Conditions for health system resilience in the response to the Covid-19 pandemic in Mauritania

Additional file 1 - Information sheet and consent for interview

Mauritania, through the Health Sector Support Programme (PASS), receives funding from the European Union. The PASS is part of the sectoral strategy of the Ministry of Health and the monitoring strategy of the National Health Development Plan (PNDS). The AI-PASS (Appui Institutionnel au PASS) programme has the same objectives: to promote equitable access to quality healthcare.

To implement the AI-PASS programme, institutional support at central level is complemented by support to the operational level. In partnership with Enabel, the Equity and Health Systems Unit of the Public Health Department of the Institute of Tropical Medicine (ITM) is providing scientific support. Two Moughataas (districts) were mobilised as learning districts: Bababé, a rural area on the banks of the Senegal River, and Dar Naim, a working-class neighbourhood in Nouakchott. The collaboration with ITM facilitates the implementation of a systemic and reflexive approach, with a dual objective: to strengthen the local health system in the two Moughataas and to help generate knowledge to feed into health policy in Mauritania.

The rational behind the programme is that the identification of a strategy adapted to local needs is only possible if the vision and opinion of all stakeholders are considered. Since May 2018, the two teams in Dar Naim and Bababé, comprised of an Enabel technical assistant, the Moughataa management team and various local stakeholders, have done a huge amount of work to strengthen the health system through a participatory approach.

During the year, the health system in Mauritania had to face up to the severe ordeal of the Covid-19 pandemic, as was the case throughout the world. Experiences of previous epidemics and crises show that the implementation of an appropriate and rapid response to an epidemic is often hampered by the fragility and dysfunction of the healthcare system. However, with the support of various partners, the two Moughataas were able to organise themselves to respond to the Covid-19 pandemic. The current situation is therefore the ideal time to take stock of the response in the Moughataas, build on it and draw lessons from it.

This survey will take around forty minutes of your time. You will be asked a few questions about the Covid-19 situation and the process by which decisions were taken and strategies put in place in the two Moughataas.

This information will not be used for any purpose other than this survey. The researchers will take appropriate measures to preserve anonymity as far as possible. The knowledge gained from this research will be shared with you and your community through small community meetings and these will be announced. After these meetings, we will publish the results so that other interested people can learn from the research.

You do not have to take part in this research if you do not want to, and choosing to take part will have no impact on your work or professional evaluation. You can stop taking part in the interview at any time. I will give you the opportunity at the end of the survey to review your remarks and you may ask to amend or delete elements if you disagree with my notes or if I have misunderstood.

Consent:

I certify that I have given my consent to participate in a survey on the response to pandemic Covid-19 at the level of Moughataa. I voluntarily agree to participate in this study, and I understand that my participation is not compulsory and that I can stop my participation at any time without having to justify myself or incur any liability.

During the course of this experience, I understand that the information gathered is strictly confidential and for the exclusive use of the concerned investigators.

I have been informed that my identity will not appear in any report or publication and that any information concerning me will be treated as confidential. I agree that the data recorded during this study may be stored in a database and used in a scientific article and communication.

Final words

Thank you very much for contributing to this survey. If you have any questions, please do not hesitate to contact us.

Interviewer contact details

Additional file 2 – Topic Guide

This thematic topic guide outlines the main questions that will be asked. The interview will be based on semi-open questions, which will be adapted iteratively during the interview process.

Respondents: members of the management team of the two Moughataas, members of the AR's operational teams, the AI-PASS team, regional authorities supporting the two Moughataas, central authorities and key partners.

In order to mitigate the risks associated with the Covid-19 pandemic, the interviews will take place online, using a platform suitable for the interviewees.

Topic guide at the District level (DHT, AR teams, National Technical Assistants)

Elements	**Objectives / Orientation questions**
Introduction	Introduction of the interview and the objectives of the study Guaranteeing confidentiality and anonymity Requesting permission to conduct the interview Requesting permission to record the interview and/or take notes
General part	Confirm the person's status • Civil servant/Private sector/NGO/Civil society/Community • Place of work (Moughataa) • Diploma (doctor, IDE, IMS, SF, TSS, auxiliary, non-medical, other)
Main questions	
Open questions/ icebreaker	Q: Can you tell me how the Moughataa of Bababé/Dar Naim managed the Covid-19 pandemic? Q: What activities/measures have been put in place to deal with the Covid-19 pandemic in the Moughataa? (Prompt: community activities, awareness-raising activities, PCI, setting up a triage system, developing & training on protocols, monitoring & supervision of staff, equipment, etc.). Q: What do you see as positive? What could be improved?

