

The Islamic Republic of Iran: a primary health care case study in the context of the COVID-19 pandemic

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Executive summary

This case study aims to document and analyse the primary health care (PHC) system in the Islamic Republic of Iran in the context of the COVID-19 pandemic between February 2020 and August 2022. It focuses on three aspects:

1. The response of PHC and essential public health functions to COVID-19;
2. Multisectoral policy and action in response to COVID-19; and
3. The community response to COVID-19.

On 19 February 2020, the first laboratory-confirmed case of COVID-19 was reported in the country. By providing outpatient care, testing and screening during epidemic waves, the PHC system reduced hospital overcrowding and workload, and increased the resilience of the secondary health care system. Hundreds of thousands of PHC volunteers received basic training and helped to educate people, screen and follow up close contacts, monitor compliance with public health regulations, and support vulnerable groups.

The COVID-19 National Committee (CNC) was established on 20 February 2020 to enhance intersectoral collaboration, with specific programmes developed by the relevant subcommittees, ministries and agencies at the national and provincial levels. The PHC structure was redesigned to provide secure access to vital health services: separate COVID-19 and routine service centres were established, with primary care packages delivered either in-person or remotely. Mental health and nutritional consultants delivered PHC services and provided targeted assistance to vulnerable households. This report identifies key learnings from the experience of the COVID-19 pandemic that can be used to inform PHC policies and programmes that preserve routine services in future crises and maintain resilience.

Introduction and national context

As one of the worst public health crises in recent history, the COVID-19 pandemic has challenged health systems worldwide. Documenting and analysing PHC responses in individual countries could help policy-makers prepare for future crises.

This country case study investigates the Islamic Republic of Iran's PHC response to COVID-19 from the initial outbreak in February 2020 until August 2022. With a population of over 85 million people, of whom 74% live in urban areas, the country's gross national income (GNI) per capita was US\$ 2960 in 2020 (1).

Public revenues, out-of-pocket expenditures, insurance premiums and taxes are the main sources of funding for the health care system. Despite the negative impact of sanctions – i.e., high inflation, increasing out-of-pocket expenses, reduced income and access to medicine and health equipment – the Islamic Republic of Iran's health indices for infant mortality, under-5 mortality, vaccination coverage and tuberculosis (TB) management are relatively good (1,2). The Social Security Organization (SSO), Iranian Health Insurance Organization (IHIO) and the military insurance scheme are the main basic health insurance providers, and the share of private insurance is small at only 7.05% of the population. About 8.5% of citizens were uninsured in 2018 (3).

Designs for an optimal platform for a PHC system date back to 1972. The initial phase to establish a PHC network began in 1974, but it was not until 1985 that PHC networks were established nationwide (3). Initially, PHC focused on communicable diseases, especially in rural areas with the highest prevalence and disease burden. In 2005, PHC capacity was expanded through the implementation of the family physician (FP) programme and universal health insurance in rural areas, nomad communities and cities with a population of fewer than 20 000 people (which amounted to 27 million people, or 32.5% of the population). Later, in 2012, the programme was expanded to urban areas within the two provinces of Fars and Mazandaran, reaching an additional 4.5 million people (5.5% of the population) (4). In 2014, reforms were introduced as part of the Health Transformation Plan (HTP) to achieve universal health coverage (UHC), which included adjustments to the PHC system to respond to noncommunicable diseases (NCDs) and rising urbanization (3).

The PHC system in villages relies on the services provided by the *Behvarz*, community health workers who have been formally trained. *Behvarz* are based in rural health houses and serve up to 1200 people. In addition, middle-to-large-sized villages have a comprehensive rural health care centre, which hosts a family physician and a team of up to 10 health workers (i.e., experts in public health, disease control, environmental health and laboratory techniques, a nurse and midwife, physician, and mental health and nutritional health consultants) (3, 5). These rural health care centres provide more complex health care services to nearly 7000 designated populations. Such comprehensive coverage of PHC in rural areas of the country has revolutionized population health indices and reduced disparities over time (4, 6).

In urban areas, health posts and comprehensive urban health care centres provide services comparable to those provided by health houses and rural health care centres. The network is managed by district health centres and the universities of medical sciences (UMSs). Each province has at least one UMS (3,5). In mid-2022, 18 242 health houses, 5489 health posts and 5517 (2723 urban and 2794 rural) comprehensive health care centres existed in the Islamic Republic of Iran.

The location of PHC centres is designed to ensure accessibility within a maximum of 30 minutes of driving. PHC services are provided free of charge to the designated populations. In addition, target groups (e.g., pregnant women and children) receive proactive monitoring and care (3). While all people living in rural, marginal and less developed urban areas, and those living in most cities and provinces are covered comprehensively by the PHC network, the PHC system has remained fragile as the main point of care in Tehran (6). Densely populated big cities require substantial per capita spending, as well as investments in infrastructure and human resources. The PHC sector has not reached a sufficient level of development due to sanctions, a decline in public revenues, and the preference of influential policy-makers for secondary-level services (3,7).

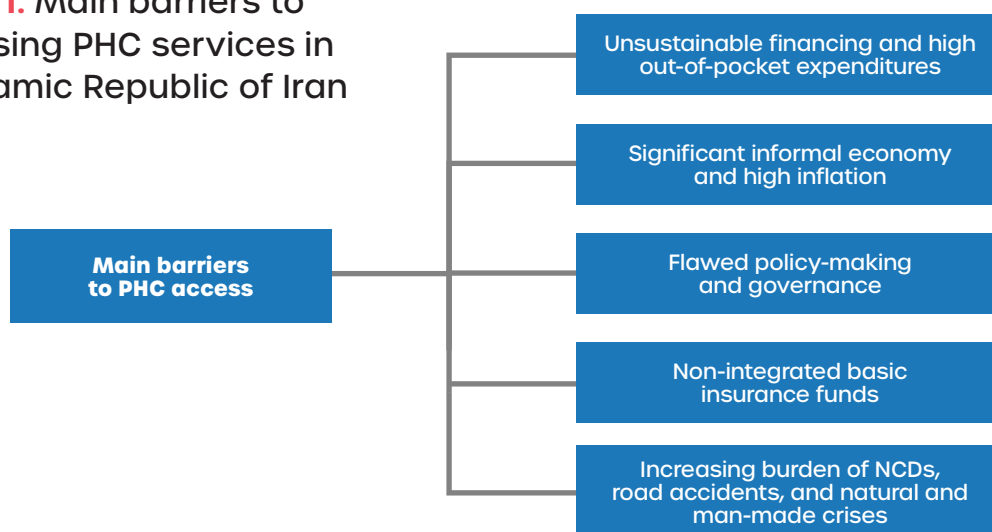
In 2017, PHC represented 38% of current health expenditure (CHE) (6). In 2015, following introduction of the HTP and implementation of the National Action Plan for the Prevention and Control of NCDs (8), primary care service packages were updated and strengthened to foster intersectoral collaboration (6). Furthermore, the vital census was replaced by an integrated health portal (SIB) (an electronic health record) (9); the payment system was reformed; the referral system was strengthened; and legal migrants and non-Iranian residents became entitled to use services similar to Iranians.

Despite its achievements, the PHC system faces challenges due to the increasing burden of NCDs, ageing populations, urbanization and inadequate integration of social determinants of health (SDH) into PHC (3). A 2010 WHO assessment reveals that 20–40% of health expenditure was wasted at that time, owing to inefficiency (10). More recently, the provincial PHC performance evaluation in 2021 found interprovincial differences, hence the need to improve resource allocation and management (11). Figure 1 shows the main barriers to accessing PHC services.

Initial response to COVID-19

On 19 February 2020, the first laboratory-confirmed case of COVID-19 was reported in Qom city, 150 km south of Tehran (see Annex 1. Timeline of events and policies). This was also the first officially reported death from COVID-19 in West Asia, the Middle East and North Africa (13). The COVID-19 pandemic, combined with the imposition by the United States of its harshest unilateral sanctions against the Islamic Republic of Iran, have caused several challenges to the country's health sector. In turn, these may have increased the burden of the pandemic and the number of casualties (7).

Figure 1. Main barriers to accessing PHC services in the Islamic Republic of Iran



Source: Soltani et al. (12).

The National Security Council and the Supreme Leader established the COVID-19 National Committee (CNC) on 20 February 2020. The CNC is directed by the President and includes representatives from eight ministries, not least the Minister of Health and Medical Education who offers technical support, and various intersectoral coordination committees (14). In each of the 31 provinces, the governors also established COVID-19 Provincial Committees. Initially, strict quarantine and traffic restrictions were not implemented, and instead people were only encouraged to stay home. Gradually, by 26 February 2020, the CNC began to close schools, universities, workplaces and religious sites; it restricted ceremonies; cash transactions in banks were banned; and extended the expiration date for third-party insurance to promote the stay-at-home strategy and social distancing policy. Despite all of these interventions, however, the initial delay in the introduction of prevention and mitigation measures by the CNC led to widespread disease prevalence, with cases of COVID-19 confirmed in all 31 provinces within two weeks.

