### Rural Health Service Package - Theory of Change

#### Approach
- Develop a clear consultative process to assess functionality of healthcare facilities (HCFs)
- Implement quality improvement (QI) in a structured and replicable manner
- Co-develop interventions with community
- Facilitate systematic volunteer placements
- Conduct district-wide planning workshop to inform QI guide development
- Embed OCA engagement in the community
- Conduct capacity building of HCF staff, community health structures and DHO
- Work collaboratively with partners to address rural health system needs
- OCA staff to collaborate with MOH
- Develop strong MEAL systems to support evidence building
- Conduct research on rural health policy and systems

#### Outputs
- HCF infrastructure meets national standards
- Community-specific interventions for QI developed
- Assessments completed at 2 HCFs
- QI guide developed and agreed by DHO, HCFs, communities and partners
- HCF staff trained in quality healthcare management
- Improved supervision and support at all levels of the rural health system
- HCF staff, community health structures and DHO are trained to identify and deliver QI projects
- Quarterly coordination meetings with community-based structures held
- Peer reviewed papers published
- Assessment tools developed
- QI roadmap template developed with MOH

#### Outcomes
- Improved access and quality of care at 2 rural healthcare facilities
- Improved overall functionality of 2 rural HCFs
- 2 rural health systems are strengthened to deliver and sustain high quality services
- Learning shared on effectiveness of rural health service package

#### Impact
- Inform best practice in improving access to quality healthcare for rural communities.
## Rural Health Service Package - Kanyanga

### Areas for Improvement

1. **Health Service Delivery**
   - Poor WASH facilities in the villages is an area of concern for RHP staff and community leaders contributing to diarrhoeal infections.
   - A lack of basic diagnostic tools contributed to the inequality in maternity care between women at the RHP and women seen at outreach clinics.
   - Lack of infrastructure particularly in Maternity annex and mother’s shelter resulting in transport as a barrier for pregnant women.
   - Limited diagnosis and monitoring of chronic diseases and child health issues.
   - Poor support for GBV cases at community level.

2. **Health Workforce**
   - CBVs inadequately trained and supported to deliver CLTS programs.
   - A contributing factor in lack of medication supply is that antibiotics are overprescribed, partly due to patient expectation of receiving treatments, therefore training is needed in this matter.
   - NHC functionality lacking according to current guidelines.
   - Lack of ability for RHP staff to design and deliver their own QI projects.

3. **Health Information**
   - Medication and commodity supply ordering chain not efficient.
   - NHCs not completing HIA4B forms.

4. **Essential Medicines**
   - National level drug shortages manifest as incomplete “essential” medicines packages for the RHP; supply does not meet demand particularly for asthma, pain killers, and antibiotic medications.

5. **Health Financing**
   - DHO has inadequate financial resources to improve facilities and no other health focused NGOs are in the region.
   - Communities lack knowledge of CDF funding.

6. **Leadership and Governance**
   - MoH Maternal and Neonatal Referral Guidelines not being followed.
   - ANC guidelines for Positive Pregnancy not being followed.
   - IPC and WASH Guidelines not being met.

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Completed by: Dr Kerry Greenan and Dr Eleanor Richards.

Date: August 2021.
## Rural Health Service Package - Kanyanga
### Quality Improvement Roadmap

**Completed by:** Dr Kerry Greenan and Dr Eleanor Richards  
**Date:** August 2021

### 1. Health Service Delivery

**Accessibility of Facility**
- Mobile ultrasound equipment to enhance accessibility of maternal services
- Set up an emergency transport scheme for maternal and malarial emergencies from community to facility
- Sensitize community on saving scheme and communal food banks to reduce the burden on individual families in times of emergency.

**Strengthen referral system linkages**
- Work with community, schools, HCF, CBVs, DHO and traditional leaders to improve referrals for GBV, safeguarding, abuse, underage pregnancies, etc.
- Support establishment of one stop center for GBV in Zimba

### 2. Health Workforce

**WASH in HCF**
- Access to water in the facility
- Improved toilets
- Protected waste disposal
- MHM inclusive WASH facilities
- Environmental cleaning resources

**Infrastructure/Equipment**
- Mother’s Waiting Shelter
- Solar Power
- Improved Inclusivity
- Fencing to improve privacy
- Space-use planning for existing infrastructure
- Improved outreach kit for community visits (BP machine, weighing scales, diagnostic tools)
- Testing supplies

### 3. Health Information

- Increase reporting (specifically HIA4b) of NHCs into HCF
- Lobby Zamtel to boost signal to access digital health reporting systems

### 4. Essential Medicines

- Through antibiotic stewardship, improving stocks of antibiotics at facility

### 5. Health Financing

- Share impact with MoH to increase evidence for health investment
- Advocate for other health organisations to work in Zimba District

### 6. Leadership and Governance

- Support facilities to better utilise existing digital medicine stock management systems, and deliver a project to enhance digital patient record keeping in rural facilities
- Continuous refinement of the HCF assessment tool/checklist
Rural Health Service Package Assessment Phase

Month 1

During the first month of assessment phase, the assessment team will focus on integrating with health post staff and community. The team will also complete the first evaluation of the HCF Assessment Checklist. By the end of this month, the checklist should be complete and the assessment team will have a clear work plan for this phase.

Main Activities

- Familiarization Visits
  - Meet staff and community members in target facilities
  - Spend time in facility and joining outreach visits to gain understanding of activities
  - Build relationships
  - Meet with DHO (including: district health director, senior environmental health technician and senior health promotion officer)

- Work Plan Development
  - Conduct and review research on Zambian resources (MOH, DHO, etc.)
  - Begin conducting HCF Assessment Checklist (ongoing)
  - Upon return to Livingstone, analyze data collected on emerging trends to plan for interviews and qualitative data collection through community members and staff

Months 2 - 3

After completing the HCF Assessment checklist, the assessment team will identify specific topics which score less than 70% on the checklist. The assessment team will focus on interviewing and investigating these gaps. The team should find time to meet with all the required persons, and continue gathering data that will support the development of the HCF Assessment Report.

Main Activities

- Continuation of HCF Assessment checklist - ongoing validation of findings
- Required Interviews/conversations
  - DHO, Facility Staff, CBVs
  - Community Structures: HCCs, NHCs, Community Champions
  - Community members, headmen
  - OCA staff
  - Other Stakeholders
- Interviews should be determined by the gaps identified in the HCF Assessment Checklist
- Begin compiling information into HCF Assessment report and developing recommendations
Month 4
This month, the assessment team will draft their report, including key takeaways and proposed recommendations. The team will hold feedback sessions with both DHO and HCF staff to gain feedback. The team will include notes from these session in their HCF Assessment report. All identified gaps will be highlighted on the HCF Areas for Improvement document and recommendations on the way forward to be included on the HCF Quality Improvement Roadmap.

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Main Activities
- Draft HCF Assessment Report within 6 Pillars of Health Care Framework
- Draft HCF Areas for Improvement according to HCF Assessment Report under the 6 Pillars for Healthcare Framework
- Draft HCF Quality Improvement Roadmap according to proposed recommendations on the way forward as outlined in HCF Assessment Report
- Hold Feedback Session with District Health Office staff on HCF Areas for Improvement and HCF Quality Improvement Roadmap
- Hold Feedback Session with healthcare facility staff on HCF Areas for Improvement and HCF Quality Improvement Roadmap
- Incorporate all feedback into HCF Assessment Report, HCF Areas for Improvement and HCF Quality Improvement Roadmap

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Deliverables
- HCF Assessment Checklist
  - The Assessment checklist should be fully completed utilising data inputs from Health Posts and Outreach Posts, through inventory investigations, observations, and conversations with HCF staff and volunteers.

- HCF Assessment Report
  - Utilising the HCF Assessment Report outline, the report will discuss all gaps identified in the HCF Assessment Checklist (any sub-category under 70% should be mentioned). Qualitative data collected from interviews and conversations will be supplemented to identify thematic areas for improvement. Any capacity building activities that took place during the Assessment phase should also be included.

- HCF Areas for Improvement
  - The visual graphic broken down by the 6 pillars of health care will show the key areas for improvement from each facility as outlined in the Assessment Report.

- HCF Quality Improvement Roadmap
  - The visual graphic broken down by the 6 pillars of health care will show the suggested Roadmap for paths forward for the identified areas of improvement. The final draft should include feedback from stakeholders.
Project Report
Kanyanga Rural Health Post
2021

Completed by: On Call Africa
Co-Authors: Dr Kerry Greenan  MB ChB (Hons) MRCGP
and Dr Eleanor Richards  MBBS MSPH
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EXECUTIVE SUMMARY

This report reflects the work carried out at Kanyanga Rural Health Post (RHP) by On Call Africa. Two volunteer doctors (a GP with previous experience working in rural Zambia and a junior doctor with a public health background) were placed at the Rural Health Post over three months between April and June 2021, splitting their time between the health post and the Livingstone headquarters.

