P(M)HC RESEARCH

Assessment on Access to Primary (Mental) Health Care in Kassala

within the framework of Dictorna Program for Family Medicine

AICS Khartoum Office

Dedication

" Special thanks go to Vincenzo Racalbuto for having believed in this initiative from the very beginning, and to Maria Cristina Pescante who is following up to pursue a more inclusive health in Sudan."

Acknowledgement

First and foremost, the authors would like to thank all the families who willingly and patiently shared their stories with us. Their experiences are the core of this study and a source of inspiration. We are grateful for this.

The authors are also indebted to the staff of the Ministry of Health of Kassala (Health Information Centre and Health Units and Centres Directorate) and of the Mental Health Directorate that provided invaluable assistance to the team throughout the assignment. The authors would also like to acknowledge the precious collaboration of every enumerator deployed in the field, namely Ayda Hashim Mohamed, Taysser Mohamed Ibarhim, Nawal Babikir Al Awad, Manal Abdallatif, Aballa Boar Bashir, Said Hassan Alsaid Abdalla, Wefaa Abdelazim, Deenur Mohamed.

The Italian Agency for Development and Cooperation deserves special appreciation for providing both technical and financial support to carry out the experience.

Furthermore, with the help of valuable key informants, in-depth and historical information and guidance were obtained, which greatly assisted in generating necessary information to contextualize and expand the current understanding. We owe thankfulness to all these key informants inside and outside the Ministry of Health. We would also like to thank all partners and stakeholders who contributed with their time and expertise to the final drafting of this document, among them the UNICEF and UNIDO offices in Kassala.

شكرا / Thank you.

Disclaimer

The analysis and recommendations of this study do not necessarily reflect the views of the Italian Agency for Development and Cooperation and/or the Kassala Ministry of Health. This publication reflects the views of its authors.

Study Team

Giulia Fattori	*Research Coordinator, AICS*
Dr. Sharif Abdalla Jewye	*Medical Advisor, AICS*
Mr. Mohamed Ahmed	*Data Coordinator, KMoH*
Mr. Mohamed Hassan	*Team member, KMoH*
Ms. Aida Hashim Mohamed	*Team member, KMoH*
Ms. Nawal Babikir	*Team member, KMoH*

Table of Contents

Index of Figures and Tables

Acronyms

AICS	Italian Agency for Development and Cooperation
BHSP	Basic Health Services Package
CSI	Coping Strategies Index
DS	Demand Side
FMOH	Federal Ministry of Health
HSB	Health Seeking Behaviour
KMOH	Kassala Ministry of Health
LIC	Low Income Country
MHD	Mental Health Department
MOH	Ministry of Health
PHC	Primary Health Care
PHI	Public Health Institute
P(M)HC	Primary (Mental) Health Care
PWMHDs	People With mental Health Disabilities
SMOH	State Ministry of Health
SPS	Service Provider Side
UHC	Universal Health Coverage
UNICEF	United Nations Children's Fund
UNIDO	United Nations for Industrial Development

Summary

Introduction. The network of Primary Health Care facilities in Sudan offers basic service packages all over the country. Nonetheless, constraints of different nature hinder the PHC service delivery, resulting in a gap between health policies and everyday PHC practice.

First of all, the resources allocated by the Government to each State Ministry of Health, and thus to PHC facilities, are not adequate to cover sustainable services responding to the needs of the demand side, i.e. the population. Secondly, the educational path of health professionals is hindering doctors from moving to remote areas where salaries are not attractive, causing a huge lack of essential medical professionals required by each PHC facility. As a consequence, facilities are generally understaffed and served with poor equipment, hence affecting the consistency of the services offered to the community. Thirdly, health insurance schemes may encourage PHC service providers by channelling economic resources, but not the population at the community level, especially those living in rural areas far from the logic of wage labour. Fourthly, the limited offer of financial support covering welfare needs (e.g. a wide offer of health insurance schemes, microcredit products for personal needs, family bank support dedicated to health issues…) paired with the steady inflation suffered by the SDG in the last years are calling for innovative solutions to ensure an effective PHC universal coverage.

Misalignments between policies and practices may limit the number and range of individuals receiving PHC full-service packages, disproportionately affecting people living in remote areas under poor conditions, vulnerable groups (e.g. people with mental disorders), or those unlikely to seek formal health support.

Health systems, policies, strategies and operational plans could benefit from relying on evidence-based results. Best (and worst) practices could comprehensively contribute to informing health sector stakeholders and fostering the creation, management and dissemination of knowledge to strengthen and eventually redirect advancements in the Primary Health Care (PHC) system.

Given these premises, the Ministry of Health of Kassala (KMOH), through its Mental Health Directorate, together with the Italian Agency for Development and Cooperation (AICS), performed a research on the health sector within the capital Kassala City and its peri-urban suburbs, with the specific goal to delve into the health services provided in the State, with special reference to mental health.

The study aims at bringing to the attention of policy makers the challenges and the opportunities that the health system is facing in the country, specifically in the eastern decentralized regions such as the Kassala State. The two implementors decided to undertake the research in the Kassala State to understand the current situation of the health system in the region, specifically in terms of consistency of the service packages provided, availability of staff, population covered, accessibility of insurance coverage, as well as financial sustainability and monitoring systems implemented by health facilities. Particularly the KMOH wanted to get a clearer picture of the current situation and decided to put an extra effort to understand the strengths and weaknesses of the system under its control. For this reason, the KMOH asked the Italian Agency for Development and Cooperation to collaborate in a joint research, based on the shared commitment to improving the health conditions of the eastern Sudanese population.

Furthermore, the Italian Agency for Development and Cooperation is supporting the Ministry of Health of Kassala in promoting the family medicine, a sound approach for reaching and prioritising especially the most vulnerable individuals, including those affected by mental disorders. Despite the complete absence of data on mental health, as well as the incidence of mental disorders in the country, the family medicine could represent a valid methodology to support even psychosocial relevant priorities. An exemplary

programme, aligned to the principles of the family medicine but with a specific focus on mental health for low-resource settings, was developed by the WHO in 2010. In fact, the mhGAP is the model guiding this study throughout the paper.

In order to promote improvements in the health system together with the promotion of the family medicine approach in the most decentralized and remote areas of the country such as the Kassala State, it was necessary to understand the existing health system framework in the region.

Methodology. The data collection was conducted following two complementary methodological approaches:

The **quantitative methodology,** with information coming from **93** care service providers and **304** care recipients, made it possible to quantify the consistency of the health services offered in the region and their accessibility. Surveys were designed according to a theoretical framework which had been developed in the African context to study malaria, the PASS-model, whose indicator system was replicated to assess care and resource seeking. As for the demand side, the WFP's Coping Strategies Index was used to understand the incidence of poverty on access to healthcare. The information collected came from both the Service Provider and the Demand sides, in order to give an objective and representative picture of the broader aspect of 'access' to healthcare. The study also provides useful indications extrapolated from collected data, including about access to mental healthcare.

The **qualitative methodology,** instead, aimed at in-depth exploring the pivotal theme of our research, namely mental health. For this methodology, theories from sociology, social psychology and ethno-psychiatry acted as a guide. **15** qualitative interviews were conducted by a Sudanese doctor, native to Eastern Sudan, together with a social worker who was the focal health professional for people with mental health disorders (PWMHDs). Qualitative interviews have been performed under the strict guidance of the Methodological Coordinator, an Italian psychologist. The team of professionals performed the interviews inside the private houses of the families hosting PWMHDs, who welcomed with enthusiasm the visits of the team. Through this direct interaction with family members and the informal setting, the team explored the representation of mental disorders and how they are formally caught by the health system.

Social representations vary according to culture and historical moment. Understanding their meaning is a necessary step for identifying interventions that may be suitable for the target communities, and therefore effective. Going into the details, the three tools used are described below.

Conclusions and recommendations. By using a set of indicators suggested by the PASS-Model theoretical framework developed by the Belgian Institute of Tropical Medicine, the study assessed the accessibility and consistency of primary health services offered in the state of Kassala.

The picture that emerges is that of a health system that has a potential, but lacks i) resources (financial and human) that guarantee the quality and sustainability of services, as well as the continuity of health personnel, ii) clear procedures defining the criteria for access to care (health need / entry level), iii) coordination between the different health levels (primary, secondary and tertiary), and, in connection with the previous point, iv) a sound health information system able to monitor financial aspects, services offered to the public and the patients' clinical histories. A list of recommendation is available at the end of the report in the dedicated section.

INTRODUCTION

Health systems, policies, strategies and operational plans benefit from relying on evidence-based results from everyday practice. Best (and worst) practices could comprehensively contribute to informing health sector stakeholders and foster the creation, management and dissemination of knowledge to strengthen advancements in the Primary Health Care (PHC) services.

The present study pursues an evidence-based path by implementing a mix-method research as the suitable approach to explore the challenges and opportunities that the health sector is facing in the Kassala State. Research findings together with further evidence-based knowledge from key informants' field experience are meant to be translated into policies—at strategic level— and practice—at operational level. This study aims to step into theoretical framework, typical of the research field, in order to translate theory into practical application, particularly in areas such as public and mental health. *Intervention research* evaluates how various interventions or approaches are adopted and applied in real-world settings in order to establish an understanding of their effectiveness in different contexts.

Therefore, the challenges that implementation research applied to public health usually strives to face are the restoration of equity, e.g. by effectively addressing the urban-rural gap or gender dimension of health; the identification of the best approaches for adequately responding (in terms of both management and prevention) to the challenges posed by multimorbidity; the understanding of the quality of health services (effectiveness, people-centeredness, timeliness, integration, efficiency and safety) to improve their consistency; the development and support of models of knowledge transfer to be implemented. In this framework, the importance of contributions given by people from the communities has been recognised, since implementation research tries to answer questions that are important to communities and that contribute to understanding the social determinants of health, as well as the ways social roles and relationships affect the performance of health systems. [1]

Given these premises, the Ministry of Health of Kassala (KMOH), through its Mental Health Directorate, together with the Italian Agency for Development and Cooperation (AICS), performed a research on the health sector within the capital Kassala City and its peri-urban suburbs, with the specific goal to delve into the health services provided in the State, with special reference to mental health.

The study aims at bringing to the attention of policy makers the challenges and the opportunities that the health system is facing in the country, specifically in the eastern decentralized regions such as the Kassala State. This research is just a first step. It is now crucial to share results, successful approaches and models, as well as examples of failures, which are equally important for a boarder learning system.

Sudan is facing an important political transition phase, which may provide room for improvement transversely at different human right levels, starting from access to healthcare (Article 25 of the Universal Declaration of Human Rights, UN), with a clear focus on the most deprived rural areas.

Moving deeper into the study, we tried to identify room for improvement for the primary health care system in the Kassala State with reference to possible future interventions aimed at:

I. integrating the **family medicine** into PHC ordinary practice;
II. identifying the main **areas for improvement at service provider level** in order to improve the accessibility of basic health services, such as (but not only) psychosocial and psychiatric services;

---

[1] WHO, UNICEF, Operational Framework for PHC. Transforming Vision Into Action (2020)

III. exploring the **individual factors influencing the health seeking behaviour (HSB)** of people, in order to outline intervention promoting a fairer and more effective access to formal health services;

IV. encouraging periodic reviews of health performance at local level through **monitoring and evaluation** practices, which could guide immediate corrective action, an appropriate allocation of resources and the simultaneous information of policy makers on how to transversally assess, plan, manage and prioritize actions within the health system.

The two implementors of the study decided to undertake the research in the Kassala State to understand the current situation of the health system in the region, specifically in terms of consistency of the service packages provided, availability of staff, population covered, accessibility of insurance coverage, as well as financial sustainability and monitoring systems implemented by health facilities. Particularly the KMOH wanted to get a clearer picture of the current situation and decided to put an extra effort to understand the strengths and weaknesses of the system under its control. For this reason, the KMOH asked the Italian Agency for Development and Cooperation to collaborate in a joint research, based on the shared commitment to improving the health conditions of the eastern Sudanese population. Moreover, the interest in strengthening mental health services emerged directly from the Mental Health Directorate of the KMOH, due to its recent constitution and to the aim of giving voice to people with mental conditions in need of support.

A mixed methodology proved to be the most appropriate solution for this two-fold study. Hence, the quantitative data collection adopted and adapted for a double target, the Service Provider and the Demand, was paired with a supplementary in-depth exploration to support evidences from the demand side. The qualitative interviews were also aimed at exploring the social representation of mental disorders in Eastern Sudan, since the cultural context influences the creation of concepts in our minds, hence social identities, categorization of people, and prejudices.

The reasons behind the focus on mental health are clearly supported by the WHO's Mental Health Gap Action Programme (mhGAP, 2008)[2], which can be summarised as follows:

- Mental health is a deep-rooted component of health and well-being, thus of PHC
- Mental health disorders are widely spread among the population and a significant portion of health seekers enter in contact with the primary health care due to symptoms associated with a mental disorder
- The elevated multi-morbidity of mental disorders and noncommunicable diseases requires mental problems to be managed at primary health care level
- The majority of mental illnesses begin by the age of 14. Unfortunately, most cases go undetected and untreated (Kessler RC et al., 2007)
- Mental disorders can be treated at primary care level. Simple but adequate training to doctors, nurses and health workers can strengthen the entry points of mental health patients to the formal health care system, reducing the amount of undetected and untreated cases

---

[2] WHO website, link

- Besides the relatively simple solution, the treatment gap remains enormous due to low detection rates and to the low prioritization given to mental disorders (Thornicroft et al., 2017).[3]

Primary health care and mental health care move on the same track. A wiser articulation of PHC services, with adequate training to health professionals and a better resource management, could efficiently detect and insert into formal care paths a wider number of people in need belonging to vulnerable groups.

This report is divided into four main sections. The first section describes the current situation in terms of contextual and conceptual frameworks, analysing the problem on the one hand and presenting the theoretical approach to manage it on the other hand. The second section is dedicated to the presentation of the methodology used in the study. The third section delves into the analysis based on the 4-month data collection by considering two main axes of assessment, the Services Provider Side (SPS) and the Demand Side (DS), and explores the mental health situation in Kassala thanks to interviews offering practical insights on access to care by people with mental conditions. Lastly, the fourth and final section of this report provides conclusions and recommendations.

---

[3] WHO, Mental health in primary care: illusion or inclusion? (2018), link

CONCEPTUAL FRAMEWORK

The underlying assumption of our study is the close relationship between the structure of the PHC system, the approach pursued in offering health services, and the response to mental health needs.

The ability to respond to needs of people affected by mental disorders in the same way as PHC services respond to any other health disorder depends on countless variables, first of all the ability to detect and recognize the need. A need emerges by the match of the health seeking behaviour of a person, and the capacity of the service providers to offer a response to this behaviour.

As for our assumption, a consistent quantitative data collection was adopted for the above-mentioned double-target assessment of access to care, while a supplementary in-depth qualitative exploration was deemed useful to support the quantitative data collected from the demand side and to understand the meaning given to mental disorder in Eastern Sudan.

The conceptual framework for the design of research tools (both the surveys and the interview outline) is composed of one main theoretical strand and a research model developed to study health behaviours in developing countries, namely:

- The family medicine approach;

- The PASS-model: a model for guiding health-seeking behaviour and access to care research.

Family medicine approach

Family medicine (or Family Health) is it is a relatively recent discipline developed in the 1960s, which has been proposed as a strategy to reorient the health care model by setting up multi-professional teams at Primary Health Care level.

family medicine is defined by WHO as a "specialty of medicine concerned with providing comprehensive care to individuals and families and integrating biomedical, behavioural, and social sciences; an academic medical discipline that includes comprehensive health care services, education, and research; known as general practice in some countries".[4]

A Family doctor is defined by WHO as "a medical practitioner who is a specialist trained to provide health care services for all individuals regardless of age, sex, or type of health problem; provides primary and continuing care for entire families within their communities; addresses physical, psychological, and social problems; coordinates comprehensive health care services with other specialists as needed; may also be known as a family physician or a general practitioner in some countries".[5]

Consequently, in this document the Family Health Approach denotes "health care services provided by a family health team, characterized by comprehensive, continuous, coordinated, collaborative, personal, family-and community-oriented services, comprehensive medical care with a particular emphasis on the family unit. Family Health Approach is known as Family Practice or General Practice in some countries". Hence, the aim of the Family Health Approach is to strengthen Primary Health Care services by setting up multidisciplinary teams (PHI, 2016).

The core principles of the family medicine could have been resumed by WONCA (short name for World Organization of Family Doctors)[6] as follows:

- **Accessibility care.** Family practice addresses the unmet health problems of the whole population.

---

[4] WHO, Regional Office for the Eastern Mediterranean, Conceptual and strategic approach to family practice, towards universal health coverage through family practice in the Eastern Mediterranean Region (2014)

[5] Roberts J.L. (WHO), Terminology. A glossary of technical terms on the economics and finance of health services (1998)

[6] Improving health systems: the contribution of family medicine. Singapore, WONCA. 2002

- **Continuity of care.** Family practice ensures ongoing care of individuals such as children, pregnant women and patients suffering from chronic diseases and ensures patients receive specialized and hospital care throughout their lives.
- **Comprehensive care.** Family practice provides integrated health promotion, disease prevention, curative care, rehabilitation, and physical, psychological and social support to individuals. Family physicians can provide independent care for 85%–90% of problems encountered in daily practice.
- **Coordinated care.** Family practice can deal with many of the health problems suffered by individuals at their first contact with their family physician team, but, whenever necessary, the family physician should ensure appropriate and timely referral of the patient to specialist services.
- **Collaborative care.** A family practice team should be prepared to work with other medical, health and social care providers, delegating to them the care of their patients whenever appropriate, with due regard to the competence of other disciplines. Family physicians have traditionally served as the patient's first contact and point of entry into the health care system.
- **Family-oriented care.** Family practice addresses the health problems of individuals in the context of their family circumstances, their social and cultural networks and the circumstances in which they live and work.
- **Community-oriented care.** The patient's problems should be seen in the context of his or her life in the local community, ensuring community engagement in decision-making about the health and well-being of its members and awareness of the processes of care delivery through a family practice approach.
- **Central patient-doctor relationship.** In the early 2000s the authors Mead and Bower made an attempt to review the conceptual and the empirical literature in order to develop a model based on the elements characterizing the doctor-patient relationship within the concept of patient-centred care. They identified the following four (4) dimensions: biopsychosocial perspective, patient-as-person, sharing power and responsibility and therapeutic alliance.[7] The three dimensions of care contained in the "Bio-psychosocial / holistic perspective" (biomedical, psychological and social) are meant to be integrated, implying that not only should care be delivered with bio-medical, social and psychological elements, but that **decisions made in one of these domains should explicitly be influenced in due consideration of the features belonging to the other two**.

---

[7] Mead N., Bower P., Patient-centeredness: a conceptual framework and review of the empirical literature, Soc Sci Med. 2000 Oct; 51(7):1087-110

Referring to a clear conceptual framework is an essential step for measuring and hence monitoring and evaluating the patient-centred approach. Mead and Bower finally represented in the following figure the patient-centred care framework, used as a fundamental conceptual basis in this study.

- Patient-as-person
- Bio-psychosocial / holistic perspective

Disease and illness experience

Whole Person

Common ground

Patient-doctor relationship

- Sharing power and responsibility
- Therapeutic alliance
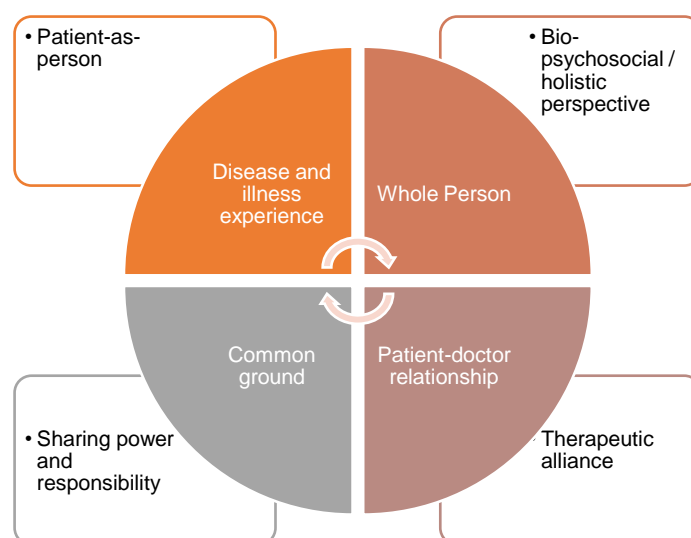
Figure 1. Conceptual framework of patient-centered care (PCC)

It is important to underline that there is no standard model of family practice with predefined elements that can be used as a reference. Countries have different elements developed based on specific needs for family practice implementation. Family practice is more likely to succeed when based on careful consideration of the country's local conditions (ERMO WHO, 2014).

Family practice is made unique by its holistic approach and people-centredness. These principles, orientating the central patient-doctor relationship, led the WONCA to state that every family in the world should have access to a family doctor. Hence, a family doctor for every community.

The table below is an attempt made by WHO (2008) to represent the difference between conventional care and people-centred care.

Conventional care	People-centred care
Focus on illness and cure	Focus on health **needs**
Relationship limited to the moment of consultation	Enduring personal **relationship**
Episodic curative care	Comprehensive, continuous and person-centred care
Responsibility limited to effective and safe advice to the patient at the moment of consultation	Responsibility for the health of all people in the **community** throughout the **life cycle**; responsibility for tackling determinants of ill health
Users are consumers of the care they purchase	**People are partners** in managing their own health and the health of their communities

Table 1. Different approach to care

PASS-model: a model for guiding health seeking behaviour and access to care research

According to the *PASS-model for Health Seeking Behaviour (HSB) and access to care research* developed by the Belgian Institute of Tropical Medicine of Antwerp, there are four (4) main categories impacting on HSB: i) illness perception and explanatory models, ii) decision-making and social values, iii) access to care and resource seeking, and iv) medical pluralism (Hausmann-Muela et al., 2012). This multi-dimensional model lays on worldviews, social structures and values, and health institutions that participate together in creating social representations of health behaviour and in defining the context for health-seeking processes.

Notwithstanding *HSB* has been widely explored in the last decades, few studies have explored health seeking behaviour applied to the mental health sector in low-medium income countries, and, especially for Sudan, little literature is available.

Within the *P(M)HC RESEARCH*, an attempt was made to respond to the lack of data concerning both i) the accessibility of PHC services for the population in need, especially for the vulnerable groups, and ii) the consistency of the services provided by health structures, with a specific focus on mental health care. Therefore, the research looks at the PASS-model as a further theoretical foundation to guide its path and adopts a focus on the category "access to care and resource seeking" to assess the consistency of the services available on the ground. To reach its purpose, the research targets both the Service Provider Side (SPS), namely the PHC facilities, and the Demand Side (DS), or rather the patients of the PHC facilities, in order to ascertain the quantity and quality of care supply.

It is worth mentioning that the assessment has not been limited to health seeking behaviour applied to mental health. Therefore, the chapter about data analysis presents both the results related to PHC facilities (considering the whole range of services provided) and those related to patients who benefit from the various services available. The reason behind this choice is the absence of an updated baseline of the PHC services offered in the target Kassala State, thus implicitly calling for a broader data collection. As a non-expected result, the research succeeded in building up a detailed, though not exhaustive, baseline of the regional PHC sector.

Despite being originally developed for malaria, the PASS-model is a practical and intelligible tool assisting researchers in the field to identify the most potentially relevant variables decoding HSB and access to care. The tool has been designed by its author to support any researcher in contextualizing health behaviour into a specific social, political, and economic framework, regardless of the country income level. The PASS-model unleashed its potential under the P(M)HC REASEARCH, allowing the researchers to straightforwardly identify a set of indicators and sub-indicators orienting the data collection and guiding the subsequent analysis.

