Masanga Hospital Pharmacy

A Development Project organized by Pharmacists without Borders Denmark and Masanga Hospital Rehabilitation Project.

Copenhagen 2018

Content

A. Summary

This document provides a description of the Masanga Hospital Pharmacy development project. The project is a collaboration between Pharmacists without Borders Denmark and Masanga Hospital Rehabilitation Project. The project aims to improve the health of patients at Masanga Hospital by ensuring a sustainable, fully operating, high quality hospital pharmacy. The aim is divided into three overall objectives in relation to patient care, storage and logistics and an integrated pharmacy. The objectives are inspired by the Joint FIP/WHO Guidelines on Good Pharmacy Practice as well as conducted studies and practical experiences by Danish volunteers and Pharmacy Master Thesis students. This has resulted in a profound knowledge of the local context of Masanga Hospital. The report describes the partners involved in the project, the project analysis and the objectives and success criteria, including measurable indicators, of the project.

B. Partners

B.1 Pharmacist without Borders – Denmark

Pharmacist without Borders – Denmark (PwB-DK), is a humanitarian non-governmental organization working to promote health through safe use of medicines. To foster good health conditions, it is essential that knowledge about safe and effective use of medicines is an integrated part of the health care system. Expanding this knowledge enables healthcare professionals to provide patients with evidence-based treatment, and communicate crucial information to patients about safe usage of medicine.

PwB-DK was founded in 2000 and is engaged in projects with focus on use of medicines, civic information, education, and capacity building. Currently PwB-DK has projects in Tanzania, Ghana and Sierra Leone, where Danish pharmacists and pharmacy students have been stationed on-location to facilitate and support local projects. In PwB-DK we believe that local engagement and ownership are essential for achieving a sustainable goal, which can persist after project finalisation. Therefore, the commitment of volunteers in Denmark as well as our local partners is essential throughout the project.

The general assembly is the highest authority of PwB-DK. The board of PwB-DK is elected at the annual general meeting. PwB-DK currently runs 3 projects, each of which is organized by a project group in Denmark with close ties to our collaborating partners in Africa. Furthermore, there is also a student network operating mainly from University of Copenhagen. The volunteers in the organization are trained specifically within the pharmaceutical field, which gives a strong academic backbone to all projects and ensures high quality and context relevance.

B.2 Danish partners

PwB-DK is a member of CISU (Civil Society in Development) who supports Danish organisations' national and global development work and provides a great platform for knowledge sharing and capacity building with other member organisations.

As for the project in Sierra Leone, PwB-DK works closely together with Masanga Denmark, who initiated the Masanga Hospital Rehabilitation Project (MHRP) and functions as a pivotal partner for the local development work. Masanga Denmark coordinates practicalities in relation to the stationing of volunteers and is the main connection to the MHRP International Board.

Finally, PwB-DK continuously engages in other civil society organisations, relevant for our work in Masange, among others:

- Magburaka Education and Computer Center (MECC)
- Engineers without Borders
- CapaCare
- Masanga Outreach Project

B.3 Masanga Hospital Rehabilitation Project (MHRP)

MHRP was initiated by a group of committed healthcare professionals and business people from Denmark, Holland, Norway and the UK who have come together to create life and opportunity in the post conflict zone of Sierra Leone, one of the poorest countries in the world.
MHRP is now constituted of 5 charities, namely Masanga DK (previously Association Friends of Masanga) in Denmark, Sierra Leone Adventists Abroad in UK, Franca Masanga (Masanga Netherlands), Capacare in Norway and Masanga UK. The five charities appoint the International Board of Masanga, which is the overriding governing body coordinating the activities of the 5 partner charities. The charities are constituted in each their country and each has a board of trustees. Each charity has at least one representative in the International Board of Masanga.

MHRP aims to create a sustainable 100 bed general hospital that is managed and staffed by local people and funded by the Government of Sierra Leone. Moreover, to support the general hospital and to address the severe shortage of healthcare expertise in Sierra Leone, MHRP aims for the hospital to serve as a teaching institution with strong links to European medical institutions. Thus, MRHP are developing self-funded education facilities to train healthcare professionals with skills in nursing and surgical techniques.

Furthermore, the hospital is also creating local businesses capable of serving the hospital and education facilities, creating local employment and contributing to the long-term funding of the hospital.

B.4 Collaboration Agreement

The official collaboration agreement consists of a Memorandum of Understanding (MoU) between Masanga Hospital Rehabilitation Project and PwB-DK. The MoU states the intended common line of action in regard to the development of the hospital pharmacy. In the MoU is stated that the project will be reevaluated by YEAR 2025.

C. Project analysis

C.1 The Background of the Project

Originally, the project was initiated by the organisation Masanga DK in 2005. At that time, the focus on improving the hospital pharmacy was only a smaller part of a greater project focusing on re-establishing the entire hospital after the devastation from the civil war (1991-2001).

Three Danish pharmacy students were stationed in Masanga for periods of five months between 2005 and 2011 to help establish the pharmacy and teach the staff basic knowledge in pharmacy practice. In 2011, two members of PwB-DK were situated in Masanga for 10 months on a combined research and labour stay. During that period, the pharmacy experienced a remarkable progress as the staff received intensive training and close supervision on how to improve pharmacy practice. Subsequently, collaboration with MHRP was agreed, naming PwB-DK as a strategic partner organisation in the further development of the pharmacy.

In 2013 and 2014 two research projects were carried out with relation to Masanga Hospital Pharmacy resulting in profound knowledge in regards to medicine use and health-seeking behaviour. During the same period the Masanga Pharmacy Practice Manual was formulated, establishing the first collection of standard-operational-procedures on basic work routines, thus making the foundation for improving the current practice at the pharmacy.

In 2016, a master student in pharmacy conducted her master's thesis project in collaboration with PwB-DK and MHRP. The aim of the study was to assess the current level of Good Pharmacy Practice (GPP) at Masanga Hospital Pharmacy. The study results function as a baseline for the development project and are reflected in the objectives and success criteria (see p. 8).

