NigeriaMRS Mobile

USER GUIDE

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1. Introduction

NMRS mobile is a mobile application adaption of the NMRS web application, developed to support the easy collection and management of patient information in and outside of the facility setting.

In facility setting, the NMRS application can be deployed and used in a Point-Of-Care (PoC) model where each service provider access and updates patient information electronically online real-time. In community settings and all Out-of-facility scenarios, the application support nearly all the features and functionalities provided on NMRS web version in addition to providing offline data capture.

The app includes features that allows for patient registration and HTS data capture, ART and PMTCT enrolment forms. Other functionality includes data capture for retention forms such as support for capturing ARV refills and Laboratory orders. These forms can be captured offline and synchronized into their respective facility or community NMRS database on network availability. In addition, the application automatically captures geographical coordinates of the mobile device at the time to data capture to help program managers understand the geographical spread of certain patient categories such as new positives for hotspot mapping to support intensified case finding.

To ensure security and confidentiality of patient information, all data captured on the phone is cleared from the phone once it has been synchronized with the database. Care should be taken by each implementing partner to ensure that only authorized persons are provided access to login into this application. The host device authentication feature should also be enabled to provide additional security.

1.1 System design/Architecture

The NMRS mobile application relies on an NMRS Web application as backend database system to work properly. By design, each form in the mobile version aligns with equivalent forms in the web application utilizing the same concept and same encounter type definition. This makes the mobile version more or less an instance of the web running in native mobile mode. Changes in concept or forms on the web can be made to automatically reflect on the mobile. The objective of the approach is to ensure seamless data flow between the two application and limit discrepancies in data submitted from either instance.

2. Getting Started

Before installing the application on any device, please ensure that the requirement as outlined in this section are met as that would really help the user experience and limit errors that are hard to replicate.

2.1 Software requirement

The current version of NMRS mobile application is targeted at android devices from version 4.1 (KitKat) through to version 8.1 (Oreo) OS versions. The application requires permission to access location feature and device USB port. If data over internet rather than local network, ensure the device can connect to provision of internet data.

2.2 Hard requirement

The minimum requirement for running the application in any mobile device is as listed below as

- Device with 2G RAM available.
- Consider tablet with high battery capacity from 3000 mAH.
- WIFI connectivity

  If device will be used for Biometric capture, the additional functionality is required.
- OTG cable for USB connectivity
- Secugen Hamster IV plus fingerprint scanner

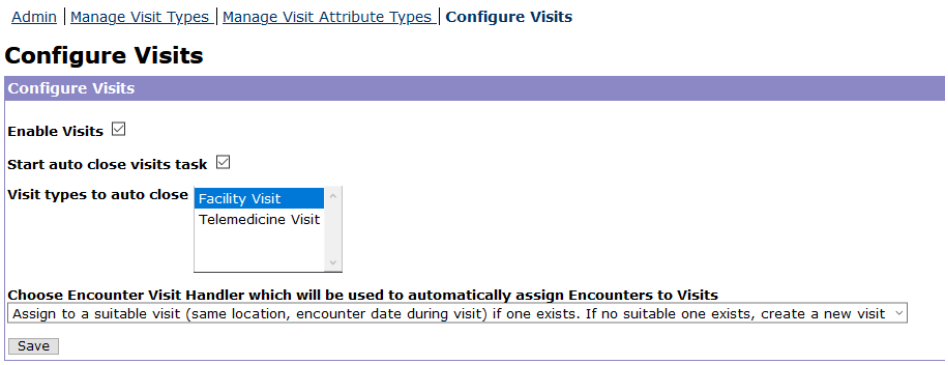
2.3 NMRS Server configuration

As already noted, the mobile application requires an NMRS compliant backend application. Follow these steps to configure the server appropriately. Download and follow the User guide Here to install the NMRS on the Server.

a. Please ensure the mobile device is connected to the same network as the NMRS server such that the targeted NMRS instance is reachable from the mobile device. Confirm this by attempting to browse the NMRS application on the mobile web browser.
b. Download the updated NMRS metadata module (DOWNLOAD FROM HERE) from GitHub and install on your NMRS instance. This should populate the "**form resources**" table in the database. This data is a json representation

of the forms displayed on the mobile app and would be downloaded alongside other configuration data at first run of the application.

c. Ensure to configure visit at the server to allow NMRS automatically assign encounters to visit. The configure visit page URL is at "/openmrs/admin/visits/configureVisits.list ". Simply click on the save button **without changing anything** to automatically configure visit.



d. Install and start the NMRS biometric service on the server if not already running on the server. The biometric service runs on port 2018, run the command below on windows command line as an administrator to allow the service port number on the server firewall.

```
netsh advfirewall firewall add rule name= "NMRS Fingerprint Port 2018" dir=in action=allow protocol=TCP localport=2018
```

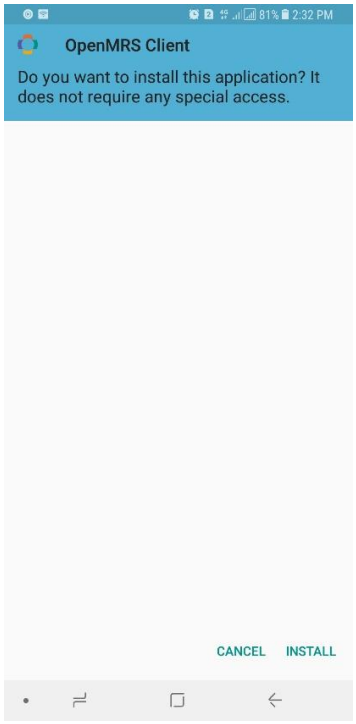
e. Confirm that the NMRS application and the biometric service are both reachable from the mobile device by accessing the URLs on the device browser.

