Iran's Experience with the COVID-19 Pandemic: Focusing on Vulnerable Populations

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Abstract Iran was one of the first countries to be affected by the COVID-19 pandemic. The onset of the pandemic coincided with the serious ongoing economic problems that Iran was facing and which have seriously impacted the lives of Iranians. According to official statistics, there were about six million infections and 130,000 deaths due to COVID-19 by December 2021. Quarantine, social distancing, and other health protocols had an adverse impact on mental and social health. Vulnerable groups, including children, women heads of households, the homeless, drug addicts, and the disabled were at higher risk. Although initially governmental and non-governmental organizations were not prepared to manage the pandemic, overtime serious efforts were made to implement innovative measures in the areas of education and mental health service provision. Economic conditions in Iran have adversely impacted all these measures. The authors discuss Iran's experience with COVID-19 focusing on the health, social, psychological, and economic factors and draw lessons from these experiences.

Introduction

Iran is situated in southwest Asia. It borders Armenia, Azerbaijan, Turkmenistan, and the Caspian Sea in the north and Afghanistan and Pakistan in the east. The country's western and northwestern neighbors are Iraq and Turkey, respectively. Its border in

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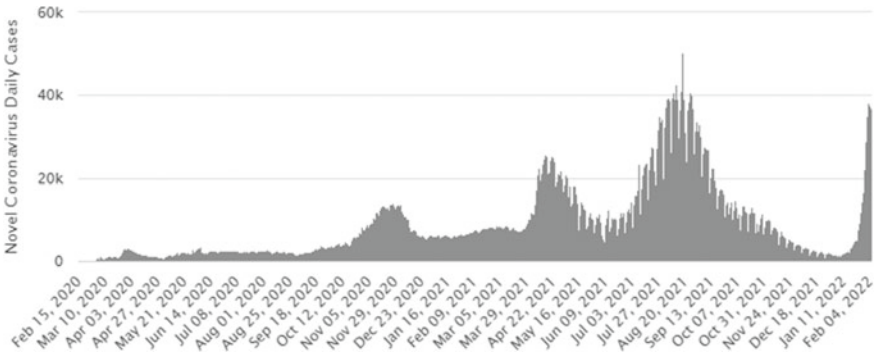

Fig. 1 Number of daily new confirmed cases per million people in Iran from February 15, 2020 to February 04, 2022. *Source* COVID-19 data repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University

the south extends to the Sea of Oman and the Persian Gulf. The capital city of Iran is Tehran.

Iran, the second largest country in the Middle East, has a population of over 80 million. Persian speakers make up about 60% of its population. Non-Persian speaking ethnic groups include Kurd (7%), Baloch (2%), Lor (2%), and Bakhtiari. Azeri-speaking Turks (24%) reside in the northwest and west. Turkmens (2%) live in the northeast. And the Qashqai tribe lives in the south. Arab tribes, with a population of about 2% of the country, reside in the southwest.

The COVID-19 pandemic in Iran was officially confirmed for the first time on February 20, 2020 in the city of Qom which is located 148 km from the capital [1]. A few weeks after the first positive case was identified, the Iranian Ministry of Health announced that the virus had infected all the provinces of Iran [2]. Figures 1 and 2 show the number of daily cases and deaths in Iran from February 15, 2020 to February 15, 2022.

The onset of the COVID-19 pandemic coincided with the end of the solar year, the Persian new year or *Nowruz* (March 21) which marks the beginning of spring. On this day people go for shopping and the streets are over-crowded. During the Nowruz holidays families travel, gather together, and organize ceremonies to celebrate.

Economic Conditions

Iran is currently experiencing one of the most challenging economic and social periods in recent decades. The economic crisis was at its peak in May 2018 when the former US President Donald Trump violated the Iran Nuclear Non-Proliferation Treaty and then withdrew. US sanctions have seriously affected Iran's economy which is dependent on its oil industry. The largest decrease in the gross domestic product (GDP) resulted from these sanctions in 2020 when GDP decreased to 6.8%.