C.2 Short Description of the Project Context

The health situation in Sierra Leone

Sierra Leone became independent from the United Kingdom in 1961. While being one of the poorest countries in the world, Sierra Leone still struggles to improve poverty and health. Between 1991-2002 the country was hit by a devastating civil war, and lately the West African 2014 Ebola Outbreak caused approximately 4000 deaths, but had far-reaching consequences for national economy, education and health. (https://www.cdc.gov/vhf/ebola/history/2014-2016-outbreak/cost-of-ebola.html).

The National Health Sector Service Plan sets out priorities and plans of action to improve the general poor health condition of the population manifested in alarming health indicators. According to UNDP's development report 2016, out of 189 countries, Sierra Leone ranks 179 on the Human Development Index. Life expectancy at birth is 51.3 years,

the under-5 mortality was found to be 120 out of 1000 live births, and more than half of the population lives below the income poverty line of $1.99 per day (http://hdr.undp.org/en/countries/profiles/SLE). In order to reduce the maternity- and under-5-mortality, the government of Sierra Leone launched the Free Health Care Initiative (FHCI) in April 2010. The FHCI is offering medicines and healthcare free of charge to pregnant and breast-feeding woman and children under the age of five. FHCI has resulted in a massive increase in the demand of healthcare services in public institutions (mainly hospitals and health centres), which has not been met with allocation of additional resources. In general terms the public healthcare sector lacks funding, resources and human capacity to provide basic medical care to the majority of the Sierra Leonean population. The Ebola crisis in 2014 to 2015 has further put back any improvements made by the government during the past years.

At the same time the existing pluralistic health care system in Sierra Leone makes people consult many different providers including friends and relatives, drug peddlers and traditional healers before reaching the professional health sector. Most medicines are easily available within the informal sector and traditional herbalists and healers are in general considered as trustworthy sources of care. Hence, the context needs to be taken into consideration when aiming to strengthen the quality of primary healthcare in the professional sector.

Masanga Hospital

Masanga Hospital is a 100-bed teaching hospital placed in the rural part of northern Sierra Leone. It originated as a leprosy hospital, explaining the rural location, however, today it offers high-quality healthcare to all kinds of patients. The hospital has a good reputation with both national and international patients seeking treatment.

Although being a government hospital, it is mainly run and supported by the NGO MHRP, which has its main roots in the Danish organisation Masanga DK as described earlier. The organisation supports the hospital financially as well as with knowledge capacity building but works on a long-term sustainable strategy by ensuring education of local health professionals and creating lasting financial terms by building up local businesses on the hospital campus.

The pharmacy

Masanga Hospital Pharmacy is an integrated hospital unit placed in the centre of the out-patient department, serving both the admitted and ambulant patients. The pharmacy's employees are educated nurse aids or nurses and has continuously received further education in medicine handling by PwB-DK. The basic level of knowledge, however, still needs to be improved in order to strengthen the overall quality of the pharmacy and ensure safe treatment for all patients visiting Masanga Hospital.

C.3 Development of the Project Objectives

It should be clear by now that PwB-DK has profound knowledge in relation to the situation and context of Masanga Hospital Pharmacy. Based on the many stationings and research projects conducted at the hospital, the project group has identified three main objectives in order to build a sustainable, high quality hospital pharmacy.

The three objectives all center around an assumption that strengthening of Good Pharmacy Practice (GPP) will lead to an improvement of patient care. GPP has been defined by the International Pharmaceutical Federation (FIP) and World Health Organization (WHO) as:

"the practice of pharmacy that responds to the needs of the people who use the pharmacists' services to provide optimal, evidence-based care."

Furthermore, these guidelines state that:

"To support this practice it is essential that there be an established national framework of quality standards and guidelines."

Since the late 1990s FIP and WHO has worked together to provide a standardized approached to GPP, latest with the Joint *FIP/WHO Guidelines on Good Pharmacy Practice: Standards for quality of pharmacy services* from 2012.

The GPP guidelines provide a description of how pharmacists can improve access to health care, health promotion and the use of medicines on behalf of patient care. The key element is the commitment into practice in all settings in order to promote excellence in practice for the benefit of the patients. The conditions of practice vary from country to country. Therefore, each national pharmacy professional organization is best able to decide what can be achieved and within what time-scale (Joint FIP/WHO, 2011). In developing the national standards, the needs of the users of healthcare services as well as the capacity of national healthcare systems must be recognized to support these services (Joint FIP/WHO, 2011).

The GPP guidelines is organized around four major roles for pharmacists (see figure). Each role represents an area of medication management and use in which the pharmacist has responsibilities. The roles are described in much detail elsewhere (see Joint FIP/WHO, 2011). However, for this project description it is enough to mention that the three objectives have been developed as a recast of the GPP guidelines.

(Figure reprinted with permission from Stine Trolle's Master's thesis page 24)

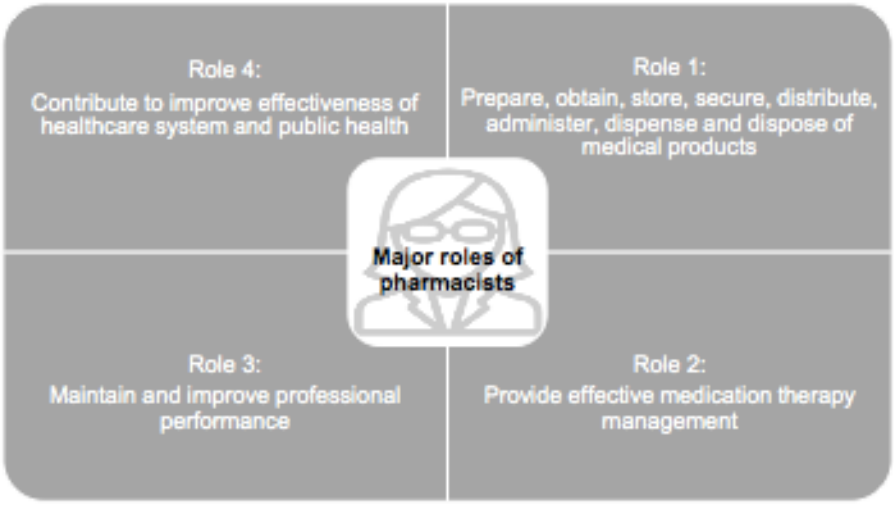
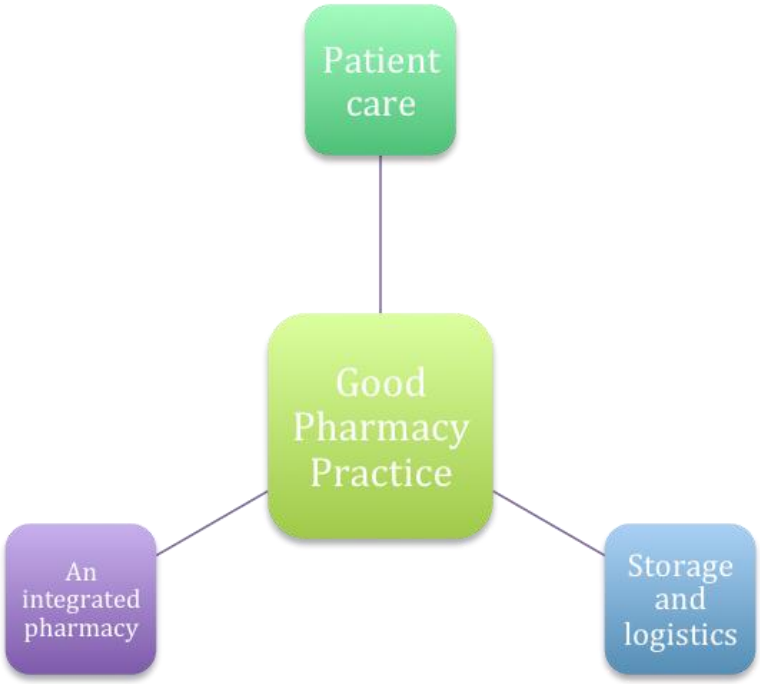


