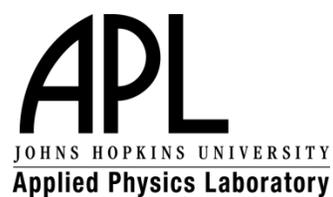


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# SAGES Mobile Data Collection User Guide

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Surveillance Center, Division of GEIS Operations



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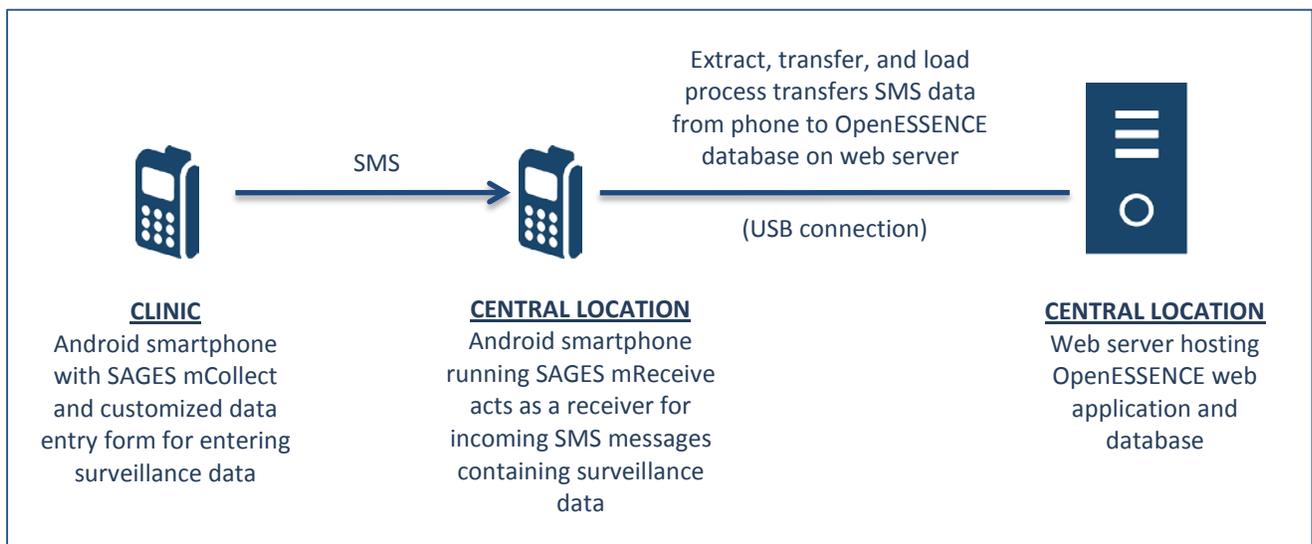
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## INTRODUCTION

Rapid data acquisition is arguably the most challenging aspect of establishing a successful electronic disease surveillance system. In the SAGES system, data can be collected from multiple sources (such as paper-based patient records and clinic logbooks). The process of turning the paper-based records into electronic data depends on the available technology infrastructure:

- If Internet access is available, then a laptop, desktop, or other web accessible device can connect to the OpenESSENCE web application to enter data directly into the OpenESSENCE database, using the data entry forms available in the application.
- If cellular coverage is available, then data can be entered by using simple cell phones to submit manually entered formatted/delimited SMS (Short Message Service) messages, or by using Android devices with data entry forms to submit auto-generated formatted/delimited SMS messages. The SMS messages are received at a central location by an Android smartphone running SAGES mReceive, which is connected to a computer hosting the OpenESSENCE database. The SMS messages are automatically pulled from the receiving phone and written into the database.

This guide focuses on the Android device SMS method of data collection in SAGES. The figure below describes the notional process using Android smartphones. The web application method of entering data is described in the OpenESSENCE User Guide.



The process depends on defining a data entry form (called an XForm, based on XML format) using an open source tool called ODK<sup>1</sup> Build. The form is then loaded into an Android phone-based application called SAGES mCollect, a JHU/APL tool which is a modified version of the popular open source ODK Collect Android phone application. SAGES mCollect, in conjunction with the data entry form, enables the collection of data using a form-based interface on the Android device, and the submission of that data over the SMS protocol. That data is received by an Android device running the SAGES mReceive application.