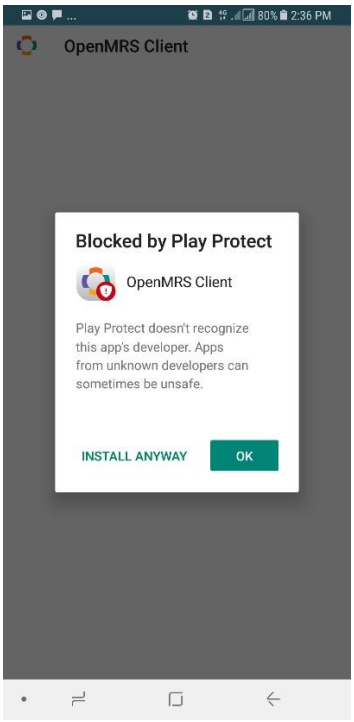
http://[ServerIP]:[ServerPort]/openmrs and http://[ServerIP]:2018/server

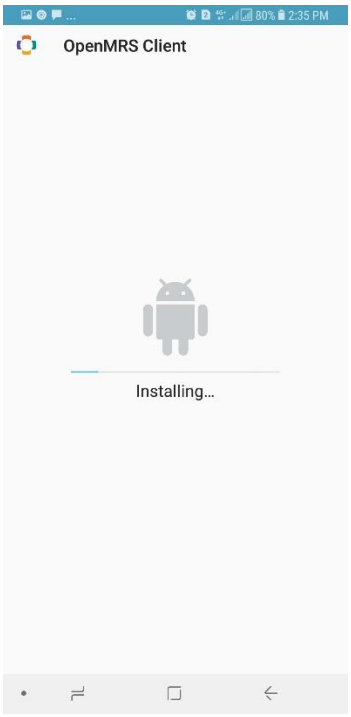
If unreachable, check and configure the anti-virus application on the device to allow access on NMRS port (e.g., 8080) and the biometric port (2018).

2.4 Installation on mobile device

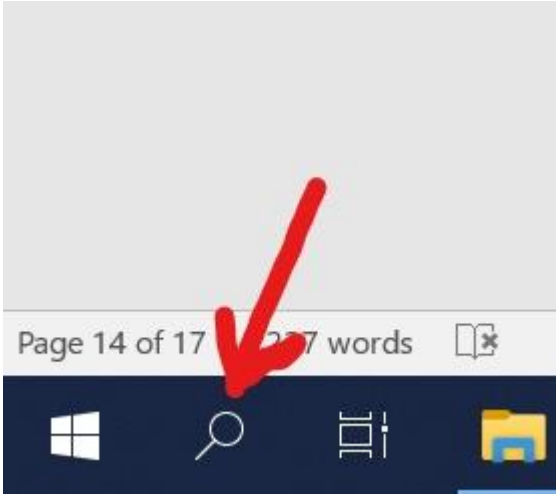
a. Download the NMRS installation package (APK) from NMRS Mobile download page and click on install once downloaded. Some later devices might restrict installation of application not downloaded from Google play store. If this is the case the device will show prompt for "Block by Play protect". Click on "install Anyway" to proceed.

