

# The impact of COVID-19 on primary health care services in Qatar: 2 years of response and coping 2020-2021

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## ABSTRACT

**Background:** Health care systems worldwide have rapidly responded to manage the COVID-19 pandemic by providing screening tests, contact tracing, treatment, and vaccination. However, the long duration of the pandemic has had an enormous load on the health care systems, which disrupted continuity of the essential non-covid services, long waiting time for appointments, and increase in the utilization of telemedicine services. Primary health care was established as an essential foundation for the global response to the COVID-19. In Qatar, Primary Health Care Corporation (PHCC), the main primary care services provided played a major role in the response to the pandemic. However, its services were affected and disrupted, and new services were added. Hence, the aim of this analysis is to understand the long-term impact of the COVID-19 on the services provided by PHCC in Qatar in terms of PHCC pandemic response, change in utilization of the core, and preventative services, and the introduction of new alternative services. **Methods:** A retrospective data analysis was conducted for all the appointments and visits for all the PHCC health centers in the years of 2020 and 2021. The study conducted a comparison of the services utilizations using the utilization figures of PHCC services between 1<sup>st</sup> of January and 31<sup>st</sup> of December 2019 as a reference year. The differences in the utilization per service were presented in frequencies and percentages. **Results:** The in-person services dropped drastically in 2020 at 36% reduction in comparison to 2019. However, the newly introduced virtual consultation services in 2020 reached their highest utilization figures in 2021 at 908,965 virtual visits. The COVID-19 specific related services ranging from the COVID-19 drive-through testing to vaccine administration constituted a total number of 2,836,127 visits corresponding to 44% of the total PHCC services utilization visits in 2021. In 2021, PHCC dental services dropped by 25.2%. The most noticeable utilization drops in 2021 were among the preventative services with 53.2% and 78.9% in colorectal screening and non-communicable diseases (NCDs) risk factors annual screening services, respectively. However, mental health services have witnessed a surge in utilization at 134.1% increase in 2021 in comparison to 2019. **Conclusion:** The COVID-19 pandemic caused a disruption in the PHCC utilization of core services, namely dental services. Additionally, PHCC preventive services utilizations were affected drastically including cancer and NCDs risk factors annual screening. Nevertheless, PHCC managed to provide alternative virtual services and played a vital role in responding to the pandemic by leading the COVID-19 vaccination campaign in Qatar. However, future research is needed to establish which vulnerable patient groups were most affected by the pandemic, to continue to inform strategies and policies directed at mitigating the impact of future potential pandemics.

**Keywords:** COVID-19, primary health care, preventative services, Qatar

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## Introduction

Health care systems worldwide have rapidly responded to manage the COVID-19 pandemic through providing screening tests, contact tracing, treatment, and vaccination.<sup>[1]</sup> The long duration of the pandemic and growing number of the COVID-19 cases has had a dramatic load on the health care systems, which caused disruption in continuity of the essential non-covid services, long waiting time for appointments, and increase in the utilization of telemedicine services.<sup>[2,3]</sup>

A strong primary health care system is the foundation of an efficient and effective national health service. The World Health Organization (WHO) highlighted the importance of the primary health care as an essential foundation for the global response to the COVID-19. The main functions of primary care in the COVID-19 response include vaccination, diagnose and manage potential cases, reduce the risk of transmission of infection to contacts and health care workers, maintain delivery of essential health services, and strengthen risk communication.<sup>[4]</sup>

Primary Health Care Corporation (PHCC), the main primary care provider in Qatar is serving 1.6 million individuals throughout a network of 28 primary health care centers covering the country. The services range from preventive services such as disease screening, immunization, and lifestyle counseling to therapeutic services for long-term conditions, antenatal, and urgent care for all age groups. In addition to that, PHCC provides general dental services, pharmacy, and laboratory services.<sup>[5]</sup>

As of June 9, 2022, more than 370,000 cases and 677 deaths have been reported in Qatar due to four COVID-19 pandemic waves.<sup>[6]</sup> The first wave started with the introduction of the virus in February 2020 and peaked in late May 2020.<sup>[7]</sup> The second wave started in January 2021 and peaked in the first week of March due to the introduction of the Alpha (B.1.1.7) variant. However, the third wave that was triggered by the introduction of the Beta (B.1.351) variant, started in mid-March and peaked in mid-April 2021.<sup>[7]</sup> The fourth wave was triggered by the introduction of the Omicron (B.1.1.529) variant, which started in December 2021 and peaked in mid of Jan 2022.<sup>[8]</sup>