	(Prompt: at local level, at higher level)
Cognitive capacity: Information and knowledge management • The ability to collect information through different channels: the monitoring system, dialogue and collaboration with stakeholders, etc. • The ability to integrate and analyse information: awareness, creation of meaning, interpretation, analysis and understanding of this information.	Q: Can you tell me how the information and data on Covid-19 was/is managed at Moughataa level? (Prompt: data collection, data analysis, use of data to adapt strategies) Q: Through which channels do you (or the Moughataa) collect information? (Prompt: Monitoring system, dialogue/collaboration with stakeholders, etc.) Q: Which stakeholders do you work with to obtain information? How are things organised? Q: Were you involved? And if so, how? Q: What do you see as positive? Which could be improved? What were/are the causes of any weaknesses? Q: What did you do/what was done with this information? (Prompt: analysis, reflection discussion, taking or adapting certain activities or strategies) Q: Do you have an example of a decision you made or adapted based on some of the information you obtained?
Behavioural capacity: The capacity to manage uncertainty • The capacity to make or adopt certain decisions during critical incidents • The capacity to anticipate and deal with uncertainty • The capacity to manage and/or access flexible resources	Q: You talked about the measures and strategies that have been put in place. What decisions were taken or measures put in place at your level? Q: If you think of a decision that was put in place, how was the decision-making process? (Prompt: clarity of instructions, taking account of the local context, flexibility, etc.) Q: Did you encounter any problems with certain decisions? If so, what actions have you (your team or yourself) taken to deal with these challenges? Q: If you think of a critical incident during this pandemic Covid-19 in your Moughataa, structure or community. What did you decide? What solution or strategy have you put in place to deal with it? Q: How do you rate the capacity of the Moughataa to take decisions and deal with critical incidents/problems in the fight against Covid-19? What are its strengths and weaknesses? What are the causes of these weaknesses?

	Q: In terms of resources (Prompt: think of HR, financial resources, equipment, inputs, infrastructure), what measures have been put in place to deal with the COVID-19 pandemic at your level? Q: What do you see as positive? What could be improved? What were/are the causes of the weaknesses? Q: What have you (or your team) done to meet the challenges?
The capacity to manage interdependence or contextual integration: • The capacity to position and align with the different levels of the healthcare system • The capacity to engage with multiple dynamics at different levels • The capacity to identify responses that go beyond health and make the link with political, economic and psychosocial dimensions	Q: What coordination measures have been put in place in your Moughataa? Q: Who were the key players or partners? Q: In your opinion, were any players missing? If so, who? Q: Can you describe how the collaboration with your superiors/the regional/central level worked? Q: In terms of coordination, what were the strengths? What could be improved? Q: If you can think of any shortcomings, what actions or decisions have you (or your team) taken to improve coordination? Q: In what areas, apart from health, do you think we need to work together to combat Covid-19 or the impact of Covid-19? Have you (the Moughataa, the structure, the organisation, society) made any decisions or taken any action on this subject?
The capacity for legitimacy: • The capacity to make legitimate decisions that are socially acceptable and adapted to the context • The capacity to create a climate of trust with communities	Q: Can you describe how you collaborated with the communities? Q: What actions or activities did you or your team put in place to interact with the communities? Q: If not, can you think of a time (a situation, a topic, an activity) that you felt was important to interact with the communities? Q: If so, do you think these collaborations will be integrated into your future work, apart from responding to Covid-19? Q: How would you rate the extent to which the population's experiences are considered? Q: Do you see/have you seen any gaps? In terms of themes? population groups? Etc. ? Q: How do you assess the legitimacy of decisions taken as part of the Covid-19 response at Moughataa level? (Prompt: social acceptability, considering context, living conditions, the vulnerable, etc.).

	Q: What are your thoughts on the level of trust among the population regarding the response to the pandemic at Moughataa level? Q: What could be the causes of a lack of trust?
Resilience : absorption, adaptation, transformation Period post-Covid-19	Q: In your opinion, what was a positive effect or consequence of Covid-19 at Moughataa level? Q: Are there any reforms, innovative strategies or activities that have been implemented at Moughataa level that can/could contribute in the long term to strengthening the local healthcare system? Q: Has Covid-19 brought to light certain opportunities that were being seized or missed out by the Moughataa? Q: If you can think of one thing, what is the main lesson you learned from the Covid-19 pandemic? Which lesson(s) will help you in your future work, outside the Covid-19 response? Q: What actions/strategies have been initiated in your Moughataa to mitigate the collateral impacts of the Covid-19 pandemic? During the Covid-19 period and afterwards (at this time)? (Prompt: Continuity of care, planning activities, strategies, etc.)
Recap	Going through all your answers (make a summary), is there anything else you would like to add?
Final words	Thank the person Confirm confidentiality