Hereafter are briefly described the indicators that were integrated into the surveys directed to the Service Provider Side (SPS) and to the Demand Side (DS) for assessing the access to care and resource seeking.

Access to care and resource seeking

Among the examples for grouping key indicators for the HSB, the categorization of the five "As" stands out: *availability*, *accessibility*, *acceptability*, *accommodation* and *affordability* of health resources[8]. The convenience of this categorization is due to an easy identification of crucial potential hindrances to adequate care. Assessing care accessibility factors requires researchers to explore both the provider and the demand sides.

Availability, accessibility and accommodation
The key factors for access to health are: 1) the *availability* of health resources within a certain geographical region, thus referring to the institutions in charge of promoting health policies that should cover their whole political territory, from the most centralized areas to the most remote and capillary ones; 2) the *accessibility* to the available health resources by the population itself, which is a socio-structural factor. Although accommodation is usually also considered as a fundamental factor determining access to health care, the research did not register any evidence of this factor in the target area.

The indicators considered by the authors to explore the availability and accessibility factors were: i) geographical localization of health services, ii) availability of medical equipment; ii) availability of health personnel, including community workers; iv) availability of pharmaceutical and other treatment resources; v) availability of preventive measures vi) availability of traditional and informal health care providers; vii) distance from home to health services; viii) distance from fields, forest or working place to health resources; ix) mobility factors, such as road conditions, safety, transport; x) health facilities opening hours, and xi) waiting time at the health centre and people's work load.

Acceptability

Acceptability is frequently associated with, and more often reduced to, satisfaction. Indeed, the concept is much wider and refers to the social and cultural distance between the offer, i.e. health care providers, and the demand side. Hence, the indicators playing a crucial role for assessing acceptability have been listed as follows: i) clear communication and respect; ii) confidentiality and privacy; iii) perceived quality of care; iv) perceived benefits, v) perceived inconveniences, and vi) perceived risks of preventive measures and treatment.

In low-income countries the above-mentioned indicators are difficult to assess, since the relationship existing between health workers, especially doctors, and patients is experienced as hierarchical. Additionally, the poor educational context characterizing the majority of rural areas contributes to exacerbating the gap between poor and uneducated people and the educated middle class, from which the professionals normally originate. Therefore, it is infrequent to observe open dissatisfaction by the demand side, especially on concepts such as 'confidentiality' or 'privacy', typically belonging to Western cultures and not even understandable by the target population of this research. This is the reason why the exploration of this indicator has been minimized, in order to adapt the survey to the cultural context.

---

[8] Penchansky and Thomas (1981) published an article titled "The Concept of Access: Definition and Relationship to Consumer Satisfaction."

Affordability

The costs associated with the disease not only hamper the timely search for treatment, but can also have a serious negative impact on people's financial resources, contributing to impoverishing households living in resource-poor settings.

In 2004 Steven Russell published an article on *The economic burden of illness for households in developing countries*, in which he measured the economic costs and consequences of illness on households. His study observed that in low-income areas illness imposed high and regressive cost burdens on families hosting a sick person. Focusing on malaria, it was measured that the direct and indirect costs of this illness amounted to 10% of the family income. An even worse picture emerged when considering the costs associated with TB and HIV/AIDS (more than 10% of the income). 'Health service weaknesses, including low coverage, user charges, and poor quality of care, contributed to high costs in many countries'. Family living below the poverty threshold in low-income countries struggled to cope with ill-health burden, calling for a meaningful increase in health sector investments to expand access to preventive and curative health services.

Russell's intuition stressed the need to distinguish between direct costs (medical or non-medical), indirect costs and intangible, or indirect, costs. As explained in the conceptual framework of Russell's paper, the household is the unit of analysis chosen for assessing the costs of illnesses, since decision-making concerning care and coping strategies emerged from negotiations within the family.
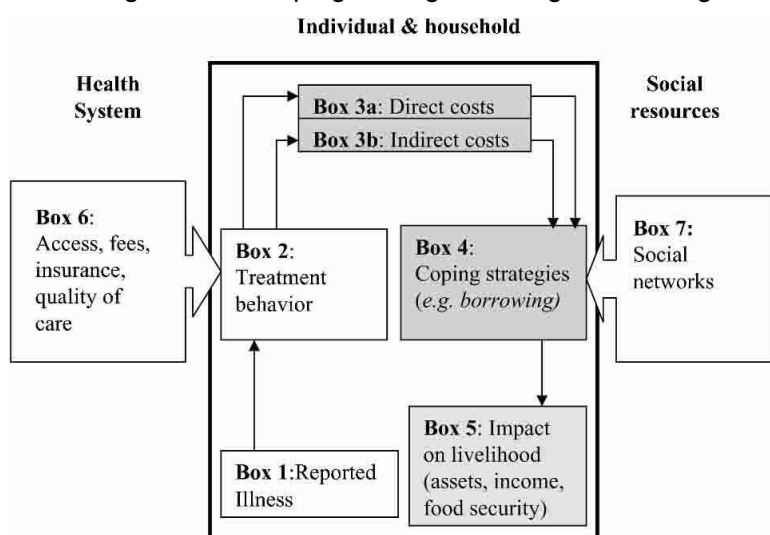
This figure, taken from Russell (2004), shows the consequences of the decision-making flow in response to perceived illness. Health seeking behaviour (Box 2) is influenced by different factors, including the local health system (Box 6).

Illness costs are pinpointed as follows:

I. direct costs, referring to household expenditure linked to seeking and receiving treatment, such as hospital costs, practitioners' fees or medicine costs, as well as non-medical expenses such as transport, meals and accommodation (direct non-medical costs).

II. indirect costs, considered as the loss of productive time—both of patients and caregivers—due to morbidity. A relevant sub-category of indirect costs are intangible costs. They are often incalculable, since certain effects of sickness cannot be directly converted into monetary values. These include some infirmity long-term out-turns such as abandonment of schooling, disability and deformity, social exclusion, and psychosocial factors.

Within research on HSB, considering the cost burden is therefore essential, as well as analysing resource seeking, and coping strategies become crucial.

Resource seeking and coping strategies

Households are frequently unable to cover illness costs with their own financial resources, thus employ various strategies to obtain adequate means, often pursuing a multi-step approach. Unfortunately, this path is irrespective of the urgency of treatment needs and may vary in time depending on social networks or actual coincidences and is closely influenced by social vulnerability.

The second category considered concerns coping strategies, 'which are punctual strategies activated in order to cope with disease' (Hausmann-Muela et al., 2012). Although strategies may vary between countries and cultures, in 2019 WFP proposed a comprehensive list of possible coping strategies that a household can go for (Sudan Comprehensive Food Security Assessment 2018). The WFP strategies have been adopted in this study providing a valuable opportunity to compare results to the baseline based on 2018 data.

The ability to activate relevant networks when asking for support is a key factor for moving forward with the treatment. Regrettably, a household may find itself in the condition of delaying or, even more sadly, abandoning the treatment because of the risk to stress the family budget, thus increasing the vulnerability of the affected patient (Swift J. 1989, Chambers R. 1995).

CONTEXTUAL FRAMEWORK

The Primary Health Care Sector in Sudan, an overview

Health is central to the 2030 Agenda for Sustainable Development as it relates to many of the Sustainable Development Goals and is the specific focus of Goal 3 (Ensure healthy lives and promote well-being for all at all ages). Commitment to equity and leaving no one behind is captured in target 3.8 on achieving Universal Health Coverage (UHC). Universal health coverage means that all individuals and communities receive the health services they need—including promotive, protective, preventive, curative, rehabilitative and palliative services—of sufficient quality, without experiencing financial hardship.

The demonstrated links of Primary Health Care (PHC) to better health outcomes, improved equity, increased health security and better cost-efficiency make primary health care the cornerstone of health systems strengthening. Health systems built on the foundation of primary health care are essential to achieve universal health coverage.[9]

Despite its importance, PHC in the country has suffered from low political priority and financing, inefficient organisation, weak performance measurement, and lack of a clear and efficient operational framework. Sudan is struggling in understanding how to structurally engage the national PHC initiatives in a national UHC reform. Despite increasing the tax-based financing system and broadening the national insurance coverage, they are still well below expectations. The will to maximise the utilisation of resources and to increase the investments in the PHC sector, as well as the possibility to finance the essential Basic Health Services Package (BHSP) for the whole population regardless the insurance coverage or the economic status, is still a remote goal.

Sudan health performances are significantly deficient compared to countries with similar demographic and economic figures, especially when looking at basic outcomes such as for maternal and child health (Tables 2,3,4). Maternal and child mortality ratios ranked Sudan among the weakest LIC of sub-Saharan Africa. Moreover, health indicators vary considerably across states, drawing attention to inequality

---

[9] WHO-UNICEF, Operational Framework for Primary Health Care Transforming Vision Into Action (2020)

between rural and urban areas, and between different localities. Inequality in service coverage is also strictly related to income and education levels[10] (Table 3).

	Neonatal mortality	Post-natal mortality	Infant mortality	Child mortality	< 5 mortality
■ Red Sead	18.60	25.60	44.20	17.90	61.30
■ Gedaref	32.60	20.80	53.40	24.60	76.70
■ Kassala	47.20	15.00	62.10	19.70	80.50
■ Khartoum	30.50	14.60	45.10	4.90	49.80
■ Rural	30.40	21.10	54.50	19.30	72.80
■ Urban	30.30	14.80	45.10	18.80	56.50

Figure 2. Early childhood mortality rate per area/State (MICS 2014)
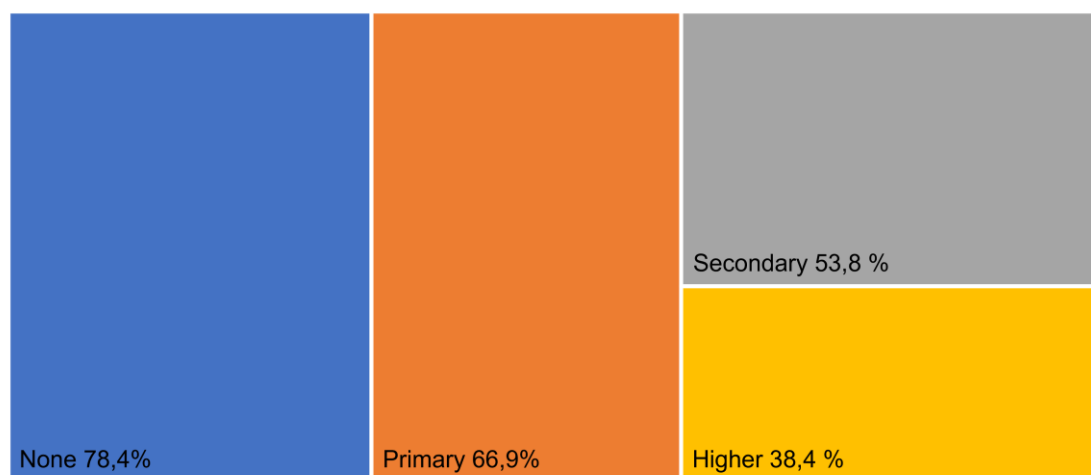
Figure 3. <5 mortality rate by mothers' education (MICS 2014)

---

[10] MoH and Central Bureaus of Statistics, Sudan Household Health Survey (2010), link ; UNICEF, Sudan MICS (2014), link

	Neonatal mortality	Post-natal mortality	Infant mortality	Child mortality	< 5 mortality
■ Richest	25.70	8.20	33.90	5.70	39.40
■ Fourth	25.00	17.70	42.70	17.70	59.60
■ Middle	31.20	19.20	50.30	18.20	67.70
■ Second	36.00	24.30	60.30	20.90	79.90
■ Poorest	41.10	23.80	64.90	20.60	84.20
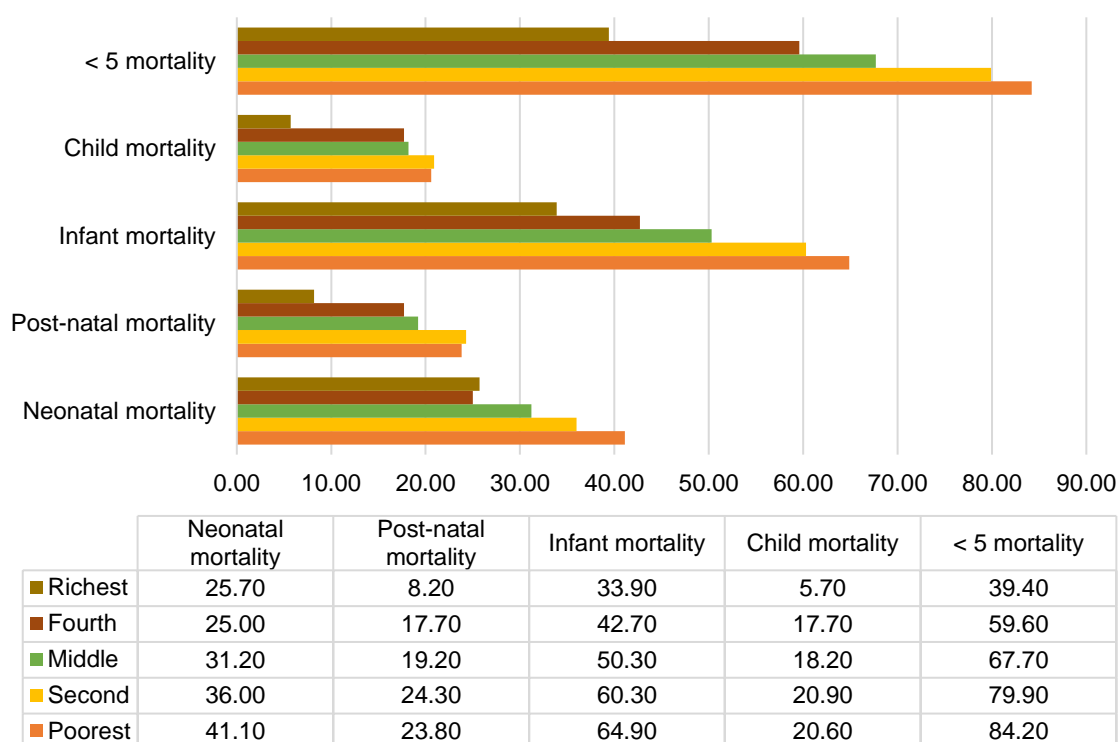
Figure 4. Early childhood mortality rate per wealth index quintile (MICS 2014)

Ensuring alignment between policies, objectives of national health financing reforms and PHC operational framework, is an essential step towards a real UHC. Misalignments can negatively impact on both the service providers and the health seekers.

Health system organization and financing mechanism
Health is a priority in the social development agenda of the country.

In August 2019, the Transitional Military Council (TMC) and the Forces for Freedom and Change (FFC) initiated a Constitutional Declaration that replaced the Sudan's 2005 Interim Constitution and would govern the three-year transition period. Within Chapter 4, *Rights and freedom Charter*, the Sudan Constitutional Declaration clearly refers to the right to health in two key articles:

- Art. 48. Women's rights, clause 5 'The state shall provide free healthcare for motherhood, childhood and pregnant women.'

- Art. 64 Right to health 'The state shall undertake to provide primary health care and emergency services free of charge for all citizens, develop public health, and establish, develop and qualify basic treatment and diagnostic institutions.'

The goal is ambitious compared to the baseline from which the Sudanese transitional government took its first steps. However, not impossible.

Under the previous regime, an attempt was made in 2012, when the Government launched the PHC Expansion project. At the time only 24% of the population were provided with a comprehensive package of PHC services, thus the Government stated four main goals to be reached by the end of 2020:

- to increase the proportion of citizens covered by PHC services to 100%

- to increase the coverage of the existing health units by full packages of PHC equipment and staff to 100%

- to provide PHC services while ensuring sustainability

- to ensure insurance coverage, or financial protection, for all poor people, enabling them to benefit from health services (PHI, 2020).

Although notable results were achieved by 2018, the goal is still far from being completely achieved in terms of health units and centres established and training provided to health human resources.

As anticipated, health services are provided by the government, at federal and state levels, and by health sub-systems such as insurance schemes, armed forces and private service providers. The National Health Insurance Fund (NHIF), besides being a financial body for the health sector, has its own health facilities mainly located in big urban areas. The armed forces and the parastatal organisations have their own health networks as well. Finally, the private sector is providing a large number of additional services, even though concentrated in major cities and focusing on the more remunerative curative care.

That said, the public sector is the main entry point to health coverage for the larger population, since it is the most capillary and affordable channel. The public health service management is developed in a three-fold structure:

- Federal Minister of Health (FMoH)

- State Ministry of Health, in each decentralized state (SMoH)

- Locality Health Management Authority (LHMA).

The provision of PHC services is delivered through three levels of access (primary, secondary, and tertiary level), depending on i) the population per catchment area, ii) the level of specialization of the services needed. According to Standards and metrologies of Sudan Health System '*Services and Health Units*' (FMoH, 2010), the PHC package should be provided mainly through primary and secondary level facilities such as rural hospitals, family health centres and family health units. Nonetheless, due to low financing and limited staff capacities at the local management level, most facilities rely on the direct supervision of the State Ministry of Health for financing, accounting and strategic decision-making.

It is worth focusing on the financing schemes taking place in the Sudanese health sector. The financial resources supporting the development of this sector mainly come from the Ministries of Health, the National Health Insurance Fund, the Armed Forces Health Insurance Schemes, the International Donors schemes and, not less important, the out-of-pocket (OOP) expenditures of health seekers, i.e. the expenditure that the household has to pay out of his pocket in case of illness of any member of the family.

According to the *System of Health Accounts* (2018)[11], per capita health expenditure dwindled fromUS$ 132.3 in 2015 to US$ 58.8 in 2018, falling even below US$ 62 in 2011.

The 69% of the Current Health Expenditure comes from private sources and almost equals the OOP expenditure of the population, spending on average US$ 40.73 per capita on health. Normally, user fees are charged at public health facilities and are fully paid as out-of-pocket sums or as co-payments through insurance schemes (if covered or exempted/ waived), although the mechanisms and the eligibility criteria are not clearly identified.

---

[11] FMoH, WHO, *System of Health Accounts* Report (2018), link

The major consumption of private resources is mainly due to the steady decrease in government investments in the health sector. In 2018 the total General Government Health Expenditure—sourced by the Federal and States governments—amounted to US$ 594.2 million, or the 24.06% of the Current Health Expenditure, equal to less than US$ 15 per capita, far from covering the medical need of the population. The Government Health Expenditure as percentage of GDP was 1.15%.
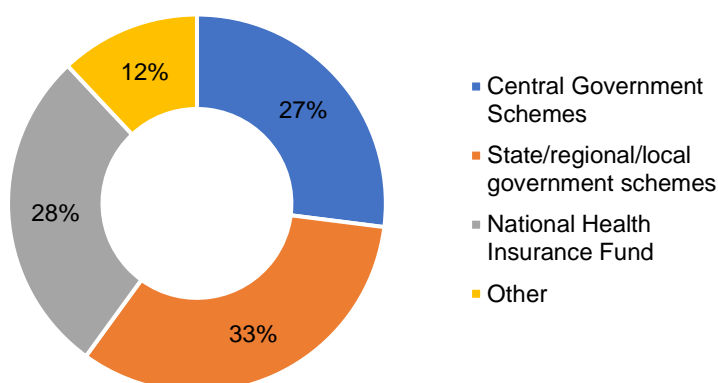
As for the 24.06% from public revenues, the main source are the Central government schemes, through the Federal Ministry of Finance (27%) and the State/regional/local government schemes (33%). Another relevant contribution comes from the Social Health Insurance (National Health Insurance Fund), contributing with the 28% to the public revenues for the Current Health Expenditure.

Figure 5. Public revenues of the Current Health Expenditure (CHE)

Financing Revenues		Amount USD	Percent	Amount SDG	Per Capita $US
Public Revenues		**594,291,998**	**24.06%**	**14,144,149,560**	14.16
	Central government schemes	163,506,941.89	6.62%	3,891,465,217.01	3.89
	State/regional/local government schemes	193,702,269.59	7.84%	4,610,114,016.28	4.61
	Social health insurance schemes	164,231,229.87	6.65%	3,908,703,271.00	3.91
	Other Public	72,851,556.98	2.95%	1,733,867,056.03	1.74
Private Revenues		**1,712,022,465**	**69.31%**	**40,746,134,674**	40.78
	Household funds	1,710,145,794.74	69.23%	40,701,469,914.88	40.73
	Other Private funds	1,876,670.55	0.08%	44,664,759.03	0.04
Rest of the World		**163,860,085.10**	**6.63%**	**3,899,870,025.33**	3.90
	Rest of the World	163,860,085.10	6.63%	3,899,870,025.33	3.90
Total CHE		2,470,174,549	100%	58,790,154,259.56	58.84
Capital Expenditure		98,611,647.67		2,346,957,214.58	2.35
THE		2,568,786,196		61,137,111,474	61.2

Table 2. Health Financing Revenues (2018).
Source: System of health accounts report (WHO, FMoH)

In Sudan, Health Care Services Providers receive funds from financing agents in exchange for, or in anticipation of, providing the required health care services. Generally, the most substantial funds are allocated to hospitals and ambulatory care providers (88.8%), while **only 5.9% is allocated to preventive care services. Sudan health care delivery system is curative biased**. It is evident from the fact that almost 89% of the Current Health Expenditure is for curative services, and from the 99.5% of households' health expenses allocated to curative care, while prevention received less than 0.5%. These data show how the awareness on preventive care and a healthy lifestyle is completely absent among the Sudanese population.

A detailed picture of the household Out-Of-Pocket Expenditure on Health is reported in Table 3. Over 36% of OOP is spent at the primary health care centres, mainly for paying user fees and medicine costs, while 40.8% is spent at general hospitals.

Provider description	Amount (SDG)
General hospitals	16.590.693.955
Specialized hospitals	70.917.978
Offices of medical specialists	6.516.985.511
Unspecified medical practices	2.205.702.887
Dental practice	484.719.890
Health care centres	14.651.096.618
Providers of preventive care	181.353.075
Total	**40.701.469.915**

Table 3. Household Direct Out-Of-Pocket Expenditure by Service Providers (2018).
Source: System of health accounts report (WHO, FMoH)

These findings should act as an alarm bell to government policy makers. As anticipated above, the Sudanese Constitution states that the provision of primary care should be granted, free of charge, to the whole population. A clear implication of the evidence reported on health accounting should go in the direction of generating additional public resources, to boost the General Government Health Expenditure especially in the provision of primary health care services, but also in raising awareness on the importance of preventive care.

Family health in Sudan

The Public Health Institute conducted a situational analysis in June 2015 on practicing family physicians and trainees at Khartoum and Gezira States level (PHI, 2016).

Concerning the **governance of family health practice**, it was found that in Khartoum and Gezira states there was strong political commitment to support implementation of family medicine programme. Nonetheless, there was no written policy governing and directing the current efforts in implementing family health practice. Job descriptions for Family Practitioners as well as other paramedics at PHC level were developed by FMOH, although formal endorsement and dissemination was not done properly. The Gezira State Ministry of Health designated a department for the family medicine program. Its role is focused on managing and coordinating the training of family medicine students at family health centres, and not extended to service provision at PHC level in the holistic and comprehensive way described in the conceptual framework.

Reform in health information is still underway to provide better integration and to improve reporting and information quality at all health system levels, including PHC at first and second levels. However, adopting a family practice approach and reforming PHC financing should have implications on the set of indicators, including quality and performance indicators, to be adopted by the whole health information system.

As for resources and capacity building, the current undergraduate training is generally clinical-oriented and scarcely addresses other dimensions of the holistic approach to health, as defined by WHO. Family medicine training programs are relatively new in Sudan. There are five (5) institutions currently offering a

degree in family medicine. Four of these institutions are located in Khartoum and one in Gezira. The FMoH in collaboration with the PHI adopted a family medicine master training program in 2012. The Sudan Medical Specialization Board (SMSB) also provides a four-year family medicine training and a MD degree for trainees (program established in 2010). The University of Medical Sciences and technology (UMST) is also considered a pioneer institution, which started the family medicine program by a one-year diploma in 2006. Nevertheless, candidates were sent to work in Saudi Arabia upon completion of the program. Alzaem Alzahari University has recently established a family medicine program as well.