PHCC responded rapidly to the pandemic by providing the COVID-19 testing in all primary health centers. In addition to that PHCC opened four COVID-19 centers for testing and holding in the first three waves. As the epidemic continued, PHCC started to open a drive-through for testing in twelve health centers. PHCC maintained only urgent services and walk-in clinics during the peaks and initiated new alternative services such as virtual/telephone consultation and home medication delivery to respond to maintain the continuity of the care.<sup>[9,10]</sup> At the same time some of the primary care services were suspended, for example, cancer screening and lifestyle medicine clinics.<sup>[11]</sup> The PHCC response to the COVID-19 pandemic and then later the coping with the pandemic across all the services provided by PHCC over 2 years of the pandemic

was not conducted previously; hence, this analysis is novel in this context.

The aim of this analysis is to understand the long-term impact of the COVID-19 on the services provided by PHCC in Qatar in terms of PHCC pandemic response, change in utilization of the core and preventative services, and the introduction of new alternative services.

## Material and Methods

### Study setting

All the 28 health centers affiliated with the PHCC in Qatar.

### Study duration

The study assessed all the PHCC services between January 1, 2019 and December 31, 2021.

### Study design

A retrospective data analysis was conducted for the primary care services between 2019 and 2021 in all the PHCC 28 health centers, in addition to the COVID-19 related services between 2020 and 2021.

### Sample size and sampling

All the visits in the aforementioned period of time for all the PHCC services were included in the data extraction.

### Data collection

The data was extracted annually from the business health intelligence department at the PHCC and included all the appointments and walking visits for all the health centers during the aforementioned period. The business health intelligence department at the PHCC is responsible for collating and reporting on the services utilization across all the PHCC health centers from the health information system.

### Data analysis

The yearly all-cause of health center visits in-person and virtual visits prior and post the COVID-19 pandemic between January 1, 2019 and December 31, 2021 have been analyzed. The services utilizations were categorized into three main groups PHCC business as usual services, COVID-19 related services, and the virtual/telemedicine services that were introduced due to the COVID-19. The COVID-19 services at the PHCC were focused on the COVID-19 testing and vaccination services. The PHCC business as usual services were categorized into primary care core services (family medicine, dental services, maternal services); preventative services (well-baby/immunization services, wellness services, smoking cessation, NCD annual health check called SMART check, colorectal cancer screening, and breast cancer screening); additional services (home care, ophthalmology, ENT, dermatology, pharmacy, and laboratory services). In the analysis, we presented the volume of virtual and in-person visits.

The volume of the COVID-19 related services was calculated yearly in the addition to the newly virtual services that were introduced as a part of the PHCC services modifications due to the COVID-19 pandemic. The utilization trends were established to track the differences between the first year and the second year of PHCC the COVID-19 related response.

We conducted a comparison of the services utilization using the utilization figures of the PHCC business as usual services between 1<sup>st</sup> of January and 31<sup>st</sup> of December 2019 as a reference year and then calculated the absolute difference in the utilization figures per service between 1<sup>st</sup> of January and 31<sup>st</sup> of December for 2020 and 2021, respectively. The percentages of services utilization change were calculated using the 2019 utilization figures as a reference year per service for all the services in 2020 and 2021. Descriptive statistical analysis using STATA 14 was conducted. The service’s types were presented as categorical variables and were reported as frequencies and percentages and compared using the Chi-squared test. *P* value <0.05 was considered statistically significant.

**Ethical considerations**

The utilization visits data was extracted anonymously and all the required approval to conduct the study was secured by the PHCC IRB with reference number PHCC/DCR/2020/07/077.