Topic guide at regional level, central level, partners, AI-PASS team

Elements	**Objectives/ Orientation questions**
Introduction	Introduction of the interview and the objectives of the study Guaranteeing confidentiality and anonymity Requesting permission to conduct the interview Requesting permission to record the interview and/or take notes

General part	Confirm person's status - Position at central, regional, partner level - Place of work
Main questions	
Open questions/ ice-breaker	Q: Can you share with me your main thoughts on the capacity of the Moughataas of Bababé and Dar Naim to respond to the Covid-19 pandemic? Q: What do you see as positive? What could be improved? (Prompt: at local level, at higher level)
Cognitive capacity: Information and knowledge management • The ability to collect information through different channels: the monitoring system, dialogue and collaboration with stakeholders, etc. • The ability to integrate and analyse information: awareness, creation of meaning, interpretation, analysis and understanding of this information.	Q: How would you rate the management of information and data on Covid-19 at Moughataas level? (Prompt: data collection, data analysis, use of data to adapt strategies) Q: Through which channels do you think the Moughataas have collected information? (Prompt: Monitoring system, dialogue/collaboration with stakeholders, etc.) Q: What were the strengths and/or gaps? Q: Were other actors, at Moughataa level or elsewhere, involved? If so, in what way? Q: How do you rate the analysis and use of information at Moughataa level? Q: What have you done - at your level - to ensure that information is effectively managed at Moughataa level?
Behavioural skills: The ability to manage uncertainty • The ability to make or adopt certain decisions during critical incidents • The ability to anticipate and deal with uncertainty	Q: At what level do you think decisions need to be taken in the fight against Covid-19? What decisions can be taken at operational level? Q: What challenges or opportunities might there be to take certain decisions at operational level? Q: How do you assess the decision-making capacity in relation to the response to the Covid-19 pandemic at the level of the two Moughataas?

The ability to manage and/or access flexible resources	Q: Did you encounter any problems with some of the decisions that were taken at Moughataas level? If so, could you elaborate a little? What were the causes and consequences? How can we deal with this in the future? Q: In terms of resources (Prompt: think of HR, financial resources, equipment, inputs, infrastructure), how do you assess access to resources at Moughataas level? Q: What do you see as positive? What could be improved? (Prompt: flexibility, rapid accessibility, availability, etc.) Q: What actions have you taken at your level to ensure or improve access to resources for the fight against Covid-19 in the Moughataas?
The capacity to manage interdependence or contextual integration: • The capacity to position and align with the different levels of the healthcare system • The capacity to engage with multiple dynamics at different levels • The capacity to identify responses that go beyond health and make the link with political, economic and psychosocial dimensions	Q: How do you rate the level of coordination in the response to the pandemic at the level of the two Moughataas? Q: In terms of collaboration with local players? Q: In relation to collaboration with superiors? Q: In relation to collaboration with other sectors at local level? Q: What gaps or opportunities did you see? (Prompt: key players or partners considered or not considered; areas outside health considered or not considered; etc.). Q: If you can think of a few gaps, what actions or decisions have you (your team or yourself)/the Ministry taken to improve/ facilitate coordination at the level of/with the Moughataas?
The capacity for legitimacy: • The capacity to make legitimate decisions that are socially acceptable and adapted to the context • The capacity to create a climate of trust with communities	Q: How do you rate the collaboration with communities in the Covid-19 response at Moughataas level? Q: What actions or activities were put in place by the Moughataas to interact with the communities? Q: Were there any gaps or missed opportunities in your opinion? If so, what were they? Q: What have you done at your level to strengthen this collaboration at Moughataas level? Q: How would you rate the extent to which the people's experiences have been considered? Q: Do you see/have you seen any gaps? In terms of themes? population groups? Etc. ?

	Q: How do you assess the legitimacy of the decisions taken as part of the Covid-19 response at Moughataa level? (Prompt: social acceptability, consideration of context, etc.). Q: What are your thoughts on the level of trust among the population about the management of the pandemic at Moughataas level? Q: What could be the causes of this lack of trust?
Resilience : absorption, adaptation, transformation Period post-Covid-19	Q: In your opinion, what was a positive effect or consequence of Covid-19 at Moughataas level in terms of the health system? Q: Can certain reforms, innovative strategies or activities that have been put in place at Moughataa level contribute in the long term to strengthening the local health system? Q: Has Covid-19 brought to light certain opportunities that were being seized or missed at Moughataa level? Q: If you can think of one thing, what is the main lesson you learned from the Covid-19 pandemic? What lesson will help you in your future work, in operational support, outside the Covid-19 response? Q: What actions/strategies should be undertaken in the Moughataas to mitigate the collateral impacts of the Covid-19 pandemic? During the Covid-19 period and afterwards? (Prompt: Continuity of care, planning activities, strategies, etc.)
Recap	Going through all your answers (make a summary), is there anything else you would like to add?
Final words	Thank the person Confirm confidentiality