One of the biggest challenges is the fact that the majority of family medicine graduates migrate to the gulf and elsewhere, leaving an exceptionally small number of physicians in the country performing this profession.

According to the PHC mapping survey in 2012, a minimum of 2,417 FPs is needed[12]. For this critical human resource mass to be built, an innovative strategy is needed in the shortest time possible, as well as measures to prevent the current massive brain drain to neighbouring countries.

Sudan Family Medicine Association was established in 2014 as a professional body to advocate for the new discipline, but it is not working well.

There are **major gaps** in the current implementation of the family health service model within the health system in Sudan, including:

- financing of the family health services

- making the discipline attractive

- retaining family physicians

- building relations in/with the family health teams

- establishing dedicated gates for patients when contacting the health system, depending on specific needs and on the urgency level (to date, they can enter at any point)

- setting up a referral system (a two-way feedback pathway for exchanging information on cases between the referring and referred facility)

- ensuring continuity of care, and

- other organizational issues.

Looking at the financing mechanism of family health services, the situation does not appear any different from the picture given above when considering the general health system organization and financing. Although localities are supposed to take responsibility for all issues relating to PHC services, in the current practice they actually play a minimal role. Part of PHC services is provided free of charge, while for the remaining out-of-pocket (OOP) fees are applied. Service providers' payment is mainly made through salaries paid by State Ministry of Finance. However, with the introduction of family medicine program no changes had been made regarding the financing system. As a result, the majority of physicians are still not satisfied with their income in consideration of their workloads, and compared to other specialists.

Mental health in Sudan

The principles of PHC were first outlined in the Declaration of Alma-Ata in 1978. Forty years later, global leaders ratified the Declaration of Astana at the Global Conference on Primary Health Care which took place in Kazakhstan in October 2018.

---

[12] WHO EMRO, Family practice in the countries of the Eastern Medi- terranean region: A preliminary assessment (2014)

'Primary health care (PHC) addresses the majority of a person's health needs throughout their lifetime. This includes physical, **mental and social well-being** and it is people-centred rather than disease-centred. PHC is a whole-of-society approach that includes health promotion, disease prevention, treatment, rehabilitation and palliative care.' [13]

Determinants of mental health and mental disorders include not only individual attributes such as the ability to manage one's thoughts, emotions, behaviours and interactions with others, but also social, cultural, economic, political and environmental factors such as national policies, social protection, living and working conditions, and community social supports.

Mental disorders often affect and are affected by other diseases such as cancer, cardiovascular disease and HIV infection/AIDS, thus require common services and resource mobilization efforts. For instance, there is evidence that depression predisposes people to myocardial infarction and diabetes, both of which conversely increase the likelihood of depression. Many risk factors such as low socioeconomic status, alcohol use and stress are common to both mental disorders and other noncommunicable diseases (WHO, Mental Health Action Plan 2013-2030).

Every person deserves the right care and should be ensured the right to receive primary health care, starting within the community, under a proximity principle. This applies especially to youth, since exposure to adversity at a young age is an established preventable risk factor for mental disorders. This is a fundamental premise of both, primary health care and family medicine approach, both based on common roots such as:

- meeting people's health needs throughout their lives

- addressing the broader determinants of health through multisectoral policy and action

- empowering individuals, families and communities to take charge of their own health.

The WHO's definition of PHC is particularly relevant to this research, since it includes '*mental and social well-being*' among the person's health needs throughout a lifetime, meaning that it is part of the fundamental health rights that a government should ensure to its population.

A broad definition of mental health is provided again by WHO, considering it as 'a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to his/her community.' [14]

With these guiding principles in mind, it is appropriate to consider mental health in the Sudanese context. The mental health legislation was established in 1975 and is currently under revision. Although a Mental Health Act was drafted in 1998, the Parliament approved it only in June 2018.

Mental health finally became part of the PCH service package. Specifically, Primary Mental Health Care (P(M)HC) should include the following services:

- psychological health education for the family coordinating provision of psychological care

- early diagnosis of psychological disorder (case detection)

- management of the provision of all necessary medications

- provision of care for children and teenagers

---

[13] WHO website, link
[14] WHO, UNICEF Operational Framework for PHC. Transforming Vision Into Action (2020)

- mental health education and awareness

- identification and treatment of mental illness

The above-mentioned services should be provided at different entry level in the formal health system:

Service	Community level	PHC Unit	PHC Centre	Local Hospital
Diagnosis	-	Early diagnosis of psychological disorder	Early diagnosis of psychological disorder	. Early diagnosis of psychological disorder . Coordinating provision of psychological care . Monitoring system for patients
Treatment	-	-	-	Medications provision management
Health education & counselling	-	-	. Psychological health education for the family . Education and care provision for children and teenagers	. Psychological consultation

The most recent and reliable document available on the state of mental health in Sudan is the assessment conducted from the World Health Organization in 2009 using the Assessment Instrument for Mental Health Systems (WHO-AIMS). According to it, the mental health policy was revised in 2008 and was integrated with priorities such as:

- developing a mental health component in primary health care

- dedicated human resources

- involvement of users and families

- advocacy and promotion

- protection of users' human rights

- equality and access to mental health services across different groups

- quality improvement

- financing and

- monitoring system.

By taking into consideration the following further elements describing the mental health framework, it can be said that the Sudanese health authorities are still struggling to meet them.

Mental health in the country should be managed by a dedicated authority, the Mental Health Directorate, acting under each State Ministry of Health. As for the general health system, mental health services should be organized according to population/catchment areas. Nevertheless, the structure is strongly centralized and **mental hospitals, as well as the majority of inpatient and outpatient facilities providing mental health services, are located in Khartoum City**. Such a distribution of facilities hinders the access of the wider rural population to mental health services.

In 2009 there were 17 outpatient mental health facilities available in the country, of which none specifically dedicated to the psychosocial needs of children and adolescents. These facilities treated 162.2 users per

100,000 people from general populations, the majority of which were male (52%). People treated in the outpatient facilities were primarily diagnosed with schizophrenia and related disorders (25%), but data collection on morbidity is poor, hindering a real understanding of the epidemiology of mental disorders in the country. In the same way, the average number of contacts with each patient is unavailable. In fact, none of the facilities provides active follow-up in the community, and there are no mental health mobile teams.

Although all mental health facilities have at least one psychotropic medicine of each therapeutic class (anti-psychotic, antidepressant, mood stabilizer, anxiolytic, and antiepileptic medicines) available in the facility or in a near-by pharmacy all year round, such **medications are not provided free of charge except in psychiatric emergencies.**

Day treatment facilities are not available in the country and the facilities that can host PWMHDs are 7 major community-based residential care structures available at Khartoum level. Unfortunately, due to the deficient coordination with the central health system, no further information is available. The dialogue between the two levels is weakened by the types of players involved. The formal health system is not in charge of the management of the residential facilities, since they are generally run by traditional and faith healers. Hence, facilities are frequently turned into a shelter for both homeless people and individuals with mental health disorders, losing the focus (and the priority) on the target.

The 2 mental hospitals available in the country can provide 0.43 beds per 100,000 thousand people and are integrated with mental health outpatient facilities. Mental hospitals are constantly at their full capacities, hence the average number of days spent in mental hospitals does not overcome 14 days.

In addition to the public mental health service, 200 beds are also made available for PWMHDs in forensic inpatient units, and other 700 beds in further residential facilities led by traditional healers. Forensic facilities in 2008 treated 0.52 patients per 100,000 people. 66% of them spent less than one year there, while the remaining 34 % had their stays prolonged up to 1-4 year(s).

Whilst the number of beds increased by 25% in the period 2004-2009, the number of patients in hospital increased at the same rate.

As for the last two items of the priorities for the mental health policy, financing of mental health services is a sensible topic. **In 2018 mental hospitals received only 0.3% of the funds** dedicated to hospitals, with an investment per capita equal to US$ 0.1, a paltry amount. It is therefore not surprising that free access to essential psychotropic medicines is granted exclusively in psychiatric emergencies. For those who pay Out-Of-Pocket (OOP), the cost of antipsychotic medication equals to the 39% of the minimum daily wage, while the cost of antidepressant medication equals to the 16% of it (approximately 1 US$ per day for antipsychotic medication and 0.41 US$ for the latter). **No social insurance scheme is covering mental health services**.

The lack of funds has deep implications on the availability of dedicated human resources, as well as on the quality of their job. The **total number of specialized professionals** (psychiatrists, psychologists and social workers) **working in public and private mental health facilities was 0.2 per 100,000 people** in 2008 (WHO-AICS, 2009). Furthermore, private practice is largely unregulated, especially for psychologists and social workers.

In Sudan, psychiatrists, psychotherapists and psychologists are not the only professionals who can deal with mental health. Training in mental health care is addressed to primary care staff as well, although for an irrelevant proportion: medical doctors receive only 2% percent of training dedicated mental health training, and 4 % of the training to nurses, is devoted to mental health. Nonetheless, while nurses are not

allowed to prescribe psychotropic medications in any circumstance, primary health care doctors are allowed to prescribe essential psychotropic medications, as well as psychiatric medical assistants who abandoned their specialization studies.

A few (<20%) primary health care clinics conduct assessment and have treatment protocols in place for the main mental health conditions. Moreover, professional interaction between primary health care staff and mental health professionals is very poor, as well as with complementary /alternative/traditional practitioners.

As probably known, **Sudan has no existing national human rights review body**. Inspections of human rights protection in mental hospitals are sporadic and often inconsistent. Contextually, none of the mental health staff working in mental hospitals received any training on human rights protection.

As anticipated, figures on morbidity of mental disorders in Sudan, as well as responses to them, are dramatically poor. That said, a look at the mental well-being of the Sudanese population is provided by the 5th Population and Housing Census (2008)[15]. Among the broad categories and types of disabilities, listed on the basis of the International Classification of Impairments Disabilities and Handicaps (ICIDH), mental disability was considered as well. Results are resumed in the following tables, classified by disability, gender and living area.
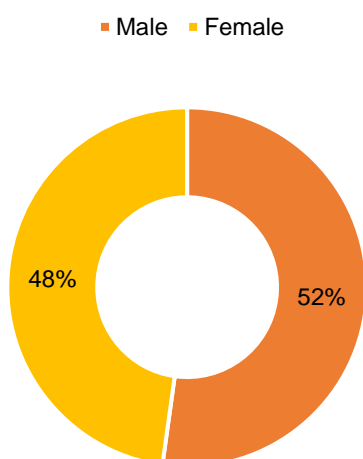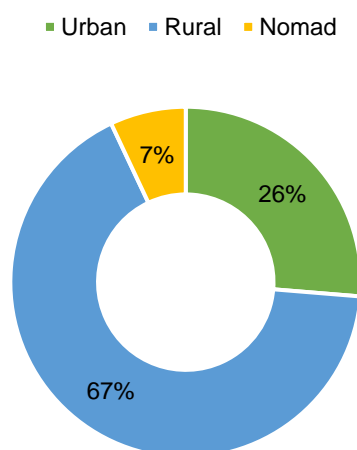

Figure 6. Disability / gender

Figure 7. Disability / mode of living

---

[15] UNSTATS findings on disability, *5th Population and Housing Census* (2008), link
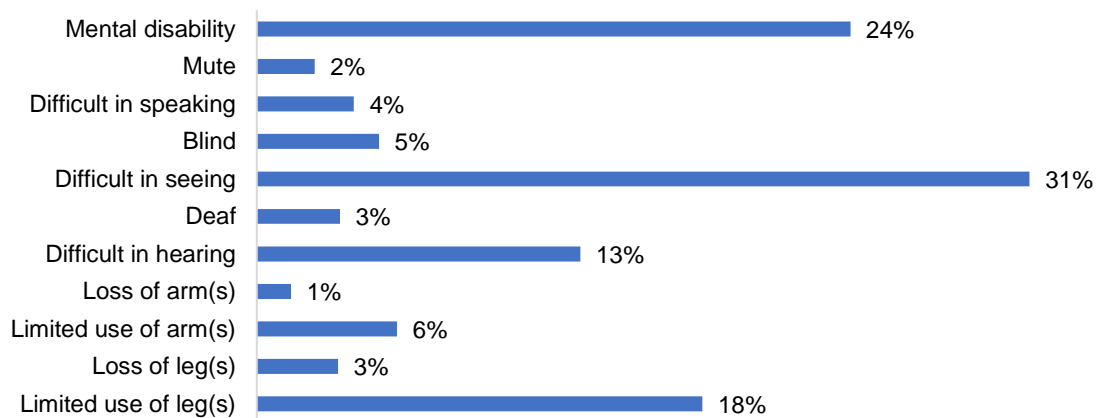
Figure 8. Disability per type

In 2008 the total population affected by a form of disability amounted to 1,854,985, 4.9% of the population. Yet, this figure is probably underestimated.

People with mental disorders often live-in vulnerable situations and may be excluded and marginalized from society, which constitutes a significant impediment to the achievement of national and international development goals. The Convention on the Rights of Persons with Disabilities, which is binding on State Parties that have ratified or acceded to it, protects and promotes the rights of all persons with disabilities, including those with mental and intellectual impairments, and also promotes their full inclusion in international cooperation including international development programmes.

A picture of the mental wellbeing of the Sudanese population can also be provided by the national suicide rate, which is considered as a relevant indicator in the United Nations Sustainable Development Goals (SDGs) under target 3.4, in the WHO 13th General Programme of Work 2019-2023[16] and in the WHO Mental Health Action Plan 2013-2030.

"People with mental disorders experience disproportionately higher rates of disability and mortality. For example, persons with major depression and schizophrenia have a 40% to 60% greater chance of dying prematurely than the general population, owing to physical health problems that are often left unattended (such as cancers, cardiovascular diseases, diabetes and HIV infection), and suicide".

"Globally, the majority of deaths by suicide occurred in low-and-middle-income countries (79%), where most of the world's population lives (84%). Regarding age, more than half (52.1%) of global suicides occurred before the age of 45 years. Most adolescents who died by suicide (90%) were from low- and middle-income countries where nearly 90% of the world's adolescents live […] Suicide is the second most common cause of death among young people worldwide".

Sudan perfectly matches with the trend, reporting a massive number of suicide cases (3,205 in 2016, 75% of which by males). The crude suicide rates per 100,000 people are among the highest in the Eastern Mediterranean Region. This figure is aligned to Yemen only, a country hit by what is considered the most terrible world humanitarian crisis, where 80% of the population is in need of primary assistance. Such data should prompt reflection on the importance of psychological support.

---

[16] WHO, *Suicide in the world. Global Health Estimates* (2019), link, CC BY-NC-SA 3.0 IGO

METHODOLOGY

Selection of enumerators

The management of the P(M)HC Research activities on the ground followed a pyramidal structure of human resources members of the KMOH and of AICS, whereby the research was ownership of the KMOH, but the Technical Assistance acting as the methodological coordinator of the research was provided by the Italian Cooperation. The organizational chart reported below shows the members involved in the field data collection and the mechanism of the team. Key figures of this structure are the Medical Advisor and the Coordinator of the enumerators for their precious role of linking the constrains and challenges coming from the field with the Methodological Coordinator, who converted the questionnaires into digital surveys and monitored the daily digital collection from the platform.

The teams of enumerators were constantly exchanging feedbacks through a WhatsApp group with the coordinator, who controlled the data collection of teams from the online platform, and in turn reported to the Director of the Statistics Department of the KMoH and to the AICS Medical Advisor. Both the latter worked in strict collaboration with the Methodological Coordinator supervising the progress of the entire research.

As already explained, the main workforce deployed in the filed were data collectors. The KMOH was assisted by the two AICS' consultants agreed on the selection criteria for 8 enumerators who were hired to cover every identified target location. These were selected on the basis of:

I.   Possession of technological / digital skills

II.   Knowledge of, and direct relationship with, PHC centres of the State.

III. Basic understanding of written and spoken English.

Enumerators were paired by putting together one person with strong digital competence and a second person with a reputable social competence recognised in the health community. The resulting couples, hence, were in general composed of i) a younger profile, skilled in the use of digital devices, and ii) a senior profile facilitating the access to PHC facilities thanks to his/her valuable reputation within the intervention communities. Senior profiles were also crucial in the resolution of logistical issues emerged on the way due to the lack of fuel and damages in the vehicles selected to drive the enumerators around.
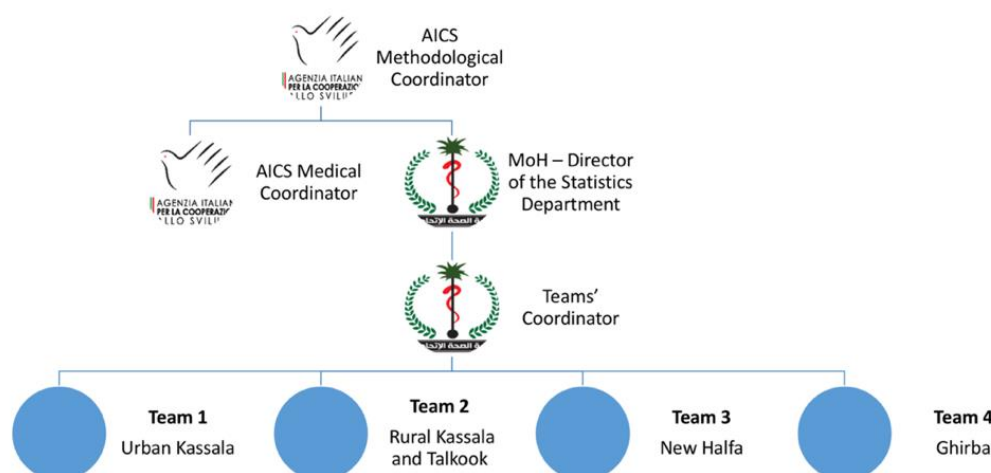
Training to enumerators

In November 2020 a training was held on the conduction of a digital data collection. The training targeted the 8 enumerators specifically hired by the KMOH to perform the task, the Medical Advisor and Coordinator of the enumerators. Basically, the team members were involved transversally at all levels, in order to have the same comprehension level of the language that would be spoken in the coming months. The training was designed, set up and performed by the Methodological Coordinator due to her previous experience acquired with digital surveys through different systems like the one used for the P(M)HC Research, i.e. the platform SurveyAnyPlace.

The tools were designed with the technical support of the AICS and besides the expertise of the local Medical Advisor, the KMOH Statistics Department, the PHC centres and units' Officer, and of the Mental Health Director, contributed to identifying a set of data collection tools adapted to the context and following a multidisciplinary approach. Prior to the training delivery, the tools were presented to enumerators for a further check, and during the training the tools were tested with the participants, in order to become acquainted with the devices and the application. The tools were set in English, but a printable Arabic version was distributed to enumerators for a deeper understanding of the items.

For details on the training, please refer to the manual 'Notes to the enumerators' (English and Arabic version), a complementary section coming together with the P(M)HC Research.

Data collection

The data collection was conducted between February and April 2021, with a supplementary data collection for the Demand Side executed in May 2021 further extending the research. The target of the Service Provider Side survey was a consistent sample of the PHC facilities located in four main areas within the Kassala State: Kassala Rural, Kassala Urban and Telkok, New Halpha, and Girba. The Demand Side surveys targeting patients were conducted in the same facilities targeted by the Service Provider Side survey.

The target areas, and consequently the facilities, were selected based on three main factors:

Transport: the fuel crisis hitting Sudan particularly affects the most decentralized States of the country, leading Kassala into an incessant dramatic lack of fuel for operations in all sectors. Although the KMOH itself contributed to the fuel stock, through its channel and through its own economic resources, deployment of field operations faced significant struggles.

In parallel to fuel shortages, vehicles were another challenge to face, since the selected ones needed structural maintenance.

Finally, the cars were mainly provided by the PHC centres themselves, and by privates who granted some vehicles to the P(M)HC Research thanks to the mediation of the KMOH.

Ethnical armed conflicts: in the months when the research was planned to be conducted, frequent clashes took place between different ethnical tribes (Beni Ameer, Nuba and Hadendowa …), contributing to movement restrictions, curfews, and recurring demonstrations blocking roads. These facts negatively impacted on the correct launch of the research, that was delayed to February. Moreover, clashes exposed team members to risk, depending on tribal belonging. Field visits were limited to the minimum in order to prevent any possible problem for human resources involved.

COVID-19 pandemic: the Covid-19 pandemic demonstrated that the whole world is truly connected in all its parts. Sudan has been hit like many other countries in the African continent, and restrictive measures have been imposed also in the state of Kassala, which, although less affected than the capital city, recorded a moderate number of cases as well. This contextual factor required the team to minimize exchange activities in group, thus affecting internal team building and close contacts with the respondents, creating a socially undesirable barrier.

Based on the three factors above, the target localities were identified within 150 Km from the KMOH headquarter in Kassala city, in order to cover urban, peri-urban and rural areas without putting at risk the staff, and ensuring the actual feasibility of the activities.

As for the size of the facilities, it was decided to exclude the PHC units due to the little services provided, and hence to focus mainly on PHC centres level, considered the capillary structure providing locally the widest range of services, as per the guidelines provided by the Federal Ministry of Health (FMoH) Standards and metrologies of Sudan Health System '*Services and Health Units*' (2010). The list of the health care facilities registered in the State was shared by the KMOH. After a further check by the research team, 137 PHC centres were found active (Urban Kassala 34, Rural Kassala 16, Telkok 10, Wadelhelew 8, River Atbara locality 9, West Kassala 5, North Delta locality - Wagar 6, New Halfa 28, Girba 12, Hamashkoreeb 2, Aroma 7). Following the rational described above, 100 facilities were targeted and 93 responded to the study.

Details of the effective target concerning the Service Provider side (PHC centres) are provided below:

Total PHC facilities to be interviewed in Kassala urban	30	
Total PHC facilities to be interviewed in Kassala rural and Talkok	24	**Total 93***
Total PHC facilities to be interviewed in New Halpha	28	
Total PHC facilities to be interviewed in Girba	12	

* During the research design phase, the goal was set to 100 facilities. Due the pandemic and the logistical challenges that enumerators might have faced along the data collection; it was decided to fly high in order to reach the real goal of 90 PHC facilities. Finally, the strategy allowed the study to reach 93 facilities.

As for the sample for the Demand Side, the target were randomly selected people receiving medical care services (for them or for a relative they were accompanying) in the waiting room of the PHC facilities listed above. **304 people** answered the survey on voluntary base, without receiving compensation, excluding persons with serious diseases.

Data collection was digitally conducted through an application working in online and offline mode. The digitalization of the surveys facilitated the collection of a significant amount of data in a very short time, but also ensured the consistency of data reported in the answers, reducing empty answers and calligraphic interpretation. The name of the facility, the address and date of the interview are reported in *Annex I* at the end of the report. The application was installed on four tablets (one per team) allowing the enumerators to work in parallel in different areas of the State. The reasons for this choice are i) the instability of the political context and the pandemic, considered highly risky for possible delays in the

research. Digital data collection halved the presence of enumerators in the field; ii) the aim of limiting environmental impact, since digital solutions reduce the amount of paper printed for each questionnaire.

	TOOL 1 Service providers' side	TOOL 2 Demand side	TOOL 3 Interviews
Service providers (*PHC facilities*)	*	-	-
Demand side (*patients*)	-	*	*
Methodology of collection	Digitally, through a Tablet	Digitally, through a Tablet	Through recording

The data collection was designed following two complementary methodological approaches:

I. **The quantitative methodology,** with information from care service providers and recipients made it possible to quantify the consistency of the health services offered in the region and their accessibility. Surveys were designed according to a theoretical framework which had been developed in the African context to study malaria, the PASS-model, whose indicators system was replicated to assess care and resource seeking. As for the Demand Side, the WFP's Coping Strategies Index was used to understand the incidence of poverty on access to health. The information collected came from both the Service Provider and the Demand sides, in order to give an objective and representative picture of the broader aspect of 'access' to healthcare. The study also provides useful indications extrapolated from collected data, including about access to mental healthcare.

