

# **Mukono Municipal Council, Uganda**

(Hospital)

**Software Engineering Intern**  
Feb 2020 -  
Omkar Bahiwal, 23

# Mukono Municipal Council

- About - <https://mukonomunicipalcouncil.go.ug/>
- Central Government Organisation for the Town of Mukono.
- Includes all the Parish, Villages Under Mukono Town and Their Health Center
- Placement Under IT - Administration Department.

# Project Work

- Development of Local Web Application for OPD Process flow Digitisation.
- Patient Queueing System.
- IT Administration Tasks Automation.
- Network Management.

Health Facility Demographic Data: FY 20 19/2020

Total Catchment Population: 79,197

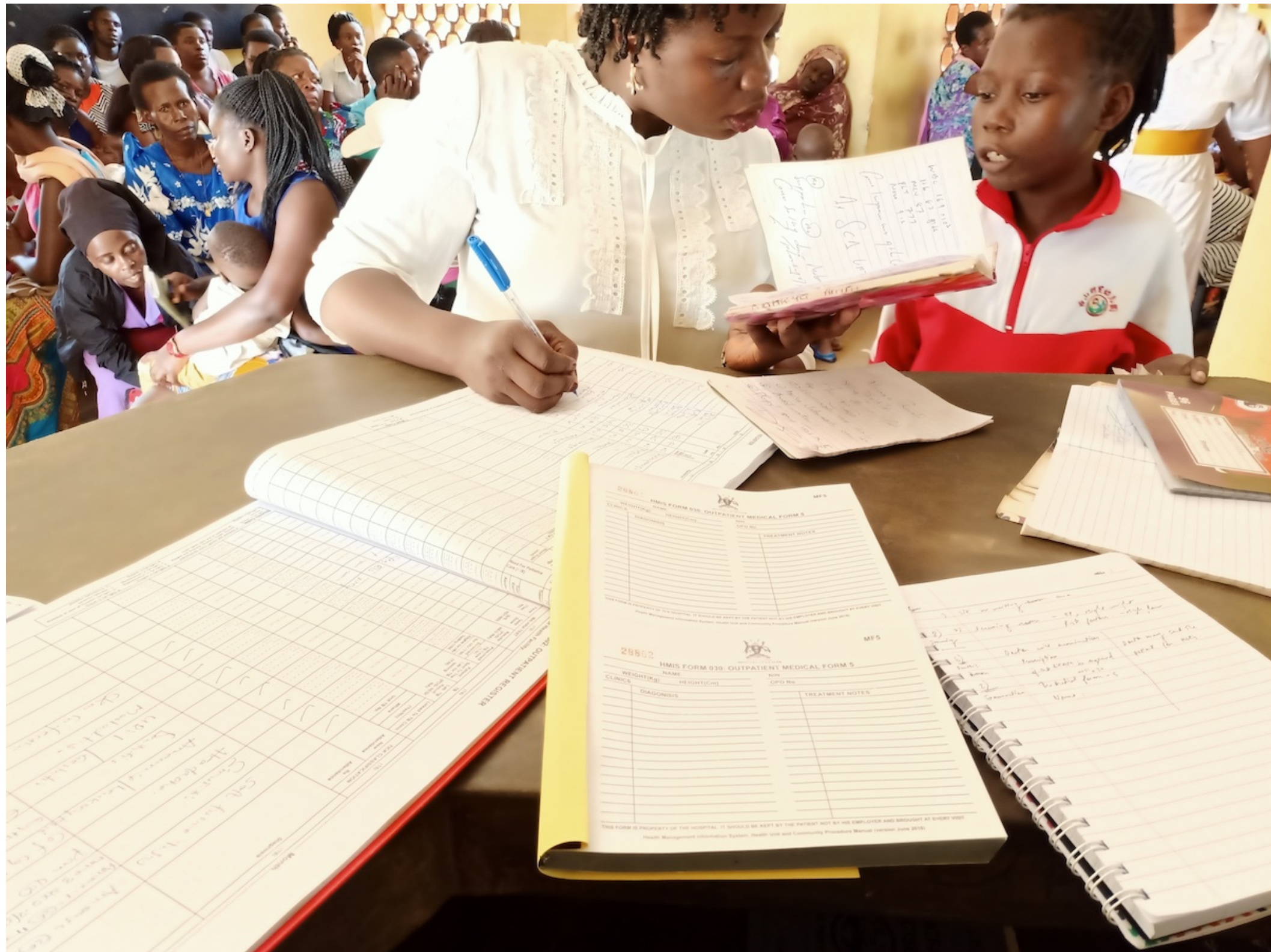
District: MUKONO Subcounty: CENTRAL DIVISION

