OPENHDS INSTALLATION AND USER GUIDE

DATABREW
July 2019

This guide assumes you are working on a minimal ubuntu server. However, you can follow the directions, install, and use OpenHDS on your ubuntu desktop.

SETTING UP AWS EC2 INSTANCE

You'll need to have an ubuntu server up and running. You can either do this locally, or spin up a remote ubuntu server via AWS. For the latter option, step-by-step instructions are available at : http://www.databrew.cc/instructions/ec2.pdf. For the former, follow the instructions in the next section.

INSTALLING MINIMAL UBUNTU SERVER

- Download the Ubuntu Mini ISO fromhttps://help.ubuntu.com/community/Installation/MinimalCDUbuntu 14.04 "Trusty Tahr" LTS Minimal CD 64-bit PC (amd64, x86_64) is the recommended version for production systems (the size is approximately 37 MB). The 32-bit PC (x86) Ubuntu 14.04 "Trusty Tahr" LTS Minimal CD, is used for the evaluation platform.
- Install the operating-system with no localization options and don't install any packages.
- During installation, set the hostname of the machine to ‘data-management.local’. If you missed to change this during setup, you can change the hostname afterwards by editing the file ‘etc/hostname’.

INSTALLING JAVA 7

- Currently the only supported Version is Java 7. Different auxiliary software packages required to run a full-blown OpenHDS server have different Java requirements, version 7 is the consensus.
- Install Java with the command ‘sudo apt-get install openjdk-7-jre-headless’ from a terminal.
- *Optional:* Set the environment variable JAVA_HOME to the Java installation folder (you might need to reboot of the system for the variable to be available).

INSTALLING MySQL SERVER

- Install the MySQL server with 'sudo apt-get install mysql-server'.
- Follow the set-up instructions during installation and set the password of the root user during installation to ‘data’, leave the rest to its default.

INSTALLING PHP, PHPMYADMIN, AND APACHE2

- Run the command ‘sudo apt-get install phpmyadmin’ in a terminal
- This command will install the phpmyadmin package. This package depends on other packages to be installed (e.g. apache2 and php), and it will also install all the missing packages if they are not available on the system (which is the case if you followed this guide).
- During the installation choose MySQL as the database and say yes to set-up the config through dbconfig-common.
- Set the root password to ‘test’
- Set up a password for the PhpMyAdmin-application (e.g. ‘test’)
- PhpMyAdmin is now accessible under http://data-management.local/phpmyadmin

SET UP MySQL-USER AND DATABASES

- Open a terminal (ctr+alt+t)
  Log-in:
- sudo mysql –uroot –pdata’ this will open the MySQL CLI, login in as user root with password test
- The MySQL command prompt should appear
  Create user:
- ‘CREATE USER ‘data’@’%’ IDENTIFIED BY ‘data’;’ this command will create a new MySQL user data with the password data.
  Create databases:
- CREATE DATABASE IF NOT EXISTS ‘openhds’;
- CREATE DATABASE IF NOT EXISTS ‘odk_prod’;
- Grant access privileges to user:
- ‘GRANT ALL ON *.* TO ‘data’@’%’;’ this command will grant the user data access to all
- databases with all access rights
- - flush privileges;

SET UP MySQL-USER AND DATABASES (USING PHPMYADMIN)

- Open the PhpMyAdmin site http://data-management.local/phpmyadmin

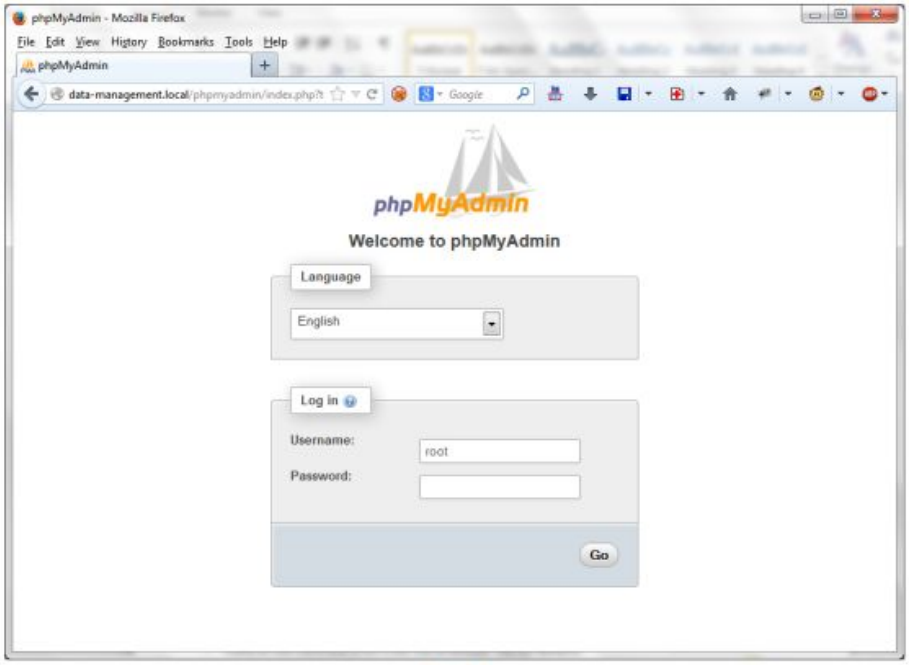


Figure 1

- Log in as user 'root' with password 'test'. From the main menu, switch to the User section

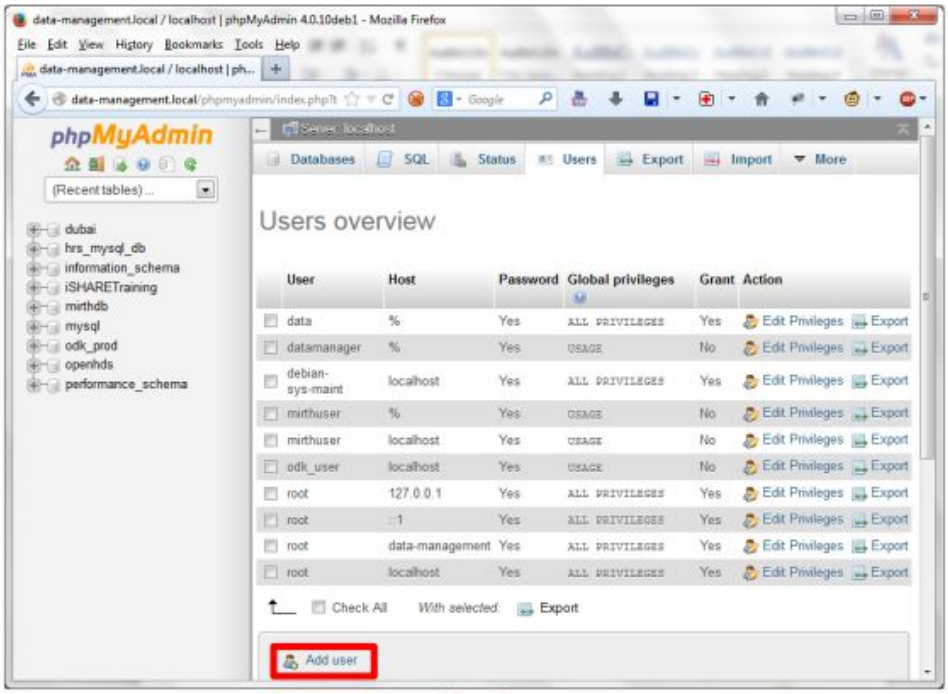


Figure 2

- From there, click on 'Add user' (Refer to Figure 2 bottom). A screen like in Figure 3 should appear.

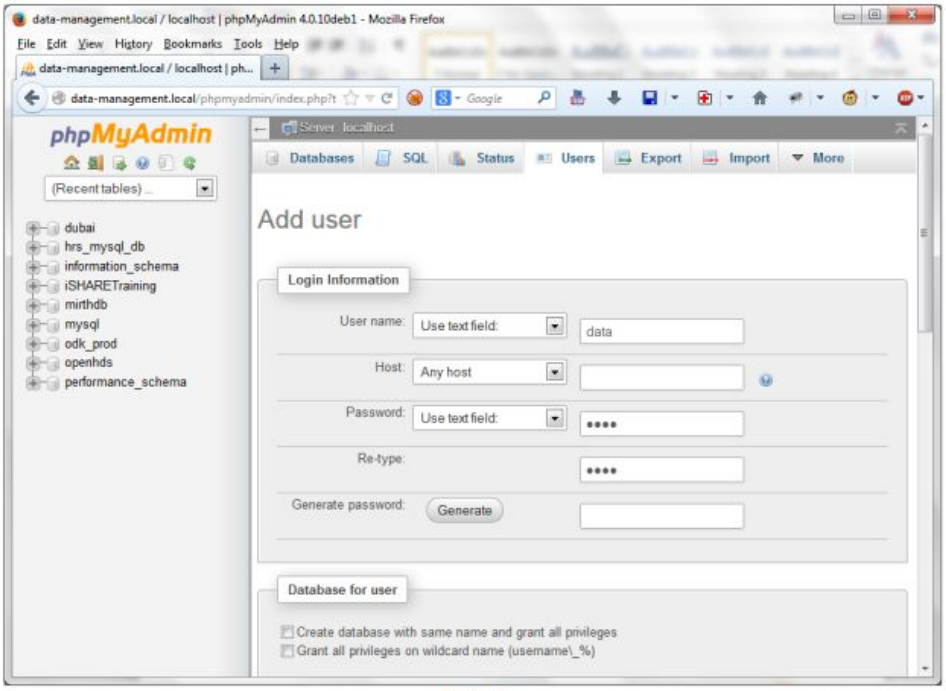


Figure 3

- Set the 'User name' to 'data' and the password fields to 'data'. Under Global privileges click on 'Check All' (refer to Figure 4).

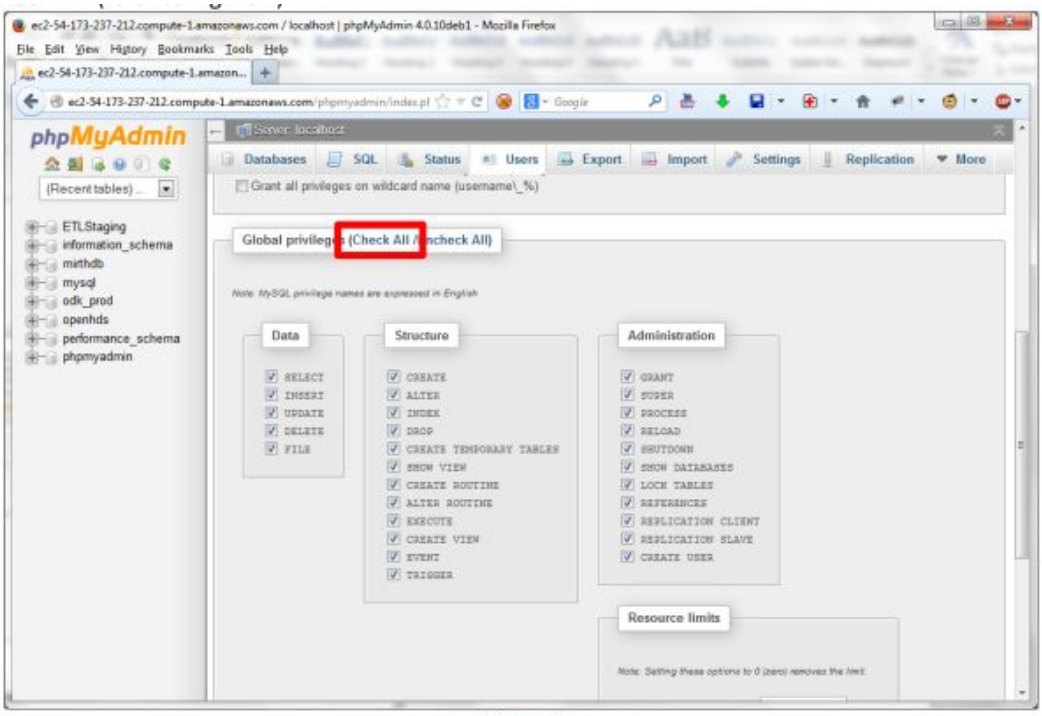


Figure 4

- Create the new user and permissions by clicking on 'Go'.
- Create databses in PHPMyAdmin

- Switch to the Databases section. Under 'Create database' input the database name (openhds and then odk_prod) and click on create to create the database (refer to Figure 5).

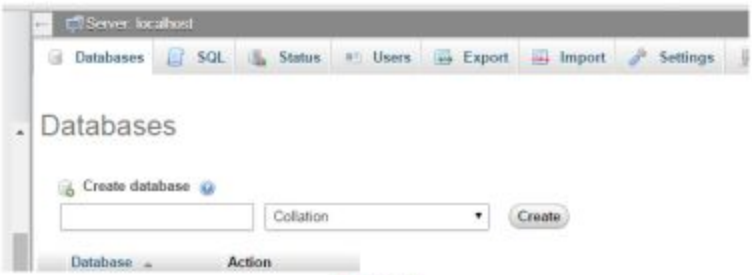


Figure 5

INSTALL TOMCAT

- Install Tomcat with 'sudo apt-get install tomcat6' .
- Check if Tomcat is running with 'sudo service tomcat6 status'. You can start the Tomcat service with 'sudo service tomcat6 start' if it is not already running.
- If the service is erroring out with a message about JAVA_HOME not set, open /etc/default/tomcat6 with 'sudo vi /etc/default/tomcat6/' , uncomment the line 'JAVA_HOME=...' and set it to folder of Java installation.
- Install tomcat6-admin with 'sudo apt-get install tomcat6-admin'.
- Configure users which have access to the Tomcat Manager. They are defined in /etc/tomcat6/tomcat-users.xml (open the file e.g. with sudo vi tomcat-users.xml).
- File might be read only. If so, execute sudo chmod 777 /etc/tomcat6/tomcat-users.xml
- Add a new role html-gui and a user in this role to above mentioned file in the <tomcat-users> section:
  <role rolename="manager-gui" />
  <user username="data" password="data" roles="manager-gui" />
- reload the Tomcat-service ('sudo service tomcat6 restart')
- You should now be able to log in into the tomcat manager under: http://serverip:tomcat_port/manager
- The Tomcat log-files are storend under /var/log/tomcat6/ (if needed)

Increase memory in Tomcat (recommended since it's default 128MB).

- Make file readable and writable /etc/default/tomcat6
- vi /ect/default/tomcat6
- Ctrl + i to edit.

- Find the line starting with 'JAVA_OPTS= ', and add the values '-Xmx1024M -Xms1024M'.
- If prompted, press Shift + E to edit file
- When finished, hit escape to leave edit mode and :wq! to save and quit.
- After saving the file, restart the Tomcat server with 'sudo service tomcat6 restart' to apply the change.

INSTALL MYSQL J CONNECTOR

- Install the mysql lib package with 'sudo apt-get install libmysql-java' which will put the MySQL connector into '/usr/share/java'
- cd to /usr/share/tomcat6/lib
- Create a symbolic link 'sudo ln -s mysql-connector-xyz.jar .',
- (from /usr/share/java : sudo ln -s ../../java/mysql.jar mysql.jar
- Restart the Tomcat-service with 'sudo service tomcat6 restart

INSTALL SSH SERVER

The SSH server installation is a good way to remotely access the server (only necessary if not already installed; on some AWS instances, it already is)
Install ssh-server with: 'sudo apt-get install -y openssh-server'

- Service option: sudo service ssh status | start | stop | restart
- Now you will be able to remotely connect to your server over SSH for example with Putty which can be downloaded from http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

INSTALL OPENHDS

- A *.war file is a Web Application Archive. This is the format that OpenHDS comes packaged in when you download our binary distribution. It is ready to be deployed to the Tomcat Servlet Application Server. Ways to obtain the OpenHDS Web Application are:
- You can build and the OpenHDS server manually from Source code available under https://github.com/SwissTPH/openhds-server (Maven build) OR
- Download a precompiled OpenHDS.war-file from https://github.com/SwissTPH/openhds
    - In both cases, you will need to make sure that the database connection parameters (hostname, user, password) are set correctly for your server. To do this, open the OpenHDS.war file with an archiving program like 7-zip, and edit the file WEB-INF/classes/database.properties. The values you are most likely to adapt are for the variables dbURL, dbUser, and dbPass. Now you are ready to deploy the war file through the Tomcat html manager.

DEPLOYING OPENHDS IN TOMCAT

- Open the Tomcat manager under http://data-managment.local:8080/manager and log in as data/data.

