A Family Medicine response to the COVID-19 lockdown: University of Pretoria perspective

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Background

The COVID-19 pandemic caused great social, political and economic disruption, and imposed unprecedented changes in work, lifestyle, service delivery and social interactions in South Africa and worldwide. Healthcare providers, working in often already overstretched healthcare systems, found themselves at the forefront of global and national efforts to contain the havoc of morbidity and mortality wreaked by SARS-CoV2.
This chapter describes efforts by the University of Pretoria's Department of Family Medicine (UPDFM) to deliver on its mandate of teaching, learning, and research in the face of the disruptions of the COVID-19 pandemic during the March-September 2020 nationwide hard lockdown.

Methods

A perspective review was undertaken, drawing on reports, meeting minutes, email correspondences and electronic personal communications analysed to describe the activities undertaken by the UPDFM during the study period.

Results

Nationally, some of the adaptive responses triggered by the COVID-19 lockdown drew from the pre-existing UPDFM repertoire of community-oriented, learner- and patient-centred practices of service delivery. Key among these practices were data collection and management using validated tools; virtual communication and meetings; health promotion and disease prevention through training nurses, community health workers and patients on newly developed Covid-19 prevention strategies; clinical intervention, including screening and diagnosis, treatment and care coordination using telemedicine and full service delivery in homeless shelters; patient referral/mobility by staff using sponsored rental cars and using an application to call an ambulance, and treatment continuation through home delivery of medication.

Conclusions

COVID-19 restrictions presented the UPDFM with a unique opportunity to draw from its experience and create rapid, impactful interventions. Most lessons learnt by the UPDFM during the crisis proved invaluable for use beyond the acute phase of the pandemic, thereby transforming the health system for better pandemic preparedness.

Introduction

The COVID-19 pandemic was a global disaster.[1] It significantly disrupted organisational and occupational practices for citizens, businesses and governments worldwide,[2,3] put public governance arrangements to the test, and disrupted interpersonal communication.[4,5] The pandemic undermined years of progress made in the fight against the human immunodeficiency virus (HIV), tuberculosis (TB), and malaria,[6] and seriously set back efforts to stem the rising tide of non-communicable diseases in southern and sub-Saharan Africa.[7] As health systems were overwhelmed and critical primary and secondary health services interrupted, direct and indirect pandemic-related morbidity and mortality increased as people failed to access needed care.[8,9] However, a crisis is also an opportunity.[10] While the pandemic tested the effectiveness of and revealed gaps in existing practices,

it also activated an unprecedented mobilisation of research and innovation systems to address immediate needs and improve overall system resilience to future crises.[11]

The first SARS-CoV2 case was identified in South Africa on 5 March 2020. A National State of Disaster was declared on 15 March 2020, and a subsequent hard lockdown was initiated on 26 March 2020. This was followed by different levels of lockdown until 5 April 2022, when the National State of Disaster was finally lifted.[12] While the restrictions adversely affected everyone, they had a particularly negative impact on the health and well-being of the poor, the homeless, and people with chronic conditions or in need of home care,[13-16] who found themselves with no or limited access to health services, food security, shelter and medication.

This chapter details the response of the University of Pretoria's Department of Family Medicine (UPDFM) to the COVID-19 lockdown in its quest for continuation of care to different vulnerable communities during the lockdown.

This chapter uses a qualitative, multi-site case study approach to describe the UPDFM's response to the COVID-19 lockdown in the first six months. Data used in this chapter were gathered from published papers (related to the UPDFM), unpublished reports from the team, UPDFM meeting minutes, data collection sheets, clinical notes, as well as email and other communication. The authors drew mainly on their own experiences and those of their colleagues as part of the broad collaborative team, with a special focus on the first six months of lockdown, (26 March - 30 September 2020). This period represented a time of great crisis and opportunity for the UPDFM, as reflected in the various data sources used, complemented with observational notes from a range of sites.