Additional file 3 – Management of the Covid-19 pandemic in Dar Naim

The first case of Covid-19 was recorded on 15 May and the first death on 18 May 2020. Quite quickly, the capital of Nouakchott, including the Nouakchott North region, became the epicentre of the pandemic. While in April the strategy focused on the regional level, as soon as cases began to increase, the national level took the decision to decentralise the response to the operational level. By the end of February 2021, there was a cumulative total of 1,175 cases and 39 deaths. Figure 1 shows the main measures and strategies put in place in the response to the Covid-19 pandemic in Dar Naim.

It was only when the first case was recorded in Dar Naim that the management team began to react. The document review and testimonies show that there were many challenges at the time: health workers outside the Covid-19 teams did not feel responsible or involved in the fight against the epidemic, the entire team was overworked, with the main focus on screening and monitoring cases, the fear of catching the disease and the poor availability of essential medicines and protective equipment.

The team, with support from the regional level and student epidemiologists recruited by the WHO, tried to strengthen the screening strategy and the follow-up of Covid-19 cases. Three teams were set up, each with their own responsibilities: a team responsible for receiving calls, a response team responsible for investigating and screening cases, and a team for monitoring confirmed cases and contacts. Then, with the support of the AI-PASS project, the District Management Team (DMT) set up a triage system at the health centre (HC) and the other structures; a WhatsApp group was created to improve dialogue between local players and an awareness campaign in the main neighbourhoods was organised by health workers. To cope with the challenges, the District Health Officer (DHO) decided to suspend other activities, such as the DHT meetings, and to coordinate with the main NGOs to reorganise services to ensure continuity of care.

Despite the training organised in June 2020 by the central level and its partners, and the DHT's attempts to support the health facilities during a few ad hoc visits, the document review shows continued carelessness in the triage system and monitoring of Infection-prevention-control (IPC) measures. Also, the awareness campaign was more of a one-off activity that was not continued afterwards.

Through the Ministry of Youth, who assigned community workers in each Moughataa, and the efforts of various associations and the municipality, the district was able to conduct multiple awareness-raising activities to convey key messages. However, given the workload of health workers, few mechanisms, apart from WhatsApp groups, were put in place to ensure activities were properly coordinated or key information was obtained. As a result, community workers from different entities - such as the Ministry of Youth, the municipality or associations - had little contact with the response team responsible for monitoring cases and suspected cases of Covid-19. Apart from awareness-raising, financial support and the distribution of equipment and food for the most vulnerable were limited - depending on the resources available from the municipality. The aim was to ensure that each vulnerable household would receive support at least once.

During the period between the two waves, the team tried to restart activities such as meetings, supervision and workshops. After observing a drop in coverage indicators, the team also proposed conducting a catch-up vaccination campaign. In the end, this activity was taken over by national level and financed by partners in November 2020.

In December 2020, at the start of the second wave, most of the activities were once again cancelled to cope with the pandemic. This time it was done more calmly, given the previous experience, but with

less rigour in monitoring the measures (at health facility and community level), as observed in the team's reflections and reports.