In terms of financing, the government, under the Supreme Leader's decree, allocated more than US\$ 1 billion from the National Development Fund to the health sector and vulnerable households (15). The Planning and Budget Organization allocated the equivalent of about US\$ 1.971 billion to the health sector. Among other measures, the government also allocated extra funds and applied tax breaks to boost domestic production of face masks and disinfectant materials (16, 17); provided free subsidies to 3 million day labourers; suspended tax for three months (which represented 7% of gross domestic product (GDP)); transferred cash to vulnerable households (0.3% of GDP); deposited US\$ 357 million into the Unemployment Insurance Fund (0.3% of GDP); provided low-interest loans for businesses affected by COVID-19 that retained their workers; and paid US\$ 3 billion in loans with a preferential rate of 12% and a two-year repayment plan for service and production jobs (17).

Table 1 indicates the status of the COVID-19 pandemic on 14 August 2022. The WHO Iran Country Office publish trends in COVID-19 laboratory-confirmed cases and deaths, along with the number of daily COVID-19 PCR tests and percentage of positive cases (18).

Table 1. The status of the COVID-19 pandemic, 14 August 2022

Indicators	Number
Number of confirmed cases	7 475 173
Recovered patients	7 171 824
Number of deaths	142 944
Patients currently admitted to the intensive care unit (ICU) with COVID-19	1474
First-dose vaccine recipients	64 834 155
Second-dose vaccine recipients	58 205 711
Third-dose vaccine recipients	30 325 892
Total COVID-19 laboratory tests performed (polymerase chain reaction (PCR) tests)	53 513 851

Source: MoPH (2021) (26).

Methods

Data were obtained for this case study from various sources in between February 2020 and August 2022..

A Persian and English literature search was conducted across national and international journals for articles published between February 2020 to July 2022. In addition, several scholarly databases were searched, including Web of Science (WoS), PubMed, Scopus and Embase, as well as Iranian databases, including MagIran and the Scientific Information Database. The following keywords were used: family practice, primary health care, general practice, PHC, and essential public health; in combination with COVID-19, coronaviruses, novel coronavirus, coronavirus disease, severe acute respiratory syndrome coronavirus 2, SARS-CoV-2, COVID, pandemic, pandemics, epidemic and epidemics. Additionally, we reviewed the cited literature to identify similar studies. We approached PHC experts and selected national managers of various PHC programmes (on NCDs, TB, nutrition, mental health, etc.) to request unpublished documents (i.e., the content of national meetings, laws, regulations, rules, published and unpublished reports, papers, websites and speeches). In total, we reviewed the full text of 188 documents relevant to PHC and COVID-19, in Persian and English, and sought experts' views in cases of ambiguity.

To complement the literature review, the research team also conducted stakeholder consultations with 14 government officials and service managers. A discussion guide was developed reflecting key PHC components. Given the circumstances at the time, all stakeholder consultations were conducted virtually through the Skype platform and lasted 32 to 65 minutes. They were transcribed verbatim, analysed independently by two researchers with good experience in qualitative research methods, and approved by the PI.

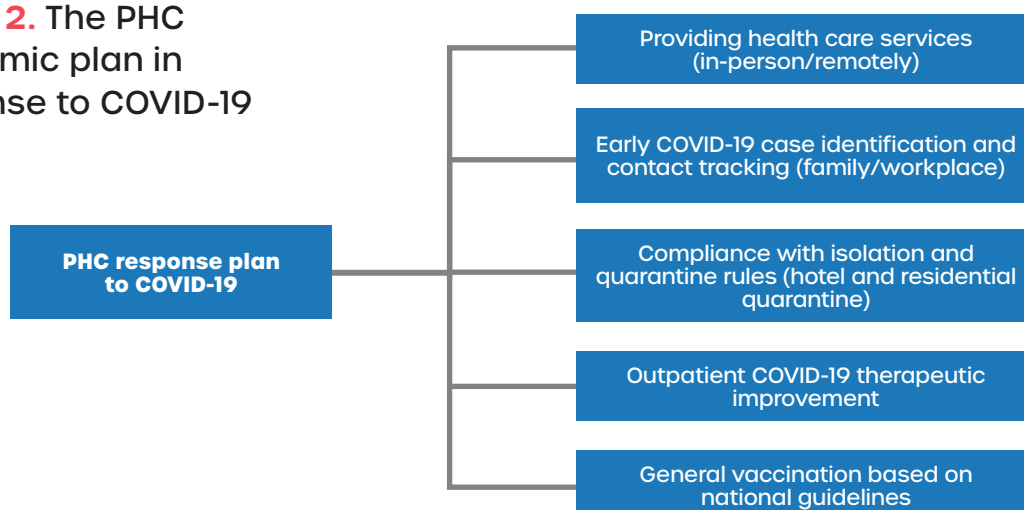
During the stakeholder consultations we aimed to document any challenges or opportunities for improving the PHC network across: 1) primary healthcare and essential public health functions, 2) multisectoral policy and action, and 3) community engagement. The data were analysed using thematic content analysis – a method for finding, analysing, organizing, characterizing and reporting themes. Despite repeated follow-ups, we faced limited access to some data and responses from few stakeholders.

How primary care and essential public health functions are responding to COVID-19

The Islamic Republic of Iran ranks 105th out of 195 countries on the Global Health Security Index (GHSI) with a score of 36.5/100. The country scores medium to high on indicators such as the strength and quality of its laboratory system, laboratory supply chains, surveillance data accessibility and transparency, and emergency preparedness and response planning. However, it needs to improve capacity to exercise response plans, risk communication, trade and travel restrictions, and financing (19).

The contemporary PHC network was built in the mid-1980s to guarantee affordable, accessible and adequate health care services within communities. Currently, the PHC network serves more than 98% of rural residents and 93% of urban inhabitants. PHC facilities were critical during the COVID-19 outbreak in terms of active screening and symptom-based case findings. Despite delays in fully utilizing PHC capacity in the management of the COVID-19 crisis, in time PHC facilities were directed to contact and screen their designated populations for COVID-19 signs and symptoms, phone-screening 78 million patients over 45 days (20, 21). Benefiting from its extensive structure and in line with the FP programme rules that define the PHC network as the public's first point of contact with the health sector, the PHC system established a pandemic response plan (Fig 2).

Figure 2. The PHC pandemic plan in response to COVID-19



Source: The authors.

Restructuring primary care facilities in response to COVID-19

In the first week of the outbreak in the Islamic Republic of Iran, 1200 24-hour and 16-hour PHC comprehensive centres were designated in cities and rural areas as COVID-19 centres for suspected cases referred from rural health houses, urban health posts, rural/urban comprehensive health service centres and other private sector centres. In selected health centres and communities, fixed and mobile sampling units were set up (e.g., in houses, squares and mosques).

“We had to plan to provide both the primary care service packages and COVID-related services.”

(Stakeholder 1).

In February 2021, when the mass vaccination programme began in cities with populations of over 20 000 people, 790 vaccination sites were added to the PHC network to prevent disruption to routine services, including maternal and infant care. Moreover, several hundred refrigerated vehicles were provided for vaccine transportation, while the Health Observatory Center was established within PHC centres to aggregate and analyse data (Fig. 3) (22).

Ambulances transported suspected COVID-19 cases to ensure public safety. In the first three months of the initial outbreak of COVID-19, all service packages were assessed and categorized into in-person and remote services, to reduce unnecessary health centre visits and disease transmission (3, 22). Annex 2 lists the innovations introduced in Iran’s PHC system at different operational levels.

Performance of designated COVID-19 centres

In 2020, a cross-sectional, descriptive-analytical study was conducted in all designated COVID-19 centres across the country, including 978 centres affiliated

with 63 medical universities/schools. This study assessed centre performance using the criteria of patient education on COVID-19 prevention and control, staff training, observing social distancing, facilities, waste management, workforce, supply of medical equipment and work processes. Staff training received the lowest self-evaluation score (in the first-level evaluation). The second-level evaluation of universities/medical institutions gave the lowest score to patient education on COVID-19 prevention and control. The highest scores were achieved across both evaluation levels for the observance of social distancing (21).

Expansion of laboratory capacity

The first confirmed cases of COVID-19 were identified in the reference virology lab at the School of Public Health, Tehran University of Medical Sciences (SPH-TUMS). Initially, due to a shortage of COVID-19 diagnostic kits, testing was limited to hospitalized patients, and samples from all over the country were sent to SPH-TUMS and then to the Pasteur Institute in Tehran.

Before long, more than 110 laboratories received diagnostic materials and technical assistance, and additional lab technicians were trained. Primary care facilities and private sector laboratories were added as testing centres to ensure community access to PCR testing and to other lab services, particularly among deprived groups such as the nomadic population (20). PHC and private sector laboratories increased the number of labs to 433 (168 public and 265 private) in September 2021 (23). In some deprived areas, testing units transported samples to diagnostic labs (Fig. 3). The structural redesign of the PHC network and additional access to instruments and reagents in private laboratories were key factors that increased COVID-19 testing capacity in the country.

COVID-19 vaccination programme

Particular segments of the population could receive their COVID-19 vaccine at 1376 mass vaccination posts that had 7149 stations (data registers and vaccinators). PHC centres sent SMS messages to their designated or registered population, and people received their vaccines during a pre-arranged appointment under the MoHME's national vaccination guidelines. In all, 4 million people with chronic conditions, those who were immunosuppressed, the elderly and health care workers were prioritized for vaccination. Subsequently, other groups were vaccinated based on age categories (21).