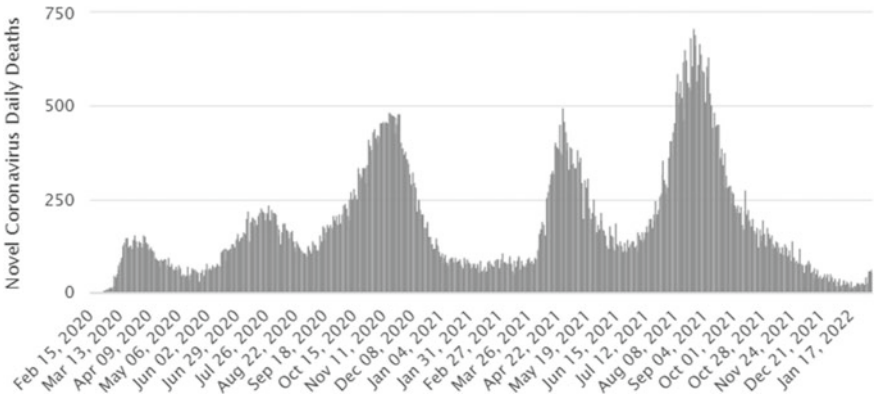

Fig. 2 Number of daily deaths in Iran from February 15, 2020 to January 17, 2022. *Source* Worldometers. https://www.worldometers.info/coronavirus/country/iran/#graph-deathsdaily

This shrinking trend in Iran's economy continued during the COVID-19 pandemic. In the spring of 2021, GDP decreased to 3.5% [3].

According to the Iranian Statistics Center, the inflation rate in Iran in 12 months upto July 2021 was 44.2%, the highest ever. Instability and rising inflation led to rising living costs putting more pressure on low-income groups as rising inflation increased the prices of basic commodities [3].

According to the Director General of Insured Affairs of the Social Security Organization, approximately 1.2 million people lost their jobs due to the COVID-19 pandemic. This figure was higher among women than among men [4]. According to a study conducted by the Higher Institute for Social Security Research, on average in 2020, 30.6% of the population lived below the absolute poverty line. This figure was 15.5% in 2017 and 21.6% in 2018 [5].

Sanctions had a significant impact on the availability of drugs in the Iranian market. Some drugs (such as Remdesivir, Dexamethasone, and Interferon Beta), which showed promising results, are now produced in Iran. At times there were drug shortages because of the increase in the number of hospitalized patients. The country was also in short supply for drugs to treat chronic non-communicable diseases. Iran had high rates of chronic non-communicable diseases such as cancer, diabetes, high blood pressure, etc. even before the pandemic. Due to the limitations of the Iranian banking system, raw materials for drug manufacture as well as for medical equipment and supplies for hospitals and medical centers were inadequate. Because of the sanctions, there are restrictions for importing high-tech equipment. Although, some personal protective equipment (PPE) (such as face masks, disinfectants, etc.) are now manufactured in Iran, there are restrictions on advanced testing and hospital equipment due to the sanctions [6].

Health System Response to COVID-19 Pandemic

The National Committee for COVID-19 Control instituted at the highest level to combat COVID-19 has as its members the President, members of the cabinet, and other relevant bodies. This committee took decisions on health, political, economic, social, and disciplinary measures. In the beginning, laboratory equipment in Iran was available only at the few centers in the capital. Diagnostic kits and laboratory technology were inadequate. But within a short time, the number of tests and laboratories was increased throughout the country. Laboratories were set up in medical universities. As of March 28, 2020, 90 laboratories set up in 31 provinces were able to perform diagnostic tests on a daily basis [7].

When the number of cases increased, the government implemented a social distancing plan. According to this plan, citizens had to keep a distance of at least two meters from each other when they were outside the house. Citizens did not have the right to leave the city and they could not move between cities. Fines were imposed for violations. Public venues as well as schools, colleges and universities, movie theaters, and venues for national sports were closed. And office hours were decreased [7].

