

The resilience of two departmental health insurance units during the COVID-19 pandemic in Senegal

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ABSTRACT

Background In its pursuit of solutions for universal health coverage (UHC), Senegal has set up two departmental health insurance units (UDAMs) since 2014. Few studies on the resilience of health systems in Africa have examined health insurance organisations. This article aims to understand how these two UDAMs have been resilient during the COVID-19 pandemic and the restrictive measures imposed by the State to maintain services to their members and reimbursements to healthcare providers.

Methods This study was a multicase study with multiple levels of analysis using a conceptual framework of resilience and analysis of organisational configurations. Empirical data are derived from document analysis, observations for 6 months and 17 qualitative in-depth interviews.

Results The results identified three main configurations concerning (1) safety and hygiene, (2) organisation and planning and (3) communication for sustainable payment. The UDAM faced the pandemic with resilience processes to absorb the shock and maintain service to their members. The UDAM learnt positive lessons from crisis management, such as remote work or the ability to support members in their care in hospitals away from their headquarters. They have innovated (transformative resilience) with the organisation of electronic payment and the use of social networks to raise funds and communicate with members. Strengthening their effectiveness after the shock of the departure of the donors in 2017 contributed to the adaptation and even transformation from the pandemic shock of 2020 and 2021. The study shows that leadership, team dynamics and adaptation to contexts are drivers of resilience processes.

Conclusion Both UDAMs adapted to the shocks of the pandemic and government measures to maintain the services of their members and their organisational routine. This resilience confirms that UDAMs are one of the possible solutions for UHC in the Sahel.

INTRODUCTION

In the Sahel region, as elsewhere, health systems endured the COVID-19 pandemic in 2020 and 2021. Due to their fragility, many were concerned about how African

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Achieving universal health coverage (UHC) requires strengthening the supply of care and demand, especially with insurance schemes.

WHAT THIS STUDY ADDS

⇒ Good leadership and anchoring in the local context promotes the deployment of local resilience strategies of two departmental health insurance units in Senegal.
⇒ Innovative use of digital technology has been key to resilience, including in rural and remote context.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Supporting the development of leadership and departmental professionalised community-based health insurance (CBHI) for UHC.
⇒ Organise operational research to mobilise the digitalisation of departmental professionalised CBHI in Africa.

health systems would be able to cope with a pandemic whose magnitude and risks were unknown.¹ The different prevalence studies of SARS-CoV-2 in Africa show that the virus circulated widely.² The Africa Centres for Disease Control and Prevention predicted that the continent's health systems were well prepared.³ In most contexts, it seemed that once the first wave of pandemic and the first drastic public health measures passed, the use of care and the functioning of health facilities returned to normal.^{4 5} This was the case for family planning in Senegal.⁶

Organisational routines and health systems were disrupted by COVID-19. After the emergency, health systems regained their habits—normality or abnormality⁷—when considering their low performance and daily challenges. We are here at the heart of the contemporary debate on the resilience of health systems and health insurance organisations, their ability to cope, adapt and even transform in the face

of a shock,^{8 9} such as the Ebola outbreak in Guinea in 2014,¹⁰ a terrorist attack in Burkina Faso in 2016¹¹ and the COVID-19 pandemic in the Sahel.¹ In this article, there will be less reference to resilience to the many daily challenges faced by health systems in Africa^{12 13} than to a high-intensity shock with significant anticipated consequences¹⁴ caused by the pandemic. Moreover, this paper is less concerned with the resilience of the health system itself (which is not often concerned with the demand side) than with the resilience of the health insurance organisations.

At the global and African level, several studies have been carried out to understand the resilience of health systems and in the context of the COVID-19 pandemic,^{8 15} including in the Sahel.^{4 5} However, access to care concerns not only supply but also demand for care.¹⁶ Some studies have shown that the demand for care has been reduced in the context of the COVID-19 pandemic.^{17–19} Few studies have attempted to understand the resilience of demand structures such as health insurance schemes.

In the Sahel, community-based health insurance (CBHI) has been one of the political choices to move toward universal health coverage (UHC).²⁰ It sometimes serves as a counterpower to the provision of care, as in Benin or Senegal.^{21 22} But unlike in Rwanda, where membership is mandatory,²³ the voluntary nature of membership makes this solution limited in the Sahel.²⁴ At best, coverage rates in Sahel countries remain below 10% of the population. Thus, several Sahel countries, including Mali and Senegal, have designed subsidy policies at 50% of the membership fees to increase the coverage.²⁵ In addition, the management of CBHIs remains devolved to volunteers who do not have sufficient availability and skills to make them perform.²⁶ Senegal thus innovated in 2014 in two departments by abolishing and merging the communal CBHIs to create a single departmental health insurance unit (UDAM) (see [box 1](#)). While membership remains voluntary, several innovations, described in detail elsewhere,²⁷ have been introduced to make these UDAMs more efficient: the professionalisation of management through the recruitment of qualified personnel, portability facilitated by individual cards, flat-rate premium fees, community mobilisations, etc.

At the time of the COVID-19 pandemic in Senegal in early 2020, these UDAMs cover more than 50% of their target population,²² while the latest national survey of 2019 shows that communal CBHI covers only 4.5% of the country's population.²⁸ Despite the termination in 2017 of the funding that supported their implementation,²⁹ the UDAM is a success for UHC in the Sahel in terms of coverage. However, while the State has decreed restrictive measures to combat the pandemic and protect the health system,³⁰ how did these two UDAMs cope with this situation? This research aims to understand the resilience of two UDAMs serving nearly 230 000 people in Senegal in the face of the COVID-19 pandemic in 2020 and 2021.