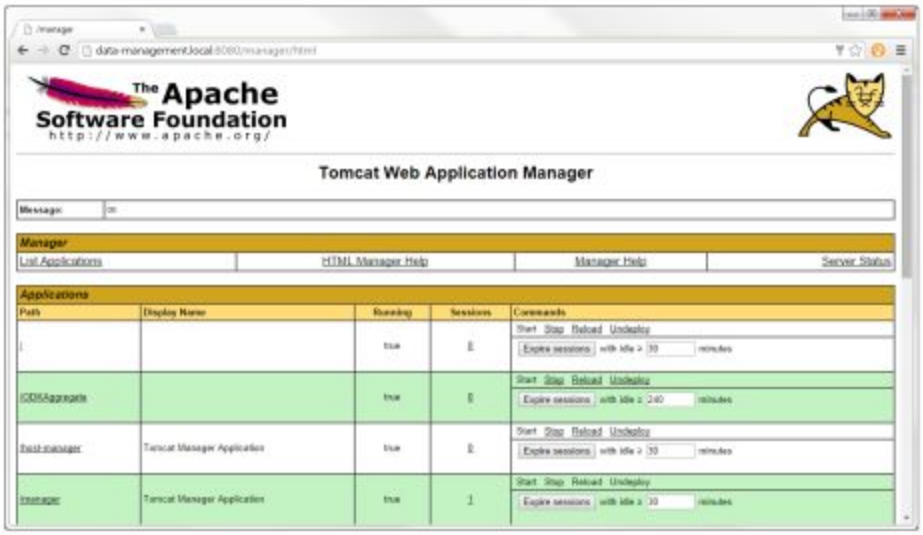


Figure 6

- Upload and submit openhds.war file

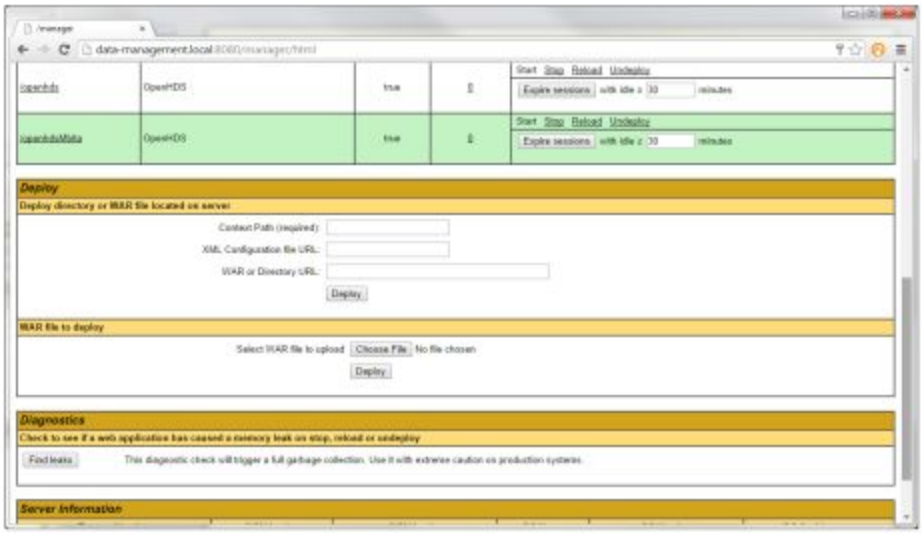


Figure 7

- Check if the application package was successfully deployed and is running. If the openhds application is not listed as “running”, check the tomcat log file.

SET UP OPENHDS REQUIRED DATA

- After you have deployed the OpenHDS application you will need to run one additional SQL script that= will insert some required data into the openhds-database, including a default administrator login (admin/test). Find the SQL-script ‘openhds-required-data.sql’ which can be found in the openhds.war-file (open with 7zip, WinRar or equivalent) under WEB-INF\classes\. If you are using phpMyadmin, log in as user data. Then select the openhds database and select the SQL section. Copy/paste the contents of the SQL file into the ‘Run SQL queries’ window and submit with ‘Go’.

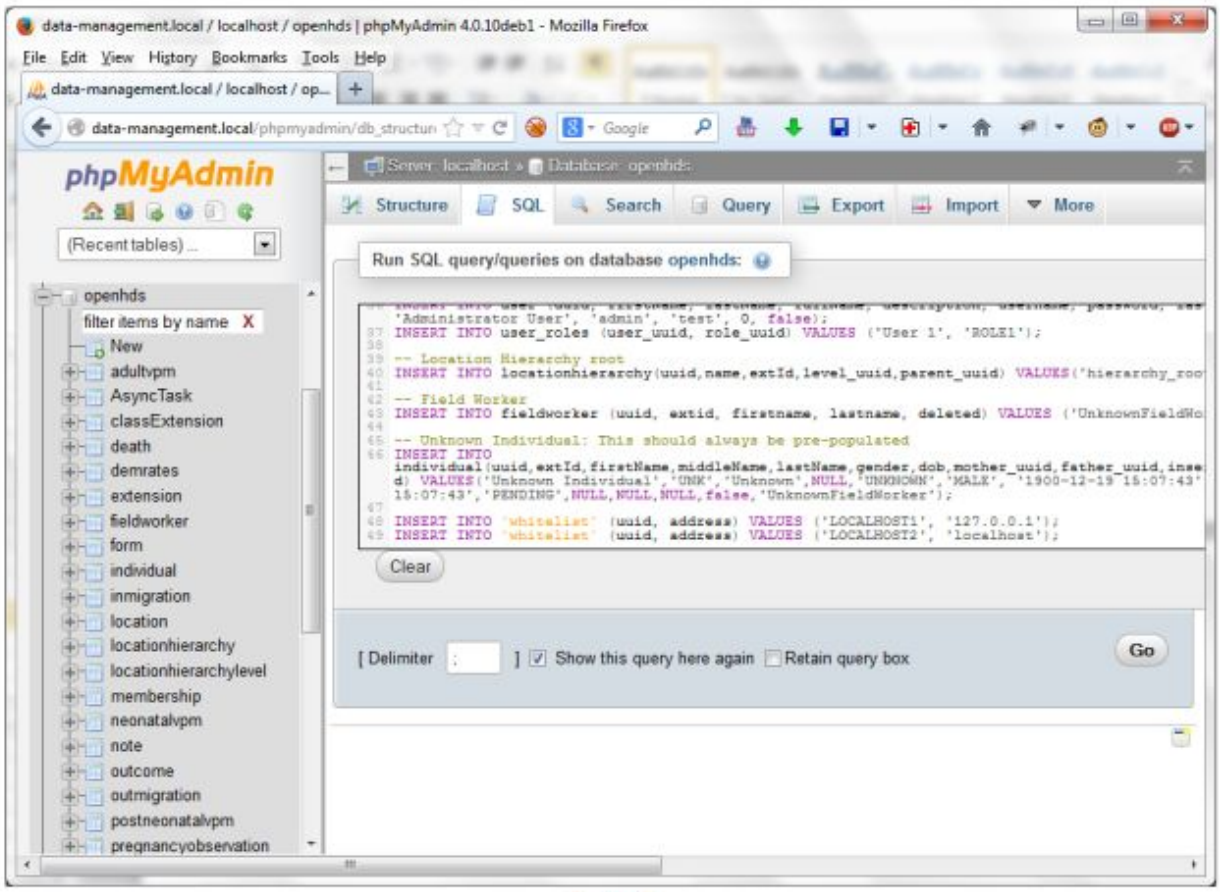


Figure 8

- Under the Ubuntu terminal you can extract the war file with ‘unzip openhds.war’. Then issue a ‘mysql –udata –pdata openhds < /path/to/sql/file/openhds-required-data.sql’ to run the SQL script.

CHANGING THE LANGUAGE OF OPENHDS

- he OpenHDS server platform is localized in several languages. At the moment, the supported languages include English, French, Portuguese and Swahili. To switch the language the OpenHDS Application is displayed in
    - 1) Click on the 'Select language' link on either the login page or from the top of the menu once logged in (see Figure 9).

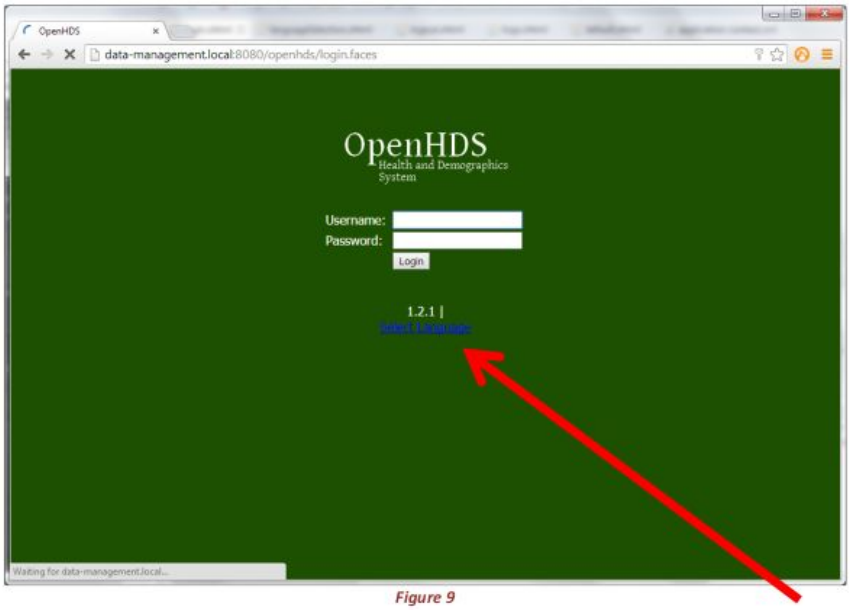


Figure 9

    - 2) On the Internationalization page, select your display language and click on 'Change Locale' to save the settings (refer to Figure 10).

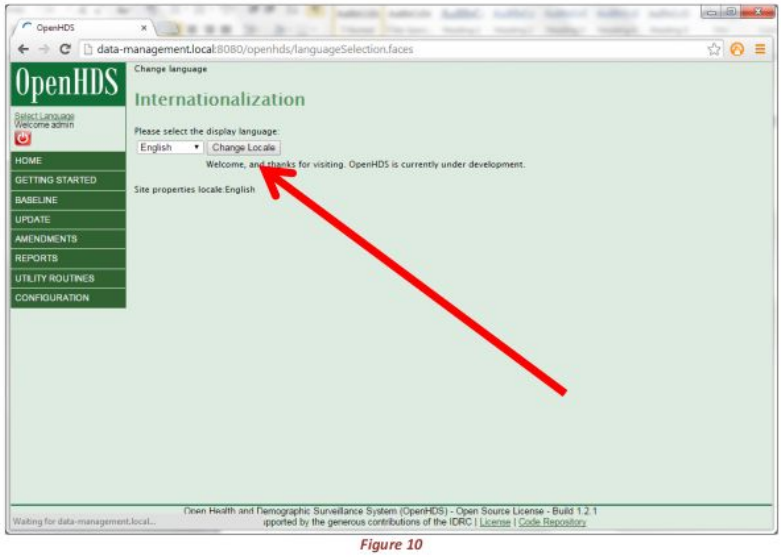


Figure 10

CODE AND PARAMETERS

- In the configuration section of OpenHDS we need to choose the code and parameters used in the system (Figure 11).
- The following parameters can be set:
    - Unknown Identifier:
    - Not Applicable:
    - Male:
    - Female:
    - Yes:
    - No:
    - Birth:
    - Death:
    - In Migration:
    - Out Migration:
    - Enumeration:
    - Marriage:
    - Live Birth:
    - Still Birth:
    - Miscarriage:
    - Abortion:
    - Data Status Warning:
    - Data Status Valid:
    - Data Status Fatal:
    - Data Status Void:
    - Data Status Pending:
    - Data Status Closed:
    - Locale:
    - Date Format:
    - Use Autocomplete:
    - Visit At:
    - Minimum Age of Parenthood:
    - Minimum Age of Household Head:
    - Minimum Age of Marriage:
    - Minimum Age of Pregnancy:
    - Earliest Enumeration Date (dd-MM-yyyy)
    - Earliest Event Date (dd-MM-yyyy)

Those parameters then will be used in the web application and in the OpenHDS mobile. Especially important for the data collection are the following parameters:

- 1. Visit At: this parameter can have the two values “location” or “Socialgroup”. These two values basically are the two standards between East Africa (visit at location level) or West

Africa (visit at Social Group level). When the tablet it's synced this parameter will influence 16the logic in the tablet. The Visit ID will be Location ID or SocialGroup ID + round Number, and the individuals shown from the tablet will be the one of the location selected or the one of the social group visited depending on the visit level.

- 2. The Minimum Age parameters all will be considered in the tablet logic (e.g. a child cannot be chosen as household head, and a woman of less than n years cannot have a pregnancy, etc)
- 3. Earliest Event Date: a not compulsory field. This if set, can be used in the forms if we want to force a lower limit to dates of events (e.g Migration can not be before the start of the study or of a specific round etc).

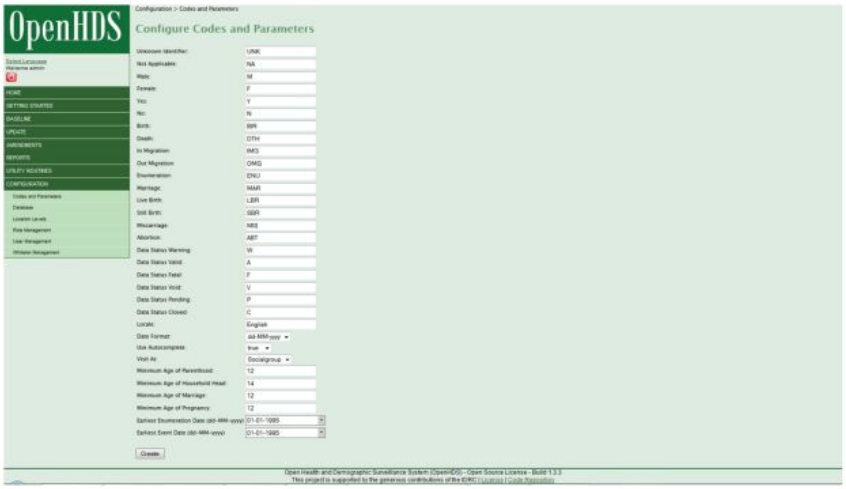


Figure 11

INSTALLING MIRTH

- MirthConnect is used to transfer data into OpenHDS by making web service calls. This is used for submitting data during the baseline and update rounds, but also for ingesting legacy data from a system like HRS2. Make sure you have an updated Java with Java Web Start to run the Mirth Connect Administrator Application.
    - Download the Linux installer from http://www.mirthcorp.com/community/downloads (~116MB).
    - Issue a 'chmod a+x mirth....sh' to mark the installer as executable.
    - Run the installer with 'sudo ./mirth...sh' .
    - Read through the agreements, scroll with enter and set-up as follows:

Installation steps

- Default install to /usr/local/mirthconnect
- Symlinks go to /usr/local/bin
- Set port number, e.g.port 8082 (since port 8080 is in use by tomcat).
- Set apps and log directory (/usr/local/mirthconnect/apps and /logs resp.)
- After installation, check if connection to http://data-management.local:8082 is okay.

- Launch the Mirth Connect Administrator from above site
- Log in with admin/admin
- Create an admin account (data/data) - no need to register.
- You can start/stop/etc the Mirth Connect service by running 'sudo service mcservice start|stop|status' (service is located in /usr/local/mirthconnect).

Set-up Mirth Connect to use the MySQL database

- By default, Mirth will use the Derby database. We will need to change this to MySQL. First create a Mirth database user in PHPMyAdmin, e.g. with following script:

- CREATE DATABASE mirthdb DEFAULT CHARACTER SET utf8;
- GRANT ALL ON mirthdb.* TO data@'%' IDENTIFIED BY 'data' WITH GRANT OPTION;

- Now open the file 'mirth.properties' in / usr/local/mirthconnect/conf for editing. Change the line starting with 'database' to 'mysql', change 'database.url' to 'jdbc:mysql://localhost:3306/mirthdb' (or your database name), and set the values for 'database.username' and 'database.password'.