One hospital was identified in each city to admit patients diagnosed with COVID-19. In response to the spread of the infection and the increase in the number of referrals, the number of hospitals admitting COVID-19 patients was increased. To reduce the burden on hospitals, a number of comprehensive healthcare centers were converted into outpatient admission centers or 24/7 centers and 16/7 centers. With the participation of other sectors, sports spaces, hotels, commercial centers, and exhibitions were used as inpatient and outpatient centers [7].

According to the Presidential Center for Strategic Studies, new information and communication technologies were used for COVID-19 monitoring and control. For instance, by connecting the Ministry of Health database to the e-government network of the Ministry of Communications and by monitoring telecommunication information through mobile networks, more than 112 land and air travel companies were banned from providing travel services to persons who did not observe quarantine rules. However, there were many problems while implementing these control measures. An outbreak map helped to monitor and control the pandemic by collecting telecommunications information on sick people and identifying provinces with high numbers of incoming and outgoing passengers. Outbreak risk points (combined calculation of traffic points of the infected as well as traffic flow) were calculated [8].

The Ministry of Health, Treatment, and Medical Education, as the custodian of health, launched an electronic COVID-19 self-assessment system at salamat.gov.ir3 to screen people suspected of having the disease. By entering the national code, anyone in the country could respond to simple questions on COVID-19 self-assessment and receive necessary guidance in accordance with the latest instructions from the Ministry of Health. After screening, suspected case were contacted and

provided advice. This information was later used to register and schedule individuals for the vaccination program [9, 10].

Given the increase in referrals and the number of patients hospitalized, the workload of medical staff greatly increased. The country's healthcare system had never before faced such a crisis or encountered such high workloads. Lack of information about this new disease and the behavior of the virus, non-availability of drugs, and lack of PPT equipment impacted the country's healthcare system especially in the early days of the pandemic [11].

To understand the challenges faced by hospitals and health staff at the frontline in the fight against COVID-19, a study was undertaken by the Tehran University of Medical Sciences in 11 faculties, 17 hospitals, and several research centers. Through interviews with 22 managers of different wards of hospitals, management challenges were identified (Box 1) [12].

Box 1 Management challenges

Managerial challenges included lack of preparedness, serious delays in making decisions, inability to provide protective equipment and medicines, and lack of financial resources.

Manpower challenges included stress and fear among health personnel of getting the infection, unwillingness of some to work, increased workload of specialized manpower, shortages of specialized manpower, and psychological problems faced by health staff.

Educational challenges included closure of the clinical educational system and widespread protests of medical students.

Research challenges included verification of herbal treatments through research, observance of scientific and ethical criteria, and electronic data collection.

Another study showed that the critical challenges for the management of COVID-19 were: limited information, insufficient attention to political, social, cultural, economic issues, lack of community participation, high workload of healthcare workers, work burnout, mismanagement of resources, lack of up-to-date and agreed upon guidelines for tracking contacts and patient flow, mental health problems, and lack of support for vulnerable groups [13]. Estimates indicated that family relationship networks and friendly gatherings that took place in different parts of the country caused the infection in 20 to 60% of the situations [14].

Vaccination

The COVID-19 vaccination program began in February 2021 in Iran with a limited number of Russian vaccines. More vaccines arrived three months later but they were less than 900,000 doses. Many of the promises made by the officials were not fulfilled because of the inadequate vaccine supplies. There was no domestic

vaccine production despite having forecasted that the vaccine would be manufactured by the summer of 2021. On September 23, 2021, the government imported more vaccines, thereby, accelerating the vaccination program. Currently, Sino farm, Bharat Biotechnology, Oxford AstraZeneca, Sputnik, and COViran Barekat vaccines are being used in Iran [13, 15]. According to the Ministry of Health, by January 27, 2022, a total of 60,601,957 people received the first dose; 53,873,978 the second dose; and 15,936,852 received the third vaccine dose [16].

Research shows that persons who were vaccinated had more confidence in the vaccine, the manufacturers, the government, and the health authorities [15]. However, there were individuals and groups who opposed vaccination. A study that was conducted on people over 18 years using combined quantitative and qualitative methods showed that regardless of the type of vaccine, a high proportion of people in Tehran were willing to get vaccinated. More than half of them wanted imported vaccines. The qualitative study which was conducted to better understand the experiences and perceptions of the residents in Tehran, showed that some people had doubts about the vaccine. The study highlighted their ambiguities about vaccine. There were safety concerns about the adverse effects of the vaccine and distrust of health officials and vaccine manufacturers. These were the reasons why people refused to get vaccinated [13].