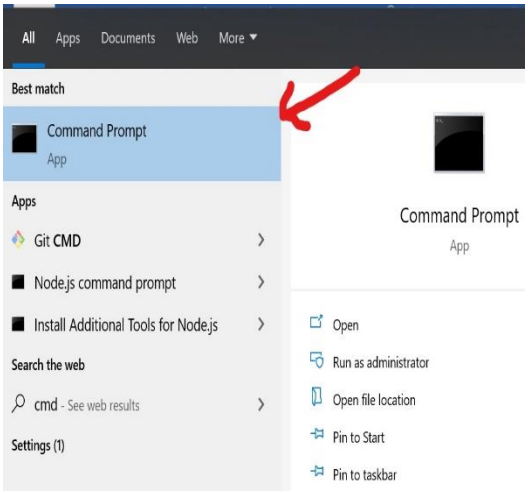


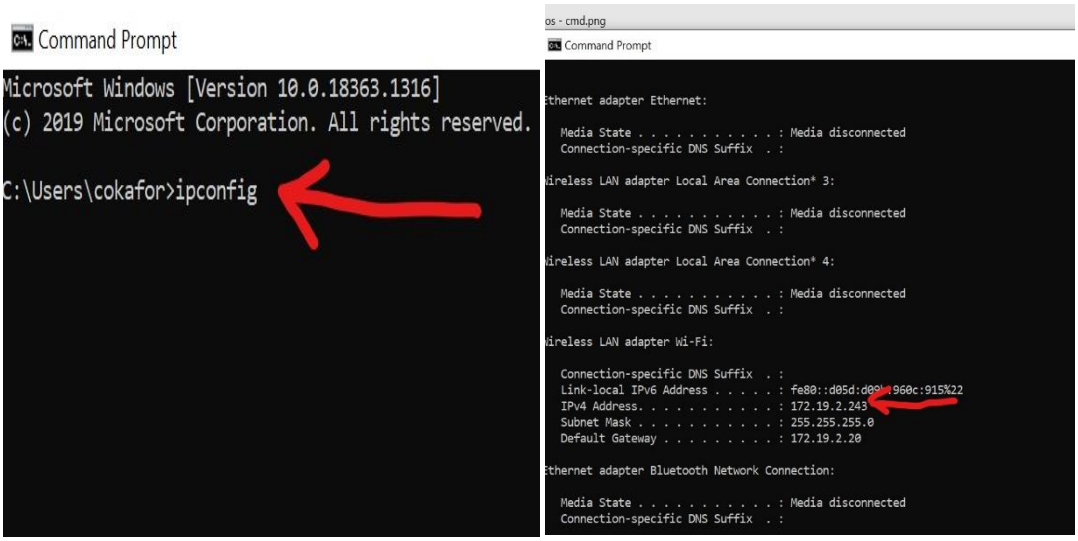




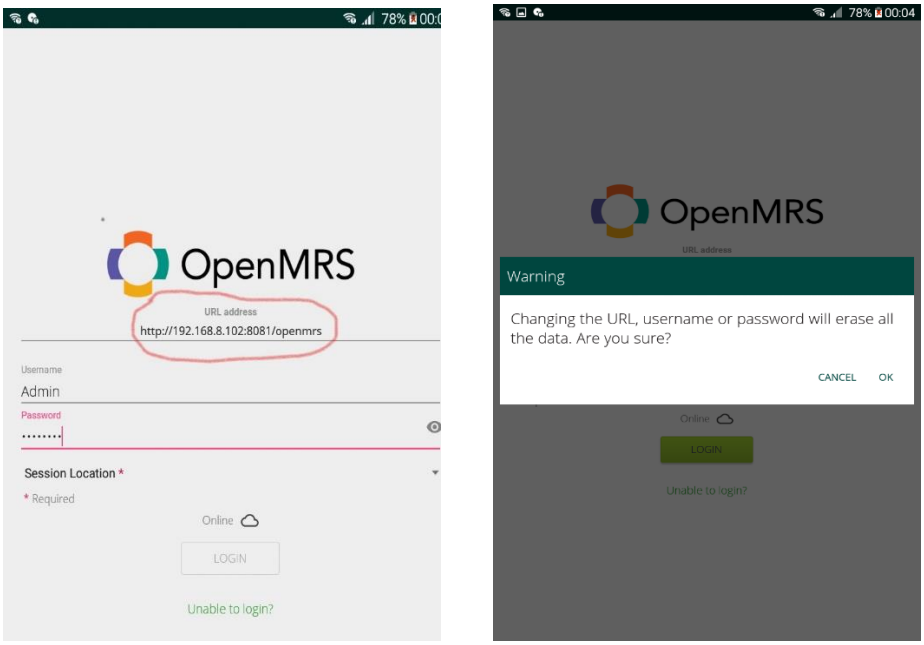
b. To get the URL from the Server, click on the search icon at the bottom of the screen, type ***cmd*** on the search box then click on the Command Prompt. When the command prompt displays, type ***ipconfig*** then click enter on the keyboard. Scroll down and locate the IPV4 Address from the list of information displayed on the command prompt. The IPV4 Address is the server IP Address.







c. Once installation is completed, the home screen will come up as shown below. Specify the URL of the NMRS instance on the “URL address” box. Provide other login information including session location as required. This step requires an active internet connection to run for the first time. Turn on the location also.



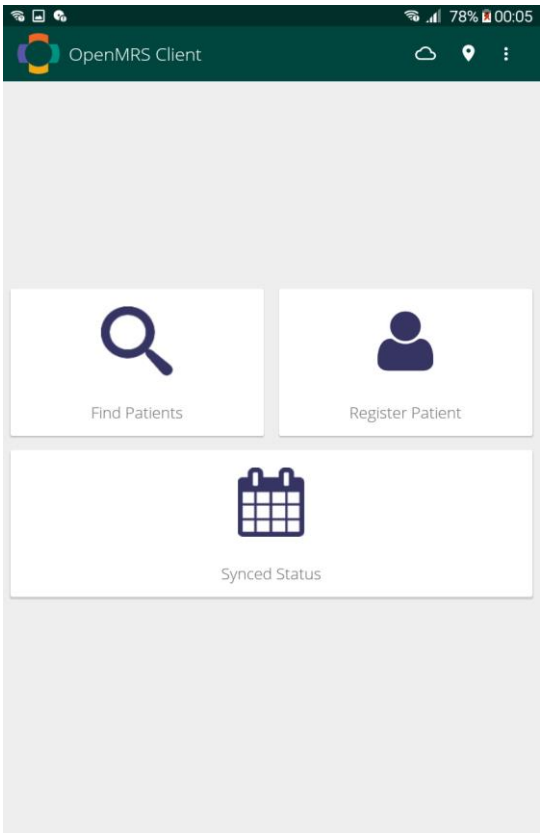
URL Address: This is the circled part on the Image above. Copy the Local IP Address from the Host Laptop or Server and paste in this field.

Username: Enter the same Username from your NMRS Web.

Password: Enter the same Password from your NMRS Web.

Session Location: Select the facility location. (Kindly note that once you select a facility and login once with it at the initial setup, you cannot use that Device again for another facility unless you uninstall the App)

d. For the first time installation, once you Login successfully, close, and re-open the app to allow the application to download all the metadata from the server into the device and re-initialize on next start up. This is the **Onboarding**.