Relevant lines to change

```
# options: derby, mysql, postgres, oracle, sqlserver

database = mysql

# examples:
#     Derby        jdbc:derby:${dir.appdata}/mirthdb;create=true
#     PostgreSQL   jdbc:postgresql://localhost:5432/mirthdb
#     MySQL        jdbc:mysql://localhost:3306/mirthdb
#     Oracle       jdbc:oracle:thin:@localhost:1521:DB
#     SQLServer    jdbc:jtds:sqlserver://localhost:1433/mirthdb

database.url = jdbc:mysql://localhost:3306/mirthdb

# if using a custom driver, specify it here
#database.driver =

# maximum number of connections allowed for the connection pool
database.max-connections = 10

# database credentials
database.username = data
database.password = data
```

- Afterwards restart the mirth connect service (sudo service mcservice restart)
- After the restart, the new database schema will be created and you can log in to the Mirth Connect Administrator with **data/data**

- Afterwards restart the mirth connect service (sudo service mcservice restart)
- After the restart, the new database schema will be created and you can log in to the Mirth Connect Administrator with data/data

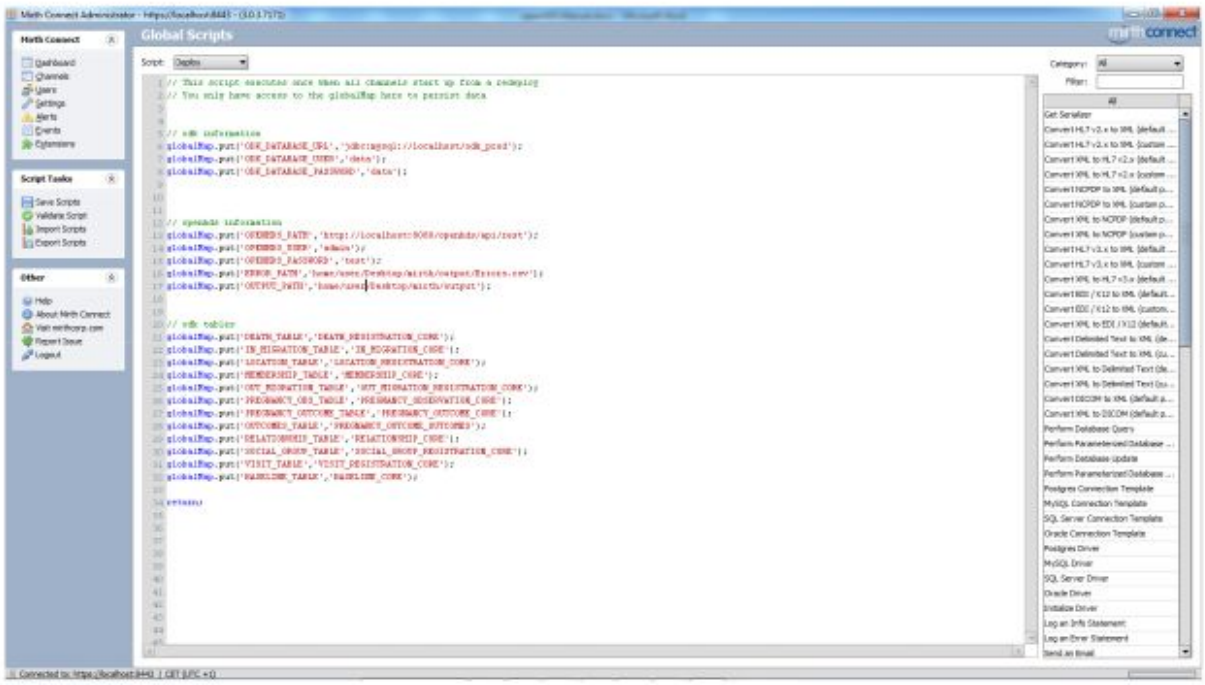
Importing MirthConnect Channels

- Download the latest release of the channel definitions, code templates, global scripts, and alerts from the OpenHDS source repository: https://github.com/SwissTPH/openhds. Using the MirthConnect Administrator application, import these resources into your MirthConnect environment.
- To do that launch Mirth Connect Administrator and log in.
- Click on Channels in the menu.
- On the “Channel Task” in the Menu then click on “Import Channel” and select the relevant Channel you want to import and when the channel is open click on the “Save Changes” on the channel task List.
- If you are running new DSS and you need to start with a “Baseline scenario” you will import the following channels:
    - Baseline
    - Baseline Households

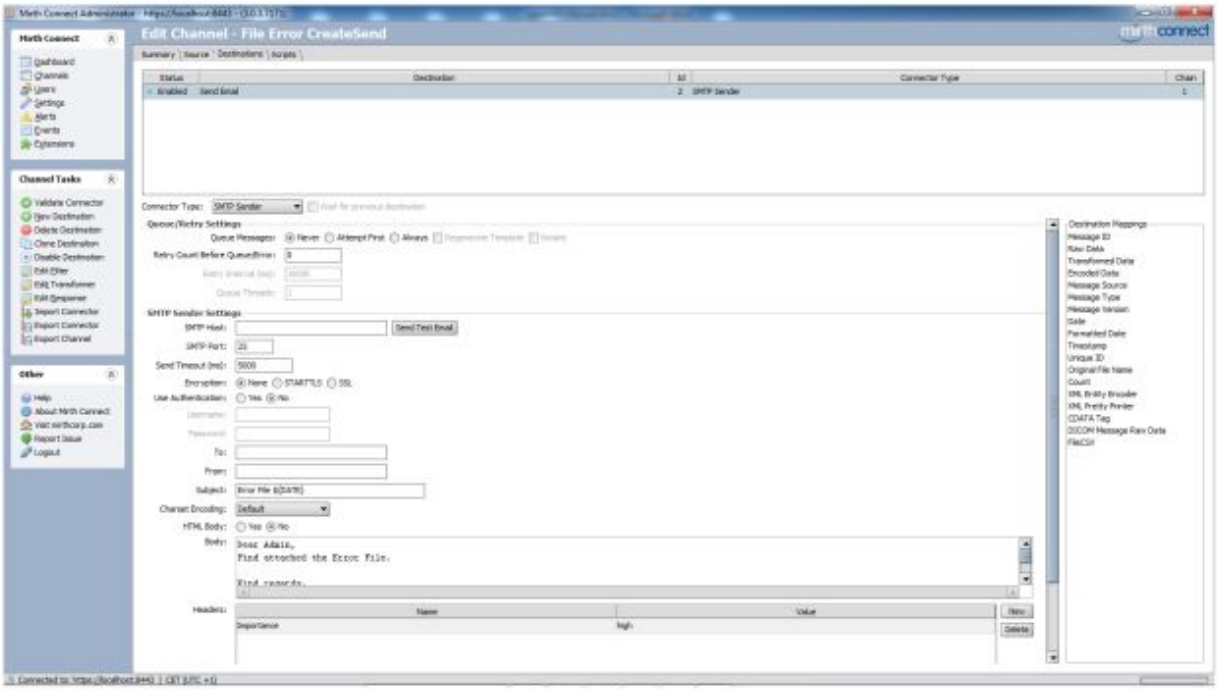
- If you are already on a running DSS (Update Rounds) you will import the following channels:
    - Update Events
    - Update Household

- In both scenario then you need to import also the channels:
    - Database error writer
    - File error create send

- After you finish importing all the channels and saving them, you need to click on “Edit Global Scripts” on the “Channel Tasks” and then click “Import Scripts”.
- You’ll be prompted to choose a script. Select the file Global Scripts.xml.
- You’ll get to the following screen where you need to configure your database connection parameters and a local path to a folder where to store the “error file” produced by mirth.



- After you have configured the variables values then you need to click on the Script Tasks Menu the item “Save Scripts”.
- Then click again on Channels and then on “Edit Code Templates” in the Channel Tasks menu.
- After done this please click on “Import Code template” and choose the file “CodeTemplates.xml”.
- Click then on Save code templates.
- Next step is to click on “Alerts” on the Mirth connect Menu.
- In the Alert Tasks menu click on “Import Alert” menu item and select the file “Events Connection Alert.xml”.
- Double click on the “Events Connection Alert” and on the channel panel on the right select the channels “Baseline” and “Baseline Households” (if in Baseline Scenario) or “Update Events” or “Update Households” (if in Update rounds scenario) and click on the enable button.
- Save the alert (Ignore any eventual warning message).
- Last step is to configure the SMTP connection on the channel “File Error CreateSend”.
- Go on the Channels list and double click on the “File Error CreateSend” channel.
- Select the “Destinations” tab. You’ll see the following screen.



INSTALLING ODKAGGREGATE

- ODKAggregate is the server component that acts as a repository for electronic forms used in the data collection (which can be synchronized to tablets), and as the recipient and storage for completed forms which are submitted from tablets. ODKAggregate provides an installer that will create the war-file with settings preconfigured according to your settings during the installation steps. The installer is available for Windows, Linux 32 or 64 and also Mac OS. This guide will assume that you download and run the Linux installer.
- see also http://opendatakit.org/use/aggregate/tomcat-install/
    - Download the appropriate (32 or 64 bit, depending on your system) Linux installer from http://opendatakit.org/downloads/ (~260MB). If you're under Ubuntu, you can issue a 'wget http://url.to.file/filename.sth' to download the file
    - Change the installer permissions with 'chmod 777 ODK[...].run'. This will set the permissions for the installer such that it is allowed to be executed.
    - Run the installer with './ODK[...].run'

Run the installer

- The ODKAggregate installer will ask for user input to set up the database connection and other configuration options.
    - Put the installer into e.g.: ~/ (the tilde stands for the user home, e.g. /home/data)
    - Set the output folder to ~/ODK
    - The port you can leave at 8080
    - The database server is hosted at 127.0.0.1

- When asked for the public internet address, insert ‘data-management.local’
- When asked for the SQL user, use: data / data (not recommended for production)
- Db name: odk_prod
- ODKAggregate instance name: odk_prod
- Configuration

Installation

- The installer ran in the previous step will create a new folder called ‘ODKAggregate’ in the install folder that you supplied in the first step. You will find the ODKAggregate.war file there and an SQL script create_db_and_user.sql.
  - Open phpMyAdmin and run theSQL script to generate the odk database.
  - Deploy the ODKAggregate.war with the Tomcat manager.
  - Start the ODKAggregate application in Tomcat manager if it is not already started.
  - Navigate to 'http://data-management.local:8080/ODKAggregate/' in a web-browser to browse to ODKAggregate
  - You should now be able to log in by using ‘Aggregate Password’ with the username you supplied in the installer and the password ‘aggregate’. You can later change the password by going to the ‘Site Admin’ section.

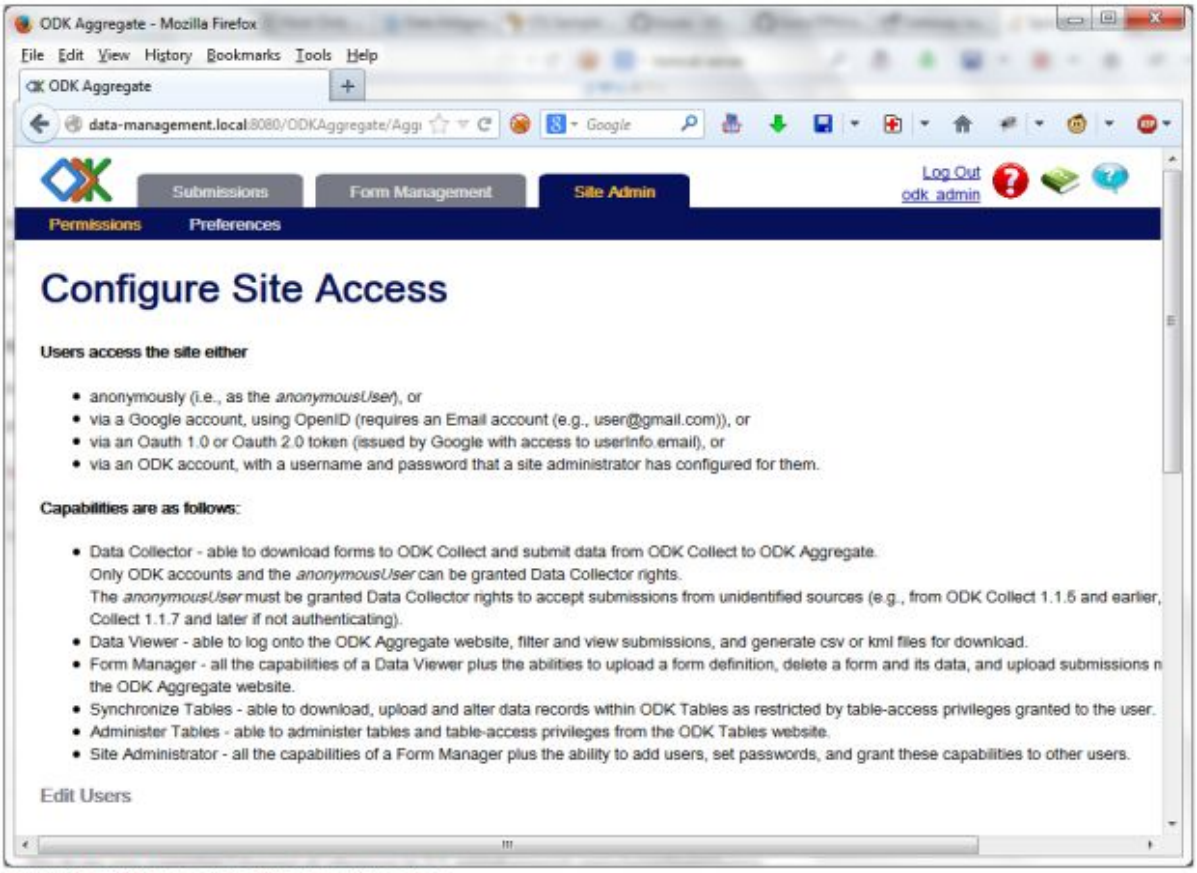


Figure 12 ODKAggregate ‘Site Admin’ section

UPLOAD HDSS CORE XLSFORMS

- This section covers the steps to obtain and upload the OpenHDS core forms, which the OpenHDS application needs for its core functionality.
- Download the OpenHDS Core Forms from https://github.com/SwissTPH/openhds (xlsx format). These forms can be modified if required, for example by adding translation to additional languages, or variables which are collected beyond the core set (however, those additional variables are not automatically integrated with the OpenHDS database). The form templates must be converted into the XForms format prior to upload them into ODKAggregate.
- To convert the xlsx file into a proper Xform there are several options. We suggest the following two:
    - http://opendatakit.org/xiframe/ (online conversion)
    - https://github.com/UW-ICTD/xlsform.exe/blob/master/README.md (windows offline converter)
- Open up http://data-management.local:8080/ODKAggregate/ in your Web browser.
- You can log in with the local ODK account if required, but you shouldn't need it to upload Forms, since by default it should be allowed for anonymous users.

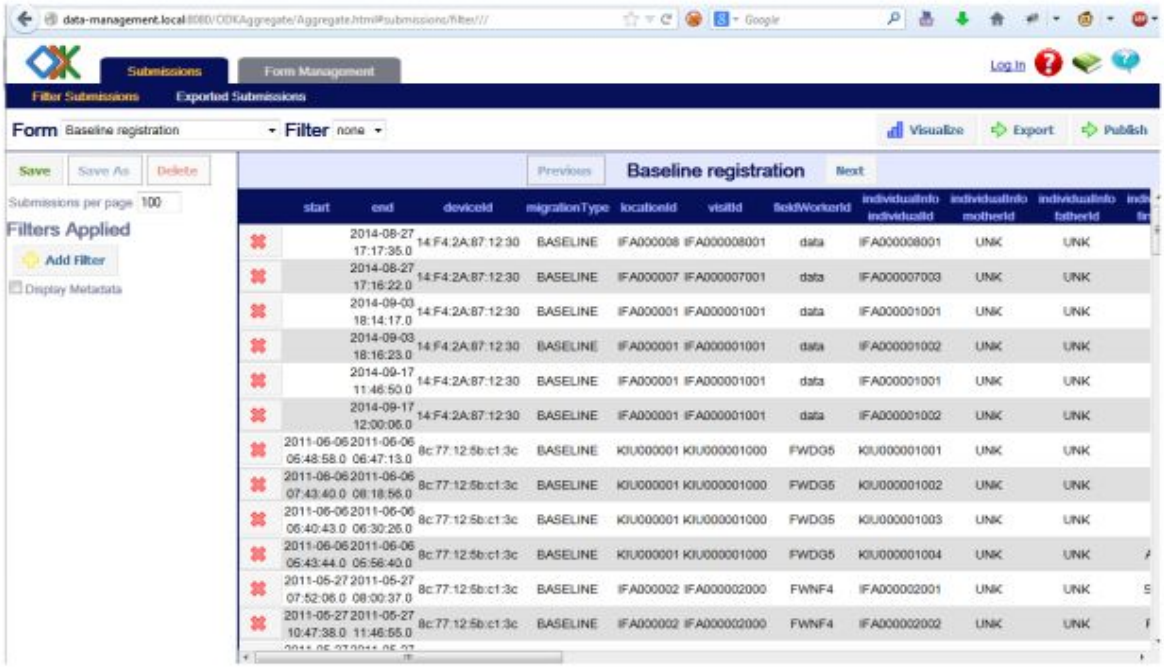


Figure 13

- Switch to management tab

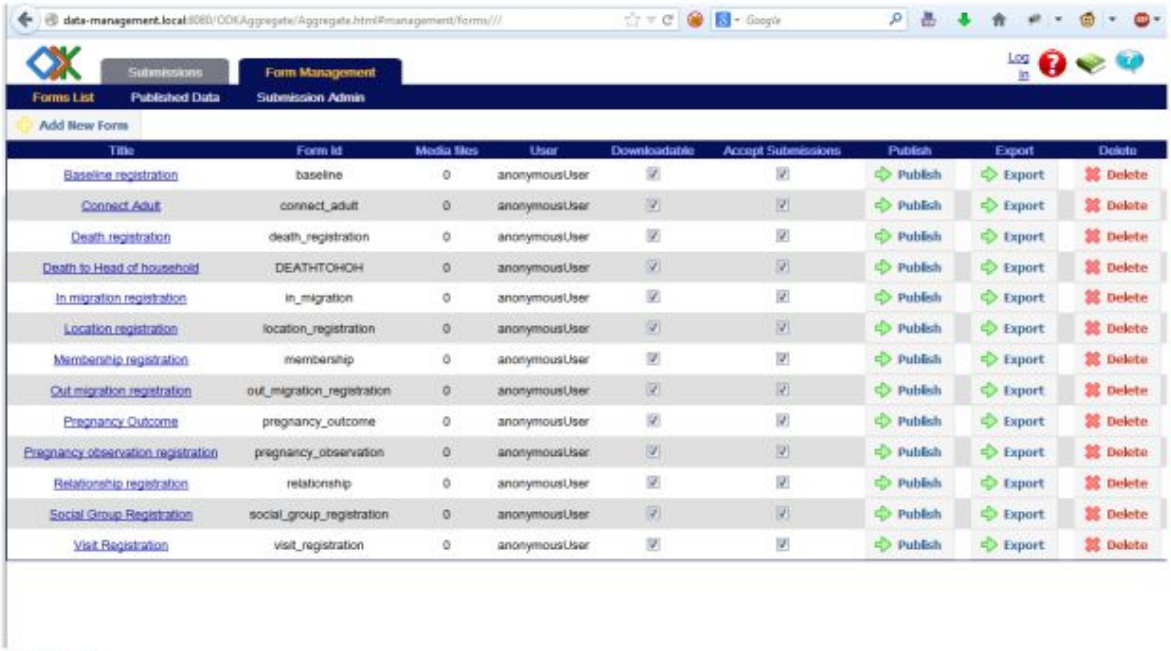


Figure 14

- Click on add new form

Click on add new form.