II. **The qualitative methodology,** instead, aimed at in-depth exploring the pivotal theme of our research, namely mental health. For this methodology, theories from sociology, social psychology and ethno-psychiatry acted as a guide. Qualitative interviews were conducted by a Sudanese doctor, native to Eastern Sudan, together with a social worker who was the focal health professional for people with mental health disorders (PWMHDs). Qualitative interviews have been performed under the strict guidance of the Methodological Coordinator, an Italian psychologist. The team of professionals performed the interviews inside the private houses of the families hosting PWMHDs who welcomed with enthusiasm the visits of the team. Through this direct interaction with family members and the informal setting, the team explored the representation of mental disorders and how they are formally caught by the health system.

Social representations vary according to culture and historical moment. Understanding their meaning is a necessary step for identifying interventions that may be suitable for the target communities, and therefore effective. Going into the details, the three tools used are described below.

Questionnaire for the Service Provider side. It is a questionnaire to be answered by medical and administrative staff of the PHC facilities and composed of 75 items grouped into the following indicators and sub-indicators:

Indicators	Sub-indicators	Indicators	Sub-indicators
Accessibility to health care	1. Identification data and distance from health resources	Availability of health care	6. Equipment
	2. Mobility factors	Affordability of health care and sustainability of the services	7. Finance
	3. General information		8. Health information system
Availability of health care	4. Staff	Inclusion of health care	9. Facilities for disability
	5. Services	Compliance with safety measures	10. Covid-19

Questionnaire for Demand side. It is a questionnaire addressing the population in their role as potential and effective clients of the health system. The population sample was identified and interviewed at the PHC facilities. This questionnaire is composed of 36 items grouped into the following indicators and sub-indicators:

Indicators	Sub-indicators	Indicators	Sub-indicators
Patients segmentation	1. Socio-economic and demographic data	Acceptability of health care	5. Perceived distance between the provider and the demand sides
Availability of health care	2. Availability of preventive initiatives	Affordability of health care	6. Accommodation
Accessibility to health care	3. Distance from health resources		7. Health expenditure management
	4. Waiting time at the health centre		8. Coping strategies

Qualitative interviews. Although the geographical target of the study counts four main areas, for qualitative interviews the team exclusively focused on urban Kassala. Tribal clashes, closure of bridges and fuel price inflation led the team to go for precautional measures preventing travel and safety complications. Furthermore, the only health facility offering psychiatric service is based in the capital of the state and is the Kassala Hospital. Likewise, the Mental Health Directorate (KMOH) is based in Kassala city as well. This institution was recently established thanks to the support of UNICEF and offers psychological support to PWMHDs in collaboration with the hospital psychiatric department.

The tool consists of a grid with guiding questions exploring various aspects contributing to tracing the social representation that the Kassala community shares around mental disorders.

The outputs from the interviews were included as quotations in the 'Demand analyses. They support evidence coming from the data collected through the Demand Side survey targeting a random sample of PWMHD's families facing constraints affecting care. In addition to this, from the analysis of qualitative interviews it was possible to outline the current state of the mental health services available specifically in Kassala, which is presented in the chapter 'Mental health in Kassala State'.

The open questions aimed at investigating the following:

I° Part: social representations of mental health disability

Objective: To explore the representation of the mental disability within the nuclear family and at community level (extended family, neighbourhood, religious community, educational / work environment): causes and long-term impact of the disability.

- Exploring the causes of the mental disorder
- Investigating the onset and manifestations of mental disorder
- Exploring the long-term impact of the disability
- Investigating the main elements of change within the ordinary life of the family, how they re-organize themselves, what meaning they attribute to changes

Objective: To explore social values and stigma within the community to which the PWMHD belongs.

- Investigating perceived representation of mental disability by the community, and whether people accept or not the mental disability
- Exploring social values within the community
- Investigating what public spaces are avoided for fear of shame, losing face, social discrediting

II° Part: building the ordinary day life within the community
Objective: To understand social pressure and social support/networks affecting the nuclear family.

- Exploring the social structure around the individual with mental disability and taking care of him/her, and the role of each individual within the structure (exploring Gender roles and relations, Age and authority, Social position, Age and sex of the ill person, Social position and social capital, Severity, length and costs of the illness)
- Investigating positive and negative elements of the new routine
- Investigating concerns and thoughts about the future

III° Part: access to health care
Objective: To explore barriers and facilitators to access to primary health care.

- Investigating trust in the main actors involved in the management process (recognition, treatment and cure) of the disease.

SERVICE PROVIDER ANALYSIS

This service provider analysis relies on the collection of primary data and feedback through the survey submitted to medical and administrative staff working at the target PHC facilities. Where relevant, the findings from the original research are integrated with results from other assessments and studies. The section is structured around six indicators and ten sub-categories of analysis: (i) identification data and distance from health resources; (ii) mobility factors; (iii) general information; (iv) staff; (v) services; (vi) equipment; (vii) finance; (vii) health information system; (ix) facilities for disability; (x) covid-19.

Indicator: Accessibility to health care

IDENTIFICATION DATA AND DISTANCE FROM HEALTH RESOURCES. Notwithstanding the original priority given to PHC centres, only 17 facilities were found sticking to FMOH requirements: 'Family Health Centres serve a community with a population not less than 10.000 persons and diameter of geographical area of a diameter of 5km'. 62 facilities out of 93 turned out to be not in compliance with parameters, thus were downgraded to PHC units, while 14 facilities could not be considered as neither centres (catchment area < 10,000 people) nor units (catchment area > 5,000 people). On the other hand, among the facilities not matching with the guiding standards, 19 are covering a geographical area even wider than expected (more than 5 km).

On the whole, the facilities targeted by the study served a population of **549,741** people, segregated per locality as indicated in the table:

Population served by the facility (No.)	**549,741**
Kassala town	298,563
Rural Kassala	75,221
Telkok	41,015
Al Girba	55,700
New Halfa	79,242

Table 4. Population served by the targeted PHC facility in the Kassala State

The average number of rooms per health facility is around 5.32, with this value gradually decreasing as the distance from the capital city increases (Al Girba with a mean of 4.33 and New Halfa of 4.25).

A similar trend was recorded for the number of beds. The average in the State is 3.36, decreasing as the distance from Kassala city increases, but the only locality significantly left behind is Al Girba, with a mean of 1.33 beds for patients.

The number of patients covered per month is in line with the population share residing in each locality. On average, 0.96% of the covered population knock on the door of PHC facilities to get health services. Only in New Halfa this percentage falls to 0.28% with a mean of 223.21 people assisted each month.

A strength of the PHC facilities of the whole region is the fixed opening hours. Although opening hours vary from facility to facility, with 24-hour opening or not, facilities are open on average 6.22 hours per day, with a peak of 8.22 hours in Telkok.

MOBILITY FACTORS. This indicator considered two main sub-categories: the state of the road and the transport options available to get to the health care facility.

Roads within 5 Km from the PCH facility are paved in 59% of cases, although in rural areas such as Rural Kassala (77%) and Telkok (100%), the viable roads to reach the health care facilities are unpaved. This data might represent a challenge especially during the rainy season, considering that water turns roads into a muddy soil barely accessible to pick-ups, preventing the majority of the population from reaching health services.

Illumination is considered another key element determining the safety during transfers towards PHC facilities. Only 51% of the roads leading to the facilities are provided with artificial lights, and in rural areas such as Rural Kassala (77%), Telkok (100%) and Al Girba (75%) the illumination is completely absent. That said, this seems to be no problem, since the facilities open in the early morning and close around 5 p.m, although the way back home can be protracted even after sunset. Women and children, in particular, are vulnerable targets in dark hours, reason why special attention should be paid to these patients.

As for the availability of emergency services on the road to get to a health facility in case of accident, the rural areas of Rural Kassala, Telkok and Al Girba are almost completely uncovered, while Urban Kassala and New Halfa have a partial service. In fact, only 6 facilities in Kassala and 14 in New Halfa declare that emergency services are available in the area.

Notwithstanding the deficiency of rescue services, the state of the road is considered sufficiently safe, by 96% of the interviewed facilities concerning the 'presence of risk of attack for robbery along the roads to get the health facility', and by 92% concerning the 'presence of risk of obstacles along the roads to get the health facility (broken tires, animals, rocks…)'. Even so, perception of the status of the road could be influenced by the context people live in, and respondents might have been biased towards a safety status not corresponding to the safety standards applied in other countries. The actual number of accidents occurred on the roads in a year, paired with the corresponding cause of the accident, would have been a more indicative item.

To conclude the assessment of the mobility factor, transport options available to get to the health care facility have been investigated. 90 facilities out of 93 are not provided with a vehicle to reach patients, both for home outpatient services and for emergency cases. The most common means of transport to reach health care services is public transport (available to reach 68% of the facilities) and, in 33% of cases, the motorcycle taxi. The taxi option is available only for the Kassala main town.

GENERAL INFORMATION. This indicator collects different features considered relevant for the assessment. The hygiene level is a countercheck for COVID-19 compliance, but at the same time can offer useful indications on the quality of the services offered by the facility, since it contributes to the mitigation of disease spreading and contaminations.

The hygiene level has been evaluated through observation by enumerators. Barely 5 out of 93 facilities were found having 'needles or sharp instruments on the ground', and only 7 showing 'blood or any body fluids evidence' within the structure. Another encouraging figure is 62 facilities applying policies for waste separation. Rural Kassala (77% of the centres) and Al Girba (66% of the centres) are the localities mainly lacking awareness on the topic. On the contrary, when coming to the basic hygienic routine of wearing gloves when getting in physical contact with patient, the percentage of facilities complying with the policy falls to only 44%. Conversely to the trend, urban Kassala is showing a poor outcome as for the rural areas (77% of the facilities not complying with the policy). Yet, New Halfa appears to be the locality chiefly sticking to the rule (96% of the facilities complying with the policy).

Within general information, awareness-raising activities were explored as well. The facilities were asked about 'materials on prevention and treatment of common diseases' (Al Girba turned out to be the most

inactive locality, with the majority of its facilities (66%) not even hanging up nor distributing awareness materials) and 'awareness raising activities on prevention and treatment of common diseases'. Among the 74 facilities offering at least awareness materials, only 42 are actively implementing activities to raise awareness in the communities. New Halfa appears to be the most proactive, with 27 out of 28 facilities moving in this direction and, in the totality of cases, awareness activities led outside the facility (100%), while Urban Kassala, Telkok and Al Girba facilities preferred the implementation of internal interventions. Besides the location, awareness activities are run on average 20-24 times per year, with the exception of New Halfa, which, despite the proactivity, did not reported more than 2 events per year, decreasing its average of events/year to 1.5. The topics commonly reported are those listed below:

- Malaria, haemorrhagic fevers and prevention (e.g. mosquito nets)
- Nutrition
- Infection control and immunization
- Reproductive health
- HIV / AIDS

- Water diarrhoea
- Covid-19
- General health promotion (e.g., hand washing)
- Tuberculosis

It is relevant to note that awareness raising on tuberculosis is led exclusively in Telkok, revealing a possible recurrence of the disease in this area.

Another issue that is worth noting rises from some missing information. In the list of the awareness campaign topics there is no trace of female cancer prevention, although events are nonetheless promoted at least in the main city of Kassala. A proof of it is the copious events organized on the 8th March for the International Women's Day, a recurring event that International Organizations and NGOs usually take advantage of for raising awareness among the population on women rights, including the right to health and specifically female health. Activities are usually carried out in collaboration with the state ministries of health and with the involvement of local PHC facilities for their extensiveness. Hence, the missing topic among the ones reported by the survey respondents should be further investigated. Even though the missing evidence could have been expected in rural areas, where gender issues might be still considered a sensible topic, this is not the case in Kassala urban areas.

Moreover, within general information the recurrency of training to staff was also surveyed. 62% of the facilities declare to be actively providing their personnel with continuing education programs (apart from facilities located in rural Kassala, 0%) on an average basis of 2 trainings minimum per year (58% of the facilities). Supplementary information should be collected about the subjects of the trainings and their targets. Moreover, it should be understood whether the target of continuing education is effectively inside a path oriented to boost the capacity of permanent staff. If turnover is high, efforts on capacity building are reset at every loss of trained staff.

Finally, the survey explored which of the interviewed facilities have already benefited from any Italian Cooperation intervention, and showed that 27 (out 93) PHC centres are or were included in programs promoted by the Italian Agency for Development and Cooperation, the majority of which in Kassala town (9), Telkok (6) and New Halfa (6).

Indicator: Accessibility of health care

STAFF and SERVICES. The basic and the additional care services expected to be run by each Family Health Centre are indicated by the FMOH in the 2010 green booklet and are reported in the following chart:

Essential cadres	Minimum	Essential cadres	Minimum
Family medicine specialist	1	EPI & nutrition cadres	1
Medical officer	1	Statistics technician	1
Lab technician	1	Health visitor	1
Nursing technician	3	Psychologist	1
Pharmacist	1	Health overseer	1
Additional cadres		Additional cadres	
Midwifery nurse	4	X – ray technician	2
Dentist	1	Ophthalmology technician	1
Dental technician	1	Ultrasound technician	1

Table 5. Health cadres expected to run each Family Health Centre (Green Booklet FMOH, 2010)

Nevertheless, the assessment gave a different picture, as indicated by the data collected and resumed in the table below.

	Kassala U.	Kassala R.	Telkok	Al Girba	New Halfa
Family Physician	2	0	0	0	0
Medical officer	30	2	0	5	1
Medical assistant	28	14	5	11	27
Obstetrics & Gynaecologist	2	1	0	0	0
Paediatrician	0	0	0	0	0
Dental assistant	10	0	0	1	0
Dermatologist	0	0	0	0	0
Assistant ophthalmologist	7	0	0	0	0
X-ray technician	0	0	0	0	0
Ultrasound technician	0	0	0	0	0
Psychologist *	0*	0*	0*	0*	0*
Psychiatrist *	0*	0*	0*	0*	0*
Physiotherapist / Physical rehabilitator *	0*	0*	0*	0*	0*
Health visitor	27	5	0	2	14
Midwives	72	33	16	32	93
Nurses	52	18	6	7	16
Nutritionists	29	11	4	12	23
Pharmacist assistant	22	1	0	3	2
Laboratory technician	59	14	0	11	20
Health promoter	1	6	0	0	0
Immunization technician	40	10	0	6	24
Statistics technician	30	2	0	0	4
Health observer	2	3	0	0	0
Social Researcher	0	0	0	0	0

In bold: basic cadres (2010 FMOH guidelines); <u>Underlined</u>: additional cadres (2010 FMOH guidelines)
Table 6. No. of professional available figures per each locality

Starting from the fundamental figure of the family medicine specialist (or physician), only two facilities in urban Kassala include such professionals. Medical officers, instead, are actually enrolled in each PHC facility of Kassala town, but the compliance is not met in the other localities, lacking strategic medical

chiefs. Therefore, decision-making in most facilities lies with medical assistants, who are not graduated doctors, but young professionals still on their educational paths.

An interesting output concerns the reproductive health specialists. Within the FMOH green booklet significant attention is paid to the intervention area of 'family, mother and child health', that should be composed of the following package:

- Antenatal, natal and post-natal care, as well as infant care and family planning

- Provision of basic emergency obstetric care (EmNOC)

- Growth monitoring for children under 5 years of age in need of nutritional support, care and treatment

- Provision of all vaccination needed to protect all family members fromtargeted diseases

- Treatment of children according to the IMCI protocol

- Follow-up of defaulter and different diseases

- Selection and referral of cases that need upper-level treatment

- Registration of vital statistics data, especially related to death, birth and nomadic movement of the community, child and mother mortality, and regular reporting.

Nevertheless, the Obstetrics and Gynaecologists available in the State are 3 (covering Kassala area only) and Paediatricians are not even taken into consideration as essential professionals. This means that the whole antenatal, pre-natal and post-natal cares are left in the hands of nurses and especially midwives, who, on the contrary, are strongly present in each one of the target localities.

Medicine of the mouth, of the eyes and of the skin is consistently underdeveloped and underrepresented. Although dental specialists are included in the additional cadres serving Family Health Centres, only 11 dental assistants are available in the State, 10 of which based in Kassala town. Comparing this information to the next indicator 'services' used to countercheck the collected data, it turns out that the facility of Al Girba, where the dental assistant is available, lacks equipment for dental service. Hence, the service is not delivered.

An equivalent situation applies to ophthalmology services. There are only 7 facilities providing care for the eyes and they are all based in Kassala town, while no service is available in rural areas.

Another service not existing in the State is dermatology. It must be said that the federal policies do not expect Family centres to provide such medical service. Dermatology is included among the specializations that should be offered at the level of State general hospitals.

In the same way, x-ray and ultrasound technicians should complete the cadre of human resources of each PHC centre, but the data collected evidenced that none of these figures is present in any target locality.

Although minor surgery is a relevant service, especially considering that the rural areas where the assessment was conducted predominantly depend on agropastoral activities, this unit is inadequately developed. Only 25% of the facilities declared the service available, and 100% of the facilities in Al Girba and New Halfa reported a complete lack of equipment for minor operation rooms (see *Annex II*).

Considering the focus of this assessment, it is worth noting that the psychologist is listed in the basic and essential health staff for a PHC centre. Unfortunately, **0% of the PHC facilities covered by the assessment showed the availability of professional figures meeting the psychosocial needs of**

the population. Although the psychiatrist is not mentioned among the minimum human resources a PHC should have, the assessment investigated the presence of this professional due to the recurrent interchange of medical figures working in a common field. No psychiatrist was found working in any of the surveyed facility, meaning that no psychological need could be met, in any case, at PHC centre level, nor at unit level.

Although the figures highlight room for improvement, it must be recognized that some health departments show strengths to be valorised.

	Kassala Urban		Kassala Rural		Telkok		Al Girba		New Halfa	
	Av.	Not	Av.	Not	Av.	Not	Av.	Not	Av.	Not
Outpatient Department OPD	29	1	13	0	10	0	12	0	10	18
Expanded Program for Immunization EPI	23	7	10	3	0	10	3	9	13	15
Nutrition	25	5	8	5	8	2	8	4	15	13
Reproductive Health Department	27	3	11	2	6	4	7	5	9	19
Laboratory	28	2	13	0	1	9	7	5	22	6
Psychological, social, and physical rehabilitation *	0*	30	0*	13	0*	10	0*	12	0*	28
Pharmacy	23	7	13	0	6	4	2	10	3	25
Short stay services	22	8	7	6	6	4	1	11	13	15
Minor surgery	8	22	1	12	7	3	0	12	7	21
Dental clinic	6	24	0	13	0	10	1	11	0	28
Eye clinic	7	23	0	13	0	10	0	12	0	28
Emergency service	14	16	0	13	8	2	0	12	1	27

Table 7. Available services at the PHC facility

General family medicine (Outpatient Department), Laboratory, Nutrition and Reproductive health show a good trend in terms of available staff and active services, as reported in the Tables 6 and 7. The outpatient department is active in all localities, despite a fall in figures concerning New Halfa (18 facilities out of 28 do not provide this basic service). Laboratory services are similarly spread all over the region, with a deficiency registered in Telkok area (only one facility offers this service). Nutrition is evidently contemplated among the essential services, hence 60% of all localities report operative nutritional services, with a slight fall to 50% when looking at New Halfa. Following the same trend, Reproductive Health shows a copious number of dedicated professionals (246 midwives deployed on the ground) and active departments within the target PHC facilities. Even in this case, only New Halfa differs from the average with 68% of its centres not having a fully operative reproductive health department, although the highest number of midwives (93) is registered here.

The Expanded Program for Immunization is reasonably aligned in performance to the abovementioned services, but in this case, there is a total drop in Immunization technicians and active immunization services in Telkok area. Considering the essentiality of vaccination practice, this data is worth special consideration when considering improvement interventions. Even though the population of Telkok is the smallest among all target localities, people living in the area are more than 40,000, including a wide number of children and young women, most of them getting pregnant very early.

To conclude, the availability of general medical staff in relation to the declared covered population was calculated (see Table 8). Considering the general family medicine as the habitual entry point to a formal path of assistance to get medical treatments, the number of medical resources available on the ground

is a clear indicator of health care accessibility. In the next table data have been compared to indicators reported by the World Bank and referred to the whole Sudan in the time lapse 2014-2017. The table considers Family Physicians, and Nurses and midwives per 1,000 people. Unfortunately, data collected in 2021 are giving a picture of Eastern Sudan as a backward, two-speed country where remote geographical areas struggle to stick to national trends, though still poor.

	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa	WB 2017	WB 2014-5
Family Physician per 1,000 people	0.007	-	-	-	-	0.262	0.410
Nurses and midwives per 1,000 people	0.42	0.17	0.07	0.13	0.37	0.69	1.20
General health staff per 1,000 people	0.30	0.40	0.12	0.32	0.53	-	-

Table 8. General health staff per 1,000 people compared with World Bank data[17]

Even considering the aggregated group of general medical staff, it is quite difficult to have 1 professional per 1,000 (or less) people. New Halfa is the only locality reaching the ratio 1 : 525, while Rural Kassala and Al Girba indicatively have 1 health professional per 950 people, and Urban Kassala and Telkok exceed the 1,000 people to be covered by each medical figure.

	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Family Physician	2	0	0	0	0
Medical officer	30	2	0	5	1
Medical assistant	28	14	5	11	27
Health visitor	27	5	0	2	14
Midwives	72	33	16	32	93
Nurses	52	18	6	7	16
Health promoter	1	6	0	0	0
Health observer	2	3	0	0	0
Total	214	81	27	57	151
1 :	**1,395**	**929**	**1.519**	**977**	**525**

Table 9. Essential medical figures in relation to the population covered in each locality

Entry points to the health care system are congested from the start of the process, and hardly capable to meet very specialized medical needs of the population.

EQUIPMENT. A detailed list of the equipment available for each locality is included in *Annex II* at the end of the report. Nonetheless, a general consideration can be made based on the average number of patients per service in each locality, since it might be considered as an indicator of the accessibility of PHC services (see Table 10 below). When the average number of patients is zero, equipment for the specific service is absent, hence the service is unavailable in the whole locality.

---

[17] The World Bank Data link ; WHO link (medical doctors), link (nurses and midwives)

	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
OUTPATIENT Average No. Patients / month for this service	1,864.8	1,206,7	413.8	678.7	238.0
LABORATORY Average No. Patients / month for this service	958.2	835.2	200.0	455.7	231.7
MINOR OPERATION ROOM Average No. Patients / month for this service	31.9	30.0	6.0	0.0	0.0
REPRODUCTIVE HEALTH Average No. Patients / month for this service	91.9	134.7	27.6	103.5	33.0
VACCINATION & NUTRITION Average No. Patients / month for this service	282.2	382.1	138.6	136.3	66.1
DENTAL ROOM Average No. Patients / month for this service	399.6	0.0	0.0	0.0	0.0
MEDICAL IMAGE Average No. Patients / month for this service	0.0	0.0	0.0	182.0	0.0
ECG ROOM Average No. Patients / month for this service	0.0	0.0	0.0	0.0	0.0
PHYSICAL REHABILITATION Average No. Patients / month for this service	0.0	0.0	0.0	0.0	0.0
PSYCHOLOGICAL SUPPORT Average No. Patients / month for this service	0.0	0.0	0.0	0.0	0.0
OPHTALMIC CLINIC Average No. Patients / month for this service	120.0	0.0	0.0	0.0	0.0
EMERGENCY Average No. Patients / month for this service	119.2	0.0	11.4	0.0	0.0
OTHER ITEMS Computer	7	3	0	7	0
Printer	5	2	0	1	0

Table 10. No. of patients/service per locality

 'Other items' data has been included in Table 10 as well, due to its relevance. Although computers and printers can be considered non-essential equipment for the delivery of PHC services, they are essential when looking at monitoring and sustainability. Only 17 out of 93 facilities are equipped with a digital device that could be used to register both financial and patients' history data. Data monitoring is further considered in the next paragraphs 'Finance' and 'Health Information System'.