Health Facility Name: MUKONO HC IV

| Population Category                              | Family Care Practice                              | Target Proportion | Target Population |              |
|--|---|-------------------|-------------------|--------------|
|  |   |                   | Annual            | Monthly      |
| Women of Child Bearing Age (WCBA: 15 - 49 Years) | Immunisation (Td)                                 | 23%               | <u>18,215</u>     | <u>1,518</u> |
| Pregnant Women                                   | Antenatal Care<br>Immunisation (Td)<br>Deliveries | 5%                | <u>3,960</u>      | <u>330</u>   |
| 0 - 11 Months (Live Births)                      | Immunisation At Birth                             | 4.85%             | <u>3,841</u>      | <u>320</u>   |
| 0 - 11 Months (Surviving Infants)                | Immunisation From 6 weeks                         | 4.30%             | <u>3,405</u>      | <u>284</u>   |
| 6 - 11 Months                                    | Vitamin A (100,000 I.U)                           | 1.93%             | <u>1,529</u>      | <u>127</u>   |
| 0 - 59 Months                                    | Polio Campaign                                    | 20.50%            | <u>16,235</u>     | <u>1,353</u> |
| 6 - 59 Months                                    | Vitamin A Measles Campaign                        | 18.13%            | <u>14,358</u>     | <u>1,197</u> |
| 12 - 59 Months                                   | Vitamin A (200,000 I.U)<br>Deworming              | 16.20%            | <u>12,830</u>     | <u>1,069</u> |
| 1 - 14 Years                                     | Deworming   | 41.7%             | <u>33,025</u>     | <u>2,752</u> |
| Girls 10 Years                                   | Immunisation (HPV)                                | 1.54%             | <u>1,220</u>      | <u>102</u>   |
| Non Pregnant Women                               | Family Planning<br>Immunisation (Td)              | 18%               | <u>14,255</u>     | <u>1,188</u> |

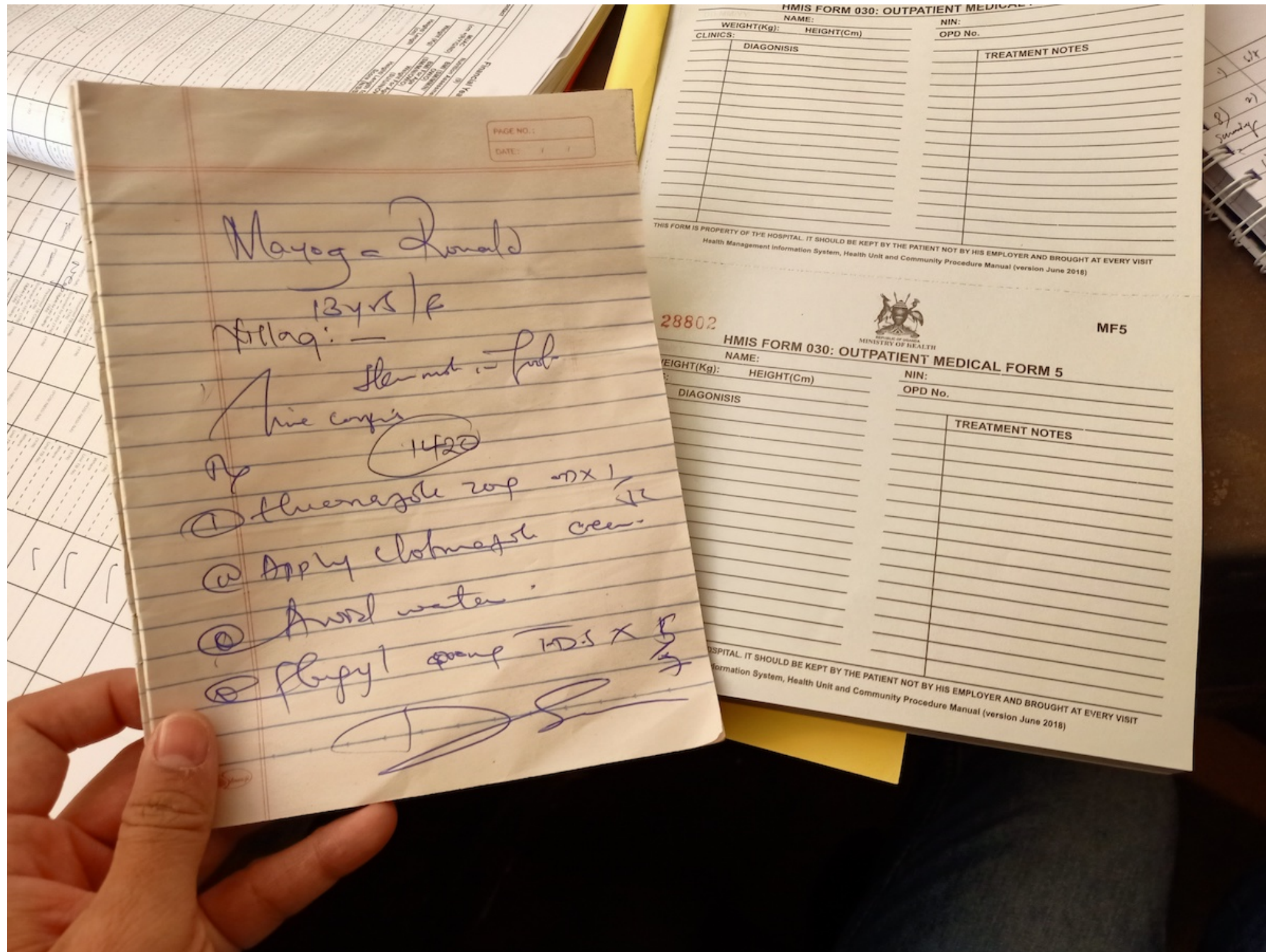
Demographics Data for Pregnancy Ward Shows 1518 Patients Monthly. Records Say Approx. 4500 Patients Monthly in OPD