Role of health information systems and telehealth

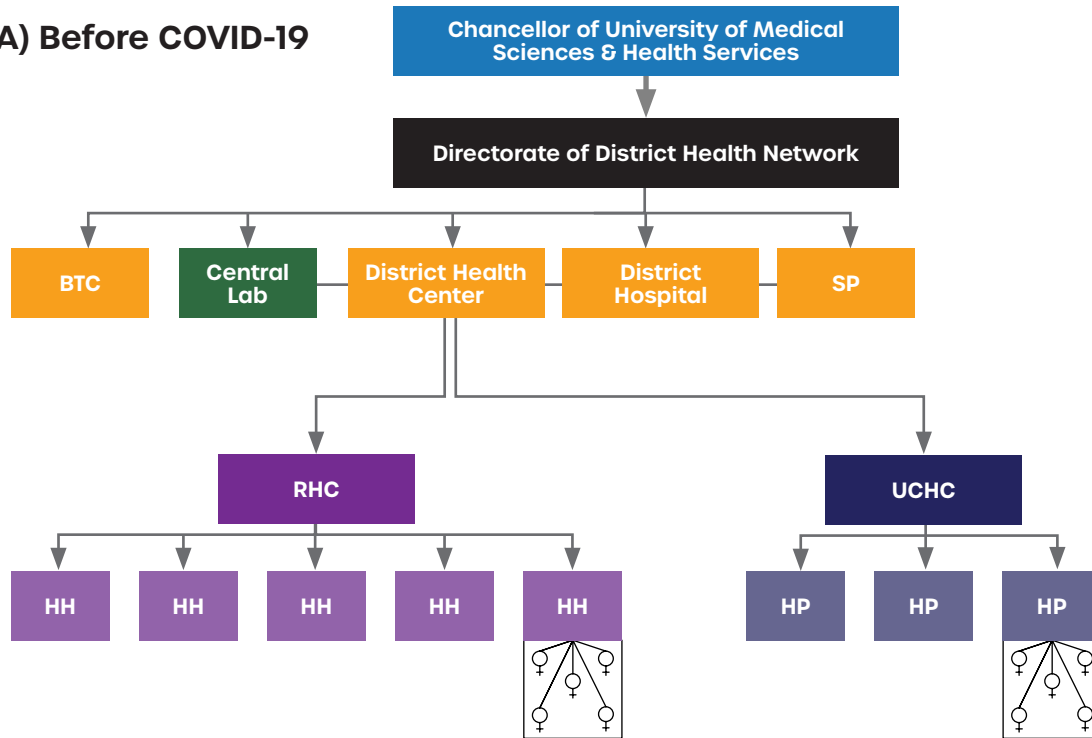
Stakeholders highlighted the value of the Integrated Health Portal (SIB) (the PHC network's health information system) and the application of telehealth services in response to COVID-19.

Integrated Health Portal (SIB)

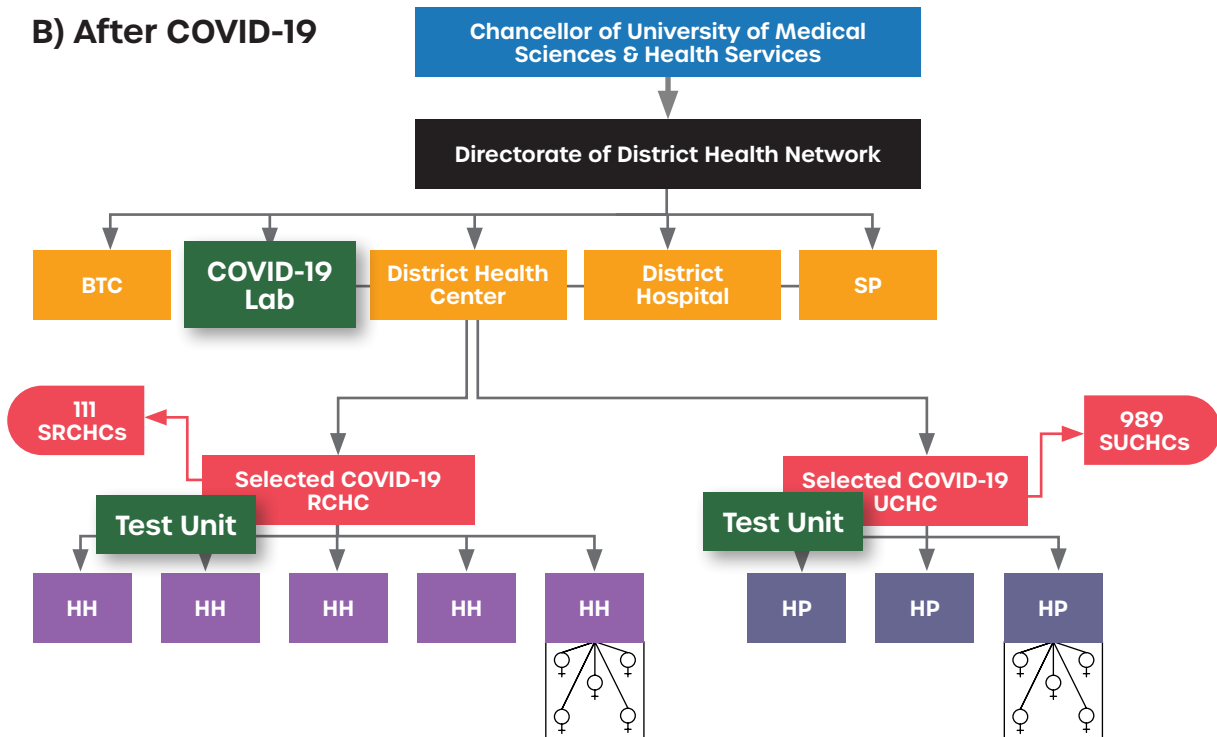
The SIB (which covers 70–95% of the population in different provinces) and the Syndromic Surveillance System (SSS) provide the information needed to plan public and specific evidence-based interventions in the Islamic Republic of Iran (23). During the pandemic response, registered people received calls from their designated PHC centres to notify them about their COVID-19 vaccination. The SIB information system was also used to:

Figure 3. Structural changes in the PHC system in response to the COVID-19 pandemic

A) Before COVID-19



B) After COVID-19



BTC: Behvarz Training Centre
 HP: Health Post
 HH: Health House
 UCHC: Urban Comprehensive Health Centre

RCHC: Rural Comprehensive Health Centre
 SP: Specialized Polyclinic
 WHV: Woman Health Volunteers

Source: Tabrizi et al. (22).

- ensure vulnerable groups receives primary care;
- identify groups in need of mental health interventions;
- identify groups in need of nutritional interventions;
- identify groups exposed to COVID-19 patients, and to follow up and train them;
- contact people for routine vaccinations, as well as COVID-19 vaccinations and the issuing of vaccine cards;
- screen and follow up with people covered by each PHC centre;
- organize “smart” queuing to direct people to the PHC centres; and
- conduct regional surveys to define necessary public health interventions.

“Our information systems still do not meet managers’ information needs and should be improved. Due to the enormous workload and an inadequate payment mechanism, PHC and treatment information seem to be of low quality. Diverse information systems [at different health system levels] also hinder optimal functioning.”

(Stakeholder 3)

The MoHME introduced a self-declaration system (www.salamat.gov.ir) to enable people to register their symptoms and then receive follow-up information from PHC personnel within 24 hours (22). This portal facilitated the identification and tracking of high-risk people. In cases where COVID-19 symptoms were reported, or tests were positive, patients could receive necessary care through their PHC centre (23). Registered people also received calls from their designated PHC centre regarding their COVID-19 vaccination. A data flow system for COVID-19 management involving different levels of PHC services was established (22).

Despite such systems, however, the increasing workload brought about by COVID-19 led to a decrease in the quality of information registration:

“The heavy workload during pandemic waves prevented the staff from performing their routine tasks.”

(Stakeholder 4)

Furthermore, the voluntary referral system instead of mandatory referral is a challenge in the country’s health system. While patients are actively identified through the PHC network and sent to higher levels of the health system if required, patients may bypass the gate-keeping referral process and access higher levels of care directly, without even incurring any additional costs.

Counselling hotlines

It was believed that public literacy about digital health might reduce unnecessary visits to PHC centres during the periods when stay-at-home guidance and movement restrictions were in place (24). In this regard, the government developed COVID-19 counselling hotlines to enhance community access to digital health.

Before the pandemic began, a three-digit hotline – 190 – was set up to disseminate information and receive feedback about emergencies, public health, medical care, tariffs and medications. Following the COVID-19 outbreak in 2020, a new hotline was established – 4030 – to answer questions from the public and provide basic and specialized guidance; 2200 operators handled incoming calls and provided phone counselling, with 1000 active operators every hour. Operators were mostly PHC workers (doctors, nurses, dietitians, psychologists, medical students and paramedics) and volunteers mobilized by the *Basij* volunteer groups (associated with the Revolutionary Guard), the Red Crescent Society and the MoHME (20). Additionally, the country's Health Insurance Organization (HIO) established the 1666 service, with 120 hotlines as of 29 February 2020 (17).

With 152 mobile phone lines per 100 people and 85% internet connectivity, all Iranians have access to the hotlines, which are of particularly benefit to less developed areas and undocumented migrants. Some stakeholders suggested that the hotlines could be improved further, however:

“This hotline must be strengthened. We speak a different language and have a different culture. Such systems must be compatible with the local people’s culture and language.”

