challenges of COVID-19 on health system there are different opportunities that need to be considered when deal with this pandemic.

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about in the daily activities of individuals. Social distancing, as one of the main instructions, means keeping a safe space between you and other people to break the disease chain and curb the speed of the COVID-19 spread. There is a plethora of studies that report the negative effects of social distancing and lockdown on the macroeconomics of the countries (1, 3, 4).

One of the distinct features of the COVID-19 crisis has its roots in the level of awareness of society and public organizations such as social institutions, especially the health system. It is expected that in the time of the crisis, the health system and other public organizations provide sufficient support for people who are in primary need of emergency services and social care. In fact, COVID-19 is diametrically opposed to the direction that healthcare systems in most developed and developing countries are headed. The health system focuses on the management of non-communicable chronic diseases such as diabetes and cardiovascular conditions, small unmet needs in rare diseases, shifting care from hospital to outpatient settings and neglecting prevention altogether.

Historically modern health systems had not dealt with such a pandemic, so the new crisis has truly been a big surprise to them. It causes devastating immediate challenges not only in health care administration but in all health system dimensions such as health care provision, financing, access, and financial risk protection of patients from health care cost. Khatab et al. investigated primaty effects of COVID-19 on spine surgeons in Jordan and found that all participants were affected minimally, intermediately or hugely by COVID-19 and those who aged old or orthopedic spine surgeons were the most affected compared to other participants (5). Moreover, in the long run, there might also be some challenges that may undermine the vital role of the health system. In other words, the longer the duration of the crisis, the more challenges may result from the COVID-19 pandemic. There are some studies that have summarized the challenges in short and long periods in macroeconomics as a general context and health care delivery as a specific context. Ayati et al. identified a brief list of immediate and longer-term effects of COVID-19 on the performance of the pharmaceutical industry in Iran (6). They found that changes in medical demand, revisions in pharmaceutical regulation, and changes in the priority of research and development options were some primaty effects of COVID-19. Furthermore, lower economic growth in the market, a longer time for new medicines to be approved and faster changes in supply chain were declared as long term consequences of the pandemic. However, considering the diverse domains of the COVID-19, identifying such challenges without considering interrelationships among them might not lead to depicting a clear overview of the pandemic's effects as a complex phenomenon on the modern health system. This study aims to demonstrate the primary and future effects of the COVID-19 pandemic on the health system as a whole and also in its different dimensions and investigates opportunities and risks concerning the upcoming future.

Methods

We use the Futures wheel (FW) method to identify immediate and secondary effects of COVID-19 on the health system and investigate interrelationships among them to provide a better portrait of the exploration. FW is one of the future research methods developed to systematically identify and present secondary and tertiary consequences of trends and events. The FW method was coined by Glenn in the 1970s and employed to think about the future (7). FW is a frequently-used method that has a broad range of applications in exploring the futures of a phenomenon. Glenn states that FW is routinely utilized to ponder over the possible effects of an event or the potential future events, to create forecasts within different alternative scenarios, represent complex interrelationships and to engage participants in thinking together about the event and its future effects (7). To start applying FW, a single trend or event is placed in the middle of a paper, then some immediate consequences of the selected event are set around the event in a wheel-like form. Next, the secondary effects of each primary effect will be drawn from the second round of the wheel. This method continues to depict a picture with clear effects of the event. There are several approaches to conducting FW. In this study, we use a streamlined methodology, as presented below.

1. Define the center change

The first step of FW is defining a trend or event as a center. In this study, COVID-19 a disease caused by SARS-CoV-2, is considered a center change. The effects of the center change on different dimensions of the health system are explored. The Health system as a social institution is defined as all actors, rules, and organizations that consider improving health as the first goal of their existence. World Health Organization (WHO) has provided a framework to analyze the health system, shedding some light on its different dimensions. The framework consists of six building blocks that are systematically interconnected striving to achieve four overall goals-outcomes, namely service delivery, health workforce, information, access to essential medicines, financing, and leadership/governance. These goals- outcomes systematically collaborate in order to provide access to the necessary quality services, hoping to increase the level of social health, protect people from financial hardship and improve the efficiency of the system. We inferred eight dimensions from the building blocks and assessed the effects of COVID-19 on them. Figure 1 shows the building blocks of the health system.