# Reception





Doctor's Prescription





**Pharmacy**



HMIS LAB 010: Health Center III Daily Activity Register for General Analysis

Name of Health Unit: \_\_\_\_\_

Month: \_\_\_\_\_ Financial Year: \_\_\_\_\_

| Patient Information       |                    |         |                        |         |         |     |     |                        |          | Hematology/Serology |     |     |     |      |     |      |              |                   |    | Parasitology       |             |             |                  |                  |               |               |                 |                    |               |    |
|---------------------------|--------------------|---------|------------------------|---------|---------|-----|-----|------------------------|----------|---------------------|-----|-----|-----|------|-----|------|--------------|-------------------|----|--------------------|-------------|-------------|------------------|------------------|---------------|---------------|-----------------|--------------------|---------------|----|
| 1                         | 2                  | 3       | 4                      | 5       | 6       | 7   | 8   | 9                      | 10       | 11                  | 12  | 13  | 14  | 15   | 16  | 17   | 18           | 19                | 20 | 21                 | 22          | 23          | 24               | 25               | 26            | 27            | 28              | 29                 | 30            | 31 |
| Date                      | NIN                | Lab No. | Patient Category (NIF) | OPD No. | IPD No. | Sex | Age | Unit/Clinic/Ward/Other | Specimen | Hb                  | WBC | RBC | Hsp | HsAg | RPR | TPHA | ABO Grouping | Rhesus D Grouping | RF | Malaria Microscopy | Malaria RDT | Urine Sugar | Urine Macroscopy | Urine Microscopy | Urine Nitrite | Urine Protein | Urine Bilirubin | Urine Urobilinogen | Urine Ketones |    |
| DDMMYYYY                  | Ketisuma<br>Fidiah | 914     | NIF                    |         |         | F   | 20  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Namsuli<br>Joseph  | 915     | NIF                    |         |         | F   | 16  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    |                    |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Namsulaya<br>Mavis | 916     | NIF                    |         |         | F   | 18  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Namato<br>Rashael  | 917     | NIF                    |         |         | F   | 9   | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Namaga<br>Nulu     | 918     | NIF                    |         |         | F   | 13  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Namaga<br>Joseph   | 919     | NIF                    |         |         | M   | 51  | opl                    | line     |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Namaga<br>Grace    | 920     | NIF                    |         |         | F   | 20  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Karungi<br>Bashir  | 921     | NIF                    |         |         | M   | 14  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Ukoko<br>Fred      | 922     | NIF                    |         |         | M   | 18  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY                  | Milio<br>Amara     | 923     | NIF                    |         |         | M   | 48  | opl                    | blt      |                     |     |     |     |      |     |      |              |                   |    | No mps seen        |             |             |                  |                  |               |               |                 |                    |               |    |
| Totals for positive tests |                    |         |                        |         |         |     |     |                        |          |                     |     |     |     |      |     |      |              |                   |    |                    |             |             |                  |                  |               |               |                 |                    |               |    |
| Totals for each test done |                    |         |                        |         |         |     |     |                        |          |                     |     |     |     |      |     |      |              |                   |    |                    |             |             |                  |                  |               |               |                 |                    |               |    |