Box 1 Summary of the functioning of departmental health insurance units (UDAMs) in Senegal

Residents living in the two departments can join the UDAM by paying a membership fee of 1000 francs per household and an annual subscription of 2500 francs per year per person (1€=655 francs). At least five people in a household must subscribe to receive a UDAM card. Preferential rates and modulated contributions (annual, half-yearly and quarterly) according to the number of dependents are offered to encourage people to enrol all members of their households. The State subsidises an additional 3500 CFA francs for contributors and fully subsidises the contributions of beneficiaries of the family security grant (indigent) and the equal opportunities card (disabled): membership fee (1000 francs), annual contribution (7000 francs) and copayment (2000 francs). When UDAM members need care, they can use their individual membership card to go to public health facilities in the department and to affiliated private pharmacies. At primary healthcare centres, UDAM beneficiaries pay a copayment of 500 francs for a consultation based on a global rate of 2000 francs and 1000 francs for childbirth, emergency care and observation for a global rate of 5000 francs. In district hospitals, UDAM beneficiaries pay a copayment ranging from 500 francs (physician's consultation rate of 10 000 francs) to 5000 francs (major surgery rate of 110 000 francs). People who have not joined the UDAMs pay 2000 francs and 5000 francs for the same consultations at the primary healthcare centres and 10 000 francs to 110 000 francs at the district hospitals. Expenses for essential drugs at regional hospitals are reimbursed by the UDAMs at the rate of 80%. In the event of stockouts of essential generic drugs in public health facilities, UDAM beneficiaries are reimbursed for 50% of purchases in private pharmacies.

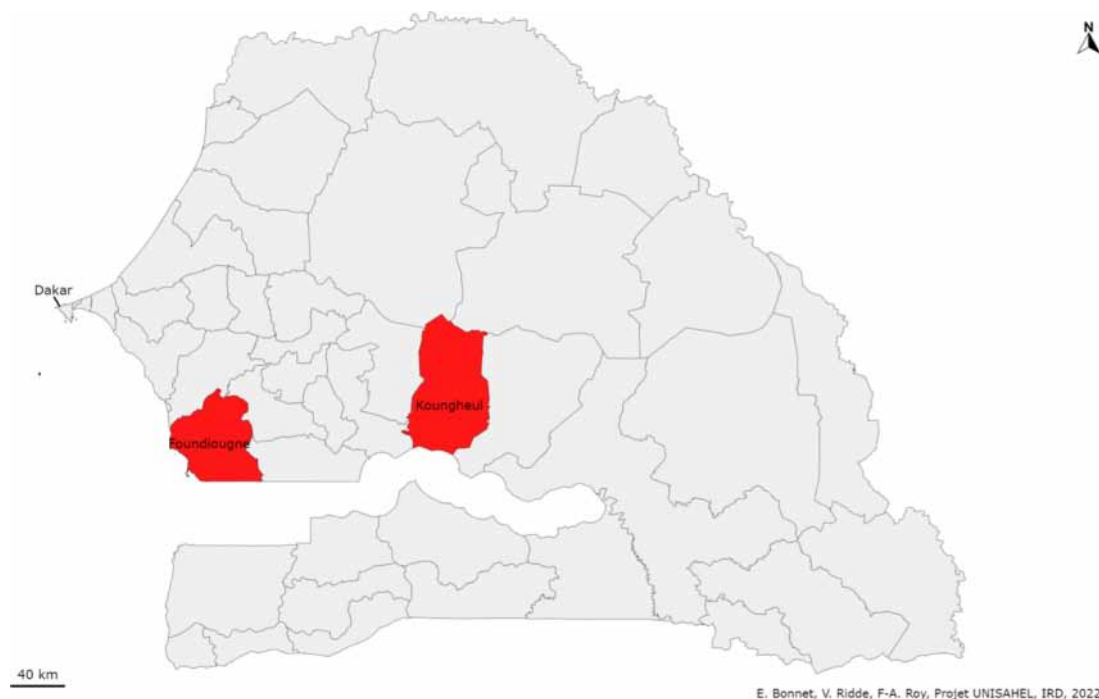
METHODS

Study setting

Senegal saw the first COVID-19 case diagnosed on 2 March 2020. On 14 March 2020, the government closed places of worship and implemented a series of increasingly restrictive measures: curfew, a ban on movement between regions, closure of schools and markets, etc. At the end of June 2020, most of these measures were suspended, and the population resumed a near-normal life. Thus, for 4 months, the entire health system and the UDAM were disrupted by the pandemic and State measures. Between 2020 and the end of 2021, Senegal experienced three epidemic waves of SARS-CoV-2, with a maximum (reported) cases on 18 July 2021 (n=1722).

The UDAM departments are located East of Dakar's capital ([figure 1](#)). Their essential characteristics are presented in [table 1](#). The functioning of the UDAMs is detailed elsewhere²⁷ but we summarise how it works in [box 1](#).

Given this mode of operation, we could postulate that the COVID-19 pandemic would disrupt the operation of the UDAMs and, in particular, the collection of premiums in the villages, social marketing activities for memberships, the travel of members to the headquarters for administrative acts, the sending of requests for reimbursements by the health facilities, the capacity to carry out these reimbursements, etc. Moreover, several UDAM



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Figure 1 Location of departmental health insurance units in Senegal.

employees were affected by SARS-CoV-2 and some were on sick leave for several days.