2. Data collection

FW commonly uses brainstorming as the data collection technique in quest of identifying the changes and their consequences. To this end, a small group of participants who were familiar with the center change were selected and were required to think together about the future effects of the center. Since there are multitudes of publications on short- and secondary effects of COVID-19 on the health system, it sounded judicious to use such evidence as an input to start to depict the big picture. Hence, in the current study, we decided to do a systematic search of

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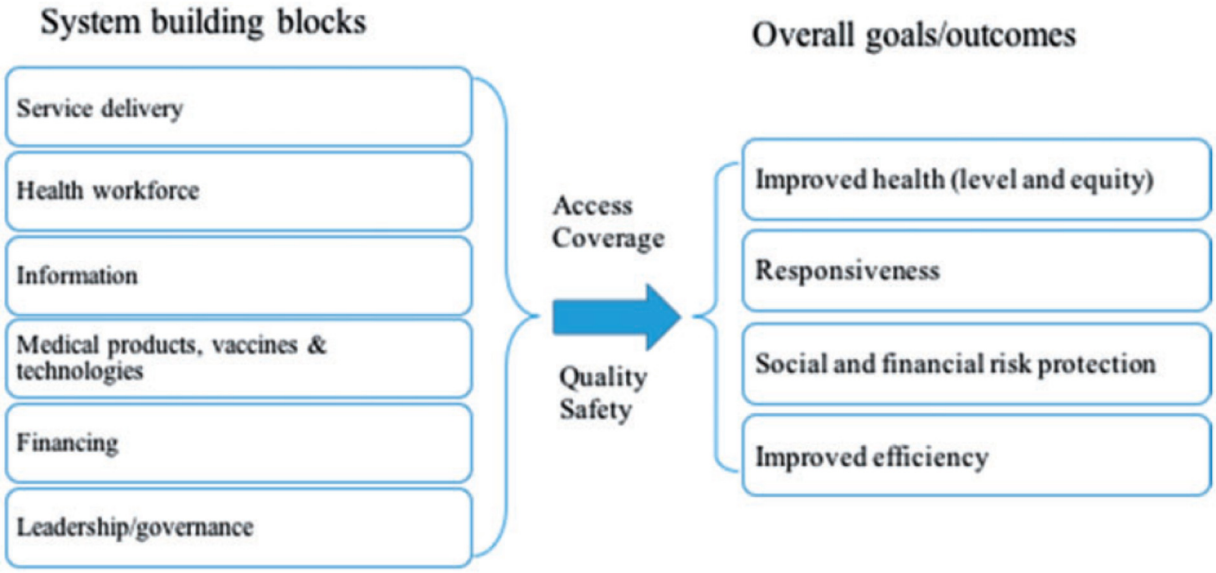

Fig. 1. Building blocks of the health system

electronic databases and also a focused group discussion to capture the possible effects of COVID-19 on the health system.

2.1 Systematic search in electronic databases

PRISMA guideline was employed to retrieve relevant studies (8). The studies that had reported the effects of COVID-19 on the health system were selected for further meticulous evaluation. The PubMed, SCOPUS, and Web of Sciences databases were searched to find the relevant studies published from the inception of the COVID-19 up to February 2021. We also tracked the reference of the potentially relevant studies and the website of related conferences. Important terms used to design a search strategy were as follows:

((((((("health system"[Title/Abstract])OR("health care"[Title/Abstract])) OR ("health provision" [Title/Abstract]))OR ("health service"[Title/Abstract])) OR ("financing"[Title/Abstract])) OR (resource [Title/Abstract]) AND (((((impact[Title/Abstract]) OR (effect[Title/Abstract])) OR (influence[Title/Abstract])))))) AND (((((((corona-virus[Title/Abstract]) OR (coronavirus [Title/Abstract])) OR (COVID-19[Title/Abstract])) OR ("novel coronavirus"[Title/Abstract])) OR ("novel coronavirus disease"[Title/Abstract])) OR (SARS-COV-2[Title/Abstract])) OR ("severe acute respiratory syndrome coronavirus 2"[Title/Abstract])) OR (2019-nCov[Title/Abstract]))

We did not apply language restrictions to select relevant studies. The retrieved results were entered into the Endnote software. After removing duplicates, the titles and then abstracts were scanned. Afterward, the references of the remaining studies were searched and following that, the full texts of all studies were reviewed. Two authors (ZG and RSSh) independently did the above steps. General and specific information from the included studies were extracted and then summarized.