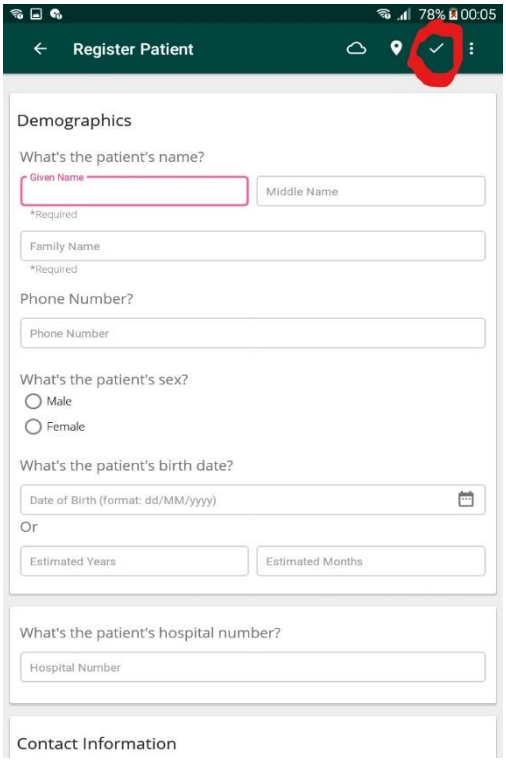


Successful login page showing menu items for "**Patient registration"**, "**Searching for patient"** and checking the "**Sync status".**

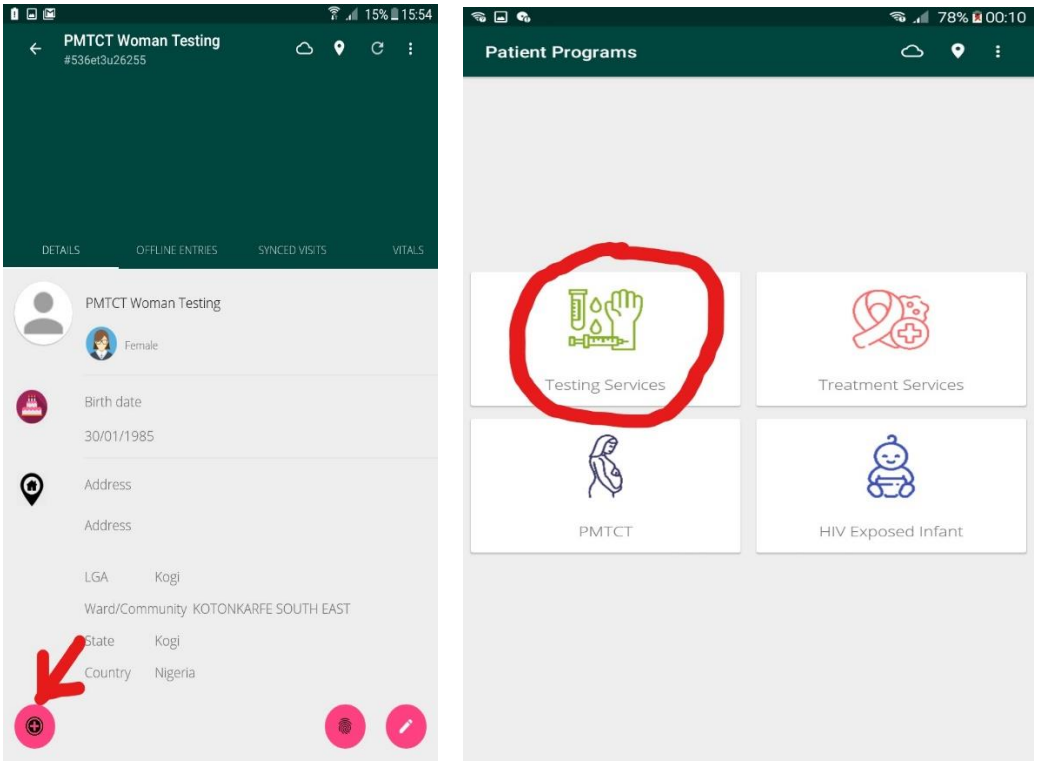
3. Data Collection

3.1 Patient Registration

Register a new patient by clicking on “Register Patient” from the landing page**.** Enter all details on the fields and click on the Circled icon to submit the form. Once registration is completed, you can use the “Find Patients” to locate the patient subsequently. If the device is online, it will automatically sync to the server.



To capture HTS information for a patient, first find the patient using the “Find Patient” and click on the patient. This will open the patient dashboard as shown in the image on the left below.