Indicator: Affordability of health care and sustainability of the services

FINANCE. As already described in the contextual framework, the majority of the population have to cover the costs related to health through out-of-pocket expenses. In order to investigate the affordability of the provided services, the research has tried to analyse the financial system on which PHC centres rely on.

Unexpectedly, the facilities offering services upon fees were found to be only 28 out of the 93 interviewed. The respondents were asked also about the average prices for the following four main different categories

of expenditure: fee for consultation with doctors, cost portion covered by insurance, medicines, laboratory and investigation services. Results are presented as aggregated data and also disaggregated by locality.

It is clear that the two expenditure categories weighting the most on patients are medicines and laboratory services. Although the figure could have been predictable, due to the need of importing both medicines and laboratory equipment, and the low costs of health consultations, the situation remains alarming. Laboratory services and investigations are connected to prevention and to a prompt detection of diseases. Medicines are necessary to treat diseases. If patients have to cover costs by OOP and these costs are heavily weighting on the household budget, they could decide —or find themselves forced —to cut some of them, with consequent implications on health.
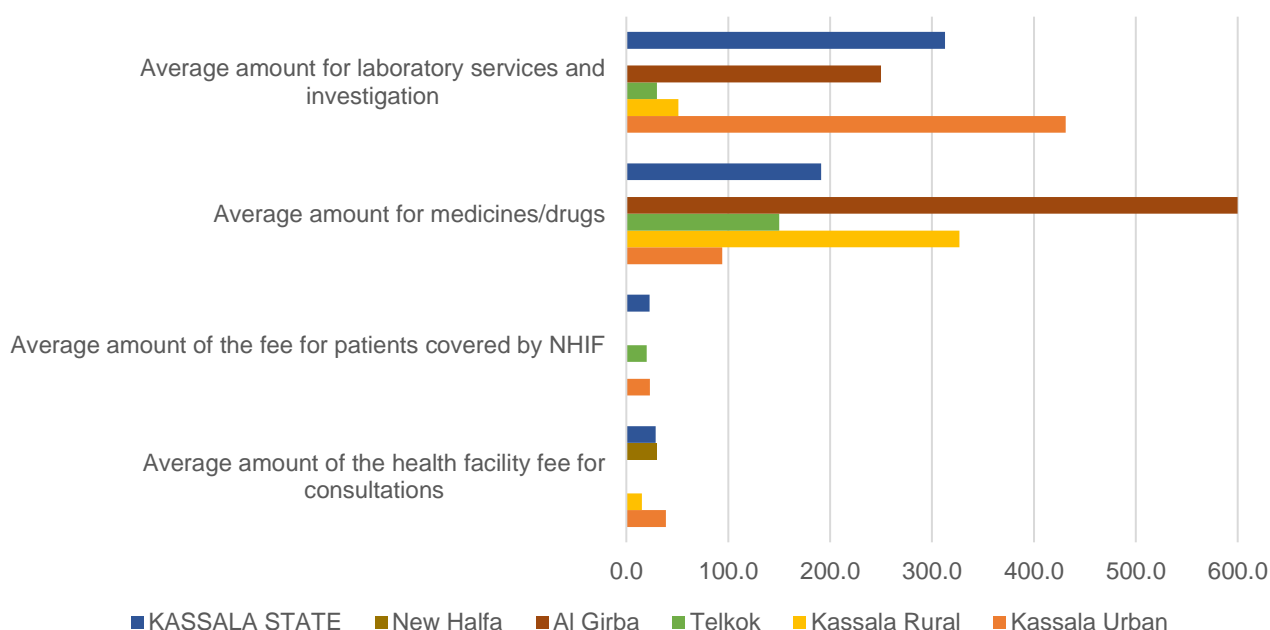
Figure 9. Estimated costs for health care (SDG)

At PHC facilities the cost of the services could be either covered through direct payment by the patient (OOP), or through public or private health insurance. The number of facilities accepting direct payment falls from 28 to 15, while 27 are commonly covering the offered services through the NHIF.

In the final analysis, in the State of Kassala the 3 main sources of income ensuring the sustainability of PHC facilities are patients, the NHIF and the Government in a proportion that varies based on the locality.

Considering that data collected in Al Girba and New Halfa for this item cannot be considered valid, the figures reported refer only to Kassala Urban, Rural and Telkok, although not all facilities answered this question.
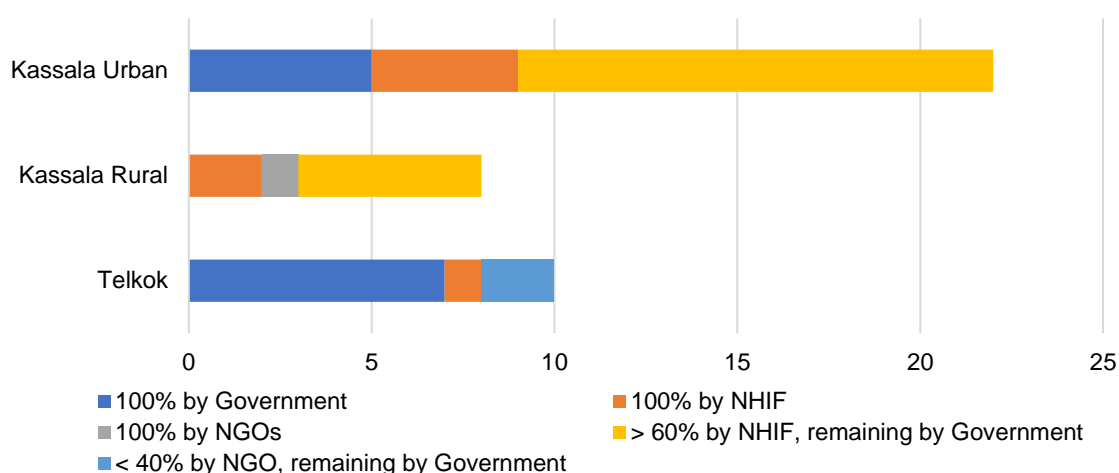
Figure 10. PHC facilities' source of financial support

The facilities furthermore reported the figures of the average income / month in the last two years. Yet, this data is hardly helpful in giving a clear picture of the facility's income, since the exchange rate in the last 4 years has seen a steady and sharp depreciation of the Sudanese pound (from 8.35 on the 1st January 2018, to 455.88 on the 15th April 2021). Moreover, the official exchange rate has been continuously affected by the parallel market.

The figures reported below are interesting for the comparison between the income of the last month (January 2021) and the income on the last six months, before the second COVID-19 pandemic wave. Apart from Telkok, the affluence of people to PHC facilities has dramatically decreased. It can be easily affirmed that there is a connection between the accessibility of services and the pandemic, hence a deterioration in the capacity of the health system to cope with the population during emergencies.

	Kassala Urban	Kassala Rural	Telkok	Al Girba
Average of the last month*	68,058.25	55,677.45	13,200.00	15,000.00
Average of the last 6 months**	328,225.07	196,714.00	11,000.00	90,000.00
Monthly average in 2019***	77,635.08	144,000.00	5,280.00	20,000.00
Monthly average in 2018****	79,448.33	240,000.00	5,280.00	18,000.00

Figure 11. Average monthly income of the facilities (in SDG)

*	Exchange rate in January 2021 (average): SDG/EUR, 1:67,5, while in the black-market SDG/EUR, 1:430
**	Exchange rate in the last 6 months of 2020 (average): SDG/EUR, 1:64,6
***	Exchange rate in 2019 (average): SDG/EUR, 1:51,5
****	Exchange rate in 2018 (average): SDG/EUR, 1:24[18]

This trend is common to all the countries hit by the pandemic and transversal to their economic status. That said, it is obvious that in a country like Sudan, where PHC coverage and basic services suffer from

---

[18] Free currency rate, link

a weak baseline, the situation becomes more critical. Improving the capacity of the health system to better reach, serve and take care of its citizens can improve even the response to health emergencies.

Even more important than financial data is the financial monitoring system. Although the SMOH should oversee all public facilities offering PHC services, in Rural Kassala, Telkok and Al Girba the financial monitoring is apparently not applied. The two localities where formal monitoring is performed are New Halfa, mainly controlled by the MOH, and Kassala Urban, where facilities are monitored by the MOH, the NHIF and a few of them by themselves.

The inconsistency of some of the collected figures reveals a weak capacity of the staff to understand the questions on the topic and, on the other side, the lack of a clear monitoring system collecting the information required. Further confirmation is given in the next section.

HEALTH INFORMATION SYSTEM. The monitoring of financial figures can be useful to understand the service sustainability and affordability, but, in order to better understand the service accessibility and the quality of care offered to each patient, monitoring of health information and patients' history is even more important.

Unfortunately, although 98% of the facilities declare to register their daily activities, only 4 keep track of each patient's history. The impossibility to track the steps gone through by the patient affects the quality of the care he/she receives. Without a clear picture of all the steps, it is likely that investigations and treatments already performed are uselessly repeated, while the ones actually needed are delayed. Furthermore, in a context where people have little education, their ability to understand and again to talk about their medical history is almost inexistant.
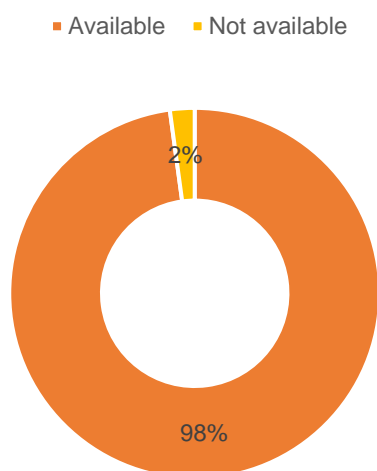
Figure 12. Daily activities' register
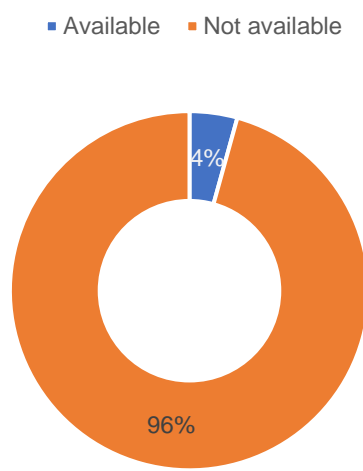
Figure 13. Patient history recording

Although the indicator 'inclusiveness of health care' is presented in the next paragraph in relation to the accessibility of PHC services for PWDs, it is commonly known that inclusion is a wide concept referring to many vulnerable categories of the population. With a couple of questions under the sub-indicator health information system, the study tried to explore the accessibility of PHC services for migrants and refugees, and for the different tribes composing the population of Eastern Sudan.

Not all the facilities accept patients without identification documents. 16 facilities, 12 of which in Urban Kassala, do not allow people to receive PHC services if they are not identified under the law. The two main categories of the population who could be mostly affected by this exclusion are women together with migrant and refugees. In Eastern Sudan registration at birth at the General register Office is not yet a common practice, especially for baby girls. Many women have the chance to register and obtain a national I.D. only when they get married. Similarly, for refugees and migrants it often takes a long time to access to an I.D., which prevents their access to the PHC facilities applying selection criteria for getting the services.

On the other hand, PHC services are generally available to all nationalities. In fact, only 2 facilities declared not to assist people of a different nationality.

As for the tribal coverage of the services, it is possible to notice a different trend in each locality, but it is reasonable to believe that the trend of the tribes' coverage follows the tribes' presence in each locality. Thus, Kassala Urban provides PHC services especially to Hausa, Arab tribes, Hadandawa, Beni Ameer and Nubian tribes, but not excluding people from Fallatah, Bargo, Barno, Ababdah and Bisharyeen, or Africans. In the other 4 localities, instead, the distribution varies based on the tribal presence in catchment areas. In Kassala Rural most patients come from Beni Ameer, then Arab, then Hausa tribes. In Tekok, almost 90% of patients are Hadandawa. In Al Girba there is a huge presence of Arab and Nubian tribes, with a minor representation of the others. For New Halfa again, the figures are not consistent, and no considerations can be provided.

Indicator: Inclusiveness of health care

FACILITIES FOR DISABILITY. As anticipated, inclusion is a wide concept pertaining to the segments of the population that are commonly left behind due to their vulnerability. Among them, there are people with disabilities (here with reference to physical disabilities, since mental ones have been taken into consideration in the previous paragraphs when analysing psychological support).

PWDs face a double barrier in accessing health care, since the simple physical access to buildings can already be an obstacle. PHC facilities are not always disability-friendly and the data collected demonstrates it clearly.

	Kassala Urban		Kassala Rural		Telkok		Al Girba		New Halfa	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Availability of a ramps for people with physical disabilities	1	29	0	13	1	9	0	12	0	28
Doors having a width greater than / equal to 90 cm	12	18	0	13	9	1	0	12	0	28
Toilets with handles in a rotating area greater than / equal to 150 cm2	0	30	0	13	0	10	0	12	0	28

Table 11. Provision of infrastructure and facilitations for people with disabilities (PWDs)

Only 2 facilities are provided with a ramp to facilitate the entrance to PWDs. Better but not optimal data are those about the doors having a width allowing a wheelchair to enter. In Kassala Urban and Telkok 12 and 9 facilities respectively considered this requirement during the construction phase. Nevertheless, the poorest scenario comes when looking at toilet facilities for PWDs. This is a sensitive and delicate issue, heavily contributing to the impossibility and unwillingness of PWDs to move outside their homes.

Ensuring universal PHC package coverage should start by providing all people with the possibility to physically access the medical centres, free from any restriction.

Indicator: Compliance with safety measures for COVID-19

COVID-19. The contingency during which the assessment took place required the team to explore the challenges faced by the PHC centres to comply with COVID-19 safety measures.

Due to the length of the survey and its scope, that was not originally supposed to include COVID-19 compliance, this section was skipped by some of the target facilities, thus decreasing the sample number to 82-89 facilities, depending on the item. For this reason, data for the indicator are not reported disaggregated by locality, but generally referred to the relevant target area as a whole.

Safety measures for COVID-19 were assessed through two sub-indicators including items concerning i) compliance with rules by both patients and PHC staff (Table 12), and ii) practices pursued by healthcare providers (Table 13).

Although the data speak for themselves, it seems interesting to point out how a simple measure like physical distancing is not even considered in almost half of the interviewed facilities (46%). This is particularly worrying for vulnerable people, namely elderly people and pregnant women who cannot benefit from a dedicated waiting room within the facility. Similarly, visitors continue to be allowed inside the health care facilities with not restrictions due to COVID-19 in almost all facilities (93%).

Data collected for the previous indicators clearly highlight a lack of sufficient space where isolating and hence protecting both vulnerable patients and suspected cases of COVID-19 (66% of the facilities do not isolate people with symptoms).

After all, one of the most critical aspects is the impossibility to test suspected cases. Besides 88% of the facilities declaring not to test suspected cases, it is worth saying that before April 2021 none of the laboratories or PHC facilities in the country was provided with means for testing for COVID-19, which is why 94% of the facilities never detected any positive or suspected case.

COMPLIANCY WITH COVID-19 MEASURES	Yes	No
Physical distancing measures are implemented by staff and by patients	54%	46%
Patients wear mask (surgical, cloth mask, etc.)	30%	70%
Pregnant women and or new mothers and their children have dedicated waiting room	8%	92%
Visitors have limited access to health facilities	7%	93%
Facilities are cleaned and disinfected at least twice per day	18%	82%
Availability of appropriate Personal Protective Equipment (PPE) for all personnel at the point-of-care	12%	88%
Equipment as oxygen, nasal cannulas, non-invasive ventilation devices are available	5%	95%
Suspected cases can be isolated or at least separated from other patients	34%	66%
Availability of any vehicle for transferring patient to health facility with intensive unit	9%	91%
If suspected case is detected, all suspected cases and staff should be tested	12%	88%
Safe waste management is practice	51%	49%
All material and vehicle that have been in contact with suspected or positive cases are properly decontaminated	38%	62%
Have suspected cases ever been detected by the health care facility?	6%	94%

Table 12. Compliancy with covid-19 measures

Considering the daily practice of healthcare workers within the facilities, the picture is not brighter. In 60% of the facilities professionals do not wear surgical nor FFP2 masks. Nonetheless, 81% of the facilities have staff aware of the risk factors for infection, symptoms and signs of the pathology, although appropriate training on COVID-19 for healthcare workers and other staff is provided only in 29% of the target facilities. However, in some cases wearing a mask is a mandatory requirement to enter the facility.

Similarly, 63% of the staff consider to not come back home or wear surgical mask at home, but at the same time the same percentage of staff come to work even if they have symptoms (65%). This data can further indicate a lack of resources in the facilities. The number of health professionals is limited, and staff turnover cannot be applied.

HEALTHCARE PROVIDERS PRACTICE	Yes	No
All staff wear surgical mask or FFP2	40%	60%
Practicing hand hygiene according to international standard	58%	42%
Healthcare staff (including physicians, nursing and anybody in contact with patient) know risk factors for infection and clinical symptoms and signs of COVID-19	81%	19%
Healthcare staff work in contact with COVID-19 positive patients should consider to not come back home or wear surgical mask at home	63%	37%
Long-term healthcare staff do not come to work if they have symptoms	35%	65%
Procedures for reporting and transferring people under investigation and probable/confirmed cases	37%	63%
Appropriate training on COVID-19 for healthcare workers and other staff is provided or is planned	29%	71%
All staff is trained on procedures for putting on and safely removing doffing Personal Protective Equipment (PPE)	48%	52%
All staff wear special shoes at work than can be left at the hospital	5%	95%
Alcohol-based hand rub or hand washing point is available for all people	12%	88%

Table 13. Healthcare providers practice

In order to assess the impact of COVID-19 on daily activities, the study further explored the number of patients during the first pandemic wave, i.e. May 2020 in Sudan, and in October 2020, when the emergency had eased after the summer peak. It is interesting how rural areas appear not be touched by the phenomenon. Patients in May did not significantly vary in Telkok and Al Girba compared to patients in October.

The situation was different in Kassala rural and urban areas. In both localities the research shows variations in attendance atat PHC facilities. The reason cannot be definitely identified as any specific cause, but it is reasonable to suppose that the impact of COVID-19 was more feared by citizens residing in urban centres and neighbouring villages, due to the more frequent exchanges with the capital city Khartoum, that has been significantly affected by the virus.

A similar trend has been observed in the number of children under 5 years of age brought to the PHC centres. In the month of May, the young patients halved in Kassala urban and had a slightly lower decrease in Kassala rural. Nevertheless, as for adults, no similar trend has been observed in the deepest rural   localities.

	Kassala Urban	Kassala Rural	Telkok	Al Girba
Please indicate the total number of patients coming in PHC during the month of **May 2020**	1,346.35	766.00	377.89	347.50
Please indicate the total number of patients coming in PHC during the month of **October 2020**	1,928.95	892.69	361.78	403.33
Please indicate the total number of children from 0 to 5 years old coming in PHC during the month of **May 2020**	63.80	42.00	133.22	.,50
Please indicate the total number of children from 0 to 5 years old coming in PHC during the month of **October 2020**	112.00	62.17	132.89	4.33

Table 14. Trend of patients under COVID-19 pandemic

DEMAND ANALYSIS

The demand side analysis relies on the collection of primary information and feedback through surveys conducted with individuals receiving medical cares at the PHC facilities. Where relevant, findings from the original research are integrated with results from other assessments and studies. This section is structured around the following eight categories of analysis: (i) socio-economic and demographic data; (ii) availability of preventive initiatives; (iii) availability of preventive initiatives; (iv) accessibility - waiting time at the health centre; (v) acceptability; (vi) accommodation; (vii) affordability of health resources; (viii) coping strategies.

Indicators	Sub-indicators	Indicators	Sub-indicators
Patients segmentation	1. Socio-economic and demographic data	Acceptability of health care	5. Perceived distance between the provider and the demand sides
Availability of health care	2. Availability of preventive initiatives	Affordability of health care	6. Health expenditure management
Accessibility to health care	3. Distance from health resources		7. Accommodation
	4. Waiting time at the health centre		8. Coping strategies

Indicator: Patients segmentation

SOCIO-ECONOMIC AND DEMOGRAPHIC DATA. The random sampling brought in the study 304 people who voluntary decided to answer the survey.

The picture given by data shows households composed on average of 5.68 members, where the family leader is unexpectedly in prevalence a woman (209, against 95 families led by a man), and the family leader is aged in his/her 40-50s, independently of the gender.

The family leader is considered the most representative person in the household. Data reported hereafter describe the socio-demographic data of the person in this role in order to understand the profile of the families normally using the PHC services in the Kassala State.

A first interesting aspect concerns the possession of identification documents. 25% of the women heading households do not possess a legal document stating their existence or identification, compared to only 4% of men who are not legally registered. This aspect appears even more significant when considering nationality, since 97% of the households are Sudanese. People in Sudan, and specifically in Kassala State, do not go through particular issues when they want to register themselves or their children at the General Register Office. That said, the registration of people at birth and at death is not a common practice. This information was confirmed by key informants supporting the study, who underlined how this phenomenon regards much more women than men, especially when coming from rural families. Many women are registered with an identification document only when they get married due to administrative procedures required to legalize the union.

Although this information may not be so relevant for our study, it is however important to understand the difficulties faced by the health system in keeping track of patients' health histories, which could be itself an interesting topic for further consideration in future interventions.

Moving on to the analysis of patients segmentation, the variety of the ethnicities using the PHC services is described by Figure 14 below and is consistent with the distribution of the population:

Tribal identity	No. HH
Arab tribes	50
Hausa	35
Fallatah	9
Bargho	1
Barno	4
Kalumba	1
Hadandawa	63
Beni Ameer	100
Beeja	4
Ababdah / Bisharyeen	0
Rashaida / Zebeidja	2
Nubian tribes	23
African tribes	12

Figure 14. Ethnicity

Beni Ameer and Hadandawa tribes are evidently prevalent in the state, followed by the Arab tribes and Hausa members. Rashaida and Zebeidja tribes should be significantly represented in the area, but the random sampling did not allow to collect information on their health behaviours, since only few Rashaida members were included in the sample. That might be caused by a biased selection operated by the enumerators in the interview phase, by the little presence of Rashaida in the health care facilities, or by their unwillingness to be interviewed.

The most prevailing education levels of household leaders are the elementary school and the informal qualification that here in Sudan is normally associated with koranic school, where people learn to read, write and make calculations at a very little expense (Figure 15).