A number of assessments were carried out, including a community health needs assessment, semi-structured interviews with RHP and District Health Office staff, and a patient health beliefs questionnaire. The main findings were that:

- Poor WASH facilities in the villages are a concern for RHP staff and community leaders, and undoubtedly contribute to the high burden of diarrhoeal diseases, but the community members often do not consider treating or boiling their water or building and using a latrine a priority.
- Care for pregnant women does not meet Zambian standards, for the most part due to a lack of resources for haemoglobin, blood sugar and urinalysis testing. Additionally, a lack of blood pressure machines contributed to the inequality in maternity care between women at the RHP and women seen at outreach clinics. For women with abnormalities detected at routine antenatal appointments, there are many barriers to accessing hospital care such as transport cost.
- National-level drug shortages manifest as incomplete “essential” medicines packages for the RHP; supply does not meet demand particularly for asthma and antibiotic medications. A contributing factor is that antibiotics are over-prescribed, partly due to patient expectation of receiving treatments.
- There is very limited diagnosis and monitoring of chronic diseases and child health issues.

The findings were used to inform the design and implementation of quality improvement interventions with the aim of creating sustainable changes at the RHP. Initial interventions included training for staff, health promotion sessions for patients, and creation of an outreach kit designed specifically for its purpose.

We will describe the assessment methods and core work projects in this report, as well as make recommendations for further assessments and interventions to be carried out by the key stakeholders: RHP staff, OCA volunteers, DHO staff, and future funders. All assessment and teaching resources created will be available to future volunteer doctors for their use.

With our heartfelt thanks to:

DHO Director - Dr. Zulu
Kanyanga Health Post Staff - Kelvin M’hango, Criston Silungwe and Alex Bulawayo
OCA Staff - Ben Margetts, Rachel Lynch, Mike Luhamba, Victor Malambo, Royder Sitali, Prevent Simwatachela, Emmanuel Siampondo
ACRONYMS

ANC - Antenatal Care
ARV - Anti-retroviral medicines
BP - Blood Pressure
CBV - Community-based Volunteer
CHW - Community Health Worker
CO(G) - Clinical Officer (General)
COC - Combined Oral Contraceptive
DHO - District Health Office
EHO/T - Environmental Health Officer/ Technician
FP - Family Planning
HCC - Health Centre Committee
MoH - Ministry of Health
NHC - Neighbourhood Health Committee
NIC - Nurse In-Charge
OCA - On Call Africa
OPD - Outpatient department
ORS - Oral rehydration solution
POP - Progesterone-only pill
QI - Quality Improvement
RDT - Rapid diagnostic test
RHP/C - Rural Health Post/ Centre
SMAG - Safe Motherhood Action Group
URTI - Upper respiratory tract infection
WHO - World Health Organisation
ZMH - Zimba Mission Hospital
INTRODUCTION TO KANYANGA

Kanyanga is a Rural Health Post located in Zimba District of the Southern Province of Zambia. It has an estimated catchment population of 24,701. Within the catchment area are 15 communities, with the furthest being 45km away from Kanyanga. There are numerous streams and rivers in the area, making access difficult, particularly during the rainy season. Tonga is the mostly widely spoken language in the area. The average household size is 7-9.33 people. Road access between community outreach posts and the health post is poor. The dirt roads are of variable size and quality and 4x4 vehicles are required. The post sees approximately 60 patients per day and has around 30 births per month.

The health post consists of two buildings, the first containing registration and the pharmacy, and the second for outpatient clinics, dispensing and the delivery room. A third building has been built for use as the maternity unit (which is currently taking place in the same building as the outpatient department) but is not yet in use due to lack of power and water access. There is also a mother's shelter on the same site.

The staff is made up of two nurses, one Clinical Officer General, one environmental health technician and 38 CBVs (who are spread across the 15 outreach posts). The CBVs have various roles including malaria, HIV and TB screening and treatment, SMAG (Safe Motherhood Action Group) as well as offering general health advice and education within their communities.

The services currently offered at Kanyanga RHP include:

- General outpatient clinic and emergency services
- Under 5s clinics for weight monitoring and immunisations
- Antenatal clinic and maternal care
- Family planning
- HIV clinics
- Monthly outreach clinics providing the above services to the 15 communities
## ASSESSMENT TIMELINE AND ACTIVITIES SUMMARY

<table>
<thead>
<tr>
<th>Assessment activity</th>
<th>Aim</th>
<th>Process</th>
<th>Summary of findings</th>
<th>Limitations of process/findings</th>
<th>Next steps/ action points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1 (Livingstone)</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Needs assessment</td>
<td>To describe the state of health and healthcare in Zambia, with focus on rural communities</td>
<td>Review national and local data (from MoH, OCA), and MoH policy documents. Identify areas that need further investigation.</td>
<td>URTI and diarrhoea common. Significant WASH issues. Standards for health posts and health centres identified from MoH documents.</td>
<td>Limited sources.</td>
<td>Gather further information on unaddressed areas (e.g. patient/ community beliefs and priorities) and review whether Kanyanga meets MoH standards.</td>
</tr>
<tr>
<td>Logic model creation (see appendices)</td>
<td>To describe how we anticipate the programme will achieve its goals</td>
<td>Map inputs and planned activities to outcomes and short and long term goals.</td>
<td>NA</td>
<td>Theoretical, to be tested and evaluated</td>
<td>Implement planned activities and monitor outcomes.</td>
</tr>
<tr>
<td><strong>Week 2 (Kanyanga - 6 days)</strong></td>
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</tr>
<tr>
<td>Relationship building</td>
<td>To get to know staff, including their backgrounds and training, and build trust.</td>
<td>Introduced to community (headmen and staff) by the Chief and DHO Director. Informal conversations with staff individually.</td>
<td>1 in-charge nurse, 1 junior nurse, 1 COG, 1 EHO - all varying experience levels. Many CHWs representing different areas (e.g. DAPP TCE, SMAG) including 1 trained CHA who has not been employed.</td>
<td>NA</td>
<td>Develop interventions that take into account staff members’ skillsets, backgrounds and interests.</td>
</tr>
<tr>
<td>Reporting systems</td>
<td>To understand what information is routinely collected and how it is collected, processed and communicated.</td>
<td>Review MoH registers (e.g. FP, antenatal care, maternity admissions, delivery), reports for the NHC/HCC, record books completed by CHWs etc.</td>
<td>Individual patient data is collected in specific MoH registers, in clinic and on outreach. CHWs also write summary reports for the DHO.</td>
<td>Paper records are time-consuming to review and summarise.</td>
<td>Review data trends over time, and assess whether data collected accurately reflects the reality of the clinic function. Identify what data would be useful to collect for OCA use.</td>
</tr>
<tr>
<td>Clinic equipment</td>
<td>To take stock of equipment available and in use at the clinic, including functional status</td>
<td>Review equipment present throughout the clinic, including whether they work or are expired, and if equipment matches available kit lists (e.g. from MoH standards, USAID labour ward emergency boxes).</td>
<td>A number of BP machines are not working. Equipment available often does not match available kit lists/standards. Some pieces of equipment found (i.e. urinalysis sticks) have expired.</td>
<td>Some equipment may have been missed as storage sometimes disorganised.</td>
<td>Test whether “broken” pieces of equipment can be fixed, e.g. with new batteries.</td>
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</tr>
<tr>
<td>Outreach</td>
<td>To understand the outreach process and services provided.</td>
<td>Attended on outreach days (when transport available) and assisted in providing services.</td>
<td>All outreach posts are visited in the latter 2 weeks of the month, often 2 posts each day. Clinical staff travel by motorbike. Under 5s, FP and ANC services are provided. There is low uptake of referrals for women to receive ANC at Kanyanga or the hospital.</td>
<td>Difficult for OCA volunteers to attend due to outreach taking place only 2 weeks of the month, and the OCA cruiser is required for travel.</td>
<td>Plan further outreach attendance in advance with consideration of travel options. Perform staff training and health promotion activities regarding referral for ANC in complicated or high-risk cases.</td>
</tr>
</tbody>
</table>

**Week 3 (Livingstone)**

| DHO Director meeting | To describe our findings and plans for interventions and gather feedback. | 1 hour meeting with DHO director. | Discussed national level drug shortages, issues with antibiotic prescribing, practices around antenatal referrals, community perspectives on FP. | NA | Review resources DHO director able to send us. Utilise information when planning interventions. |