The forms used in this guide are intended to show the general look and feel of the forms. Since the forms you will be using will be customized to reflect the data you are interested in collecting, your forms will likely appear different than the ones shown in this guide.

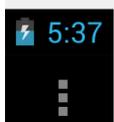
The process of creating a data entry form using ODK Build is outside the scope of this document. For the purposes of this document, it is assumed that:

1. SAGES mCollect is pre-installed on the sending phone (CLINIC phone, from the diagram above).
2. The data entry form is pre-loaded on the sending phone.
3. SAGES mReceive is pre-loaded on the receiving phone.

The SAGES mCollect and mReceive applications have been tested on Android version 2.3 and higher.

The images in this guide are based on Android version 4.1.2.

Throughout this guide, we will use the term *context menu*. A context menu provides options within the context of the screen you are on. An example of a context menu is the action bar shown below. Please note that depending on the type of Android phone you are using, the context menu button may appear differently.



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<sup>1</sup>ODK (Open Data Kit) is an open-source suite of tools developed by the University of Washington that helps organizations author, field, and manage mobile data collection solutions.

## SAGES mCollect User Scenario

The following steps describe the general use of SAGES mCollect to enter data into forms on an Android smartphone or tablet. The data can then be submitted to the receiving smartphone via SMS.

The form images shown in this guide are representative of a typical form that you may use in your implementation. The main steps in completing a form using SAGES mCollect are:

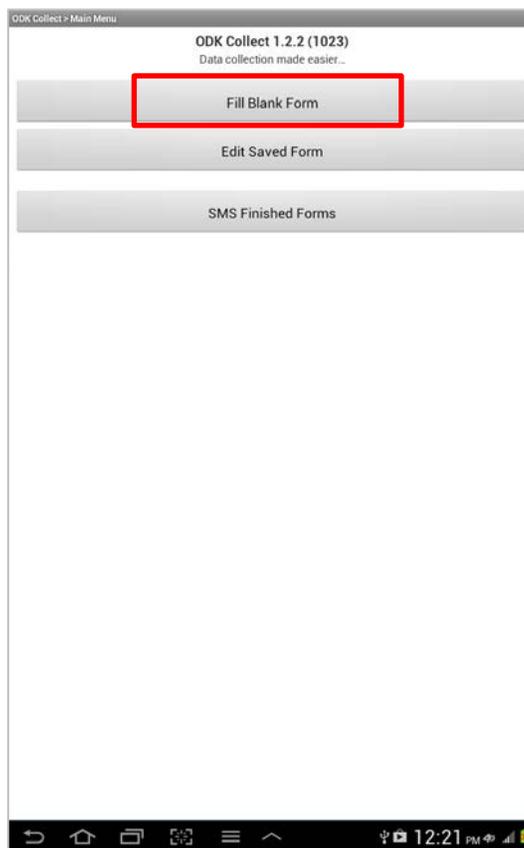
1. Fill out blank form
2. Save form (edits are allowed)
3. Finalize form (edits are allowed)
4. Submit form via SMS (no further edits allowed)

The next sections will describe each step in further detail.

### How to Fill Out a Blank Form and Save

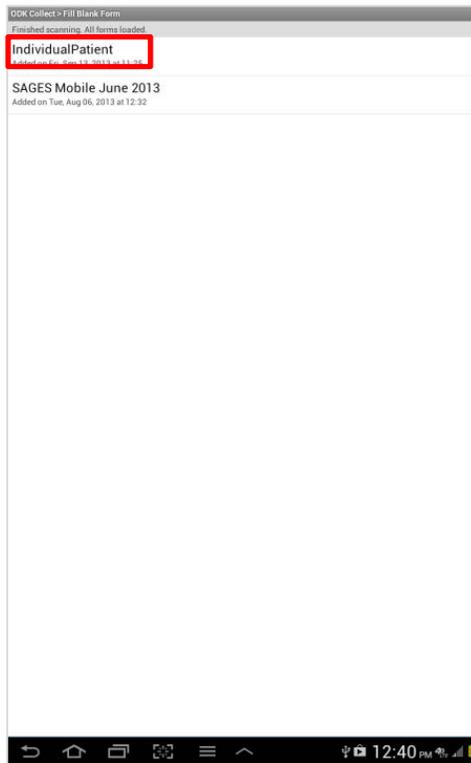
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1. On the smartphone or tablet, launch the SAGES mCollect application, which brings you to the main screen of the application. Select **Fill Blank Form** to select a pre-loaded form.



