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The Resilience of Senegal's Hospitals to the First Waves of the COVID-19 Pandemic

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Key Messages

1. Five recurring configurations were identified to study the effects of the COVID-19 pandemic in eight hospitals in Senegal.
2. The impact of the COVID-19 epidemic on patients' access to care was relatively positive for COVID-19 patients but more deleterious for non-COVID-19 patients.
3. The hospitals implemented various strategies to cope with and adapt to the pandemic but ultimately found themselves in the same difficult and abnormal situations as before the epidemic.

Introduction

In early 2020, the SARS-CoV-2 coronavirus (COVID-19) outbreak spread around the world. Africa was not spared. Health systems faced this unprecedented shock by deploying immediate responses and using exceptional mobilization of health actors. However, even before the crisis, health systems in Africa were vulnerable (Sagan et al. 2020), often failing to provide effective care or meet the legitimate expectations of patients (McKee & Healy 2002). They were also poorly prepared (OCDE 2022), demonstrating the inability to learn from past crises (European Observatory on Health Systems and Policies et al. 2021). The pandemic highlighted the limitations of many health systems (Haldane et al. 2021).

The application of the concept of resilience to health systems is relatively recent (Haldane et al. 2021). It requires clarification and stabilization to be measured in practice (Dedet, Kraepiel, & Rapp 2021; Turenne et al. 2019). In recent years, and especially since the Ebola outbreak of 2013–2014 in West Africa, the idea that health systems need to be resilient when faced with sudden shocks, such as epidemics, has attracted considerable attention (Kruk et al. 2015; Lerosier et al. 2023; Ridde, Lechat, & Meda 2016). Given the likelihood of future pandemics and other major shocks, there is an urgent need to design more resilient health systems capable of coping with crises while maintaining their essential functions. Analyzing the resilience of health systems during the pandemic can strengthen countries' preparedness and response to future health challenges (Haldane et al. 2021). Wishing to learn from the

experiences of the last two years of crisis (European Observatory on Health Systems and Policies et al. 2021; Khalil, Mataria, & Ravagli 2022), authors have studied systems' ability to anticipate and predict the shock of the pandemic, how it absorbed and responded to this shock, and its ability to maintain access to current care during the crisis (Dedet, Kraepiel, & Rapp 2021; Juárez-Ramírez et al. 2022).

At the heart of health systems, hospitals play a central role in delivering care (McKee & Healy 2002). In our view, studying the resilience of hospitals means analyzing "the ability of hospitals and their staff, faced with shocks, challenges or chronic destabilising tensions (unexpected or expected, sudden or insidious, internal or external) to absorb, adapt, and transform to maintain and improve access to quality care" (Ridde et al. 2021). Transformative capacity is essential to address the long-term structural challenges of health systems (European Observatory on Health Systems and Policies et al. 2021).

Although the COVID-19 pandemic has shown clear examples of resilience (e.g., absorption of pressures by health workers, the introduction of new methods of work or types of services [European Observatory on Health Systems and Policies et al. 2021]), it has occurred in a complex context for Senegal's hospitals and health facilities (Paul et al. 2020). It raised questions about the capacity of the Senegalese health system to absorb, adapt, and even recover from pandemic shock.

Context and Methods

In 2020, at the onset of the COVID-19 pandemic, the Senegalese health sector had less than 5 percent of the national budget (World Health Organization 2022). The latest National Health Accounts (2014–2016) show that almost half of the national health expenditure is incurred directly by households and less than a quarter by the state. Moreover, while Senegal committed itself to a proactive health care coverage policy, in 2019, less than 5 percent of the population joined these community-based insurance programs (Agence Nationale de la Statistique et de la Démographie et ICF 2020). Therefore, the standard for patients is user fees payment—highlighting health system equity challenges (Paul et al. 2019). At the hospital level, the wealthiest 20 percent of users absorb 53 percent of the use of services, while the poorest 20 percent benefit from only 12 percent (Samba 2022). In 2013, national and regional hospitals accounted for 66 percent of total public funding for health care providers, and district hospitals only 30 percent. Thus, as elsewhere in West Africa, hospital-centrism is strictly necessary. The primary health investments are directed to these hospitals in Senegal, while most of the diseases are received at the level of health centers and posts. Regarding care organization, Senegal had seventy-five district hospitals and 1,499 primary health posts in 2020.