Despite these challenges, the pandemic and the government measures imposed at the national level, the evolution of two key indicators of UDAM functioning shows

the persistence of near-normal functioning (figure 2). The number of new contributory beneficiaries and the amounts of bills reimbursed to care providers have not significantly changed. They remained at a relatively constant level during the study period. While the article does not address the resilience of health facilities and their capacity to continue to provide healthcare to the population, the indicator of the evolution of the amounts reimbursed by the UDAMs to the latter show that this has been the case. We can, therefore, postulate that the two UDAMs were resilient. The purpose of this article is to understand how this was possible.

Conceptual approach and study design

The conceptual approach of this research is part of our analysis of the concept of resilience in health systems⁹ and the analytical framework applied in several countries.³¹ In our study, resilience means UDAM's ability to cope with pandemic shocks, absorb, adapt and/or transform to maintain and improve access for its members to comprehensive, relevant and quality health and insurance services. We sought to report empirically (1) the context of the pandemic as perceived by the people concerned, (2) its effects on individuals and on UDAM's organisational routines, (3) the strategies deployed to deal with it (including the ability to learn from the experience of shocks) and (4) the consequences (positive or negative) of these strategies for their functioning. This is what we have named configurations, drawing on the use of this concept by the sociologists of organisations³² or evaluation.³³ Configuration is a coherent set of different 'forms and interconnected elements'³³ or 'natural cluster'.³² In this paper, we conceptually defined the configuration around the resilience analysis framework.³¹

Table 1 Characteristics of the two UDAMs in 2020

Characteristics	Kounghoul	Foundiougne
Type of economy	Agriculture, trade, livestock	Agriculture, fisheries, trade, tourism, livestock
Number of villages	425	357
Number of municipalities	9	17
Number of inhabitants	210 124	364 800
Primary health posts contracted	30	52
Number of health centres (hospitals) contracted	1	4 of which 1 secondary
Number of regional hospitals agreed	2	2
Number of UDAM members	14 135	15 800
Number of UDAM beneficiaries	103 252	129 984
Total benefits paid (CFA francs)	145 395 482	270 644 775
Penetration rate	49%	58%
UDAM, departmental health insurance unit.		

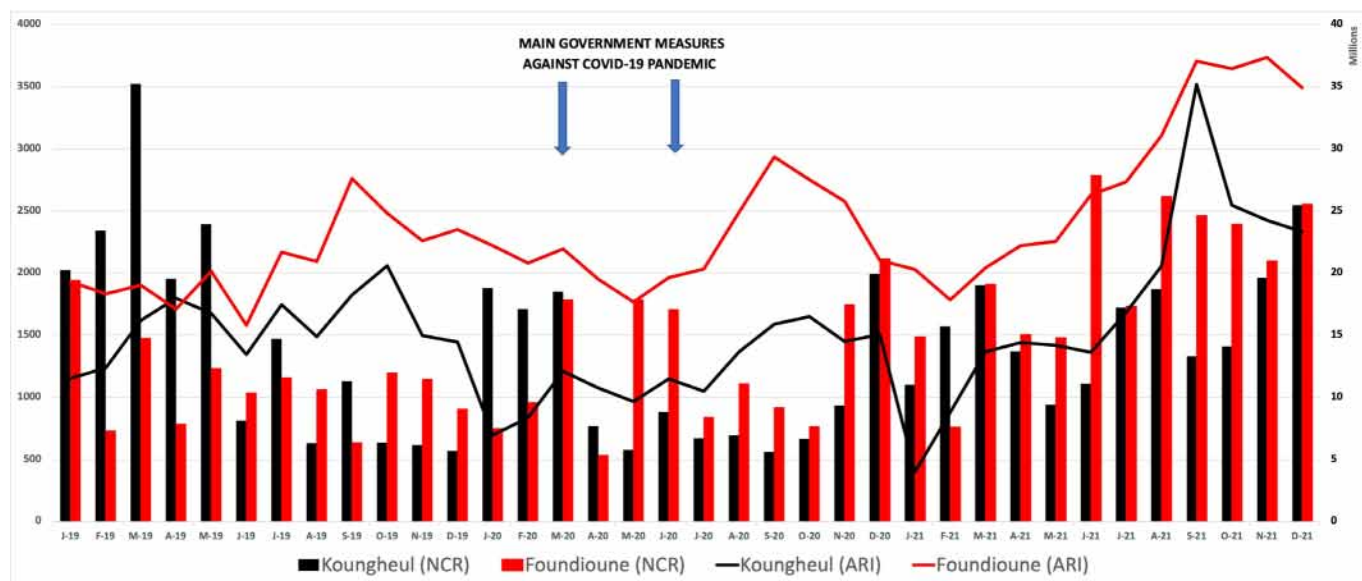


Figure 2 Two critical indicators of UDAM functioning from 2019 to 2021. New Contributory Recipients (NCR): members and their entitled persons who paid their contributions per month (left axis, by number). Amounts of refunded invoices (ARI): payments made to healthcare providers for reimbursement of UDAM members' deeds (right axis, CFA francs million). Kougheul (black), Foundioune (red).

The methodological strategy we used was a multicase study with several levels of analysis.³⁴ The cases are the only two UDAMs existing in Senegal at the time of the study. The levels of analysis correspond to the conceptual dimensions of the resilience configurations. The analysis is based on an empirical and retrospective qualitative research approach through documentation review, individual interviews and field observations conducted between May and November 2021 (ie, around the third epidemic wave). After an exploratory and reflexive analysis at the beginning of the pandemic,²² we wanted in-depth empirical data to understand better resilience from the perspectives of a diverse group of stakeholders.