2. Choose the form you want to fill out. For this example, select **Individual Patient**.

Swipe the screen to begin filling out the form.

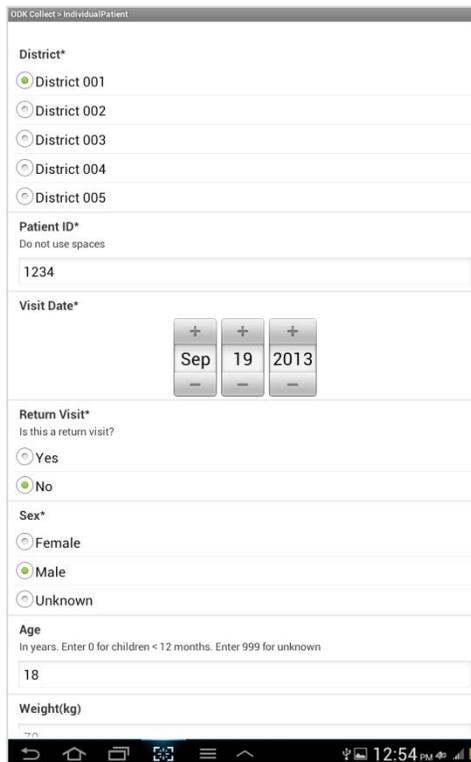


3. Fill out each of the fields related to the individual patient visit. Required fields are marked with an asterisk.

Scroll down to complete the entire form.

The data entry form is customizable (fields, labels, required/not required, etc.)

The data entry form is created using ODK Build and then loaded onto the phone/tablet. The process of creating the form is beyond the scope of this document.



4. At any time, you can jump to a specific area in the form by accessing the context menu and choosing **Go To Prompt**.

ODK Collect > Individual Patient

District\*

District 001

District 002

District 003

District 004

District 005

Patient ID\*

Do not use spaces

1234

Visit Date\*

+

+

+

Sep 19 2013

Return Visit\*

Is this a return visit?

Yes

No

Sex\*

Female

Male

Unknown

Age

In years. Enter 0 for children < 12 months. Enter 999 for unknown

18

Save Form

Go To Prompt

Change Language

General Settings

5. A condensed summary view of the form's fields and current values are displayed. If you want to edit any of the values, tap anywhere on the form to go to the full form screen.
- You can also use the options at the bottom to go to the start or end of the form.

ODK Collect > IndividualPatient

District\*  
District001

Patient ID\*  
1234

Visit Date\*  
19/09/13

Return Visit\*  
No

Sex\*  
Female

Age  
18

Weight(kg)  
70.0

Bp Systolic (mm/Hg)  
/ Diastolic (mm/Hg)

Pulse (beats/min)

Temperature (deg Celcius)

Notes

Symptoms\*

Diagnoses

Go Up    Go To Start    Go To End

6. Once you have finished filling out the form, tap the context menu and select **Save Form**.

After a form is saved, it can still be re-opened for editing.