The UPDFM is a department within the University of Pretoria in Tshwane district, Gauteng, South Africa. Tshwane district has an estimated population of 3 275 152, with a total of eight community health centres and 68 clinics. Being an academic department, the UPDFM has three overlapping roles: holistic bio-psycho-social community-focused district-model-based PHC delivery; medical undergraduate, postgraduate and clinical associate training; and research. Community engagement is at the centre of all these roles. In clinical practice, the UPDFM actively takes part in district health service delivery in Gauteng, Mpumalanga, and North-West provinces.[17]

The University of Pretoria Department of Family Medicine

The Department of Family Medicine (DFM) forms part of the School of Medicine in the Faculty of Health Sciences at the University of Pretoria (UP), with key faculty holding joint appointments in the Gauteng Provincial Department of Health (GDoH). As such, the DFM has three concurrent responsibilities. Academically, the DFM is expected to educate and train undergraduate and graduate medical and clinical associate students in a way that equips them to deliver quality primary health care (PHC) to people living in South Africa; to support the delivery of quality health care in the City of Tshwane (CoT) and across the provinces as and when required; and to engage in basic and applied research.

In terms of clinical practice, the DFM actively participates in district health service delivery in Gauteng, Mpumalanga, and North-West provinces. Tshwane district forms the hub of the UPDFM's activities, with a population of over three million[18] attending a range of health facilities that are part of the referral system.[19] About 80% of Tshwane residents use public health services.[20]

The UPDFM offers service delivery through the community-oriented primary care (COPC) model based on the principles of using evidence-based approaches, equitable, integrated, person-centered care that is organised in a manageable geographical region with good information management and geo informatics.[21,22]

In Tshwane district, the UPDFM implements COPC at clinics, community health centres, and district hospitals, as well as in a range of community settings such as households, homeless shelters, and old age homes. In other provinces, the model extends to rural and mining communities, in partnership with indigent healthcare providers and the private sector. The UPDFM's comprehensive care involves five types of activities, namely promotive, preventive, curative, rehabilitative, and palliative care. In this process, the UPDFM incorporates the three components of the WHO framework,[21] namely: integrated health services with an emphasis on primary care and public health functions; multisectoral policy and action; and empowered people and communities. The COPC model was adapted to manage the COVID-19 pandemic in all settings where the UPDFM was rendering services.

The UPDFM offers training to undergraduate students in years one to four through the Longitudinal Community Attachment for Students (L-CAS) programme. The programme links medical students to integrated primary care from the household to the hospital and back. It introduces students to integrated, interdisciplinary and coordinated primary health care services outside the hospital environment. The programme also involves training for consultation in different situations and environments, in partnership with ward-based outreach teams (WBOTs).[17] At postgraduate training level, students fall into two groups, namely medical registrars (clinical trainee specialists) or other postgraduate trainees. The latter group are either attached to the UPDFM or co-supervised with other departments, and may be either involved with UPDFM research projects or collect data elsewhere.

Clinical associate (ClinA) students, called 'physician assistants' in other settings, undergo a three-year training programme for the Bachelor of Clinical Medical Practice (BCMP) degree. They spend their first year learning clinical theory and practice at the UP campus, and the remaining two years doing clinical practice at allocated clinical sites under family physician mentorship. This

involves intensive in-service training at health facilities serviced by or partnering with the UPDFM.[17] A clinical associate is a professional member of the healthcare team, with the necessary knowledge, skills and attitude to function effectively, mainly in the district/government healthcare system in South Africa. Clinical associates play a vital role in rural health care, where doctors are few and far apart. Their support ensures better health care for patients, and enables doctors to engage in a greater number of outreach programmes.[17] The role of clinical associates became even more prominent during the COVID-19 pandemic crisis, when a huge number were employed by the UPDFM to implement COPC, especially in rural and mining communities.

During COVID-19 lockdown, training was extended to nurses, community health workers (CHWs) and patients, to equip them on Covid-19 prevention guidelines and practices.

CHWs are crucial for the success of COPC in that they visit households and assess health needs before patients present at formal facilities. The UPDFM is involved in the development of this cadre through continuous work-based education and training.[17] CHWs collect and transmit household data to a central repository, using a purpose-built application (AitaHealth™) on their tablets.[23] AitaHealth™ is a purpose-built data-collection, support and management system.[23] Using web and mobile-phone technology, team leaders and CHWs, assisted by doctors and other specialists, work with real-time information to make decisions and provide care.