Sampling and data sources

We carried out qualitative in-depth interviews with a sample of persons selected based on their in-depth knowledge of the functioning of the UDAM and identified in advance through the exploratory study.²² A total of 17 people (11 men and 6 women) were interviewed in the two UDAMs (11 in Kougheul and 6 in Foundioune), including four care providers and 8 UDAM administrative staff, 3 board members and 2 beneficiaries. BK and VR made the observations at the offices of the two UDAMs headed by NBM and IS. The interviews were conducted by BK mainly in French (often with a mixture of Wolof and two exclusively in Wolof) using an interview guide containing the conceptual dimensions of the analytical framework, validated by the research team. The authors' reflexivity statement has been added as an online supplemental appendix.

Analysis

As often in qualitative approaches, analyses started parallel with data collection. First, regular meetings

were held between team members, including in the field, to ensure understanding of the conceptual framework and the quality of empirical data. Each dimension of the conceptual framework was explained based on empirical examples and exploratory configurations were made directly in the field during collective discussions between the authors of the article. Then, all interviews were fully transcribed in French. Finally, all empirical data have been analysed manually using a thematic analysis approach to the dimensions of the conceptual framework.³⁵ The configuration was the primary analytical tool to report relevant organisational dimensions on the elements mobilised by UDAM to continue providing services to its members. The exploratory configurations discussed in the field were thus improved and refined during this analytical process. A detailed analytical report was prepared and validated. It served as the basis for the drafting of this article.

RESULTS

As the exploratory analysis showed,²² there are few observed differences in response to the pandemic between the two UDAMs, even if they have not coordinated to deploy their strategies. Since they were established together and followed by the same project, their functions and roles are similar. While the social and health contexts are somewhat different, similar responses to the pandemic are understandable.

In the face of the pandemic, empirical results show that UDAM implemented strategies in three specific areas, which are configurations: (1) safety and hygiene, (2) organisation and planning and (3) communication for the maintenance of payments. We describe the

Safety and hygiene

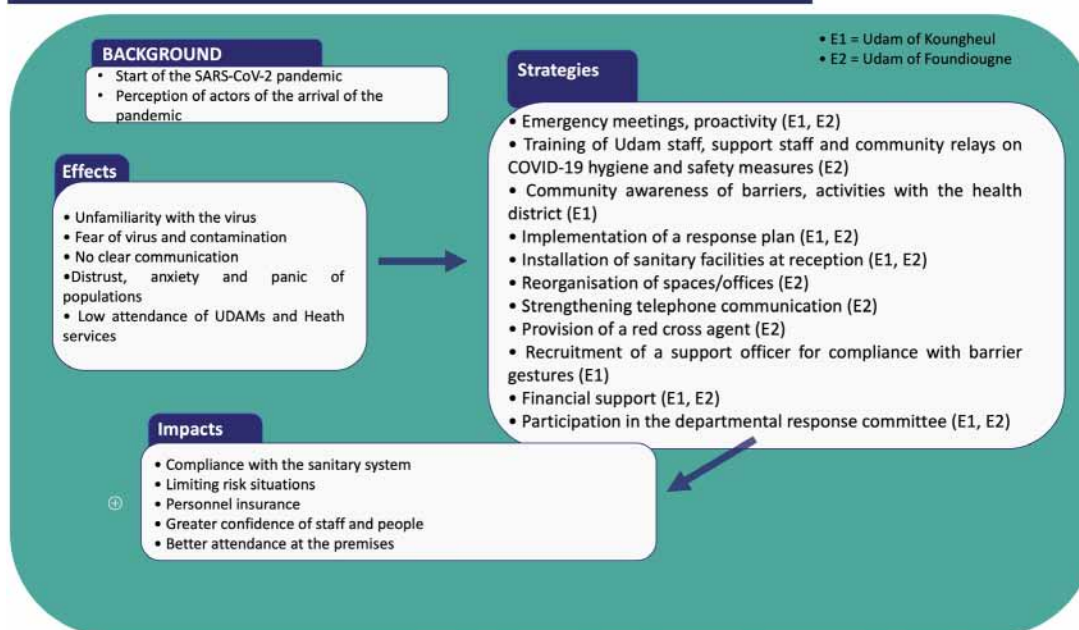


Figure 3 Personal safety and hygiene configuration.

four dimensions of each of these three configurations (figures 3–5), which concern the two UDAMs overall.

Personal safety and hygiene

The context of the pandemic's arrival is characterised by some anxiety among UDAM populations and implementors "The covid came as a surprise... in the beginning, it had created a panic, especially the first cases" (UDAM assistant manager). This feeling was amplified by the lack of knowledge of this new virus, the drastic measures organised by the State and the anxiogenic

vision of the information. This seemed more present at the Koungheul UDAM, where the headquarters is adjacent to the hospital, and 'people were thinking about health facilities because of being risky spaces', remembers the director. However, health facilities remained underused in a context where they were perceived as vectors of the new coronavirus. This context caused fear, shock and anxiety in the people we met. They feared, in particular, contamination but also stigmatisation.