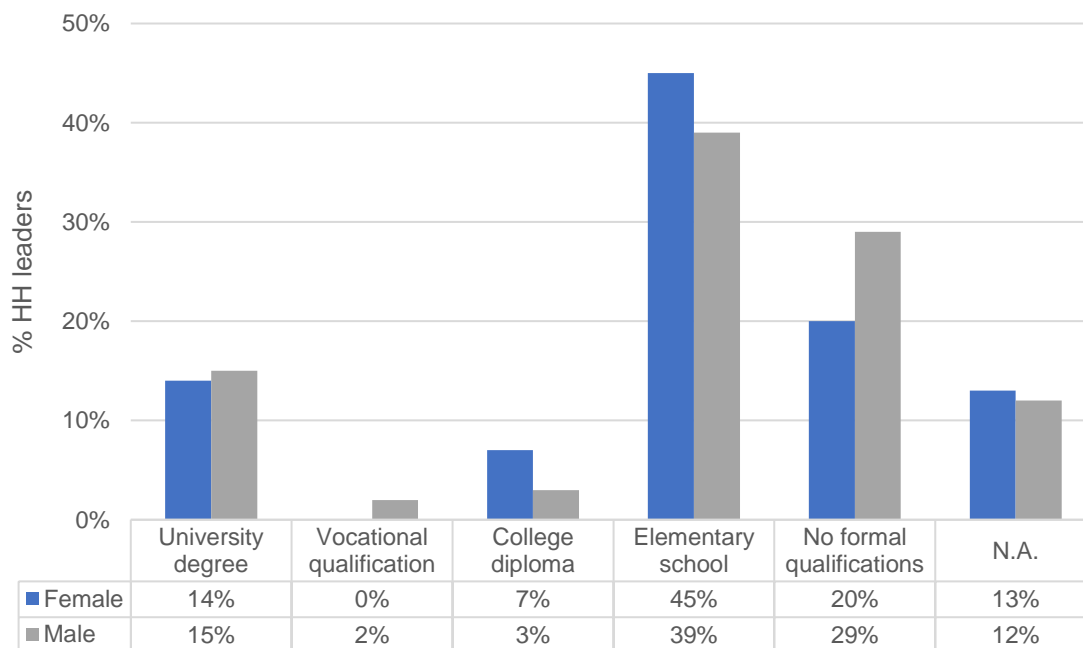|	University degree	Vocational qualification	College diploma	Elementary school	No formal qualifications	N.A.
Female	14%	0%	7%	45%	20%	13%
Male	15%	2%	3%	39%	29%	12%

Figure 15. HH Leaders' highest level of education / gender

The marital status (Figure 16) shows another important social value of the Kassala community, that is marriage. Independently of gender, marriage is a status symbol in Eastern Sudan and is related to family honour and personal respectability, especially for women (Hamed et al., 2017).

	Single	Married	Divorced or separated	Widowed	N.A.
■Female	16%	69%	7%	7%	0%
■Male	23%	67%	4%	5%	0%
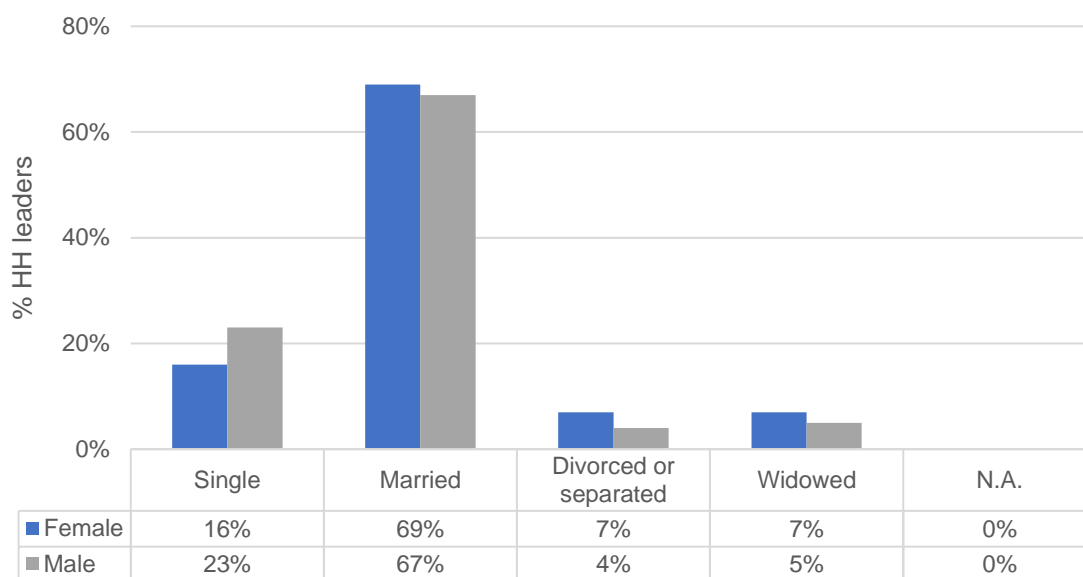
Figure 16. HH Leaders' marital status / gender

It is quite rare that women have a job, since their role in the society is mainly expected to be deployed within the family and inside the house. 76% of the female family leaders is not working compared to 12% of men, although it is interesting to notice that 44% of men have been classified in the N.A. category. An assumption might be that the social role of men is strongly connected to their capacity to economically contribute to the family income. Hence, declaring themselves as 'Not working' could discredit them (Figure 17).

	Civil servant (Government)	Employed by the private sector	Agriculture worker	Student	Retired	Not working	N.A.
■Female	10%	0%	0%	9%	1%	76%	4%
■Male	16%	2%	20%	5%	1%	12%	44%

Figure 17. HH Leaders' occupation / gender

Finally, considering health insurance coverage, 72% of women are register at the NHIF while only 63% has a health insurance.

Women

NHIF member Non-NHIF member

28%
72%

Men

NHIF member Non-NHIF member

37%
63%

Indicator: Availability of health care
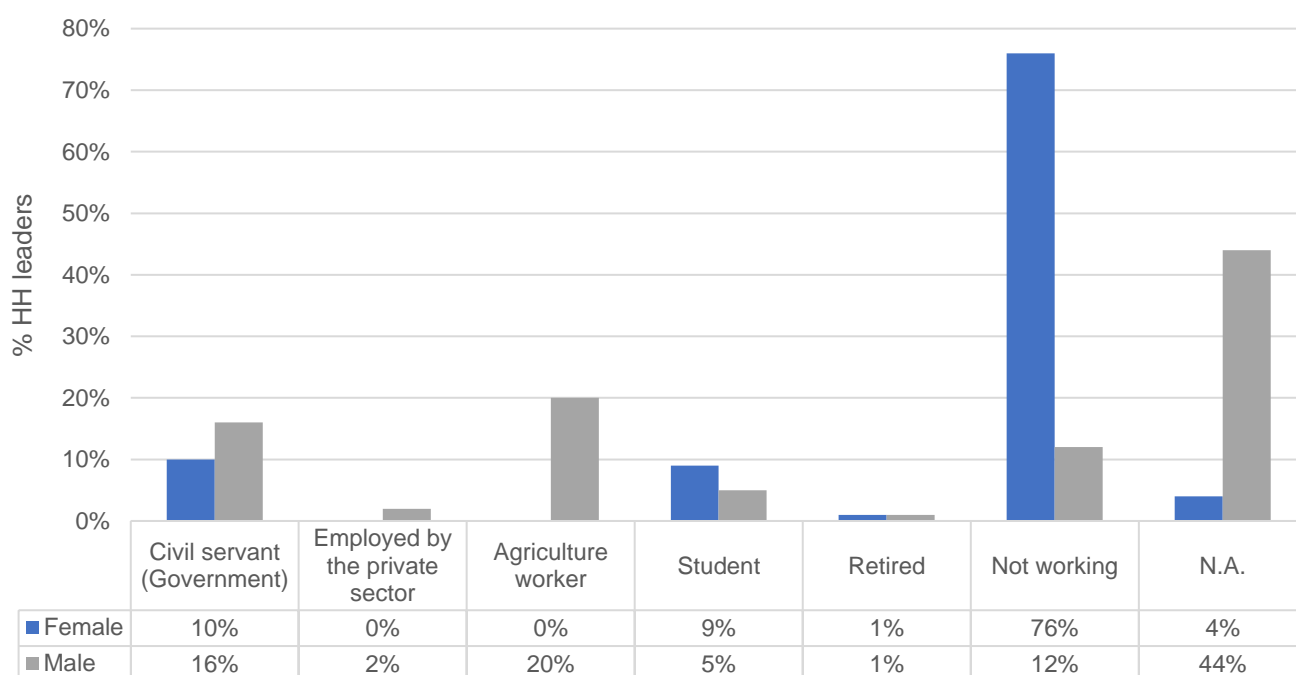
AVAILABILITY OF PREVENTIVE INITIATIVES. Since the availability of infrastructures, services and health professionals have been explored by the Service Providers Side analysis, people interviewed with the Demand Side survey were asked about the participation in preventive initiatives promoted by the PHC facilities they normally refer to, and/or by the Ministry of Health.

Results are in line with the health system priorities described in the contextual framework: prevention received less than 0.5% Current Health Expenditure, thus awareness activities on preventive care and a healthy lifestyle are dramatically poor among the Sudanese population (Figure 18).

Awareness-raising campaigns are just an example of preventive care activities aimed at boosting the *perceived susceptibility* to diseases. Perceived susceptibility is a crucial concept when aiming at stimulating a health seeking behaviour, hence access to health. This concept describes whether people perceive themselves to be at risk or susceptible to risk to get a disease. This difference in aptitude is translated into different behaviours towards self-care, since attitude is a necessary, though not sufficient, condition for a behaviour to be implemented (Hausmann-Muela et al., 2012).

Poor prevention is consequently impacting on people's health seeking behaviour and is a cross-cutting indicator of the availability and accessibility of health care.
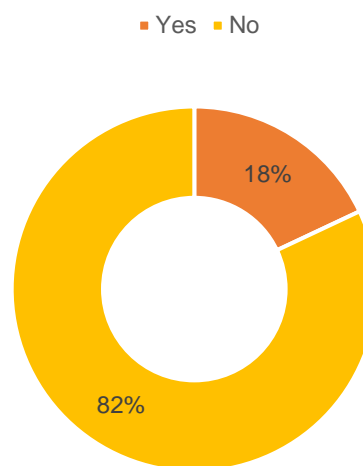

Yes No

18%
82%

Figure 18. Previous participation to initiative on preventive care

Indicator: Accessibility of health care

ACCESSIBILITY - DISTANCE FROM HEALTH RESOURCES. Another relevant indicator of care accessibility is the distance, in terms of time and/or Km, to cover in order to reach the health care facilities located closest to one's own house.

Respondents were asked to indicate the distance in kilometres or hours from their homes. Table 15 below reports the average values for these two measurement units.

Facility	Hours	Km
Public Hospitals	1.81	15.0
PHC Centre	1.25	1.3
Private clinics / physicians	1.33	34.2
Traditional healers	1.00	0.2
Pharmacies / drug sellers	1.70	5.8

Table 15. Distance home-PHC facility

Distance is not necessarily a heavy problem if means of transport are available, affordable and reliable. Unfortunately, the item exploring this chance did not provide the desired results. In fact, almost 70% of the households reach the health facilities on foot and possibly by public bus (20%) or animal (10%) (Figure 16). It is worth reminding that refuelling in Kassala town is notably difficult, and even worse in the capillary areas of the State. The chronic lack of fuel and the steadily sharp increase in fuel price made public transport unaffordable to many poor families living in Kassala and surroundings. Macroeconomic changes are affecting the system especially at the bottom of the social pyramid.

Interviews

"There are financial problems namely in transport. One day we had no money (to get the center), but a lady drove us to the hospital and also gave us 500 SDG."

"Sometimes we don't ha e money (for transport) and she (a mental ill person) get mad because of this."

Means of transport	%
By foot	69%
Animal (donkey, horse, camel…)	10%
Bus	27%
Private motorcycle	5%
Private car	7%
Taxi	7%
Motorcycle taxi	1%
Bicycle	4%
Vehicle provided by the health facility	0%

Table 16. Options to get the health care facility

A positive note can be found in mobility safety perceived by people. 97% of the respondents perceived as "Safe" the mobility from home to the health facility they normally refer to.

These perceptions are not giving the real picture of roads or safety status, but at least are excluding the presence of major obstacles such as risks of assaults, robberies or sexual harassment to women and kids.

ACCESSIBILITY - WAITING TIME AT THE HEALTH CENTRE. Care accessibility could be further explored by considering the time needed to come in contact with doctors or treatments.

In the Kassala State services appear to be available without a long wait. 63% of patients can get a treatment or meet a doctor in 30 minutes, while only 11% of patients report a waiting time exceeding 4 hours (Figure 17).

Time range	%
< 30 minutes	63%
31-60 minutes	14%
1-2 hours	12%
> 4 hours	11%

Table 17. Waiting time before medical needs are met (once entered the health centre)

Indicator: Acceptability of health care

ACCEPTABILITY (perceived distance between the provider and the demand sides). As described in the conceptual framework, acceptability is 'related to the social and cultural distance between the provider and the demand sides' (Hausmann-Muela et al., 2012). Although acceptability is often reduced to satisfaction, there are other factors participating: clear communication and respect, confidentiality and privacy, perceived quality of care, and perceived risks of preventive measures and treatment.

The present study focuses on the health personnel-patient dynamics, since they could be a first hurdle in getting health care. Specifically, people were asked about the perception of personal respect received from staff and doctors, and from the relevant facility professionals as for the confidentiality of their personal details.

The concept of privacy is still far from the cultural context where the research took place, nonetheless people are very sensitive to confidentiality, discretion and respect of private life, including personal health condition. The majority of the respondents declared to be satisfied both with the human respect perceived towards themselves (83%), and also with the confidentiality kept by health professionals on their health conditions (84%).
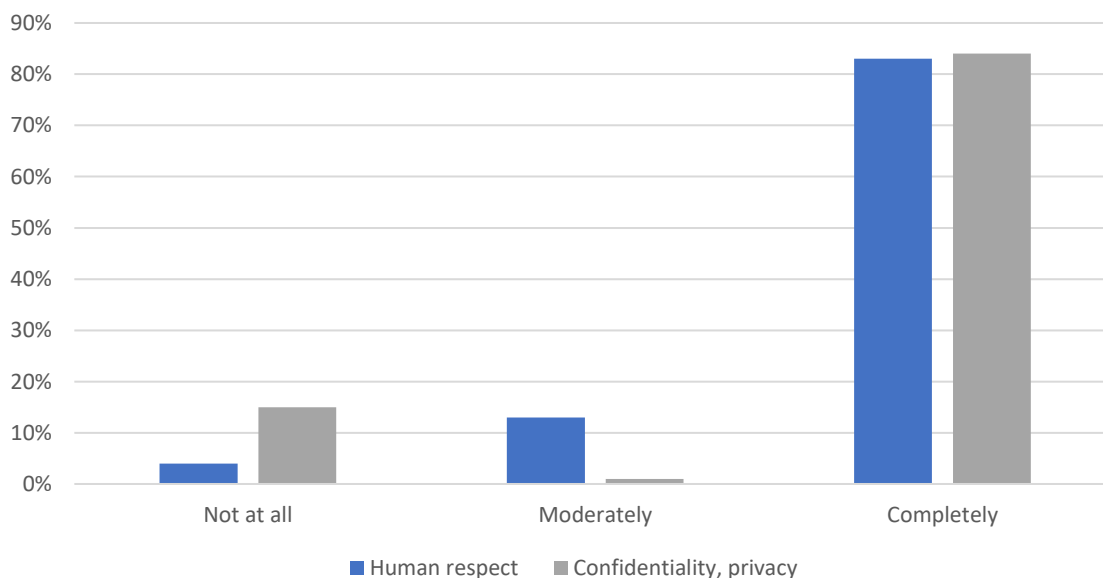

Figure 19. Perceived respect by health facility's staff and perceived respect of privacy

The comprehensive evaluation of the quality of services provided by the health facility people normally refer to is reported in the following chart. Most respondents report a nor-bad-nor-good quality tending to satisfaction with the services received.

As for non-satisfied patients, major complaints concern health personnel behaviour and include poor explanations on dosage and treatment regimens, rudeness by health personnel, and a blaming-the-victim mentality.

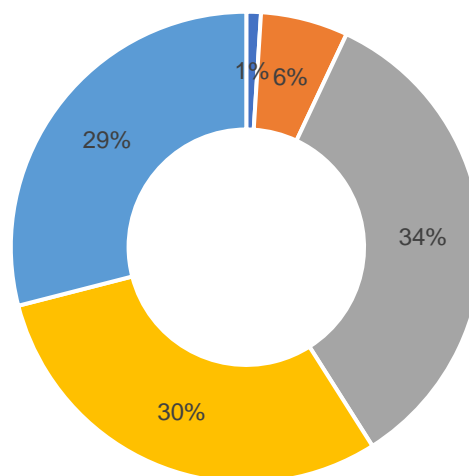| Interviews |
| --- |
| "He (the doctor) did not explain anything to me." |
| "I don't know what my diagnosis is. I used to ask them (doctors) frequently. Sometimes I even got sad and couldn't eat because they don' tell me the right diagnosis. They just explain saying that they only ask god for me." |

■ Terrible ■ Bad ■ Nor good nor bad ■ Good ■ Excellent

Figure 20. Evaluation on the quality of PHC services

Indicator: Affordability of health care

As outlined in the conceptual framework, it is essential to differentiate between the expenditures people could face when in need of health care.

- Direct costs are the expenses that a household faces for seeking and receiving treatment and for preventive measures and can either stem from medical treatment (direct medical costs), or from other non-medical expenses such as transport, meals and accommodation (direct non-medical costs).

- Indirect costs refer to productivity loss or earnings loss due to the morbidity time during which the patient and caretaker(s) stop or reduce productive activities while seeking or receiving treatment.

- Incalculable or intangible costs are those related to certain consequences of illness that cannot be expressed or directly converted into monetary values. These include some illness' long-term consequences such as abandonment of schooling, disability and deformity, social exclusion, and psychosocial factors.

AFFORDABILITY OF HEALTH RESOURCES. Direct costs for health care were explored through questions asking the average of expenditures in the last three (3) months for direct medical costs such as health centre fees, traditional healer fees or treatment costs, as well as direct non-medical costs such as transport, meals and accommodation.

The most oppressive costs on families turned out to be medicines, since most of them are not covered by health insurance, and accommodation during the stays at health centres for receiving treatment. Consultancy fees and transport are also significant costs within health care expenditures.

The financial weight of care clearly emerged in the qualitative interviews with families hosting PWMHDs. People struggle to find the money for public transport to reach the health facility where the patient undergoes periodic controls, and they cannot always afford the medicines to control the symptoms of the mental disorder. A practical example concerns the drug needed by a girl affected by epilepsy, that in Sudan is classified as a mental disease. Her father pays around 2,000 SDG/month for 3 different types of medicines that are also frequently out of stock. Since he has not a stable job and a family on his back, he frequently asks people in the neighbourhood to buy medicine for his daughter.

Expenditure of the last 3 months for:	SDG
Health centres' fee	2,300.42
Traditional healers' fee	117.67
Medicines / drugs	3,283.90

Table 18. Expenditure directly related to health within the last 3 months

Expenditure of the last 3 months for:	SDG
Transport to go back and forth from the Health facility	974.00
Meals along your permanence in the Health facility	485.37
Accommodation (if needed)	1,335.16

Table 19. Expenditure indirectly related to health within the last 3 months

---

Interviews

"Although we're having medical insurance, I pay again for some medicines."

"I'm used to pay for some medications although I'm not working. But people help me a lot."

"I don't have money to buy my medications. When I ask my husband money for medication or life expenses he's always shouting."

The unavailability of medicines and/or specialized health services is not a rare phenomenon and heavily impacts on the economy of a family, since commonly requires to travel to Khartoum to find a hospital specialized in certain treatments or the unavailable medicines necessary to treat the disease.

Moving on to analyzing the affordability of health resources, incalculable or intangible costs would have been difficult to explore without having a baseline and a follow-up, or without the support of qualitative interviews focusing on these themes. The study tried at least to investigate the productivity or earnings loss (indirect costs) by asking the respondent if that day he/she stopped or reduced his/her working activities for seeking / receiving treatment for him/herself or the accompanied person.

The results should be interpreted in light of the prevalence of female respondents, and in light of the socio-demographic picture described above. The majority of women (more than 75% of the sample in this case) does not have a job, and are socially recognized as the person in charge of taking care of others.
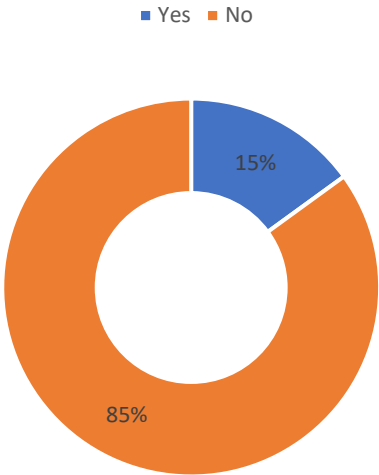

■ Yes ■ No

15%

85%

Figure 21. Repercussion on working activities for seeking / receiving treatment

That said, 15% of the respondents accused the indirect costs of health care declaring an average loss around 4,710 SDG for the entire period in which they had to be hospitalized themselves / accompany a family member to receive treatment.

ACCOMODATION. Countries with a low-middle level of income frequently rely on strong social connections, constitutingthe main element of what is considered the social capital. Individuals themselves may be poor, since they do not own many resources, but as a collective group, such as an extended family, they are much richer when considering the resources they can put together.

Accommodation is part of the resources that extended families normally share in Sudan. Once requested to travel for job, personal or health reasons, people contact the part of the family residing in the destination area and agree on hosting solutions that prevent the person from spending money for renting a room or an apartment. Being a guest does not mean no cost at all, since a common sense of social duty implies bringing food or non-food items to the hosting family, but it is normally accepted that the present is proportional to the guest's financial capabilities.

Nevertheless, to become a common good, personal resources need to be at least sufficient for the nuclear family itself, but this is not always the case. As shown by Figures 22 and 23 below, there is a 9% of respondents who do not even live in a house. Moreover, Figure 24 shows that, among people declaring to have a residence, 53% of the houses are made of mud and straw, metal plates or even of simple wood and cloth. Although Guttya could represent a valid and decent residential solution, when properly built, the other mentioned solutions are very poor structures which even put at risk the members living in.

That said, the real opportunity to host an external family member is finally depending on the type of resource that the family can or cannot share.

Normally houses, of different nature, are composed of 2 or 3 rooms maximum, and, even considering the possible available external area that many houses used to have, the space to host relatives might be not so much due to the numerosity of each family.
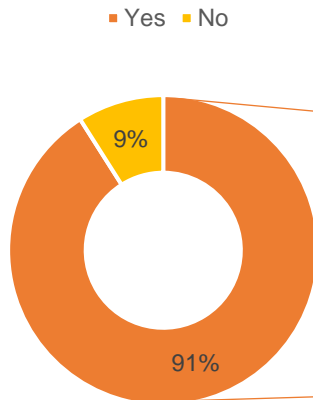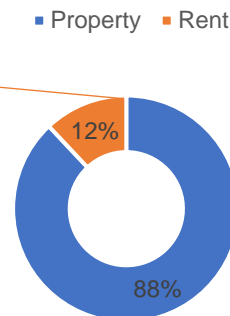

Figure 22. Living in a house
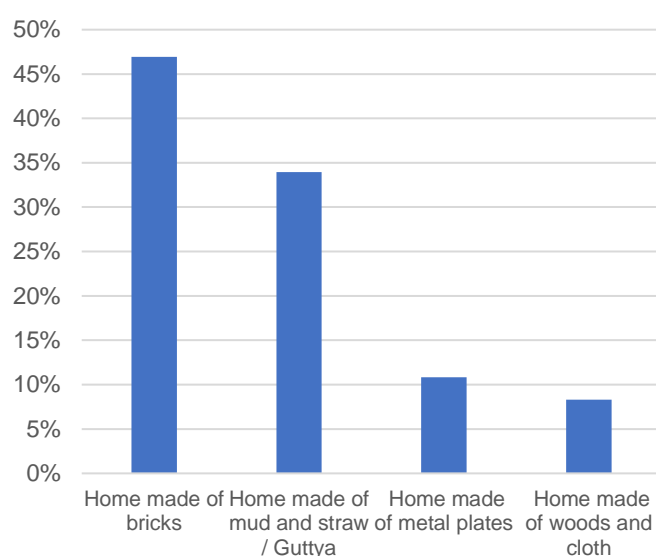
Figure 23. Property or rent
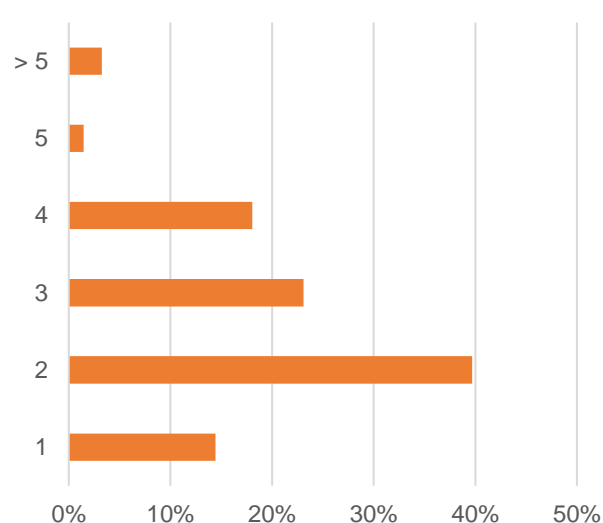
Figure 24. Type of house

Figure 25. No. of rooms

Finally, the study revealed the burden of accommodation prices, since problems come up when common resources, specifically accommodation, are not available in the area and the service needs to be outsourced. Renting a room or an apartment may require a huge financial sacrifice from poor families, and Sudanese policymakers in their role as development actors should take this information into account to plan future intervention.