Research is an ongoing endeavour in the UPDFM. Data collected on an ongoing basis through implementation of COPC and other funded projects is available for research. From 2020, the UPDFM has also collected longitudinal data from two sites for the South African Population Research Infrastructure Network (SAPRIN) project, a health demographic surveillance system project commissioned by the South African Medical Research Council (SAMRC) with funding from the Department of Science and Innovation (DSI). This project is in partnership with the University of the Witwatersrand (Wits) and the University of Johannesburg (UJ).[24]

Impact of COVID-19 lockdown on the health system

COVID-19 impacted different components of the health system served by the UPDFM. Hard lockdowns at the start of the pandemic to curb the spread of COVID-19 had extremely negative effects on health-service users, especially vulnerable and key populations. The documented negative impact on the health system is described here, including impacts on health-service users, the health workforce, and the process of healthcare delivery.

- Impact on health-service users: During the lockdown, health-service users experienced issues such as limited space to practise social distancing; congested facilities; loss of income resulting in food shortages, hunger and new diseases; anxiety and depression; as well as inadequate access to health education.[25] Vulnerable groups, such as people living with intellectual disabilities, people experiencing homelessness, and substance users, battled to comply with general COVID-19 prevention measures,[14,26] including sanitising and masking. In addition, patient access to chronic medication was ruscestricted due to limited transportation during lockdown, leading to more patients lost-to-follow-up.

- Impact on the health workforce: A meta-analysis by Gholami et al.[27] reported that a significantly high number of healthcare workers were infected with COVID-19 compared to the general public globally. Similar trends were observed in three academic hospitals in Tshwane district, with an 11.1% period prevalence of SARS-CoV-2 infections.[28] This resulted in a shortage of healthcare workers at different levels of the healthcare system across Tshwane. A number of temporary healthcare worker posts were created, bloating the staff establishment in provinces. Furthermore, changes were reported in self-perception of mental well-being among health workers in Tshwane,[29] many of whom felt overworked, with long hours under difficult conditions, and fears of being infected.

- Impact on health-service delivery: Part of the government's response to the pandemic was to dedicate certain health facilities as 'COVID-19 hospitals'. Tshwane District Hospital (TDH) was one such example, while Skinner Street Clinic (a PHC clinic on TDH grounds, with a headcount of 58 147 in 2019/2020) was closed.[20] Dedicating facilities to managing COVID-19 resulted in staff repurposing, leaving gaps in the routine care of other health conditions. In some facilities in Tshwane, there was a reported decrease in the number of mental health visits during the lockdown period.[30] Many patients on chronic medication missed their regular clinic appointments, while others could not get appointments because of staff shortages.

Impact of COVID-19 on the UPDFM care model

The UPDFM's model of care was disrupted in several ways at the beginning of the pandemic. The disruptions were experienced across the UPDFM's three roles, namely holistic health service, training, and research. However, focus here is on disruptions related to the provision of holistic health services, since they affected the other two areas (teaching and research). Disruptions included unavailability of the PHC facilities due to their designation for the exclusive care of people with COVID-19; increase in the numbers of patients lost to follow-up due to lockdown restrictions and lack of transportation; shifts in the primary facility for acute health services, from clinics to hospital emergency units; reduction in human resources available at PHC facilities due to either sickness

or redeployments; patient overloads at some healthcare sites due to an influx of people experiencing homelessness accessing healthcare and seeking shelter; low availability of services for diagnosing COVID-19 due to the polymerase chain reaction (PCR) test being the only diagnostic test, sites being fewer and results taking longer; inconsistent or absent guidelines and tools for managing COVID-19; disrupted communication among HCWs due to restricted physical interaction and non-streamlined health communication systems; and pausing of CHW visits to households due to restriction on movements , leading to disrupted care coordination.

Results

Findings are presented from the analysis of documented evidence of interventions by the UPDFM during the first six months of COVID-19 lockdown (Table 1).