Organisation and planning

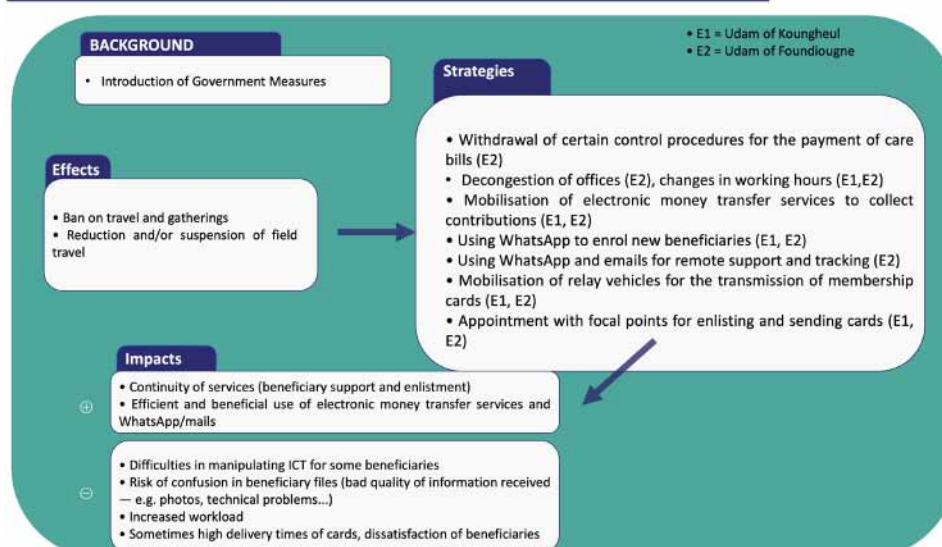


Figure 4 Organisation and planning configuration.

Communication for the maintenance of payments

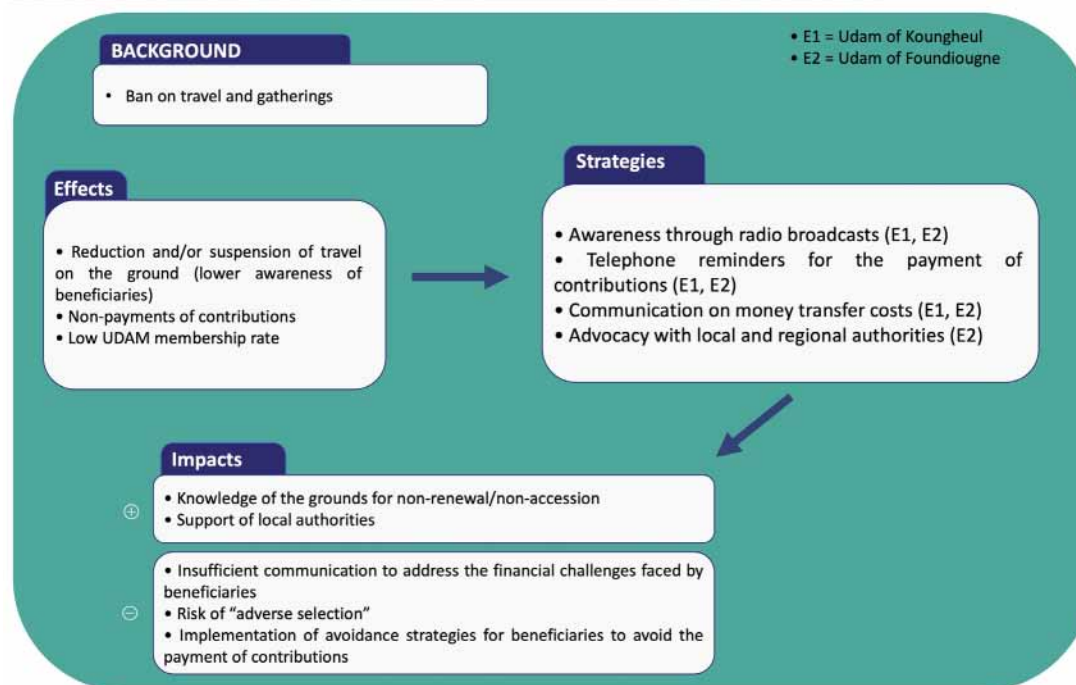


Figure 5 The communication configuration.

To deal with this situation, different strategies have been deployed by the two UDAMs. These strategies are multifaceted and concern the organisation of work, the recruitment of dedicated staff and participation in the response.

The risk of contamination was taken seriously by the UDAM. For example, they provided information and protocol for members who had to come into the offices for reimbursement of care payments or letters of reference to continue their treatment journey. Thus, from the beginning of the pandemic, the UDAM organised an emergency meeting to decide on the strategies to be deployed, including how to ensure the permanence of the barrier gestures in the context of public reception. The leadership and responsiveness of the two directors were commended for these quick actions to maintain continuity of services and not having to close the office. At their initiative, UDAM staff were trained in Foundiougne, including support staff. In Kounghoul, an assistant accountant of the UDAM remembers, "When we got the news of the first case in Dakar, we took action. An emergency meeting was called by the director to take action. First of all, the Director gave instructions to wear masks and wash hands. We really reorganized our operations. Then, he recruited an agent to support the vigil to ensure that the barrier measures are respected".

A collaboration with medical district officer allowed "small training and guidance on what Covid is, and this allowed them to understand better and know what behaviour should be adopted," said the manager. In Kounghoul, the UDAM team participated in awareness-raising

activities organised by the health district team "to sensitize our parents in the houses in the neighbourhoods and practically, if I am not mistaken, we did more than ten days to 15 days". The UDAM even took part financially (1.5 million in Kounghoul, 550 000 in Foundiougne) in the departmental committee to manage the COVID-19 pandemic. The directors were among the members targeted by the administrative authorities to participate in this committee, showing their social commitment beyond their functioning.

In addition, the UDAM also rapidly deployed human and material resources to ensure continuity of services in an epidemic context: hand washing stations, temperature taking, mask requirements, etc. Red Cross volunteers at the headquarters of the Foundiougne UDAM supported these activities. Redevelopment of the premises and distribution of staff in the rooms took place at the Foundiougne UDAM to reduce the density: "there was this internal rearrangement, which earned us all these results," remembers an accountant.