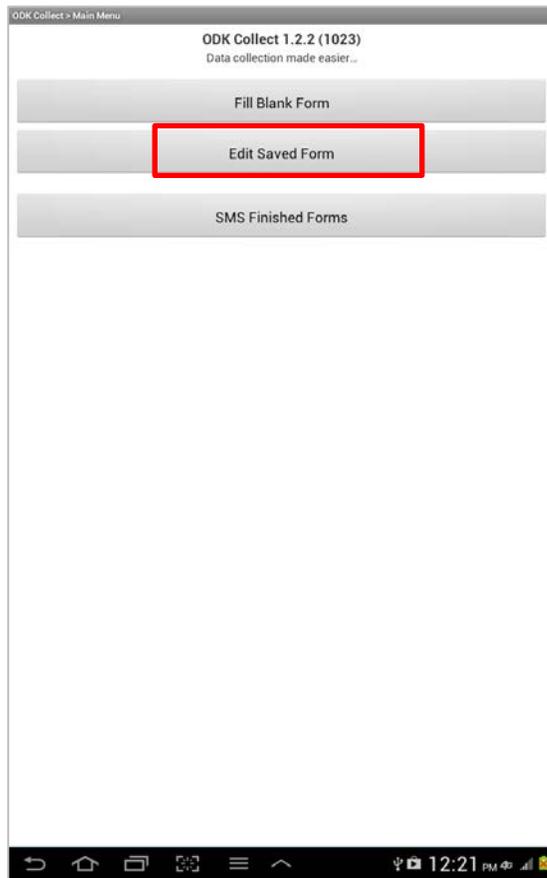
Saving the form is not the same as submitting the form via SMS. The form must still be finalized, and then submitted. You will see how to finalize and submit a form later in this guide.

The screenshot displays the ODK Collect 'IndividualPatient' form. The title bar reads 'ODK Collect > IndividualPatient'. The form contains several sections: 'District\*' with radio buttons for District 001 through 005; 'Patient ID\*' with a text field containing '1234' and the instruction 'Do not use spaces'; 'Visit Date\*' with a date picker showing 'Sep 19 2013'; 'Return Visit\*' with radio buttons for 'Yes' and 'No'; 'Sex\*' with radio buttons for 'Female', 'Male', and 'Unknown'; and 'Age' with a text field and instructions. At the bottom, a dark navigation bar contains icons for 'Save Form' (a document icon), 'Go To Prompt', 'Change Language', and 'General Settings'. The 'Save Form' icon is highlighted with a red square. The Android system bar at the very bottom shows the time as 1:54 PM.

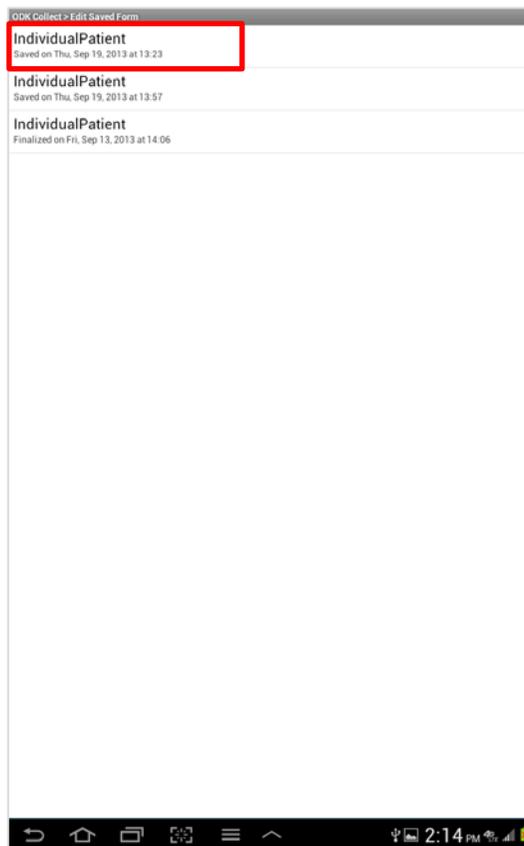
## How to Edit a Saved Form

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1. On the smartphone or tablet, launch the SAGES mCollect application, which brings you to the **Main Menu** of the application. Select **Edit Saved Form**.



2. The **Edit Saved Form** view appears. The most recently saved form instance is at the top of the list. Select the specific individual form that you want to edit.



3. A summary view of the form appears. Tap anywhere on the form to launch the full version of the form. Finish entering or editing the data in the form.