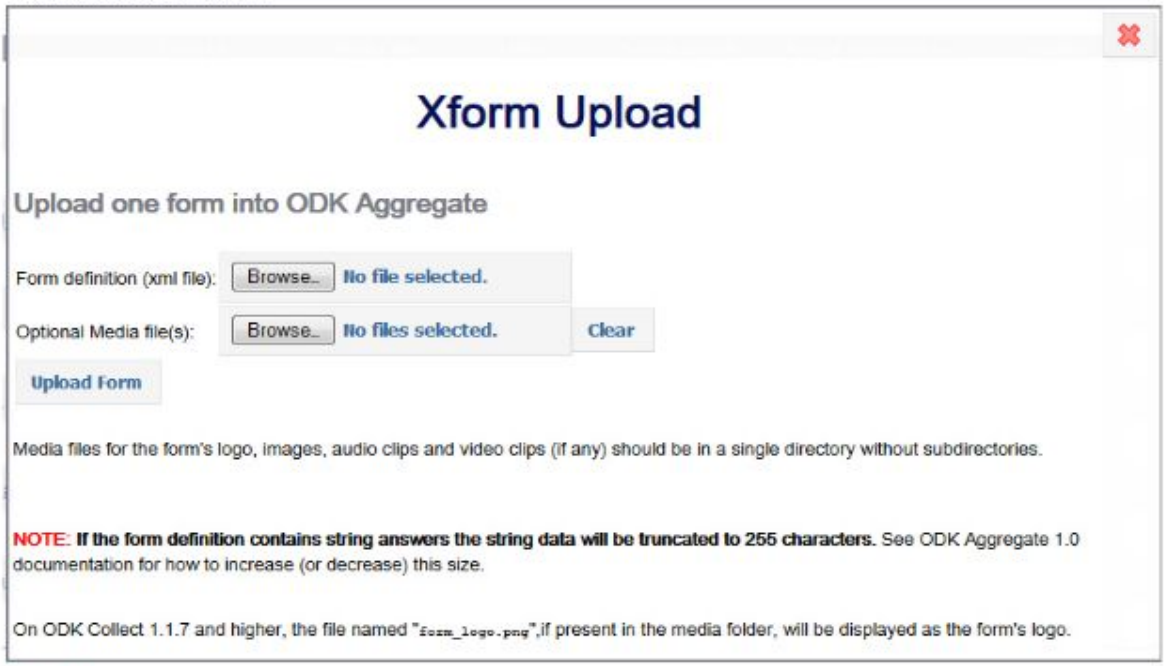


Figure 15

- Click browse and select the XForm (.xml).
- Click on 'Upload Form' to submit the form.
- After a successful upload, the new form will appear in the 'Forms List'.

- Upload the other forms, one by one.

CREATE DATABASE AND VIEWS FOR DATA MANAGEMENT

- This section provides SQL statements that will provide the Data Manager with a simplified database view of errors that occurred while sending data to OpenHDS. This allows for a fast and uncomplicated determination of cause of problematic data. These entries can then be corrected and resubmitted for a successful insertion into OpenHDS. After logging in as user root select the odk_prod database and execute following SQL script:

Error table and views

```
CREATE TABLE `errors` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `CHANNEL` varchar(30) DEFAULT NULL,
  `DATA` varchar(1000) DEFAULT NULL,
  `ERROR` varchar(280) DEFAULT NULL,
  `exported` int(1) DEFAULT '0',
  `inserted_timestamp` timestamp DEFAULT CURRENT_TIMESTAMP,
 `COMMENT` varchar(500) DEFAULT NULL,
  PRIMARY KEY (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=1 DEFAULT CHARSET=latin1;


#UPDATE ROUND VIEWS
create view IN_MIGRATION_VIEW as select * from IN_MIGRATION_CORE where
PROCESSED_BY_MIRTH=2;
create view LOCATION_VIEW as select * from LOCATION_REGISTRATION_CORE where
PROCESSED_BY_MIRTH=2;
create view DEATH_VIEW as select * from DEATH_REGISTRATION_CORE where
PROCESSED_BY_MIRTH=2;
create view MEMBERSHIP_VIEW as  select * from MEMBERSHIP_CORE where
PROCESSED_BY_MIRTH=2;
create view OUT_MIGRATION_VIEW as select * from
OUT_MIGRATION_REGISTRATION_CORE where PROCESSED_BY_MIRTH=2;
create view PREGNANCY_OBSERVATION_VIEW as select * from
PREGNANCY_OBSERVATION_CORE where PROCESSED_BY_MIRTH=2;
create view PREGNANCY_OUTCOME_VIEW  as select * from PREGNANCY_OUTCOME_CORE
where PROCESSED_BY_MIRTH=2;
create view RELATIONSHIP_VIEW  as select * from RELATIONSHIP_CORE where
PROCESSED_BY_MIRTH=2;
 create view SOCIALGROUP_VIEW  as select *  FROM SOCIAL_GROUP_REGISTRATION_CORE
where PROCESSED_BY_MIRTH=2;
CREATE VIEW DEATHTOHOH_VIEW AS SELECT * FROM DEATHTOHOH_CORE
WHERE PROCESSED_BY_MIRTH =2;
# BASELINE  ROUND VIEW
create view BASELINE_VIEW  as select * from BASELINE_CORE where
PROCESSED_BY_MIRTH=2;
CREATE USER 'datamanager'@'%' IDENTIFIED BY 'dataODKmanager';

GRANT SELECT, UPDATE ON DEATH_VIEW TO 'datamanager'@'%';
```

```
GRANT SELECT, UPDATE ON errors TO 'datamanager'@'%';

GRANT SELECT, UPDATE ON IN_MIGRATION_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON LOCATION_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON MEMBERSHIP_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON OUT_MIGRATION_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON PREGNANCY_OBSERVATION_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON PREGNANCY_OUTCOME_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON RELATIONSHIP_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON SOCIALGROUP_VIEW TO 'datamanager'@'%';
GRANT SELECT, UPDATE ON DEATHTOHOH_VIEW TO 'datamanager'@'%';
# BASELINE  ROUND PERMISSIONS
GRANT SELECT, UPDATE ON BASELINE_VIEW TO 'datamanager'@'%';
```

DATAMANAGER MYSQL USER

- The above script will also create a MySQL user ‘datamanager’ with the password ‘dataODKmanager’. This special user only has access to these error views and error table. With these he can modify and reset the erroneous data. Refer to section ‘Error handling’ in the Data Management section below for more details.

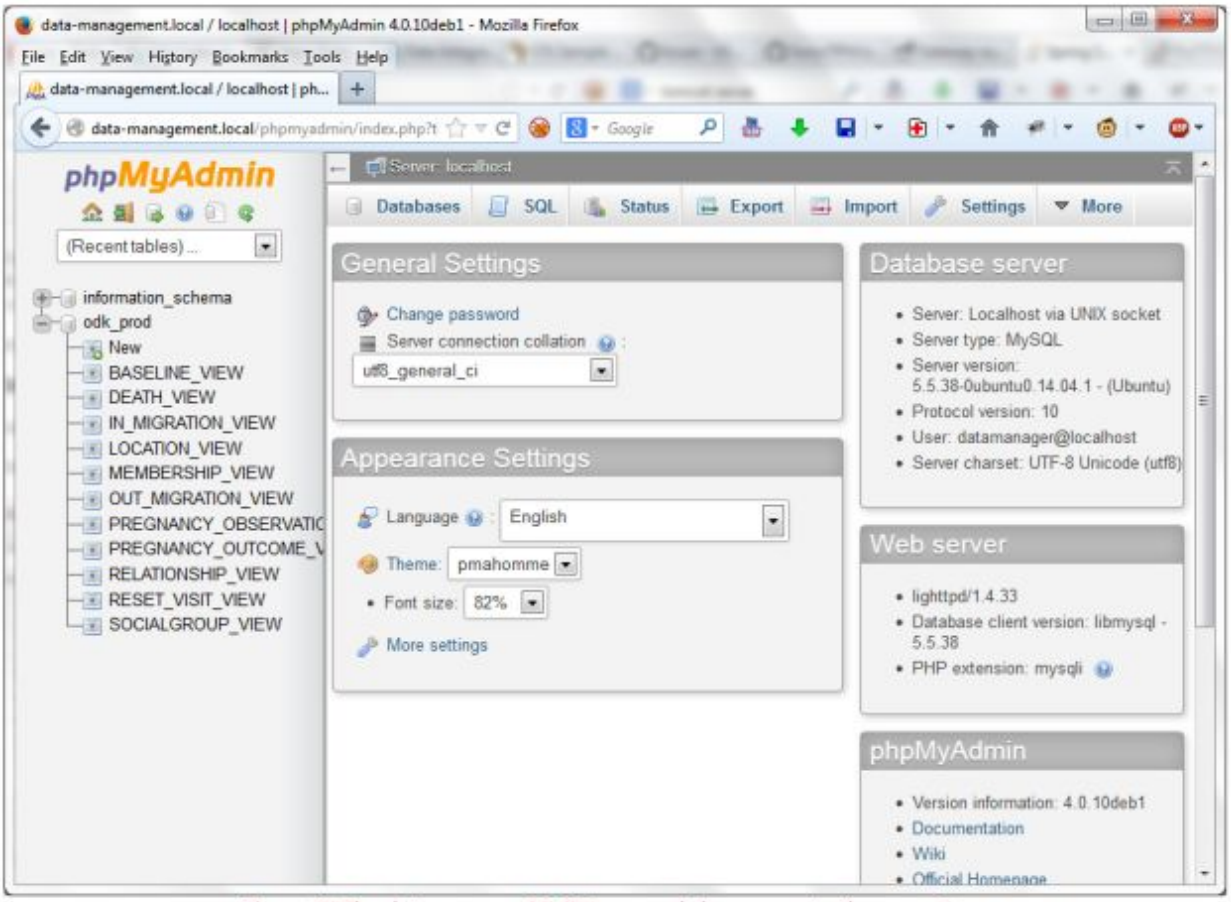


Figure 16 The datamanager MySQL user only has access to the error views

CUSTOM LOCATION HIERARCHY

- By default OpenHDS has a location hierarchy that starts and the country level, goes down to region, District, Village and finally Subvillage. It is possible to modify these labels to have a custom location hierarchy where this is needed.
- To customize the location hierarchy, open the OpenHDS web-application and log in. Then navigate to 'Configuration' and finally to 'Location Levels'.

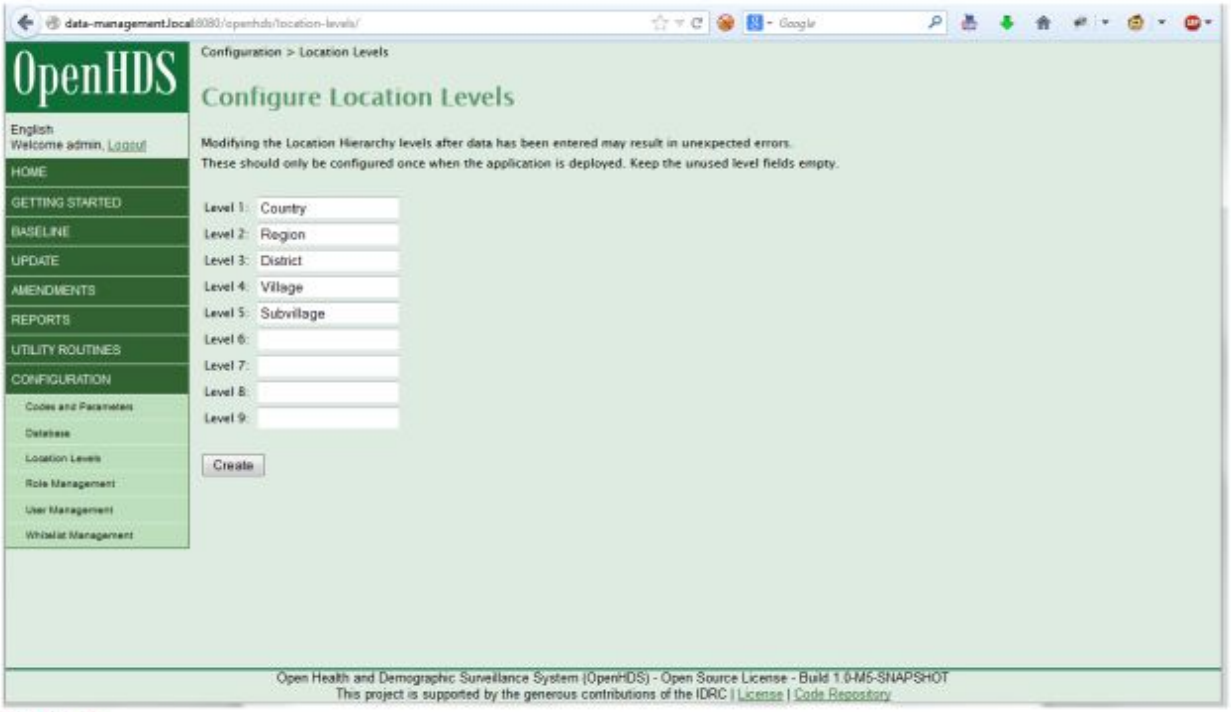


Figure 17

- The OpenHDS system can manage up to 9 levels in the location hierarchy.
- To change the labels edit the Level entries and then save with the button 'Create'.
- You will need to stop and start the openhds webapp in Tomcat for the changes to register.
- Next you need to populate the location hierarchy. Navigate to Utility Routines->Location Hierarchy and select Create after filling in a location. Start at the top of the hierarchy (e.g. country), and work your way down to build a hierarchy tree by specifying the parent of each location (e.g. the village a sub-village belongs to).

Important

- Note that the definition of your location hierarchy forms the basis of a standard ID naming convention which is used throughout in all OpenHDS systems. IDs for the core entities of the HDSS data base are constructed as follows:
- Location Id 9 digits (e.g. KWM000087)
- Visit ID 12 digits (e.g. KWM000087005 = Location ID + round 3 digit))
- SocialGroup/Household ID 11 digits (e.g. KWM00008700 = Location ID + 00)
- Individual ID 12 digits (e.g.KWM000087001 = Location ID + individual cardinality 001,002...)
- Once you have changed the location Levels, you'll also need to update the OpenHDS mobile application to handle these changes.
- Re-syncing the tablet (see section Tablet setup) through the sync database function will bring the new levels automatically in the mobile application. Buttons will be shown or hidden in the tablet according to the configuration on the server.

TABLET SETUP

- Download the OpenHDS apk from https://github.com/SwissTPH/openhds . If you should into installation troubles, make sure that Installation from untrusted sources is enabled in the settings under security.
- Download ODKCollect (from the Google Play Store or from https://opendatakit.org/downloads/download-info/odk-collect-apk/).

- Install OpenHDS mobile and ODKCollect.

Set-up OpenHDS Mobile

Figure 18

- Tap the “preferences” button at the upper right hand corner.