COPING STRATEGIES. The Coping Strategies Index (CSI) is a tool rapid enough to provide real-time information on food insecurity and thus also on the household financial status.

The CSI measures behaviour, i.e. what people do when they cannot access enough food. There are a number of fairly regular behavioural responses ("coping strategies") to food insecurity that people use to manage household food shortage. These coping strategies are easy to observe.[19]

The tool is used to identify areas and population groups where the needs are greatest. It can also shed light on the causes of high malnutrition rates or causes of uncommunicable disease, which are often very difficult to identify. If coping strategies are tracked over a long period, CSI is useful for monitoring long-term trends in food insecurity and hence the poverty level of the population.

Even though the goal of the study was not tracking the economic status of the population in Kassala, the authors used the CSI to have a clearer picture of the sample and how the respondents' economic situation could affect their access to health care. Although the data collected cannot be considered representative, since not all respondents answered the questions about the CSI, the strategies people could rely on to respond to economic scarcity include reducing health expenses, as in the table below.

---

[19] WPF, The Coping Strategies Index (2008), link

Rely on less preferred and less expensive food
Eat borrowed food or borrow money to purchase food
Rely on help from friends or relatives (Musaada)
Limit portion size at mealtimes
Restrict consumption for adults in order for small children to eat
Reduce number of meals eaten in a day
Spent savings
Reduced non-food expenses on health (cut down on medical expenses)
Sold household assets/goods
Borrowed money / food from a money lender / savings group
Borrowed money from a formal financial source (e.g., banks, microfinance institution, etc.)
Sold productive assets or means of production
Sold house or land
Begging (seek assistance)

Table 20. Coping Strategies to get food for the household when financial resources are insufficient

Interviews

"(To get food or medicines) I'm used to sell things I have at home like furniture and curtains."

In the sample of the study only 8% of respondents declared to face difficulties in getting enough food or money to buy food for their families in the 7 days before the interview. But another 16% had provided food to their families by borrowing food or money from friends/relatives or moneylenders, pointing out the same financial difficulties of the first group of respondents. Finally, 22% of the interviewees are clearly living in economic shortages that are affecting their quality of health by directly impacting on food consumption (quantity and quality), but also by indirectly impacting on access to health care.

In fact, the WFP Sudan Comprehensive Food Security Assessment conducted in 2018, using the same CSI, reported 1 in 4 households (23%) having to reduce the health expenditure to cope with the lack of food.
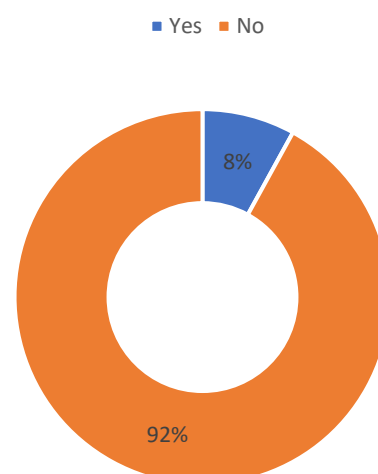

Figure 26. Difficulties to have enough food or money to buy food for your family in the past 7 days

MENTAL HEALTH IN KASSALA STATE

The State of Kassala is located in the eastern part of the country. The state is bordered to the east by the state of Eretria, to the north by the Red Sea State, to the west by the Khartoum State and the River Nile State, and to the southwest by the Gedaref State. The Kassala State has an area of 42,285 km^2 and consists of eleven (11) regions, nine (9) of which primarily rural, while the localities of Kassala town and New Halfa are classified as urban centres. The State is generally characterized by long-term poverty and high rates of malnutrition, and it is also vulnerable to natural disasters such as floods occurring during the rainy season, or outbreaks of epidemic diseases such as cholera, chikungunya and dengue fever, in addition to the high prevalence of endemic diseases, malaria and tuberculosis. The presence of refugees and asylum seekers in the State of Kassala poses an additional burden on the health system and other public services in the State. Health services are provided at two levels, primary and secondary, while patients seeking for tertiary level need to refer mainly to Khartoum.

Considering the local context described above, it is evident that certain individuals and groups in the society may be at a significantly higher risk of experiencing mental health problems. These vulnerable groups may (but do not necessarily) include members of households living in poverty, people with chronic health conditions, infants and children exposed to maltreatment and neglect, adolescents first exposed to substance use, minority groups, indigenous populations, elderly people, people experiencing discrimination and human rights violations, prisoners, and people exposed to conflict, natural disasters or other humanitarian emergencies.

At global level, the current financial crisis provides a powerful example of how macroeconomic factors could lead to cuts in funding despite a concomitant need for more mental health and social services because of higher rates of mental disorders and suicides, as well as the emergence of new vulnerable groups (for example, the unemployed youth).

In many societies, mental disorders are related to marginalization and impoverishment, domestic violence and abuse, and overwork and stress are of growing concern, especially for women's health.

This is the case of Kassala, where the majority of the interviews reported cases of mental disorder affecting women after getting married, close to divorce, or suffering from post-partum depression.

This is not meant to be the only target as for psychological sufferance, but for sure the lack of opportunity for women to have equal rights as men is a factor affecting women's mental wellbeing. Forced marriage, housekeeping as the only permitted activities, the pressure to be at the same time a good wife, a good mother, a good daughter, the pressure for having many kids, including at least one male, the impossibility to follow one's own interests or passion, or to work outside the house —sometimes because of the low chances to find a job, sometimes due to the will of the family. Life conditions of women in eastern Sudan are strictly orientated by traditions and religious beliefs, leaving them little chance for empowerment. The most educated families may allow daughters to study up to university, but adult life is meant to be as closest as possible to the family of origin, and the expectation of a good marriage is still present. That might be comprehensible, due to i) the poor chance for women to get jobs with a decent salary, and ii) the impossibility to live by themselves, which is socially not accepted. But the right of choice is strongly violated.

Women' families who were interviewed reported that their patients were diagnosed mainly with major depression and bipolar disorder. The diagnoses reported by families often do not match with the real ones, since doctors are not always willing to spend time explaining to patients, either their families, what precisely is the disease, how to manage symptoms, or the side effects of treatments. The impact of being

just labelled with a psychiatric disease is that the stigma falls on the affected person and frequently on the whole family, since the causes of mental disorders are often not clear, associated with evil creatures or god's will.

Besides interviews with families, key informants contributed to providing details about the mental health situation in Kassala. All contributions confirmed the social weight of stigmatization mainly due to ignorance on the topic. Before accessing formal services at the psychiatric department of Kassala Teaching Hospital, uneducated and poor families recognizing mental conditions in their relatives usually bring them:

to the *Shiouh*, a religious healer looking after patients with the Qur'an, asking the help of God by reading Qur'an verses

to the *Dejalin*, a traditional healer offering services against money and relying on traditional techniques to heal patients. For example, he (usually a man) uses *buhur* (special wood used for purification purposes) or *mahaya,* a practice consisting in writing healing notes on a wood plate that will be irrigated in order to offer the patient a healing water to drink, or to use for washing him/herself. Unfortunately, the *Dejalin* practices also include tying the patient with strings or ropes, beating him/her to expel the evil creature possessing the patient (*arwah shirrira,* bad spirits).

The failure of religious and traditional practices leads people to consult a doctor from the formal health system.

Unfortunately, the family of the patient is not always supporting the person affected by a mental disorder, and may even more strongly insinuate to the patient that he/she is a *maajnun*, a crazy/mad person.

This is the main picture revealed by the interviews. According to it, interviews allowed to collect also interesting information on responses offered to mental disorders.

Figures in the table below describe the resources available at State level – even though it is correct to notice that mental health services are available exclusively in the State's capital, Kassala city [20].

n. psychiatrists	0
n. psychologists	92
n. mental health nurses	2
n. social workers	20

Table 21. Number of mental health operators in Kassala State

The public institutions dealing with mental health in Kassala are basically two: the Kassala Teaching Hospital, with its psychiatric department established in 1973, and the Mental Health Directorate established in November 2019 thanks to the support of UNICEF.

Entering into details of the response offered by the psychiatric department, as for today no psychiatrist is available and the team taking care of patients is composed of one physician, 11 psychologists, 2 nurses

---

[20] Data refer to June 2021

and 2 social workers. The therapeutic services provided consist of pharmacological treatments, behavioural therapy and psychosocial support.

Catchment modalities varies from clinic referral or direct contact sought by the family hosting a PWMHD, to the police department reporting the presence of a PWMHD in jail or coming from the judicial court. That said, it is worth noting that from interviews appeared clear that the number of families seeking for help is consistently low. Furthermore, the working days of the psychiatric department are just 2 days out of the week.

Moving to the Mental Health Directorate (MHD), 11 psychologists and 1 social worker are the key figures of the institution. They offer psychological support to families, cognitive behavioural therapy for individuals and treat also substance addiction. The MHD is provided also with a mobile unit to reach families living in remote areas, but the chronic lack of fuel together with the inflation in fuel price, make this service almost unavailable.

Catchment modalities differs from the ones of the hospital due to the strict collaboration with UNICEF, hence mainly focusing on youth and children. Referrals come from child and family protection units dislocated by UNICEF in the field, from families of children or schools where awareness raising actives were led to upraise cases of possible disorders.

Compared to the hospital, the accessibility of the MHD in terms of opening hours is clearly more welcoming the need of the community, in fact they are open from 8.00 a.m. to 4.00p.m. every working day of the week. Nonetheless, the Mental Health Director is reporting that this working table is however not enough to offer a full support to families with a PWMHD and the centre should become able to provide a 24h service all over the year.

As for methods, practices and pharmacological treatments adopted by health professionals, the study collected the following evidence:

Pharmacological drugs used to calm down psychotic or schizophrenic patients reaching the facility during the ongoing crisis are: diazepam (mainly in form of injected Valium), promethazine (Phenergan), haloperidol, and carbamazepine (Tegretol)

Psychosocial support offered to patients and families could be distinguished into two main categories:

Home visits, mainly conducted by social workers for the follow-up of the medical treatment, of the socio-economic capacity to access medications and consultancies, of the relationships inside the nuclear family to ensure the safety of all its members.

Community Behavioural Therapy (CBT), conducted by psychologists and social workers, aimed at acting on the feelings and emotions of a group, usually the family.

Another medical treatment for severe states of mental disorders:

Electroconvulsive therapy (ECT), a treatment most commonly used in patients with severe major depression or bipolar disorder who did not responded to other treatments. ECT

involves a brief electrical stimulation of the brain while the patient is under anaesthesia. Apparently, ECT is a practice that have been banned from the health services by the Government. Nonetheless, this treatment is still used in police departments, mainly in prisons environments, where also severe patients from the hospital are sent to receive the treatment.

The police department in Kassala is, nowadays, the main catchment institution for people with significant mental disorders. *Maajnun* living alone, abandoned from their families and with no institution able to host them, can easily develop antisocial behaviours frightening people around. The only authority intervening in similar cases in the police. After a first evaluation of the arrested person, the mental health services are alerted to cooperate in dealing with the patient.

To conclude, the table below reports some of the suggestions collected from the health professionals dealing everyday with mental health:

♦ **Psychiatrist.** As for June 2021, no psychiatrist is available in the whole State of Kassala. The presence of professionals is deemed necessary to prevent misleading treatments and therapies.
♦ **Environment.** The spaces dedicated inside as well as outside the hospital should be appropriate and attractive to patients, families and visitors. It is a crucial aspect to reduce stigmatization among the community.
♦ **Mental health pharmacy.** A dedicated pharmacy should ensure the availability and affordability of medical treatments for mental conditions. The pharmacy should be linked to health insurance schemes covering most treatments, especially the most expensive ones. Up today, it is exactly the opposite.
♦ **Regular training and refresher courses.** Health professionals have to cooperate in the early detection and actual management of people affected by mental conditions. For this reason, it is important to inform and train the staff working in the health facility at primary and secondary level.
♦ **24-hour service.** Mental health services should be available 24h to avoid that the entry point to the formal system is the police department. People, and especially PWMHD's families, need to rely on a continuous service able to help them when most needed, for instance during patients' psychotic crisis.
♦ **Running costs.** Social and mental services should frequently follow up with patients directly at their homes. Home visits have proved to have a positive effect on the correct taking of the pharmacological treatment, as well as on the attitude of both the patient and the family. The basic resources to promote this simple activity are a vehicle and fuel. Non-health resources are as needed as the medical ones.

CONCLUSIONS and RECOMMENDATIONS

The present study has used a series of indicators suggested by the PASS-Model theoretical framework developed by the Belgian Institute of Tropical Medicine to assess the accessibility and consistency of the primary health services offered in the State of Kassala.

The emerging picture is that of a health system having a potential, but lacking i) resources (financial and human) that ensure the quality and sustainability of services, as well as the continuity of health personnel, ii) clear procedures defining the criteria for access to care (health need / entry level), iii) coordination between the different health levels (primary, secondary and tertiary), and, in connection to the previous point, iv) a sound health information system able to monitor financial aspects, services offered to the public and the patients' clinical histories.

Further investigation for each indicator considered has shown as follows:

Care accessibility. PHC services do not always respect their catchment area as established by the FMOH guidelines. Within the study several PHC centres were found covering single small communities, while wider communities were covered instead by one PHC unit suffering from the large number of people referring to it, the poor availability of services and the high turnover of the few personnel trying to face everyone's needs. The facilities are reachable with different options, and, if catchment area coverage is respected, people can get to their destination on foot, by animals or by public transport (when having a job). The waiting time to have one's medical needs met, mostly ranging from 30 minutes to 2 hours as for being examined, is not affecting the perceived quality of the services.

Availability of health care. The significant lack of personnel and the poor equipment the facilities have to work with, affect the availability and quality of the services provided. The reproductive health service appears to be the most efficient, while other services such as dental, eye and psychological and rehabilitation services are far from being considered available and consistent. Due to the focus of the study, 0% of the assessed PHC facilities showed any professionals available for responding to the psychosocial needs of the population. It is worth noting that despite the large number of midwives and nurses deployed in the field, 1/3 of the families that were interviewed to understand the role of mental disorders in the community reported that the PWMHD was a woman and suffering from post-partum depression. In conclusion, prevention initiatives are promoted by a limited number of facilities, although the importance of these activities is generally recognised and, when implemented, they are promoted in gathering places where a large part of the communities can join them.

Acceptability of health care. The comprehensive evaluation of the quality of services shows a prevalent satisfaction with the services received. The evaluation takes into account the respect perceived by patients for their confidential information and for themselves as human beings. The distance facility's personnel-patient seems not affecting the relationship between the service provider and the demand side. Non-satisfaction, when registered, is however mainly referring to health personnel behaviour and include poor explanations on dosage and treatment regimens, rudeness by health personnel, and a blaming-the-victim mentality.

Affordability of health care and sustainability of the services. Both indicators turned out to be critical, the first for the patients and second for the facilities. The two expenditure categories weighting the most on patients are medicines and laboratory services.

The cost of the services could be either covered through direct payment by the patient (OOP), or through public or private health insurance. Curiously, the study has revealed that the number of facilities accepting direct payment falls from 28 to 15, while 27 are commonly covering the offered services through the NHIF. But NHIF is not covering many of the consultancies, treatments and medicines needed by people, and moreover not everyone has a health insurance. This information came up clearly from the interviews with PWMHD's families, who are facing financial challenges to get medicines for treating the mental condition of their relatives.

Considering the sustainability of the services, hence of the facilities, in the State of Kassala the three main sources of income of a PHC facility are patients (OOP), the NHIF and the Government in a proportion that varies based on the locality. Due to the little investment by the Government and the little income generation of each facility, many of them closed. In fact, during the first steps of this study the authors asked the KMOH to provide an updated list of the active hospitals, centres and units in the State. The list, although considered updated, was corrected by deep data cleansing due to the closure of many facilities, mainly for financial reasons. It is worth to notice that collecting reliable information on patients' histories as well as on the financial situation of the facilities was not easy, due to the absence of a proper health information system in most facilities.

Inclusion of health care. Kassala Urban and Telkok are the only locations with facilities reporting to have at least a ramp available for people with physical disabilities and / or doors having a width greater than / equal to 90 cm. Physical disability is the only disability taken into consideration, since no service is available for people with mental impairments.

A final consideration on mental health should be made separately. Outputs from the fieldwork are full of shadows and it is still difficult to have a clear picture of the situation in the Kassala State, just as it would be quite hard doing the same for the whole Sudan. Hence, within the conclusions of this study, the authors try to further analyse the concept of mental health and how to support it, by relying on an important contribution from WHO, which since the early 2000s has been working to take care of the mental health of the world population, even in resource-poor contexts like Sudan.

'Mental disorders frequently lead individuals and families into poverty. Because of stigmatization and discrimination, persons with mental disorders often have their human rights violated and many are denied economic, social and cultural rights, with restrictions on the rights to work and education, as well as reproductive rights and the right to the highest attainable standard of health. They may also be subject to unhygienic and inhuman living conditions, physical and sexual abuse, neglect, and harmful and degrading treatment practices in health facilities. They are often denied civil and political rights such as the right to marry and found a family, personal liberty, the right to vote and to participate effectively and fully in public life, and the right to exercise their legal capacity on other issues affecting them, including their treatment and care.' (WHO, Mental Health Action Plan 2013-2030)

The P(M)HC Research gave a picture in line with the WHO description above. Sudanese PWMHDs the team came across, were people with families trying hard to cope with their everyday needs, but also people whose rights were denied. Their poor level of education together with their little knowledge on mental health, and the stigmatization and discrimination of whatever considered 'out of normal', isolate mental disorders in a separate and silent bubble within the society.

Mental, neurological and substance use disorders are highly prevalent in Sudan, accounting for a large burden of disease and disability, even if this need still remains hidden under the surface. A wide gap remains between available health system capacities and resources, what is urgently needed, and what is available to reduce the burden. Mental disorders could heavily affect the ability of children to learn and the ability of adults to integrate well into families, at work, and into society in general.

1. BOOSTING FAMILY MEDICINE

A first recommendation is to **strengthen the family medicine approach**, whose principles and guidelines would help to early identify physical and psychological symptoms thanks to the personal and ongoing relationship with general practitioners in possession of the medical and personal history of each patient. Family physicians, social workers, community health workers, community nurses, inpatient or outpatient service providers, outreach care workers (…) become key figures in closing the gap between patients and health services.

Mental disorder is a private and delicate topic. It takes time to be shared with a person outside the family, and when symptoms are evident it means that the disorder could be in an advanced status, harder to be treated. The available psychiatrists and psychologists are not sufficient to serve the whole affected population, from the entrance to the health system, along the follow-up and until the end of the therapy —when an end is possible. Health specialists need the support of valid and unreplaceable figures having close contacts and ongoing relations with the community.

In order to create a hierarchical structure of the access to metal health care, as it would be for standard care, community health professionals should be able to recognize needs and deliver primary interventions as front-line personnel.

To strengthen the family medicine approach, integrated with mental health components, community-based programmes should incorporate the following general principles:

❤ All health care centre staff should receive basic training in family practice, with age-, sex- and culturally sensitive practices that address the required knowledge, attitude and skills to communicate with their catchment population.

❤ Health care centres should provide appropriate education and information on health promotion, disease management and medications for all groups of patients, in particular vulnerable groups of the community such as mothers, children, people suffering from communicable and noncommunicable diseases and the elderly.

❤ Health care centres should make every effort to adapt their administrative procedures to the special needs of their catchment population, for example people with disabilities, chronic patients, elderly people with low educational levels or with mental conditions.

❤ Health care centre systems should be cost-sensitive in order to facilitate access to needed care by low-income people.

❤ Health care centres should adopt systems that support a continuum of care both within the community level and between the community and secondary and tertiary care levels.

♥ Health care centres should train volunteers and use them in the follow-up of defaulters, provide simple health care services at the doorsteps of the community, etc.

♥ All record-keeping systems in health care centres should support care continuity, by keeping records on care as well as facilitating access of the households through interdisciplinary collaboration.

♥ Individual patients, families and other groups within the community should be part of participatory decision-making mechanisms regarding the organization of the family practice services.

♥ The physical environment of each health care facilities should be acceptable and matched with culture of clients; simple and easily readable signage should be posted throughout the health care centre in order to locate easily recognized available services.

♥ Key health care staff should be easily identifiable by name badges and name boards.

♥ Health care centre should be equipped with good lighting, non-slip floor surfaces, stable furniture and clear walkways.

♥ Health care centre facilities, including waiting areas, should be clean and safe environments protecting patients and their caregivers.

These general principles can be adapted to each health care centre and provider setting in order to ensure responsiveness and sensitivity to the community served.

Recognizing the essential need to provide services for people with mental disorders and their caregivers, and to bridge the gap between available resources and the large need for these services, the WHO Department of Mental Health and Substance Abuse launched the Mental Health Gap Action Programme (mhGAP) in 2008. The key objectives of mhGAP are to reinforce the commitment of governments, international organizations and other stakeholders to increase the allocation of financial and human resources for care of mental disorders and to achieve much higher coverage with key interventions in low- and middle-income countries.

The following recommendations are aligned with the mhGAP Intervention Guide (mhGAP-IG) published in 2010 and addressing mental disorders in non-specialized health settings.

2. TRAINING PROGRAMME IN MENTAL HEALTH

In line with the first recommendation, the second one is to **invest in training of healthcare providers working in non-specialist settings** to deliver interventions as front-line personnel, along with mechanisms to ensure their continued support and follow-up.

The objective of the training programme is to teach non-specialist healthcare providers the skills and knowledge needed to assess and manage people with priority mental conditions. The duration of training depends on the local resources, as well as on the knowledge and skills that non-specialist healthcare providers already have. Usually, this training process takes several full days and can be conducted face-to-face or via e-learning, depending on feasibility.

The training structure can follow a cascade plan with two levels:

a ToT, where a master facilitator trains 'trainers', followed by

different training to the non- specialist front-line healthcare providers made by the new trainers.

WHO has also developed psychological interventions in simplified form. These are scalable interventions, and their delivery requires a less intense level of specialist human resource use. It means that the intervention has been modified to use fewer resources compared to conventional psychological interventions and that people with and without previous training in mental health care can effectively deliver low-intensity versions as long as they are trained and supervised.

3. PROVISION OF TREATMENT AND CARE

Pharmacological and psychological interventions are recommended to be provided by non-specialised health care providers.

Examples of scalable psychological intervention manuals within the mhGAP that can be accessed on the dedicated website and target the main areas of intervention:

Problem Management,

Interpersonal Therapy,

Maternal Depression, and

Parental Skills.

Pharmacological interventions can be used to treat symptoms of mental conditions to shorten the course of many disorders, reduce disability and prevent relapse. Essential medicines are part of the 21st WHO Essential Medicines List (EML). Access to essential medicines is a component of "the right to health."