Health promotion

The UPDFM launched the "Health is in our Hands" awareness campaign in an effort to combat the massive amount of false information about COVID-19 that was circulating. The campaign aimed to produce a number of understandable, timely, locally relevant, scientifically educated, and easily accessible visual texts to assist everyone in understanding important healthcare issues and the doable steps they may take to manage COVID-19 and stop the spread of SARS-CoV-2. Each of the brief educational videos in this series covers a distinct COVID-19-related theme. External funding made it possible for translation from English into Afrikaans, isiXhosa, isiZulu and Sepedi. The videos were distributed via the various projects the UPDFM was involved in.

Screening tools

There were no central or standardised tools for COVID-19 screening. A standardised tool for gathering biographical data and medical history of individuals experiencing homelessness was also not available. In order to tackle this issue, various data-collection instruments were developed and personnel were trained to utilise electronic questionnaires to record and evaluate individuals. Survey tools included AitaHealth,[23] Qualtrics[31] and Phulukisa.[32] and the Vula app. In the first few months of the pandemic, COVID-19 screening questions were added to the AitaHealth app which was used by CHWs to screen household members for COVID-19, and an automated response advised CHWs on the action to be taken, i.e. whether the screened individual ought to get tested or not. After creating a COVID-19 screening note, a team leader was also able to reply to the note and advise a CHW on what to do next.

The Qualtrics online survey platform was used to create interviewer-administered questionnaires in the early stages of lockdown. In addition, the Phulukisa Healthcare Solutions platform (developed in partnership with a pri-vate-sector company), was used at a later stage with a view to adopting it as a comprehensive platform. Both these platforms were used mostly in homeless shelters by data capturers and clinicians to capture biographical information, medical history, substance-use history, and to do COVID-19 screening.

The Vula Mobile app[33] allows for back-and-forth text communication as well as exchange of images between the referring practitioner at the primary care facility and the accepting doctor at the referral centre. The app was designed and developed by a private company and made available for public service use in 2014. During COVID-19 lockdown, it was also used by social workers to follow up on homeless patients discharged from temporary COVID-19 hospitals. The UPDFM collaborated with Tshwane District to establish a COVID-19 call centre that provided a toll-free helpline. The line was managed by a group of medical students who received assistance from family physicians. The Vula application was utilised to facilitate the coordination of information dissemination between the call centre and healthcare establishments.

Communication and coordination of care

The findings indicate that the disruption of care coordination was attributable to the unavailability of certain facilities at their customary referral level, which was due to their conversion into COVID-19 hospitals or their exclusive focus on emergency cases. Virtual multidisciplinary team (MDT) meetings were introduced to improve care coordination, coordination of resources, teaching, support of nursing staff, referral to tertiary care, and clinical support. Initially the meetings were daily, and then less frequent as stability was reached. A variety of online meeting platforms facilitated engagement and cooperation among stakeholders, which was key in dealing with the crisis. Using platforms like Zoom and Ms Teams enabled interactions between the UPDFM and other role players such as the City of Tshwane (CoT), the GDoH, the local non-profit sector, the Department of Social Development (DSD), Gauteng Emergency Services, and some private companies. This created various synergies, and strengthened cooperation as resources were stretched.

Access to medicines and care

While the country was under lockdown, many people on chronic medication avoided medical facilities and did not collect their medicines. Accordingly, in collaboration with clinic management, the UPDFM introduced home delivery of medication for chronic-care patients who normally collected from Skinner Street Clinic. This was done to improve treatment adherence and access to chronic medications, to decongest medical facilities, and to provide alternative access to patients who missed follow-up consultations or medication collection visits. An appointment list recording upcoming and missed appointments was used to identify eligibility for home delivery of medication. Administrative staff phoned those with active repeatable scripts and offered home delivery of medica-

tion. Clinical staff audited the rest of the files and conducted telephonic consultations to determine whether chronic medication could be safely continued or adjusted. Those eligible were offered a home-delivery option. Furthermore, those qualifying for central chronic medicines dispensing and distribution (CCMDD) but were not yet enrolled, were offered enrolment telephonically for subsequent medicine supply.[20]