**Week 4 (Kanyanga - 10 days)**

<p>| Staff meeting | To summarise the needs we have identified and our plans to address them. Gather feedback and ideas. | &lt;1 hour meeting with as many staff and CHWs as possible. | Staff report issues with transport, power, and communication with the DHO (poor phone signal). | Staff may not feel comfortable honestly critiquing our conclusions and suggestions. | Pass on staff thoughts to DHO and OCA, and take into account when planning assessments and interventions. Planned staff training and headmen meeting. |</p>
<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Activities</th>
<th>Findings</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headmen meeting</td>
<td>To elicit whether our observations are consistent with the communities’ experiences and gather further detail.</td>
<td>1 hour meeting with 14 headmen (organised through in-charge nurse). Semi-structured group interview style.</td>
<td>Concerns voiced about drug shortages (e.g. paracetamol, malaria medicines), general health of the communities, lack of access to safe water or use of latrines, hesitancy of women to deliver at ZMH. Happy with clinic and staff.</td>
<td>Headmen may not feel comfortable honestly critiquing our conclusions and suggestions. CHW translator used. Pass on community perspective to DHO and OCA, and take into account when planning assessments and interventions.</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>To understand the current state of drug stock, how the meds are tracked and ordered. To learn what treatment options are available.</td>
<td>Explanation of how the pharmacy works from CHW. Audit of drug stock (incl expiration dates) against stock cards.</td>
<td>There are significant drug shortages, due to receiving incomplete and infrequent packages of medicines from the DHO.</td>
<td>The stock cards may not be up to date if our audit happens shortly before a CHW reviews the pharmacy. Vaccines were not reviewed. Utilise information on drugs available when designing staff training on treatment options.</td>
</tr>
<tr>
<td>Family planning</td>
<td>To understand what options are offered and accepted, and how counselling and monitoring happens.</td>
<td>Completed WHO “method mix” assessment, and developed a staff questionnaire (based on WHO resources) about FP skills.</td>
<td>Group counselling on options performed by CHWs prior to administration of methods. Multiple methods offered, and staff confident in their use.</td>
<td>Staff self-reporting of FP skills and confidence may be biased. Community outreach to encourage uptake of FP important.</td>
</tr>
<tr>
<td>Antibiotic audit</td>
<td>To identify how frequently antibiotics are prescribed and whether they are appropriate.</td>
<td>Review outpatient register for frequency of antibiotic prescriptions, and review patient notes in detail for assessment of indications.</td>
<td>Up to 100% of patients seen in daily clinics are prescribed antibiotics, often unnecessarily. Quality of medical note-taking regarding examination and rationale is limited.</td>
<td>Staff training on management of unwell children and indications for antibiotic use developed.</td>
</tr>
<tr>
<td>Patient priorities</td>
<td>To elicit from patients what they think about the clinic and their own health.</td>
<td>Short questionnaire performed while patients wait to be seen in clinic.</td>
<td>Patients are happy with the staff and services provided at the RHP, but do value receiving medicines to take home. They often feel they are unhealthy.</td>
<td>Use of CHW or nurse as translator may lead to biased answers. If the questionnaire is to be repeated, we should use an OCA translator.</td>
</tr>
<tr>
<td>Date</td>
<td>Type of Activity</td>
<td>Participant</td>
<td>Notes</td>
<td></td>
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<tr>
<td>----------</td>
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<td></td>
</tr>
<tr>
<td>16/04/2021</td>
<td>Outreach</td>
<td>Kerry</td>
<td>Visited Matebele and Ngandu Outreach Clinics Assisted with family planning sessions and administered depot contraception Also some general outpatients seen (see Kobo records)</td>
<td></td>
</tr>
<tr>
<td>19/04/2021</td>
<td>Outreach</td>
<td>Eleanor</td>
<td>Visited Siajumbe and Chilikwazi Running of antenatal clinic with assistance of CHW</td>
<td></td>
</tr>
<tr>
<td>04/05/2021</td>
<td>Health Promotion</td>
<td>Eleanor</td>
<td>Session on importance of attending Zimba for antenatal scans when recommended as high risk. Attended by 12 women/partners attending for 1st booking visit.</td>
<td></td>
</tr>
<tr>
<td>06/05/2021</td>
<td>Health Promotion</td>
<td>Kerry/Eleanor</td>
<td>Session on recognising and caring for sick children, as well as how to keep children healthy Attended by 17 women attending for antenatal clinic</td>
<td></td>
</tr>
<tr>
<td>18/05/2021</td>
<td>Outreach</td>
<td>Kerry/Eleanor</td>
<td>Walked to Siakasipa for PM outreach session Assisted with family planning clinic documentation and administration of depot Health promotion as below Trial of new outreach kit</td>
<td></td>
</tr>
<tr>
<td>18/05/2021</td>
<td>Health Promotion</td>
<td>Kerry/Eleanor</td>
<td>Carried out at Siakasipa outreach Health promotion around treatment and prevention of diarrhoea and preventing childhood illness Attended by 13 women awaiting family planning and under 5s clinic</td>
<td></td>
</tr>
<tr>
<td>19/05/2021</td>
<td>Health Promotion</td>
<td>Kerry/Eleanor</td>
<td>Carried out at Kanyanga Health promotion around spotting the sick child, caring for unwell children and preventing childhood illness Attended by 6 women awaiting under 5s clinic</td>
<td></td>
</tr>
<tr>
<td>20/05/2021</td>
<td>Health Promotion</td>
<td>Eleanor</td>
<td>Carried out at Kanyanga Health promotion about antenatal referral processes and importance of going to Zimba when referred. Discussion around barriers to this and fears about C-sections. Attended by 15 women in antenatal clinic</td>
<td></td>
</tr>
<tr>
<td>01/06/2021</td>
<td>Health Promotion</td>
<td>Eleanor</td>
<td>Health promotion on need to attend Zimba for antenatal services when referred. 10 women/partners attending for antenatal clinic.</td>
<td></td>
</tr>
<tr>
<td>02/06/2021</td>
<td>Health Promotion</td>
<td>Kerry</td>
<td>Health promotion for prevention and management of diarrhoea including sanitation. 6 mothers attending for under 5s clinic.</td>
<td></td>
</tr>
</tbody>
</table>
CORE WORK PROJECTS

Health Needs Assessment

A health needs assessment for Kanyanga was performed with the majority of research and synthesis performed prior to our first visit, with the aim of developing our foundational understanding of the current state of health needs and the problems faced, and to identify areas that needed further investigation. Resources from the WHO\(^1\) and CDC\(^2\) were utilised to construct the assessment process, and information on the needs of the community was gathered from Zambian MoH policy documents, openly available online sources, and prior OCA household surveys.

During our time in Kanyanga, we also surveyed patients (see below), and assessed Kanyanga RHP against the Zambian MoH standards for a RHP and rural health centre (RHC) (as described in the National Health Care Package 2012\(^3\)) as part of the needs assessment process. Please see the Kanyanga Community Health Needs Assessment supplementary document for the full report.

Patient Health Beliefs and Priorities

We designed and conducted a patient survey to assess beliefs about their own health and their priorities while at Kanyanga RHP. Staff nurses and CHWs acted as interpreters for us, and we selected patients waiting to be seen in clinic on different days, depending on availability. The survey is available on Kobo (and in the appendices below) and can be edited as needed to be used at other health facilities.

We surveyed 25 patients, with an average age of 30 (8 men and 17 women). Around half of the patients were attending on behalf of themselves (see Figure 1). The distribution of presenting problems is shown in Figure 2 below (n = number of patients, note that some patients attended with multiple complaints therefore there are more than 25 results).
When asked to describe how healthy they saw themselves, only a minority of patients described themselves as “healthy” or “very healthy” (Figure 3). When asked whether they had specific concerns about their health, most people responded with either no concerns, or repeated the acute complaint that had brought them to clinic on that day.

Finally, we assessed patient satisfaction with the services being provided at Kanyanga. Most patients had visited Kanyanga before, with an average of 2.16 visits in the last 6 months. All patients described being “happy” or “very happy” with the services provided at Kanyanga (Figure 4). The main reasons cited for being happy with the services were that they would receive “treatments” or “medications” (n=20), liking the staff (n=6) and the location of the clinic (n=4). When asked what could be improved at Kanyanga, the most common responses were to ensure that drugs did not run out, and to have more staff and a bigger clinic.

This questionnaire gives a useful insight into patient health beliefs. We noted in our medication optimisation project that there was some concern that patients had high expectations to receive antibiotics, however it should be noted that whilst medications and treatments were frequently mentioned as important to patients, the type of medication was not specified. In general, it seems that patients are very happy with the services but that this is tied to an expectation for treatment.

There are a number of limitations to this assessment. We relied on CHWs or nurses to interpret, which may influence patients reporting on their satisfaction. Additionally, some of our phrasing used to describe general health and wellbeing may not have been easily translated; for example when asking people to describe their general health over the last 6 months the answers received referenced their current acute illness. The availability of staff to translate meant we could only survey a limited number of patients as we were taking staff away from other duties. Additionally, as we were only surveying those who attended the clinic, it does not give an indication of the health beliefs of the wider community, who may not be seeking healthcare via Kanyanga if at all.

This questionnaire could be repeated at other RHP/RHCs as an insight into patient health beliefs. Phrasing and interpretation should be considered, and it may be useful to carry this out with a Tonga-speaking member of OCA staff to reduce bias.

Maternal Health (Antenatal Care and Referrals)

Through observation of and participation in antenatal clinics at Kanyanga and on outreach (in Chilikazi and Syejumba) we noted that there is limited provision of some routine antenatal tests and assessments (which does not meet the Zambian MoH standards for ANC(4)) and
that the standard of ANC for those women who attend outreach clinics is significantly lower due to even more limited resources. Additionally, there were low referral rates and uptake of referrals to ZMH following identification of high risk pregnancy or abnormal findings in ANC.

Through discussion with the clinic staff and the Headmen, we elucidated that there is a hesitancy within the community to travel to ZMH for ANC or delivery care, due to cost of transport and perceived quality of the mother’s shelter. CHWs and Headmen commented that the need for care at ZMH was not considered important enough to manage the costs. Clients also described concerns about referral such as the belief that care at ZMH would always result in a caesarean section. Clinic staff were hesitant to refer to ZMH as they were aware that few women would attend, they report receiving little feedback on results of referrals, and feel they can manage most things (that the guidelines(5) would recommend referring onwards) themselves.