This chapter aims to describe the resilience of eight public health facilities (PHF) in eight regions of Senegal in the face of the first wave of the COVID-19 pandemic. PHF were the first to be asked to deal with the first COVID-19 cases, representing the upper level of the Senegalese health pyramid. In the fourteen Senegalese regions, there are thirty-seven PHF, eleven of which are level 1 (departmental hospitals), fifteen level 2 (regional hospitals), and eleven level 3 (national hospitals, only in the Dakar and Diourbel regions). At the time of the study, only the Kédougou region had no regional hospital.

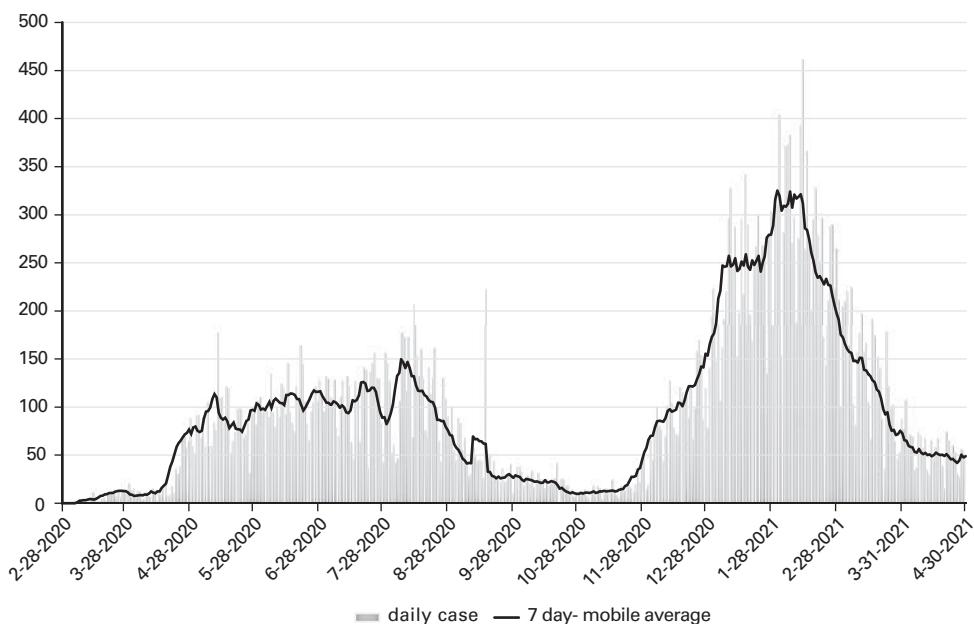


Figure 10.1

Evolution of COVID-19 cases in Senegal (seven-day mobile average). *Source:* <https://www.covid19afrique.com/pays>

The study occurred between March and April 2021, when the country had just suffered a second wave of COVID-19 with a sharp increase in the number of people infected (figure 10.1).

Hospitals have had to cope with two epidemic waves (April to August 2020 and December 2020 to March 2021) and adapt to binding government measures. Indeed, following the first confirmed case of COVID-19 on March 2, 2020, the government prohibited public gatherings and attendance at places of worship (beginning March 1, 2020). On March 23, the government added three measures: a general curfew, a ban on movement between regions, and the closure of markets. The places of worship were reopened on May 11, the traffic restriction between the areas was lifted on June 4, and the markets' curfew and closure were lifted on June 29 (Ridde & Faye 2022b).

This is qualitative and retrospective research based on a multiple case studies approach (Yin 2012). Eight referral PHF and their epidemic treatment centers (ETC) were selected in eight regions of Senegal: Dakar, Kaolack, Diourbel, Louga, Sédiou, Tamba, Ziguinchor, and Thiès. Extending the research to all fourteen regions was impossible for financial and logistical reasons. A reasoned selection of regions was made considering the need for information from the Ministry of Health and about the pandemic distribution (incidence rate) to have various epidemic contexts. Different types of PHF were selected: Dakar (PHF3), Kaolack (PHF2), Diourbel (PHF3), Louga (PHF2), Sédiou (PHF1), Tamba (PHF2), Ziguinchor (PHF2), and Thiès (PHF2). Thus, PHF in these regions had variable beds, staff, and equipment.

The conceptual framework for the study was developed based on knowledge syntheses on the resilience of health systems (Biddle, Wahedi, & Bozorgmehr 2020; Saulnier et al.