**Results**

**Overall services utilization**

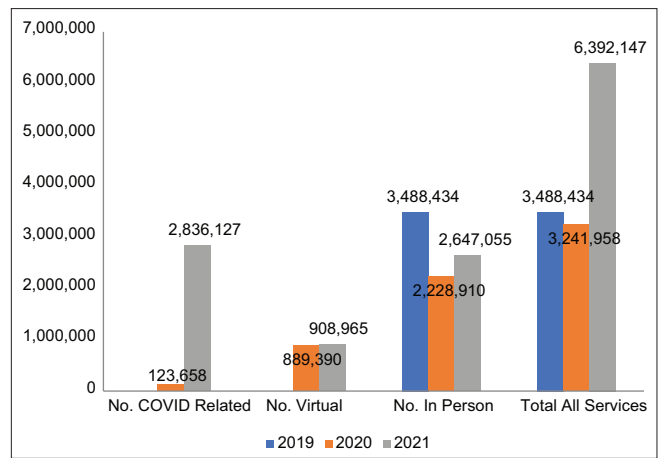
The in-person services dropped drastically since the start of the COVID-19 pandemic in March 2020 at the PHCC health centers in comparison to number of in-person visits in 2019 with the lowest number of visits captured in 2020 at 2,228,910 as illustrated in Figure 1. The reduction in person visits was 36% when compared to the visits in 2019. However, there was a steady increase in the virtual consultation services since their inception in March 2020 due to the needs that emerged after the pandemic. The number of PHCC virtual consultations was the highest in 2021 at 908,965 virtual visits as shown in Figure 1.

**COVID-19 related services**

The COVID-19 related services provided by PHCC health centers from mid-March 2020 and onwards were demonstrated in Table 1. The PHCC started providing the COVID-19 specific services ranging from the COVID-19 drive-through testing at 18 health centers to the COVID-19 vaccine administration services at PHCC 28 affiliated health centers. The latter two services constituted a total number of visits of 2,836,127 corresponding to 44% of the total PHCC services utilization in 2021. The vaccination services utilization reached 2,219,894 visits in 2021.

**Preventative services**

In 2020, preventative services utilization rates were the most affected by the COVID-19 pandemic with significant reductions in the utilization rates in comparison to 2019, as illustrated in Table 2.



**Figure 1:** PHCC services utilization by service type grouped into in-person, virtual, and COVID-19 specific services 2019–2021

**Table 1: PHCC COVID-19 services utilization in 2020 and 2021**

Type of Services	Utilization 2020	Utilization 2021
No. of drive-through testing	119,791	616,233
No. of vaccine administrated	3,867	2,219,894
Total no. of COVID related services	123,658	2,836,127

The most drastic decline occurred in the utilization rate of breast cancer screening services at 79.5 and 100% reduction in the rates in 2020 and 2021, respectively. Colorectal cancer screening was among the preventative services that were affected significantly with a drop in the utilization rate by 83.7% in 2020 and 53.2% in 2021.

The annual health check for non-communicable diseases behavioral and metabolic risk factors called SMART check at PHCC demonstrated a steep decline in the services utilization in 2020 and 2021 at 63.8 and 78.9% reduction in the utilization rate in comparison to the 2019 level, respectively, as illustrated in Table 2. The associated healthy lifestyle clinics and smoking cessations’ services related to the non-communicable diseases risk factors showed a reduction in the services utilization in 2020 in 2021 with the highest reduction in 2020 compared to 2019 at 38.9 and 40.1%, respectively. Well-baby and immunization services showed a reduction in the utilization rate by 10.1 and 12.7% in 2020 and 2021, respectively.

**Dental services**

While the utilization rate of the PHCC dental services dropped by 30.1% in 2020 and 25.2% in 2021, family medicine services started inclining in 2021 in comparison to 2019 with 6.1% increase as demonstrated in Table 2. Home health care services demonstrated a slight reduction in the utilization in 2020 and 2021 in comparison to 2019 at 8.2 and 7.7%, respectively.

**Additional services**

Primary care-based mental health and laboratory services showed a sharp increase in utilization. Mental health services

**Table 2: PHCC services utilization by type of service and the effect of COVID-19 on the utilization in 2020 and 2021 in reference to 2019**