Initial interventions aimed at improving quality of ANC and referral rates among staff and uptake of referrals among clients included: staff training on ANC standards (including routine testing rationale and ideal frequency) and non-emergency referrals (including discussion around referring onwards abnormal findings, and barriers to referral), provision of an additional BP machine to be taken on outreach for earlier identification and monitoring of BP issues, and health promotion sessions for clients and their partners on the importance and value of attending ZMH if referred (including addressing specific client concerns).

Discussions with the DHO Director on the above issues at two meetings elicited many relevant insights:

- The WHO aims to have all women receive at least one scan in pregnancy, ideally before 20 weeks gestation. ZMH does have capacity to handle increased demand for their scanning services and antenatal/ delivery care, but there are many barriers to getting women to ZMH. The DHO does sometimes perform outreach into the communities to scan high-risk women (aim to do this quarterly) but this is limited by funding and has not happened in the past year. The DHO hopes to place a portable ultrasound machine in Motichela. They would also like a doppler but have no funding for this.
- The MoH Maternal and Neonatal Referral Guidelines are used to guide referrals to ZMH, but this guideline is not used religiously as clinic staff understand resource limitations at the district level and often are able to manage many “high-risk” pregnancies when needed.
- A risk/ referral register is completed by the RHP and sent to ZMH as a safety-net to ensure non-emergency referrals are expected and/ or followed up on.
- Some examples of testing that should be happening throughout pregnancy include: Haemoglobin at booking and third trimester; BP at every encounter; urinalysis at booking and after 20 weeks; blood sugar at booking, at 20 weeks, and more frequently if woman is on ARVs; HIV test every 3 months; and syphilis testing at booking.

We considered the value of donating a handheld doppler for Kanyanga staff to use to assess fetal heartbeat. While the NIC did report that the device would be useful, and we postulated that it could be used for reassurance when unable to auscultate a heartbeat, or to confirm the need for referral to ZMH, we decided against the donation at this time. We were
concerned that the device could be used inappropriately or inadequately, and that it could falsely reassure staff and clients. The main underlying problem with ANC and referrals at the moment is that basic tests are not regularly being performed (e.g. BP on outreach, urinalysis in the third trimester) or critically interpreted (e.g. abnormal findings on abdominal palpation) and that women are resistant to referral to ZMH. A handheld doppler does not address these issues and could cause more harm than good. We think it could be introduced to the clinic at a later date, but only once we are seeing an increase in the quality of ANC provided and an increase in uptake of referrals to ZMH. If a doppler were to be introduced to Kanyanga there would need to be consistent and close mentoring and monitoring of its use to ensure that it is used appropriately and cases are managed safely.

Our recommendations for ongoing work in maternal care at Kanyanga are:

1. Ensure that infrastructure and WASH facilities at Kanyanga are appropriate for maternal care, in particular for the Mother’s Shelter.
2. To continue health promotion and community outreach activities that address women’s concerns about referral to ZMH, and encourage women to attend Kanyanga if they experience abnormalities.
3. To continue mentoring and supporting staff in recognising, managing, and referring onwards abnormal findings in pregnancy.
4. To ensure that adequate equipment is available to clinic staff to be able to perform at the level expected of a health centre for in-clinic appointments and on outreach. For example: blood pressure machines, urinalysis sticks, blood sugar testing, and haemoglobin testing.
5. To further develop the use of the risk/ referral register, for example consider the creation of a separate register specifically for antenatal/ labour/ postnatal referrals that will include space to add in feedback from ZMH on the cases, and that can be used retrospectively for monitoring and evaluation purposes.
6. To develop a structure for monitoring the quality of antenatal care that women receive.
7. Additionally, to prioritise the hiring of a midwife for Kanyanga to help manage the high maternity service use.

Medicines Management and Antibiotic Stewardship

Assessments:

As part of our efforts to map the RHP’s resources, we discussed with staff the processes for ordering medications and maintaining the pharmacy. Medications are ordered from Zimba: a member of staff must go in person to Zimba to give in the medication request sheet, and then return when the medications are ready to collect a few days later. Sometimes the medication delivery may coincide with a visit from the DHO or with the monthly vaccine delivery, in which case they can be delivered directly. We discussed the pharmacy protocols: each medication has a card, and when a delivery arrives the medication is counted and card updated. When medication is removed to use in OPD or on outreach, this is recorded and the total adjusted to reflect how much stock remains. One particular CHW is responsible for managing the medications, although they must be ordered by the nurses or CO. When it is noted that a medication is running low, further supply is requested from Zimba. Medications received from Zimba do not always reflect what is ordered due to district level shortages. A physical medication count is carried out once a month to ensure that the stock cards are
accurate, and it was noted that there are sometimes discrepancies in this. We were informed by staff that stock-outs are common at Kanyanga, and that this mostly involves asthma medications, paracetamol, and some common antibiotics such as amoxicillin and X-pen. We also discussed this issue with the District Health Office Director, who confirmed that the district suffers from shortages, particularly “essential medicines”, whilst anti-malarials, anti-retrovirals (ARVs) and rapid diagnostic tests (RDTs) are in better supply due to different funding streams, though Kanyanga staff do report stock-outs of malaria RDTs and some anti-malarial preparations. The DHO Director confirmed that Kanyanga staff follow correct protocols for ordering medications. Medications for treating asthma had been unavailable in Southern Province for more than 6 months when we visited.

Following discussions about the pharmacy processes at Kanyanga, we also performed a stock review which involved recording every medication available and checking the stock cards for concordance and expiry date accuracy (53% of the stock cards were correct). Recording which medications were physically in stock allowed us to appreciate which treatments were available, and we were able to map this against Zambian Standard Treatment Guidelines\(^{(6)}\) for use in our antibiotic teaching project (see below). We also observed medication stock-outs while in Kanyanga, for example during one week the only antibiotics available were amoxicillin and metronidazole, but a further medication order had not yet been placed.

The strengths of this assessment are that by understanding medication availability on the ground and the processes and challenges involved in procuring more medications, we could appreciate some of the difficulties in providing medical care. This led to our medication usage optimisation project (below) which was focused around antibiotic usage, but also prompted us to explore other methods of procurement, such as writing to asthma charities to try and obtain medications which have been in shortage for some time. We are limited in how much we can change due to ongoing national level shortages of medications.

This observation prompted us to carry out an audit of 50 patient records from one week (when we were not present in Kanyanga). We found that 98% of the patients we reviewed had received an antibiotic prescription, while only 6% of the antibiotics issued had been in line with guidance. The most common indications for prescribing antibiotics were URTI and diarrhoea, and the most common antibiotics prescribed were co-trimoxazole and amoxicillin. 73% of the antibiotics were prescribed to those aged 16 and under.

Discussions with staff suggested that patient expectations to receive antibiotics were high and that there was a fear of complaints to the headmen in the event that they did not prescribe antibiotics. We carried out a patient health priorities questionnaire of 25 patients attending clinic, and found that patient satisfaction with the clinic was generally very high (all patients stated that they were either “happy” or “very happy” with the services at the health post). Although patients cited receiving “medications” or “treatment” as a high priority, they did not specifically mention antibiotics. We also held a meeting attended by 14 village Headmen, where we explored some of these concerns. They reported no complaints from their communities and again reported high levels of satisfaction with the clinic, and high levels of trust in the staff. When asked about any issues, again medication shortages were cited, although the focus was more on analgesia: antibiotics were not specifically mentioned.

Interventions:

We proposed a number of interventions to tackle this issue: group staff training sessions, one-to-one mentoring with prescribers, and community health education sessions. We
provided staff education sessions to nurses, CO and CHWs on how to assess unwell children and a separate session on indications for antibiotics for common presentations, with a particular emphasis on URTI. We measured the impact of this teaching session by asking participants to complete a pre and post-teaching assessment questionnaire: although all rated themselves as very confident in assessing who needed antibiotics, the average score (reflecting correctly identified antibiotic indications) increased from 40% to 64% following the teaching session. We emphasised the need for health education when not prescribing antibiotics, and suggested alternative medications that we could prescribe (e.g. paracetamol for pain, ORS for diarrhoea). We also gave a teaching session to prescribers at the clinic which focused on choice of antibiotic, utilising the Zambian Standard Treatment Guidelines(6) and our findings from the pharmacy stock review. We provided summary posters regarding these topics, which have been displayed in clinic and also packed into the outreach kit.

We supplemented these teaching sessions by carrying out one-to-one clinical mentoring during general OPD clinics, including challenging inappropriate prescribing where necessary. We found the antibiotic prescribing rates reduced to 36% (with 65% in-keeping with guidelines) when we sat in clinic, and did not witness any resistance from patients or any complaints when not prescribing antibiotics, although this does not rule out patient dissatisfaction.

We also provided health education sessions for patients around how to assess an unwell child, when to bring them to Kanyanga for treatment and how to look after them at home. This was attended by 17 women attending antenatal clinic, and another 6 mothers attending the under-5s clinic. We discussed how to manage and prevent diarrhoea at an outreach clinic in Siakasipa attended by 13 adults.