(Stakeholder 6)

Providing routine services

Similar to almost all countries, restrictions imposed on health care providers and recipients, particularly at the beginning of the COVID-19 outbreak, led to the interruption of routine health care services, including PHC, in the Islamic Republic of Iran (12). The pandemic and the associated control measures severely disrupted essential NCD services in the Eastern Mediterranean Region, with much of this disruption continuing for three months to more than a year.

To decrease the impact of health care disruption on people with NCDs, countries implemented task-shifting, staff redeployment, teleconsultation and electronic prescribing. They also set up outreach services and field hospitals, mobilized community volunteers and disseminated information on safe health care service use via social media and other virtual channels (25). NCD services (prevention, early diagnosis, screening and treatment) decreased by an average of 18.9% (up

to 75% in some services) in 2020 compared with 2019, with a greater decrease observed in physician-centred compared to nonphysician-centred services (26). Gradually, NCD-related care resumed for priority target groups (e.g., cancer, diabetes) in selected PHC centres, where – depending on the epidemic severity – individuals were provided with either in-person or telephone care at allotted times. Specific guidelines were also prepared on remote support to COVID-19 patients with NCDs (26).

“We had many challenges in the first few months because the virus was unknown and our readiness was inadequate, but we steadily improved the system. In some provinces, routine vaccination indicators were disrupted but quickly restored. The pandemic took all available energy. Insufficient diagnostic equipment, personal protective equipment (PPE), and facilities caused initial and ongoing difficulties. Inappropriate coordination among groups was a major issue.”

(Stakeholder 3)

Another service that was severely affected by the COVID-19 pandemic was TB care. Designated laboratories and treatment facilities (hospitals) were affected because COVID-19 patients took up staff time, or laboratories focused all of their resources on COVID-19 testing. The number of health care staff responsible for following up suspected COVID-19 cases among TB patients decreased; referrals for patients diagnosed with TB were delayed; people were scared of being tested for TB because they were fearful of catching COVID-19, while health care workers were anxious about sampling and testing of sputum and respiratory secretions. Poverty and malnutrition – exacerbated by the pandemic – contributed to latent TB becoming active in the country. Overall, COVID-19 and its effects have hampered the country’s ongoing efforts to manage TB (27). Before the pandemic, the difference between TB incidence and the notification rate was 20%; but this increased to 48% by early 2021. Due to delays in patient referrals and diagnosis (largely as a result of fear among laboratory specialists), the proportion of grade 2 and 3 smear patients increased. Challenges were also encountered in implementing the Directly Observed Therapy Short course (DOTS) programme for TB control due to staff shortages and fear.

“We must improve the diagnostic algorithm, especially for HIV patients. To compensate for setbacks, we must strengthen our diagnosis system with GeneXpert and target larger groups.”

(Stakeholder 2)

“Poverty and pandemic affected TB patients’ nutrition. The Mostazafan (Poor), Ehsan (Benefaction), and Barakat (Prosperity) Foundations gave nourishment packages to these patients, and treatment outcomes improved.”

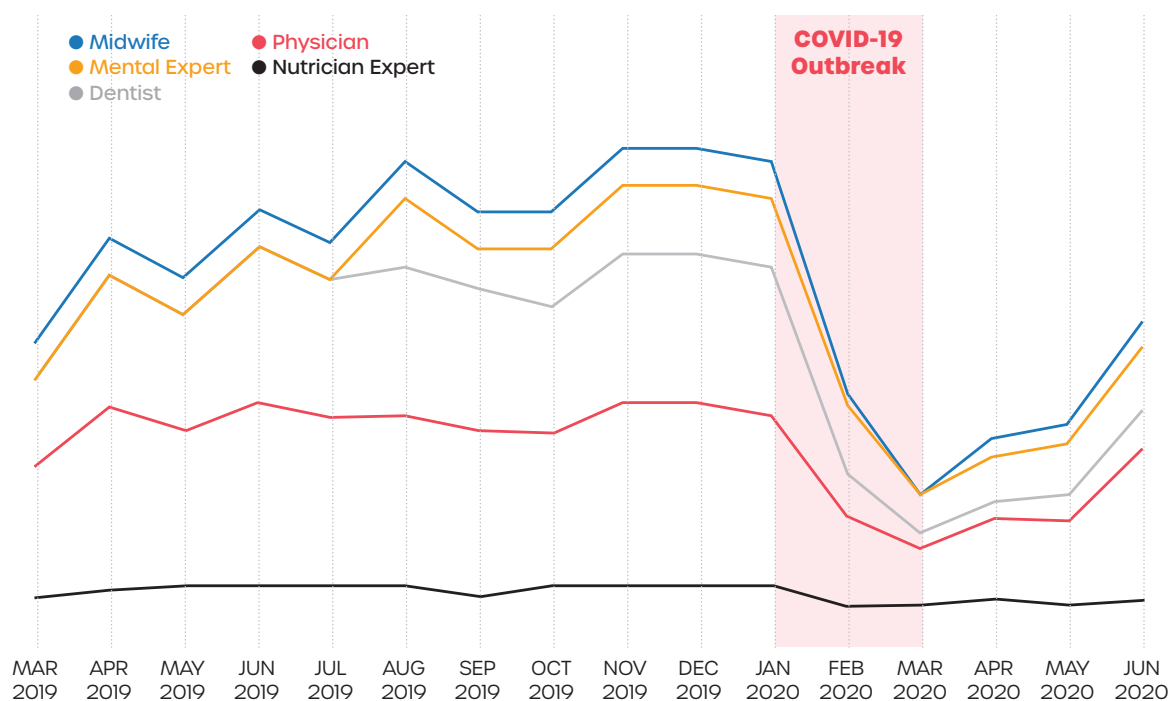
(Stakeholder 6)

SIB data show that the crisis reduced the provision of routine services (Fig. 4). According to a review of PHC provider performance in 2019–2020, the weighted average number of essential services provided declined dramatically after the start of COVID-19 (in Jan 2020) (p -value <0.05). The average number of services provided by doctors, dentists, midwives, mental health specialists and nutritionists decreased by 2410.65, 2914.66, 460.85, 718.81 and 627.95, respectively (28).

Nutrition services

The PHC network provides nutrition services, and data relating to nutrition were recently added to the SIB portal. Due to constraints caused by COVID-19, nutrition services decreased by 30–35% during the period under review. To overcome the service disruption, as a first step, nutrition services shifted to teleconsultations and remote counselling. Next, pregnant women and children under 5 years, especially those with developmental disorders and malnutrition, were referred to designated centres to access services.

Figure 4. Trends in PHC staff services, weighted average (2019–2020)



Source: SIB data

“Iran is the only country that has hired a nutritionist at the PHC level to provide free diet and counselling to individuals as part of a defined service package.”

(Stakeholder 6)

The pandemic led to job losses and inflated food prices. A survey of 22 000 urban and rural families found a 35% drop in food intake, including a 22% drop in fruit, 36.8% in milk and dairy products, 34% in red meat and 20% in chicken consumption (29). In response, the MoHME developed guidelines for target groups at PHC centres, while mass and social media were utilized to improve public awareness of nutritional therapies for COVID-19 recovery. Along with phone counselling provided by PHC centres, the 4030 hotlines also provided free access to 400 nutrition consultants.

“We established a list of malnourished pregnant women, under-5 children, and breastfeeding mothers, assessed their health, and discovered poverty-related malnutrition. Each was given a food basket. Last year the Imam Khomeini Relief Committee and the Alavi Foundation identified vulnerable groups and delivered food packages to 80 000 pregnant women and 60 000 under-5 children. In less developed provinces, the Ministry of Cooperatives, Labour and Social Welfare (MCLSW) paid a nutrition allowance to caregivers of malnourished children without enough support.”

(Stakeholder 6)

“We planned to give iron and vitamin D supplements to women, kids and school children, but resources were insufficient for the past two years. We are seeking building-focused contributors’ support. Donors must be educated about supporting the poor. In a pandemic, managers and governments should prioritize prevention over treatment. Investment is needed for food security and nutrition.”