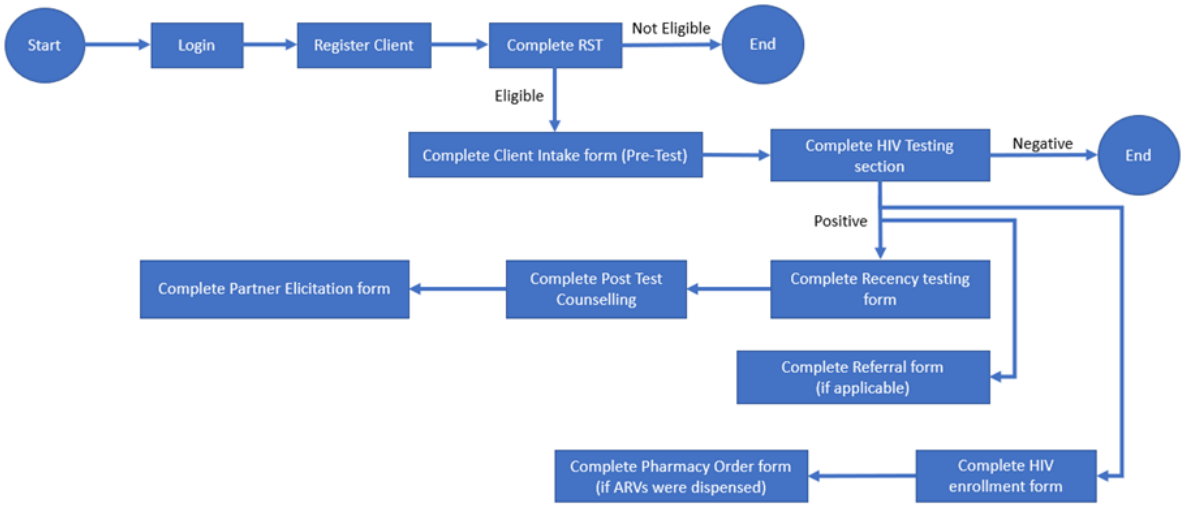


Clicking on the icon with an arrow open an enrollment page shown on the right. This page contains 4 options for Testing Services, Treatment services, PMTCT and HIV exposed infant.

Click on any of the sections to enroll the client into the program.

3.2 Testing services:

Clicking on it takes you first to the Risk stratification page. The outcome from the form determines if you will proceed further into client intake form or not. If the client is ineligible, the form ends but if eligible the form proceeds to the client intake form and to others following the flow chart shown below.



3.3 PMTCT:

This opens the PMTCT form for enrolment into the PMTCT program. Confirmed positive clients are then enrolled further into the treatment program.

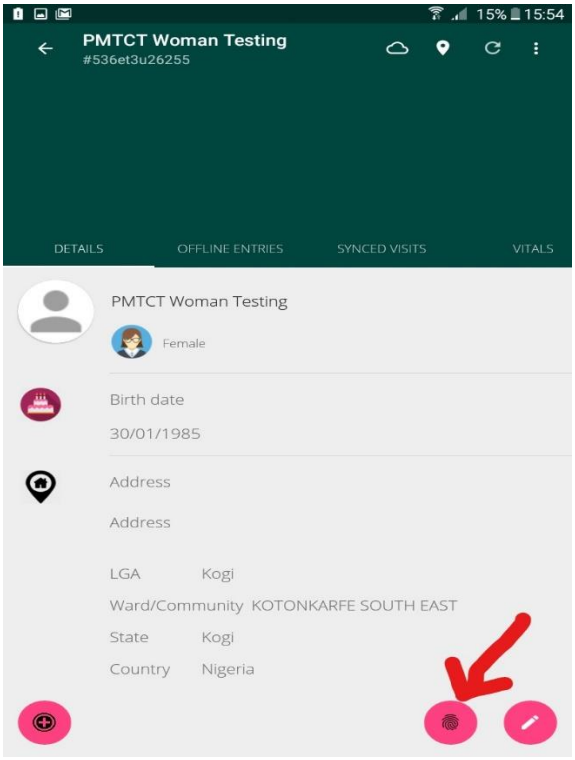
3.4 Treatment Services:

These contains the drug dispensation, and the Laboratory order forms which can be captured for patient already enrolled in treatment program.

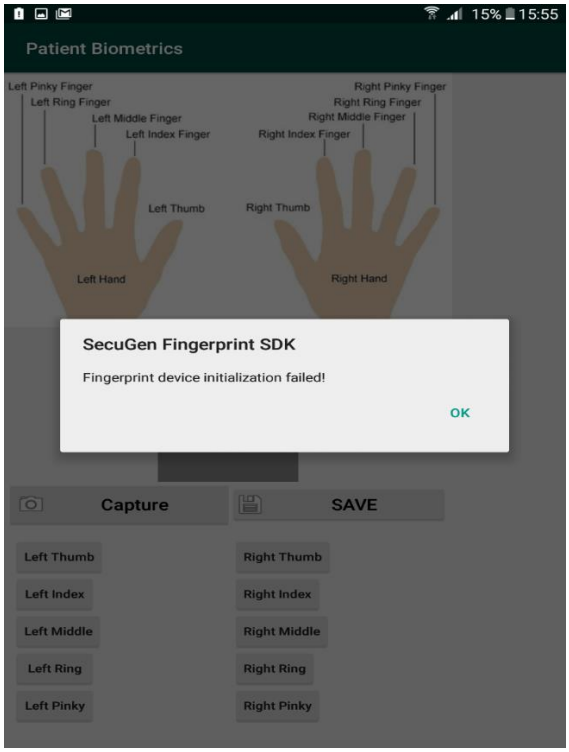
3.5 HIV exposed Infant: This section is not yet activated.