A significant proportion of patients faced barriers in accessing hospitals for regular consultations, including transportation limitations, apprehension regarding Covid-19, and other factors. The UPDFM's ability to manage the sudden influx of patients was facilitated by alternative modes of patient transportation and the staff's exceptional commitment to their duties. This encompassed the accumulation of individuals awaiting referral for additional medical attention. In April 2020, the UPDFM successfully negotiated and obtained a total of 15 pick-up trucks from a car rental company without incurring any rental fees. The aforementioned items were utilised for the purpose of administering medication, conveying patients from destitute shelters to medical facilities, and conveying personal protective equipment and medical supplies to facilitate the efforts of Community Health Workers in addressing the COVID-19 outbreak. The UPDFM also implemented the utilisation of the pre-existing Mpilo application utilised by the Gauteng Emergency Services to facilitate the dispatch of ambulances for the conveyance of patients between homeless shelters and healthcare facilities.

COPC in mining communities

When the COVID-19 pandemic started, the UPDFM strengthened its working relationships with mining companies to introduce COPC in 24 mining communities. Utilising existing Ward-based Primary Healthcare Outreach Teams (WBPHCOTs), this support focused on strengthening CHW training, as well as monitoring and evaluation of WBPHCOT work. Up to 100 clinical associates started working in the programme collaborating with Occupational Health Services at the mines and the District Health Services in the mining communities. Among the activities they embarked on were COVID-19 screening and testing, home visits, home care, delivery of food parcels, and vaccination.

Recommendations

- Foster strong collaboration among relevant parties to generate mutually beneficial reactions, and deliberately strive for the harmonisation of healthcare efforts.
- Continuously evaluate methodologies and frameworks to assess their preparedness for managing crises.
- Adopt innovative approaches in all aspects of work, as this facilitates ingenuity and results in essential resolutions.

- Prompt establishment of a proficient communication plan to facilitate the uniformity of procedures and impede the proliferation of the disease.
- Develop novel strategies to effectively mobilise and utilise resources to counteract the proclivity for resource depletion during periods of pandemic.
- Enhance the preparedness of the healthcare system by establishing unambiguous protocols and evaluating novel approaches for handling pandemics.
- Record the insights gained during periods of crisis and incorporate effective ones into standard practise after the crisis has passed. Conversely, it is important to retain unsuccessful approaches as cautionary examples.

Conclusions

The disruption and restrictions that came with the COVID-19 lockdown presented the UPDFM with a unique opportunity to think and act more innovatively so as to create rapid, impactful interventions. Like the rest of the country, the UPDFM was initially unprepared as the pandemic was unexpected and government communication on national plans yielded little guidance. These challenges changed in the latter stages of the pandemic as more information became available. The unprecedented pandemic meant that the UPDFM's COPC model had to respond in adaptive ways. Strategies evolved while they were being implemented, as evidenced in documentation, observations and personal interpretations of the team members. The UPDFM's adaptability proved to be invaluable in responding to the health crisis. These proved to be invaluable lessons for pandemic preparedness for the health system.

Table 1. Summary of challenges and interventions implemented by the UPDFM during COVID-19 lockdown, 26 March - 30 September 2020

Areas of concern	Challenge	Interventions
Lack of effective tools to screen for COVID-19	No central or standardised data collection tools for COVID-19 screening. No standardised tool for the collection of biographic and medical history information for people experiencing homelessness.	Self-developed tools and spreadsheets to screen for COVID-19 and respond appropriately delivered digitally via: • Qualtrics online survey platform (people experiencing homelessness, substance users, patients on chronic medication) • Phulukisa (people experiencing homelessness, substance users, and patients on chronic medication) • AitaHealth (COVID-19 screening, household registration)
Care coordination	Care coordination was disrupted due to some facilities being unavailable at their usual referral level, either because of being converted to a COVID-19 hospital or hospitals only attending to emergency cases.	Virtual multidisciplinary team meetings (MDT) were held to better coordinate distribution of resources, plan training of health workers on COVID-19, improve clinical support and patient referral.
Communication between healthcare workers	Face-to-face meetings could not be held, this resulted in a lack of support for clinical decisions. Staff (especially administration staff) worked from home Lack of access to digital tools to work remotely	Daily virtual meetings were held using different platforms such as Microsoft Teams, Zoom, and WhatsApp.
Health promotion and disease prevention	Fake news was spreading fast about COVID-19.	A series of videos on COVID-19 were developed and translated into different languages.
Management continuity	A number of patients were lost-to-follow-up due to diminished access to health facilities.	Telemedicine (Telephonic consultation with patients accessing if they qualified for home delivery of medication). Home delivery of medication