(Stakeholder 6)

Mental health

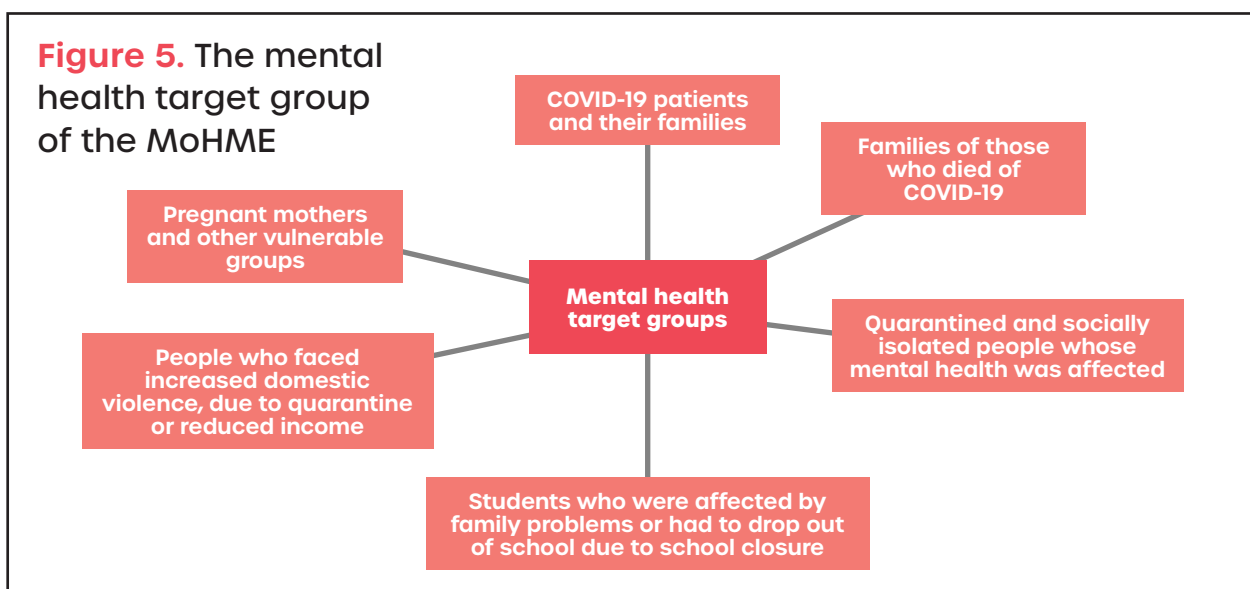
According to two national studies, the prevalence of mental health disorders in the Islamic Republic of Iran stood at 23.6% and 23.4% in 2015 (30). Since this time, as part of HTP reforms, mental health treatments have been added to primary care service packages, with over 2000 psychologists with master’s degrees delivering

free services to their assigned population. In 2021, a countrywide survey of 30 000 people found that mental health disorders had risen to 29.7% in the general population and 39% among COVID-19 patients. The pandemic enabled the MoHME to expand the target populations for mental health services (31) (Fig 5).

At the discretion of other health care providers (physicians, nurses, midwives), PHC patients were referred to mental health counsellors. Public (national TV and radio) and social media disseminated information about mental health services available to the community. The 4030 hotlines recruited hundreds of mental health specialists to provide counselling to those in need. Families who lost loved ones to COVID-19 and could not hold funerals received five counselling sessions, while patients who recovered from COVID-19, who showed signs/symptoms of mental health disorders in their initial examination, were invited to counselling centres by mental health specialists. Certain respondents felt that primary care could be more efficient with better external communication, however.

“COVID-19 greatly impacts social determinants of health, especially mental health, which is linked to risk factors and social services. Mental health workers cannot ignore social issues. We wanted community social services to complement our work. ”

(Stakeholder 5).



Source: The authors

Furthermore, the social determinants of health can be better controlled through intersectoral referrals. In the Islamic Republic of Iran, the MoHME worked with the Ministry of Education to improve the NAMAD programme (the student social care system), which addresses mental health and social difficulties among targeted students.

Training and protection of health workers

Three general categories of action were taken to protect PHC personnel. First, adjustments were made to the work structure and physical environment. Vulnerable PHC workers, including those with chronic conditions or pregnant women, were permitted to work remotely or to relocate to alternative facilities to minimize exposure to the virus. COVID-19-designated PHC centres equipped with pulse oximeter and laser thermometer, were specified to provide required healthcare services for suspected or confirmed cases, while other PHC centers provided routine care to other customers.

Second, tools and equipment were provided to protect personnel. While PPE was scarce at the beginning of the pandemic, supplies gradually grew over time. Understanding the hazard and exposure risk was key to selecting and using PPE. The source of infection, type of contact, transmission and spread, duration and type of tasks performed by PPE users were all essential considerations (32). Using national and international sources, many guidelines and standards were published for using PPE in medical facilities.

This leads to the third type of action that was taken to protect PHC personnel, namely the issuance of guidelines and training. The National Scientific Committee on COVID-19 was established under the CNC structure, as a multidisciplinary committee responsible for developing and constantly updating clinical and preventive guidelines. Provincial multidisciplinary scientific committees were also established, comprising scientific associations and provincial managers. Different CNC committees could receive feedback from provincial committees. Routine and COVID-19 services guidelines were updated regularly and provided to health workers (20), while personnel and managers were trained on epidemics, diagnosis, treatment of patients and how to manage those suspected of having COVID-19, as well as community education. A minimum score of 70% was required for personnel to be involved in COVID-19 service delivery. Webinars, WhatsApp and Skype, video lectures and face-to-face lectures were used as methods of communication with the health workforce, although some stakeholders were critical of the training provision and lack of attention to employee mental health:

“Online training was useful and quick during the pandemic... The pandemic experience shows that staff does not receive required training completely and, especially during the peak of the epidemic, operate according to past practices; we must prepare the PHC workforce before the crisis. Different training techniques (seminars, brochures, training courses) did not provide the desired results in practice since we practiced simultaneous training and the crisis.”

(Stakeholder 4)

“Mental health of the health workforce was not addressed nationally. Many universities have taken action, but the national issue remains unsolved. Some steps were taken. In future crises, the mental health of employees should also be considered.”

(Stakeholder 5)

Environmental health

In collaboration with the PHC Office at the MoHME, environmental health departments at the national, provincial and local levels developed, implemented and monitored the following COVID-19-related policies:

- Guidelines and regulations for physical distancing and environmental and workplace health were distributed in various public places, including tourist attractions, airports, hotels, sports and leisure centres, public transportation and shopping centres.
- To re-open, all business owners and employees were mandated to receive three vaccination doses and QR codes were issued by the MoHME to be placed on the window of business premises. Customers could scan the QR code with their phones to complain about or praise the business unit.

How multisectoral policy and action are responding to COVID-19

Comparative evidence strongly emphasizes the need for intersectoral collaboration to respond to global crises like COVID-19 (33). While COVID-19 brought the world to a standstill in 2020 and 2021, the need became clearer for meaningful interaction between the health sector and all other sectors influencing health through professional advocacy, political support and partnership with nongovernmental actors, i.e., civil society and public representatives. The pandemic has emphasized that a strong and resilient PHC system is the basis for successful crisis response, health security and ultimately the achievement of UHC. In such crisis situations, a whole-of-government and whole-of-society approach is crucial for sustainable health development. With particular programmes developed in the Islamic Republic of Iran by relevant committees, ministries and agencies at the national and provincial levels, the CNC and its specialized subcommittees planned and enhanced multisectoral collaboration in response to COVID-19. Three mechanisms for multi-sectoral collaboration were identified, as described below.

Multisectoral policy and action for health

The country's PHC network used many resources during the COVID-19 pandemic. Earmarking and preparing resources and the workforce for future crises should be a priority. Below, we summarize the cross-sectoral policies and activities used to improve the health system's response to COVID-19.

- With assets such as mosques, schools, the *Basij*, municipalities and other organizations, the health service delivery structure was expanded to include over 58 COVID-19 centres and 307 new testing sites. The development of 272 temporary care facilities with 1145 sanitarium beds became possible through strategic partnership with municipalities, mosques and the Ministry of Sport and Youth (MoSY). The military provided an additional 3500 hospital beds, 22 000 sanitarium beds, 17 000 active beds, portable laboratories and vaccination bases, and laboratory kits.
- On 4 August 2020, the Ministry of Foreign Affairs (MFA) and the MoHME had their first conversation about vaccination supplies. After determining the requirements and providing initial estimates, the MFA declared the import of vaccines its top priority. This included monitoring the funds allocation and negotiating the purchase and transportation of vaccines. In addition, the Islamic Republic of Iran approached the international Humanitarian Buffer mechanism established within the COVAX facility to provide 1.6 million doses of COVID-19 vaccines for Afghan refugees.
- The trade/import clearance of COVID-19-related sanitary goods was no longer subject to bureaucratic procedures.
- PHC staff provided services according to agreed COVID-19 standards. The MoHME, in collaboration with other stakeholders, issued guidelines for physical distancing, health worker training, screening, daily symptom analysis, care for vulnerable groups, and environmental and occupational health measures (13). One stakeholder confirmed,

“Since 1987, we [the Ministry of Cooperatives, Labour and Social Welfare – MCLSW] have collaborated with the MoHME to build worker health centers.”

(Stakeholder 14)

- With the cooperation of the military, the Tehran Exhibition Centre was transformed into a 2000-bed mobile hospital within just two days.

Multisectoral policy and action for public places

Various ministries, departments, public and private sectors, and nongovernmental organizations (NGOs) cooperated to minimize COVID-19 transmission in the country (17, 20). The following activities were undertaken:

- Cities were divided into four categories: blue zone (mild risk); yellow zone (moderate risk); orange zone (high risk); red zone (very risky) (see Annex 2. Innovation table for further details).
- The Islamic Republic of Iran’s Broadcasting (IRIB) played a leading role in disseminating clear instructions and sharing real-time data with the community and relaying risk communication.