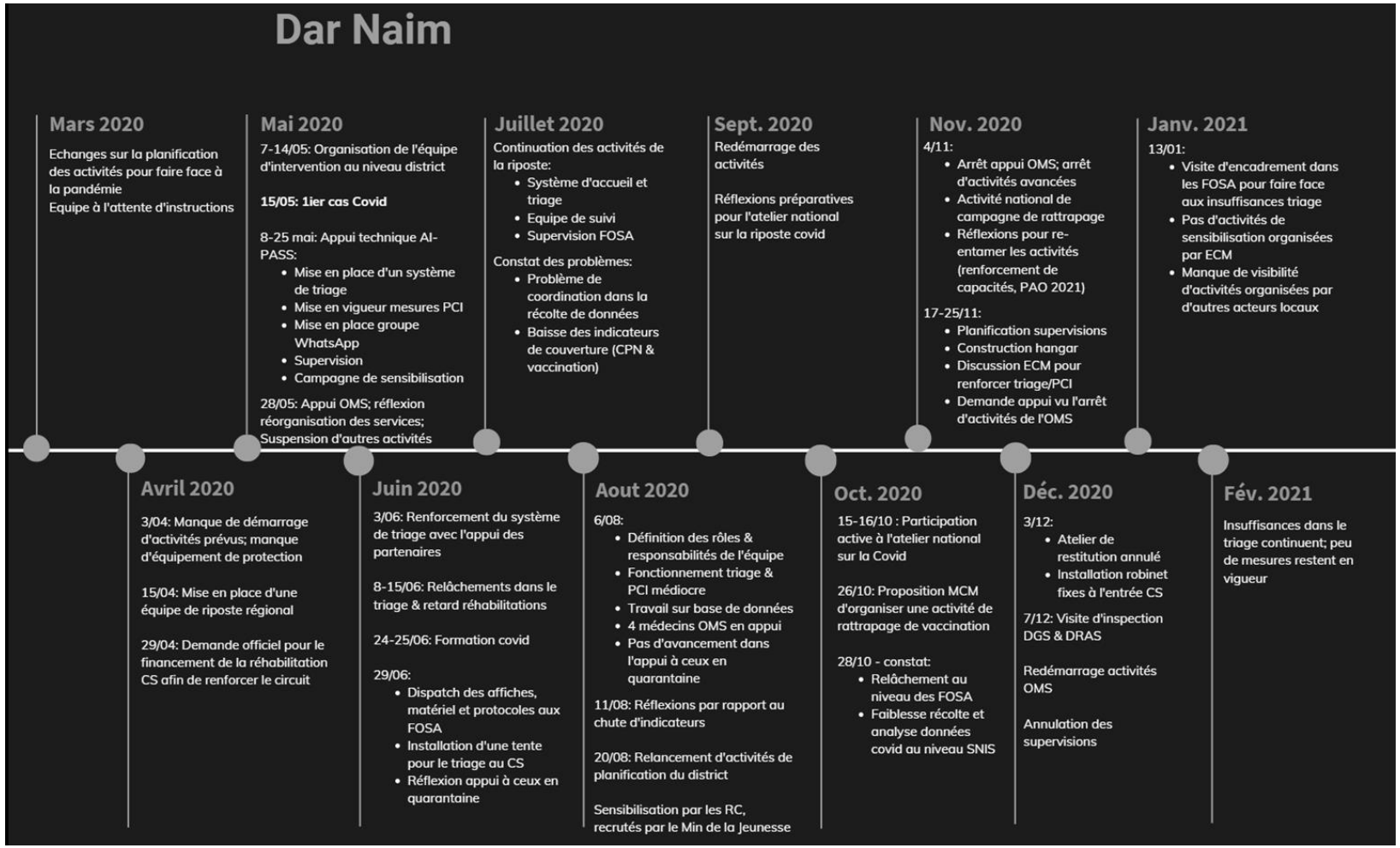

Figure 1: Chronogram of taken decisions and strategies in Dar Naim (Sources : Minutes of meetings and strategic documents)

Additional file 4 – Management of the Covid-19 pandemic in Bababé

The first case in Bababé was only detected on 21 June 2020. Since then, the number of cases remained exceptionally low. During the study period, there were only 25 cases and no deaths in the district. Figure 2 shows the main measures and strategies put in place in the response to the Covid-19 pandemic in Bababé.

Compared with other districts, Bababé was highly active from the start of the pandemic. Less than a week after the first case was reported in the country, the communities met with the authorities and the management team to take stock of the situation. The main aim of the agreed strategy was to set up a community-based surveillance and early warning system to control the flow of traders along the Senegal River.

In terms of health facilities, the DHT, with the support of the AI-PASS project, attempted to reorganise services to ensure continuity of staff, as well as setting up a reception and triage system and monitoring IPC measures.

Numerous initiatives were taken by the municipality, communities and associations throughout the period. From the outset, the town council took the responsibility for convening meetings to monitor the situation, and for arranging for donations to be collected and hygiene kits to be purchased to make it easier for people to follow the measures. With the support of the diaspora, various associations and villages organised collections and activities to support the most vulnerable.

In April 2020, a coordination platform was set up between the local authorities, the DHT and the communities, to step up efforts and coordinate activities. Various awareness-raising activities were organised with the support of volunteers, and information was shared via WhatsApp groups. This ensured everyone was at the same level of information and the response strategy could be fine-tuned on an ongoing basis.