There are four main groups of medications that target the priority mental conditions mentioned in this guide:

- antipsychotics for psychotic disorders

- drugs for mood disorders (depressive or bipolar)

- anticonvulsants/antiepileptics

- medications for management of substance withdrawal, intoxication or dependence.

Medicines for mental and behavioural disorders		
Medicine name	**Disorder category**	**Indication**
Amitriptyline	Medicines used in depressive disorders	Depressive disorders
Carbamazepine	Medicines used in bipolar disorders	Bipolar or related disorders
Chlorpromazine	Medicines used in psychotic disorders	Schizophrenia or other primary psychotic disorders
Clomipramine	Medicines used for obsessive compulsive disorders	Obsessive-compulsive disorder
Clozapine	Medicines used in psychotic disorders	Schizophrenia or other primary psychotic disorders
Diazepam	Medicines for anxiety disorders	Anxiety
Fluoxetine	Medicines used in depressive disorders	Depressive disorders
Fluphenazine	Medicines used in psychotic disorders	Schizophrenia
Haloperidol	Medicines used in psychotic disorders	Schizophrenia or other primary psychotic disorders
Lithium carbonate	Medicines used in bipolar disorders	Bipolar or related disorders
Methadone	Medicines for disorders due to psychoactive substance use	Opioid dependence
Nicotine replacement therapy	Medicines for disorders due to psychoactive substance use	Nicotine dependence
Risperidone	Medicines used in psychotic disorders	Schizophrenia or other primary psychotic disorders
Valproic acid	Medicines used in bipolar disorders	Bipolar or related disorders

The experiences of many countries show that improvements in the supply and use of medicines are possible. Access of populations to essential medicines are determined by:

- a rational selection of medicines

- making prices affordable

- ensuring sustainable financing, and

- availability of reliable health and supply systems.

4. INTEGRATING MENTAL HEALTH IN HEALTH INSURANCE

WHO's determinants of access to essential medicines bring the attention to the financial factor, which is a key aspect in poor countries.

As emerged in the study, the national health insurance has a limited coverage of health expenditures. Policymakers should consider a dialogue with the **NHIF and private insurances to redefine the converge plans in order to take into consideration a wider range of needs**, from a broader number of specialized consultancies to a broader number of essential medicines.

As household assets in resource-poor settings were inadequate to cope with the costs of these diseases, there is a urgent need for more collective health service and resource provision to support household treatment and coping strategies.

Disaggregated illness cost data by socioeconomic groups is scarce in the literature and database systems, possibly because measuring income or socioeconomic status is immensely difficult. This means that policymakers had limited information about the groups most affected by illness and the economic impact of illness on the poorest. A new financing system should be studied to allow more meaningful comparisons of the economic burden of illness across settings and diseases.

Financial and private institutions are called to design new specific mechanisms aiming to support people in covering medical expenses. New products should firstly aim at relieving the burden of poor families affected by the disease —or even promoting preventive measures for family members' health. Thus, financing mechanisms should also aim at reducing the individual, local and systemic risk itself, in order to concretely boost access to credit in rural areas and among less wealthy groups.

Health policy research and debates need to be broadened, because even if health services have been improved, they cannot protect households from all illness costs, in particular expenditure on non-medical items and indirect costs. (Russel S., 2004)

WHO recommends reorganizing health services around people's needs and expectations. To improve health and social outcomes, health systems must put people first. To become more relevant, services also have to do more to meet the needs of the entire population, while at the same time addressing the specific needs of some population subgroups. Therefore, a successful family practice programme depends on the degree of households' awareness about the benefits and processes of family practice and their active cooperation with health care providers.

An effective family practice programme should cover both physical and mental health, including the provision of equal and timely access to basic promotive, preventive, curative, rehabilitative and palliative health services, and health education, regular screening programmes and appropriate treatment of illnesses and different kinds of disabilities.

But change requires time. Especially when considering attitudes and consequently behaviour.

For this reason, what the private sector does through advertising, that is the most powerful mean of persuasion, must be translated into public health measures with the implementation of advocacy and awareness-raising activities. In this study the focus is on mental health, which is the weakest sector in public health, thus the one requiring more effort in triggering a change in attitudes to act more conscious behaviours.

5. ADVOCACY AND AWARENESS RAISING

Mental health advocacy uses information in deliberate and strategic ways to **influence others to create change**. It involves the promotion of the needs and rights of people with mental disorders, as well as that of the general population. Advocacy is different from education. Education informs and helps create awareness of an issue. **Advocacy**, on the other hand, **aims to persuade**.

A basic principle is that advocacy is only effective when the target audience is asked to do something. Mobilizing people means asking them to become part of the solution.

This is done through requests and calls for specific actions, and involves people at two different levels:

💬 Advocacy actions within the general population: mobilization of PWMHDs and their caregivers, using the media to increase awareness of mental health issues, provide education about mental health issues in public places, ….

💬 Advocacy actions with health and mental health workers: promoting an understanding of the importance of community care, community participation and human rights of people affected by mental conditions, provide adequate training and support to mental health and general health workers).

In parallel with the promotion of a change in people's mindset, various actors should be directly involved in the efforts for a new interpretation of the PHC and the mental health. In this direction, interdisciplinary and intersectoral collaboration is crucial especially for an effective inclusion of marginalized groups of people such as people with mental conditions.

6. NETWORKING AND INTERSECTORAL COLLABORATION

The implementation of programmes aiming at macro changes requires the collaboration of various sectors and stakeholders, such as:

✳ **Specialist and non-specialist health services and care-providers:** psychologists, community health workers, social workers, inpatient or outpatient service providers, outreach care workers.

✳ **Service users:** groups or individuals living with the same condition, family members with the same condition or caring for someone with the same condition (after seeking consent from all those involved).

✳ **Family and friends:** Identifying the person's prior social activities that, if reinitiated, would have the potential for providing direct or indirect psychological and social support (e.g., family gatherings, outings with friends, visiting neighbours, social activities at work sites, sports, community activities) and encouraging the person to resume these activities.

✳ **Informal community support:** spiritual groups, saving groups, recreational groups, women groups, youth support groups, cultural groups, self-help groups, helplines.

✳ **Education and employment:** schools, education, income generating or vocational training programmes. Specifically, suicide prevention programmes in school settings, including mental health

awareness training and skills training, to reduce suicide attempts and suicide deaths among adolescent students.

* **Non-governmental organizations:** legal aid, child protection services, gender-based violence programmes or psychosocial support programmes.

* **Government services and benefits:** public justice systems, child welfare, pension, disability, transport discounts.

Last but not least, Monitoring and Evaluation (M&E) can provide information about whether the health system is making a difference and for whom, it can identify areas on target or aspects of the system that need to be adjusted. Information gained from M&E can demonstrate to health policymakers, implementers and funders that their investments are paying off. M&E provides vital information for learning from past experiences, improving service delivery, planning, allocating resource and reporting results to key stakeholders.

For this reason, FMOH together with SMOH should invest in training key personnel in the collection, cleaning and processing of data throughout the financial year. The 'Notes to enumerators' are just a starting point that authors wish could stimulate other SMOH to promote activities similar to those promoted at Kassala level. SMOHs should capitalize and invest in staff skills for data collection, research methodologies, data entry, cleaning, processing and analysis, to the benefit of the health system itself. Definition of SMART indicators paired with a systematic data collection could ensure a smooth monitoring process to follow up health policies, programmes and services at different levels, as well as to track patients' clinical histories after coming in contact with the health system at any level.

7. DATA COLLECTION AND INFORMATION MONITORING SYSTEM

The last recommendation, hence, suggests **designing and implement an inclusive and coordinated Monitoring and Evaluation programme** that should involve planning, coordinating, collecting, cleaning, analysing and using data from federal, statal and local levels. Such system requires the FMOH to invest resources on a dedicated multidisciplinary team to plan and carry out the M&E programme.

Indicators used to monitor should be part of the national health information system and equal in all the States and at all levels, besides adapted to the context. Collecting data using indicators will assist in monitoring health programme, both under a financing and an operational point of view. They will also assist in reporting on national health when interlocution with public and private donors and investors.

M&E process identifies successes and areas for improvement by currently updating data.

To conclude, the authors recommend conducting further studies in Sudan on the understanding of mental health and the use of relevant services, keeping the focus on the community level, rather than on the macro health system. For example, researchers could look into the responses and attitudes of traditional and religious healers regarding mental health patients, as well as into the everyday management of the disorders affecting PWMHDs and their caregivers, and the actual match between needs and health system responses.

I. List of PHC facilities

Urban Kassala locality

No.	PHC facility name	Location	Interview date	No.	PHC facility name	Location	Interview date
1	Elnahada	South Elsawagi	2021-01-11	17	West gash	West gash	2021-01-06
2	Hamed wakeel	Hamed wakeel	2021-01-11	18	ELsikka heded	ELsikka heded	2021-01-06
3	Yahya Elhussein	Banat South	2021-01-11	19	Altadamon	Halanga SQ5	2021-01-06
4	Altora	Altora	2021-01-11	20	Albarno and bargo	Albarno & bargo	2021-01-05
5	wownoor	Wownoor	2021-01-12	21	Biryay	Biryay	2021-01-05
6	Elsalam	Halanga	2021-01-12	22	South Halanga	All Halanga	2021-01-05
7	Mastora	Mastora	2021-01-10	23	West Mokram	Eastern Kassala	2021-01-04
8	Elshaheed raibaa	Hi elshaheed	2021-01-10	24	Mokram Elderwa	Mokram Elderwa	2021-01-04
9	El roman	He alarb SQ27	2021-01-10	25	kadogli	Kadogli	2021-01-04
10	ELmansora	Banat SQ31	2021-01-10	26	East inkaz	Alngaz	2021-01-04
11	North Halanga(Jamaa)	North Halanga	2021-01-07	27	Bant 42	Bant SQ42	2021-01-04
12	Elmergania	Elmergania	2021-01-07	28	Banat 36	Banat SQ36	2021-01-03
13	soriba	Soriba	2021-01-07	29	Tarawa	Tarawa	2021-01-03
14	Elhidaya	Alkatmia gadima	2021-01-07	30	banat 20	Banat 20	2021-01-03
15	Elkormota	Elkormota	2021-01-06	31	Elshaabia (Closed)	El shaabia	2021-01-03
16	North Sawagi	North Sawagi	2021-01-06				

Rural Kassala locality

No.	PHC facility name	Location	Interview date
1	Elmaria	Elmareia	2021-01-20
2	Wadsharefy Elmasjed	Wadsharefy	2021-01-18
3	Awaad	Awaad	2021-01-20
4	Fadayeab	Fedayeb	2021-01-17
5	Elshokria	Elshokria	2021-01-13
6	Elsabdarat	Elsabdarat	2021-01-13
7	Hafarat Golsa	Golsa	2021-01-17
8	Amara	Amara	2021-01-14
9	North Elhomadab Elrahma alskan	Alskan	2021-01-14
10	Radeef	Alradeef	2021-01-17
11	OPD	Old Camp	2021-01-18
12	Kertaey	Kertaey	2021-01-21
13	Ellafa	Ellafa	2021-01-14
14	Wadsharefy wasat	Wadsharefy	2021-01-19

Talkok locality

No.	PHC facility name	Location	Interview date
1	Maman	Maman	2021-01-17
2	Tahday osees	Tahday	2021-01-13
3	Elatyot elmasjed	Elatyot	2021-01-13
4	(Yedaroot) Jabal Haboob	Jabal haboob	2021-01-13
5	Tahjar	Tahjar	2021-01-12
6	Tawayeet wasat	Tawayeet	2021-01-12
7	Darasta	Darasa	2021-01-16
8	Timekrif	Timekrif	2021-01-16
9	Timeket balley	Balley	2021-01-17
10	Kashom tamay	Kashom tamay	2021-01-17

Al Girba locality

No.	PHC facility name	Location	Interview date
1	Elraaya	Elraaya	2021-01-10
2	1 Arab janoob	1 Arab janoob	2021-01-11
3	Ard elhajar	Ard elhajar	2021-01-13
4	2 Arab ellahaween janoob	2 Arab ellahaween janoob	2020-01-09
5	2 Arab elshokria shamal	2 Arab elshokria shamal	2021-01-09
6	Dar elsalam	Dar elsalam	2021-01-13
7	Sangat	Elgirba	2021-01-13
8	Khor ellaben	Khor ellaben	2021-01-12
9	Elmonabaa	Elmonabaa	2021-01-12
10	Korak	Korak	2021-01-13
11	Wad deman	Wad deman	2021-01-10
12	1 Arab shamal	1 Arab shamal	2021-01-11

New Halfa locality

No.	PHC facility name	Location	Interview date	No.	PHC facility name	Location	Interview date
1	Elhara elola	Elhara elola	2021-02-14	15	22 eskan	22 eskan	2021-02-12
2	El hara elrabaa	El hara elrabaa	2021-02-12	16	24 eskan	24 eskan	2021-02-14
3	Elsofya eljadeda	Elsofya eljadeda	2021-02-14	17	19 eskan	19 eskan	2021-02-12
4	Gely	Gely	2021-02-15	18	12 eskan	12 eskan	2021-02-10
5	Om reka	Om reka	2021-02-15	19	4 eskan	4 eskan	2021-02-10
6	Omraho	Omraho	2021-02-15	20	33 eskan	33 eskan	2021-02-10
7	Shakely	Shakely	2021-02-15	21	23 Eskan	3 eskan	2021-02-12
8	18 Eskan	Hey Osman	2021-02-12	22	13 eskan	13 eskan	2021-02-10
9	Elabbasia	Elabbasia	2021-02-9	23	2 eskan	2 eskan	2021-02-10
10	1 Eskan	Elmoasasa	2021-02-10	24	8 eskan	8 eskan	2021-02-10
11	Elmahalij	Elmahalij	2021-02-8	25	Elthora moraba 1	Elthora moraba 1	2021-02-8
12	Elthora moraba 2	Elthora moraba 2	2021-02-9	26	Dabarosa elgadeema	Abdalmonam salih	2021-02-9
13	Dabarosa elgadeema	Dabarosa elgadeema	2021-02-9	27	Elray	Elray	2021-02-9
14	26 eskan	26 eskan	2021-02-12	28	20 Eskan	20 Eskan	2021-02-14

II. Table of available equipment per each service/locality

OUTPATIENT	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Stethoscope	45	17	9	16	21
Foetal Scope	26	8	2	10	11
Adult Weight Scale	24	10	8	1	18
Infant Weight scale	20	5	5	10	20
Sphygmomanometer	41	14	5	5	17
Thermometer	18	15	4	6	19
ENT Diagnostic Set	0	0	1	2	1
Foreign body extraction hook	3	1	1	0	2
Ear syringe	1	5	1	3	0
Tongue Depressor (BOX)	6	8	3	4	0
Diagnostic Set	0	0	1	0	3
Torch	3	3	2	2	0
Nebulizer	14	3	1	1	6
Glucometer	4	1	2	0	6
Mobile Examination Lamp	1	1.320	3	0	1
No. Patients / month for this service	1.864.8	1.206,7	413.8	678.7	238.0

LABORATORY	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Microscope	29	15	2	10	20
Haemoglobinometer	15	10	1	6	9
White Cell Chamber	16	5	1	8	7
Electric Centrifuge	20	11	1	6	13
Manual Centrifuge	0	0	2	4	0
Timer (Stopwatch)	8	5	0	8	8
Bunsen Burner	1	2	1	5	0
Tube Rack	33	11	2	6	8
ESR Tube	24	48	2	5	12
ESR Rack	26	6	2	3	12
Pipette fixed	16	11	1	4	1
Pipette adjustable	14	7	0	4	0
Colorimeter	8	5	0	3	4
Spectrophotometer	2	0	0	1	0
Flame photometer	0	1	0	0	0
Haematology analyser	7	0	0	0	1
C-Reactive Protein (CRP)	0	0	0	1	0
No. Patients / month for this service	958.2	835.2	200.0	455.7	231.7

MINOR OPERATION ROOM	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Autoclave 18 Lt with drum set	7	1	4	0	0
Dressing Tray	5	1	7	0	0
Kidney Dish mid	8	1	7	0	0
Kidney Dish small	18	1	9	0	0
Dressing Set	4	1	2	0	0
Instrument trolley	4	1	3	0	0
No. Patients / month for this service	31.9	30.0	6.0	0.0	0.0

REPRODUCTIVE HEALTH	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Cusco's Speculum	105	23	0	3	16
Sims Retractor	1	2	0	0	6
Artery Forceps	22	8	15	6	14
Kale pot (bowl)	11	4	2	1	14
Examination Tray	11	5	0	2	17
Kidney Dish mid	20	19	3	2	16
Kidney Dish small	17	6	6	0	12
Delivery table	7	3	2	2	17
Delivery set	9	2	16	2	13
Mobile lamp	5	2	0	1	5
Gynaecological set	3	2	0	0	1
Infant ambo bag	5	2	1	2	1
Suction machine	6	3	4	1	1
Instrument tray	5	7	0	0	3
No. Patients / month for this service	91.9	134.7	27.6	103.5	33.0

VACCINATION & NUTRITION	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Infant Weight Scale	17	8	0	9	16
Adult Weight Scale	20	5	4	0	16
Thermometer	12	3	0	0	25
Freeze Tag	6	6	0	0	15
MUAC	66	83	25	33	15
Length and height board	22	10	9	8	16
Salter Weight Scale	22	10	9	7	15
Refrigerator	12	7	0	9	15
Cold Box	43	31	1	5	15
Safety box	104	45	0	15	14
Vaccination Carrier + Ice Bag	41	28	0	104	14
No. Patients / month for this service	282.2	382.1	138.6	136.3	66.1

DENTAL ROOM	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Dental Unit	2	0	0	1	0
Dental x-ray	0	0	0	0	0
Dental instrument set	3	0	0	1	0
Autoclave with drum	3	0	0	0	0
No. Patients / month for this service	399.6	0.0	0.0	0.0	0.0

MEDICAL IMAGE	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Conventional X-Ray	0	0	0	1	0
General Ultrasound Machine	0	0	0	0	0
Hanger (A, B & C)	0	0	0	0	0
Cassettes A	0	0	0	2	0
Cassettes B	0	0	0	0	0
Cassettes C	0	0	0	2	0
Lead aprons	0	0	0	0	0
Processing tanks	0	0	0	0	0
No. Patients / month for this service	0.0	0.0	0.0	182.0	0.0

ECG ROOM	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
ECG Machine	0	0	0	0	0
No. Patients / month for this service	0.0	0.0	0.0	0.0	0.0

PHYSICAL REHABILITATION	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Bed for physical rehabilitation / physiotherapy	0	0	0	0	0
Weights	0	0	0	0	0
No. Patients / month for this service	0,0	0,0	0,0	0,0	0,0

PSYCHOLOGICAL SUPPORT	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Room for private consultation (granting the access to 1 patient per time)	0	0	0	0	0
No. Patients / month for this service	0,0	0,0	0,0	0,0	0,0

OPHTALMIC CLINIC	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Examination chart	2	0	0	0	0
Trial Lens Set	1	0	0	0	0
Examination Lamp	2	0	0	0	0
Ophthalmoscope	1	0	0	0	0
No. Patients / month for this service	120.0	0.0	0.0	0.0	0.0

EMERGENCY	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Ambulance	0	0	0	0	0
Vehicle/s for home visits	0	0	0	0	0
No. Patients / month for this service	119.2	0.0	11.4	0.0	0.0

MEDICAL FORNITURE	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Examination Couch	54	28	11	13	25
Screen	51	23	12	12	34
Intra Venus Stand	53	17	11	11	5
Medical Bed with Mattress	76	18	5	4	10
Bed Side Cabinet	11	0	3	2	1
Stool	16	1	2	5	0
Patient trolley	9	1	1	0	0

FORNITURE	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Office Desk	192	65	34	30	28
Office Chair	67	25	27	48	30
Chair	352	75	44	34	70
Waiting chair (Three seats)	134	48	29	39	674
Cupboard (2 sides)	124	41	35	22	27
Cupboard (half size)	1	9	0	3	9

OTHER ITEMS	Kassala Urban	Kassala Rural	Telkok	Al Girba	New Halfa
Computer	7	3	0	7	0
Dust bin	132	28	22	10	1
Printer	5	2	0	1	0
Television + Digital satellite	2	2	0	0	0

References

Ali, A. A. A., & Okud, A. (2013). *Factors affecting unmet need for family planning in Eastern Sudan*. BMC Public Health, 13, Article 102. doi:10.1186/1471-2458-13-102

Ali S. H., Agyapong V. I. O., *Barriers to mental health service utilisation in Sudan - perspectives of careers and psychiatrists*, BMC Health Services Research (2016) 16:31 DOI 10.1186/s12913-016-1280-2

Abdelgadir H. M. Osman, A. Bakhiet, S. Elmusharaf, A. Omer and A. Abdelrahman, *Sudan's mental health service: challenges and future horizons* (2019), BJPsych International, Volume 17, Issue 1 , February 2020 , pp. 17 – 19, doi:10.1192/bji.2019.19

Chambers R. Poverty and livelihoods: whose reality counts?, Environ Urban, (1995), 7:173-204

Federal Ministry of Health (FMoH) Standards and metrologies of Sudan Health System '*Services and Health Units'* (2010)

Hamed S.,Ahlberg B.-M.,Trenholm J., Powerlessness, Normalization, and Resistance: A Foucauldian Discourse Analysis of Women's Narratives on Obstetric Fistula in Eastern Sudan, Qualitative Health Research, Volume 27, Issue 12, Pages 1828 – 18411, October 2017, DOI 10.1177/1049732317720423

Hausmann Muela, S., Muela Ribera, J., Toomer, E., & Peeters Grietens, K. (2012). *The PASS-model: a model for guiding health-seeking behavior and access to care research*. Malaria Reports, 2(1), e3. doi:10.4081/malaria.2012.e3

Henshaw EJ, Freedman-doan CR, Michigan E. *Conceptualizing Mental Health Care Utilization Using the Health Belief Model*. Clin Psychol Sci Pract. 2009;16(4):420–39.

Holloway, I., & Wheeler, S. (2016), *Qualitative research in nursing and healthcare*, John Wiley & Sons, Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19, 8SQ, UK.

Kessler RC, Amminger GP, Aguilar-Gaxiola S, Alonso J, Lee S, Ustun TB. *Age of onset of mental disorders: A review of recent literature*. Curr Opin Psychiatry. 2007;20(4):359-364. doi:10.1097/ YCO.0b013e32816ebc8c

MoH, WHO, System of health accounts report (2018)

Mohammed S., Nagla S., Morten S., Asma E., Arja A., *Illness perceptions and quality of life among tuberculosis patients in Gezira, Sudan*, African Health Sciences Open Access, Volume 15, Issue 2, Pages 385 – 393, 2015, DOI 10.4314/ahs.v15i2.11

Public Health Institute (MoH), Strengthening primary health care in Sudan through a family health approach policy option (2016)

Public Health Institute (MoH), Universal health coverage. Primary health care self-assessment in Sudan, (2020)

R. E. Rakel, D. P. Rakel, *Textbook of family medicine*, 9th Edition (2015), Elsevier

Swift J. *Why are rural people vulnerable to famine?* IDS Bull-I Dev Stud 1989; 20:8-15. 65

Thornicroft G, Chatterji S, Evans-Lacko S, et al. *Undertreatment of people with major depressive disorder in 21 countries*. Br J Psychiatry. 2017; 210(02):119-124. doi:10.1192/bjp.bp.116.188078

WFP, Sudan Comprehensive Food Security Assessment 2018 (2019)

WHO, WHO-AIMS Report on mental health system in Sudan (2009)

WHO, *Mental Health Gap Action Plan 2013-2030*, (2013), link

WHO EMRO, Conceptual and strategic approach to family practice. Towards universal health coverage through family practice in the Eastern Mediterranean Region (2014)