The stakeholders believe that these strategies allowed the continuity of UDAM services to their members while limiting the risk of the spread of SARS-CoV-2. Staff involvement and appropriate actions contribute to this explanation of this positive vision:

If we continued our activities, it was thanks to all the staff's assurance. It is true that at first people were afraid, but they had to realize that the service was not a place at risk because the sick go here before going to reference structures" (a collector UDAM Foundiougne)

Thus, both UDAMs demonstrated an absorptive process of resilience (continued to provide the same insurance services through minor adjustments) where the safety of their members and staff had to be ensured.

Organisation and planning

Figure 4 provides a comprehensive and more detailed view of the configuration mobilised in the area of organisation and planning.

Beyond the issues of fear and ignorance about the virus, the UDAM dealt with very restrictive government measures such as the ban on the movement and gatherings of people or the closure of markets.

These measures severely limited the routine activities of UDAM, especially all field activities in villages, which raised awareness of the importance of health insurance and collecting contributions. Collectors and mutual promotion agents remember this in both UDAM: 'It was really a total slowdown'. It even affected checking and validating invoices in health posts carried out by the Foundiougne UDAM. Koungheul, on the other hand, controls invoices directly at its headquarters.

Different strategies have been deployed by the two UDAMs. To not penalise health facilities and given their importance in their budgets, the Foundiougne UDAM decided to pay the bills for care services without its usual control procedures during the period of State restrictive measures. It was a vital risk taking. It was necessary to find solutions to maintain the services, and an administrative assistant from Foundiougne remembers that "We have heard of services where staff were reduced, as well as services that were closed down, but in this case, the director really took the matter in hand. She dared and, as they say, he who dares really wins".

To cope with the absence of travel and reduce the risk of viral transmission, the two UDAMs mobilised electronic money transfer services "there were many of them sending their dues via e-money. All this has made that we were able to keep the course about this pandemic" remembers an accountant. This was a significant break from the past because this payment method was not permitted and favoured before the pandemic unless informal arrangements were made. In addition, the WhatsApp network, which is widely used in Senegal on a confidential basis, was used to keep in touch with UDAM members and encourage their membership. Sending membership files through this media made it possible to maintain contact with remote people and limit risks at a time when the virus's transmission modes are not yet well known.

With the new technologies, just use WhatsApp, photograph all those people we'd like to enlist and send it to the collector; you know? So he has their photos and filiations and fills in the membership form. From the membership form, enrolment is made" (Administrative Assistant, UDAM Foundiougne)

WhatsApp was used to send support letters to Foundiougne UDAM members living in remote villages and to present such a document to get to a regional reference structure. The hospital would also receive this letter by email for confirmation. However, although innovative, these technological means were not within everyone's reach, and some members continued to go to UDAM headquarters to file their files. The Koungheul UDAM did not use this strategy because it considered the use of WhatsApp to pose ethical challenges. Also, its headquarters is adjacent to the district hospital, thus simplifying administrative procedures. Since the members could not travel to receive their cards once they had been manufactured, the UDAM used relays for their transport, such as ambulances, tank trucks or collective buses, and individuals whose movements they knew. The ban on activity was imposed between regions and urban centres, but not between villages in the same area. In addition, since the villages had a UDAM focal point, the maps were sent together to that person who could distribute them throughout the village.

The main benefits of these strategies are that they ensured the continuity of the collection of contributions and thus the enrolment of members in this pandemic period. However, using electronic file transmission may have created additional work for managers because of the need to control data quality and identity of photos, technical problems, etc. The delivery times of cards have sometimes increased, causing dissatisfaction.

In addition, most of these measures were consistent with government decisions that sought to reduce contact and gatherings between people, thinking of limiting contamination at a time when our knowledge of the spread of the virus was limited.

The UDAMs were able to mobilise an adaptive (changed their administrative processes to enable continued service delivery) and transformative (restructuring the ways of UDAM working: digital payments) resilience process to better organise and plan in the context of a pandemic.

Communication for the maintenance of payments

Figure 5 provides a comprehensive and more detailed view of the configuration mobilised in the field of communication.

The context of the pandemic reduced population displacement and possible clustering, particularly in villages. This posed challenges for those within the UDAM to raise awareness about membership and collect insurance premiums. The local social fabric also changed during this period when the spread of the virus and its modes of contamination were perceived very differently among people, between denial and apprehension.

The effects of this context were seen in the light of the apprehension of the pandemic, the belief in its

reality and the acceptance of the draconian measures imposed by the State, the consequences of which were also on the economic means of households (ie, the closure of local markets). Thus, the renewal (see payment) of contributions may have been an important problem for some households that are more economically affected than others. An accountant explains that “their economic activity has decreased considerably and this has had an impact on the contributions they had to renew so on, that must be emphasized”.

To address these challenges, UDAM implemented a series of communication activities. These included information on the pandemic so that UDAM could participate in the national response and maintain membership. As visits to villages and homes were banned or very limited, the UDAM mobilised community radio stations to spread messages about the continued operation of the insurance. In addition, the telephone was used to collect fees: “We always use phone calls to encourage people to pay contributions. Some make promises to pay in a short time, but others talk about their inability to renew, and they cannot be forced”. These calls were used to ask members not to travel or to use electronic payment forms. It was necessary to explain that UDAM could not bear the costs of transferring these payments but that if users paid them, it remained a saving compared with the cost of their travel. Finally, a plea was made to the local and regional authorities to obtain their financial support for the accession of certain difficult members during this period. While some communities have always supported UDAM by paying membership fees, their support has sometimes improved during this period, with the Foundiougne UDAM director citing the example of support from two town halls in particular. In Kounghoul, a plea was made for 150 villages to receive seeds to organise collective fields whose products were sold to finance contributions.