As in other districts, the initial challenges were multiple, due to a lack of equipment and uncertainty about the latest guidelines. Specifically, in Bababé, there was a shortage of health workers to ensure that the response was put in place. So, the team did its best through occasional supervision by the DHO and the organisation of training for health staff in May 2020. In addition, on several occasions, the triage and referral system at the health centre was adapted or revitalised. At facility level, an initial screening campaign for health workers was organised in June but was halted by the regional health directorate due to the small number of available tests.

When the first cases were detected, the voluntary community network (VCN) was set up, comprising the actors involved in the action research (AR), as part of the AI-PASS programme, and representatives from each community. The key objectives of this network were to ensure basic community surveillance, raise awareness and engage in dialogue with communities, and share information with health workers.

However, as soon as the team felt more comfortable and the number of cases seemed to be under control, the district management team decided to restart the AR activities. During a joint evaluation of the Covid-19 period with a WHO representative, it was decided to include the emergency response as one of the DHT's key functions. Later, as part of the district's annual planning exercise, key response activities were selected to ensure an adequate budget in the future.

During the second wave in Mauritania, following a circular from the central level, the departmental committee, headed by the Hakim and bringing together the mayors, the DHO and the various departments, was revitalised. This committee made it possible to respond to challenges in a dynamic

and efficient way, and two awareness campaigns were organised in December 2020 and January 2021.

However, despite the various initiatives taken by the management team, as shown in the reports, by February 2021, the triage system no longer seemed to be working, and communities were not following the measures very closely. Nevertheless, the departmental commission and the VCN remained active and met when problems arose.