Figure reprinted with permission from Stine Trolle's master's thesis p. 12.

Hence, with reference to the GPP guidelines and based on Trolle's baseline-study on the level of GPP at Masanga Hospital Pharmacy, three overall objectives have been stated to guide the project, centering around the following three areas:

1. Patient care
2. Storage and logistics
3. An Integrated Pharmacy

Each area represents an important aspect of GPP, which will be shortly described in the following.



The three main areas on how to improve GPP at Masanga Hospital

D. Project description

D.1 Target group and participants

The Masanga Hospital Pharmacy project overall aim is to improve the health status of the patients at the hospital by ensuring a high level of good pharmacy practice. This aim is reached by increasing the internal capacities at the pharmacy through close collaboration and engagement with the pharmacy staff. Furthermore, the project aims to strengthen the handling and management of medicines at the entire hospital, hence includes participation of health professionals affiliated to all levels and departments of the hospital.

D.2 The project's aim, objectives and success criteria (including indicators)

The overall aim of the project is:

To improve the health of patients at Masanga Hospital by ensuring a sustainable, fully operating high quality hospital pharmacy.

The aim is divided into three overall objectives structured under three areas: Patient care, storage and logistics, and an integrated pharmacy:

1. Improved patient care

1.1 The knowledge and qualifications of the pharmacy staff are sufficient to provide good patient care.

The pharmacy staff is responsible for dispensing medicines to the OPD and inwarded patients. In order to ensure that patients receive proper care, a minimum level of knowledge and education in regard to pharmacology and pharmacy practice is required. The staff should be familiar with the medical product available at the hospital and be able to ensure correct medical treatment in close dialogue with the prescribing doctor. This requires that the staff has received a minimum level of professional training and that the staff has access to a minimum amount of relevant updated information on medicines and medical therapy.

1.2 The majority of OPD patients are informed properly about their treatment.

In order to ensure high-quality patient care, patients need to be well informed about the use of their prescribed medicines. As first-line healthcare providers, the pharmacy staff needs high quality training on dispensing practice, including communication skills, which should strengthen their ability to provide patients with the information needed to adhere to medical therapy. The staff should be qualified in proper labelling of pharmaceutical products and be able to communicate this information orally to the patients while taking into account individual cultural and socio-economic factors.

2. Proper storage and logistics

The pharmacy is responsible for the procurement and storing of pharmaceutical products at the hospital. In order to ensure the availability of high-quality medicines, the pharmacy staff should ensure proper storage conditions and safe handling of medicines at the hospital. This requires an implemented storage system and frequent monitoring of stores, including a standardized procurement system.

2.1 The storages are organized according to a relevant storage system and the use of medicines is monitored on a frequent basis.

The storages should be organized according to WHO’s ATC-system. Storages should be kept clean and temperatures should be monitored.

2.2 Sufficient medicines of adequate quality are always available.

The majority of medicines should be procured from well-established manufacturers. Standards on how and when to procure new medicines should be available in order to secure continuous access to high-quality products. There should be a procedure for the management of expired medicines, and for products obtained outside the main hospital

supply-chain (e.g. donated medicines).

2.3 The staff uses a well-defined and safe practice for managing medicines including dispensing and distribution to the wards.

There should be a standard for safe handling of medicines covering the entire hospital, including the wards. The standard should define how medicines are obtained from the stores to the wards or pharmacy, and describe practices for safe dispensing of medicines to patients.

3. An integrated pharmacy

The pharmacy should be a well-used resource and knowledge bank for the entire hospital. Hospital employees from the different hospital units should be familiar with the capacities of the pharmacy and use the pharmacy on a daily basis to share questions on pharmaceutical products and treatments. The pharmacy should likewise be outward-oriented by offering training and information-sharing with other healthcare professionals at the hospital. Finally, the pharmacy should share knowledge with other healthcare facilities to increase collaborations and the quality of the pharmacy services.

3.1 The pharmacy is a well-integrated knowledge base for the safe and rational use of medicines at the entire hospital and is used as such by health personal on a daily basis.

The healthcare professionals at the hospital are aware of the services provided by the pharmacy and use them actively in their daily work. The pharmacy reaches out to other healthcare facilities at and nearby the hospital.

Objectives

The following pages link the objectives with the selected indicators and success criteria. The indicators describe, how we want to measure whether we reach our success criteria. For each indicator is linked 2-3 measuring methods based on Stine Trolle's master thesis. For more information on each measuring methods see Appendix A. The baseline results derived from Trolle's study are summed up below each of the measurement methods. The success criteria describe the expected level of each indicator at project termination.