- Friday (Islamic) prayers were suspended from 26 February 2020 until October 2021, and holy and sacred places were closed in collaboration with religious authorities.
- Also on 26 February 2020, doctors and specialists checked all land, air and water borders in partnership with traffic police. The Ministry of Roads and Transport and the Ministry of Agriculture, among others, collaborated to coordinate the safe transport of people, animals and cargo.
- From the time at which public vaccinations began in early 2021, vaccine certificates became necessary for travel and they replaced specific travel permits issued by local authorities.
- Office hours were shortened. Initially, two-thirds of government employees were instructed to work from home; however, this quota was lowered as vaccination coverage gradually increased.
- On 15 March 2020, schools and universities were closed and education continued through various virtual media. Schools and universities did not open again until 3 April 2022.
- Sports competitions, cinemas and concerts were closed.
- The municipalities educated over 200 000 people suffering from drug addiction about COVID-19, screened child labourers and supplied PPE.
- When the volume of burials of COVID-19 patients became a public challenge, clerics volunteered to follow religious principles and traditions.
- The private sector contributed in many ways to the COVID-19 response, as summarized in (Fig. 6) (17, 34).
- One respondent suggested that the design of private laboratories should be considered for future crises, however, to maximize capacity and business functions:

“The laboratory structure is not constructed to separate usual and COVID-19 patients during the pandemic, so some private labs could not provide the COVID-19 test to keep regular clients.”

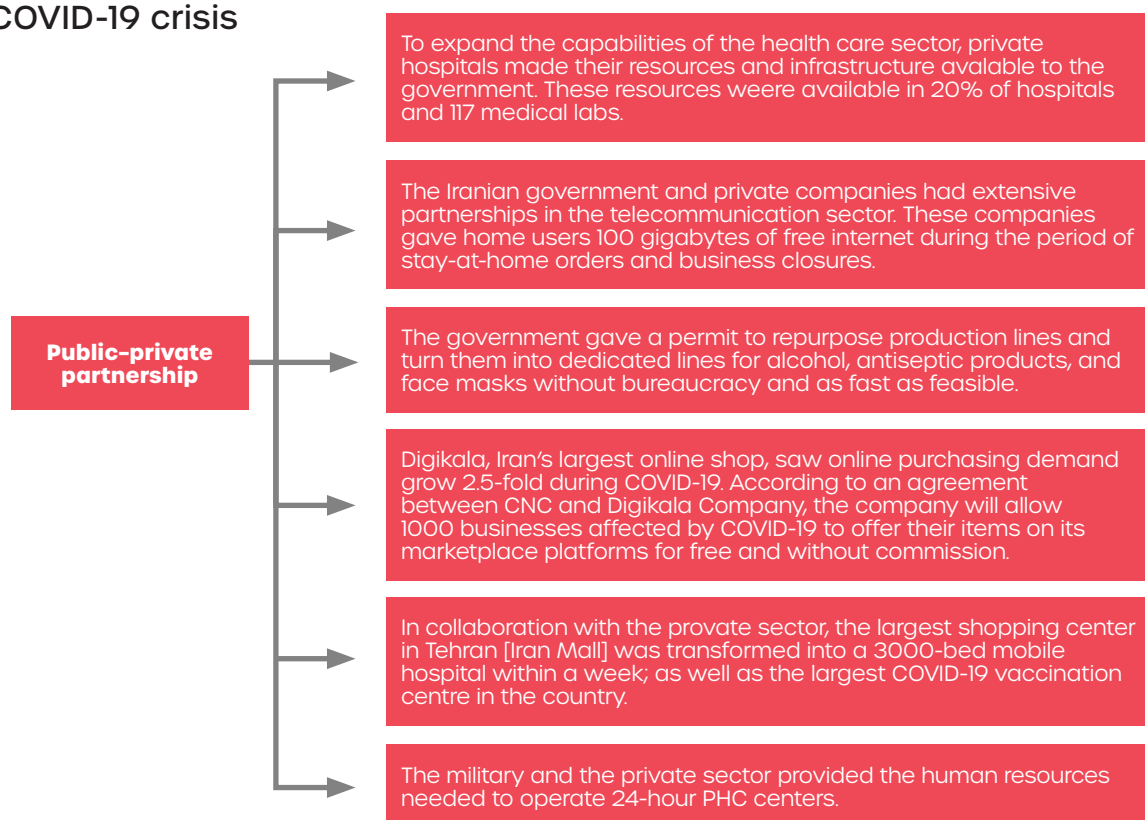
(Stakeholder 12).

Multisectoral policy and action for social determinants of health (SDH)

Physical separation, targeted closures, stay-at-home orders, bans on public gatherings and reduced mobility are examples of the public health and social measures introduced in the Islamic Republic of Iran to manage the spread of COVID-19. However, these measures resulted in significant and unequal health, social and economic damage among various socioeconomic groups across the country, with a disproportionately negative impact on already vulnerable populations (20). Indeed, COVID-19 impoverished millions; women and low-skilled employees lost a disproportionate share of jobs, and social support mechanisms were insufficient. The crisis has disrupted education, causing extensive social

effects for young people, especially economically disadvantaged youth (13). For the most marginalized communities, food security has been compromised. Further, the pandemic has exacerbated gender inequality, discrimination and stigma, while public health and social policies have had a more pronounced effect on the mental health of disadvantaged groups. Health systems have been overloaded and services have been reduced, resulting in increased morbidity in non-COVID-19-related conditions (13).

Figure 6. Public-private partnership during the COVID-19 crisis



Source: The authors

Against this backdrop, and during a time of economic sanctions and severe inflation, the Islamic Republic of Iran took the following steps to address SDH during the COVID-19 pandemic (34):

- PHC facilities connected pregnant women, children and malnourished patients with organizations providing food and financial aid.
- The government (MCLSW and the Ministry of Economic Affairs and Finance) provided various financial assistance to different groups of people depending on their specific needs (20).
- Municipalities provided hot meals to homeless shelters and child labourers. Basij set up sites to distribute free masks and sanitizer, especially in marginal areas (20).

- The Ministry of Economic Affairs and Finance responded to COVID-19 by:
 - providing pandemic response funds to the MoHME;
 - urging individuals and institutions to reroute their tax liabilities to the MoHME as financial aid;
 - cutting taxes for affected businesses;
 - making business licence renewals tax-free;
 - providing grants and loans to low-income households (13).
- Insurance companies received partial support from the government.
- Donors and activists fed vulnerable groups.
- The Provincial Food Security Working Group enlisted the assistance of key stakeholders to respond:

“We recommended governors, universities, and health deputies to bring malnutrition and vulnerable support to the working group of health and food security, which they did. We hired donors, and the agenda was implemented successfully in the provinces and cities.”

(Stakeholder 6)

However, key challenges included poor coordination mechanisms, as well as insufficient communication to inform the public and civil society about PHC priorities at the national, provincial and local levels.

“There could be much more capacity if there were a clear list of duties and priorities for collaboration”

(Stakeholder 6).

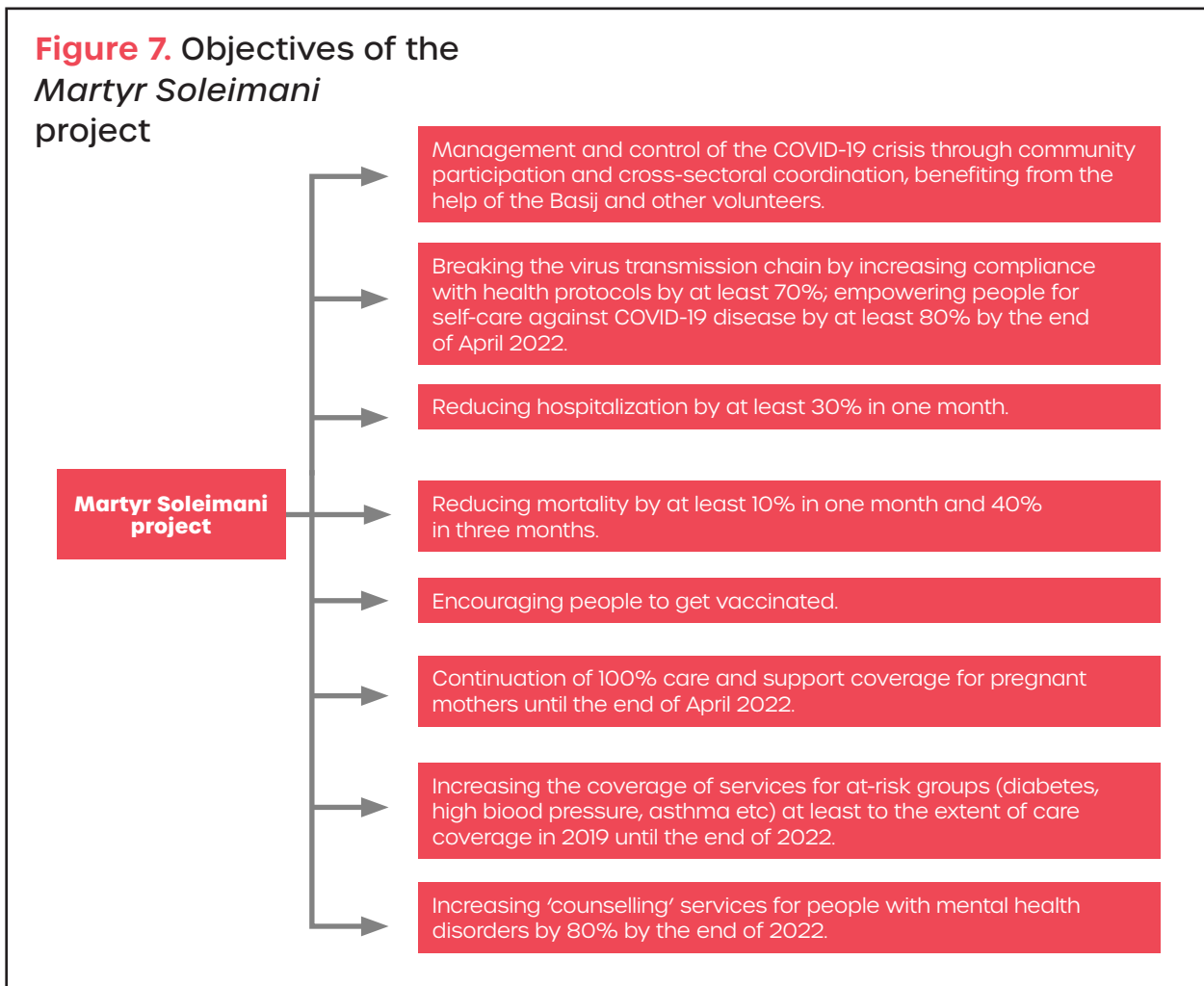
To improve multisectoral action in future crises, lessons gained from the COVID-19 pandemic should be translated into crisis response plans (i.e., formal agreements). Furthermore, multisector partners should be assisted and encouraged to participate through tax exemptions and others incentives.