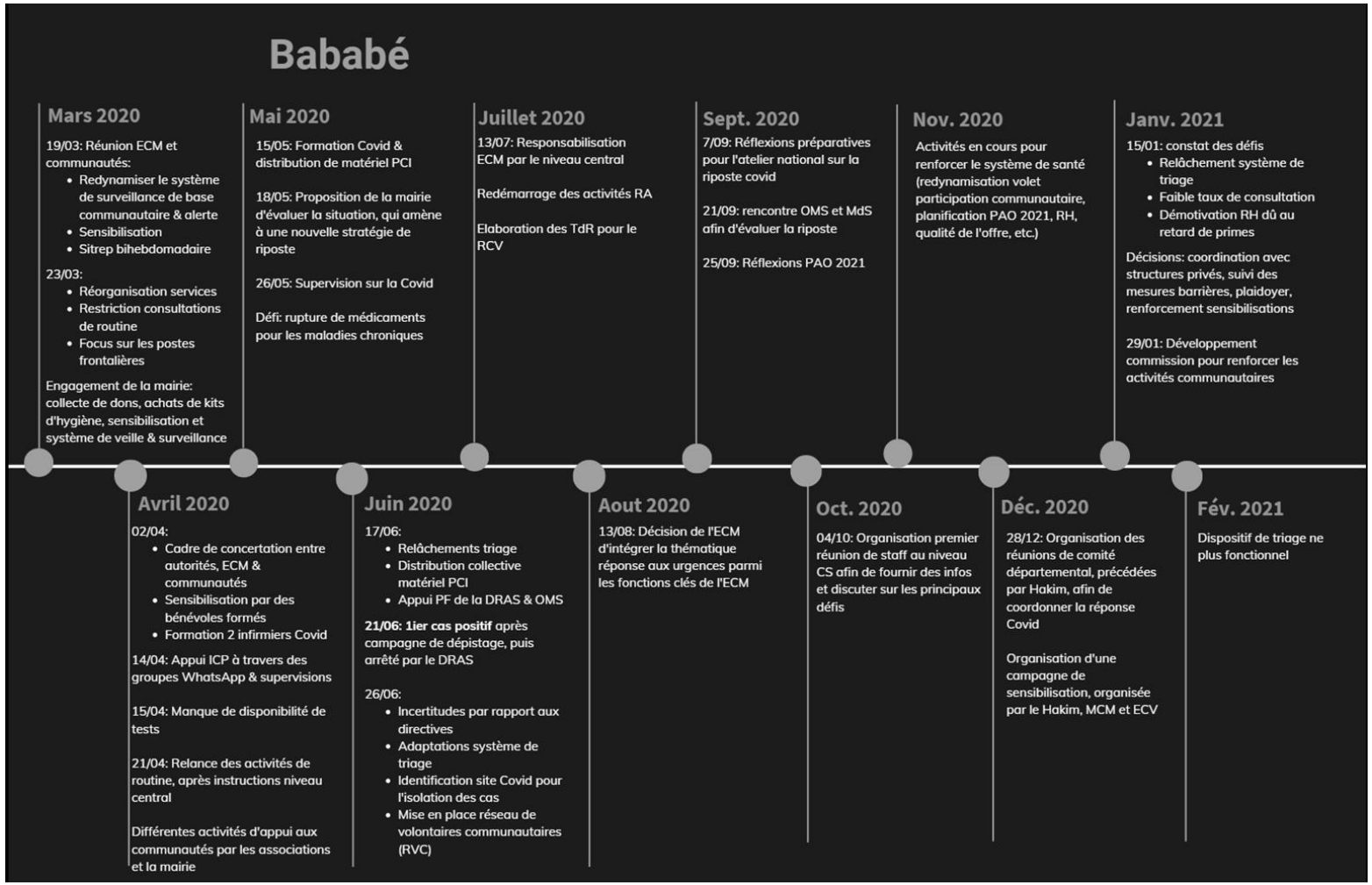

Figure 2: Chronogram of taken decision and strategies in Bababé (Sources : Minutes of meetings and strategic documents)

Additional file 5 – Capacity to manage the pandemic – Comparison between Dar Naim and Bababé

	Dar Naim	**Bababé**
Cognitive capacity	Collection focused on epidemiological data; little information on the experiences and challenges of communities and healthcare workers	
	Analysis: Weak - Exchanges between the DHT and some partners, but focused mostly on case monitoring	Analysis: Weak - Exchanges at DHT level and with communities, but mostly focused on case monitoring
	Some attempts: analysis of vaccination coverage and proposal to organise a campaign to catch-up; discussions to support the most vulnerable; reorganisation of services, etc.	Some attempts : development of a sitrep to enhance capacity to advocate towards superiors ; reorganisation of services
	Weak documentation of lessons learned: some members reflect on their experiences, but not leading to concrete action, except when related to the organisation of services	Weak documentation of on lessons learned: Covid evaluation by WHO without any follow-up or sharing of the report; some members are considering identifying a surveillance manager within the DHT and allocating a specific budget to the response
Behavioural capacity (capacity to manage uncertainties)	Lack of access to financial resources; maldistribution of HR and coordination challenges	Lack of access to resources: lack of HR; availability of financial resources more evident due to support from communities and diaspora
	Dependence on partners +++ financially and technically	
	Capacity to anticipate: organisation of Covid-response and services; launch of response when the first case is registered	Capacity to anticipate: organisation of Covid-response and services; creation of a platform for dialogue with key actors and communities; launch of the response 1 week after the national declaration
	Poor level of adaptation by the DHT; following instructions from hierarchical levels	Poor level of adaptation by the DHT; following instructions from hierarchical levels Community dynamics filling the gap
	Weak monitoring and ad hoc supervision; increased after the first wave	Weak monitoring and ad hoc supervision
Capacity to manage interdependence	Coordination with partners on an ad hoc basis, with little overall visibility	Coordination with partners on an ad hoc basis; more manageable visibility
	Consultation with regional/central level on an ad hoc basis; reinforced during the pandemic	
	Weak influence of alignment with local administrative authorities; weak coordination	Strong influence of alignment with local administrative authorities; increased coordination during the pandemic; major initiatives by the municipality and the Hakim to set up a coordination platform
Capacity to ensure legitimacy	Focus of the Covid-response: screening and monitoring cases	
	Weak dialogue between DHT, health workers and communities; recognition of challenges and impact on populations, but lack of concrete action	Creation of and consultation with the CVN; dialogue via WhatsApp Setting up mechanisms for consultation and dialogue strengthens a climate of trust, even if this is sometimes difficult due to socio-cultural aspects

	Several awareness-raising activities organised by the municipality and associations; occasional support from the municipality. Weak awareness-raising capacity of the DHT	Several activities organised by a range of actors: setting up the community surveillance system; awareness-raising activities; provision of financial support and food for the most vulnerable; etc. Awareness-raising capacity of the DHT and health workers, strengthened by the communities themselves
Leadership	Experience, knowledge and systemic vision; weak management skills	Limited experience and systemic vision; more difficult to manage a small team
	Hierarchy-focused organisational culture	
	Limited coordination capacity	Coordination capacity facilitated through coordination platform that was set up before the pandemic
Individual capacity	Weak capacity of the DHT to function or organise itself in the absence of the DHO	Ability of some DHT members to function and organise themselves in the absence of the DHO; however, challenges due to lack of HR
	Gradual capacity building among healthcare workers	
Community resilience	Weak community dynamics	Important dynamics within the communities, supported by diaspora and civil society
	Limited level of solidarity	Important solidarity mechanisms
Level of resilience	Absorptive capacity ++: poor preparation and adaptation; influenced by hierarchy	Absorptive capacity: influenced by hierarchy; weak follow-up culture
	Adaptative capacity: strengthening dialogue and consultation at DHT level; flexibility in organising services	Adoptative capacity ++: strengthening dialogue and consultation at DHT level and with key actors at community level, leading to a more dynamic response
	Transformative capacity: important reflections by DHO; weak knowledge management	Transformative capacity: creation of a platform for developing the CVN and the departmental committee; weak knowledge management

Table 1: Summary of capacities of the two Moughataas during the response to the Covid-19 pandemic
(CVN : Community Volunteering Network ; DHO ; District Health Officer; DHT : District Health Team ; HR : Human Resources; NGO: Non-governmental organisation)

Additional file 6 – Reflexivity statement

Study conceptualisation

How does this study address local research and policy priorities?