2.2 Expert panel

An FW study can be investigated more effectively with a diverse team compared to using the best individual expert on the center change. Consequently, we attempted to select a diverse group of participants to analyze the subject. We invited nine participants with a variety of education, experience, and skill backgrounds, including one health economist, one epidemiologist, one general physician, two public health experts, one pharmacist, and two pharmacoeconomists with at least five-year experience in the field of the health system, either as researcher or manager.

3. Data analysis

Having nominated the participants, they were briefed about COVID-19, the health system structure, and also the results of the literature review by two facilitators (MN and MH) via the virtual platform. To explore the primary effects, the participants were demanded to discuss the first-round effects of COVID-19 on the health system based on their ideas, experience and retrieved studies. The exact difference between the primary effects and that of future effects stemmed from this point that the first order effects should happen without any interval changes. Managing this task was one of the main tasks of the facilitators (MN and MH).

Each participant offered his/her suggestions, and the other added some points to them. Discussion continued to reach a consensus among the participants. This process is repeated for future effects based upon the former order as well.

4. Identify the opportunities and risks

Having finalized different order effects of COVID-19 on the health system, a draft of the figure was prepared by the facilitators. The participants also briefly observed the findings, then started a discussion on the opportunities and

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risks from the health system in dealing with COVID-19 in the future.

Results

The search resulted in 713 records relevant to the aims of the study. After reviewing the titles and abstracts, 186 remained to scan their full texts. Finally, 54 records were included in the study (Fig. 2).

The included studies were analyzed by two reviewers to extract both general and specific information such as authors, the year of publication, the type of the study, the scope of analysis, the current effect, the future effect, and the outcomes of the effects on the health system. The results were rearranged to be used for designing FW based on the primary and future effects of COVID-19 on the eight important dimensions of the health system inferred from the building blocks. The results are summarized in Table 1.

The COVID-19 effects on the dimensions of the health system

Figure 3 offers a visual representation of the effect of COVID-19 on the health system based on FW structure. Below, the details of the effects in different dimensions of the analysis are provided.

Medical Education

Teaching and learning processes in most medical universities have undergone a violation ensuing from the outbreak of COVID-19. There are several primary effects of COVID-19 on both practical courses of surgical training and theoretical courses, which may eventually result in the slowdown of the learning curve among medical students (10, 12, 20, 54). To cut the COVID-19 transmission chain, most universities had to cancel routine classes and start using webinars and e-learning materials to continue education. Nonetheless, establishing a good platform for conducting e-learning courses requires sufficient infrastructure that had not been available in the early weeks of the pandemic. Medical students who must pass some courses in hospitals and engage in practical activities experience an imposed additional mental pressure exerted on them and their instructors. These primary effects of COVID-19 have increased academic failure, dropout rate, shortage in some medical specialties such as infectious diseases experts due to changes in the field of study, decreased tendency to academic activities and also the prevalence of mental and psychological disorders among teachers and medical students. Using e-learning processes in routine medical education would persist even after the end of the pandemic as they facilitate the teaching and learning processes in terms of saving the time and cost of education.

Service delivery

Service delivery is one of the dimensions of the health system that has faced considerable challenges amid the COVID-19 pandemic. Most routine health care deliveries such as preventive services, elective surgical procedures, rehabilitation care, and screening programs were fully or partially withdrawn. Some studies also have reported a decrease in vaccination coverage. A drastic increase in the need for intensive care beds for patients needing ventilation services during COVID-19 caused a lack of access to these beds (12, 24, 53). Patients with non-communicable