HMIS LAB 010: Health Center III Daily Activity Register for General Analysis

Name of Health Unit: \_\_\_\_\_

Month: \_\_\_\_\_ Financial Year: \_\_\_\_\_

| Patient Information |                         |         |                        |         |         |     |     |                        |          | Hematology/Serology |     |     |     |      |     |      |              |                   |    | Parasitology       |             |             |                  |                  |               |               |                 |                    |               |    |
|---------------------|-------------------------|---------|------------------------|---------|---------|-----|-----|------------------------|----------|---------------------|-----|-----|-----|------|-----|------|--------------|-------------------|----|--------------------|-------------|-------------|------------------|------------------|---------------|---------------|-----------------|--------------------|---------------|----|
| 1                   | 2                       | 3       | 4                      | 5       | 6       | 7   | 8   | 9                      | 10       | 11                  | 12  | 13  | 14  | 15   | 16  | 17   | 18           | 19                | 20 | 21                 | 22          | 23          | 24               | 25               | 26            | 27            | 28              | 29                 | 30            | 31 |
| Date                | NIN                     | Lab No. | Patient Category (NIF) | OPD No. | IPD No. | Sex | Age | Unit/Clinic/Ward/Other | Specimen | Hb                  | WBC | RBC | Hsp | HsAg | RPR | TPHA | ABO Grouping | Rhesus D Grouping | RF | Malaria Microscopy | Malaria RDT | Urine Sugar | Urine Macroscopy | Urine Microscopy | Urine Nitrite | Urine Protein | Urine Bilirubin | Urine Urobilinogen | Urine Ketones |    |
| DDMMYYYY            | Pale yellow<br>clear    |         |                        |         |         |     |     |                        |          |                     |     |     |     |      |     |      |              |                   |    |                    |             |             |                  |                  |               |               |                 |                    |               |    |
| DDMMYYYY            | Pale yellow<br>& turbid |         |                        |         |         |     |     |                        |          |                     |     |     |     |      |     |      |              |                   |    |                    |             |             |                  |                  |               |               |                 |                    |               |    |

# Lab Sample Collection Records



HMIS Form 3b

**Ministry Of Health**  
**National Tuberculosis and Leprosy Control Program (NTLP)**  
**NATIONAL TB REFERENCE LABORATORY (NTRL)**  
Gene Xpert Request and Report Form

**25334**

Referring Health Unit MASSTE HCU District Mkw Region Cen  
Patient's Name A. WINDO NOKAH Sex F Age 35  
Sub County MASSTE LC I/Village Kaga  
Patient's Phone Contact \_\_\_\_\_ Next of Kin contact \_\_\_\_\_  
Date Sputum collected 25/2/20 Time Sputum Collected 8:20am  
Sample Collected by Mbenello Sam Phone Contact 082249893

**TYPE OF PATIENT**

|  |  |  |
|--|--|--|
| <input type="checkbox"/> HIV positive          | <input type="checkbox"/> Smear Pos at 2 months | <input type="checkbox"/> Health workers              |
| <input type="checkbox"/> Children (0-14 years) | <input type="checkbox"/> Treatment Failure     | <input type="checkbox"/> Pregnant/ lactating mothers |
| <input type="checkbox"/> Diabetic              | <input type="checkbox"/> Relapse               | <input type="checkbox"/> Prisoners & refugees        |
| <input type="checkbox"/> Contact of DR TB      | <input type="checkbox"/> Lost to follow up     | <input type="checkbox"/> Others (specify) _____      |

**HIV STATUS**  
Positive ☐  
Negative ☒  
Unknown ☐

**SPUTUM SMEAR RESULTS**  
Negative ☐  
Positive Scanty ☐  
Positive 1+ ☐  
positive 2+ ☐  
Positive 3+ ☐  
Unknown ☐

**CHEST X-RAY STATUS**  
unknown ☐  
Abnormal ☐  
Normal ☐

Requesting Clinician Amuna Date 25/2/20 Phone No. 082249893  
Gene Xpert site \_\_\_\_\_ District \_\_\_\_\_  
Sample Received by \_\_\_\_\_ Date \_\_\_\_\_

**XPRT MTB/RIF RESULTS**  
Date Tested 26.2.20

**XPRT MTB RESULTS**  
MTB Not Detected ☐  
MTB Detected ☒  
Invalid ☐  
Error ☐  
No result ☐ m

**RIF RESISTANCE STATUS**  
Not Applicable ☐  
Rif Resistance not Detected ☒  
Rif Resistance Detected ☐  
Indeterminate ☐