2021; Turenne et al. 2019) and an international research program (Ridde et al. 2021). The aim was to observe (1) the contexts in which the pandemic occurred, (2) the events (the pandemic), (3) the effects of the pandemic on the organizational routines of PHF, (4) the strategies deployed by the actors to address these effects, and (5) the impacts of these strategies perceived as positive and/or harmful. Ultimately, the objective was to study (6) the impact of these strategies on the use of patient care (and its five determinants) (Cu et al. 2021), and (7) the resilience processes of PHF, that is, their absorption, adaptability, and/or transformation.

Two research assistants and researchers collected the data in March 2021 in the seven regions outside Dakar and in April 2021 in Dakar. The data are mainly based on individual interviews and some small group discussions. A total of 189 interviews were conducted, of which 101 medical or support personnel were carried out in the eight PHF between twelve and sixteen people per region). Data collection was organized around configurations like the concept used by the sociology of organizations (Mintzberg 1989) or realistic evaluation (Pawson 2013). The analysis of empirical data was carried out using the analytical approach of multiple case studies (Yin 2012) and the seven dimensions of our conceptual framework while considering new dimensions and other emerging information from an inductive perspective.

The preliminary report of this study was shared with vital national decision-makers for comments, and its content was presented at a workshop at the Ministry of Health in June 2021.

Five Hospital Configurations to Deal with the Pandemic

Based on the conceptual framework and empirical data collected, several configurations were identified in the eight PHF in the eight regions. Analysis of these configurations identified five recurring configurations (i.e., generic and cross-sectional to regions):

1. Reorganization of infrastructure (seven regions concerned)
2. Reorganization of the work of professionals (six regions)
3. Communication and awareness-raising activities with the community (five regions)
4. Managing the risk of infection (five regions)
5. Adaptation of patient care (five regions)

We offer a narrative synthesis for each configuration. Due to lack of space, only the first configuration presents a descriptive figure to enhance its readability.

Reorganization of Infrastructure

Before the arrival of the COVID-19 pandemic, patient reception capacity was limited in some regions due to the absence of ETC and laboratories and the rapid saturation of some ETC. A lack of qualified personnel, protective equipment, and other equipment could be observed regularly. The pandemic led to increased patient admissions, rapid saturation of ETC, and overloading for professionals. Several strategies have been put in place to address the pandemic's effects on the health facilities. These strategies include the creation of ETC,