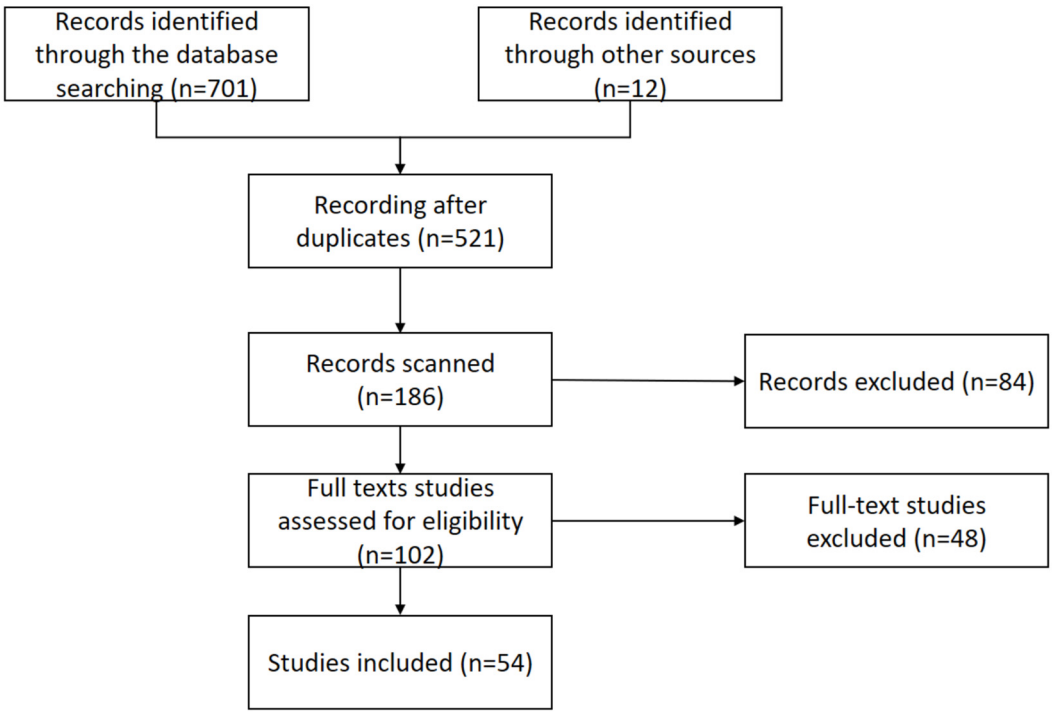

Fig. 2. Flowchart for identifying qualified studies

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Table 1. Primary and secondary effects of COVID-19 on different dimensions of the health system

Dimensions	Primary effect	Future effect (secondaryprimary effect)
Service delivery	- Disruption in the prevention and treatment services for (NCDs) (29) - Disruption in the rehabilitation services (30) - Postponement of public screening programs (31) - Disruptions in delivery of surgical services (19) - Decrease delivering primary health care (21) - Decrease in receiving basic primary healthcare services (e.g. delay in vaccination against infectious diseases) (21) - Restricted access to intensive care units (18) - Inconvenience on treatment of other disease (24) - Cancel most medical tourism activities (16) - Heterogeneous distribution of hospital beds (32) - Cancellation of outpatient office visits, elective procedures, and elective surgeries (24, 27, 33) - Decreasing access to mental health services (27) - Reducing pregnant women's access to services (21, 34-36)	- Increase the burden of NCDs chronic health problems and increase the cost of treatment and the financial burden of health insurance (9) - Requirement to use **telemedicine** to replace in-person consultation (10**,** 11-13) - Shifting service delivery from hospital to outpatient settings (13) - Limit investment in prevention services (14, 15) - Public pressure for a higher share of the health care GDP (16) - Increase mortality and morbidity for elderly people (15, 17-20) - Increase both communicable and non-communicable diseases (21-25) - Pressure of economic burden of the diseases (16) - Revise curriculums and courses (12, 26) - Decrease incomes related to medical tourism (16) - Increase virtual access to medical consultations and services (12, 27) - Changing patients' behavior in seeking health care (28) - Decline in important health indicators such as IMR and MMR
Medical education	- Disruption in surgical and non-surgical training (12) - Postpone exams in all level of medical education (16) - Cancel routine methods of education (12, 16, 17) - Shortage in infrastructure for medical education (26) - Virtual meetings with colleagues (12, 37) - Increases of webinars and e-learning (11, 37) - Early graduating in Final-year medical students (26) - The slowdown of the learning curve of medical students (26) - Disrupt on practical education for medical students (26) - Increase anxiety and depression among students (22, 30, 38-42)	- Reduce the skills and competencies of healthcare workers (12) - Increase medical error - Increase academic failure (12, 17) - Education dropout (12) - Increase virtual education (11, 37) - Continue to virtual education even after the pandemic because economic benefits (11, 37) - Burnout among trainees (26, 38, 39) - Tendency to change the field of the study (26) - Decreased tendency to academic activities (10) - An opportunity to enrich educational activities (10) - Prevalence mental disorders among students (22, 30, 38-40)
Workforce	- Physical and mental exhaustion of the healthcare workforce(22, 33, 40, 42) - Working conditions and occupational safety problems(40, 42) - Stress, anxiety, and depression(22, 40, 42) - Need to support forces(42) - Threat to the safety of medical staff(40) - Sleep and eating disorders among health care providers(40) - Medical staff shortage(41)	- Burnout among primary health care providers (22, 33) - exacerbate human resource shortage (33, 41) - prevalence of mental disorders among medical professionals (40) - Decreased quality of life and job satisfaction (30, 41) - Increased absence from work (22)
Infrastructures and hospitals capacity	- Decrease capacity of intensive care units(19, 43) - add extra beds to hospitals(19) - medical device, medicines, PPE shortages(30, 39, 43) - challenges in recycling hospital waste(43)	- Need for additional investment in hospital infrastructure and medical technologies (19, 33, 43) - Increase hospital infrastructure (19, 33, 43)