Figure 19

- Click on the URL to start editing the entry

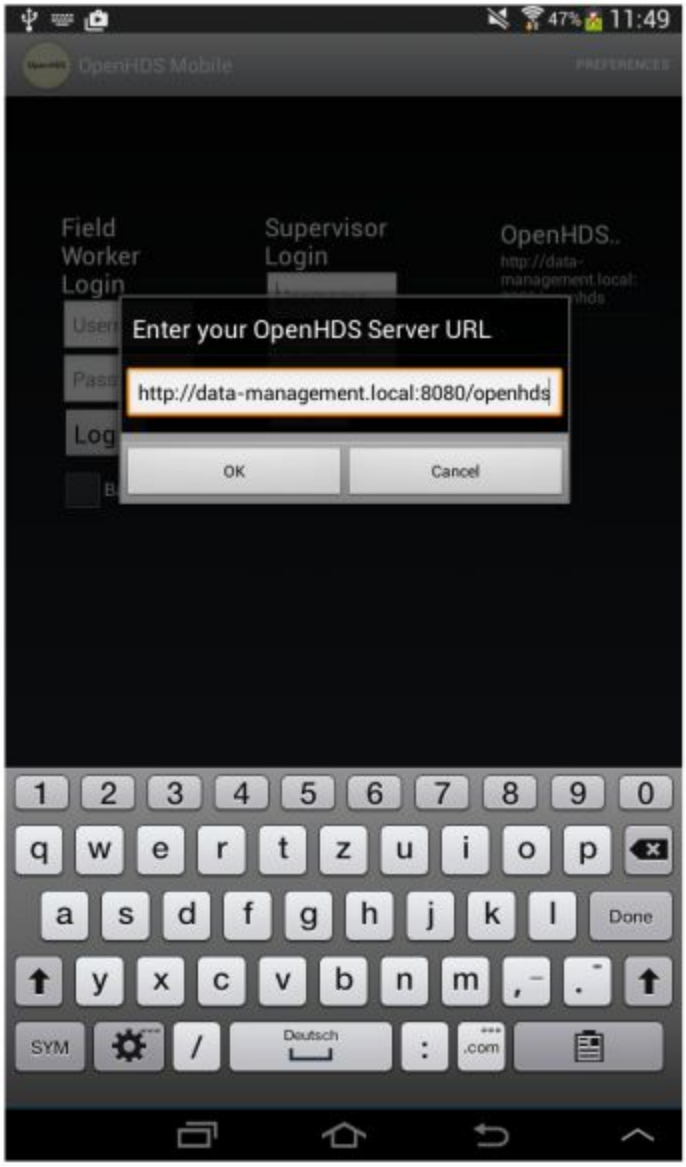


Figure 20

- Enter the URL to the OpenHDS server and confirm your input with a click on “OK”

Set-up OpenHDS Mobile

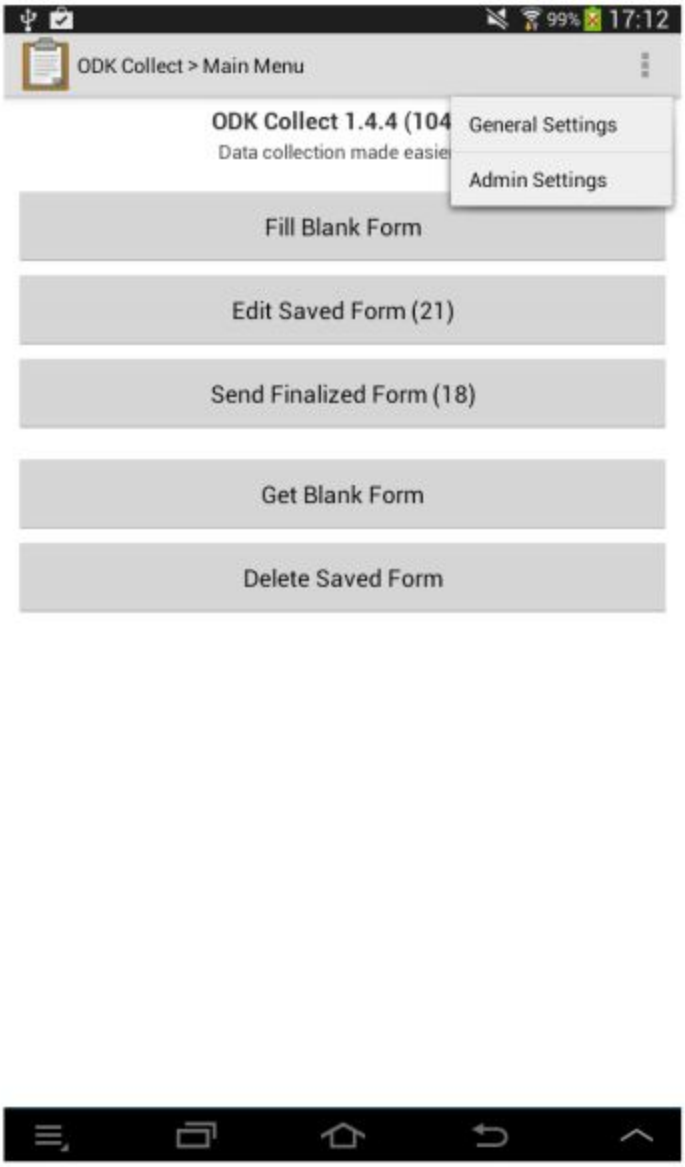


Figure 21

- Open the Menu at the upper right hand corner (or tab the hardware menu button on your device respectively) and select “General Settings”

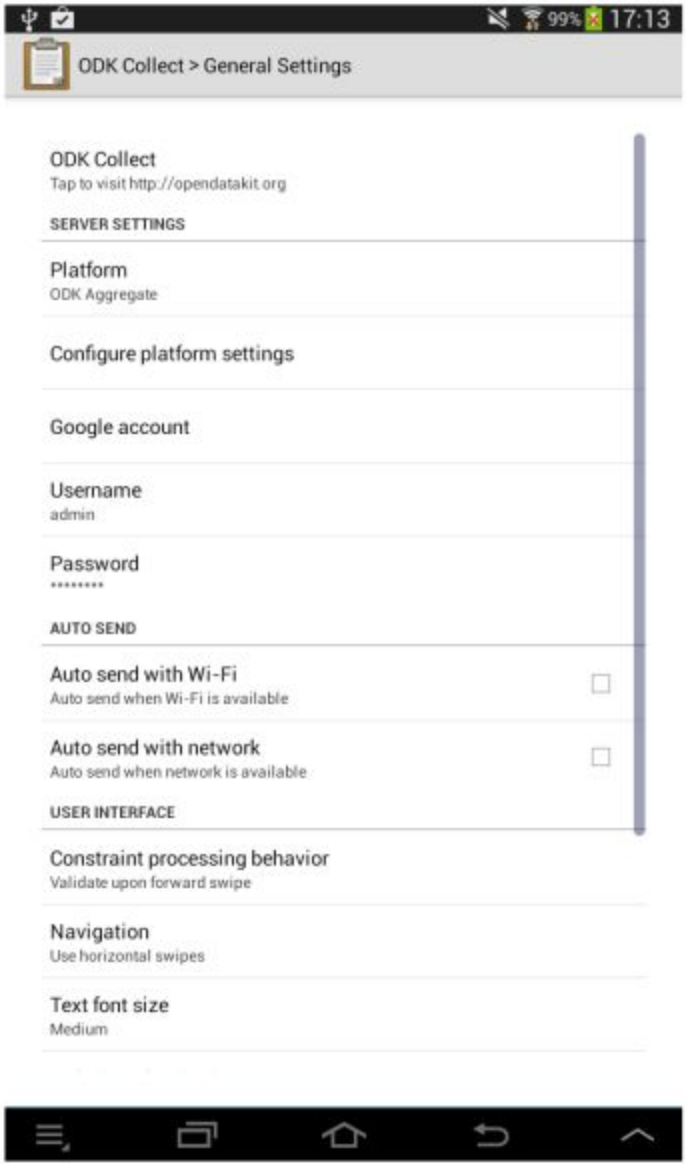


Figure 22

- Select the option “Configure platform settings”

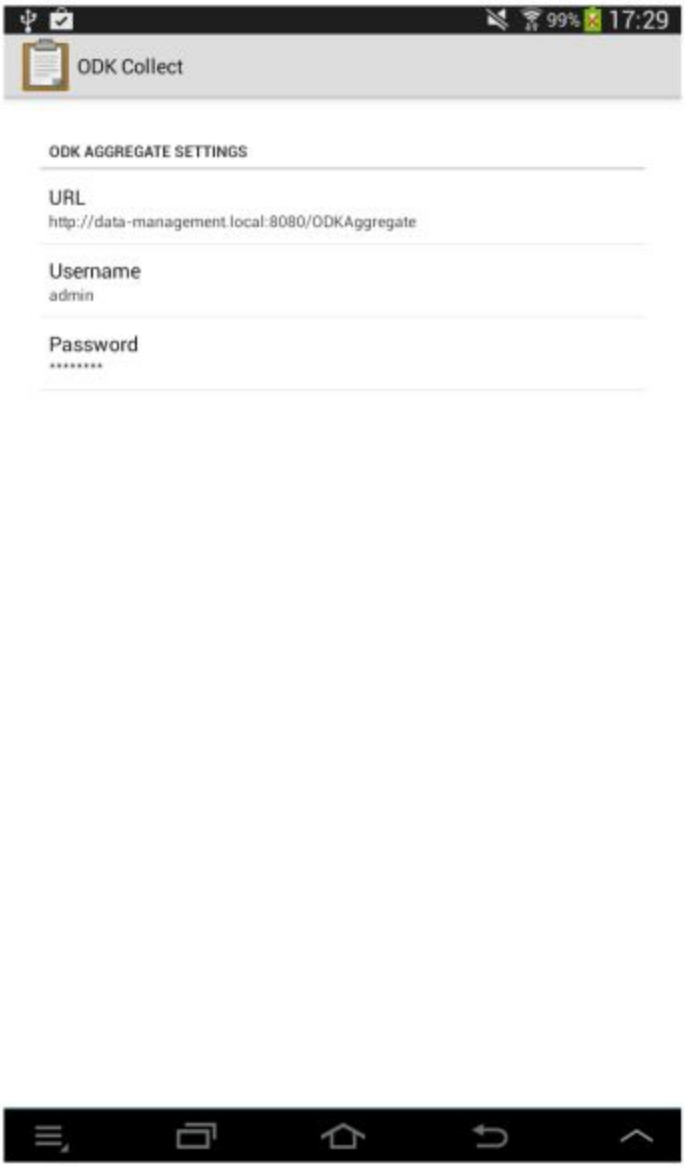

99%
17:29
ODK Collect
ODK AGGREGATE SETTINGS
URL
http://data-management.local:8080/ODKAggregate
Username
admin
Password
••••••••

Figure 23

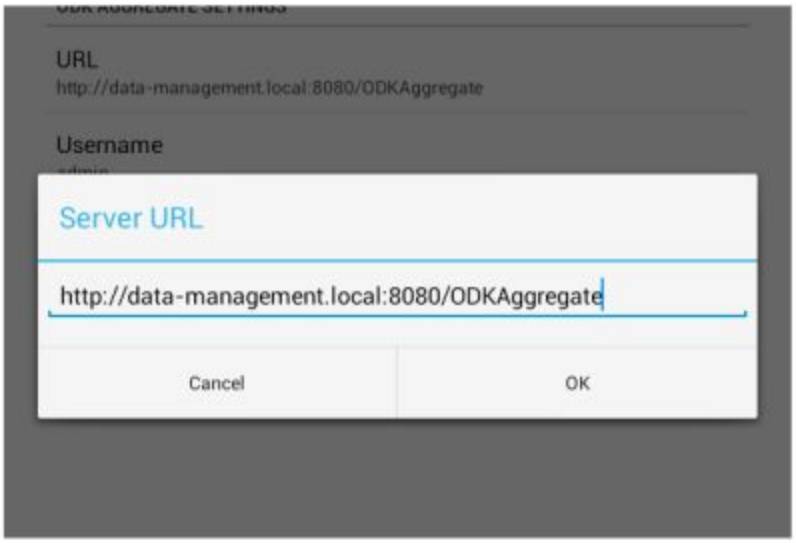


Figure 24

Synchronizing OpenHDS Mobile

NOTE:

- Before you can start the synchronization with OpenHDS Mobile, make sure you have set-up
- OpenHDS as described in the section “Set up OpenHDS”.
- Before starting syncing the tablets it is mandatory to prepare the data on the server to be synced to the tablet.
- So the following steps must be executed on OpenHDS server (Web interface):
    - 1) Login as admin to OpenHDS server.
    - 2) Click on the menu Item Utility Routines Round Codes
        - a. Create the round (0= Baseline, 1= First follow up etc. etc.)
    - 3) Click on the menu item Utility Tasks

      a. In the field Round number enter the number of the round just created and click on Start Visit Task. Wait till you see that the task is ended as in the figure below.

Task Name	Total Items Processed	Start Time Stamp	End Time Stamp	MD5 Hash
Visit Task	7017	12-09-2014 11:56:02	12-09-2014 11:56:08	e8b49b011e0972b593b27989452460a7

b. Now Click on the button Start Individual Task and wait till it finish as shown in the following figure.

Task Name	Total Items Processed	Start Time Stamp	End Time Stamp	MD5 Hash
Visit Task	7017	12-09-2014 11:56:02	12-09-2014 11:56:08	e8b49b011e0972b593b27989452460a7
Individual Task	33325	25-11-2014 07:31:28	25-11-2014 07:34:26	027e9cb4567270b35f2da7fce5a73582

c. Click on the button Start Location Task and wait till it finish as shown in the following figure.

Task Name	Total Items Processed	Start Time Stamp	End Time Stamp	MD5 Hash
Visit Task	7017	12-09-2014 11:56:02	12-09-2014 11:56:08	e8b49b011e0972b593b27989452460a7
Individual Task	33325	25-11-2014 07:31:28	25-11-2014 07:34:26	027e9cb4567270b35f2da7fce5a73582
Location Task	8747	25-11-2014 07:35:11	25-11-2014 07:35:25	6f85d39a494f19a074150fea9a26a735

d. Click on the button Start Relationship Task and wait till it finish as shown in the following figure.

Task Name	Total Items Processed	Start Time Stamp	End Time Stamp	MD5 Hash
Visit Task	7017	12-09-2014 11:56:02	12-09-2014 11:56:08	e8b49b011e0972b593b27989452460a7
Individual Task	33325	25-11-2014 07:31:28	25-11-2014 07:34:26	027e9cb4567270b35f2da7fce5a73582
Location Task	8747	25-11-2014 07:35:11	25-11-2014 07:35:25	6f85d39a494f19a074150fea9a26a735
Relationship Task	4384	25-11-2014 07:35:30	25-11-2014 07:35:36	ea0619acadee30d6432eac92317b27bd

e. Finally Click on the button Start Socialgroup Task and wait till it finish as shown in the following figure.