**MTB DETECTED MEDIUM**

Name of Lab. personnel Jwo Signature [Signature] Date 26.2.20

Version 15th Dec 2016

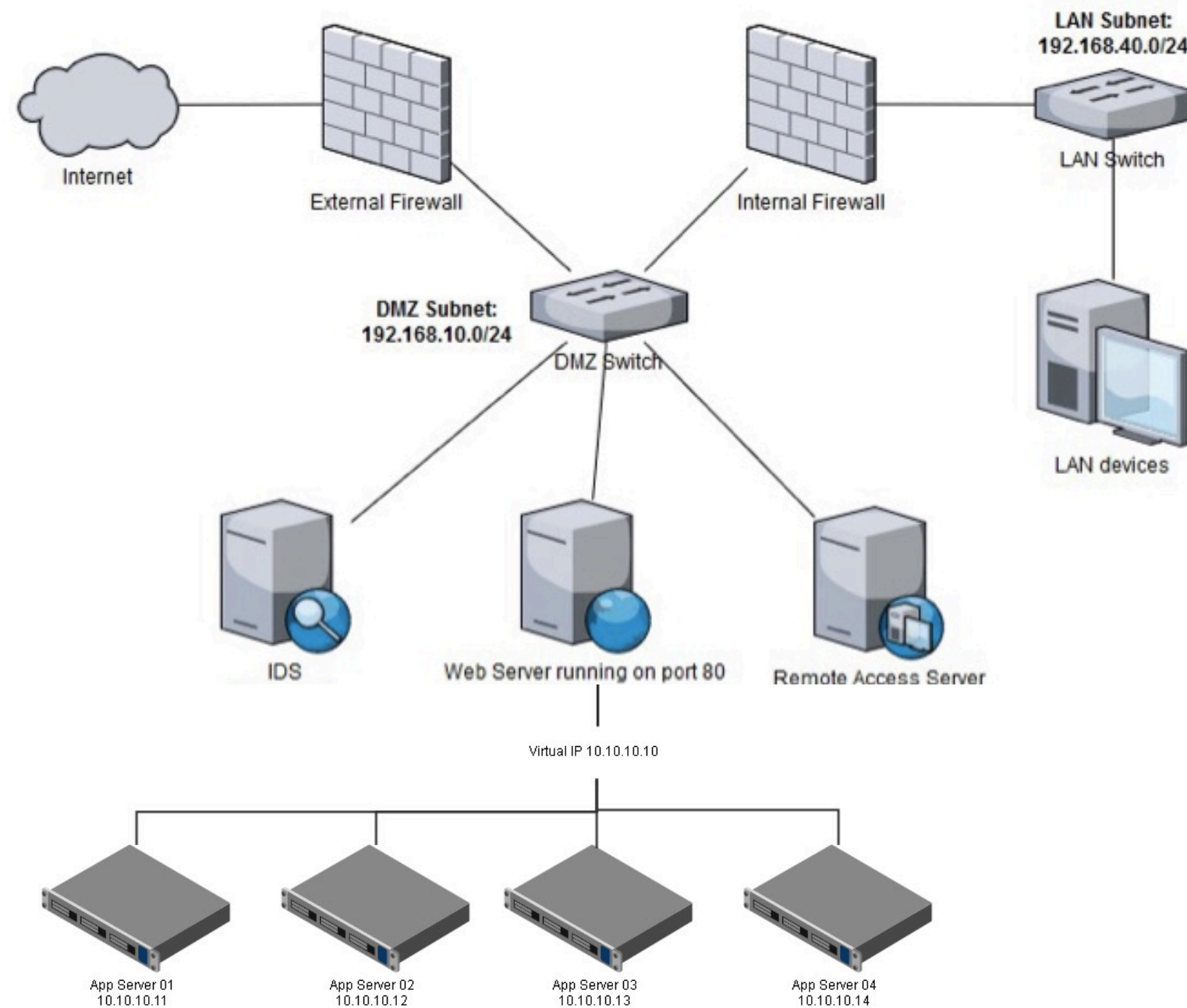
# Lab Results

# Technical Details

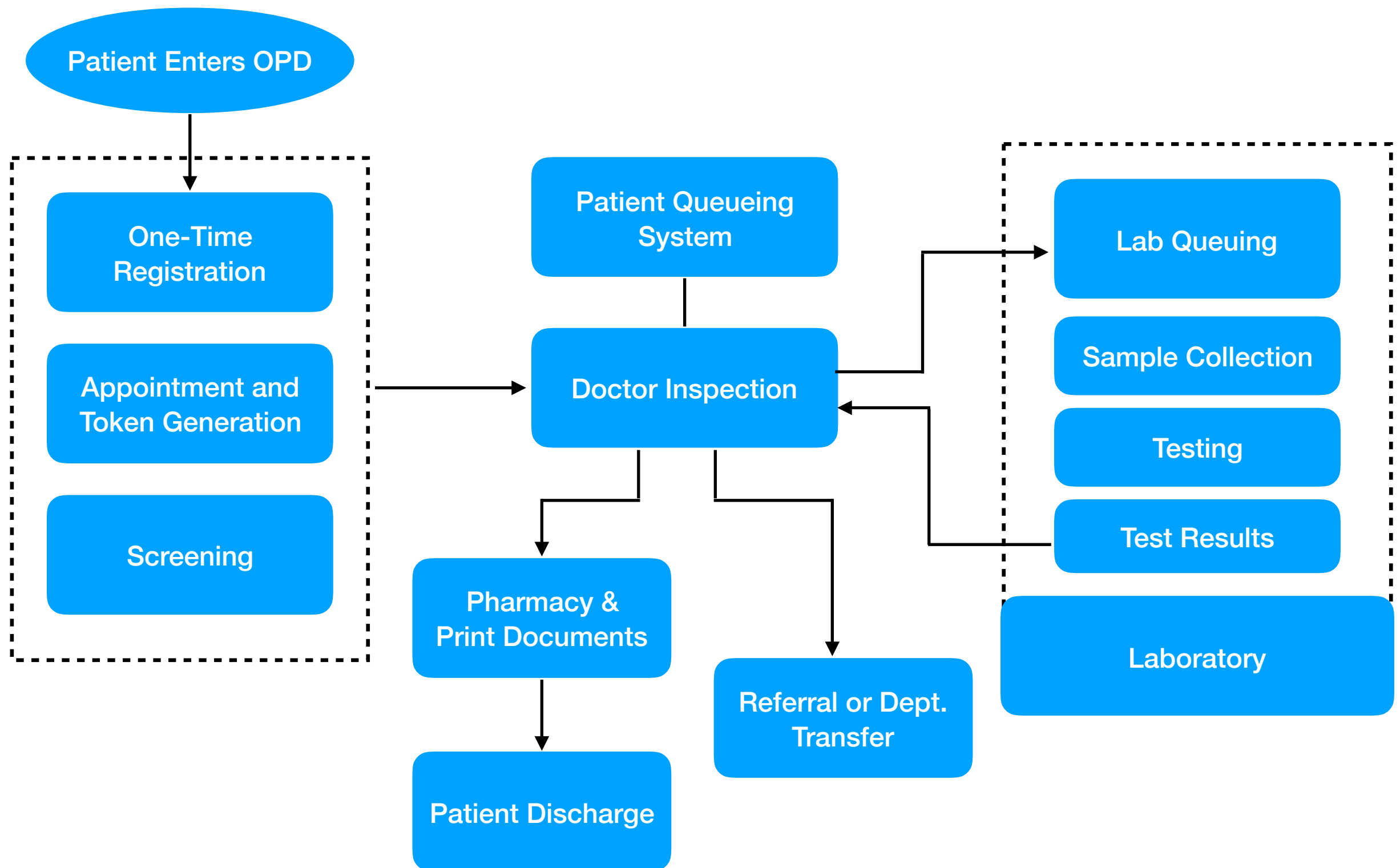
- Implementation of Locally Hosted Web Application.
- Web Server : Apache / IIS 9 with PHP
- Database Server : MySQL
- Windows Server 2019
- According to WHO Standards







# LAN and Hosting Infrastructure in the Hospital



**OPD Management System**



# ScreenShots

Patient Registration

localhost:8888/registration.php

### - Patient Registration -

**First Name :**

**Last Name :**

**NID / Passport No. :**

**Category :** ☐ National ☐ Foreigner  
☐ Refugee

**Gender :** ☐ Male  
☐ Female

**DOB :**

**Phone :**

**Address :**

**Patient One Time Registration using  
National ID or Passport  
(at Reception)**



Patient Appointment and Token

PHP File Upload

localhost:8888/appointment.php

- Patient Appointment and Token Generation -

Patient NID / Passport No.:

cm980001

Appoint Available Doctor:

Dr. Omkar Bahiwal

Comments :

Fever and Temperature...