diseases such as diabetes mellitus and hypertension postponed receiving continuous care due to the risk of infection by COVID-19. In some cases, pregnant women have reported having trouble accessing important maternal and child services during the pandemic. Using telecommunication devices and virtual visits of the patients were among the first options available to the healthcare providers to follow their patients. Medical tourism centers in most countries had to cancel their activities due to the national lockdown and the restriction on people's travel between countries and regions. These primary effects have incurred a higher burden of non-communicable diseases in most affected countries by COVID-19 (32). Moreover, appearing the pandemic notoriously accelerates also the burden of communicable diseases. One of the future effects of COVID-19 on the dimensions of service delivery would be permanent changes in the medical-seeking behavior of the patients and other individuals. These changes not only do not limit preference to use virtual and telecommunication materials but can also go beyond this and touch this point that they are inclined to use some form of community-oriented services instead of traditional health care platforms such as hospitals.

Pharmaceutical Industry

Among the primary effects of COVID-19 on the pharmaceutical industry included changes in the demands for medicines, shortages in intermediate materials for produc-

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Table 1. Continued

Dimensions	Primary effects	Secondary effects
Stewardship and Health policy	- Decrease public trust to health system administration(47, 52, 56) - Deep financial losses for hospitals and medical providers(27, 33) - Structural and cultural weakness of the health system(27)	- Need to public-private partnerships (44) - Focus on resiliency of the health system (38, 45, 46) - Increase investment on public health (9, 47) - Using expert opinions on macro decision making (48) - Using capacity of NGOs in health system (49) - Evidence-informed policy making (9, 50) - Empower observatory in health system (51) - Invest more money to health system to deal with future health crisis (52, 53) - Revise on priority setting framework to set programs (46) - Revise role of the hospitals and medical centers (54, 55) - Change in financing systems in health system (53) - Empower inter-country collaboration to deal with health crisis (30, 51, 54) -
Health technologies	- Change preferences toward using tele-medicines for proving care (55) - Rapid reporting of the results of the laboratory and imaging tests (11) - Increase virtual visits of the patients (13)	- Accelerate digitalization(11) - Growth of technology tools, including: telehealth, artificial intelligence, and robotics (10, 11, 55) - Increase using technology for managing the pandemic and other diseases (53) -
Research system	- Focus on COVID-19 studies and neglect other diseases (59) - Disruption in the peer review process (59) - Shift the funds for COVID-19 research (58) - Performance of researchers, specifically women researchers (60) -	- Ethical Issues (57) - Delay of the current path of scientific progress (58, 59) - Negative effects on female researchers (60)
Pharmaceutical industry	- Demand changes, regulation revisions, research and development process changes and the shift towards telecommunication and tele-medicines (45) - Shortage in intermediate material (61) - Increase demand for laboratory tests (62) - Disruption in supply chain of medicines (20) - Shortage of medicines and equipment (63)	- Industry growth slow-down, approval delays, moving towards self-sufficiency in pharm-production supply chain and trend changes in consumption of health-market products along with ethical dilemma (6)