Service type	No. of visits by type of service	2019 as baseline year			Year of 2020			Year of 2021			P
		No. of utilization	No. of utilization year 2020	Difference in absolute number of service utilization to baseline year 2019	Percentage of change compared to baseline year 2019	No. of utilization 2021	Difference in absolute number of service utilization to baseline year 2019	Percentage of change compared to baseline year 2019			
Primary care core services											
Family medicine	2,349,295	2,220,951	-128,344	-5.5	2,492,434	143,139	6.1	<0.001			
Dental services	385,155	269,116	-116,039	-30.1	288,015	-97,140	-25.2	<0.001			
Maternal services	45,905	40,217	-5,688	-12.4	44,564	-1,341	-2.9	<0.001			
Primary care preventative services											
Well-baby/immunization services	186,753	167,882	-18,871	-10.1	163,038	-23,715	-12.7	<0.001			
Healthy lifestyle clinics	120,807	73,764	-47,043	-38.9	118,404	-2,403	-2.0	<0.001			
Smoking cessation	3,809	2,280	-1,529	-40.1	3,286	-523	-13.7	<0.001			
SMART annual health check	10,211	3,694	-6,517	-63.8	2,158	-8,053	-78.9	<0.001			
Colorectal cancer screening services	18,868	3,076	-15,792	-83.7	8,821	-10,047	-53.2	<0.001			
Breast cancer screening services	10,552	2,165	-8,387	-79.5	0	-10,552	-100.0	<0.001			
Primary care additional services											
Home health care services	90,336	82,920	-7,416	-8.2	83,364	-6,972	-7.7	<0.001			
Specialist Ophthalmology services	90,650	64,703	-25,947	-28.6	85,924	-4,726	-5.2	<0.001			
Specialist ENT services	28,409	22,378	-6,031	-21.2	35,146	6,737	23.7	<0.001			
Specialist dermatology services	26,827	22,033	-4,794	-17.9	32,698	5,871	21.9	<0.001			
Pharmacy services	2,399,709	1,923,128	-476,581	-19.9	2,293,848	-105,861	-4.4	<0.001			
Laboratory services	671,099	992,757	321,658	47.9	1,665,583	994,484	148.2	<0.001			
Radiology services	172,328	137,887	-34,441	-20.0	174,261	1,933	1.1	<0.001			
Mental health specialized services	1,301	1,407	106	8.1	3,046	1,745	134.1	<0.001			



demonstrated a significant increase in services utilization in 2020 and 2021 with an increase of 134.1% captured in 2021. Laboratory services demonstrated a steady increase in the utilization rate in comparison to 2019 due to the additional COVID-19 testing services offered by the PHCC at the community level with the highest utilization rate increase at 148.2% in 2021, as shown in Table 2.

## Discussion

The current study demonstrates a substantial reduction in the in-person visits in 2020 in comparison to 2019, as well as a progressive restoration of the in-person utilization rate in 2021, corresponding with the initial COVID-19 outbreak and the subsequent control of the outbreak, respectively. In person, the utilization rate had not recovered to its pre-COVID-19 level. The abrupt reduction in the number of PHCC health center visits was likely attributed to social distancing and restrictions associated with the COVID-19 outbreak<sup>[12]</sup> and the suspension of the PHCC non-urgent services in 2020 and 2021.<sup>[9]</sup> The inadequate knowledge of the virus and the fear of contracting the disease made patients and their family members reluctant to visit the health facilities.<sup>[12-15]</sup> Patients may have chosen to postpone or cancel their in-person care at the health centers even when the lockdown and the restrictions were lifted or relaxed.<sup>[12,15]</sup> The results show that there was a conversion of many in-person visits to the newly introduced teleconsultation services at the primary health care corporation. The latter trend was observed in many countries during SARS-COV-2 outbreak.<sup>[16,17]</sup> In China, due to the quarantine and social distancing needed, there has been a surge in the utilization of telehealth and virtual services provided by the traditional health facilities or via the technology companies during the pandemic.<sup>[17,18]</sup>

### COVID-19 related services

Globally as all the countries started to roll out vaccines against SARS-COV-2, primary care providers have been playing a significant role.<sup>[19,20]</sup> In Qatar, the primary health care health centers have been at the forefront of the COVID-19 vaccination campaign. This was reflected in the increased utilization number of the COVID-19 related services, namely, the vaccination administration services especially in 2021. The increased vaccination utilization might be attributed to the trust in the primary health care staff, as trusted professionals who know their patients and are well placed to address the vaccine hesitancy among their target population.<sup>[21]</sup> Additionally, it might be attributed to the availability and accessibility of the primary health care centers in Qatar in which 27 health centers were operating in 2020.<sup>[22]</sup> Therefore, there was a trend observed in the increased number of people residing in Qatar registering at the PHCC health centers in 2020 and 2021.<sup>[23]</sup> However, the scale of the challenge of achieving high levels of vaccination, leaving no-one unprotected is great.<sup>[21]</sup> Due to the efforts put in place in Qatar, the two doses of COVID-19 vaccination coverage reached 89.7% of the total population by June 2022.<sup>[24]</sup>

## Core health care services

### Dental services

The delivery of dental services across much of the world has been affected heavily by the pandemic as of March 2020, due to the high infection risk associated with the aerosol-generated procedures, such as the use of high-speed drill.<sup>[25]</sup> The latter trend was observed in the PHCC dental services delivery where the services utilization was dropped significantly as of 2020. Additionally, many dental personnel during the pandemic were redeployed to frontline health services to provide a range of clinical procedures beyond their usual scope of practice which affected the dental services provision.<sup>[26]</sup> The teleconsultation dental services unlike the family medicine teleconsultation were limited due to the nature of dental cases and treatment.