To combat shortages in other types of medications, we have written to the Global Asthma Network charity to try to source asthma medicines. We have also discussed with RHP staff that some simple medications such as antihistamines and paracetamol can be sourced from local shops for a low price, but patients are still reluctant to purchase them due to the cost.

We hope that through the above interventions, we will see a reduction in the overprescribing of antibiotics by staff, and also a reduction in the presentation of self-limiting viral illness to the clinic. On re-auditing the notes the week following the first teaching session, we noted a decrease in the rate of antibiotic prescribing to 74%, with 19% being compliant with guidelines. We did note some patients who had not received antibiotics despite having high fevers, but it was difficult to assess from the notes whether this was appropriate, and those patients had not reattended and no adverse events were noted by clinic staff. We expect this to continue to improve. We hope that staff will feel more confident in their clinical assessment of who needs antibiotic treatment, and that this will have an overall effect on the rate of medication stock-outs at Kanyanga. We are currently re-auditing notes to assess for any improvement in prescribing rates following our initial intervention.

This intervention’s strengths lie in the fact that it is multi-faceted, and targets multiple factors in terms of antibiotic overprescribing and medication usage: staff behaviours, patient education and optimisation of medication usage. We are limited by long-term district level shortages which impact the availability of correct antibiotics, and the low level of health literacy amongst the population, leading to requests for treatment for minor illnesses.

Our recommendations for the improvement of medicines management are:

1. Ongoing teaching and mentoring of staff, as well as health education to continue to reach as many patients as possible.
2. The notes audit should be repeated at intervals to ensure improvement is demonstrated and maintained.

3. To design and implement a more streamlined medication ordering process, potentially via WhatsApp, so that shortages are anticipated, medications ordered earlier, and staff time and transport resources are saved.

4. Alternative sources for medication procurement could be investigated given that there are national and district level issues with stock-outs, which hampers attempts to improve the medication supply.

Outreach Kit

While on outreach with the staff we noted that an inefficiency in preparation for the clinics (i.e. time taken to pack the kit the morning of the clinic) and the use of a heavy, simple and disorganised box appeared to hinder the flow of the outreach process. Additionally, patients attending outreach clinics were not receiving the same standard of care at Kanyanga, partly due to a lack of equipment while on outreach. We postulated that use of a more organised and easily transportable kit bag, designed for this purpose, would improve the experience of providing outreach care for the staff.

We reviewed the current kit box and its contents, and then held a kit planning session with the staff (including the nurse in charge and CHWs) to talk through what would be useful to include in an outreach kit and how much of each item is needed. We then procured appropriately sized bags in Livingstone with multiple compartments of different sizes, at a cost of 240 ZMW, and also donated a BP machine and new batteries to be included in the kit. We decided to trial the new kit bag at the outreach clinic in Siakasipa, a village within walking distance of Kanyanga. We packed the bag together with the NIC and CO the morning of that outreach day, and labelled the bag compartments with laminated labels to aid re-packing.

We hoped that the new outreach kit would be easier to transport than the old metal box, easier to keep organised and faster to re-stock. Feedback from the NIC following the first trial day included that the bag was easy to use and lightweight, but that it would not be suitable during the rainy season. Following a few uses the bag unfortunately was torn along a seam (although still usable), potentially as a result of over-packing.
Our recommendations for the improvement of outreach clinics are:

1. To procure a waterproof cover for the bag for the rainy season, and to order a higher-quality and more durable bag that is the right shape and size.
2. To develop a system for monitoring the use of the kit, including which kit items are being used and how frequently they need re-stocking, and which items are not useful and may be taking up valuable space.
3. To develop a structure for monitoring the quality of care provided on outreach, and to address any inequality in care provided on outreach in comparison with in-clinic encounters at the RHP.
4. To consider provision of rechargeable batteries for equipment such as the BP monitor as more economical long-term, and avoids further battery procurement issues.

**Chronic Disease Management**

From observation in clinic and discussions with staff, it was noted that chronic disease management (in particular hypertension and asthma) is very ad-hoc. Patients who attend with hypertension will be given a month’s supply of medications and told to come back when it is finished. From the pharmacy stock take, there is a good supply of nifedipine, amiloride/hydrochlorothiazide, atenolol and furosemide. Asthma medications such as salbutamol have been out of stock in the district since November 2020, with a few patients managing to procure these from elsewhere intermittently. There is no facility to test for diabetes at Kanyanga. It was noted in clinic and during a notes audit that on occasion high blood pressure readings were not recognized or acted upon. On discussion with staff, there was no register of patients with chronic diseases, therefore it was the patient’s responsibility alone to return for more medications. One nurse mentioned that they often know the patients well and if they do not see them for a while they may call to check on them, but this system is subject to human error.

We attended a teaching session given by a member of staff on hypertension, and used this as a discussion point for management of chronic disease and the importance of lifelong follow-up. The importance of highlighting abnormal measurements with a coloured pen prior to the patient seeing the nurse or CO was also emphasised to CHWs. During our time in Kanyanga, one member of staff started to make a register of hypertensive and asthmatic patients to enable follow-up which we have encouraged. The District Health Office Director also suggested using the register to form a regular clinic for hypertensive patient reviews, and another for asthma patients. This would facilitate follow-up, but also ensure that at-risk patients would not be attending together with potential COVID patients. She also suggested that there should be glucose testing kits available, and this could be lobbied for from the organisations who provide ART, since there are a number of patients at Kanyanga who are on ART which may induce hyperglycaemia. Patients with diabetes need to be referred to Zimba for further investigation management.

Our recommendations would be to further encourage the recording of chronic diseases to enable callbacks if patients are not attending, and to be able to screen better. Implementing a regular follow-up clinic for patients with chronic diseases could help with this. If glucose testing strips could be procured (with the aid of the DHO lobbying HIV organisations) this would help to diagnose diabetes which is likely to be present in higher rates than currently detected.
Child Health

We attended Under-5s clinics both on outreach and at Kanyang RHP. Children are weighed and then receive immunisations appropriate for their age. The weight and the immunisations received are documented both on a child health card that stays with the parents, and also in the Ministry of Health ledger which stays at the clinic. There did not seem to be a way to keep track of children who may not be attending, and this was highlighted following a significant event where we were asked to assess a 4 year old child who had severe malnutrition on a background of cerebral palsy; we referred the child to Zimba but they did not attend and sadly the child passed away. The RHP staff noted that the child had not been seen at the RHP for a significant period of time.

We did not see any evidence of newborn or 8 week checks (NIPE) happening. However, upon checking the WHO standards(7), the advice is for checks at birth, at 48-72 hours, 7-14 days and 6 weeks, with the recommended checks being feeding, history of convulsions, fast breathing, severe chest in-drawing, no spontaneous movement, temperature and jaundice. The Under-5s ledger suggests that these assessments are being made, but we recommend reviewing this process for opportunities for improvement.

Before we left, a new electronic recording system had been introduced for child health (ZEIR) which would display to staff which children were overdue for their checks and therefore might help to improve follow-up. Staff should be using this with all births, and according to the DHO director, the hope is that eventually the paper ledgers will be obsolete once the electronic records have been taken up appropriately.

Family Planning

Through observation of family planning clinic we noted that women often have their weight consistently measured at encounters but often their BP is missed, particularly on outreach. Counselling about options, side effects, and correct use of different methods is performed in a group setting by a CHW prior to the clients being seen individually. It was not clear to us as observers how much of an informed choice the clients were making with this strategy. Speaking with the DHO Director about FP, she suggested that major issues include the presence of false beliefs in the communities about FP (e.g. that it is irreversible/ makes one barren) and the risk of intimate partner violence associated with use of FP.

To further investigate this we reviewed the WHO Family Planning Global Handbook(8) which recommends checking BP but if BP monitoring is not available in resource-limited settings women should not be denied hormonal methods simply because their BP cannot be measured. The Zambian FP record card provided to women does include a space for BP to be written. The WHO also produced some FP service monitoring tools, of which we used a tally chart(9) (and Zambian MoH FP ledger) to assess FP method mix and created a provider survey which we adapted from a WHO resource(10) to focus on providers’ reported FP skills and counselling.

We found that over April 2021 there were 97 entries of patients receiving FP care, of whom 69 (71.1%) received an injectable contraceptive (Depot-Provera/ Sayana Press/ Norethisterat), 19 (19.6%) received a COC, 9 (9.3%) received a POP, and one (1.0%) woman had her Jadelle implant removed. Of the four FP providers surveyed, all four had
been trained in the use of the COC, POP, and injectable contraceptives. Two had also been trained in the use of the implant. All providers were “very confident” talking to women about how to use FP correctly, and reported that they performed different elements of counselling women about contraception “often” or “very often”.

We concluded that currently there is little demand for improvement of the FP services provided from staff or patients, and that there is a good mix of FP methods provided. We did donate a BP machine to be included in the outreach kit to improve monitoring of BP in FP and ANC care, although we would recommend focusing on outreach and health promotion to women and their partners to increase general uptake of FP, and safety for women, as the next step.

Our recommendations for the future development of FP services are:

1. To assess community perspectives on FP, beyond that of those already attending FP clinic.
2. To perform community FP outreach and health promotion, addressing myths and concerns.
3. To consider staff training on tips and techniques for counselling clients on FP method choice and proper use, including encouraging monitoring of BP where possible.