Task Name	Total Items Processed	Start Time Stamp	End Time Stamp	MD5 Hash
Visit Task	7017	12-09-2014 11:56:02	12-09-2014 11:56:08	e8b49b011e0972b593b27989452460a7
Individual Task	33325	25-11-2014 07:31:28	25-11-2014 07:34:26	027e9cb4567270b35f2da7fce5a73582
Location Task	8747	25-11-2014 07:35:11	25-11-2014 07:35:25	6f85d39a494f19a074150fea9a26a735
Relationship Task	4384	25-11-2014 07:35:30	25-11-2014 07:35:36	ea0619acadee30d6432eac92317b27bd
Social Group Task	5461	25-11-2014 07:35:46	25-11-2014 07:35:51	cc5f854bf001a898947600e092cdabbd

- The tasks must be executed in the order described.
- They are separated because in case you need to amend an individual or a Location or Relationship etc. it is only necessary to re-run only the task involved and not all.
- Now you can start with the synchronization process.
- In the «Supervisor Login» section, provide the user credentials and click on «Login»


99% 17:15
OpenHDS Mobile
PREFERENCES
Field Worker Login
Username
Password
Login
Baseline
Supervisor Login
Username
Password
Login
1 2 3 4 5 6 7 8 9 0
q w e r t z u i o p
a s d f g h j k l
y x c v b n m , ! . ?
SYM
Deutsch

Figure 25

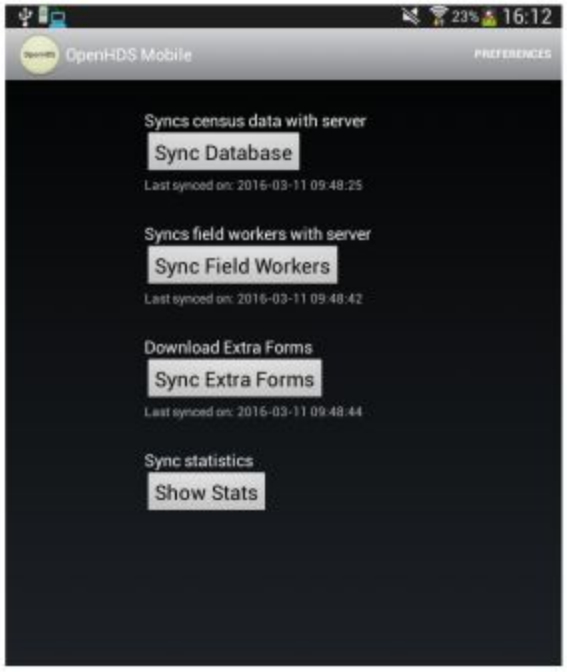


Figure 26

Synchronizing ODKCollect

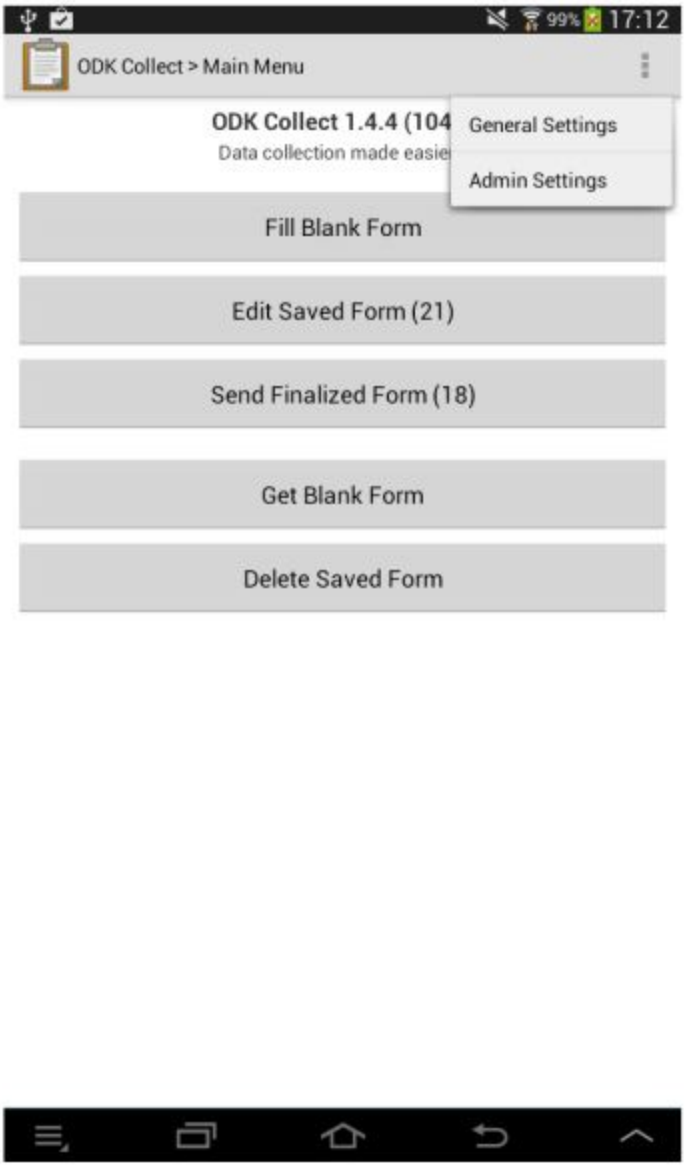


Figure 28

- Select “Get Blank Form”
- ODKCollect will now query for all available forms directly on the server and display them in an overview.

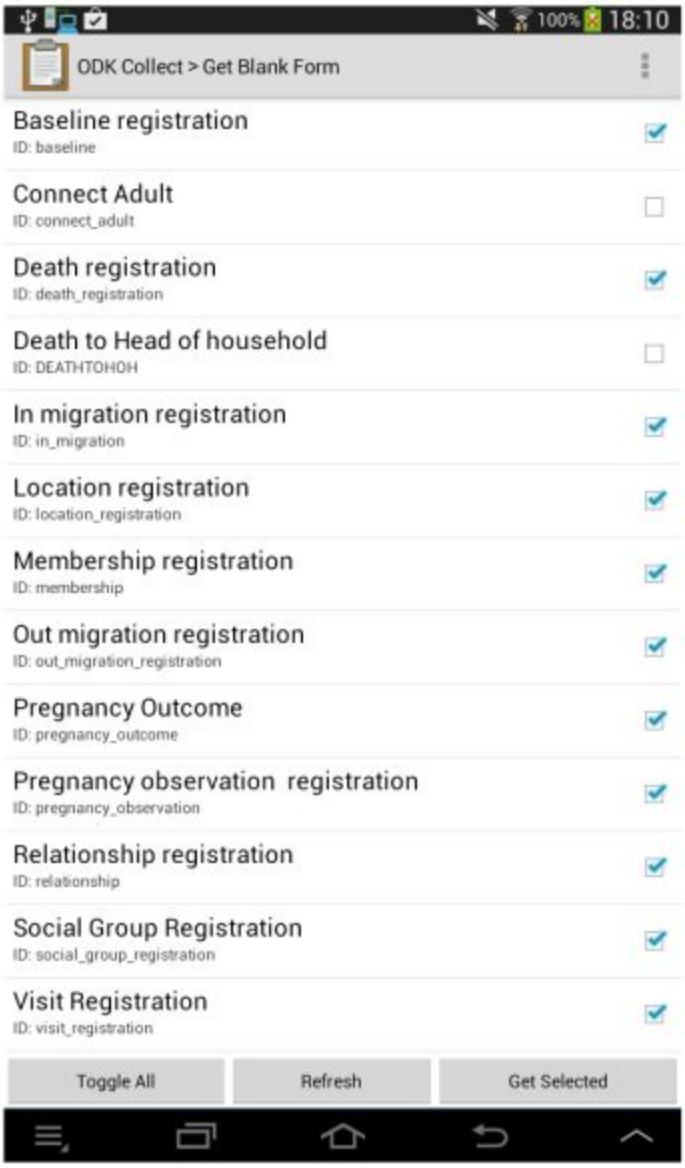


Figure 29

- Select the Forms you want to synchronize with the tablet
- Click on «Get Selected» to start the import process

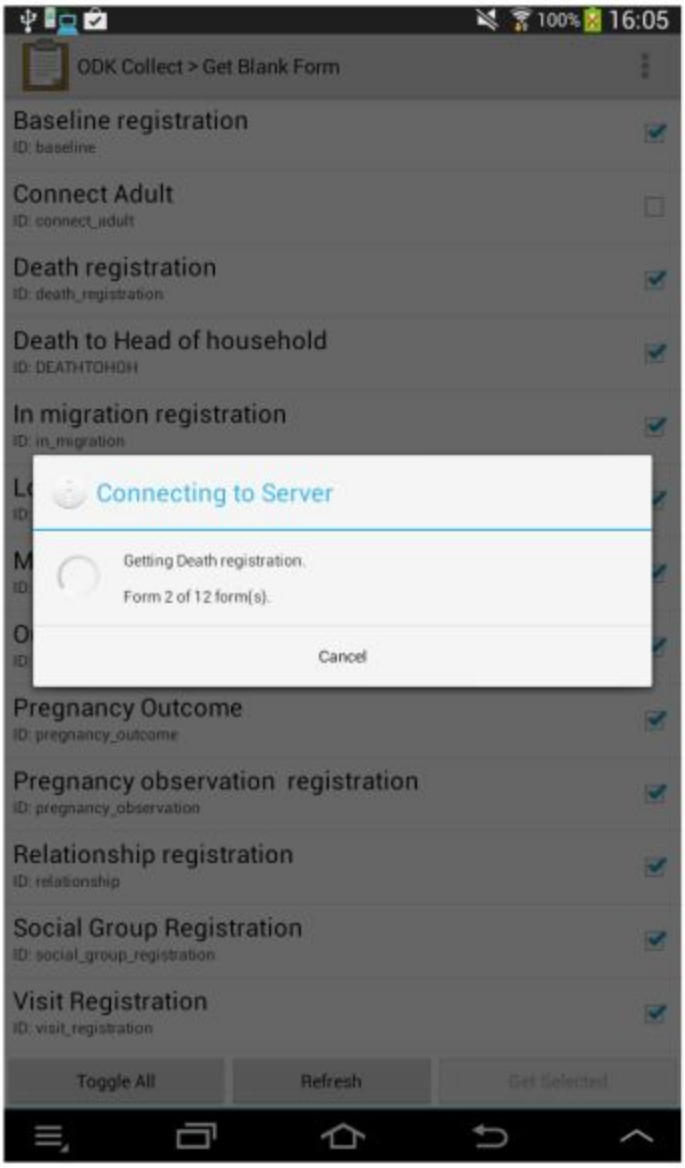


Figure 30

- The selected forms are transferred and imported one by one into ODKCollect
- The imported forms are displayed. Make sure there were no errors.

USER MANUAL

Field Worder Manual

- This section gives detailed descriptions on how a Field Worker will work with OpenHDS mobile application in the field.
- Below are the procedures for OpenHDS mobile data collection using Android Tablet computers.

Getting Started

- To get into the application you have to find and tap the icon which looks like Figure 31,
- First for security purpose, Field worker will need to have login credentials to be able to access the application. Hence they will be encountered with the following page as shown in Figure 33Error! Reference source not found. Below:
- A Field worker will always use “Log in as FieldFigure 31 Worker”.

Figure 31

Changing the Language of OpenHDS Mobile

- In OpenHDS Mobile it is also possible to have the interface displayed in the language of your choice.
- At the moment we have implemented support for these languages:
- English, Spanish and Portuguese.
- To select a different display language, open the Preferences menu in the login screen and click on Language. In the List select the language that you want the application to be displayed in (Figure 32).
- The language switch is immediate.

Figure 32

Field Worker Login

- Figure 33 is the login page “Field Worker Login”.

Figure 33

- Figure 34 shows the main menu display, on the left column is the information about location and individuals while on the right column is event information. Note that most of the buttons are always disabled until it is right time for usage, for instance the “Select Individual” button cannot be active if the location information has not been select etc.
- On the top right corner you will see the name of the Field worker logged in the device. Only two buttons are active at the main menu page. That means Field worker can only select the location for visiting, beginning with Region as the top level and/or Find the location Geo point of that particular location.

Figure 34

Creating New Location

- When Field worker is visiting a new household s/he will have to create a new location, to create a new location select round after select round tap “Create Location” button then fill in Name of location, type of location and tap Record Location to record GPS reading.

Figure 35

- Once Field worker taps the “Create Location” button s/he will see the location page as depicted on Figure 36 below;

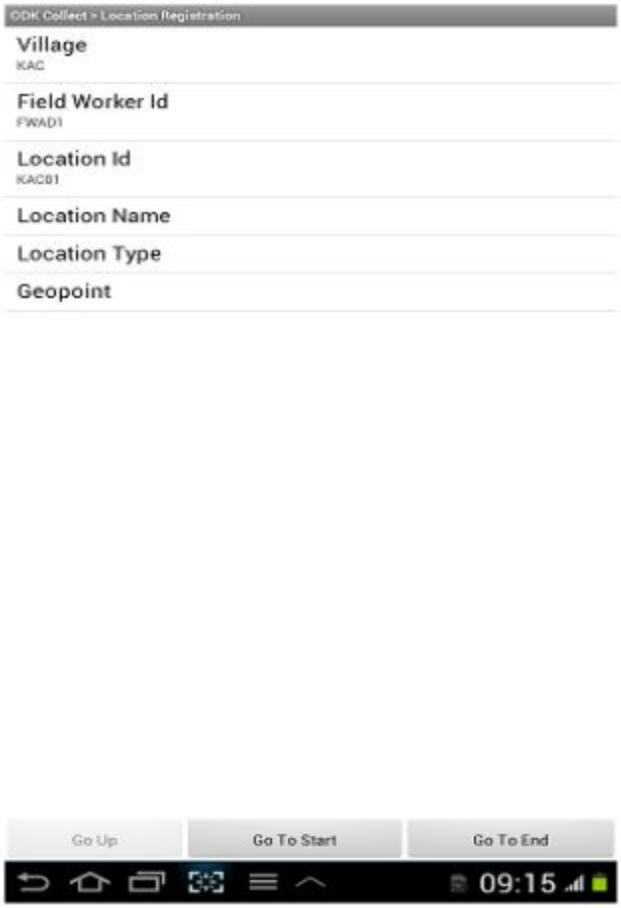


Figure 36

- Most of the fields are pre-filled by the tablet, only two fields need to be filled in, these are Location Name, Location Type Geo point.
- The device might take a bit longer to register the GPS coordinates accuracy depends on the number of available satellites but most of the time the best accuracy is when the reading is less than 6 meters accuracy, there you can press record location as per Figure 37. Please note the lower the numbers the better the accuracy.

Figure 37

- Please note that to get the best reading is recommended tablet users to be outside the building:

Language Selection

- Field workers have an option to choose the language they are comfortable to work with, therefore once they have open the form ready for data entry, they can select the language by tapping the Menu button as shown in Figure 38 below;

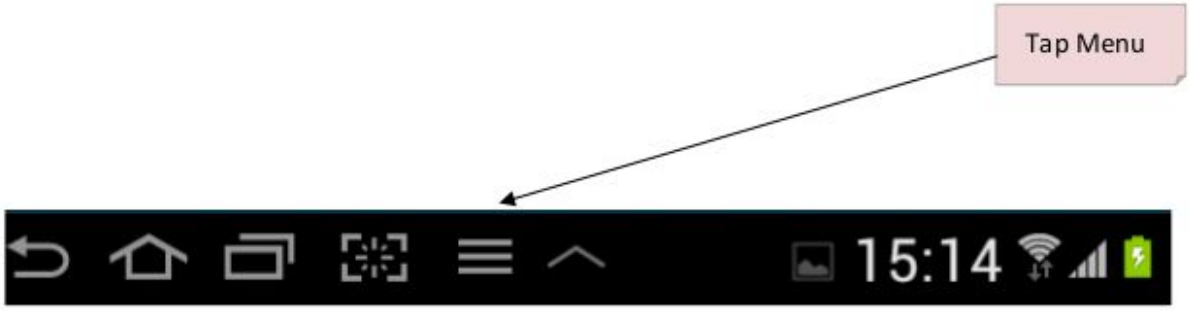


Figure 38

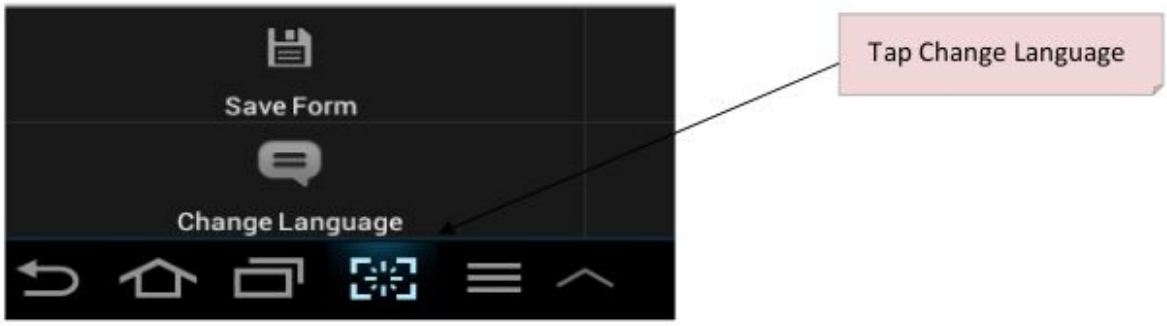


Figure 39

- The tap change language to go to Language selection menu as per figure 40 below;

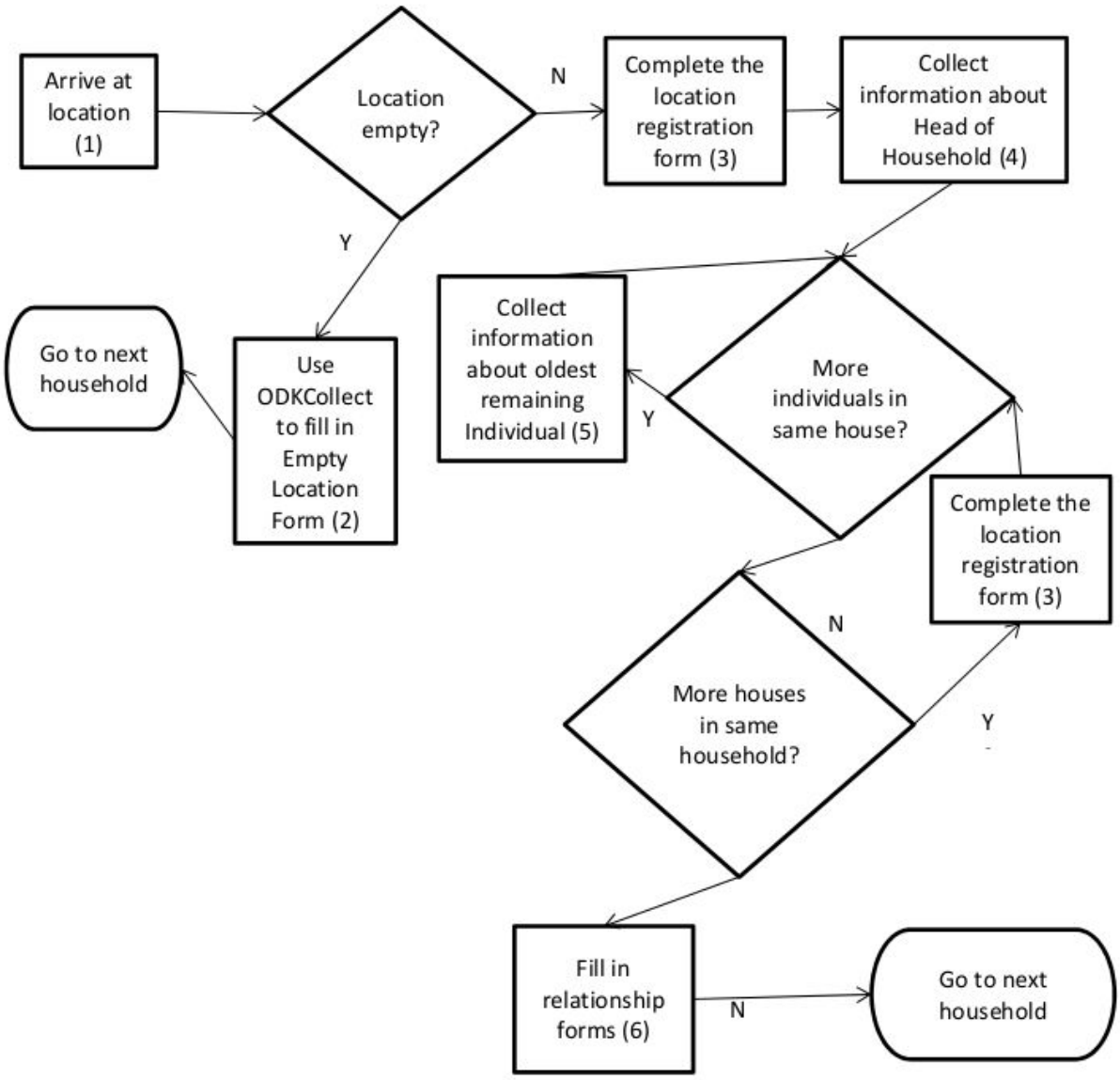
Figure 40

Tablet Workflows

- This section gives detailed descriptions on how the fieldworker has to handle each specific visit round and the included duties.