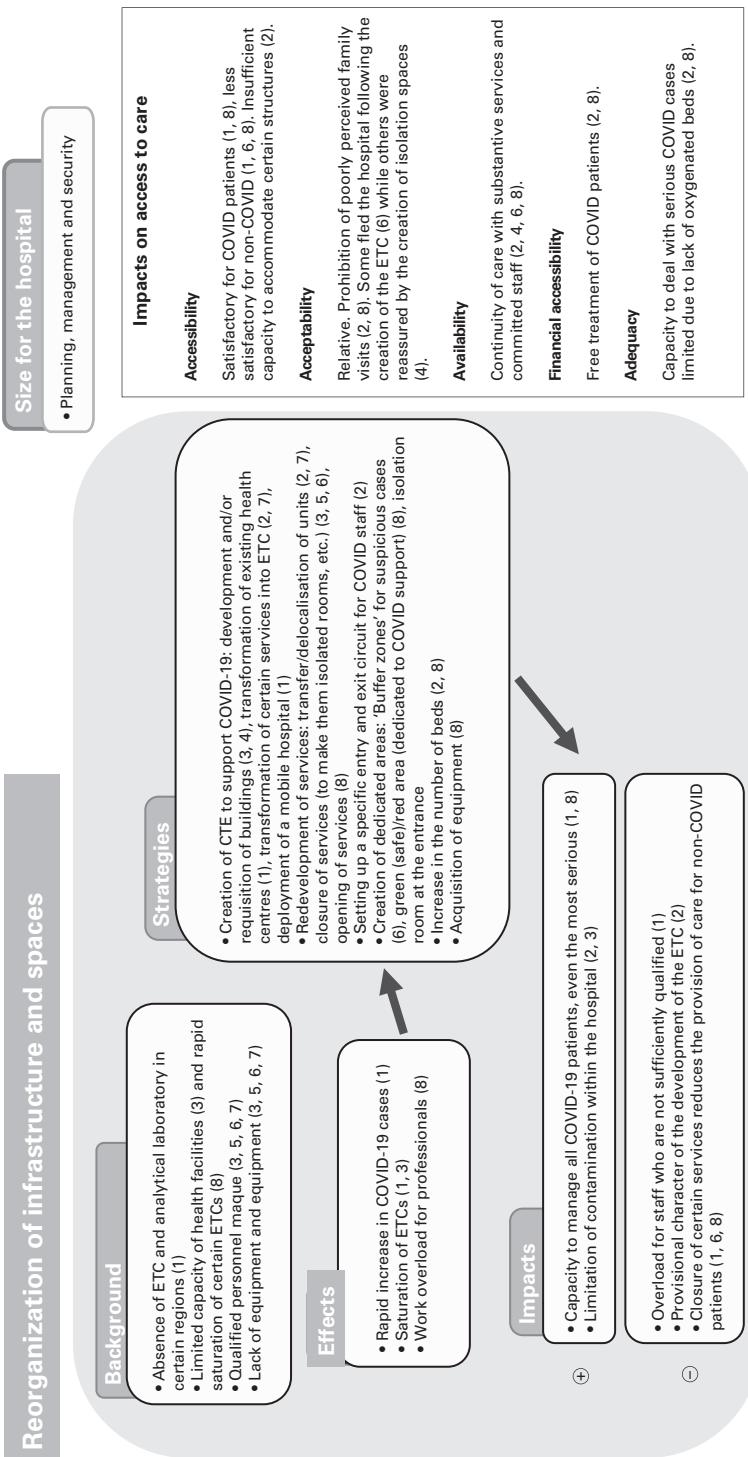


Figure 10.2
Summary of configuration 1: “Infrastructural reorganization.” *Note:* Figures from 1 to 8 represent the regions that we do not name for ethical reasons.

the development of service, the creation of specific care areas and traffic circuits, the increase in the number of beds available, and the acquisition of suitable equipment. These strategies improved the capacity to manage even the most severe COVID-19 patients and limited the virus's spread within health structures. However, these new developments were often temporary. In addition, staff suffered from high workloads. The closure of some services (due to redesigning services) also reduced care provision for non-COVID-19 patients.

Reorganization of the Work of Professionals

The spread of COVID-19 increased the risks and cases of contamination of hospital professionals. In addition, the decline in staff attendance led to an overall decrease in their activities and delays in payments of staff salaries from revenue. To deal with these effects of the pandemic, hospitals have put several strategies in place, such as redeployment and recruitment of staff, the introduction of new hygiene and protection measures (e.g., mandatory wearing of masks, physical distancing), isolation of contaminated personnel, and changes in professional practices (e.g., end of scheduled surgery, relays, and shifts of caregivers). These strategies improved the capacity to manage even the most severe COVID-19 patients and limited the virus's spread within health structures. Solidarity emerged between the caregivers who have committed themselves to the fight against COVID-19. However, staff had a workload that remained too high, and delayed payment of bonuses led to decreased motivation. This led to fatigue, disengagement, and long-term mental health impacts.

Communication and Awareness-Raising Activities with the Community

The COVID-19 pandemic spread rapidly to communities. The government implemented restrictive (and often unappreciated) barrier measures on the part of the population—often without sufficiently involving community actors. In addition to the population's denial of the virus, this led to noncompliance with these barriers, stigmatization of health structures and caregivers by the population, and the circulation of false information about the virus. To address these effects of the pandemic on hospitals, health care staff were trained in the medical and psychosocial care of COVID-19 patients and community awareness. Communication and awareness-raising activities involving community actors/leaders were set up in the neighborhoods. These strategies led to the population's increased belief in the existence of the virus. It also increased their confidence, mobilization, and attendance of health structures. However, caregivers were still concerned about the population's failure to comply with the barrier measures.

Managing the Risk of Infection

Before the outbreak of the pandemic, there needed to be more compliance by staff to hygiene and protective measures (e.g., wearing masks), to a lack of cleanliness in health facilities, and to a lack of qualified personnel, protective equipment, and other equipment. The pandemic led to an increase in admissions and workload. This upsurge also increased

the risk of infection among professionals. Several strategies were put in place to address the pandemic's effects on the risk of infection. These strategies include introducing new measures for caregivers and patients (e.g., specific entry/exit circuit, mandatory wearing of masks, handwashing and temperature-taking), isolation of suspected COVID-19 cases, and prohibiting or regulating family visits. These measures, considered adequate, have led to a practical limitation of the spread of the virus within health structures.