Quality Improvement and Reflection Staff Teaching

Most, if not all, of our observations and subsequent planning have employed quality improvement methodologies and reflection as the mainstay of our processes. For example, we assisted on a case of a severely malnourished child who died in the village shortly after we recommended referral to ZMH; we spent a lot of time reflecting on this case and whether we could or should have done something different. We ran a training session for the Kanyanga staff about the value of personal and team reflection, and introductory quality improvement methodology to encourage ownership of projects going forward. We hope that continued QI mentoring will further increase the sustainability of the work implemented at Kanyanga.

Our recommendations for future QI work are:

1. To work with and mentor Kanyanga staff with the aim of equipping them with the skills necessary to run their own QI projects.
2. To implement and encourage team reflection sessions following significant events, such as an unexpected child death, with the aim of identifying improvements that could be made.
3. Additionally, the Patient Health Belief questionnaire is a useful assessment tool which can be utilised at other RHPs/RHCs as part of the process of identifying areas for improvement. We recommend using a Tonga-speaking member of OCA staff rather than RHP/RHC staff to reduce bias from patients when answering. It could also be expanded to include members of the wider community, not just those visiting the RHP.
### RECOMMENDATIONS AND STAKEHOLDER MATRIX (Priorities (first and second) likely to have the most impact are identified as (1) and (2))

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<thead>
<tr>
<th>Infrastructure:</th>
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<th>OCA</th>
<th>DHO</th>
<th>Funding partners</th>
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<tr>
<td>(1) Appropriate infrastructure and WASH facilities e.g. a new safe water source and latrines for the Mother’s Shelter</td>
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<td>(2) Provision of power to the RHP via solar panels</td>
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<td>Network boosting to allow staff better internet access for training and referrals</td>
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<td>(1) To prioritise the hiring of a midwife for Kanyanga to help manage the high maternity service use.</td>
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<td>(2) To ensure that adequate equipment is available to clinic staff to be able to perform at the level expected of a health centre for in-clinic appointments and on outreach. For example: blood pressure machines, urinalysis sticks, blood sugar testing, and haemoglobin testing.</td>
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<td>To continue health promotion and community outreach activities that address women’s concerns about referral to ZMH, and encourage women to attend Kanyanga if they experience abnormalities.</td>
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<td>X</td>
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<tr>
<td>To develop a structure for monitoring the quality of antenatal care that women receive.</td>
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<th>OCA</th>
<th>DHO</th>
<th>Funding partners</th>
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<td>(1) To design and implement a more streamlined medication ordering process, potentially via WhatsApp, so that shortages are anticipated, medications ordered earlier, and staff time and transport resources are saved.</td>
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<td>(2) Explore alternative medication procurement avenues - particularly for analgesia, asthma medications and antibiotics</td>
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<td>Repeat notes audit to assess antibiotic prescribing at 3 and 6 months post-intervention</td>
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<td>Ongoing teaching and mentoring of staff regarding antibiotic usage as needed based on audit results</td>
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<tr>
<td>Further health promotion for community members about preventing and managing simple illnesses at home</td>
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### Outreach kit:
- (1) To develop a structure for monitoring the quality of care provided on outreach, and to address any inequality in care provided on outreach in comparison with in-clinic encounters at the RHP.  
- (2) To procure a higher-quality and more durable bag, with a waterproof cover for rainy season.
- To develop a system for monitoring the use of the kit, including which kit items are being used and how frequently they need re-stocking, and which items are not useful and may be taking up valuable space.
- To consider provision of rechargeable batteries for equipment such as the BP monitor as more economical long-term, and avoids further battery procurement issues.

### Chronic disease management:
- (1) Provision of glucose testing and working BP machines to allow diagnosis/ monitoring of diabetes and hypertension.
- (2) Continue and review use of the chronic diseases register.
- Consider implementing a regular afternoon clinic specific for certain chronic diseases (e.g. diabetes, hypertension) to make follow-up easier and safer.

### Child health:
- (1) To review processes for newborn and 6 week checks to ensure early detection of childhood illness.
- (2) Assess usage and compliance with the ZEIR technology.
- Consider a register for ‘at-risk’ children, i.e. those with learning disabilities, special needs or safeguarding issues.

### Family planning:
- (1) To assess community perspectives on FP, beyond that of those already attending FP clinic, and to perform community FP outreach and health promotion, addressing myths and concerns.
- (2) To consider staff training on tips and techniques for counselling clients on FP method choice and proper use, including encouraging monitoring of BP where possible.

### Quality improvement:
- (1) To mentor Kanyanga staff with the aim of equipping them with the skills necessary to run their own QI projects.
- (2) To implement and encourage team reflection sessions following significant events, such as an unexpected child death, with the aim of identifying improvements that could be made.
- When repeating the Patient Health Belief questionnaire use a Tonga-speaking member of OCA staff.

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CONCLUSION

Over April to June 2021, we lived and worked alongside the people of Kanyanga, integrating ourselves into the community (for example by learning some Tonga, and supporting the local football team) in order to understand in as great detail as possible the problems faced and the resources available. We were challenged by the situations in which we found ourselves, and were pleasantly surprised by the resilience of the RHP staff and the community. Kanyanga has access to some brilliant assets: the staff at the post and at the District Health Office, the supportive Chief and Headmen, partnerships with OCA and other NGOs, and the welcoming and gracious nature of the community.

A number of assessments were carried out, including a community health needs assessment, semi-structured interviews with RHP and District Health Office staff, and a patient health beliefs questionnaire. The main findings were that:

- Poor WASH facilities in the villages are a concern for RHP staff and community leaders, and undoubtedly contribute to the high burden of diarrhoeal diseases, but the community members often do not consider treating or boiling their water or building and using a latrine a priority.
- Care for pregnant women does not meet Zambian standards, for the most part due to a lack of resources for haemoglobin, blood sugar and urinalysis testing. Additionally, a lack of blood pressure machines contributed to the inequality in maternity care between women at the RHP and women seen at outreach clinics. For women with abnormalities detected at routine antenatal appointments, there are many barriers to accessing hospital care such as transport cost.
- National-level drug shortages manifest as incomplete “essential” medicines packages for the RHP; supply does not meet demand particularly for asthma and antibiotic medications. A contributing factor is that antibiotics are over-prescribed, partly due to patient expectation of receiving treatments.
- There is very limited diagnosis and monitoring of chronic diseases and child health issues.

The findings were used to inform the design and implementation of quality improvement interventions with the aim of creating sustainable changes at the RHP. Initial interventions included training for staff (including on quality improvement methods), health promotion sessions for patients, and the creation of a fit-for-purpose outreach kit.

As described in the Health Needs Assessment and it's assessment of Kanyanga against MoH minimum standards, Kanyanga’s service provision goes far beyond that of a rural health post (i.e. in the size of population they serve, the staff at the centre, and the diverse services provided) but they are much more under-resourced than the standard for a rural health centre. Therefore many of our recommendations are to increase resource provision to Kanyanga (working towards the standards for a rural health centre) and improve communication streams between levels of care (e.g. the medications ordering process with the DHO), alongside ongoing clinical mentoring of staff and the development of monitoring processes for important patient groups (e.g. antenatal women with concerning findings, patients with chronic diseases, and at-risk children).

Our deepest thanks go to all those involved whose support and engagement made this work possible.
REFERENCES


## APPENDIX 1: PROJECT LOGIC MODEL

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short term outcomes</th>
<th>Mid-long term outcomes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial: - £500 (donation)</td>
<td>Relationship building with HP &amp; community</td>
<td>Patient survey data. Community health needs assessment incl SWOT analysis.</td>
<td>Increased community trust in CBVs, HP, MoH</td>
<td>Improved health and empowerment of rural communities</td>
</tr>
<tr>
<td>Data: - National stats - OCA household survey data - Population demographics - HP attendance records - Birth &amp; death records etc.</td>
<td>Map community health needs and assets incl. Patient survey, WASH meeting with headmen</td>
<td>Model health post standards for MoH. Improved holistic training programme for CBVs.</td>
<td>Improved OCA and MoH understanding of needs of rural communities</td>
<td>Increased capacity of the rural healthcare system</td>
</tr>
<tr>
<td>Human resources: - OCA volunteers - OCA External strategy consultant - HP staff (RN, EHT, CO etc) - CBVs</td>
<td>Review MoH, WHO, literature guidelines/standards and compare with practice re. HP service provision and CBV training. Assess opportunities for digital tech at HP to facilitate improvements.</td>
<td>3-monthly report on outreach &amp; referrals (incl. Feedback from DHO). QIP and Staff training on referrals.</td>
<td>Increased ability of HP/HC staff to recognise opportunities for service/health improvement</td>
<td>Standardised HP/HC provision of good quality services</td>
</tr>
<tr>
<td>Community resources: - Chief &amp; headmen - Engagement with HP - Agriculture &amp; livestock</td>
<td>Review referral, outreach and transport services</td>
<td>OCA volunteer patient consultations, Clinical mentoring of HP staff Quality improvement projects/capacity building planning QI training of HP staff</td>
<td>Improved engagement in and competency of HP staff to perform QIP.</td>
<td>Increased breadth of clinical and managerial skill set of HP staff, and confidence using said skills.</td>
</tr>
<tr>
<td>Physical: - Clinic equipment - Medicines - Motorbike - Mother’s shelter - Staff housing</td>
<td>OCA volunteer patient consultations Clinical mentoring of HP staff Quality improvement projects/capacity building planning QI training of HP staff</td>
<td>Community health promotion activities</td>
<td>Increased clinical effectiveness and efficiency of CBVs and HP staff.</td>
<td>Impact:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OCA volunteer feedback</td>
<td>OCA patient consultation log, QIP data, lessons learned presented to OCA &amp; HP staff (?HCC) monthly. Ongoing QI assessment and long-term capacity building implementation plan. Pre- and post- QIP training staff self-reporting</td>
<td>Improved access to, quality and capacity of rural healthcare in Zambia, through replicable and sustainable processes and partnerships with the MoH, other NGOs, and the community.</td>
</tr>
</tbody>
</table>
Patient health questionnaire

Gender

- Female
- Male
- Other
- Prefer not to say

Age

______________________________

Village

______________________________

HIV status

- Positive
- Negative
- Unknown

Have you come to clinic for yourself or someone else?