Baseline Visit

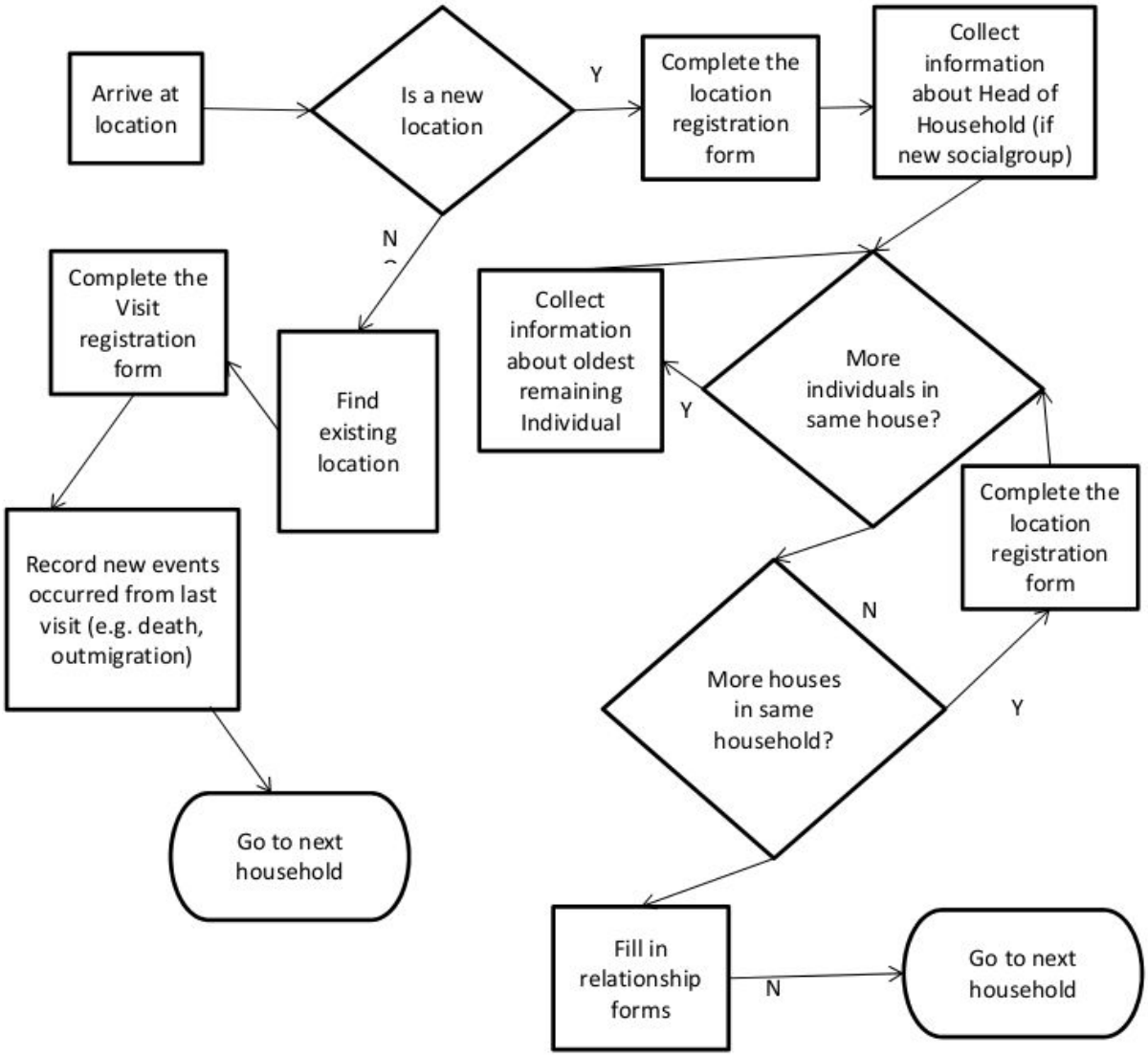
- Following flowchart shows the basic workflow of a baseline visit;



- (1) On arrival at the household, find the head of the household. If no one is in the location, an empty location form is completed to keep track of houses that need to be revisited. TODO: we need the head of household (not a different respondent) because of the consent, correct?
- (2) The empty location form, unlike all other forms, needs to be filled in by starting ODKCollect, choosing fill blank form, and completing the questionnaire
- (3) First collect the information about the location (house) in which the head of household lives. If this is the first house in the household, log in to OpenHDS, and find the village by going down the location hierarchy. Select “Create location” and complete the questionnaire. For further houses, come back to this step after completing (4) and (5) as shown in the flowchart.
- (4) Record information about the head of household by first filling in the baseline form (select “Baseline“ to start the form). Select “no” in response to the prompts if mother and father are known. After completing the form chose “Membership”. Chose “Create” when asked whether to search for 47or create a household. Fill in the household information, use the last name of the head of household as household name. Finish by selecting “Clear individual”.
- (5) If there are more individuals living in the same house, register them in decreasing order of age. First fill in the Baseline form. If the parents are in the same household, respond yes to the prompt whether they are registered in the system, and search for the correct individual. After completing the Baseline form complete the Membership form.
- (6) Fill in the relationship form for married individuals in the same household

Follow-up Visit

- Following flowchart shows the basic workflow of an update visit



Find Existing Location

- A Field worker should be able to explore the location for enumeration starting at Region level down
- to Household they wish to visit

Figure 42

Filtering Existing Location

- Sometimes a Field Worker my encounter a very long list of locations. To quickly and accurately enable them select the desired location, they will use location filtering by tapping "Filter Location" button and the Figure 43 below shows the search location page for user to search the actual location they need to visit.

Figure 43

Create Visit

- Every time a Field worker visits the household s/he will have to create a visit by tapping the "Create Visit" button. This can only be done once the location has been selected. So after tapping the visit the Search for an Individual page displays as per Figure 44 below. There a Field worker can tap Search individual after selecting location information and individual names, or just tap the search button without filing in any data for results. A

successful search will populate the list of household members in that location ready for the Field worker to pick the individual who shall be interviewed.

- Please note: if you are in the household page and unable to view household members, tap “Select Individual” button and all members will be displayed.

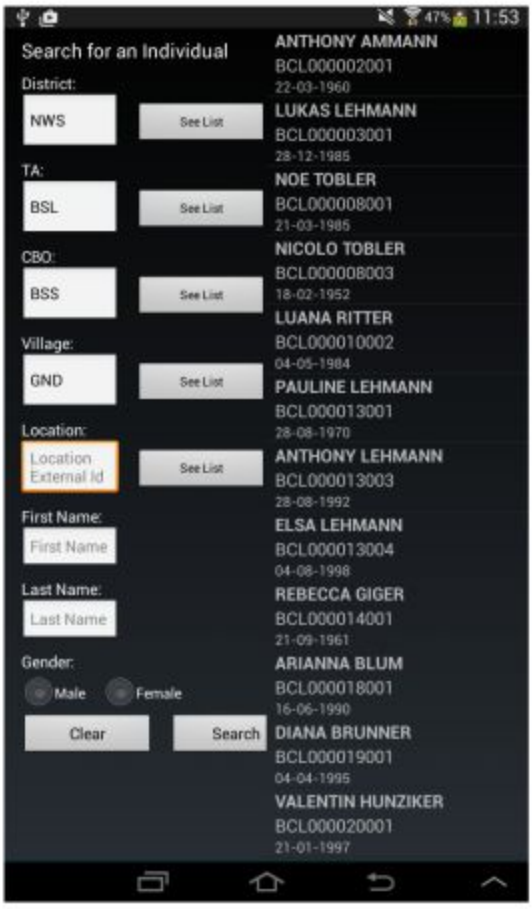


Figure 44

In Migration

- In Migration can be in two forms. External from outside HDSS area or Internal from HDSS area:
    - External in Migration
        - To In migrate an individual from outside the HDSS area, tap In Migration button. This button can only be active when the Field worker has created a visit. Once they tap that button the pop up message window will show up asking if it was Internal or External, the Field worker selects the external as per Figure 45 below;

Figure 45

- The tablet will try to link mother and father information of the in migrating individual to the existingindividual, therefore it will ask if the mother and father of the in migrating individual are known and registered in the system as per Figure 46 and Figure 47 below.
- There he should search for the individual to in migrate from the tablet.
- IMPORTANT: Please note that at some point when an individual is asked whether s/he has ever registered with the HDSS, s/he might say NO which at some point it might not be the truth. To avoid duplicate individual registration to HDSS system, Field worker MUST search for the individual's information to verify their existence in the tablet before attempting to add as new individual.

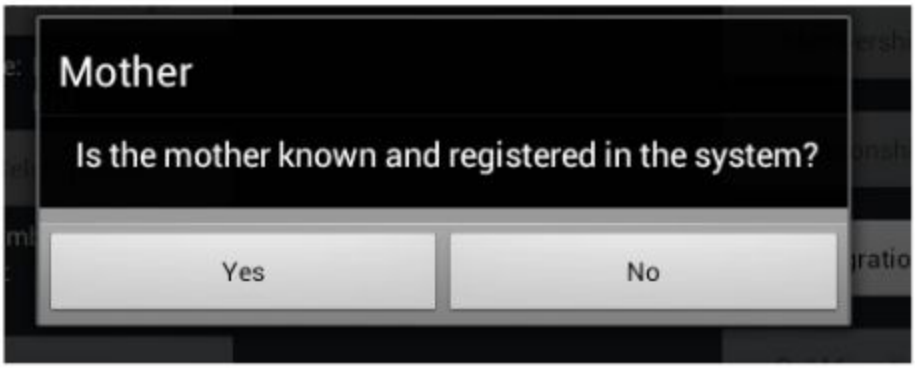


Figure 46

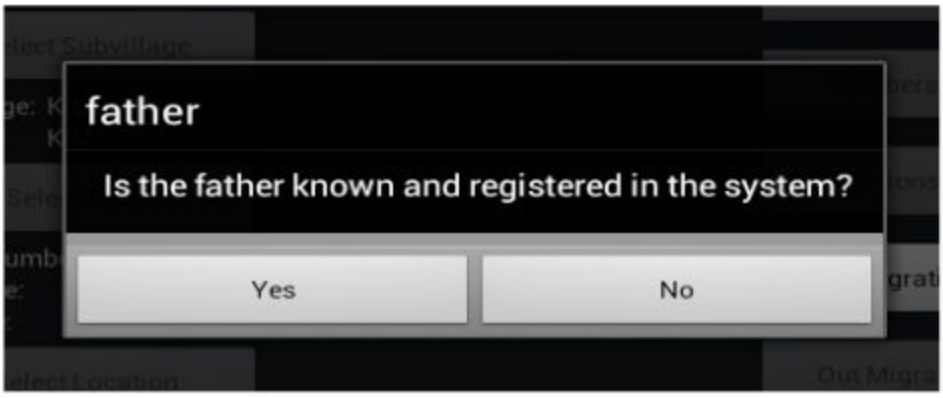


Figure 47

- If either mother and/or father of the in migrating individual are known then the tablet will open the search for individual page ready for Field worker to search for the mother and father of the in migrating individual starting with mother and then mother to create the membership as per Figure 48 below:

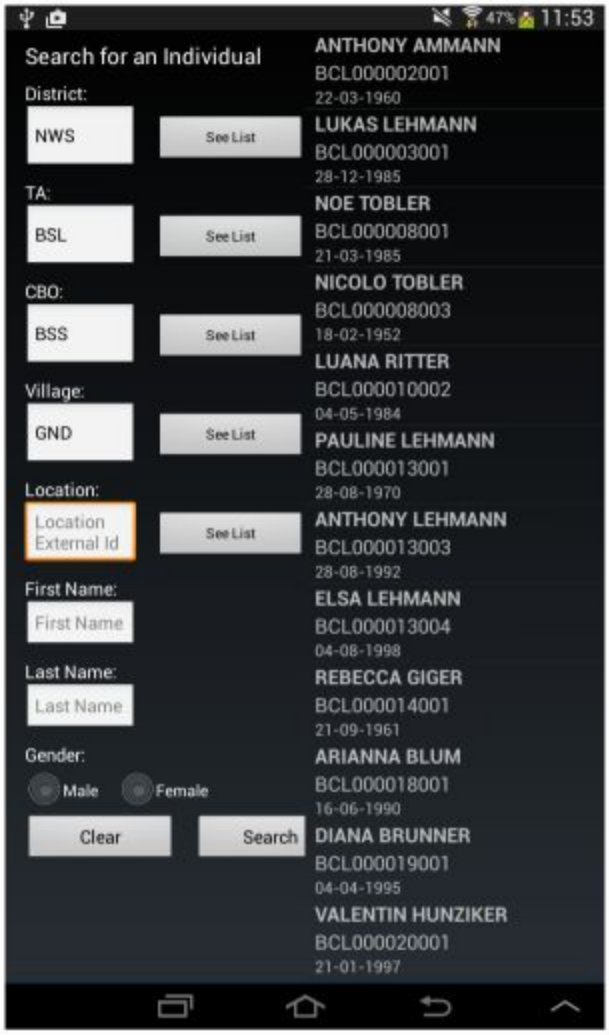


Figure 48

- Please bear in mind that the searching functionality will allow Field worker to search from different location hierarchy that is to say they can search on region level to get more results or search on village level to get fewer results. Therefore if Field worker leaves blank in Village text box then the search will display all individuals for that district in the Region.
- Once Field worker finds the matching mother or father the tablet will assign them to that individual and take Field worker on the page for registering the in migrating individual information as depicted in Figure 49 below;

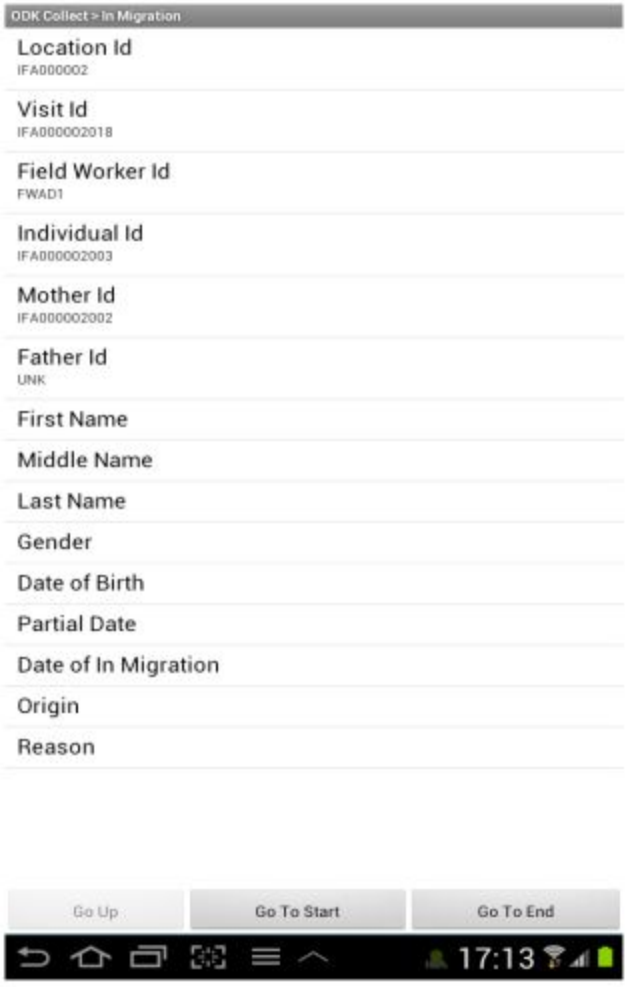


Figure 49

- If both mother and father are unknown then the tablet will instead directly open the In Migration form with some pre-filled information ready for the Field worker to continue with filling in the names and other information of the individual as per Figure 49 above.
- After external in-migration the Field worker has to create a membership. The pop up window will show up prompting the Field worker to create membership of the individual. Field Worker MUST create the membership. Below Figure 50 is the window asking Field worker to create membership. Also please follow the procedures for adding individual membership on the membership section;

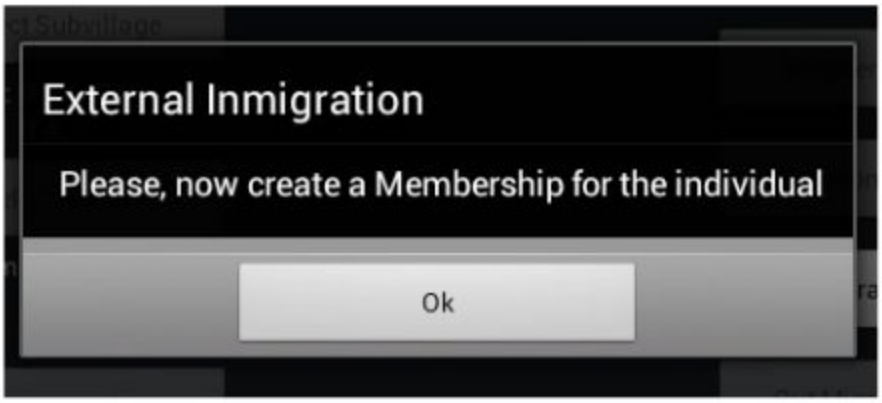


Figure 50

- If we are migrating a social group in a new household first the field worker should migrate the head of the household.
- Then select the head of the head of the household and create Household (button Household).
- Then create the membership for him (indicating him as the head), then membership for all others individuals.