Generate Token

Fetch Patient Info -

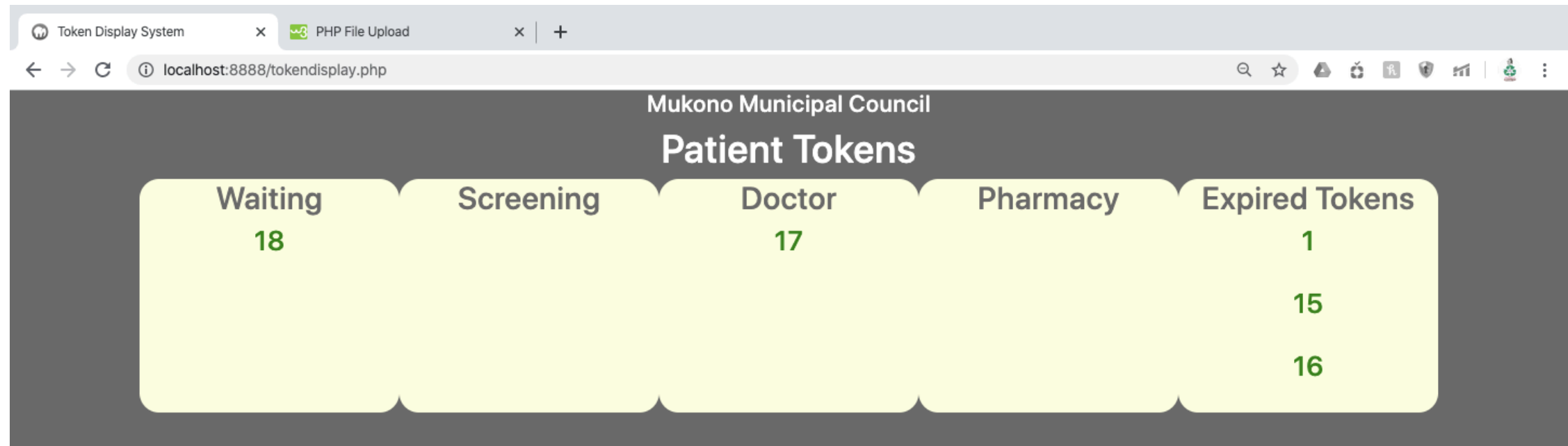
NID or Passport No. :

cm980001

Fetch Details

|            |                                    |          |
|------------|------------------------------------|----------|
| Byamukama  | Wilfred                            | Male     |
| 1999-01-01 | National                           | kigombya |
| 0702885074 | Last Updated : 2020-03-06 16:33:52 |          |

# Appointment and Token Generation (at Reception)



**Token Display Near Waiting Area  
(Patient Queueing)**



## - Patient Screening -

Waiting  
Tokens

18

Call

Screening  
Tokens

Forward

Token  
No. :

Enter Token Number of the

Fetch Details

Byamukama

Wilfred

Male

1999-01-01

National

kigombya

0702885074

Height (cm):

Enter the Height of the Patient

Weight (kg):

Enter the Weight of the Patient

BP (mmHg):

Enter the Blood Pressure of the Patient

Submit Data

# Screening

## - Doctor's Patient Management -

Hello,  
Dr. Omkar Bahiwal

Logout

Screened  
Patient  
Tokens

Call

Active  
Patient  
Tokens

17

Forward to Lab

Forward to Pharmacy

Token  
No. :

Enter Token Number of the

Fetch Details

Token No. 17

|                       |                 |                 |
|-----------------------|-----------------|-----------------|
| Byamukama             | Wilfred         | Male            |
| 1999-01-01 (Age : 21) | National        | kigombya        |
| BP : 1231 mmHg        | Weight : 123 kg | Height : 123 cm |

Medicines :  
Amoxicillin  
Acetaminophen  
asd  
Amox

Other Medicines :

Diagnosis :

Treatment Notes :

Generate Prescription

Lab Tested  
Patient  
Tokens

Call

Select Lab Tests :

Select Labtests  
CBC  
Blood Smear Test for Malaria  
HIV Test

send for labtest

# Doctor's Interface

Laboratory x PHP File Upload x +

localhost:8888/laboratory.php

- Pathology Laboratory Testing -

Waiting Tokens

Forward

Sample Tokens

Forward

Testing Tokens

Forward to Doctor

Token No. :

Enter Token Num

Fetch Details

|                 |          |          |
|-----------------|----------|----------|
| Byamukama       | Wilfred  | Male     |
| 1999-01-01 (21) | National | kigombya |
| 0702885074      |          |          |