- Yourself
- Child
- Partner
- Other family member
- Other
What type of problem have you come to clinic for?

- [ ] Breathing
- [ ] Diarrhoea/Vomiting
- [ ] Ear problems/Throat problems
- [ ] Fever
- [ ] Long-term pain
- [ ] Skin
- [ ] Injury
- [ ] Sexual Health/Urinary
- [ ] Antenatal
- [ ] Family planning
- [ ] Women's health/gynaecology
- [ ] Child vaccinations
- [ ] Other

How healthy have you been in the past 6 months?

- [ ] Very unhealthy
- [ ] Unhealthy
- [ ] Average
- [ ] Healthy
- [ ] Very healthy

What is your main concern about your health?

________________________________________________________________________

How many times have you visited the health centre/outreach post in the past 6 months?

________________________________________________________________________

Overall, how happy are you with the health centre/outreach posts?

- [ ] Very unhappy
- [ ] Unhappy
- [ ] Average
- [ ] Happy
- [ ] Very Happy

Why are you happy/unhappy?

________________________________________________________________________

What could the health centre/CHWs do to help you be healthier?

________________________________________________________________________
SPOTTING THE SICK CHILD

**Danger Signs:**
- Treat & refer
- Fever >38°C for more than 7 days
- Unusually sleepy, unconscious
- Cough more than 14 days
- Chest indrawing
- Diarrhoea more than 14 days
- Blood in stool
- Not able to feed anything
- Vomits everything
- Red on MUAC
- Swelling of feet
- Convulsions

**Sick, but no danger signs:**
- Fever >38°C less than 7 days
- Diarrhoea less than 14 days, no blood
- Yellow on MUAC
- Fast breathing:
  - Age 2-12 months, 50+ breaths/minute
  - Age 12 months - 5 years, 40+ breaths/minute

**Reassuring signs:**
- Monitor
- Awake, playing normally
- Feeding well, urinating normally, normal skin pinch
- Cough but normal breathing
Diarrhoea Assessment and Management

What is it?
• 3 or more loose stools per day

How to treat:
• Rehydration with clean water and ORS (see below)
• Zinc supplements
• Continue nutrient-rich foods and breastfeeding
• Antibiotics only if bloody diarrhoea or more than 14 days

How to make ORS:
Mix:
• half a small spoon of salt
• six small spoons of sugar
• one litre of safe water
Give small amounts at regular intervals on a continuous basis

When to come to the health post:
• Severe dehydration:
  • lethargy
  • sunken eyes
  • unable to drink well
  • skin pinch goes back very slowly
  • reduced urination
• Some dehydration:
  • restlessness, irritability
  • sunken eyes
  • drinks eagerly, thirsty
• Bloody diarrhoea
• Diarrhoea lasting more than 14 days

How to prevent:
• Clean/boiled drinking-water
• Use of latrines
• Hand-washing with soap
• Breastfeeding
• Good personal and food hygiene
• Rotavirus vaccination for children
When Should I Give Antibiotics?

Remember: always check the guidance when giving antibiotics to ensure the CORRECT antibiotic is prescribed.

**Ear Pain:**
- Fever (>38°C)
- Severe pain in the ear, worse at night
- Babies cry, rub or pull the ear
- Red bulging eardrum
- Blood and/or pus discharge
- Symptoms for less than 2 weeks

**Sore Throat/URTI:**
- Fever (>38°C)
- Tonsillar exudate
- Tender cervical lymph nodes
- Painful enlarged tonsils
- Absence of viral signs e.g. nasal stuffiness, coryza, irritating cough, conjunctivitis

**Lower Respiratory Tract Symptoms:**
- Fever (>38°C)
- Breathlessness and cough
- Chest pain
- O/E: harsh breath sounds, crepitations, reduced breath sounds, increased respiration rate and chest indrawing

**Urogential Symptoms** (suggestive of STI)
- Urethral/vaginal discharge
- Genital ulcer/growth
- Associated lower abdominal pain
- Inguinal bubo
- Scrotal swelling

**Abdominal Pain/Diarrhoea:**
- Bloody diarrhoea or mucus in the stool
- Specific organisms identified on culture

**Deep Wounds:**
- Fever (>38°C)
- Deep wounds
- Presence of pus
- Surrounding cellulitis
**What Antibiotic Should I Give?**

**Sore Throat/URTI:**
- Penicillin V – 7 days
  OR
- Erythromycin – 7 days

**Ear Pain:**
- Amoxicillin – 5 days
  OR
- Penicillin V – 7-10 days
  OR
- Erythromycin – 5 days

**Pneumonia:**
- IV Benzylpenicillin or Ceftriaxone if severe, then:
  - Amoxicillin – 5 days OR
  - Erythromycin - 7 days

**Atypical pneumonia:**
- PCP: Co-trimoxazole - 21 days
- Chlamydia or Mycoplasma: Erythromycin - 14 days

**Dysentery:**
- Nalidixic acid - 5 days
  OR
- Ciprofloxacin - 7 days
  OR
- Metronidazole - 5 days
  OR
- Co-trimoxazole - 10 days

**Peptic Ulcer Disease:**
- Amoxicillin - 7 days
  PLUS
- Metronidazole - 7 days
  PLUS
- Omeprazole 20mg BD - 7 days

**UTI:**
- Nitrofurantoin - 5-7 days
- Nalidixic acid- 5 days

**Suspected pyelonephritis:**
- IV ceftriaxone OR cefotaxime
  THEN
- Amoxicillin OR Ciprofloxacin - 14 days total

**Urethral discharge:**
- Ciprofloxacin STAT PLUS Doxycycline for 7 days
- If persistent after 1 week, add in STAT dose metronidazole

**PID (Urethral Discharge + Abdominal Pain):**
- Ciprofloxacin STAT PLUS Metronidazole STAT PLUS Doxycycline for 7 days
APPENDIX 4: EXAMPLE HEALTH PROMOTION SCRIPTS

Antenatal care and referral

Some women are recommended to deliver at the local hospital [name of hospital], but this can seem like a big challenge. We want to talk to you about why you may be referred to hospital.

There are some pregnancy problems that are known to be dangerous for women, for example:

- Being very young
- Known medical conditions, for example severe anaemia or diabetes
- Having had lots of babies before
- Previous surgery, for example cesarean section
- Previous pregnancy of delivery complications, such as heavy bleeding

If any of these apply to you, it would be much safer for you to have your baby at hospital where they can protect you from danger and treat you if needed.

Depending on your situation, you may be referred to the hospital early in pregnancy or closer to the time of delivery.

If you are referred to hospital for your delivery, it is also important that you attend the hospital before labour for an ultrasound scan. The earlier you go to the hospital for your antenatal care, the safer you will be.

Ultrasound scans are very useful because they can give us lots of information about your pregnancy and the baby. The more information we have, the better we can protect you and baby.

Does anyone have any questions?
Do you have any concerns about going to the hospital?
Unwell children - health promotion script

Children get coughs and colds very often - these mild illnesses are a normal part of growth, but they can be scary for parents. We want to talk to you about how to look after your child when they are sick.

Some illnesses are dangerous for children, but many are safe. Most will go away on their own, without needing treatment. If you are worried that your child is sick, you can check them for worrying signs, for example: [point to the danger signs box on the poster]

- Very fast breathing or a cough lasting many days
- Unusually sleepy or unconscious
- Diarrhoea for many days, or blood in the stool
- Not able to feed anything at all or vomiting everything - this will lead to severe dehydration

If your child has any of these danger signs, they should be assessed at [name of health post].