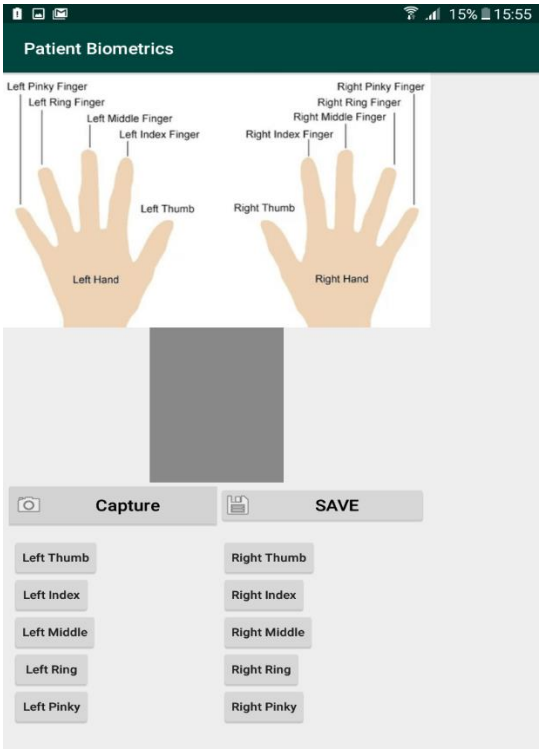
3.6 Biometric Data Capture

To capture patient biometric data, start from the patient dashboard as described earlier. From the patient dashboard, click on the fingerprint icon as circled in the image below.



Clicking on this Icon opens the biometric capture page. The Secugen device must be connected first to the phone through an OTG cable connected to the phone before clicking on the Icon so as to instantiate and activate the Secugen services. If you click on the icon without connecting a Secugen device will show an error message as shown in the image below on the left. If the device is properly connected, the page opens as shown on the right.





To capture fingerprint, first select the hand icon to capture before clicking on the Capture button. If the capture is of good quality, the image will show up on the box. If the image is wrongly capture, an error message will be displayed for re-capture.

A minimum of 6 fingers is required to be captured before the prints can be saved button is enabled. To ensure good quality image is captured, place the fingers lightly on the Secugen device screen. Doing otherwise will lead to poor quality captured and prompt for re-capture.

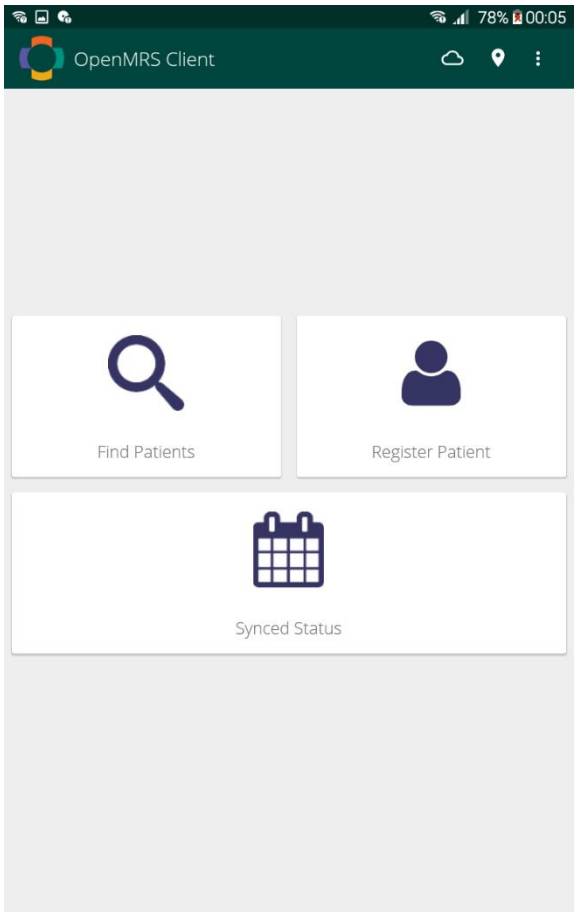
For the fingerprint template to sync successfully to the Server, the PBS service must be running on the server or the host laptop.

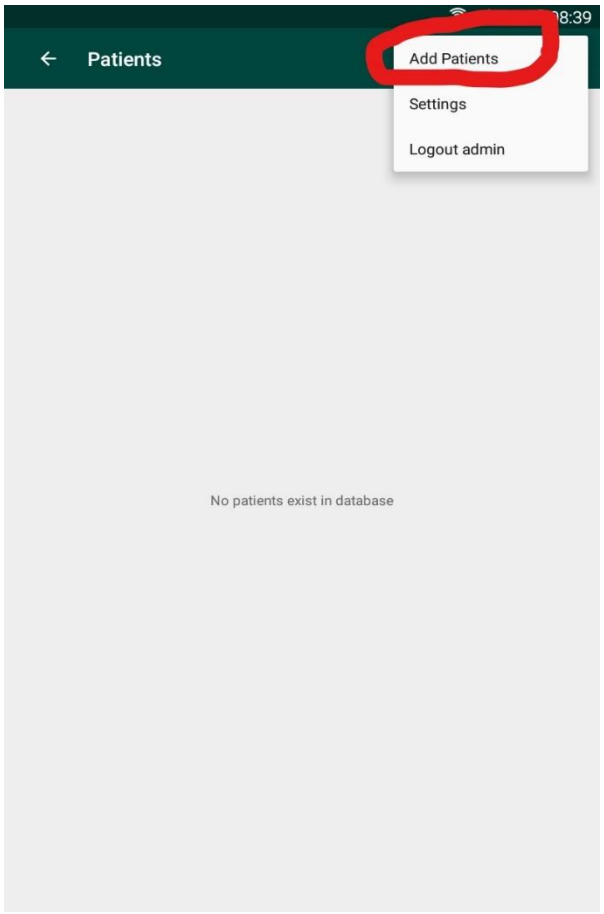
You are expected to run this one-time code on the windows command line to allow port 2018 on the firewall.