Interviewees believe these strategies have mixed consequences and that communication cannot address the financial challenges posed by State measures to households. Thus, the leaders of the Foundiougne UDAM perceived that the members, in this context and despite the communication strategies, may have selected the persons to whom they have decided to renew contributions. Local experts refer to an ‘adverse selection’ that will undoubtedly need to be studied with quantitative analyses. However, they seem to have taken it seriously as this can impact UDAM’s financial stability.

One could see someone with ten beneficiaries and renews the cards for five people. There, he can give an argument to justify the inability to continue because of the pandemic, but I was always asking staff to investigate to see the truth of what that person says.

This configuration shows the deployment of a process not only of adaptive resilience but also of transformation

(restructuring the ways of UDAM working to enable continued service delivery), in particular through digitalised payment, the sustainability of which will need to be studied.

DISCUSSION

As with the health services in Senegal, UDAM’s activities were reduced at the beginning of the pandemic and by the government measures imposed to curb its effects.³⁶ Through innovative responses, the UDAM could absorb the shock and maintain services to their members, continue reimbursements to their care providers (figure 2) and even contribute to the fight against the pandemic. From the three empirical configurations, we can understand how the UDAM was resilient to the shock caused by the COVID-19 pandemic. In several areas, they were able to anticipate and take risks. They immediately responded to the pandemic and the need to adapt their actions. Positive lessons have been learnt from this pandemic management. For example, remote work and the ability to support UDAM members in their care journey in hospitals away from their headquarters. The same applies to electronic payment or the use of social networks to raise funds and communicate with members. Indeed, some strategies deployed to address the pandemic in 2020 were maintained in 2022 and are part of organisational routines. The digitalisation of UDAM’s functioning thus forms part of a global³⁷ and national movement³⁸ because when we call for resilience, “we have to cultivate transformative capabilities to succeed in the long run”.¹⁴

If we refer to the processes of resilience,⁸ we are therefore faced with a triple concomitant process which varies according to the activities and configurations concerned not only absorption (security and hygiene), adaptation (communication) but also transformation (electronic communication, digital payment). Thus, we can propose that pandemic resilience strategies potentially have a transformative impact in addition to adaptation and absorption. It should also be noted that the UDAMs have shown an ability to learn from the experience when the international technical and financial partner ceased support in 2017 to be better prepared for the arrival of future shocks, a quality of a learning and resilient organisation.¹³

The following discussion allows for further reflection on the main drivers of these resilience processes in UDAMs: the leadership of managers and the dynamics of teams, the adaptation of the strategies deployed to local contexts and the innovation of digital payment.

As with public policy styles,³⁹ the leadership of health organisation leaders helps explain their capacities and resilience strategy in the face of a significant event such as the COVID-19 pandemic and State-imposed restrictive measures. Leadership is one of the resilience capacities of health organisations^{13 40} and a daily strategy

for resilience in Kenya and South Africa.^{12 41} The classic dichotomy between transactional (exchange) and transformative leadership⁴² seems to the advantage of the latter in this study since UDAM officials (a woman and a man, authors of this article) have been able to introduce changes through strategies that we have uncovered, from ‘discontinuity and changes in style’.³⁹ The individual characteristics of these people and the length of their presence and team management contribute to the leadership that fostered innovation and resilience. This research, together with our knowledge of the field and our recent analysis of the factors favourable to the sustainability of UDAMs, suggests that our hypothesis of the role of leadership is well grounded. Indeed, the human and social leadership skills of UDAM managers and the dynamism of their team have been identified as important factors in their sustainability in a recent study.²⁹ Indeed, they have been in the leadership since 2014, when a development cooperation project started to create UDAM and ended in 2017.²⁷ Since the start of the project, they have demonstrated innovation and have managed to develop their insurance offerings and membership to become a model for the country and the region.²⁵ In addition to the institutional constraints linked to their relationship with State guardianship, they have been able to create a climate of trust and teamwork, as our many field observations confirm. A climate of trust and teamwork is theoretically⁴² and empirically conducive to innovation in health systems, especially in Africa,⁴³ and therefore innovative and adaptive strategies for resilience. Governance capacities are at the heart of the resilience of health systems, as a recent systematic review for Africa shows.⁴⁴

Our research was part of studying the resilience of health organisations in Africa.^{8 31} In a subsequent study, it would be interesting to be part of the contemporary research development into the innovation climate in such a health organisation. The thematic dimensions proposed following Newman’s review and his colleagues⁴² could inspire us: creative and committed team, transformational and ethical leadership, quality of communication, etc. It would also be interesting to consider the different theories they suggest to understand the observed innovation climate better. Similarly, studies on teamwork are scarce in health systems in Africa and could be convened to understand resilience. An innovation-friendly team environment includes supporting colleagues’ efforts to introduce new and better ways of acting and operating for the benefit of the organisation.⁴⁵ This evidence of leadership, adaptation and resilience at the outset of the development project has been tested by the pandemic, which needed to find new strategies. The survival of these two organisations, and their employees, was also the case since more than 60% of the UDAM budget came from the membership that had to be maintained in a challenging pandemic context. Moreover,

the fact that UDAM is not financially dependent on the State, unlike CBHI,⁴⁶ and thus reliant on public management dysfunctions reinforces their employees’ involvement. Indeed, the risks of this dependency are high. In 2018, only 56% of the bills for consultation provided free of charge to children under the age of 5 under the national free policy were reimbursed by the State.⁴⁶ Thus, the individual motivation of UDAM officials was great to find solutions in a context of job insecurity in Senegal, beyond teamwork and in favour of the organisation.