Adaptation of Patient Management

Before the pandemic, patient reception capacities in health facilities, especially in emergencies, were limited in some regions. The pandemic led to increased admissions, rapid saturation of ETC, and work overload for professionals. Several strategies have been put in place to address the pandemic's effects on patient management. These strategies include introducing new hygiene measures for caregivers and patients (e.g., mandatory wearing of masks, handwashing, and temperature-taking), the care and follow-up of patients at home, and using the kitchens in the structures to prevent families from providing food to patients. These strategies have facilitated the organization of staff work and improved the capacity to manage even the most severe COVID-19 patients while limiting the spread of the virus within health structures. However, as patients feared being infected in health care facilities and hospitals and professionals were highly stigmatized, the structures remained infrequent, their revenues were falling, payment of staff salaries paid by the latter was delayed, and the risk of death at home was high. In addition, reducing some activities decreased care provision, particularly for non-COVID-19 patients.

From Configurations to Hospital Resilience

The global analysis of configurations allows us to study the effects of the COVID-19 pandemic on reference PHF in Senegal. It is essential to consider context in the study of resilience because we know that hospitals in West Africa operate in a challenging environment where hospital infrastructure and professionals are generally insufficient (Paul et al. 2020; Ridde 2021). Compared to other regions of other countries (Coulibaly et al. 2022; Lerosier et al. 2023; Ridde, Traverson, & Zinszer 2023) or in Senegal, the situation in Dakar is often privileged, concentrating on human resources and hospitals. However, the implementation challenges posed by the pandemic remain essential, including in Dakar (Ridde & Faye 2022a). Thus, many contextual elements highlighted by data collection reveal these challenges and shortcomings, as elsewhere in the region: the absence of specialized personnel (anesthetists, psychologists), essential equipment (oxygen extractor), and essential devices (electricity generators). The effects of the pandemic also disrupted the organizational routines of hospitals, like in Mali (Coulibaly et al. 2022). This led to saturation of ETC, overload of staff and sometimes their contamination (and consequent absenteeism), high risks of infection of patients and professionals within health structures due to lack of awareness of the virus and its modes of transmission, and the stigmatization of staff and patients. Hospitals have implemented various strategies to cope with these effects and adapt to the emergency (table 10.1).

Table 10.1
Key strategies implemented by the eight Senegalese PHF studied

Configurations	Key Strategies Deployed
Reorganization of infrastructure	<ul style="list-style-type: none"> • Fitting-out of a building to deal with COVID-19 cases • Transformation of a health center into an ETC • Deployment of a mobile hospital by the army • Transfer of the diabetes unit to expand ETC • Replacement of infectious disease service in ETC • Transformation of the hangar into an office for ETC health personnel • Gradual increase in the number of oxygenated beds (from two to five beds) • Reorganizing infectious diseases into ETC • Delocalization of the endocrinology service to integrate it into the ETC • Plan an entry and exit circuit for COVID-19 support staff • Requisition of buildings dedicated to HIV patients • Creation of an isolation room at the entrance to the hospital • Temporary closure of maternity • Reduction of certain services to make them isolated rooms • Creation of buffer zones for suspected cases • Transformation of the surgical service into ETC • Opening of an extra-hospital center
Reorganization of the work of professionals	<ul style="list-style-type: none"> • ETC staff meeting every Monday • Redeployment of nurses in the ETC • Planning an entry and exit circuit for staff dedicated to COVID-19 support • Creation of a team to disinfect ETC and caregivers • Division of work teams that reengage every two weeks to respect the fourteen days of incubation of the virus • Respect for physical distancing • Secondment of staff at ETC level • Training of <i>badienou golkh</i> (community godmothers) • Mandatory wearing of masks • Isolation of midwives • Specialist doctors' watch for suspicious cases • End of scheduled surgery • Volunteering system to support staff • Assignment and recruitment of public and private staff under the ETC