Mental Health Consequences and Interventions

Even before the COVID-19 outbreak, mental health indicators in Iranian society were not favorable [17, 18]. The first study on mental health conducted in 2000 revealed that about 21% of the population was diagnosed with psychological problems. The second study conducted in 2012 indicated that 23.6% of the population was diagnosed with psychological problems and required psychiatric services. According to the findings of the 2015 study, the rate was 23.4% [17, 19].

According to the Secretary of the COVID-19 Mental Health Committee that conducted national research on 25,000 people in January 2021, almost a year after the COVID-19 pandemic began, showed that 29.7% of the population suffered from psychological disorders. This was a significant increase when compared to 2015. Among the study participants, 14.9% were already infected. Of these, 39.6% had psychological problems. Four percent of these people were already infected. And of these had lost a loved one at the time of the research and 40.8% suffered from mental health problems. These findings indicate that mental disorders were exacerbated by the pandemic [20].

Research on the anxiety status of more than 12,000 people found that frequency and severity of anxiety symptoms were significantly higher in people with infection. The level of anxiety among women was significantly higher than among men. The level of anxiety in the age group of 21–40 years was significantly higher than in other age groups. The higher the level of education, the more significant was the level of anxiety. The more people followed the news regarding COVID-19, the greater

was their anxiety. The level of anxiety among people who lost a family member, acquaintance, or friend was significantly higher [1].

The study indicated that COVID-19 caused many psychological problems such as stress, anxiety, depression, paranoid thoughts, and loneliness. Psychological interventions such as spirituality-based therapies for obsession, cognitive behavioral therapy, reality therapy, and acceptance and commitment-based therapy, could perhaps help reduce the effects of the disease. This study also showed that positive psychological traits of individuals such as self-care, conscientiousness, psychological toughness, social support, resilience, sense of cohesion, hope, sense of humor, and spiritual health contributed positively in addressing these problems [21].

Based on the statistics provided by the Director General of the Consultation and Psychological Affairs of the State Welfare Organization, a number of calls by couples related to family disputes during the quarantine period were made. The number of disputes between couples were three-fold higher in this period. Some of the couple disputes were related to how to observe health guidelines such as when a family member could go out of the house. With the closure of schools and the presence of children at home, many marital disputes arose over the upbringing of children. Home stay also resulted in violence including verbal and physical violence. Sometimes severe violence was reported [22].

To provide mental health services, a psychological self-assessment system was made available through the website of salamat.gov.ir. People could ask questions, receive feedback, and get access to self-care education on mental health. In addition, individuals could call 4030 and 1480 phone lines and get directly connected to mental health experts to get their services. They could also be referred to comprehensive health service centers for face-to-face services [1].

The Mental Health Committee of the National COVID-19 Committee provided educational materials related to mental health and offered information to the public on various visual, written, and audio platforms.

Formulation of guidelines for psychosocial support of patients and their family members and notifying them to health centers where other measures were undertaken to control the pandemic [23]. Guidelines for psychosocial support were provided to the survivors and families of the deceased. In Iran's culture, customs for mourning ceremonies are very important. Burial is part of the mourning process which provides an opportunity for mourners to express their feelings and emotions over the death of their loved ones and also enables them to vent their feelings. Given COVID-19 restrictions, the possibility of holding ordinary mourning ceremonies by gathering people in the third, seventh, fortieth day ceremonies as well as visits by friends and relatives was impossible. Therefore, the survivors not only lost their loved ones, but also could not gather and pay their respects to the deceased. They felt that their loved ones had died alone and without their support. Being next to someone who is seriously ill is an important expression of love. But, because of physical distancing, the infected person passed away without the presence of the family. And the bereaved family members remained with intense regret, feelings of guilt, and helplessness. The absence of a mourning ceremony, not being able to say goodbye to the loved one, not seeing the body before burial, and imagining the pain and suffering the dead

may have endured, left painful memories which remained with the survivors. Death resulting from COVID-19 made the mourning process difficult and had devastating long-lasting effects on the survivors [22].