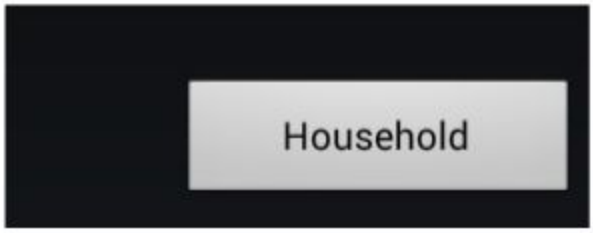


Figure 51

- Internal In Migration:
- If the individual has migrated from internal the HDSS, once a pop up message shows up tap Internal to in migrate the individual as depicted in Figure 52 below;

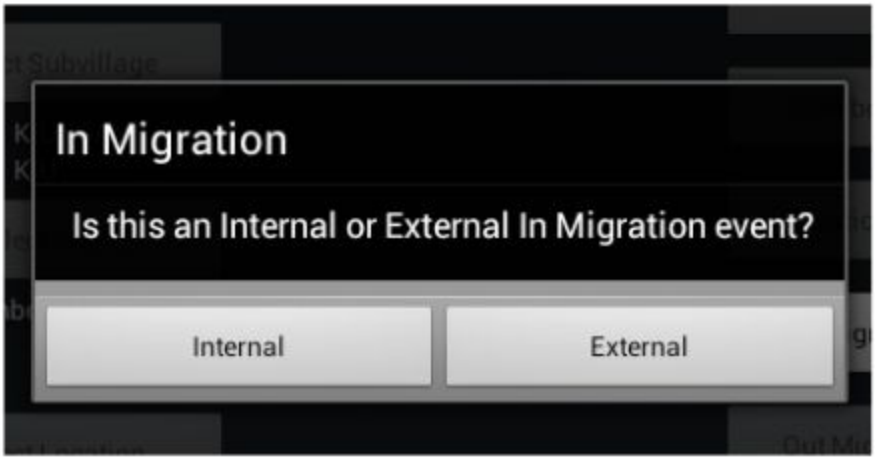
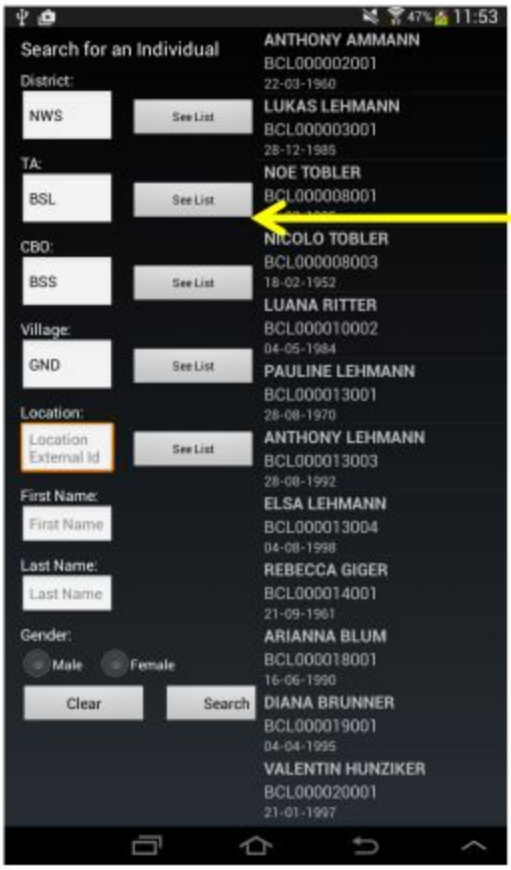


Figure 52

- For the internal In Migration the individual to in migrate shall already be available in the tablet, therefore Field worker will be required to search for the individual to in migrate when the “Search for an Individual” page opens as shown in Figure 53 below. Every button next to the text box field will populate the list of available location information for Field worker to pick the necessary information for Field worker to search for the individual to in migrate



Field Worker can tap **See List** button to view the Location IDs of different places to search the individual to in migrate

Figure 53

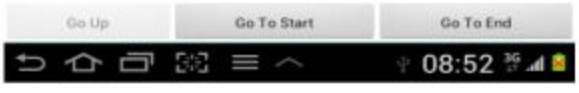


Figure 54

- Once a Field worker finds the individual they wish to in migrate s/he will tap to proceed to the next page for finalizing the in migration process as displayed in Figure 54 above. Field worker should fill in and save the form and exit.

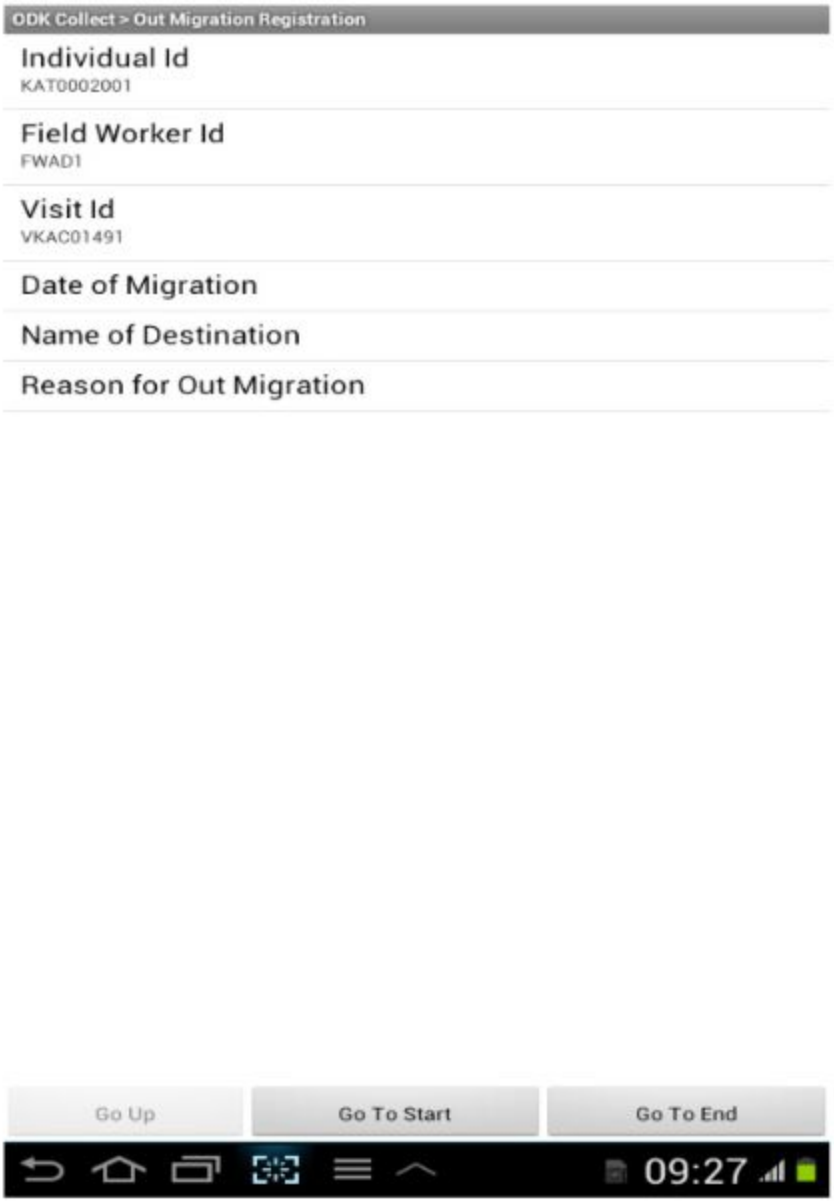


Figure 55

- Most of the fields will be pre-filled except for Date of Out Migration, Name of destination and Reason for Out migration.

Membership

- Membership MUST be created soon after the individual has been in migrated in the household otherwise the tablet will not allow Field worker to perform other events of that individual. To create 57membership Field worker should tap “Create Membership” button then tap location ID to select the household to in migrate the individual as per Figure 56 below depicting

Figure 56

- The field worker taps Household ID (arrow) to pick the household in migration.
- Field worker should start filling the blank fields as depicted in Figure 57 below, once finished should save the form and exit at the end of the form;

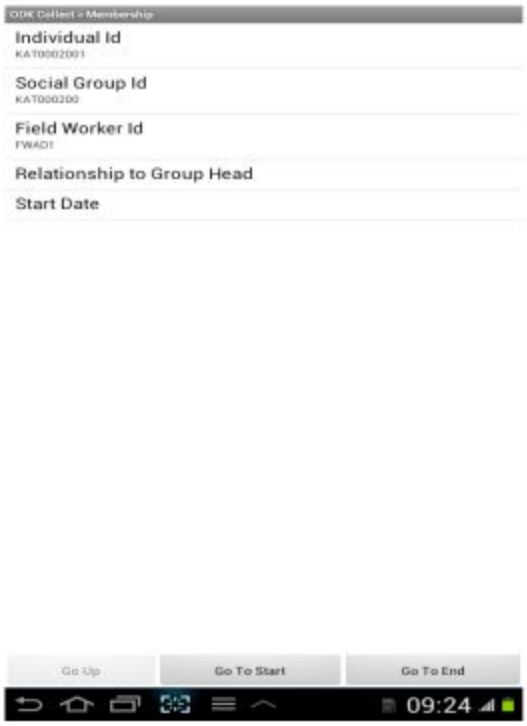


Figure 57

Change Head of Household

- To change the Head of Household you must first select a location and then fill out the visit form. After you did this, a button “Change Hoh” will appear:

Figure 58 Change Hoh

- By clicking on the button, a list of all the eligible individuals which are associated with the same location/household is displayed (refer to Figure 59). When you select an entry from the list, a confirmation dialog will pop up, asking you if you want to continue with the selected individual. If you continue, the Change Head of Household form will load for you to fill out.

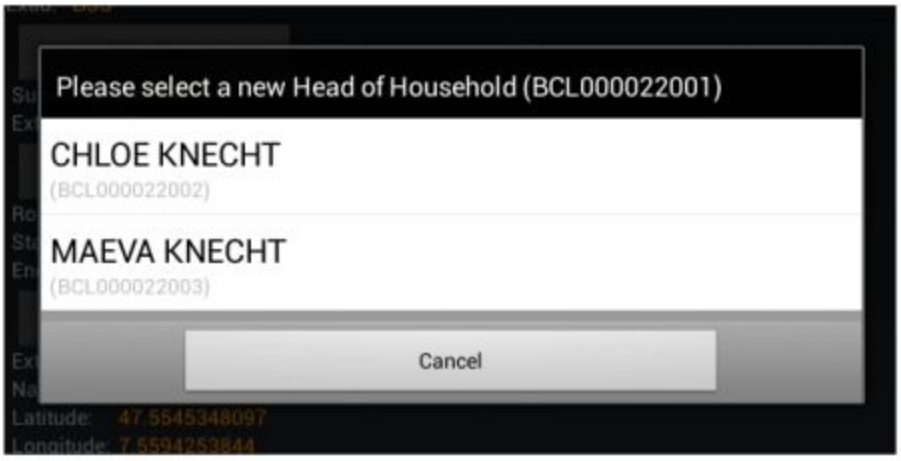


Figure 59

- If there are no eligible successors found or no current Head of household defined for this Socialgroup/Location, a message will be displayed.

Relationship

- To create the relationship tap “Select Individual” button and the list of all individual will be listed, and the Field worker will pick the household member they wish to add the relationship by tapping that member and next the Field worker will tap the ”Relationship”, then the Field worker will search for the individual to add the relationship with. The Field worker should press “Search” button to list individual and pick the one s/he is going to add the relationship and the Relationship page will come up for the Field worker for finalize the relationship by filling in Relationship type and Start Date as shown in Figure 60 below:

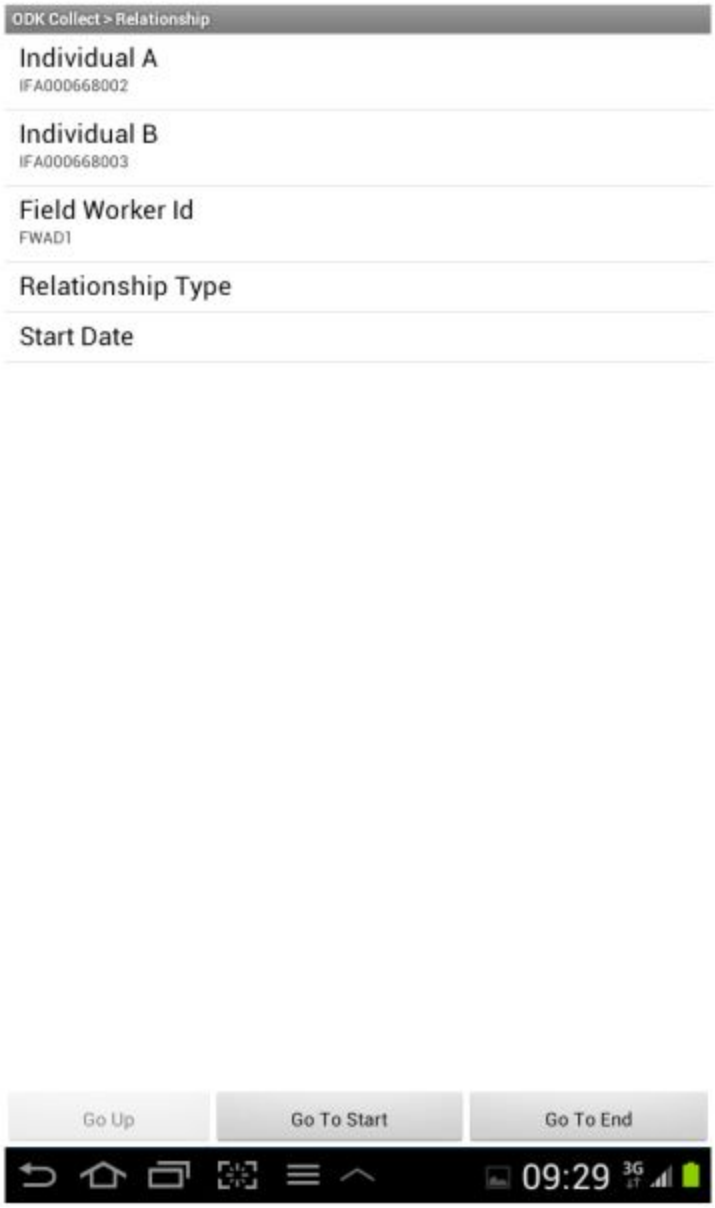

ODK Collect > Relationship
Individual A
IFA000668002
Individual B
IFA000668003
Field Worker Id
FWAD1
Relationship Type
Start Date
Go Up
Go To Start
Go To End
09:29

Figure 60