Objective 1: Patient care

1.1 <u>The pharmacy staff has adequate knowledge about health and medicines.</u>

Indicator 1.1. is monitored by the following two measuring methods:

1.1.1 GPP assessment tool D1: Information available
1.1.2 GPP assessment tool C2: Qualification of staff

Baseline results, November 2016:

- Information available to dispenser/pharmacy *(GPP assessment tool D1)*:
    - For the pharmacy staff, limited information resources were available (D1). The staff has no access to drug formularies, drug catalogues, or computer with drug information.
    - Few medicine handbooks were available, but they were outdated and not used by the pharmacy staff.
    - Smartphones with health and medicines apps were planned to be implemented. However, later during the field trip period, the smartphones were introduced to the pharmacy staff. The smartphones contained apps, which could be used to look up medicine names, correct dosage and adverse effects. The apps available at the time of implementation were MEDCAPE and MSF Guidelines. The outcome of this implementation was not measured as it would have been too soon after the implementation.

- Qualification of staff *(GPP assessment tool C2)*:
    - As mentioned earlier, one nursing aid, since July 2011, and one nurse, since July 2016 were employed in the pharmacy. Furthermore, one PwB-DK volunteer (pharmaconomic) has been stationed since June 2016 (C2/C3). The main role of the PwB-DK volunteer was support and management of the pharmacy. There was no pharmacist or pharmacy technician employed at the pharmacy. However, two former employees were currently in Freetown to complete a pharmacy technician degree (1st and 2nd year).

Success criteria:
By July 2025,
- **The pharmacy has access to information resources including drug formularies, drug catalogues and a computer with Internet access. Furthermore, at least one smartphone is available with relevant pharmacy related apps.**
- **The pharmacy staff consists of at least one pharmacy technician and 2-3 experienced staff members.**

1.2: Patients' have adequate knowledge of their diagnosis and dosage of medicines

Indicator 1.2 is monitored through:

1.2.1: Patient care: Patients' knowledge of dosage and diagnosis

Baseline results, November 2016:

- Patients' knowledge of dosage (N=76) *(Patient Care: Patients' knowledge of dosage and diagnosis)*:
    - 95% did not know how to take their medicine (includes dose, frequency and duration).
        - Knows dosage 5.3% of cases asked (= 95 % did not know)
        - Knows dose 55.3% of cases asked
        - Knows frequency 44.7% of cases asked
        - Knows duration 15.8% of cases asked
- Patients' knowledge of diagnosis (N=76) *(Patient Care: Patients' knowledge of dosage and diagnosis)*:
    - Knows treatment cause 15.8% of cases asked
    - Treatment cause as informed by the patients (in order of prevalence): "Do Not Know", "Sick", "Pain", "Other", "Do Not Feel Okay", "Blood", "Malaria", "Very Sick", "To Get Well", "Infection", "Diabetes", "Ulcer", "High Blood Pressure", "Doctor Told Me", "Hot Body", "Health"
- Use of labeling (N=76) *(Patient Care: Patients' knowledge of dosage and diagnosis)*:
    - 46.1% of patients looked at the labeling.

Success criteria:

By July 2025,

- **At least 60 % of the patients leaving the pharmacy know their diagnosis and how to take their medicines.**
- **60 % of all patients are aware of the labeling and are able to use it in order to understand their dosage schedule.**

Objective 2: Storage and Logistics

2.1 Organization of storages monitored through

2.1.1 GPP assessment tool B1-B7: Storage

Baseline results, November 2016

- Storage *(GPP assessment tool B1-B7)*:
    - Cleanliness of facilities: Signs of termites, water leakage in Big Store.
    - Storage conditions: Temperature not monitored
    - System for storage of medicine: ATC-system in the Pharmacy Local Store.
- Good storage practices of medicines *(GPP assessment tool B6/B7)*:
    - The good storage practices were medium (B6/B7).
        - Expired medicines were stored in a separate room and records for expired drugs were available. Procedure for disposal of expired medicine was in place in order to meet the Pharmacy Board legislation, but the main part of the expired drugs was still in use.

        - The lacks in storage practice were that opened bottles were not labeled with opening date, and all tins/bottles that had been opened did not have a lid on (dispensary site). For the first-expired-first-out (FEFO) adherence, two out of 20 randomly selected medicines in the local pharmacy storage did not adhere to FEFO.

Success criteria:

By July 2025,

- **Temperature control in all refrigerators.**
- **Temperature and humidity control in medicine storage rooms.**
- **Use of ATC systems at all places where medicines are stored and implement work procedures that ensure first-expired-first-out (FEFO)**
- **Implement procedures to handle sign of termites and other pests.**
- **All opened tins/bottles in the dispensary site must have a lid on.**

2.2 Availability of high quality medicines monitored through

2.2.1 Logistics: Origin of medicines in stock and quality of medicines

Baseline results, November 2016

- Origin of medicine in stock *(Logistic: origin of medicine)*:
    - Medicine items in stock (total) 161
        - Bought at IDA 65%
        - Bought at Local supplier May-Oct 2016 29%
        - Donated Medicine 6%
        - FHC medicines 0%
- Quality of medicines (*Logistic: Quality of medicines)*:
    - Expiration date exceeded or not registered 32%
        - Whereof expiration date exceeded: 17%

Success criteria:

By July 2025,

- **Develop and implement a list of essential medicines for Masanga Hospital Pharmacy ("standardsortiment")**
- **Develop and implement procedure to manage donated medicine**
- **Develop and implement work procedures to**
    1) Ensure that the expiry date of all medicine in stock is checked every second month,
    2) Manage medicine close to expiration date, and
    3) Manage expired medicine.
- **Ensure best possible medicine quality and rationale procurement.**

2.3 Safe practice for managing medicines monitored through

2.3.1 GPP assessment tool D2-D7: Dispensing

Baseline:

- Dispensing *(GPP assessment tool D2-D4)*:
    - D2: Number of medicine in stock 161
    - D4: Average total dispensing time 3 minutes 21 seconds
    - D4a: Dispensary average time 2 minutes 17.4 seconds
    - D4b: Counselling time average 37.6 seconds
- Packaging material *(GPP assessment tool D5)*:
    - Dispensed medicines were packed in small dispensing zip lock transparent plastic bags (dispensing bags) (D5). However, few exceptions occurred such as new bottles (e.g. ibuprofen oral suspensions for children) or blister packed medicines (e.g. artesunate tablets and omeprazole capsules). There was no use of original containers for packaging except from bottles.
    - In-appropriated packaging material was observed, as also light sensitive medicines (e.g. tuberculosis medicine) were packaged in the regular dispensing bags.
- Dispensing equipment *(GPP assessment tool D6)*:
    - Equipment available for dispensing medicine was tablet-counting trays and non-filled labels printed on the dispensing bags (D6). However, the tablet-counting trays were not in use. A spatula or spoon were not used for dispensing. Instead, the counting of tablets and capsules was performed mostly by bare hand, but occasionally the dispenser was wearing vinyl gloves.
- Dispensing procedure *(GPP assessment tool D7)*:
    - There were no controls carried out of the prescriptions and medicines before dispensing (D7).
    - However, if there were any doubts, the pharmacy staff asked each other for advice. The number of tablets for prescriptions were calculated (calculator available, but most of the time, the number was calculated without) and counted by the same person in the pharmacy staff.
    - Several challenges and barriers were observed during the field trip in relation the dispensing procedure. Especially in the pharmacy, there were a lot of interruptions by other hospital staff visiting, collecting dispensed medicine for the in-patients or copying new prescription-information about the patients into the pharmacy books. There were a lot of talking, people and demands (friendly though), which could influence the dispensing procedure.
    - Adequate labeling (N=76) *(Patient Care: Patients' knowledge of dosage and diagnosis)*:
        - 0% of medicine adequately labeled.
        - The good labeling practice (E3) was measured at the same time, as the patient care interviews (n=76). Information like medicine name, strength, quantity, date, dose, and patient name all need to be written on a correct labeling. The result showed that the information on the labeling were limited, and none of the medicines were labeled correctly. The label of the dispensing bags contained a medicine name written as a shortcut or abbreviation (e.g. paracetamol was written as "PCT") and the dose written as vertical lines illustrating dose and frequency.

Success criteria:
By July 2025,

- **Develop and implement work procedures to ensure safe dispensing practice**
  - **80 % of all medicine packages are adequately labeled.**
  - **Use of dispensing equipment**
  - **Contamination prevention**
- **Identification of medicine in stock that require specific storage conditions and assessment of appropriate packaging material (e.g., light sensitive medicines)**

3: An Integrated Pharmacy

3.1 Capacity building, monitored through:

3.1.1 Capacity building: Interdisciplinary collaboration and pharmacy's collaboration with other healthcare facilities.

Baseline:

- Interdisciplinary collaboration *(Capacity building: Interdisciplinary collaborations)*:
  - How often are the healthcare providers contacting the pharmacy staff for professional queries: Doctors: 45%, CHO/OPD doctor: 25%, Nurse student: 15%, Nurse: 10 %, STP: 5%
  - The STP (5%) was the group using the pharmacy the least, even though this group was one of the biggest of healthcare workers at the hospital. However, to open the dialog with this group, the pharmacy staff invited the STPs to an introduction to the pharmacy. The effect of this has not been measured as the event was placed after the data collection period.

- Pharmacy's collaboration with other healthcare facilities (*Capacity building: Pharmacy's collaboration with other healthcare facilities, quantitative measurement)*:
  - Outpatient department (OPD): Yes
  - Masanga Hospital: Yes
  - Masanga village: No
  - Local area: No
  - District level: No
  - National Level: No

- Masanga Hospital: collaboration takes place (*Capacity building: Pharmacy's collaboration with other healthcare facilities, qualitative measurement):*
  - Participation of the daily morning and afternoon hand-over (medical conference) with the doctors, CHOs, STPs and representatives from the pharmacy. This gave an insight of the situation at the hospital, the admitted patients (in-patients), prescriptions and cases of concern.
  - Prescription interventions for the in-patients, if the doctor's prescription was unclear

or change need to happen.
    - At in-patient's admission, transfer or discharge, the pharmacy must be informed by the nurses or doctors at the wards to update the patient chart, copied in the pharmacy.
    - An emergency cupboard for the ambulance and Maternity Ward, was about to be planned with supervision from the pharmacy.

Success criteria:

By July 2025,

- **All new healthcare professionals at Masanga Hospital are introduced to the pharmacy and the services provided. The introduction consists of a tour of the pharmacy and a presentation of the hospitals list of essential medicines. Conducted introductions are registered in a file in the pharmacy.**
- **Increased interaction with the healthcare professionals who prescribe medicine to patients at Masanga Hospital.**
- **The pharmacy has increased the communication and collaboration with other healthcare facilities**

D.3 Important remarks on challenges and limitations

As elaborated above, Danish pharmacists and pharmacy students have been present in Masanga since 2005. Furthermore, since 2012 Masanga Pharmacy Project has been a part of PwB-DK. As a result of continuous engagements with the field and MHRP, PwB-DK has profound insights into the context and situation of the hospital pharmacy. The project goals hence build on these insights, while taking into account the challenges and risks related to doing development work in rural Sierra Leone. One main experience is the challenges related to the unstable employment situation at the pharmacy, including the employment of untrained staff, which means that volunteers often end up repeating the same tasks and activities as the previous, hence making it difficult to gain high quality development goals.

In order to increase the level of education among the pharmacy staff, and as a part of the strategy, the former pharmacy manager, Osman Mohamed Bangura, was offered economic support to study to become a pharmacy technician at the College of Medicine and Allied Health Sciences, Freetown. He has signed an employment contract with the hospital's management and is expected to return as full-time manager of the pharmacy by 2019.

Furthermore, another former employee, Aruna Kargbo, has likewise been offered a pharmacy technician education by the Heineken Foundation, hence, on a longer term, increases the competence level of the pharmacy intensively. Therefore, the finalization of the project description has awaited the permanent employment of a trained pharmacy technician at the hospital. The employment of Mr. Bangura, and subsequently Mr. Kargbo, will provide the staff stability needed to conduct sustainable development work.

The main assumptions leading to the objectives are:

- Good collaboration between the involved partners including the hospital pharmacy staff.
- The consistency of a trained staff at the pharmacy.
- The possibility to continuously recruit high quality volunteers to be stationed in Masanga.
- The consistency of a working group in Denmark who continuously monitors and evaluates the project activities and objectives.