Samples Collected :

Upload Lab Results

Test

Choose file No file chosen

Upload Report

Submit Data

Lab (Test) Interface



## - Pharmacy Patient Management -

Doc Patient  
Tokens

17

Call

Active  
Patient  
Tokens

Expire

Token  
No. :

Enter Token Number of the

Fetch Details

Byamukama

Wilfred

Male

1999-01-01 (Age : 21)

National

kigombya

BP : 1231 mmHg

Weight : 123 kg

Height : 123 cm

Medicines :

Amoxicillin  
Acetaminophen  
asd  
Amox

Medicines :

Diagnosis :

Treatment Notes :

Dispense

## Pharmacy Stock Dispensary.

Displaying the current stock of medicines.

| SNo. | M-ID | Medicine      | Dosage | Stock | Desc                        | Date of Expiry | Personnel Initials | Date of Issue | Last_Updated        | Dispense Quantity    | Confirm?                 |
|------|------|---------------|--------|-------|-----------------------------|----------------|--------------------|---------------|---------------------|----------------------|--------------------------|
| 1    | 1    | Amoxicillin   | 500mg  | 1000  | Antibiotic                  |                |                    |               | 2020-03-09 15:59:22 | <input type="text"/> | <input type="checkbox"/> |
| 2    | 2    | Acetaminophen | 500mg  | 500   | Analgesic - Paracetamol     |                |                    |               | 2020-03-09 16:12:44 | <input type="text"/> | <input type="checkbox"/> |
| 3    | 6    | asd           | asdasd | 33    | sdsa                        | 2030-03-12     | asdas              | 2020-03-10    | 2020-03-18 15:12:56 | <input type="text"/> | <input type="checkbox"/> |
| 4    | 7    | Amox          | Test   | 12    | asdasd                      | 2020-03-25     | OB                 | 2020-03-19    | 2020-03-18 15:20:00 | <input type="text"/> | <input type="checkbox"/> |
| 5    | 8    | crocin        | 500mg  | 1000  | Head Ache anti Inflammatory | 2020-03-31     | OB                 | 2020-03-18    | 2020-03-18 16:19:17 | <input type="text"/> | <input type="checkbox"/> |

Submit

# Pharmacy and Dispensary

localhost:8888 / localhost / mukono-master

localhost:8888/phpMyAdmin/db\_structure.php?server=1&db=mukono-master

Server: localhost:8889 » Database: mukono-master

Structure SQL Search Query Export Import Operations Privileges Routines Events Triggers Designer

Filters  
Containing the word:

| Table                                     | Action                                      | Rows      | Type          | Collation              | Size             | Overhead   |
|---|---|-----------|---------------|------------------------|------------------|------------|
| <input type="checkbox"/> doctors          | ★ Browse Structure Search Insert Empty Drop | 2         | InnoDB        | utf8_general_ci        | 32.0 KiB         | -          |
| <input type="checkbox"/> labtests         | ★ Browse Structure Search Insert Empty Drop | 18        | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <input type="checkbox"/> lab_records      | ★ Browse Structure Search Insert Empty Drop | 1         | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <input type="checkbox"/> medicines        | ★ Browse Structure Search Insert Empty Drop | 5         | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <input type="checkbox"/> medicine_stock   | ★ Browse Structure Search Insert Empty Drop | 1         | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <input type="checkbox"/> opd_prescription | ★ Browse Structure Search Insert Empty Drop | 12        | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <input type="checkbox"/> patient-info     | ★ Browse Structure Search Insert Empty Drop | 0         | InnoDB        | utf8_general_ci        | 32.0 KiB         | -          |
| <input type="checkbox"/> patient_info     | ★ Browse Structure Search Insert Empty Drop | 8         | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <input type="checkbox"/> tokens           | ★ Browse Structure Search Insert Empty Drop | 6         | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <input type="checkbox"/> tokens_table     | ★ Browse Structure Search Insert Empty Drop | 0         | InnoDB        | utf8_general_ci        | 16.0 KiB         | -          |
| <b>10 tables</b>                          | <b>Sum</b>                                  | <b>53</b> | <b>InnoDB</b> | <b>utf8_general_ci</b> | <b>192.0 KiB</b> | <b>0 B</b> |

☐ Check all With selected:

Print Data dictionary

Create table  
Name: Number of columns: 4

# Database in MySQL

# Next Stages and Scope

- Healthcare Analytics and DSS
- Cloud Based hosting for remote supervision.
- Implementation of the OPD System in Other Healthcare Centres in MMC

**Thank You!**