- netsh advfirewall firewall add rule name= "NMRS Fingerprint Port 2018" dir=in action=allow protocol=TCP localport=2018

3.7 Downloading existing patient from the server.

To download an already existing patient, kindly navigate to the Find Patients. Use the menu icon at the top to locate “Add patients” as shown in the image by the right below.





Click on the Add patients to search for a Patient by name, then click on “download” icon to download the patient information into the device database. You can download as much patients as you want.

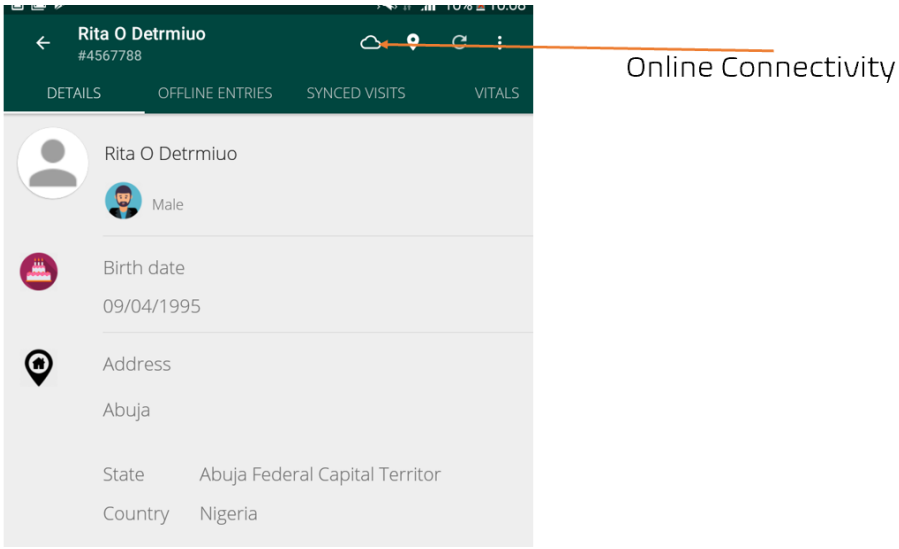
The Downloaded patients can have these details updated, such as the Pharmacy Order form and the Laboratory forms and the Biometric data capture.

4.0 Online and Offline mode

4.1 Online mode

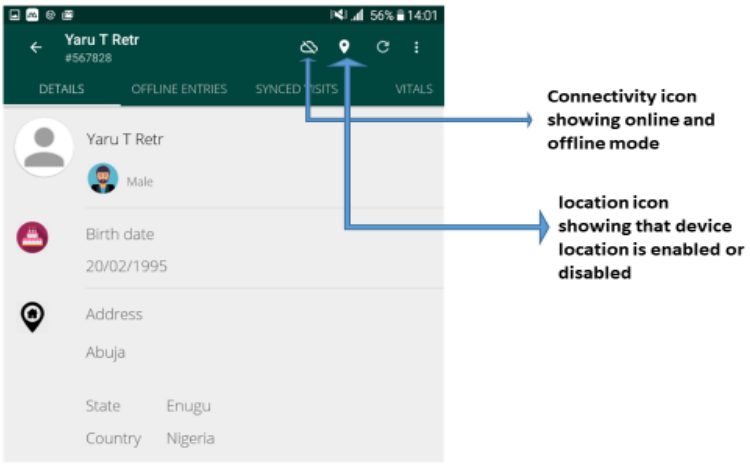
The NMRS mobile app switches to online mode when it detects that the mobile device is connected to the same network as the NMRS web application specified during onboarding process. In this mode, login attempts are authenticated online, form entry is synced to the

NMRS deployment in the facility immediately the submit button is hit on the app and it is available for edit and analysis from the from the NMRS web app.



4.2 Offline mode

The offline mode is either by clicking on the connectivity icon in the mobile app as shown in the image below or by turning off the device network connection.



Patient basic information page

For the offline mode to work, the user first needs to onboard within the same network as the NMRS web for proper authentication, afterwards data entry can continue offline. The user may decide to login and logout outside the facility network. In the mode, all forms capture on the application are saved in the device in an encrypted format. Full functionality is enabled with the exception that all data updates changes are local to the device. Captured data is automatically synced to the backend once the device is re-connected to the network.

5.0 Usage scenarios

The anticipated possible usage scenarios for the NMRS mobile are as follows:

Community testing program

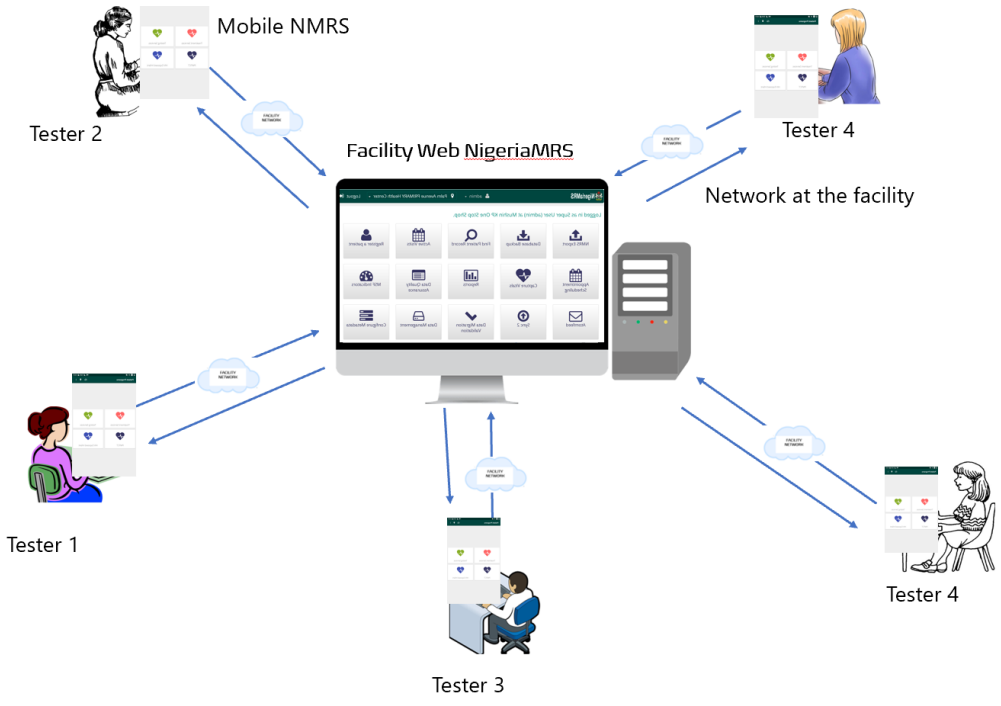
The NMRS application is designed to capture HTS data. The offline functionality makes it possible for community testers to use the device in remote areas in designated LGAs to capture patient information and have the data synchronized with the NMRS instances set up for community testing at these LGAs once connectivity is restored.

ART initiation at the Community

The NMRS application has the capability to capture client's initial treatment information if treatment is initiated at the community.

Facility setting

1. The application is perfect for use within facility with **multiple testing points** within the facility premises. The device is small enough to be held with no extra cabling required. This is an easy way to have all HIV testing in the facility documented and hence enable accurate analysis and reporting of HTS indicators as the documentation would capture both negative and positive test cases.



Multi-point testing at facility

2. Optionally, the NMRS mobile can be configured to be used in a facility with a **point-of-care** setting. In this mode, patient information can be queried and updated one per time, only on supply of valid patient ART number. This means that a doctor can query

and update a patient care card, a pharmacy can fill a pharmacy order form for a patient just like they would with NMRS web application. A lab personnel and fill sample collection form immediately a sample has been taken.

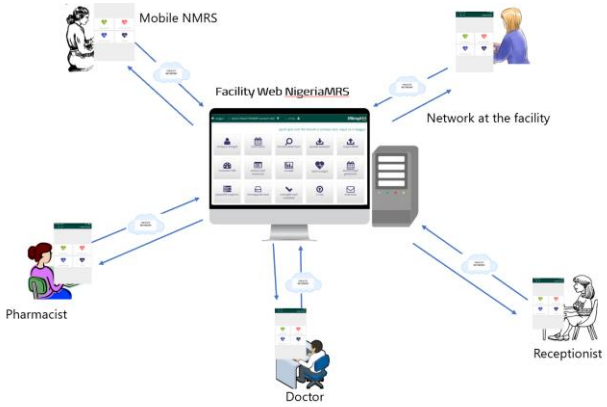


Figure 1: Point of care.

6.0 Troubleshooting and Support

In recognition of the need to support upgrades and continue to respond from troubleshooting feedback, an helpdesk has been set up to attend to the needs of all users through the identified Points of Contacts (POC). Helpdesk contact are:

Email: nmrsmobile@cihpng.org

Telephone: 09097619524, 09087713516, 09093266709

WhatsApp: Click to join NigeriaMRS Mobile Technical Whatsapp Group

FREQUENTLY ASKED QUESTIONS

1. **App crashes while syncing data to the server.**
   Navigate to the configure visit on the NMRS web settings ("/openmrs/admin/visits/configureVisits.list") and simply click on the **Save** button.
2. **Data on the Mobile App not syncing to the server.**
   Kindly make sure that the Mobile App is online, then toggle the cloud icon to disconnect and reconnect to the server.
3. **Forms not showing on the Mobile App.**
   This means the onboarding process was not successful. Kindly close the App, also close the NMRS web instance. Doublecheck to ensure you have the **nmrsmetadata-1.0.1-SNAPSHOT.omod** file added to the modules folder of your NMRS web instance. Restart the web instance. Wait for about two minutes and then relaunch the mobile app to effect changes.
4. **"Wrong Image" Showing while taking fingerprint capture**
   Kindly close the PBS capture view by tapping on the app back button. Disconnect and reconnect the OTG Cable from the Device. Open the PBS view again to resolve the issue.
5. **"Low quality Image Captured" while capturing the fingerprint.**
   This usually happen when the quality of the fingerprint captured is below 60%. In the event of this error, the quality level is also displayed. Additionally, when the image is **too dark or too light**, this error message is likely to occur.
   To get a good quality capture, place fingers with moderate force and also ensure the finger is not oily or sweaty.
6. **Fingerprints capture not syncing online**
   Ensure the biometric service is installed on the server and it is started. Also ensure that the service API is reachable from the device by browsing URL on the device browser (http://[ServerIP]:2018/server). If not reachable, add the port 2018 to the firewall as described in the user guide.