Social Consequences and Responses

Distancing or limiting interactions were the most effective methods to counter infection, reduce the burden of the disease, and prevent the collapse of the healthcare system. But this strategy was not without cost. It had serious emotional and social consequences.

In Iran's society, household work and maintenance of children is still the woman's responsibility. At the same time many women are engaged in economic activities. The stay-at-home policy further increased women's responsibilities [24].

A Tehran municipal poll showed that in 16% of Tehran households, family tensions increased due to staying at home. In 58% of the families, the tension between the couple increased and 46% experienced an increase in the tension between parents and children [24].

Education of millions of students across the country was stopped to prevent the spread of the virus. The pandemic crisis showed that in less developed areas of the country, there was inadequate access to the Internet, laptops, and tablets, preventing students from seeking virtual education [24].

The changing socioeconomic environment due to the COVID-19 pandemic changed fertility preferences. According to the National Household Census, about 30% of single people postponed their marriage plans. In addition, about 24% of people, postponed their decision to have a child. According to this research, financial and economic concerns associated with the COVID-19 pandemic as well as public concerns about the future were the main reasons given by respondents for delaying their decision to have children [25].

Vulnerable Groups

The impact of the COVID-19 on vulnerable groups was more complex. Vulnerable groups included the homeless, substance users, the disabled, women, the elderly, and children. Vulnerable groups suffered more severe psychological, social, and economic problems during the pandemic.

The Homeless and Substance Users

At the beginning of the COVID-19 pandemic, due to fear of spreading the disease in enclosed areas, some responsible organizations stopped the plans to provide compulsory treatment to drug users and reduced admission of substance users into mid-term residential treatment centers. A large number of prisoners were also released. One of its consequences of the lack of a coherent support program was an increase in the number of the homeless [26]. NGOs and experts came together to form a working group with the help of the government and international organizations to address this situation to reduce harm. COVID-19 protection items were provided to more than 2,500 homeless people, mostly drug users. Preventive educational material tailored to the target group's conditions were developed (for example, podcasts were prepared and hotspots were broadcasted); patients were diagnosed and suspected cases were referred to health centers; and support was provided at the policy and decision-making levels [27].

With the increase in the number of diagnostic facilities and equipment, the State Welfare Organization ensured that everyone who entered treatment centers had a medical certificate showing a negative PCR test. In most cities, PCR tests were conducted for homeless drug users. According to a study conducted in Tehran, in the first seven months of 2021, more than 11,000 PCR tests were conducted in homeless drug users which resulted in the diagnosis of 6.04% i.e. 696 positive cases [28].

Women Headed Households

Female-headed households including widows, divorced women, wives of drug users, prisoners, and unemployed men, self-employed women and girls, and wives of disabled men were among the vulnerable. According to official statistics, there were three million female-headed households in the country. Many of these women worked in non-formal occupations to meet the needs of their families and most did not have valid employment contracts, nor did they receive minimum wages. Thus, their livelihoods and occupational health were affected. They faced problems because of lack of job security, unsafe working environments, and lack of access to social support. With the outbreak of COVID-19, these women's informal jobs were impacted and the incomes were greatly reduced. Although some women were covered by supportive institutions such as the State Welfare and Relief Committee, a major challenge for women in non-formal jobs was the lack of a comprehensive information system to provide data on the type of business and to identity women working in this field. This made it difficult to provide effective support for women working in the informal sector.

Women heads of households usually reside in very small houses and the constant presence of children in the house placed several restrictions on these women. The closure of schools required that tools such as tablets and mobile phones be provided

to the children. Imposing these extra expenses on women who had lost their jobs created difficult conditions for them. Thus, the disease led to an economic crisis. This made it impossible for women to renew their contracts. They could no longer pay house rent and had to move to poorer neighborhoods and smaller houses [29].