Local anchoring and adaptation to local contexts are undoubtedly one of the strengths of the results of this study, as suggested by public health research and development innovation research.⁴⁷ Our study shows how the UDAM has been able, unlike the State that has implemented the same actions across the country,³⁶ to find innovative solutions adapted to the local specificities they know. UDAM’s officials and management teams have been in office for several years. In addition, they have long relied on village focal points and insurance premium collectors at highly decentralised levels that perfectly master the codes of conduct, local cultures and the resources and the needs of social groups and members in the regions. They are, therefore, familiar with the challenges and local cultures to know that action is potentially adapted to respond to a crisis. The role of local community anchoring strategies has been highlighted in West Africa’s Ebola resilience.⁴⁸ Adaptation is an essential element of the acceptability of public health actions, as shown in other research in Senegal.³⁶ Moreover, it is essential to have the competence to adapt to context and environment because “team member adaptivity reflects the level of flexibility and proactivity related to change and is an indicator of performance during times of change”.⁴⁹

Like dozens of e-health initiatives in Senegal, over the past few years, the UDAM has been trying to embark on digitalisation (member management, medical records and reimbursements to health centres). But they face many technical and interoperability challenges with the national system being set up (SigicMU) by the National Agency for Universal Health Coverage (ANCMU). Despite this, the UDAM has innovated during this pandemic by digitalising part of membership and payment of contributions, which became a routine in 2022. Few African countries attempt to digitalise insurance premiums such as Kenya⁵⁰ or Ghana.⁵¹ Digitalisation is not a strategy often noted in actions aimed at the resilience of health systems in Africa.⁴⁴ Not only has this made it possible to adapt to the restrictive measures of the State in times of pandemic^{1 36} but also to the needs of users, since in a recent survey (unpublished), we noted that the main reason for travel (45%) of UDAM headquarters members was for the renewal of their cards. The digitalisation and use of mobile phones are undoubtedly elements of the future health reforms in Africa.^{37 52} Still, it will not be a ‘panacea’³⁸ as an analysis of the Senegalese system has

just explained it. Currently, only 10% of payments are digitised in Senegal and only 7% of companies' wages. These figures show the project's scale to be mobilised and its potential. An ANCMU manager is optimistic and estimates that 'ACMU's monetic platform will generate more than 6 billion CFA francs/year'.⁵³ While Senegal has a national 'Digital Senegal 2025' strategy and a strategic digital health sector plan 2018–2023, its implementation is still ongoing. The ANCMU is trying to develop the digitisation of payments through a mobile application for insured persons (SAMACMU), a biometric identification system (Sibio) and a monetic subscription processing centre (SUNUCMU). The experience of both UDAMs in the context of a pandemic will undoubtedly be helpful to consider. The nine recent principles of the United Nations for 'responsible digital payments' (<https://responsiblepayments.org>) will be considered in this future development in Senegal.

We believe that the results can contribute to current thinking on UHC policies. First, they show that UDAMs were able to cope with a major shock such as a pandemic. In the absence of comparison with small CBHI whose limitations are well known,²⁰ we postulate that their professionalisation and wide scale and coverage confirm that they are a relevant option for UHC in Sahel, which does not lack shocks. Second, while leadership is not a new characteristic for the performance of health systems, the study confirms the need to build on this skill. Training, support and coaching for health leaders are urgently needed, especially in difficult contexts such as the Sahel. Finally, although health institutions in French-speaking West Africa have not yet taken up digital payment, the study shows the need to develop this strategy in the region for the UHC.

This research has some limitations to be noted. Methodologically, there may be a risk of memory bias and social desirability as we have chosen a nested research approach to strengthen the relevance of the results as recommended in the study of health systems and their resilience.⁸ Having carried out an exploratory analysis²² and then a long immersion in a field where we have been involved for several years reduces these biases and strengthens the results' credibility. In addition, we followed Biddle *et al*'s⁵⁴ advice from their review of health system resilience studies by explaining the conceptual framework for our research.

CONCLUSIONS

Our research in Senegal is part of the development of evidence for the resilience of health systems demanded by Saulnier *et al* "There is potential to learn by documenting local experiences to different risks and their effects on health and other systems, which can reduce traditional biases around contextual factors like managerial skills and power".⁸ Indeed, we tried to innovate by studying not the supply side of health systems but two organisations that structure the demand for care,

departmental insurance. While we have uncovered the role of leadership and management, confirming a great deal of research on the subject, we have also shown how the pandemic has been an opportunity to strengthen digitalisation, even in remote and rural areas. Few studies have yet examined the role of innovations in the resilience of health systems,⁵⁵ while we know that 'resilient organisations support creativity and innovation'.¹³ As we have seen, it is not about thinking that resilience promotes the status quo but rather innovation and transformation. Thus, our research suggests that the UDAM was resilient because it was able to 'succeed under varying conditions'¹⁴: first, when its international technical and financial partner ceased support in 2017 (as a planned intervention),²⁹ and then in 2020 and 2021 at the time of the COVID-19 pandemic and its restrictive measures in Senegal (as an adverse event).²²

Patient and public involvement

Our study did not involve the enrolment of patients.

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Contributors All authors defined the research questions and the corresponding study design. BK and VR acquired data and prepared them for analysis. NBM and IS provided the departmental health insurance unit data for figure 2. VR, BK and AF defined the analytical strategy. BK and VR carried out the analysis with support from all authors. All authors contributed to the interpretation of the findings. VR drafted the manuscript with support from all authors. All authors read and approved the final manuscript. VR is acting as guarantor.

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