Communication and awareness-raising activities with the community

- Training of caregivers in the medical and psychosocial care of COVID-19 cases
- Training of district and regional teams on COVID-19 management and risk awareness
- Involvement of community actors and leaders
- Use of community radio
- Discussion and explanation with patients on COVID-19
- Awareness caravans, talks
- Communication on hospital provisions for the protection of patients in the context of the pandemic
- Raising awareness among people with chronic conditions to come to hospital care
- Involvement of community authorities and sports associations
- Conduct of home visits in collaboration with community and youth relays
- Choice of relays according to their community anchoring and profile
- Targeting of crowd sites
- Follow-up and care of all simple cases at home
- Filter at hospital entrance
- Intervention of the psychiatrist in the communities and families of the sick
- Mandatory wearing of mask, handwashing, and temperature intake at the entrance
- Discreet isolation of suspicious cases
- Control and limitation of patients and accompanying persons
- Using the hospital kitchen to prevent people from bringing food to the sick
- Creation of an entry and exit circuit for staff dedicated to COVID-19 support
- Creation of a team to disinfect ETC
- Filter at hospital entrance
- Regulation of the entry and exit of people
- Installation of an inlet sorting system with temperature intake
- Installation of handwashing kits
- Filling out a triage card at the hospital entrance by patients
- Respect for physical distancing
- Communication on hospital provisions for the protection of patients
- Establishment of a secure control system at the entrance to the hospital
- Mandatory wearing of mask, handwashing, and temperature intake in hospital
- Discreet isolation of suspicious cases
- Reduce accompanying persons and visits to patients

Management of patients

Managing the risk of infection

These strategies have impacted the organizational routines of PHF. Many of the strategies cited are similar to those found in other studies in several continents (Coulibaly et al. 2022; De Araujo Oliveira et al. 2022; European Observatory on Health Systems and Policies et al. 2021; Khalil, Mataria, & Ravaghi 2022) and countries' lessons learned (Dagenais et al. 2023). In general, there is an improvement in the capacity to care for patients, a reduction in infectious risks within health facilities (as seen in China (Stennett et al. 2022) and the Middle East (Khalil, Mataria, & Ravaghi 2022), an improvement in the organization of the work of caregivers, a commitment of the staff, and an essential solidarity between professionals. Nevertheless, stakeholders have also identified adverse impacts of strategies such as work overload, high fatigue and anxiety of health workers, poorer care of non-COVID-19 patients, challenges related to paying professional bonuses, and some politicization of the response to the pandemic. Indeed, research has shown how the resilience of health personnel is at the heart of that of health facilities (Gillie, Naamati-Schneider, & Pikkell 2022; Stennett et al. 2022). In neighboring Mali, research has shown that hospital managers did not consider the psychological problems faced by health care professionals in caring for patients during the pandemic (Coulibaly, Touré et al. 2023). These elements of the health system software still need to be considered in health reforms in West Africa. Moreover, the issues of power and ideas, at the heart of all public action (Béland 2010), remain insufficiently analyzed in the region. This chapter focuses on the operational reorganizations carried out within health facilities, as opposed to the software and power elements analyzed in another article concerning the design of public policy to fight against COVID-19 in Senegal (Ridde & Faye 2022b). From a political economy approach, the study shows the important role of power (internal and external) and external influences on the choice of content for actions to combat the pandemic. A recent study has shown the extent to which policy choices in Senegal regarding universal health coverage have been negatively influenced by donors (Ridde, Caffin, & Hane 2023). These issues were undoubtedly also present for the hospitals studied, and further in-depth analysis in this regard would be essential.

Finally, the resilience of hospitals can only be fully understood by studying the impacts of the strategies put in place on access to health care (Blanchet, Diaconu, & Witter 2020; Turenne et al. 2019). It is essential to consider the effects of these configurations on the five dimensions of supply in the access to care continuum: accessibility, acceptability, availability, affordability, and adequacy (Cu et al. 2021). Overall, like studies in Europe (Webb et al. 2022) and Mali (Coulibaly et al. 2022), we found that the impact of the epidemic on COVID-19 patients' access to care in the studied health facilities was perceived by the interviewees as relatively positive, particularly in terms of accessibility, affordability, and availability (table 10.2). On the other hand, it was more sensitive regarding acceptability, mainly due to the ban on family visits and the adequacy due to the lack of beds and equipment limiting the capacity to deal with severe COVID-19 patients. In the region, prohibiting extended family members from visiting patients is an insurmountable challenge, as they support the patient in their care journey within the hospital (Coulibaly, Chabrol et al. 2023; Schnitzler 2014;). Accessibility and continuity of care for COVID-19 patients have sometimes been difficult due to reduced reception capacities, home care challenges, and the mobilization of funds over time (e.g., nonpayment of bonuses for staff). For non-COVID-19 patients, the impact was perceived as more deleterious, as shown for family planning in Senegal (Fuseini et al. 2022), due to the closure or reduction of certain services, the ban on travel between