How communities are responding to COVID-19

National COVID-19 campaign

By March 2020, the PHC network had recruited 220 000 volunteers to help with disease control and contact tracing, environmental health and safety, screening at city entry points, and community education (20, 23). The MoHME and *Mostazafan bonyad* (the Poor Foundation) launched the *Martyr Soleimani* project (Fig. 7 - see next page) on 21 November 2020 (35), which pursued specific goals through a neighbourhood-based approach.

Basij forces in each province and region helped to distribute masks and oxygen supplies at the beginning of the pandemic. Under the MoHME's guidance, *Basij* became a key body in promoting home-based screening, monitoring and supporting PHC teams in the COVID-19 vaccination programme (20).



Source: The authors

Each home, one health post

Before the COVID-19 pandemic, the PHC network started the Health Ambassadors' project to improve health tracking, home-care, monitoring and support teams. The project aimed to enrich people's health literacy, improve their access to services, increase their preparedness against health threats and help strengthen the health system through public participation. The project assigned one member (over 15 years with at least eight years of schooling) from each household to receive health education from PHC facilities and to act as an ambassador to educate the rest of the family on health matters (22). There are now 11 million health ambassadors (covering 50.1% of Iranian households), and more than 250 000 participated in the COVID-19 response (16).

WhatsApp groups were created to train 7-10-member teams on living with COVID-19. They received training through books, pamphlets, audio and video clips supplied by the MoHME's emergency services, the Centres for Communicable and Non-Communicable Diseases Control, and mental health and nutrition directorates. The ambassadors worked unpaid and voluntarily, although some universities provided compensation to student volunteers. In Gilan province, educational sites were created with free Internet access. Under the Health Ambassadors project, the PHC network is responsible for educating and directing health ambassadors and handles their registration and recruitment. The central *Basij* organization handles the registration and recruitment of *Basij* forces, and the PHC network only directs them in health matters.

Contact tracing teams (CTTs)

Led by the PHC centres, CTTs tracked over 16 million people with close contact with COVID-19 patients, reviewed their symptoms, provided training, conducted rapid tests, and referred them to PHC centres according to the agreed protocol. Across urban and rural areas, 86 249 people (38% from the health department, 33% *Basij*, 16% Health Ambassadors and 9% local volunteers) formed 24 680 CTTs.

Home-care teams (HCTs)

More than 4000 HCTs, comprised of 11 572 individuals (74% from the health sector, 19% *Basij*, and 3.3% private sector), provided care to over 300 000 people at home. They performed tests, provided medicine and made referrals to hospitals or PHC centers as needed.

“People will participate in the best way if they are aware, and the Health Ambassadors... are eager to participate in other health programmes; we need to know how to manage them.”

(Stakeholder 10)

Monitoring teams

Monitoring teams were responsible for actively monitoring public places, shops and businesses. More than 12 000 monitoring teams, comprised of 44 276 persons (38% *Basij*, 22% health sector, 17% affiliated groups, 13% Red Crescent Society) conducted approximately 8.5 million monitoring visits. Due to non-compliance with the COVID-19 health protocols, judicial authorities issued 1 110 000 official warnings and 75 571 business closures.

Support teams

Support teams were tasked with assisting vulnerable families affected by COVID-19, introducing them to medical centres or support organizations, and providing them with financial and dietary aid with community participation. Nearly 1.5 million vulnerable families were supported by 88 000 people (78% *Basij*, 12% Health Ambassadors, 5.6% community health volunteers and 2%

Red Crescent Society) working as part of 28 000 support teams. Moreover, neighbourhood community volunteers helped to make face masks and gowns, accompanied screening teams on home visits, coordinated the collection and distribution of financial aid for ventilators, oxygen production and electrocardiogram (ECG) machines, and directed the distribution of donated food packages during Ramadan.

Risk communication

The National Risk-Communication and Community Engagement Strategy for COVID-19 was designed based on the national influenza response programme with specific strategies and tasks assigned to each ministry, border control measures and modelling (20). COVID-19 risk communication informed community members about potential risks to their daily lives, jobs, education, trade, travel and relationships. This two-way conversation covered essential COVID-19 information, risk reduction advice including staying at home, social distancing and new ways to communicate with family and friends, plus it elicited community feedback from the preparedness, readiness and response phases (20). The Stay at Home campaign, Stay Together Against COVID-19 campaign, and the Social Distancing campaign are examples of such communications, which provided valuable information to the community.

The primary channels for COVID-19 risk communication were public health volunteers and various hotlines (4030, 1666, 190), which were administered by the PHC network. Official and public media, including audiovisual programmes, press conferences, printed newspapers, official websites (e.g., webda.behdasht.gov.ir), social media and other information, education and communication (IEC) materials were also utilized.

Under the direction of the CNC, the Public Relations and Community Engagement Committee developed a communication plan for COVID-19. This plan included sending simplified messages and reminders to the community and conducting surveys to gather feedback, identify preferred communication channels, and address issues as quickly as possible to combat infodemics and misconceptions.

The MoHME launched a special studio and news station for COVID-19, where the MoHME, deputy ministers and the Head of Public Relations held daily sessions to update the public on daily statistics about confirmed cases, deaths and recovered individuals, plus hygiene recommendations to keep people safe. Celebrities (actors, religious leaders, athletes, etc.), NGOs, social activists and the media also helped to raise public awareness about the virus and engaged the community in MoHME campaigns and instructions (20). Insufficient coordination and integration between groups and sectors led to conflicting messages and often confused the public, however:

“One of our weaknesses was that our senior managers and media were not professionally trained in risk communication, which resulted in contradictory messages being sent to the community. To prepare for future crises, more focus on the capacity building would be crucial.”

(Stakeholder 3)

Communication channels and skills should also be improved between health care providers (doctors, nurses, etc.) and the community, and between national health managers and both provincial providers and the community (16).

Despite the huge toll of COVID-19 on the country, communities and individuals, the pandemic response efforts boosted community participation and volunteerism. Participation in the *Martyr Soleimani* and Health Ambassador projects were invaluable in identifying new cases of COVID-19 and in reducing hospital visits. Intersectoral collaboration, training and efforts to strengthen NGOs, social networks and media participation enabled confirmed cases to be traced in the community and contained to help limit the spread of the virus.

Conclusion and lessons learned

The PHC network gained invaluable experience as a result of the COVID-19 crisis. The pandemic has revealed the urgent need to consider changes across three dimensions of health care in the country: 1) the health care structure; 2) plans and processes; and 3) health care delivery mechanisms. The most significant lessons are summarized below.

- COVID-19 disrupted primary care in many countries. In the Islamic Republic of Iran, the PHC structure was reformed to enable access to routine services. Primary care packages were categorized by in-person or remote delivery, and PHC services for COVID-19 patients were structured in parallel with routine health care centres, each providing separate services. PHC screening and triage reduced the burden for hospitals and improved the resilience of the secondary care system. Mental Health and nutritional advisors incorporated within the PHC network contributed to maintaining the healthy diet and well-being of citizens, especially pregnant women. To sustain routine services in future emergencies, we advocate developing the telemedicine infrastructure and translating acquired knowledge and experience from the COVID-19 crisis to related policies and plans.
- The Each Home, One Health Post programme – which was established as the national flagship PHC programme before the onset of the COVID-19 pandemic and is based on increasing public participation – played a vital role in keeping the community safe, improving their access to services and strengthening health system resilience by enriching people’s health literacy and increasing their preparedness against health threats.
- For the first time, primary care service packages during a crisis were prioritized. Dividing health care services between in-person or telehealth may prevent interruptions in future crises. Telehealth (e.g., the 4030 hotline) could provide screening, monitoring and counselling for NCD patients (12), at a cheaper price and on a larger scale than in-person provision, even when the pandemic is over.
- Despite glitches, the SIB enabled targeted action in PHC; vulnerable groups were identified and given access to specific services. PHC, secondary care and the private health sector should integrate their information systems. Beyond the MoHME, a multisectoral online communication strategy could help to help meet people’s multidimensional needs during crises, such as referring malnourished poor people to aid organizations.
- Multisectoral collaboration and the creation of PHC operational and community teams (including CTTs, HCTs, and monitoring and support teams) were key during the pandemic. Action plans should document the multisectoral collaboration experiences and innovations of the COVID-19 pandemic. Furthermore, those accountable for developing multisectoral cooperation may want to consider undertaking a stakeholder analysis to clarify commitments, relations and duties, and establish incentives to secure collaboration.