If your child has these signs, it is likely that they are not too unwell, and they will get better on their own: [point to the reassuring signs box on the poster]

- Awake, playing normally
- Feeding well, urinating normally - which suggests they are not dehydrated
- Normal breathing - not fast or noisy, even if there is a cough present for a few days

If you are looking after your child at home, there are a number of things you can do to help them recover:

- Keep them well hydrated, by giving them safe clean water (boiled or treated) little and often
- Give them foods they like to encourage them to eat, little and often
- If they feel hot, unwrap them and give them Panadol to help cool them down, which you can buy [name local shop and cost]
- Continue to monitor them, and take them to [name of health post] if they are worsening or you are worried about them

You can also help prevent your child from becoming unwell, by:

- Staying up to date with your child’s immunisations
- Preventing the spread of diseases by drinking clean water which is boiled or treated, and using a latrine and washing hands afterwards
- Brush their teeth with a toothbrush and Colgate, which you can buy [name local shop and cost]
- Have the family sleep under a mosquito net (ITN) every night, during all seasons
- Get a malaria test if your child has a fever or body hotness
- Eat lots of fruit and vegetables to keep your child strong, for example [name locally available options]
- Avoid giving your child fizzy or sugary drinks or snacks

Thank you very much for listening; does anyone have any questions?
APPENDIX 5: MEETING NOTES

Dr Zulu meeting 26/04/21

Drug shortages
- Kanyanga should submit drug stock reports by the 4th of the month, which are aggregated and submitted to MoH. MoH delivery once every 2 months.
- National level supply issues (e.g. last supply October) for “essential” drugs, but anti-malarials and ART and RDTs good supply.
- No issues with reports from Kanyanga (complete and timely)
- Reliance of availability of grants for procurement of some supplies
- Re. Abx: agree that over-prescription is a problem, and there are both community expectation and staff practice factors.
- Issues also with knowing alternative antibiotic options.
- There is a standard health centre stock kit.
- DHO does have treatment guidelines as algorithms and available as computer files.

Antenatal care and referrals
- WHO aim to have all women scanned at least once in pregnancy, ideally before 20 weeks.
- DHO organises outreach targeting high-risk women, aiming once quarterly, but limited by funding. Hoping for portable USS in Motichela.
- Zimba does have capacity to handle an increase in USS demand, but they sometimes run out of the jelly.
- The centres/ DHO use the MoH maternal and neonatal referral guidelines, but not religiously due to understanding resource limitations.
- There is a risk/ referral register which is completed and sent to Zimba to be checked as a safety net for non-emergency referrals who are due to attend on their own.
- At booking, the following should be checked:
  - Hb (and in third trimester)
  - BP
  - Urine (and after 20 weeks)
  - Sugar (and after 20 weeks, and more frequently for those on ARTs)
  - HIV and every 3 months
  - Syphilis (but low stock of tests)
- Issues with maintaining old BP machines, potential to fix them?
- Would like a doppler but no funding.

Outreach standards
- There is a standard outreach package and kit list, which is supposed to be prepared the day before
- Meant to provide many services on outreach but limited by number of staff. Hoping to support with additional staff from hospitals.
- Also limited by transport (i.e. motorbike can only carry so much)
Family planning counselling
- There is a standard package for training
- Cultural issues with choice and risk of GBV - importance of educating male partners
- Prevalence of myths (e.g. will make you barren, not able to change your mind)

NB. Community performance review meeting findings could be used as basis/ introduction for staff training session

Headmen meeting 05/05/21

Attendees (14), from (spelling to be checked): Siakasipa, Siabweeda, Ngandu, Siamtele, Kabasia, Siangbe, Posani, Cheemba, Manjemela, Masanzya, Chipazi

Questions asked by Kerry, translated by CHW Alex, notes taken by Ellie

Q: Any general feedback about the clinic?
A: [silence]

Q: Any complaints?
A: [silence]

Q: Are people happy with Kanyanga?
A:
- Complaints about drug shortages (x3), particularly panadol, malaria drug and RDTs. Re. panadol, patients are referred to buy it for themselves but people have no money.
- Very happy with Kanyanga as before Kanyanga existed people had to walk very long distances e.g. to Zimba
- Very happy with services provided by nurses but issues with mothers’ shelter, particularly in cold season. Would like a new shelter.

Q: Do they think women are put off giving birth here?
A: No, but sometimes women are not well prepared for delivery.

Q: Do people trust CHWs and nurses?
A: Yes.

Q: Do they think their communities are healthy or are there lots of health problems?
A:
- Not very healthy (x2), lots of coughs and headaches
- Eye problems
- Toothache - difficult to travel to Zimba for extraction due to money (costing 100-150 kwacha)
- Bone pain
- Backache, leg pain
- Cough and muscle aches
Q: Are there issues with safe water and latrine access?
A:
- Many communities do not use latrines. Poor water sources.
- Need to travel long distances to collect water e.g. leave the house at 04.00 hours and return at 09.00 hours. Streams dry up in dry season.
- Lack of latrines due to lack of health education

Q: Do people have money for latrines?
A:
- Not seen as a priority
- Community champions for health education on latrines but there is a lack of engagement
- Only 2 champions for all of Kanyanga - need to increase numbers

Q: Do people boil or treat the water?
A: No.
Q: Why not?
A: They drink from streams directly, and they’re used to that.
Q: Do they know it causes diarrhoea?
A: Yes.

Q: Do women not want to deliver at Zimba, and why not?
A: Facilities at Zimba seen as poor, lack of money, presence of OCA doctors at Kanyanga suggests they will get higher quality care here.

Q: Are they happy with the outreach services?
A: Yes.

Q: Do the headmen have any questions for us?
A:
- How will you help with the tooth and eye problems? (x2)
  → Health education is very important e.g. tooth brushing with toothbrush and colgate, washing with clean water, limiting sugar intake (e.g. sweet/ fizzy drinks), wear caps to protect eyes from sunlight. We will also try to improve the use of medicines to treat these problems when treatment is necessary.
- Some children have difficulty passing urine (but no blood in urine), what can you do?
  → These children need to be seen in Kanyaga for assessment.

Dr Zulu meeting 24/5/21

Child health
- Child health week 20/6/21 and November
  ○ Involves micronutrient supplementation for <5, pregnant, and postnatal women (Vit A and deworming), catchup immunisation, growth monitoring, malaria and HIV RDTs. Performed at all facilities and outreach sites all day for 6 days
  ○ Reliant on CHW engagement and use of MoH resources
- Identifying children
MoH responsible for mapping <5 by village and household (organised by CHW) in last quarter of 2020. Requires updating monthly & referred to following each clinic/outreach (inc checking where family are coming from)

Electronic immunisation register (ZEIR): prompts how many are due or have missed appts. Currently poor utilisation of tablets and database doesn’t match paper registers. Register should be used from birth.

MoH invested heavily in this programme. CHW have platform on phones to register children on outreach. Would be useful to have OCA understand mapping process and ZEIR to provide supports

Desire of MoH to migrate from paper to electronic records. Phased transition (behind schedule)

ANC at Zimba
- Mother shelter and ANC has capacity for additional women
- Community perception of C-section is the woman is ‘lazy’ - therefore community outreach and health promotion needed around indications
- To increase scanning at ANC - DHO intended to send sonographers to community quarterly but due to limited resources last visit was Q42020
- For patients with no money for transport - can encourage them to go to Simwatchela on Saturdays for driver’s shift change or mother’s shelter to wait for someone else who is also travelling to Zimba
- Integrated assessment clinics at Zimba with sonographers and obstetricians are theoretically possible but would need to liaise w/ hospital about best day

Feedback on referrals
- Lack of feedback is a common problem across all facilities
- Ideally: Hospital representative puts reports from hospital into slots at DHO to be fwd’d to each facility
- Regarding potential Kanyanga staff reluctance to refer: Staff are able to handle many complicated cases. Limited resources throughout district so can’t overwhelm hospital capacity for cases that could be managed in Kanyanga
  - Patients not prepared for hospital delivery or journey home. So community perceives referrals as a failure of staff

Medication ordering
- Excellent electronic system for order meds
- Facilities are meant to place orders for 3 months’ of stock when 1.5 months’ stock remains. If not supplied, when 0.5 month stock remains, can place emergency order
- System monitors average monthly consumption and indicates stock on hand
- Challenge: Many inconsistencies at ntl level for meeting orders
- Fill rate can be 5-15% of an order
- Facilities have recently been relying on emergency orders
- HQ delivery to DHO is supposed to be bimonthly, but last delivery was October 2020
Some facilities have higher stock which is redistributed to facilities in need

Bicycle ambulances
- Useful to move people from homes to Kanyanga but not onwards to Zimba
- Motorcycles are needed more than bicycles
- If better motorcycle provision: staff could arrive to see patients early with lower emergency referral rates.
- Bicycle ambulances could support a new motorcycle

Chronic disease register
- MoH standard, but not encouraged beyond HIV and TB monitoring
- Should organise chronic disease clinics (e.g. for patients with high blood pressure, asthma, diabetes) - more convenient & will improve staff and client safety during COVID-19 pandemic
- Diabetics in communities: facilities refer to the hospital for diagnostic testing. Push to decentralise management
- Lack of glucose testing at Kanyanga: issues with storage and care of equipment
  - Testing sticks are not in standard kits provided to centres, but could source from partners (e.g. HIV)
  - Limited urine analysis sticks since loss of recent grant. Hopeful to find a new MCH partnership

Staffing at Kanyanga: new team. Want to encourage to see themselves as part of the solution. Importing to upskill and build confidence as hospitals will be more stretched and dangerous through COVID-19.