Table 10.2

Perceived impact on dimensions of access to care for hospital patients

Dimensions of access to care	Positive impact(s)	Negative impact(s)
Accessibility	Satisfactory accessibility for COVID-19 patients (1, 8)	Less satisfactory accessibility for non-COVID-19 patients (1, 6, 8) Restrictions on long-distance travel (1, 5) Insufficient reception capacity of certain structures in which the management of COVID-19 cases is often favored (2) Nonfunctionality of certain services (7) Lack of oxygenated beds that limits the capacity to deal with serious COVID-19 cases (2, 8)
Acceptability	Engagement of trained care and awareness-raising staff in COVID-19 Setting up communication and awareness-raising activities with communities (1, 4, 7) Trust between caregivers and caregivers (1) Free of charge for COVID-19 (3)	Denial of the disease by the population (1, 5) Fear of patients becoming infected in hospital (6) Stigma of hospitals (7) Prohibition or regulation of family visits that are poorly perceived and understood by patients and the community (1, 2, 5, 8)
Availability	Good functioning of the ETC and continuity of patient care through functional services and committed and available staff (2, 4, 6, 8) Increase in the number of beds available and acquisition of suitable equipment (2, 8)	Overload of caregivers (1, 7) Home care has a negative impact on the management of non-COVID-19 patients in the hospital due to the number of caregivers mobilized (4) Late compliance with its resource commitments by the Central Authority (4)
Financial accessibility	Free treatment of COVID-19 patients (2, 3, 4, 6, 8) and maintenance of the same rates for other care (4, 7)	Increasing difficulty of non-COVID-19 patients to pay for hospitalizations due to reduced activity and income (1) Treatment of patients who were not included in the budget (2)
Relevance	Creating isolation spaces that reassure patients (4)	—

regions reducing patient mobility, and the economic impacts of the crisis reducing the financial capacity of patients in a system where the user has to pay for care. All these restrictions at the national level have been relatively poorly perceived by Senegalese (Diallo et al. 2022).

Conclusion

The analysis shows that the eight PHF studied, ETC, and professionals mobilized in the regions have been able to cope with the COVID-19 pandemic, similar to the two departmental health insurances in Senegal (Mbow, Senghor, & Ridde 2020). These PHF demonstrated high absorption and adaptation capabilities with a final recovery and return to standard processes. In neighboring Mali, where the operating conditions of health facilities have been even more difficult due to the crisis context for several years, a study has also shown the ability of a university hospital to cope with the pandemic and maintain access to

care (Coulibaly et al. 2022). However, this study shows only some of the transformation, which can be explained by a long-standing lack of resources (Paul et al. 2020). Whether this was different after our data collection would be a question. In Senegal, the challenges related to the management of the COVID-19 crisis have been immense, and the effects of the pandemic are sometimes complicated to be managed by health structures and by the state as a whole (Ndiaye et al. 2021; Ridde & Faye 2022a). However, the system regained its previous situation in April 2021 at the time of our data collection, an organization with weaknesses (Paul et al. 2020) to which the 2020–2024 investment plan is expected to respond (MSAS 2020). It would be possible to return to *a-normality* (Gayer 2018) given the challenges faced by the Senegalese health system, as confirmed by the crisis concerning obstetric services in hospitals in early 2022.

Reflexivity Statement

This chapter is a summary of a global analysis implemented in Senegal and coordinated by Professor Adama Faye (MD, PhD, epidemiology), director of the Institut Santé et Développement (ISED) at the Université Cheikh Anta Diop de Dakar (UCAD), and Valéry Ridde (PhD, community health), director of public health research at the Institut de recherche pour le développement (IRD), based at the ISED from 2019 to 2023. Lola Traverson, a research engineer at the IRD, coordinated the HoSPiCOVID research project (<https://u-paris.fr/hospicovid/>), and the analysis method she developed has been applied, with her support, to the case of Senegal.

Additional Resources

- An edited book about this project and original chapters, in French and free of charge: <https://www.editionsscienceetbiencommun.org/hopitaux-et-sante-publique-face-a-la-pandemie-de-covid-19/>
- A special issue of the *Health Systems & Reforms*: <https://www.tandfonline.com/toc/khsr20/9/2>
- A website of our international research project on hospitals' resilience to the COVID-19 pandemic: <https://u-paris.fr/hospicovid/>

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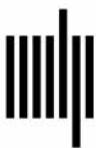
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