Development work in the context of West Africa is challenging. For instance, the outbreak of Ebola in 2014 delayed the project activities. While we strive to meet the criteria necessary to provide good development work, such situations are above our control hence can potentially lead to significant modifications in the project description and timeline.

As a way to secure good implementations of the project activities, the project group works under the following main ideologies:

1. PwB-DK should not be instructive to the partners (including the pharmacy staff) but involve them in our considerations so they contribute to establish the pharmacy.
2. PwB-DK should always be open to new ideas to achieve the development objective.
3. PwB-DK should continuously work on establishing and sustaining good relationships with the involved partners and stakeholders.

Appendix A: Tools for measuring Objectives and Indicators for FuG's Masanga project

Overview of measurement tools per objective

Objective 1: Patient care

1.1 The pharmacy staff has adequate knowledge about health and medicines.
Indicator 1.1. is monitored by the following two measuring methods:

1.1.1 GPP assessment tool D1: Information available
1.1.2 GPP assessment tool C2: Qualification of staff

1.2: Patients' have adequate knowledge of their diagnosis and dosage of medicines
Indicator 1.2 is monitored through:

1.2.1: Patient care: Patients' knowledge of dosage and diagnosis

Objective 2: Storage and Logistics

2.1 Organization of storages monitored through

2.1.1 GPP assessment tool B1-B7: Storage

2.2 Availability of high quality medicines monitored through

2.2.1 Logistics: Origin of medicines in stock and quality of medicines

2.3 Safe practice for managing medicines monitored through

2.3.1 GPP assessment tool D2-D7: Dispensing

Objective 3: An Integrated Pharmacy

3.1 Capacity building, monitored through:

3.1.1 Capacity building: Interdisciplinary collaboration and pharmacy's collaboration with other healthcare facilities.

References:
Trolle, 2017: Assessment of Good Pharmacy Practice in a hospital in rural Sierra Leone
Trap et al, 2010: MANUAL FOR MEASURING GOOD PHARMACY PRACTICE

1.1.1 GPP assessment tool D1: Information available

D1: Information available to dispenser/pharmacy staff (Trap et al. (2010) GPP indicator assessment tool, p. 8

Assessment area:	Dispensing and care quality/ Dispensing
Type:	Structure
Objective:	To ascertain the availability of information sources to the dispensary /pharmacy staff
Definition:	To verify the number and type of information sources available to the staff
Verification	Ask what information source are available – check their availability (Yes = 1 / No = 0):

	Yes	No
a) Drug catalogues e.g. MIMS, BNF		
b) (National) Drug Formulary, WHO Drug formulary		
c) Essential drugs list with Standard treatment guidelines		
d) Access to computers with drug information or internet access		
e) Medicines handbooks such as Martidale etc		

Calculation:	Calculated as the sum of a-d yes (1) divided by 5 Max score: 1
Data source:	Information sources

1.1.2 GPP assessment tool C2: Qualification of staff

C2: Number and qualifications of staff (Trap et al. (2010) GPP indicator assessment tool, p. 8)

Assessment area: Service quality/Services

Type: Structure

Objective: To ascertain the competence of dispensing site/pharmacy personnel

Definition:

- To verify the qualifications, number, years of experience and working hours of the staff in the pharmacy
- How much time (hours) does a pharmacist spend in the pharmacy on an average on a daily basis

Verification:

a) Record the staffing in the pharmacy at the day of survey

Category of staff	Number	Full time	Part-time	Years of practice experience (record for each staff)			
Pharmacist(s)							
Pharmacy technician(s)							
Nurse(s)							
Other in contact with clients							
Other not in contact with the clients							
What training/education has the “Others in contact with clients” had? E.g. dispensary assistance, in-service training:							

a) What time do you / the chief pharmacist normally arrive at the dispensing site

on a week day: _____(Time)

b) What time do you normally leave on a week day: _____ (Time)

Calculation:	a) Max score 1. Calculated as follows: Pharmacist(s) full time: 0.7 Pharmacist part time: 0.2 Other trained assistance (Pharmacy technician or nurse): 0.3 b) No of hours pharmacist spend at the dispensing site on a normal day calculated as: ≥80% of opening hours:1, if less than 80%: 0
Data source:	Pharmacy staff or written source.

1.2.1: Patient care: Patients' knowledge of dosage and diagnosis

Patient care (Trap et al. (2010) GPP indicator assessment tool, p. 8; Adjusted to the setting which is further described in Trolle, S. (2017))

Assessment area: Dispensing care and quality/RDU

Type: Outcome

Objective: To ascertain the knowledge of the patient with regard to medicines use

Definition: To verify the knowledge of the patient with regard to medicine use

Verification: Interview 10 patients leaving the pharmacy and ask to see the medicines they have received and if possible their prescription: Select one of the medicines to check patient knowledge.

Record the following (Yes = 1, No =0)

					Does the patient know the following:					
Pt. Name	**Pt. no**	**No. medicines prescribed**	**No of medicines dispensed**	**a) Discrepancy (1/0)**	**b) Dose How many /much to take (1/0)**	**c) Frequency How often to take (1/0)**	**d) Duration How long to take the medicine (1/0)**	**e) Treatment cause: Do you know why you are getting the treatment (1/0)**	**f) Other information given: Adverse reactions, how to take etc) (1/0)-record which**	**Comments**
	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
Sum of 1:										
% (sum / total no. of patient interviewed)*100										

Calculation: % of patients knowledgeable about dose, frequency, duration, treatment cause and if other information is provided calculated for each area of knowledge based on number of 1 (sum) out of total no. of

patient interviewed (0+1))*100;

Overall score: ≥ 90 % =1; 89-75% = 0.75; 74-50% = 0.5; 49-30% =0.25; <30%= 0.
Max score: 1

Data source: Patient interviewed

2.1.1 GPP assessment tool B1-B7: Storage

B1 and B2: Cleanliness of the store (15 A & 15 B) *(Trap et al. (2010) GPP indicator assessment tool, p. 17)*

Assessment area:	Medicines management quality/Storage
Type:	Process
Objective:	To assess the cleanliness and hygienic status of the pharmacy (dispensary and store room)
Definition:	To verify the level of cleanliness and hygienic status of the pharmacy
Verification:	Ask to be shown around the pharmacy, in particular the dispensing and storage area

15 A. Criteria (Yes = 1 / No = 0):	**Yes**	**No**
Are there or have there been signs of pests seen in the area?		

15 B.	**Very clean & tidy**	**Acceptable clean/tidy**	**Not clean/untidy**	**Very dirty/untidy**
The dispensary is: (Tick only one)				
The storage area is: (Tick only one)				

15 A.

Calculation: Pests seen: 0 – if no: 1

Max score: 1

15 B.

Dispensing area: a) Very clean & tidy storage: 0.3

b) Acceptable clean & tidy: 0.2

Storage area: c) Very clean & tidy storage:0.3

d) Acceptable clean & tidy: 0.2

Overall score: Sum of a to d.