The National COVID-19 Committee approved loans were provided for house rent, housing deposit, and job creation. These women were also offered livelihoods and sanitary packages [30].

The Children

Quarantine conditions for children under 12 years caused anxiety and fear and affected the formation of the child's personality. Children's social interactions were severely hampered as they could not go to school and could not be with their friends. They were also subjected to verbal and domestic abuse at home.

Around 210,000 elementary schools and about 760,000 high school students dropped out of school because of the pandemic. It was difficult for poor parents to buy smart phones and internet packages. Consequently, these children were not equipped for learning at home. Social harm caused another problem that these children faced [31].

Despite the opposition of scientific groups and non-governmental organizations, the collection plan for street children was started before the pandemic. Mobile vans patrolled in the streets to transfer them to welfare centers. This plan continued even after the pandemic.

Disabled People

The State Welfare Organization (SWO) is responsible for caring for and providing services to the disabled. Currently, it provide services to 1,531,705 individuals with disabilities. During the COVID-19 pandemic, SWO made several attempts to control the disease in the disabled through various measures including education, care, and support. According to the evaluation report of the Research Center of the Islamic Parliament, SWO was able to prepare and compile educational packages and create several communication channels for the disabled. Care and support were mostly concentrated in rehabilitation centers which covered 52,200 disabled people [32].

A considerable portion (65.96%) of the population covered by SWO was, outside, these centers and so was deprived of support during the crisis. An alternative strategy was to meet the needs of the target community through distance education. Lack of an appropriate response due to the continuing crisis exacerbated the problem. Research findings showed that COVID-19 affected the livelihoods of the disabled. A survey conducted on the disabled showed that about 80% of these people needed immediate financial assistance [32]. A large percentage of the target community

(67.7%) reported that the closure of alternative rehabilitation centers had adverse effects. The SWO showed that 2.72% of the clients living in rehabilitation centers tested positive for COVID-19. Of these, 0.26% died [32].

The Elderly

The elderly constitute 9.9% of Iran's 83 million population. This number is constantly increasing. According to one study, the elderly first received information on COVID-19 from their families, then from television, and finally from virtual networks. The pandemic caused significant changes in their lives, including changes in lifestyle, communications, and leisure time. They feared of spreading the disease to other family members and peers. This led to feelings of obsession, depression, and powerlessness in the elderly [33]. They had to stay home for long periods of time. And their children and acquaintances could not visit them which intensified their feelings of isolation [34].

Prior to the pandemic, in many large cities, the elderly followed a daily program of walking and aerobic exercise in the park. During the pandemic, city parks and sidewalks were closed at various times, which led to physical inactivity and social isolation of the elderly [35].

For some of the elderly, COVID-19 came from a divine will. It was considered to be a divine test. Others believed that it originated biologically and treatment was possible [33].

Lessons Learned

The unfavorable economic situation due to the sanctions was aggravated by the COVID-19 pandemic. The pandemic affected all programs that were designed to address the economic crisis in Iran. Vulnerable groups suffered more because they had complex health needs even before the pandemic. The virus exacerbated their health, economic, and social problems.

The following lessons were learned during the pandemic:

- To address this and future pandemics, policy-makers should have a comprehensive view of the disease that includes psychological, social, and economic dimensions. A comprehensive integrated health system should be organized to address the problems.
- It is important to strengthen health sector capacity by providing adequately trained health professionals at all levels of the healthcare system.
- There is a need for a comprehensive monitoring system which includes vulnerable groups. Accurate statistics of vulnerable groups such as women heads of households, the disabled, children, etc. are needed for different parts of the country.

- It is important not to politicize the healthcare system. Iran was affected by severe sanctions under the heading of 'maximum pressure which affected the government's ability to provide diagnostic, health, psychological, social, and economic services to the people, especially to vulnerable groups.
- Additional inputs are needed for people living below the poverty line. It is critical to ensure that there is an equitable distribution of health services.
- The pandemic revealed that the government cannot by itself provide healthcare to the population in Iran. The wave of privatization of health services, which has accelerated during the past decades, must be re-examined to design public and private health services for Iran's population.

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