ing medicines due to national lockdown in some countries such as India and China, violation of routine supply chain of medicines, and the increasing list of shortage for some common medicines. The dire need for anti-viral medicines as a response to COVID-19 led to changes in the production line of some manufacturers to produce these medicines instead of the others (33). Moreover, regulatory bodies also may change their routine rules, policies and time frame to check the quality of medicines, assess new medicines, determine price, and maker share. The regulatory bodies attempt to accelerate the processes for some important and high-demand medicines e.g. anti-viral cases and inversely postpone dedicating time to assess some form of medicines with lower priority. This is especially the case for medicines that have been included in national clinical guidelines for COVID-19 diagnosis and treatment (6). International demand for seeking a vaccine that prevents people from COVID-19 made a very competitive space in the pipelines and rapidly changed the new medicines investigation priority. These modifications in the pharmaceutical industry probably may change the future size of the pharmaceutical market, the interaction between manufacturers with regulatory bodies and the supply chains.

Research system

COVID-19, as a new disease, need scientific knowledge on ways of transmission, methods for prevention, diagnosis, and treatment. This requires the research centers, universities and scientists to fill the gap in knowledge about the pandemic. Some journals have streamlined processes of peer review and have called for the paper to be published under special issues so as to enlarge the capacity of COVID-9-related publications. During the pandemic, research systems faced challenges regarding how to respond to fake news and misinformation circulating about the prevention and efficacy of treatment options for COVID-19. Research centers and universities had to reallocate resources to generate scientific evidence about COVID-19 which eventuated in limiting research activities in other research areas (48, 60). Some researchers -especially female researchers- experienced a restricted space to conduct research activities. These primary effects may lead to a delay in the predefined path of research progress of the countries and also a decrease in the revenue gained from research activities among researchers of the other disciplines that are not directly related to the COVID-19 issues.

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Fig. 3. Effects of the COVID-19 on the different dimensions of the health system

Stewardship and Health policy

Governance of the health system and related activities, referred to elsewhere as stewardship and health policy, is the main actor amid COVID-19. Before the pandemic, health policy heavily focused on managing non-communicable diseases such as diabetes mellitus, hypertension, COPD and cancer diseases due to the huge proportion of them compared to the overall burden of all diseases. Nevertheless, COVID-19 has imposed a severe shock on health policy governance that recently has neglected the importance of prevention and promotion of health awareness of the overall population (34, 48). With the outbreak of COVID-19, people witnessed a limited capacity of the health system to manage this event and their trust in the administration, structure and organization of health policy has been diminished. Moreover, the pandemic drastically reduced the primaty incomes of hospitals and physicians and incurred financial hardship. These primary effects may showcase the weaknesses of the current health policy in handling such health crises. Changes in financing system, using the capacity of NGOs and influencers in the community in a broader scope, thinking about resiliency of overall health system, revision of the priority of the programs and policies, expanding role of hospitals and health care centers in the society, enlarging space for public-private partnership and accelerating the establishment of evidence-informed policy-making structure could be most possible events that health policymakers will put on the table to discuss and decide.

Infrastructures and hospital capacity

Hospitals are the core entity in addressing the patients infected by COVID-19 in the early weeks of the pandemic. On the one hand, the patients urgently need intensive

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care units to use ventilation devices. On the other hand, physicians, medical specialists, and nurses demand personal protective equipment (PPEs) to protect themselves against the risk of COVID-19. The emergency wards are overcrowded with the suspected individuals and their families exert pressure on the hospital managers to add extra beds. One of the other primaty effects was hospital waste that, not only has the risk of infection for medical staff but also for society (43). Increased volume of infectious wastes was one of the other challenges that hospital managers should address (44). These primary effects of COVID-19 may convince policymakers to invest in infrastructures and medical technologies in hospitals. Accelerating investment in intensive care beds in order to increase the resiliency of the hospitals facing such health crises will be another future effect.

Health technologies

One area that rapidly responded to COVID was health and communication technology adoption concerning the daily activities of the health system. In the early weeks of the pandemic, the medical specialists were convinced to use tele-communicative technologies in order to make virtual visits to the patients and to make a shared decision making for managing them (12, 13). Another point was accelerating the process of delivering the laboratory test results, especially the Polymerase Chain Reaction test (PCR test) during COVID-19. It is anticipated that this pandemic may accelerate the development of the digitalized health system through using telehealth artificial intelligence and robotics in the near future.