Figure 1. Timeline of UPDFM interventions from 26 March to 30 September 2020
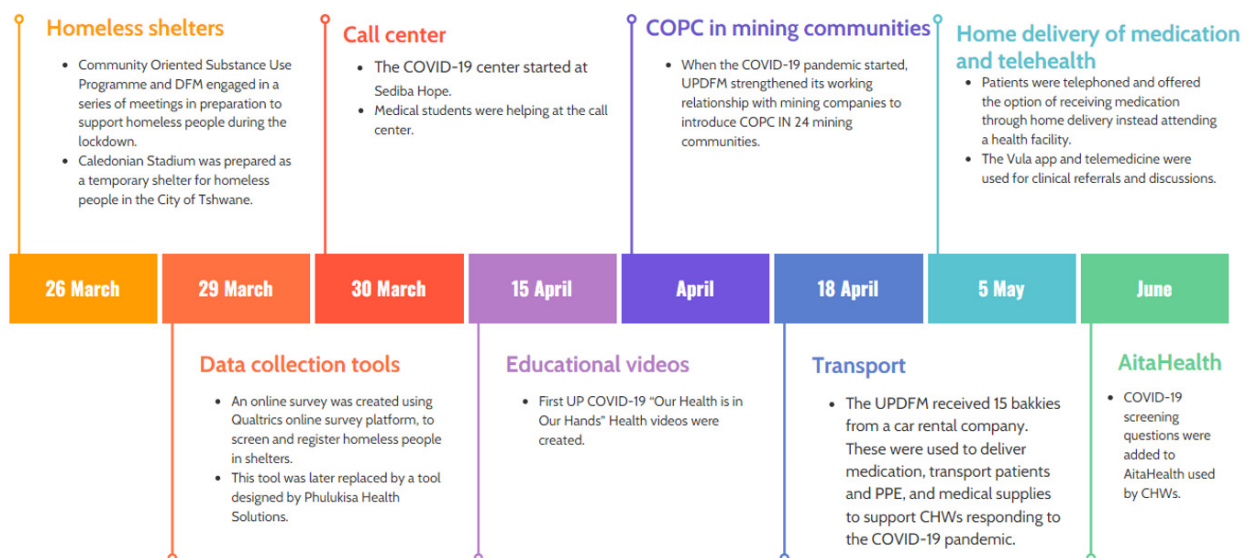
Abbreviations

Abbreviation	Description
BCMP	Bachelor of Clinical Medical Practice
CCMDD	central chronic medicines dispensing and distribution
CHW	community health worker
ClinA	clinical associate
COPC	community-oriented primary care
CoT	City of Tshwane
COVID-19	coronavirus disease of 2019
DSD	Department of Social Development
EVDS	Electronic Vaccination Data System
GDoH	Gauteng Department of Health
HIV	human immunodeficiency virus
L-CAS	Longitudinal Community Attachment for Students
MDT	multidisciplinary team
NCD	non-communicable disease
OECD	Organisation for Economic Co-operation and Development
PCR	polymerase chain reaction
PHC	primary health care
PPE	personal protective equipment
SAPRIN	South African Population Research Infrastructure Network
TB	tuberculosis
TDH	Tshwane District Hospital
UJ	University of Johannesburg
UP	University of Pretoria
UPDFM	University of Pretoria Department of Family Medicine
WBOT	ward-based outreach team
WBPHCOT	ward-based primary healthcare outreach team
WHO	World Health Organization
Wits	University of the Witwatersrand

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