The screenshot shows the 'IndividualPatient' form in ODK Collect. The form is titled 'ODK Collect > IndividualPatient' and contains the following fields:

- District\***: A list of radio buttons for District 001, District 002, District 003, District 004, and District 005. District 001 is selected.
- Patient ID\***: A text input field with the value '1234'. Below the field is the instruction 'Do not use spaces'.
- Visit Date\***: A date picker showing 'Sep 19 2013'.
- Return Visit\***: A question 'Is this a return visit?' with radio buttons for 'Yes' and 'No'. 'No' is selected.
- Sex\***: Radio buttons for 'Female', 'Male', and 'Unknown'. 'Male' is selected.
- Age**: A text input field with the value '18'. Below the field is the instruction 'In years. Enter 0 for children < 12 months. Enter 999 for unknown'.
- Weight(kg)**: A text input field.

The Android status bar at the bottom shows the time as 12:54 PM.

4. Remember to save the form after you have made your changes.

Tap the context menu button and select **Save Form**.

The screenshot shows the ODK Collect 'IndividualPatient' form. The fields include: District\* (radio buttons for District 001-005, with District 001 selected), Patient ID\* (text input with '1234' and a note 'Do not use spaces'), Visit Date\* (date picker showing 'Sep 19 2013'), Return Visit\* (radio buttons for Yes/No, with No selected), Sex\* (radio buttons for Female/Male/Unknown, with Male selected), and Age (text input with instructions). At the bottom, a context menu is open with 'Save Form' highlighted in red. The Android system bar at the very bottom shows the time as 1:54 PM.

## How to Finalize a Form

Finalizing a form indicates that the form has been completed and is ready to be submitted via SMS. A finalized form can still be edited if changes are needed. Finalizing a form is the last step before submitting via SMS.

1. After you have finished entering data in the form, swipe the screen to the LEFT to advance to the end of the form.

**NOTE:** If any required data is missing, you will be prevented from finalizing the form. A message will appear indicating that a response is required in the highlighted field, as shown in the image on the right.

The screenshot shows a mobile application interface for data collection. The form is titled "DDK Collect > IndividualPatient". It contains several fields: "District\*" with radio buttons for District 001 through 005; "Patient ID\*" with a text input field and the instruction "Do not use spaces"; "Visit Date\*" with a date picker showing "Sep 10, 2013" and a red error message "Sorry, this response is required!" overlaid on the date; "Return Visit\*" with radio buttons for "Yes" and "No"; "Sex\*" with radio buttons for "Female", "Male", and "Unknown"; "Age" with a text input field containing "18" and the instruction "In years. Enter 0 for children < 12 months. Enter 999 for unknown"; and "Weight(kg)" with an empty text input field. The bottom of the screen shows an Android navigation bar with icons for back, home, recent apps, search, and a menu, along with the time "1:13 PM" and battery status.

2. Check the **Mark form as finalized** box. Finalizing a form indicates that the form is complete and ready to be submitted via SMS. You can also give this form a unique name.

Tap **Save Form and Exit**. Now that the form finalized, it is ready to be submitted.

NOTE: You can still edit a finalized form if needed. As long as the form has not been submitted yet, it can still be edited.

The screenshot shows the ODK Collect mobile application interface. At the top, the title bar reads "ODK Collect > IndividualPatient". The main content area displays the message "You are at the end of 'IndividualPatient'." Below this, there is a section titled "Name this form:" with a text input field containing "IndividualPatient Clinic A". Underneath the input field is a checkbox labeled "Mark form as finalized", which is checked. At the bottom of the form area is a large grey button labeled "Save Form and Exit". The bottom of the screen shows the Android navigation bar with icons for back, home, and recent apps, along with the time "2:55 PM" and battery status.