Workforce

The specialists, nurses, and other medical staff drastically suffered in the short term since when COVID-19 rapidly spread country by country (62). They had to prescribe some medicines and deliver some services which were not clear how the patients clinically would respond to them. The workforce experienced anxiety and stress, fearing that they might be infected by the virus as well as lose their colleagues. Hypersomnia and eating disorders were among other problems experienced by health care providers (41). It is easily conceivable that the health system will face considerable challenges in terms of human resources such as increased burnout, prevalent mental disorders, COVID-19 sick leave and job dissatisfaction.

Discussion

This study aimed to investigate the effects of the COVID-19 pandemic on different dimensions of the health system and also depict a perspective of the future of this pandemic. Accordingly, we used the FW method that is a frequently-used method to investigate the future effects of different trends or events in the environment of the countries that the reports have been published elsewhere (30). To gather relevant information, a rapid systematic review of the published studies was conducted, followed by a discussion panel composed of a group of participants. We assessed the effects of COVID-19 on eight important dimensions of the health system such as service delivery, workforce, health policy and governance, infrastructure and hospitals, pharmaceutical industry, health technologies, medical education and research system. Medical education processes have experienced a tangible transition due to COVID-19 and most of students and teachers have faced direct challenges that could last for a longer time and influence their behaviors in the future. Platforms of health care provision alongside the hospitals and infrastructures have also drastically suffered from COVID-19 in a way that the routine practices in these centers fully or partially have changed. Health policy and governance of the health systems have tried to detect and track their weakness so that they will be able to have better management and control in similar health crises. Some structural and procedural reforms can be anticipated to happen in the near future. There are not so many positive signals for the future of the workforce after the COVID-19 pandemic and most future effects are expected to negatively affect the workforce and consequently the quality of care in the health care system. Research system entities such as research centers and medical universities have changed their funding priority to cover the evidence on challenges related to COVID-19 and probably in the future, other lines of research face a slowdown curve in research progress if enough budget is not dedicated to the research sector. Pharmaceutical manufacturers report inconvenience in importing intermediate materials from mega manufacturers in China and India so that expands the shortage list of medicines to the communities and healthcare centers. In the future, it is expected that the economic growth of the pharmaceutical markets will experience an overall slowdown curve in most countries. Changes in the plan of pharmaceutical production and research and development (R&D) activities are also another future effect of COVID-19 on this market. It is anticipated that the burden of diseases and the economic burden of non-communicable diseases will be increased and the practice variation of the medical professionals to deliver medical interventions experience will be more heterogeneous than before (64-68).

There are some studies that have investigated the future effects of COVID-19, such as Daffara who applied FW to identify the consequences of COVID-19 on a broader aspect of society and the global economy (69). This researcher merged the FW with the STEEP method to better foresight effects of the COVID-19 pandemic. He stated that COVID-19 conveyed a message to the policymakers that the health crisis is not merely a public health problem, but its effects will permeate the entire global economy of the countries.

In another study, Hasan investigated the effects of COVID-19 on Muslim societies using content analysis alongside pragmatic critical thinking processes (70). He developed three scenarios to show post-pandemic futures of the Muslim societies namely the disowned, outlier and the preferred. The disowned scenario referred to a scenario in that Organization of Islamic Cooperation (OIC) members continue to be intact and may be the most vulnerable nations with a weak health system. In the second scenario, they may face a more devastating situation com-

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pared to before the COVID-19 pandemic to protect people from the consequences of COVID-19 on population health. In this scenario, most Muslim countries continue to allocate resources for weaponry and luxuries while neglecting the healthcare sector. In the last scenario, he states that Muslim societies are more creative in managing COVID-19 and improving the health care sector (70). This study suffers from some limitations in implementing the FW method. Most of the future effects identified for each aspect may have resulted from the interaction among many factors. We decided to pinpoint the future effects of COVID-19 on the health system and acknowledged that there would be some interactions among factors to shape the future effects. This study also faces some limitations. Although it is common in future studies methods such as FW that use a small expert panel, we used a small group of participants that might not be as representative of health system.

Conclusion

The COVID-19 pandemic imposes important primary effects on each aspect of the health system. These primary effects collectively impose some challenges on the health system that will be shaped in the future. While COVID-19 comes with considerable risks, especially for the health system governance and workforce and service delivery dimensions, there is some room for the improvement of the resiliency of the health system through using digital health platforms, promoting health literacy of the population and adopting inclusive health policy-making processes.

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Conflict of Interests

The authors declare that they have no competing interests.

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