### Mental Health

The mental health services at the PHCC demonstrated a significant increase in the services utilization during the pandemic. The latter might be a result of the new strategies that were put in place including providing teleconsultations and allocating hotline for people seeking psychosocial support operating 24 h 7 days a week. In addition, communication campaigns were established to encourage the public to utilize the psychosocial teleconsultation services.<sup>[27]</sup>

## Preventative health care services

### Cancer screening

The cancer screening services for breast and colorectal cancer have been suspended and disrupted since the beginning of the COVID-19 outbreak which resulted in a substantial reduction in the services utilization in 2020 and 2021. The same pattern was observed in Italy and the UK, due to the implementation of the social distancing policies and the health care workers allocation to manage the COVID-19 cases.<sup>[28,29]</sup> In the UK, the number of people being screened and referred to a hospital with suspected lower gastrointestinal cancer, reduced sharply during the first lockdown and a deficit persisted up until September 2020.<sup>[30]</sup> The survival from colorectal cancer is closely associated with the stage of disease, with over 90% of those diagnosed at stage I surviving 5 years compared with only 10% at stage IV.<sup>[31]</sup> As delays in diagnosed enable tumors to continue to grow and advance.<sup>[32,33]</sup> Hence, the bottleneck in the diagnostic pathway is likely to have a profoundly detrimental impact on colorectal cancer outcomes in Qatar.<sup>[33]</sup> However, the cancer screening program at the PHCC has been working on developing a catch-up strategy to expand the services working hours in 2022 to reach out to the missed screening appointments.

### Non-communicable diseases risk factors screening

The COVID-19 pandemic had an enormous effect on the PHCC efforts on screening for non-communicable diseases (NCDs) behavioral and metabolic risk factors. The PHCC health needs assessment in 2019 found out that the burden of NCDs among the PHCC registered population was high with almost 12–14% with type 2 diabetes, 12–16% with hypertension, and 9–11% with dyslipidemia.<sup>[22]</sup> Hence, the COVID-19 pandemic affected

the PHCC efforts for early diagnostics and treatment for people with NCDs. The latter effect was observed in Europe during the restrictive measures such as social distancing, lockdown, and travel restrictions where people living with NCDs were impacted due to the limitation of their activity, ability to secure healthy foods, and access to prevention or health promotion services.<sup>[34]</sup>

### Well-baby/immunization services

The well-baby and immunization services were slightly disrupted during the COVID-19 pandemic in 2020 and 2021. The disruption in the latter services might raise a concern that some of the public health gains realized by the immunization might be hindered.<sup>[35]</sup>

Finally, we found that nearly all the utilization rates for primary health care core and preventative services across the 28 health centers had not recovered to pre COVID-19 levels in 2019, despite relaxing the restriction measures as of June 2021. These reductions and stagnations in preventative services will be most likely to have substantial collateral effects on the population health that considerably exceed the direct effects of the infection.

This study is the first to quantify the effect of COVID-19 pandemic on the primary health care services in the state of Qatar over two years 2020–2021. The analysis is comprehensive with detailed services utilization data as per the type of services during and after the outbreak, covering the entire services provisions. Our results are subject to several limitations including the data collection errors, services type classification cannot be ruled out even though routine data were extracted and reported using standardized procedures.

## Conclusion

In conclusion, our findings highlighted the crucial role that PHCC has played in the health system response to the COVID-19 and has continued to do so through the recovery phase. PHCC in Qatar has been the leader of the COVID-19 vaccination campaign and the COVID-19 drive-through testing services. Additionally, it provided alternative services such as telemedicine to overcome the barriers of the physical inaccessibility factors associated with the COVID-19 outbreak. Our study demonstrates the disruption in the PHCC core and preventive services utilizations due to the COVID-19 outbreak in addition to highlighting the vital role that PHCC stepped up in terms of leading the COVID-19 vaccination campaign in Qatar.

However, future research is needed to establish which vulnerable patient groups were most affected by the pandemic, to continue to inform strategies and policies directed at mitigating the impact of future potential pandemics.

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## Ethical approval

The impact of the COVID-19 on primary health care services in Qatar study was approved by the PHCC scientific and IRB committee with reference number PHCC/DCR/2020/07/077.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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