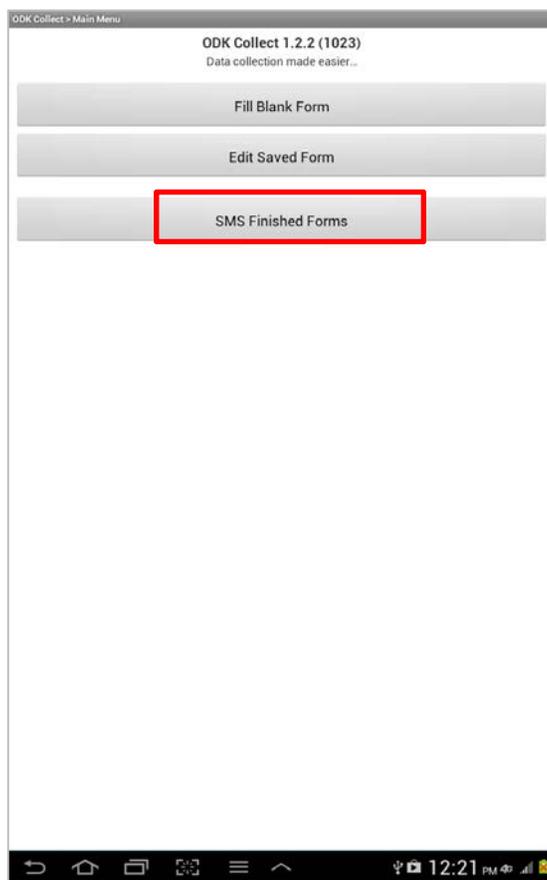
## How to Submit a Finalized Form

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After the form is finalized, it can be submitted via SMS to the receiving phone. Once a form has been submitted, you will not be able to make any further changes to it. For the purposes of this guide, we will assume that the SAGES mReceive application has already been properly configured to receive data from the sending phone/tablet. The following steps describe how to submit a finalized form from the sending phone/tablet (using SAGES mCollect).

1. From the SAGES mCollect Main Menu, tap **SMS Finished Forms**.

NOTE: You may have to tap the Back button to get back to the Main Menu.

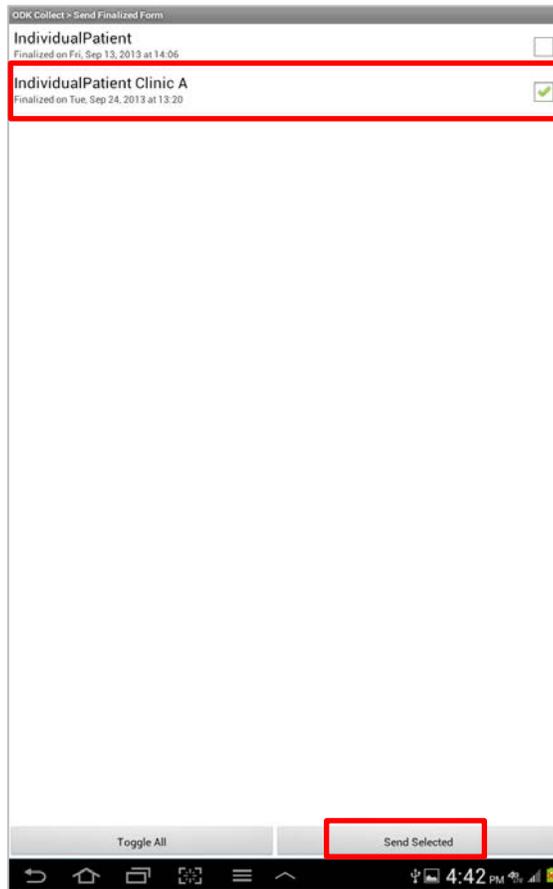


2. A screen containing a list of finalized forms will appear.

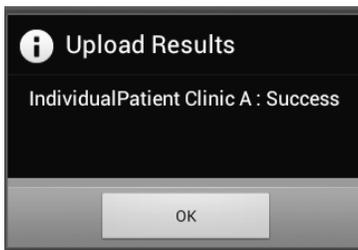
Select the form that you want to submit, and then tap **Send Selected** from the bottom of the screen.

If you multiple finalized forms that needed to be submitted, you can select multiple forms.

You can also use the **Toggle All** option, which will select (or deselect) all forms in the list.



3. After the form is submitted, you will receive a confirmation message. Tap **OK** on the message to return to the **Send Finalized Form** view. The form you just submitted will be gone from the list now.



The receiving Android smartphone (running the SAGES mReceive application) can be configured to return an acknowledgement SMS indicating that the form was received and parsed successfully, *or* it can be configured to only return a message when an error has occurred. The latter option incurs less SMS messaging costs. The acknowledgement messages are accessed from the phone's built-in Messaging application. They are not part of SAGES mCollect.