This study was developed in response to a request of the national government of the Islamic Republic of Mauritania to carry out an evaluation of the response to the Covid-19 pandemic in Mauritania.

How were local researchers involved in study design?

Regarding the design of the study, the Mauritanian researchers (members of the action research (AR) team and MoH staff as mentioned below) were consulted about the study design and involved in the selection of the study sites, Dar Naim and Bababé.

Research management

How has funding been used to support the local research team(s)?

This study was carried out by members of the action research (AR) team that were engaged in the monitoring and evaluation of the AI-PASS programme in Mauritania. There was an AR team in Dar Naim and in Bababé. We consider these AR teams to be the research partnership referred to below. AI-PASS funding allowed to organise workshops and training activities for the AR team members, and the travel expenses of the first author (KA), who supported the AR teams.

Data acquisition and analysis

How are research staff who conducted data collection acknowledged?

The first author collected the data.

How have members of the research partnership been provided with access to study data?

All data collected in the frame of this study were made available on a secure platform used to share information between the AR team members.

How were data used to develop analytical skills within the partnership?

The collected data were presented to the partnership members during a workshop held in Mauritania in 2020, which included local and national health actors. Also, staff of local and national NGOs and academics of the university of Nouakchott participated in this workshop. The results of the preliminary analysis were discussed, and this helped the actors to further reflect on their response to the Covid-19 pandemic.

Data interpretation

How have research partners collaborated in interpreting study data?

The AR team members and key staff of the Ministry of Health were kept informed about the progress of the research. During the workshop held in 2020, they provided inputs, and the initial results were discussed.

Drafting and revising for intellectual content

The manuscript was sent to the key members for inputs before submission.

How were research partners supported to develop writing skills?

Despite our best efforts, we received very little inputs of the local AR teams actors during the actual writing of the article. Reasons given include time constraints and other national priorities. No support to writing therefore could be provided.

How will research products be shared to address local needs?

As mentioned above, the preliminary results were shared during the workshop in 2020, but also at a conference on Covid-19 in Mauritania, which was held in 2021. The final results are still to be more widely disseminated in the near future by the AI-PASS programme actors.

Authorship

How is the leadership, contribution and ownership of this work by LMIC researchers recognised within the authorship?

As stated above, no local AR team members contributed to the actual writing of the paper. We acknowledged the inputs of the AR teams, the AI-PASS programme team, the Enabel staff, and the staff of the MOH Directorates.

How have early career researchers across the partnership been included within the authorship team?

The AI-PASS programme did not have early career researchers amongst its staff.

How has gender balance been addressed within the authorship?

A good balance was kept in the authorship; the first author is female. Additionally, within the AR process of the AI-PASS programme, due importance was given not only to ensure the gender balance, but also a balance in terms of ethnicity, disciplines and power.

Training

How has the project contributed to training of LMIC researchers?

We invited future academics of the university in Nouakchott to a workshop in 2021. We presented a summary of the study and its methodology, and they were invited to take part in the discussions and further analysis of the preliminary results.

Additionally, as stated above, this study is part of a larger evaluation process in the AI-PASS programme, wherein all actors are as much as possible involved through an AR approach. Local capacity building is key to this process as stated in Accoe *et al.* (2020).

Infrastructure

How has the project contributed to improvements in local infrastructure?

This study never aimed at developing local infrastructure, but the AI-PASS programme improved the infrastructure of the two districts, including computers in order to share data and information.

Governance

What safeguarding procedures were used to protect local study participants and researchers?

Confidentiality and anonymity were guaranteed throughout the study. The first author managed the data, including safe storage. All respondents were given a code, and these were used as identifiers of

the transcripts. The electronic list of interviewees' names and codes was stored securely using a password known only to the researcher. The names of the interviewees were at no time mentioned in the study.

Additionally, we set up respectful setting for the workshops in 2020 and 2021, where key actors were invited to share their inputs, in order to allow them to share their thoughts in a safe way.