Conclusion and lessons learned

- As SDH, unemployment, poverty and poor nutrition may exacerbate health crises, multisectoral strategies could help to protect vulnerable groups. In this regard, establishing the Alliance of PHC Friends – comprising people, organizations and NGOs, – could support PHC to assist poor and vulnerable people.
- UHC relies on the PHC network. COVID-19 and its devastating consequences have revealed the need to strengthen the PHC structure and incorporate integrated and lifelong services. Comprehensive plans could address SDH and ensure practical multisectoral collaboration to revitalize the PHC network as the engine for health system strengthening to achieve UHC.
- All of the measures discussed in previous sections of this case studies are recommended in the Declaration of Astana (36). Furthermore, the Primary Health Care Measurement and Improvement Initiative (PHCMI) sets out specific points for countries to address in order to increase their PHC capabilities (37). Policy-makers may want to consider these international agenda.

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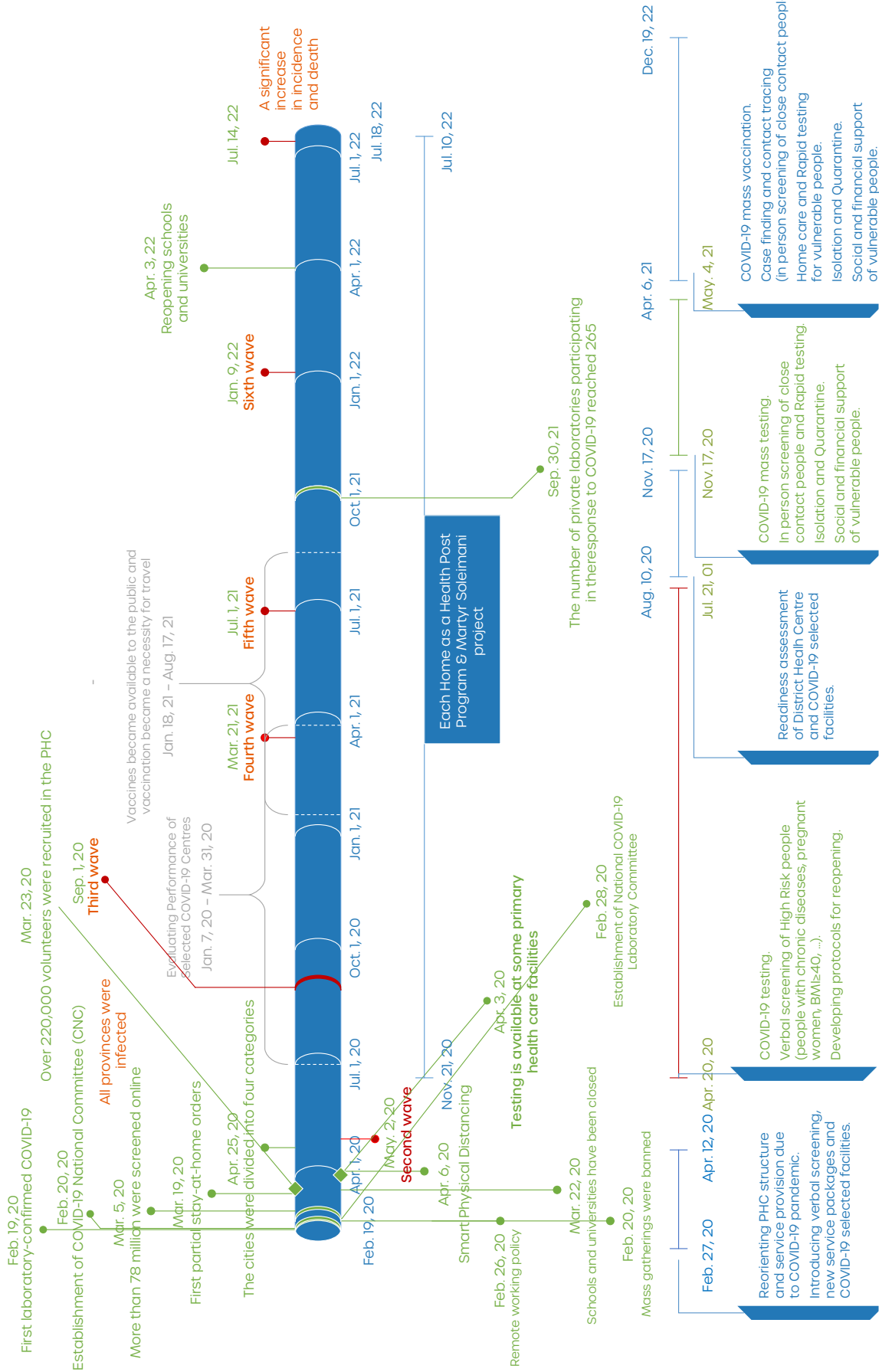
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Annexes

Annex 1. Timeline of events and policies



Source: The authors

Annex 2. Summary of key practices, policies and innovations against PHC operational levers

Operational lever	Practices, policies and innovations
Models of care	<ul style="list-style-type: none"> The PHC structure was divided into two categories: a structure for routine services and COVID-19-specific services. Services were provided in two ways: in-person (mandatory and critical services) and remotely. Outpatient treatment units for COVID-19 in the PHC centres reduced the burden on hospitals.
PHC workforce	<ul style="list-style-type: none"> Nutrition and mental health experts were added to the PHC network from 2015. Vulnerable groups and at-risk PHC workforces were protected from exposure. The military and the private sector stepped in to support health care personnel shortages in the 24-hour PHC centres.
Physical infrastructure	<ul style="list-style-type: none"> The physical infrastructure was already in place, but it became clear which organizations could be used temporarily as back up in times of crisis. The COVID-19 special centres, special testing and sampling centres, and special laboratories for COVID-19 were established to increase the PHC capacity.
Medicines and other health products	<ul style="list-style-type: none"> Donors and charity organizations were crucial in providing PPE and equipment such as thermometers and oxygen supplies to special centres. Manufacturing lines were altered to produce the required PPE, sanitizer, and medicines required in the pandemic.
Engagement with private sector providers	<ul style="list-style-type: none"> Private sector providers participated in two main ways: providing human resources for 24-hour centres and routine services to target groups. A number of PHC centres, especially in urban areas, have been established through the private sector. Private hospitals assisted the COVID-19 centres to accept patients, establish ambulatory hospitals and provide comprehensive vaccination centres.
Purchasing and payment systems	<ul style="list-style-type: none"> Most primary care services are funded by the government, on a weighted per capita basis. Extra funds, tax reliefs and subsidies were allocated to help people and health care staff.
Digital technologies for health	<ul style="list-style-type: none"> Hotline 4030, Mask App, web-based screening, social media and mobile communications. Corona Hub and Vaccination Hub to aggregate all data related to COVID-19.

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Operational lever	Practices, policies and innovations
Systems for improving the quality of care	<ul style="list-style-type: none">• Mobile health care teams visited patients at home.• Martyr Soleimani project for screening and community management.• Indicators were improved in the SIB system to show PHC outputs.• National and local surveys were conducted on the performance of selected COVID-19 centres to identify weaknesses and improve quality.
PHC-oriented research	<ul style="list-style-type: none">• Several national studies were conducted on PHC and COVID-19, including surveys on service interruption, mental health, nutrition, and performance evaluation of PHC centres, case fatality rate assessment, serological surveillance research, and lab screening for suspected COVID-19 patients.
Monitoring and evaluation	<ul style="list-style-type: none">• PHC centres monitored the community and public places in their designated areas and sent the results to the provincial medical university.• UMSs analysed collected data from PHC centres and sent them to MoHME and CNC. National/provincial and local committees were set up to evaluate and analyse the data collected.• The Health Observatory Centre was established in the MoHME to analyse and aggregate data related to the COVID-19 pandemic and vaccination, evaluate the situation by city and province, and report for evidence-based policy.• 10 monitoring and evaluation teams were organized based on 10 zones in the country and auditor training workshops were held.• Indicators, checklists and questionnaires were developed to evaluate different levels of PHC.• All selected COVID-19 health centres and district and provincial health centres were evaluated.



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The Islamic Republic of Iran:
a primary health care case
study in the context of the
COVID-19 pandemic

This case study was developed by the Alliance for Health Policy and Systems Research, an international partnership hosted by the World Health Organization, in collaboration with the WHO Regional Office for the Eastern Mediterranean (EMRO) and WHO country offices. In 2015, the Alliance commissioned the Primary Health Care Systems (PRIMASYS) case studies in twenty low- and middle-income countries (LMICs) across WHO regions. This case study builds on and expands these previous studies in the context of the COVID-19 pandemic, applying the Astana PHC framework considering integrated health services, multisectoral policy and action and people and communities. This case study aims to advance the science and lay a groundwork for improved policy efforts to advance primary health care in LMICs.