Max score: 1

Data source: Observation of storeroom and dispensary

B3: Hygiene of the pharmacy *(Trap et al. (2010) GPP indicator assessment tool, p. 18)*

Assessment area: Medicines management quality/Storage

Type: Structure

Objective: To assess the hygienic conditions of the pharmacy

Definition: To verify the availability of toilet and hand washing facilities

Verification: Ask to be shown the toilet and hand washing facilities in the pharmacy.

	Yes	No/N
a) Are toilet facilities available?		
b) Are the toilet facilities acceptable, hygienic and functioning?		
c) Are there toilet paper		
d) Is the hand washing facilities acceptable, hygienic and functioning?		
e) Is there soap for hand washing?		
Over all score: sum of a-d yes (1) divided by 4 minus NA's		

Calculation: Calculated as the sum of a-e yes (1) divided by 5 minus NA's

Max score: 1

Data source: Observation of facilities

B4: Storage conditions *(Trap et al. (2010) GPP indicator assessment tool, p. 18)*

Assessment area:	Medicines management quality/Storage
Type:	Structure
Objective:	To ascertain storage conditions
Definition:	To verify the level of good storage practices at the pharmacy/dispensary
Verification:	Ask to be shown the pharmacy and tick the following:

Criteria (Yes = 1 / No = 0):	**Yes**	**No/Na**
a) Are the medicines protected from direct sunlight (Painted glass, curtains or blinds – or no windows)?		
b) Is the temperature of the storage room monitored?		
c) Can the temperature of the storeroom be regulated (Ventilation, heater, air-condition)?		
d) Is there a functioning system for cold storage (Refrigerator)?		
e. If yes, are only medicines is stored in the refrigerator – no food or beverage?		
f. Are vaccines placed in the center of refrigerator (not in the door)?		
g) Is the temperature of the refrigerator recorded?		
h) Is the roof appropriate with no leakages?		
i) Is the storage space sufficient and adequate?		
Overall score: sum of a-i yes (1) divided by 9 minus NA's		

Calculation: Calculated as the sum of a-i yes (1) divided by 9 minus NA's

Max score: 1

Data source: Observation of storage facilities

B5: System for storage of medicines *(Trap et al. (2010) GPP indicator assessment tool, p. 18)*

Assessment area:	Medicine management quality/Storage
Type:	Structure
Objective:	To ascertain if the pharmacy is well organised and practice good storage practices
Definition:	To verify that the pharmacy practice good storage practices
Verification:	Ask to be shown around the pharmacy and observe the following conditions:

Criteria (Yes = 1 / No = 0):	**Yes**	**No**
a) Are medicines stored on shelves and /or in cupboards?		
b) Are medicines stored on shelves or in cupboards stored in a systematic manner (alphabetic, therapeutic etc)?		
c) Are the shelves labelled?		
d) Is there a separate lockable cupboard for narcotic drugs?		
e) Is the storeroom lockable?		
Over all score: sum of a-e yes (1) divided by 5		

Calculation: Calculated as the sum of a-e yes (1) divided by 5

Max score: 1

Data source: Observation of storage facilities

B6 and B7: Storage practices of medicines (19A & 19B) *(Trap et al. (2010) GPP indicator assessment tool, p. 18)*

Assessment area:	Medicine management quality/Storage
Type:	Process
Objective:	To ascertain if good storage practices are maintained and implemented
Definition:	To verify that the pharmacy have implemented and maintain good storage practices
Verification:	Ask to be shown around the pharmacy and observe the following conditions:

Criteria (Yes = 1 / No = 0):	**Yes**	**No**
a) Are opened bottles labelled with the opening date?		
b) Do all tins/bottles that have been opened have a lid on?		
c) Are there boxes on the floor in the dispensary?		
d) Is there a record for expired drugs (Check)?		
e) Are expired medicines kept separate from other medicines until disposal? (Check)?		
f) Is there a procedure for disposal of expired medicines (Check)		
g) Is FEFO[1] adhered to? (Check 20 randomly selected medicines in the storeroom for FEFO) h) Record the number of medicines that does not adhere to FEFO:	**Number:**	

Calculation: 19A: Calculated as the sum of a-f yes (1) divided by 6;

Max score: 1

19B: g and h calculated as 1 if all 20 selected medicines are stored according to FEFO else =0

Max score: 1

Data source: Observation of storage facilities

1 FEFO: First expiry first out

2.2.1 Logistics: Origin of medicines in stock and quality of medicines

Logistics: Origin of medicines in stock and quality of medicines *(Trolle, S (2017))*

Analysis performed based on the Excel file “Data analysis_logistic”

Overview of research performed based on the described Excel file.

Research 06/11-2016 by Stine Trolle	**Amount**	**Comments**
Medicine Items in Stock (>1, and in use)	161	Oct'16 Count, Drug TOTAL when > 1 row, Medicine Items Not in Stock = 12.
Medicine Items in Stock not Expired (-Oct '16) or Not Registred (empty)	110	(9 Drug TOTAL)
Medicine Items in Stock where Expiry Date is Not Registred	25	Mainly caused by small amounts bought at Poorman's
Medicine Items bought at IDA	NA	
Medicine Items bought at Poorman's Pharmacy May-Oct 2016	46	May-Oct 2016 + previously noted in Sheet
Percentage of total medicine bought at Poorman's	**28,6%**	
Medicine Items from PHU or District Medical Store		FHC, Oxytocin and TB drug (PHU), ACT (DMS)
Medicine Items donated (Registred/Noted)	10	

2.3.1 GPP assessment tool D2-D7: Dispensing

D2: Product range – medicines in stock *(Trap et al. (2010) GPP indicator assessment tool, p. 15)*

Assessment area:	Dispensing and care quality/Dispensing
Type:	Process
Objective:	To ascertain the total no. of items (different brands, strength and formulations) kept in stock
Definition:	To verify the quantity /number of items in stock
Verification:	What is the total number of items in stock (different brands, strength and formulations): _____ If precise number is not available, estimate number of items: (Tick) a)<100:____, b) 100-200: ____, c) 201-500:____ d)501-1000:____ e) >1000:___
Calculation:	Calculated as: a) <100:0 b) 100-200: 0.25 c) 201-500:0.5 d) 501-1000: 0.75 e) >1000:1
Data source	Stock management system/Pharmacy staff

D3: Product range – alternative per brand *(Trap et al. (2010) GPP indicator assessment tool, p. 16)*

Assessment area:	Dispensing and care quality/Dispensing
Type:	Process
Objective:	To ascertain the number of different brands stocked by the pharmacy of a indicator medicine (active ingredient)
Definition:	To verify the number of different brands stocked by the pharmacy of a indicator medicine (active ingredient)
Verification:	List all brands stored containing the active ingredient cotrimoxazole in the form of tablets or capsules

1.	6.
2.	
3.	
4.	
5.	

Calculation: *No of brands of cotrimoxazole stored* / *Total no. of cotrimoxazole brands registered in the country* ** 100*

Spider web Score (private sector):≥ 4 brands: 1 point, 3: 0.5, 2: 0.25 1: 0

Data source: Stock management system/Pharmacy staff

D4: Dispensing time *(Trap et al. (2010) GPP indicator assessment tool, p. 22)*

Assessment area:	Dispensing and care quality/Dispensing
Type:	Process
Objective:	To ascertain the time used to dispensing of medicines including provision of information to the patient
Definition:	Dispensing time is the time it takes for the staff to dispense the medicines after having been informed what need to be dispensed and after having obtained the medicines to be dispensed. *Note: Receiving the prescription and finding the medicines are not included only the actual dispensing and time and the time talking to the patient while dispensing including the process of payment of the medicines.*
Verification:	Measures the time it takes for the staff to dispense the medicines after having been informed what needs to be dispensed and after the medicines have been assembled. Observe the dispensing process without being noticed and record the dispensing time for 6 patients

Patient number	**1**	**2**	**3**	**4**	**5**	**6**	**Average** Total/no of pt
Dispensing time in seconds							

Calculation: Average dispensing time of 6 patients

Overall score calculated as follows[2]:

<30 sec: 0

31-60 sec: 0.5

>61 sec.: 1

Data source: Observation of dispensing process

[2] HV Hogerzeil, Field tests for rational drug use in twelve developing countries, Lancet 1993; 342;1408-10

D5: Packaging material *(Trap et al. (2010) GPP indicator assessment tool, p. 23)*

Assessment area:	Dispensing and care quality/Dispensing
Type:	Process
Objective:	To ascertain how medicines are packed
Definition:	To verify how medicines are packed
Verification:	Observe and verify the packaging material available and in use:

Type of packaging material used	**Yes**	**No/Na**
a) Pharmacy supply new bottles		
b) Dispensing envelope		
c) Pharmacy reuse old but cleaned bottles		
d) Use of manufacturers original containers		
e) Pharmacy only use new or washed bottles the patients do not bring own containers/bottles		
f) Only-appropriate packaging material is used		
In-appropriate packaging material seen was (describe):		

Calculation: Calculated as the sum of a-f yes (1) divided by 6;

Data source: Pharmacy

D6: Dispensing equipment *(Trap et al. (2010) GPP indicator assessment tool, p. 24)*

Assessment area:	Dispensing and care quality/Dispensing
Type:	Process
Objective:	To ascertain if the pharmacy has the appropriate equipment for dispensing medicines
Definition:	To verify that the pharmacy has the appropriate equipment for dispensing medicines
Verification:	Verify that the pharmacy has the following equipment in the dispensing area:

Equipment (Yes = 1 / No = 0):	**Yes**	**No**
a) A spatula or spoon		
b) Non-filled (empty) labels		
c) Tablet counting tray or similar		
d) Tablets counted by use of tray or similar instrument but not by bare hand		
e) Graduated measuring flask		
Overall score sum of a-e yes (1) divided by 5:		

Calculation: Calculated as the sum of a-e yes (1) divided by 5;

Data Source: Observation/pharmacy staff

D7: Dispensing procedure *(Trap et al. (2010) GPP indicator assessment tool, p. 24)*

Assessment area:	Dispensing and care Quality/Dispensing
Type:	Process
Objective:	To ascertain if the pharmacy has a system for controlling dispensing of prescribed medicines
Definition:	To verify that the pharmacy has appropriate procedures in place to control dispensing of prescribed medicines
Verification:	a) Observe the dispensing process. Is there a control carried out of the prescriptions and the medicines before dispensing, i.e. is it counterchecked? (Yes/No): ____ b) If yes, who undertakes the control: _____
Calculation:	a) Yes is 1, no is 0 score; b) is not scored
Data source:	Observation of dispensing.

3.1.1 Capacity building: Interdisciplinary collaboration and pharmacy's collaboration with other healthcare facilities.

Interdisciplinary collaboration *(Trolle, S (2017))*

How often is the pharmacy staff contacted by other health workers for professional queries?

Period **Health worker**	**Week** **____**	**Week** **____**	**Week** **____**	**Week** **____**	**Week** **____**

Comments:

The pharmacy's collaboration with other healthcare facilities *(Trolle, S (2017))*

Collaboration between Masanga Hospital Pharmacy and local Health Care Providers

1. **OPD**

   € Yes € No

   Comments (e.g. who, how and why)

2. **Masanga Hospital**

   € Yes € No

   Comments (e.g. who, how and why)

3. **Masanga**

   € Yes € No

   Comments (e.g. who, how and why)

4. **Local area**

   € Yes € No

   Comments (e.g. who, how and why)

5. **District**

   € Yes € No

   Comments (e.g. who, how and why)

6. **National**

   € Yes € No

   Comments (e.g. who, how and why)

Additional Comments: