# The Community Health Toolkit's Core Framework: An Overview

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This overview was published August 2019. For the latest information and features, visit http://communityhealthtoolkit.org

# INTRO

## Mission & Vision

We're building open source technology for a new model of healthcare that reaches everyone. We envision a world where primary health care is equitable, accessible, and delivered by people who are trusted in their communities.

# The Community Health Toolkit

The Community Health Toolkit (CHT) is a project by a group of leading organizations who have come together to support the development of digital health initiatives in the hardest-to-reach areas.

The CHT provides you with resources to design, build, deploy, and monitor digital tools for community health. It includes open source software frameworks and applications, guides to help design and use them, and a community forum for collaboration and support. Together, we envision a world where healthcare is of the highest attainable quality, equitable, accessible, and delivered by the people who are trusted most in their communities.

With more than 24,000 health workers using these tools to support a million home visits every month, the CHT is the most full-featured, mature, and widely-used open source software toolkit designed specifically for advanced community health systems.

# The Community Health Toolkit's Core Framework

# The Core Framework: An Overview

The Core Framework makes it faster to build full-featured, scalable digital health apps by providing a foundation developers can build on. These apps can support most languages, are offline-first, and work on basic phones (via SMS), smartphones, tablets, and computers.

App developers are able to define health system roles, permissions and reporting hierarchies, and make use of five highly configurable areas of functionality: messaging, task and schedule management, decision support workflows, longitudinal person profiles, and analytics.

The Core Framework can be used to support the unique needs of a given health system and the work of community health workers, frontline supervisors, facility-based nurses, health system managers, and even patients and caregivers.
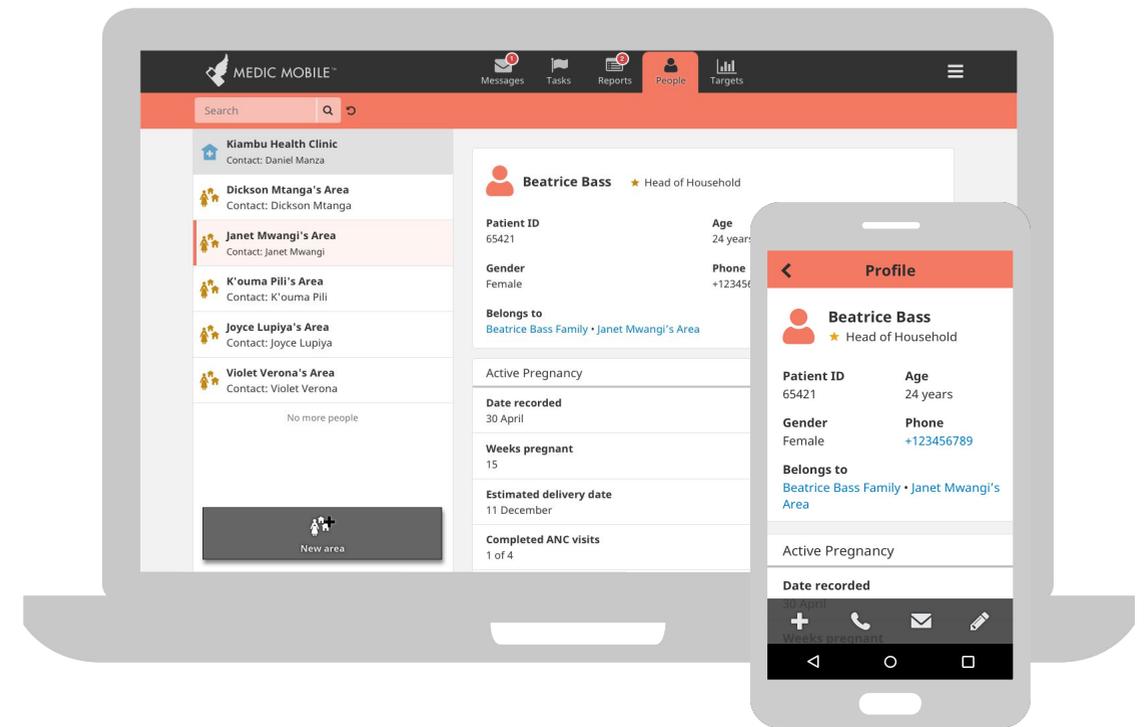
# The Core Framework: Our Responsive Web App Model

A responsive web app is a hybrid of a website and a mobile application. On desktop and laptop computers, it runs in the web browser. On Android devices (such as cell phones or tablets), it is downloaded as an app. The same source code powers the experience, meaning that the app you see on your desktop is the same app you see on your mobile device.

Web apps built with the Core Framework are fully responsive, which means content will scale to fill the available space. Users accessing the app on a mobile device will see a single-panel mobile layout. Users accessing the app on a desktop or laptop device will see a two-panel layout.
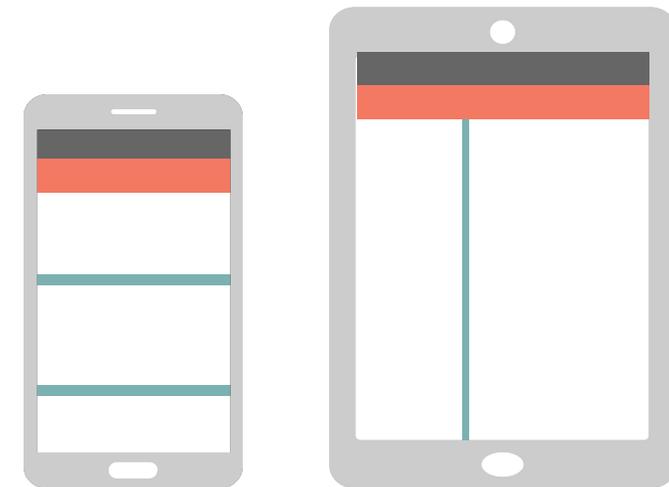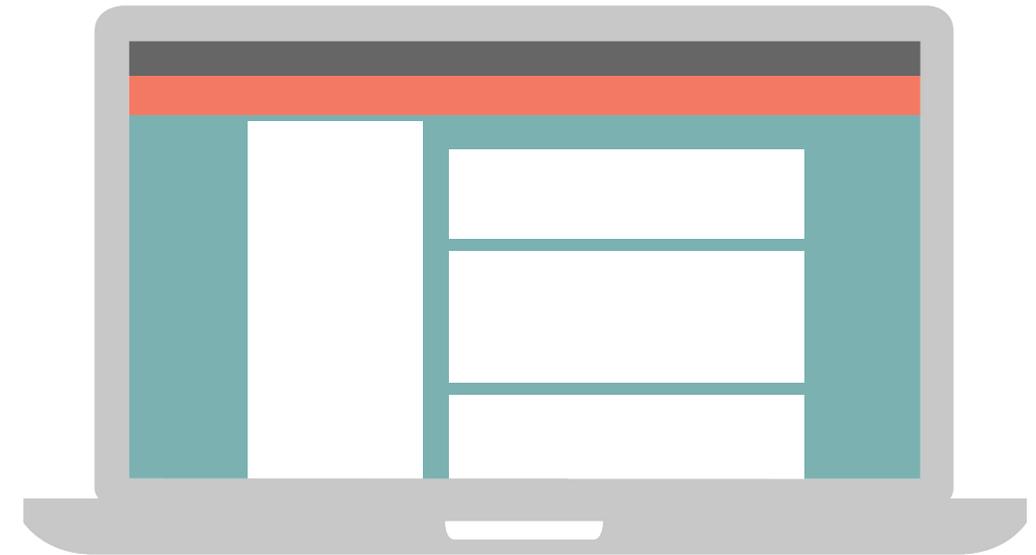
# The Core Framework: Offline-First Technology

Our technologies need to support health systems in a wide range of low infrastructure environments. Apps built with the Core Framework are designed to be offline-first and work with only an occasional internet connection.

The app stores a user's data locally on their device so that workflows can be completed without syncing to the server. When a connection becomes available, data will automatically sync to and from the server. Offline-first technology enables health workers to carry out important duties even when opportunities to sync may be weeks apart.

As with any app, there is a limit to how much data can be stored locally, particularly on a mobile device. For users needing access to large amounts of data, online user roles are available.

# The Core Framework: Made for Localization

Français (French)

हिन्दी (Hindi)

नेपाली (Nepali)

Español (Spanish)

Kiswahili (Swahili)

English

Bahasa Indonesia (Indonesian)

Bamanankan (Bambara)

Apps can be customized for different deployments and types of workflows. We're already using the framework in many countries around the world with localization settings.

Users can currently interact with the app in English, French, Hindi, Nepali, Spanish, Swahili, or Indonesian and new languages can be added in the admin console. The app also supports Bikram Sambat or Gregorian calendars and localized date formatting.

# App Development

# App Development

From a technical perspective, developing a custom app begins with writing XForms, JSON, and JavaScript code that configures the Core Framework's features to meet your organization's needs.

The Core Framework allows you to define each element in your app in a modular way, and then specify when and how it should appear for different types of users, without having to modify the underlying Framework. Collectively, this customization is referred to as Configuration Code.

Developing an app using the Core Framework requires an understanding of:

- Javascript code and expressions
- JSON format used to specify configuration
- XLSForms to setup actions and contacts

For more info about app development, visit our website.

# App Development: Reference Apps
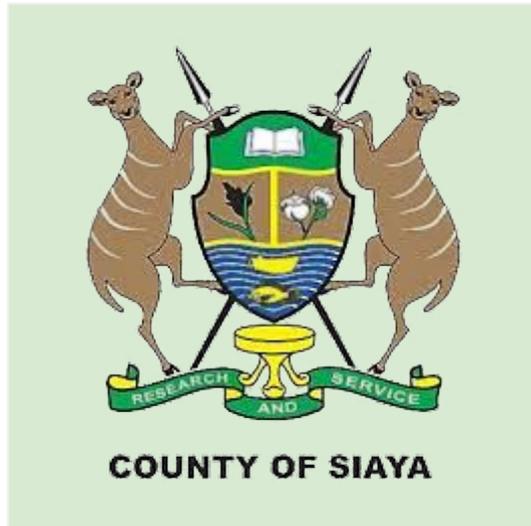

Siaya County MOH App


Muso CHW App
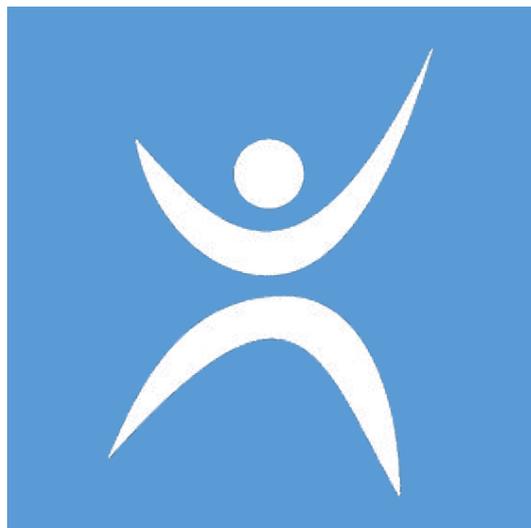

Living Goods SmartHealth App


Medic Android Demo App

The Community Health Toolkit's Reference Apps provide organizations with a template for structuring and organizing a community health workflow, its configuration code, and testing framework. They include a foundation for forms, data fields, and even analytics, and can be deployed as-is or easily customized by a developer for your unique context.

This slide deck won't describe any one Reference App in detail. Instead, we'll use screenshots from the Medic Android Demo App and other Reference Apps to give you a general idea of how the Core Framework's features can be deployed for different types of users in a wide range of health programs.

# User Personas

# User Personas



**CHW**



**CHW Supervisor**



**Nurse**



**Data Manager**

We've used the Core Framework to build apps for a variety of users, including community health workers (CHWs), CHW supervisors, nurses, system administrators, and other people who deliver care and support.

User personas give us a common understanding of who we are serving, particularly when working across diverse contexts. Our global personas are based on "typical" users, knowing that some variation is present in different settings.

Being explicit about who are we designing with and for, and understanding what's important to them helps us prioritize features, make better design decisions, and optimize impact.

# User Personas: Community Health Worker (CHW)



CHWs are the central users of apps built with the Core Framework. They conduct household visits and are responsible for the health of their community. CHWs typically live in and are chosen by their community. Their degree of health training, responsibilities, and support depends upon their country and program. Many are unpaid volunteers, though a growing number receive wages or incentives. Most operate as a CHW on a part-time basis while engaging in farming or other income-generating activities. Most CHWs are responsible for:

- Registering new people and families
- Conducting guided health assessments
- Screening for and tracking specific conditions
- Providing basic medicines and health supplies
- Reporting danger signs & referring to the clinic
- Following up about clinic visits and care

# User Personas: CHW Supervisor

The CHW supervisor is the person who trains and supports CHWs and helps them meet their monthly goals. Supervisors usually split their time between administrative duties at the local health facility and accompanying CHWs on their community visits. Most CHW supervisors are responsible for:

- Training CHWs and reinforcing health knowledge and protocols
- Following up with CHWs on high-priority cases
- Liaising with the facility-based staff on the needs at the community level
- Mobilizing CHWs to educate community on health promotion campaigns
- Tracking progress towards key impact metrics and helping CHWs reach their targets
- Aggregating CHW data and reporting on activities to health system officials

# User Personas: Nurses



Nurses are stationed at the health facility and spend their days seeing patients. They are very busy and may see 50 or more patients a day. At the clinic, they sometimes deal with staff shortages, stock-outs, and poor internet connectivity. They help train and manage CHWs, particularly during monthly meetings at the facility. They are interested in seeing improvements in health metrics for the areas their facility serves. Most nurses are responsible for:

- Assessing patients and providing primary care
- Reporting service delivery statistics to health system officials
- Coordinating care for high-priority patients through CHWs and supervisors
- Initiating events to promote healthy practices in the community

# User Personas: Data Manager



Data Managers are often based at a regional health facility and serve many local facilities. They are responsible for collating and reporting on community and health system data. Their work often involves following up with supervisors and nurses to verify data and retrieve missing information. Most data managers are responsible for:

- Collecting health system data from the field
- Verifying data for accuracy and completeness
- Aggregating data and providing reports to nurses, supervisors, and health system officials with raw numbers and trends on key metrics

# Hierarchies, User Roles & Permissions

# Hierarchies

| | |
|---|---|
| Level 3 | |

Level 2

Level 1

Level 1

Level 1

Level 2

Level 1
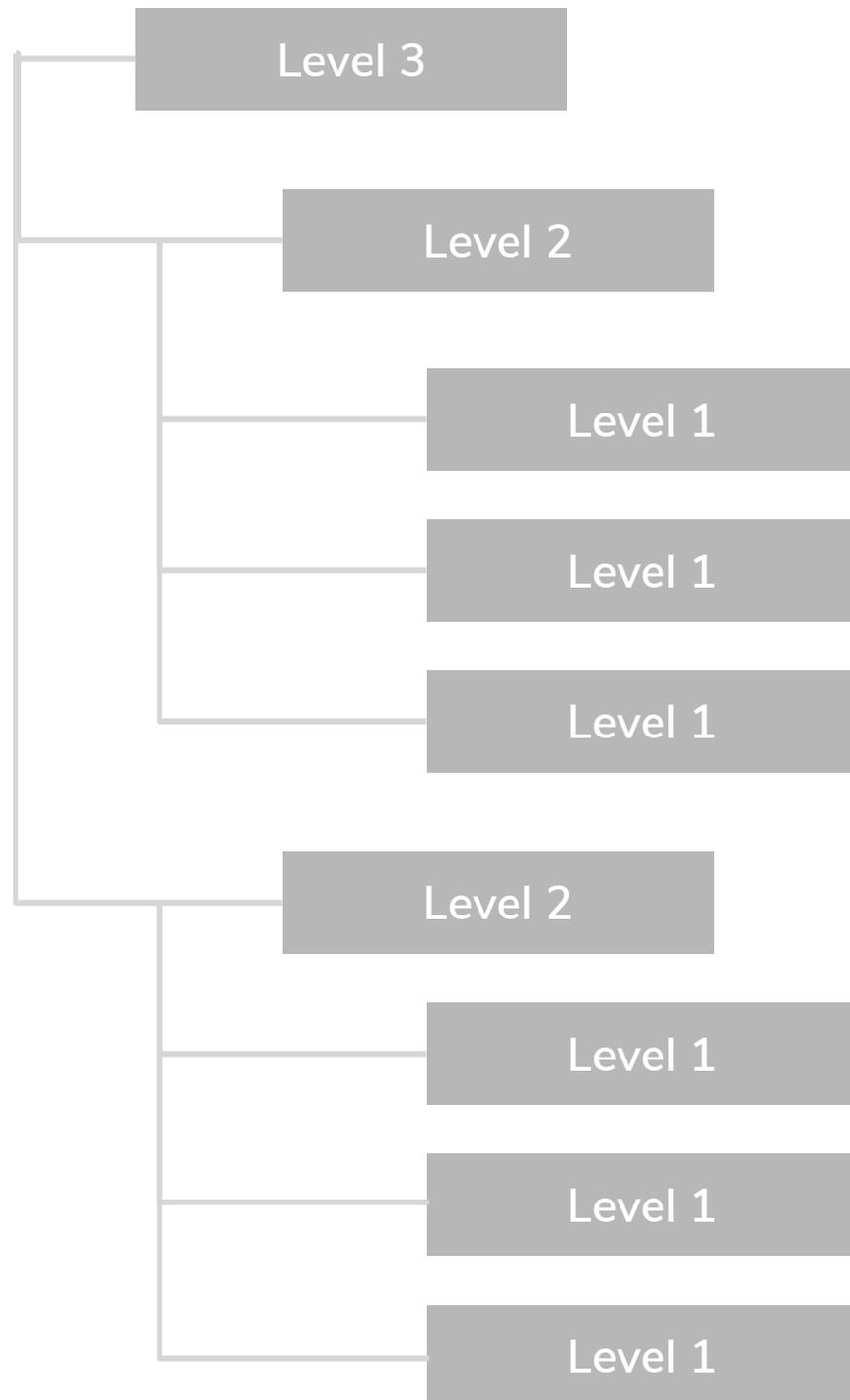
Level 1

Level 1

The Core Framework requires a hierarchy to organize the app. It is often based on the hierarchy of a health system. These levels might have different titles depending on a particular health system's configuration.

A user logging into their app will see a custom set of people, tasks, reports, and analytics based on the hierarchy level that they belong to. This allows appropriate data sharing based on the role of the user in the health system.

Note that each place in a hierarchy must have a primary contact person assigned to it. Other program staff working at the same level can be registered but there is only ever one primary contact. Supporting more flexible hierarchies is on the Core Framework development roadmap.

# Hierarchies: Sample Hierarchy "A"

**Level 3**

District

**Level 2**

Health Center A

CHW Area

**Level 1**

CHW Area

CHW Area

**Level 2**

Health Center B

CHW Area

**Level 1**
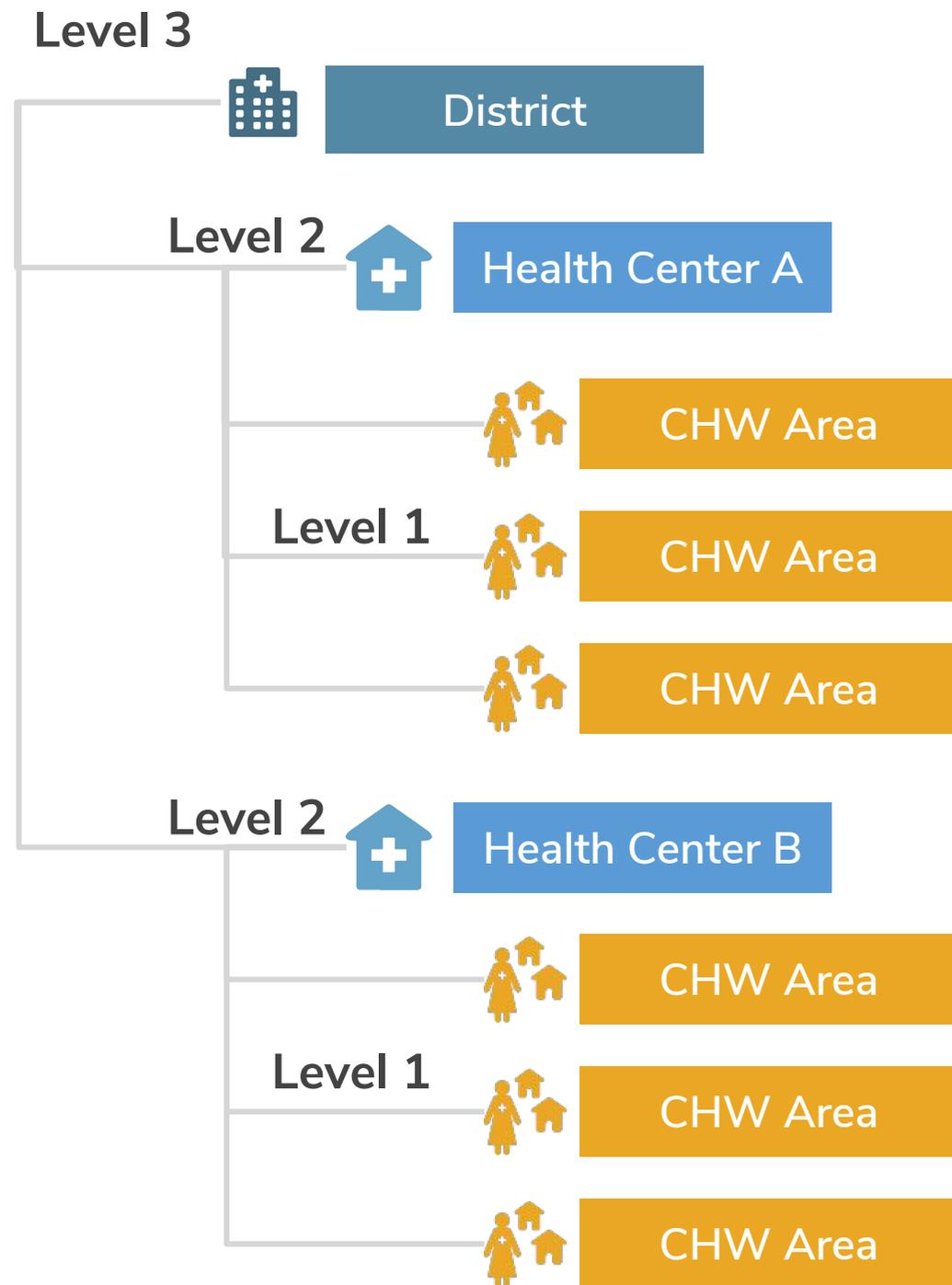
CHW Area

CHW Area

This is an example of a hierarchy that includes district, health center, and CHW areas as the three levels which serve as "places," or units of organizing people. User roles can be assigned to log in at any of these levels. For example, it would be customary for a CHW to log in at the CHW Area level and view the people, i.e. patients, who belong there.

This is the typical setup for a project that prioritizes district-level overview and aggregation. In this hierarchy, patients are often created under the "CHW Area" level, and are not organized by household.

# Hierarchies: Sample Hierarchy "B"

**Level 3**

🏥 Health Center

**Level 2** 👨‍👩 CHW Area A

**Level 1**
- 👪 Family A
- 👪 Family B
- 👪 Family C

**Level 2** 👨‍👩 CHW Area B

**Level 1**
- 👪 Family D
- 👪 Family E
- 👪 Family F
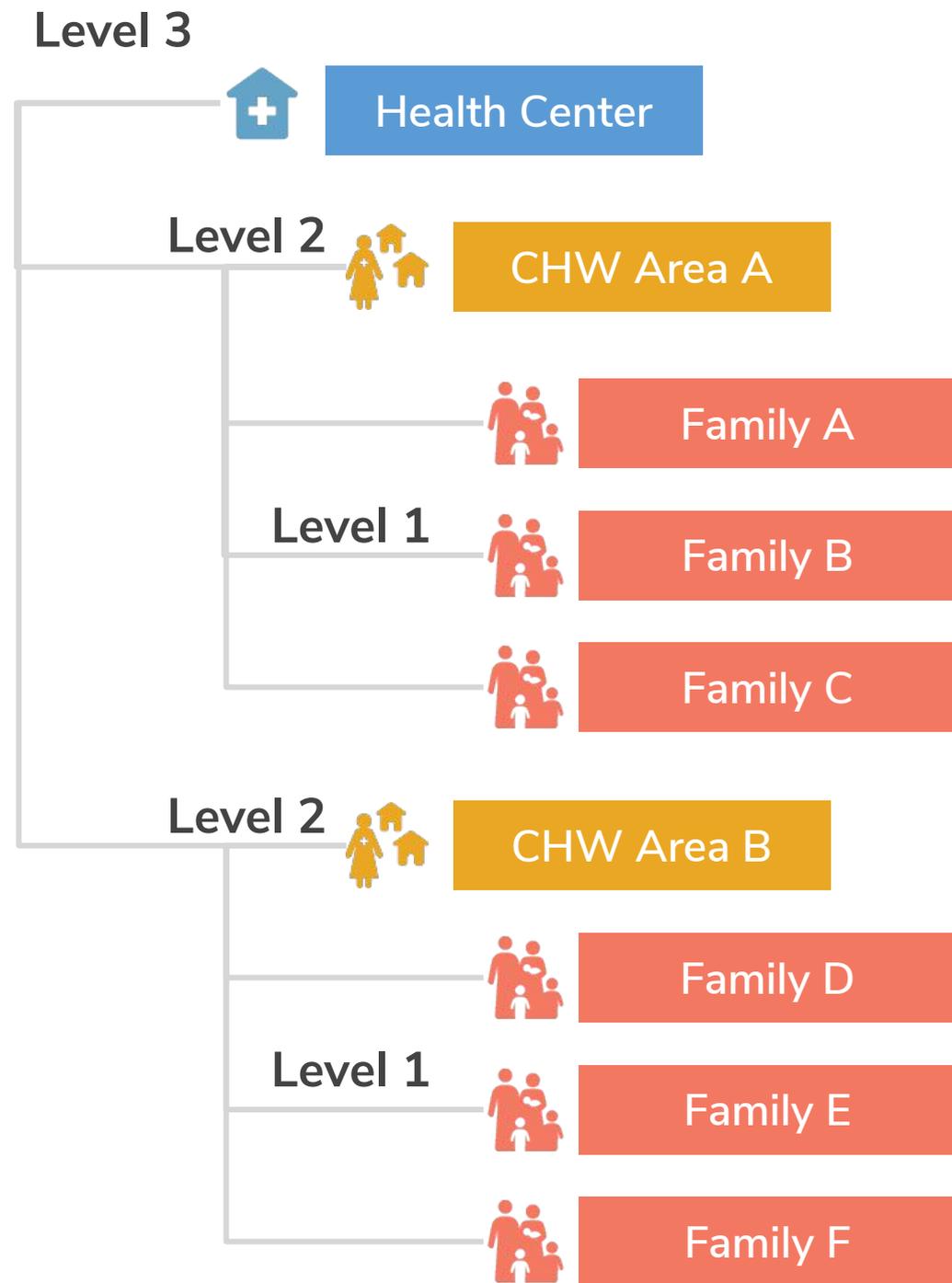
This is an example of a hierarchy that includes health center, CHW area, and families as the three levels which serve as "places" or units of organizing people. User roles can be assigned to log in at any of these levels. For example, it would be customary for a CHW to log in at the CHW Area level and view the families, and below that the people, i.e. patients or family members, who belong there.

This is the typical setup for a project that requires family-level views.

# Hierarchies: Sample Hierarchy "B" with People

The app hierarchy can be modeled after the health system, health program or the community. All people are associated with a place and these places can be associated to each other. For instance, a Family Member is part of a Household. A Household and CHWs are part of a CHW Area. A CHW Area and nurses are part of a Health Facility. Additional levels may be added as needed. The Admin level operates outside of the hierarchy and gives access to all levels and people.



Admin    Program Officer

1 CHW Supervisor: ~20 CHWs
1 CHW: ~100 Households
1 Household (HH): ~6 Family members

Health Facility    CHW Supervisor

Health Facility    CHW Supervisor

CHW Area    CHW

CHW Area    CHW

CHW Area    CHW

CHW Area    CHW

CHW Area    CHW

CHW Area    CHW

HH  HH  HH    HH  HH  HH    HH  HH  HH    HH  HH  HH    HH  HH  HH    HH  HH  HH
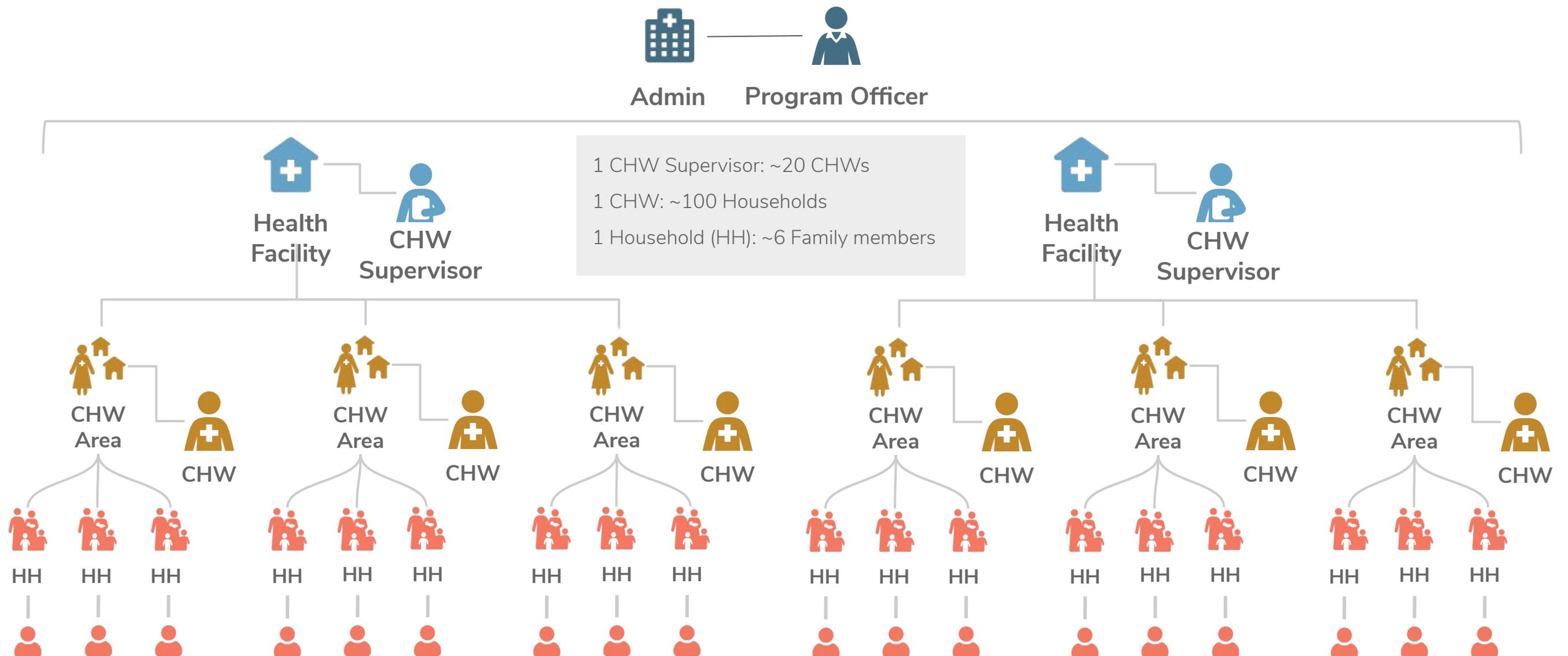
# User Roles

The app uses roles and permissions to determine who has access to what data. User roles are general categories we use to assign a collection of broad permissions to users. There are two classes of roles: online and offline. Generally speaking, CHWs are usually offline users, while managers and nurses are usually online users. SMS users do not use the app, and thus do not have a user role.

## Online Roles

Online roles are for users who need access to a lot of data and need to maintain the system or update system settings. An internet connection is required.

## Offline Roles

Offline roles are for users who need to be able to access data on the go in the field, don't need to maintain the system, and don't have a reliable internet connection. All the data they have access to will be synced to their device.

Online
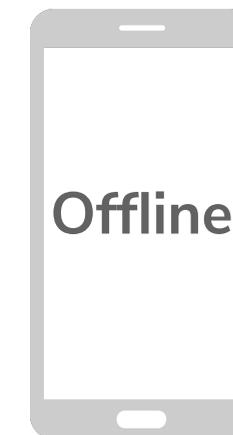
Offline

# User Roles: Sample Hierarchy "B"

Some people in the app will also be app users. Differing levels of access and permissions are assigned to each persona. A user role is created to provide them with access to the information they need. Offline and online access, storage limitations, and data privacy are taken into account.

| Persona | Hierarchy | Device | Permissions |
|---|---|---|---|
| **Program Officer** | Logs in as Admin | | Admin users, usually Program Officers, are online-only admin users not associated to a particular level. They have access to all people, places, and records in the app, but since they are online-only users, they cannot view any tasks or targets. |
| **CHW Supervisors** | Logs in at Health Facility level | | User at this level have offline access to view CHWs, fill out reports about them, and view tasks and targets related to them. Due to storage limitations, they aren't able to view households or submit reports and review tasks and targets about them. |
| **CHWs** | Logs in at CHW Area level | | Users at this level have offline access to view households and family members, submit reports about them, and view tasks and targets about them. |
| **Family members** | Registered at Household level. Does not log in. | | Family members might include fathers, mothers, children, and other adults. The program model determines which family members should be registered in the app. However, they are not users of the app, and do not log in themselves. |

# User Permissions

Roles are broad general collections of permissions. Permissions are fine grained settings that individually toggle on or off to allow a role to do a certain action or see a certain thing.

Viewing permissions determine which page tabs a user sees in the app and which types of data they do and don't have access to. User action permissions include who can create (e.g., create new users), who can delete (e.g., delete reports), who can edit (e.g., edit profiles), and who can export (e.g., export server logs).

# Accessing And Navigating The App

# Hardware & Software Requirements

Hardware procurement, ownership, and management is the responsibility of each implementing organization. We strongly urge all organizations to procure hardware locally to ensure ease of replacement, repair, sustainability, and hardware support when needed.

## Mobile Devices

The app runs on Android phones and tablets. It works best on devices running version 5.1 or later with at least 8 GB of internal memory (16 GB for supervisors) and minimum 1 GHz RAM.

## Desktops and Laptops

The app runs on most any modern computer with the newest versions of Google Chrome or Mozilla Firefox.

# Accessing on Mobile
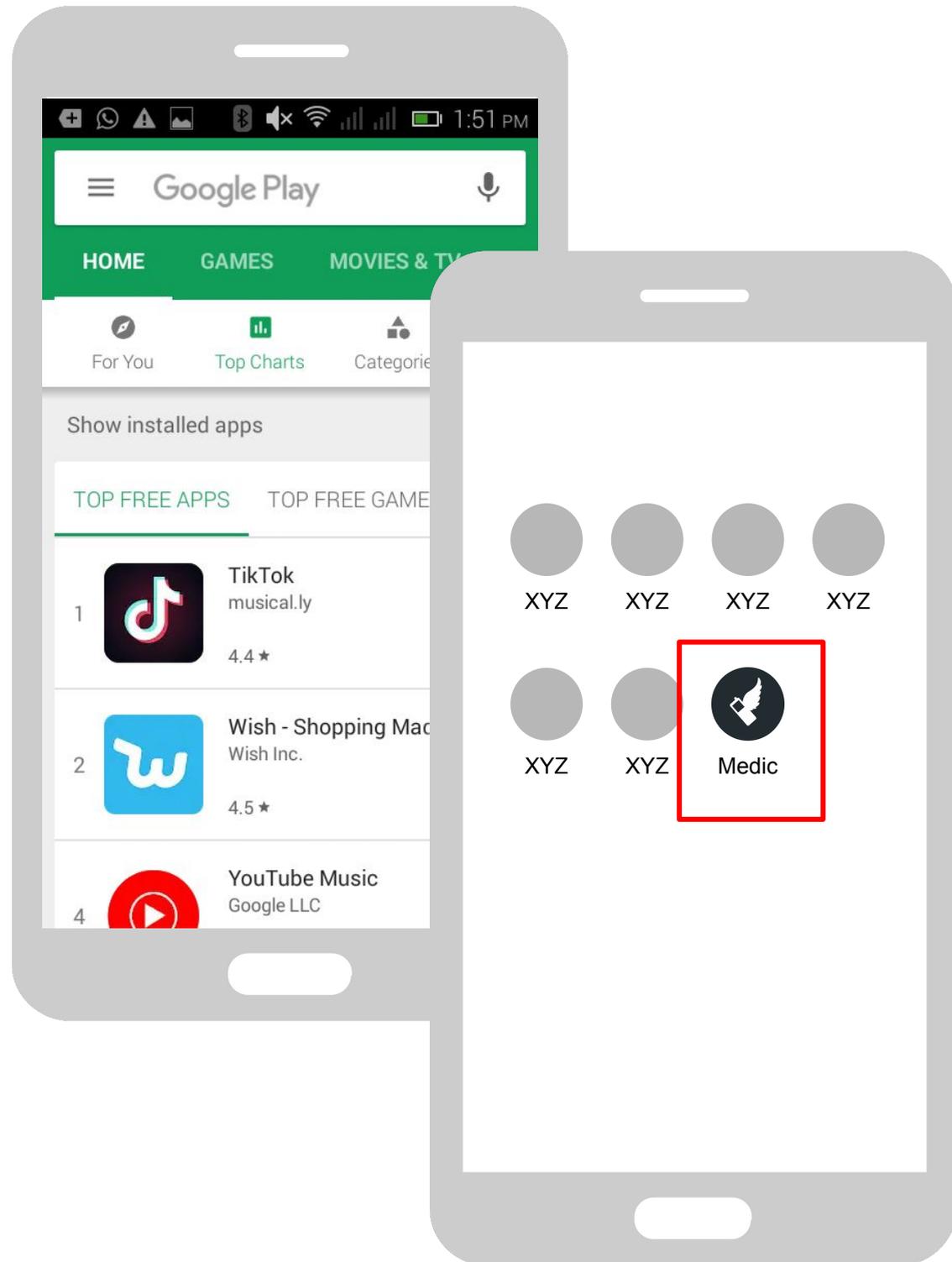


## Downloading

To download your app on a mobile device, first navigate to the Google Play Store. From there, click on the search icon in the upper right, and type in the custom name of your health app or project. Make sure the app shown is the correct one and then select it. Then, click on the "Install" button to begin the download.

## Launching

Once the download is complete, you can access your app via an app icon in your applications menu. Note that the icon, as well as the app name displayed, is customizable by the organization or project.

## Accessing on Desktop

On desktop devices, there is no need to download anything. Simply go to a web browser and type in your unique URL, for example:

{{projectname}}.app.medicmobile.org

https://projectname.medicmobile.org
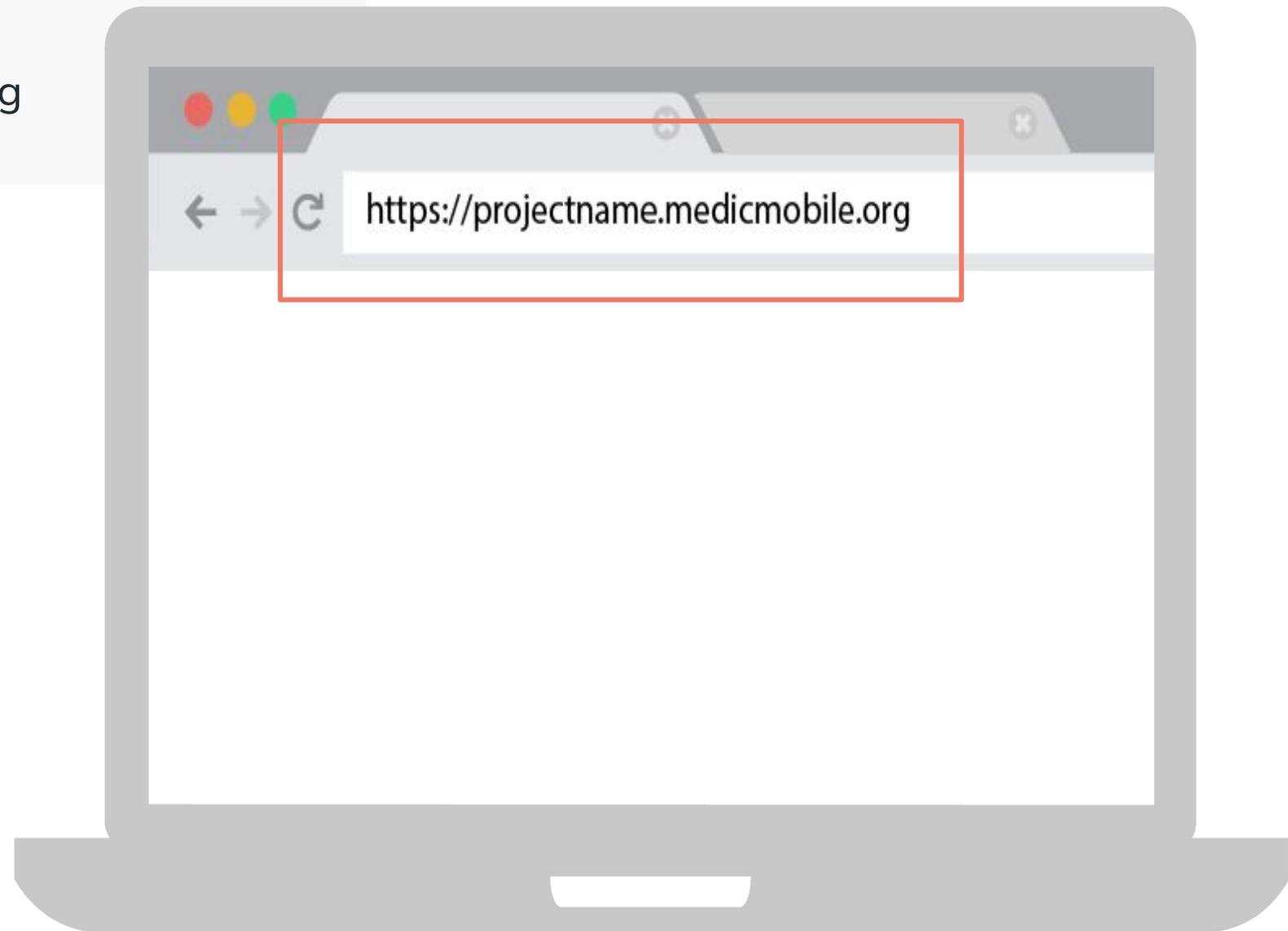
# Logging In

When accessing your app for the very first time, a login page is displayed. Users enter a username and password that grant access to their customized app experience.

On mobile devices, the app generally stays logged in after initial setup so that CHW users don't have to type in their credentials each day.

On desktop devices, the user must login again if they close the app tab or browser window.

Users may log out by going to the options menu available in the top right corner of the app.
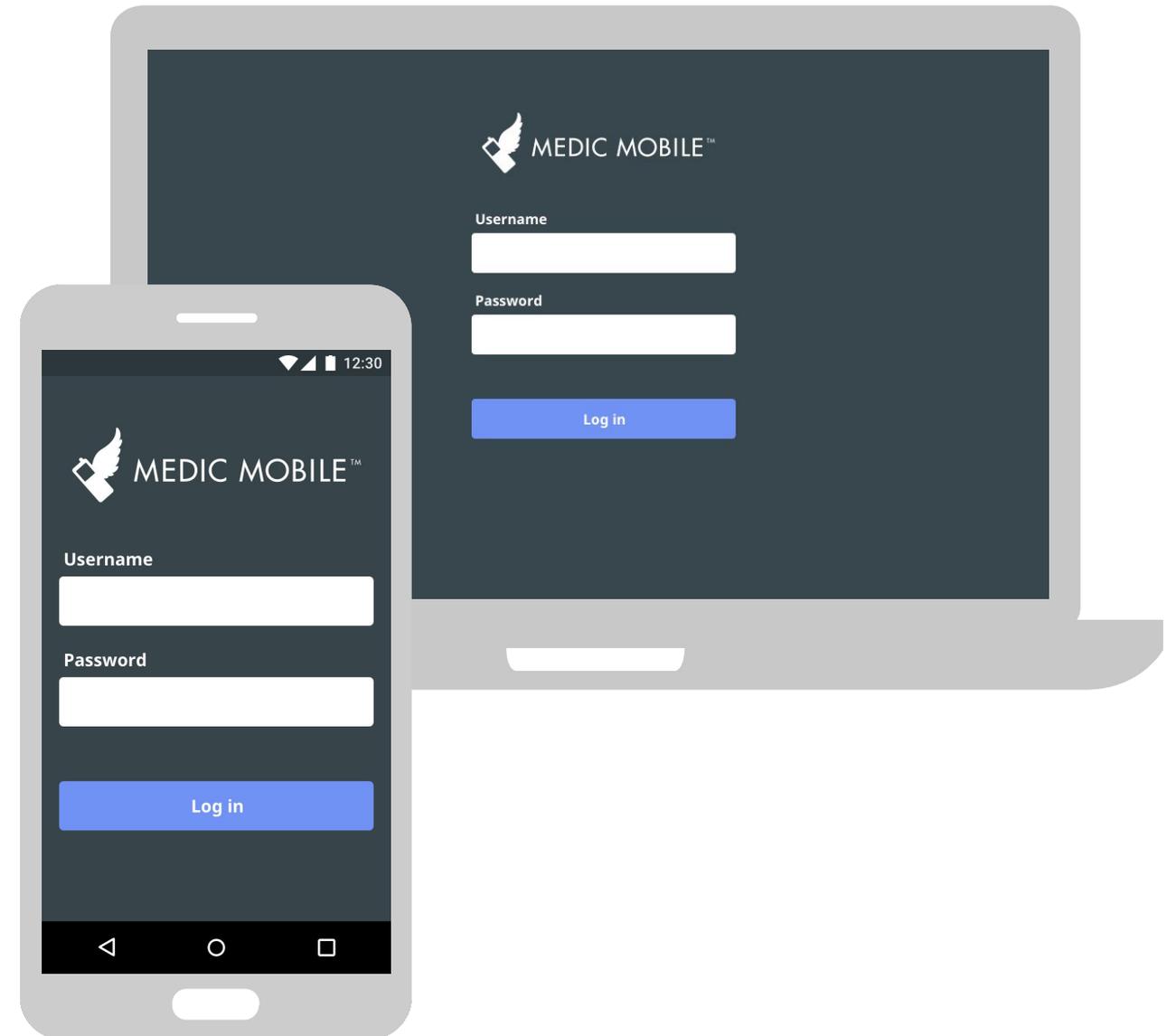
# Summary of Page Tabs

Page tabs are the primary method of navigating in your app. The number of tabs is variable depending on the user's role and place in the hierarchy. For example, non-admin users don't have Messages. The Reports tab is accessible to CHWs but often tucked away inside the secondary menu drawer.

- **People**: This is where profiles of districts, staff, CHWs and patients live

- **Tasks**: This is a list of upcoming visits, follow-ups, or other required tasks

- **Targets**: Displays real-time visualizations of key activity and impact indicators

- **Reports**: A detailed history of all forms submitted by CHWs and other staff

- **Messages**: A place for community-based staff to send and exchange messages
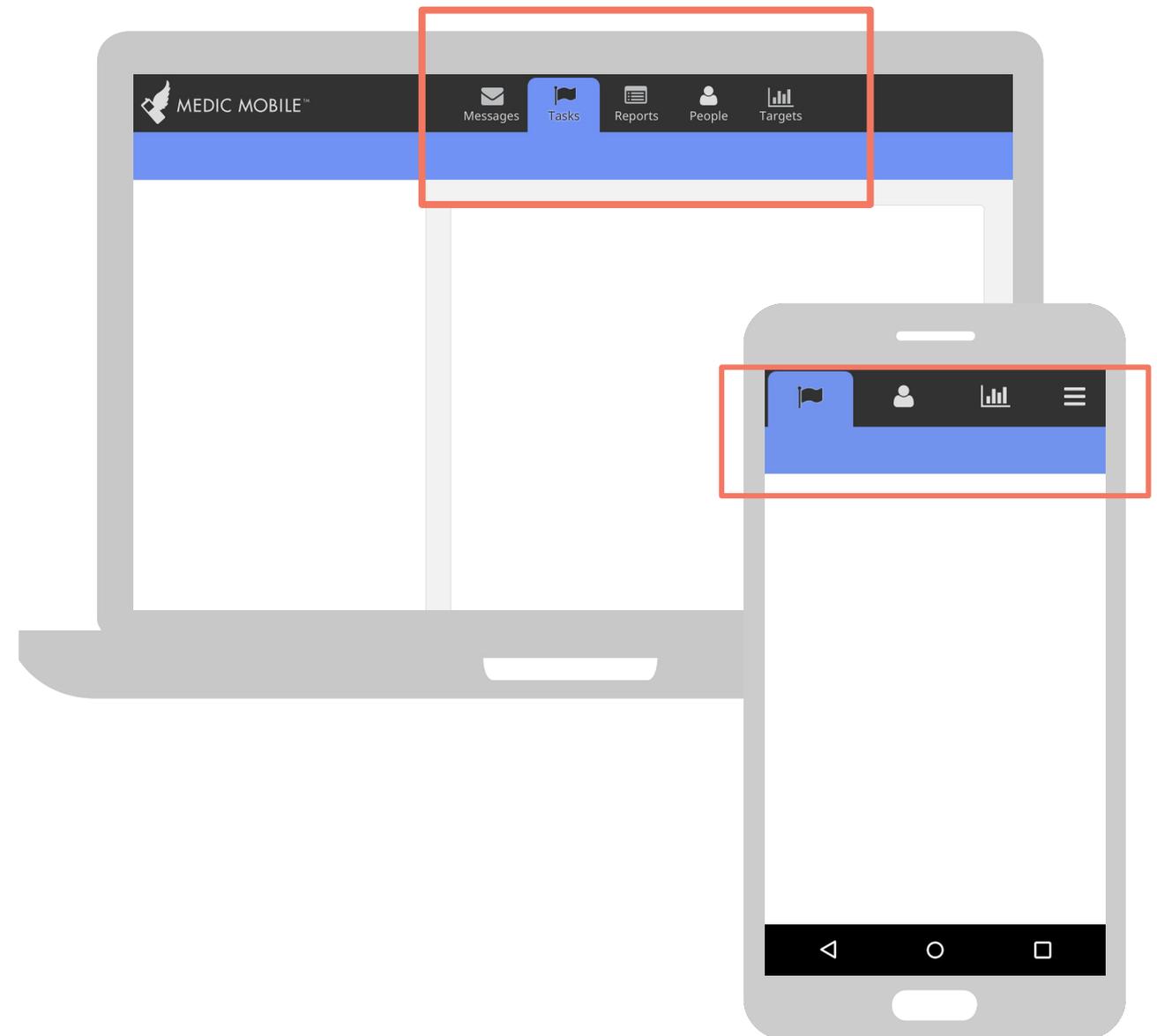
# The Menu Drawer

Tap the menu icon in the upper right corner of the header to access other pages, edit personal settings, view sync status and more.

- **Admin Console**: Change advanced app settings (only admin users will see this)

- **Guided Tour**: Review new features and important tips

- **About**: View your app version and other detailed database information

- **User Settings:** Update basic user information like email, phone number, and password

- **Report Bug:** Let us know if something isn't working or you encounter errors

- **Log Out:** Sign out of the app
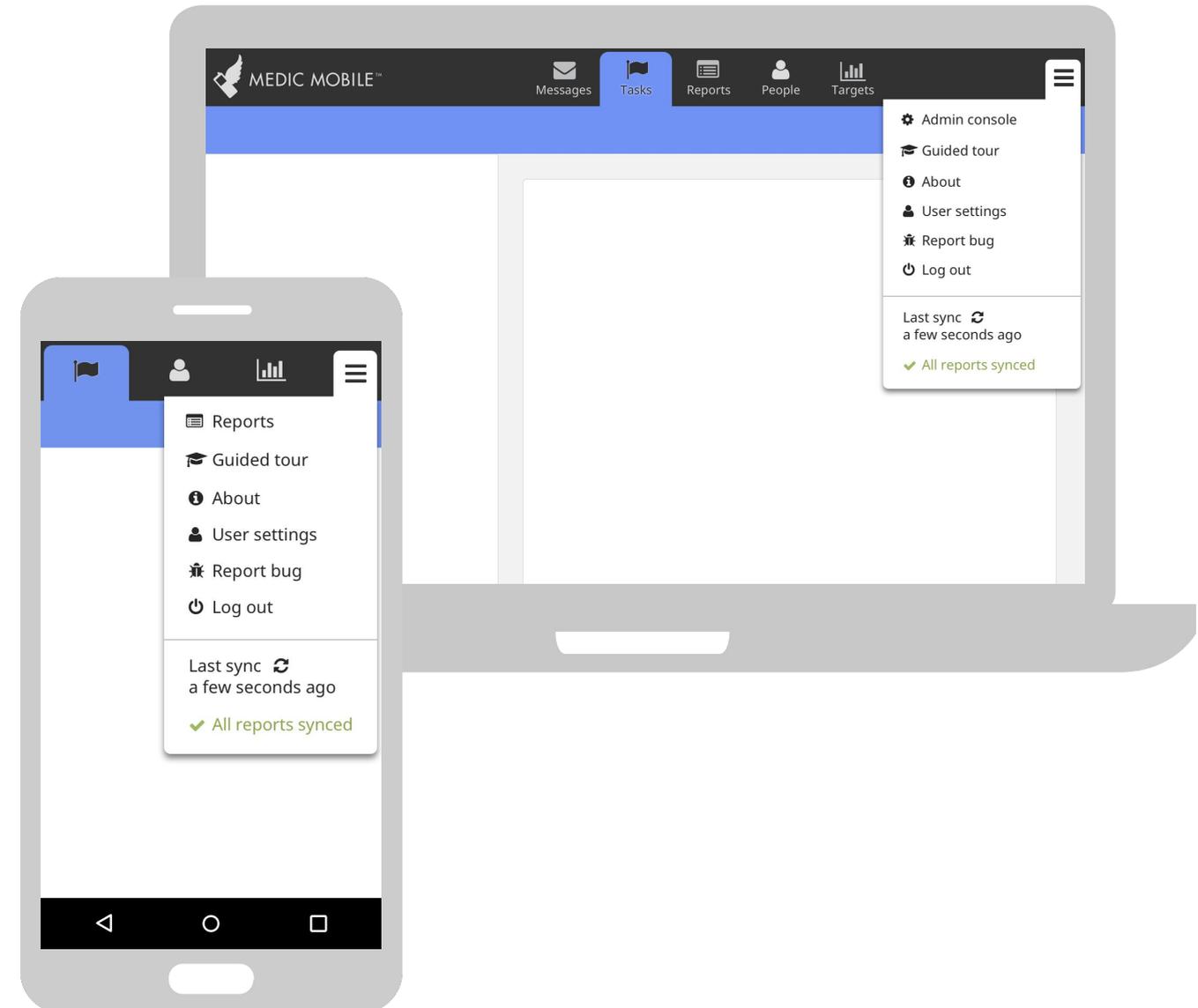
# Sync Status

At the bottom of the menu is a notification which provides important about sync status. It lets you know whether reports are being submitted.

If the sync status is green and says "All reports synced," your reports have been sent. This means you have successfully uploaded all of your data to the server. However, it doesn't necessarily mean you have downloaded all of the most recent data from the server.

If the indicator is red, it means there are still reports waiting to send. This means you have not successfully uploaded all of your data to the server. You should check your internet and data connection.

Last sync ⟳
a few seconds ago

✔ All reports synced

Last sync ⟳
20 minutes ago

⚠ Reports to sync

# FEATURE TOUR

# Person & Family Profiles

# People and Places: Overview

"People" is the generic name we use for individuals in the app. They can be patients, family members, nurses or health workers. Anyone with a profile in the app is a person.

"Places" is the generic name that represents a level in the hierarchy. "People" belong to "places" and "places" belong to other higher level "places" in the hierarchy.

Depending on the context, a "place" might be a health facility and the "people" who get created at that level might be nurses. Most often for CHWs, these "places" are families.

Users can access their "people" and "places" from the People tab.
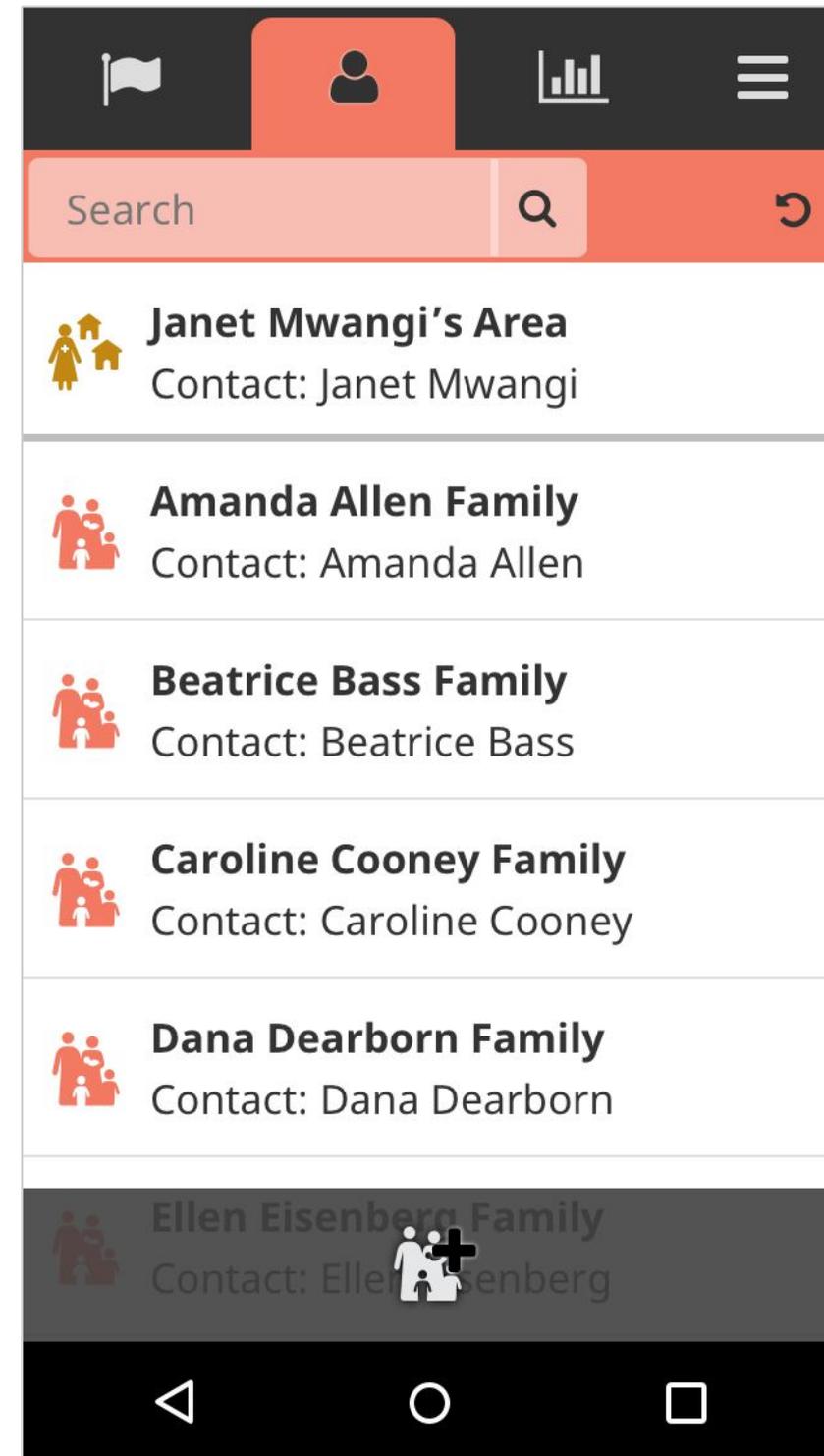
# People: Main List

The view on the right is what a logged-in CHW would see in when they access the "People" tab.

The item at the top of the list is the "place" the user belongs to. Below that, we see a list of the "places" they serve, represented by families. Individual "people" are not shown here, but they will appear in search results.

Because this list defaults to show the "places" below the user in the hierarchy, a CHW supervisor would see a different view. Instead of families, they might see a list of CHW Areas they manage.

New "places" can be added to this level of the hierarchy by clicking on the "Add new +" button at the bottom of the screen. This allows a CHW to add a new family to their list, or a CHW supervisor to add a new Area they manage.
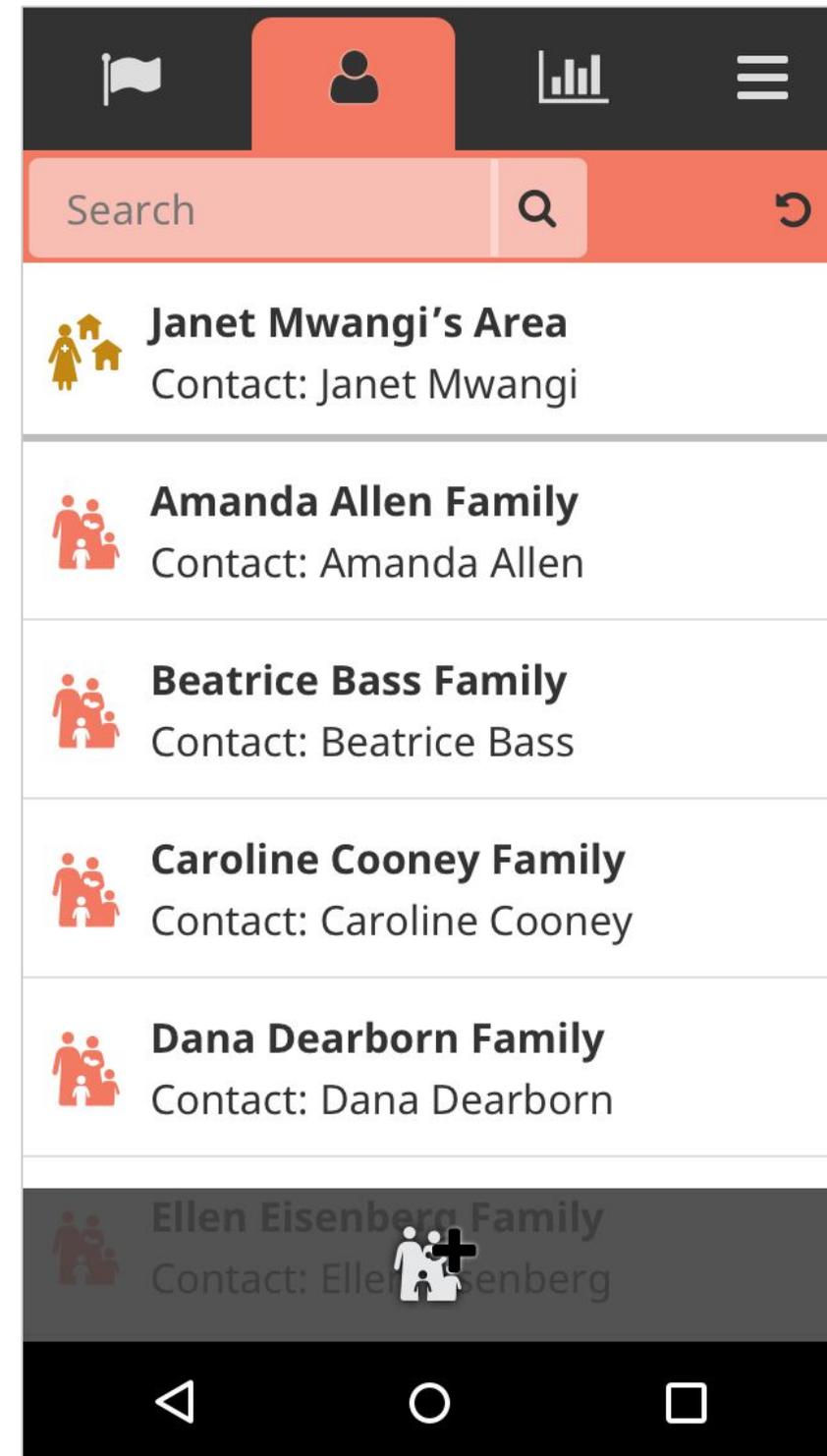
# People: Searching

Search for a "person" or "place" by clicking in the search area at the top of the screen. The freetext search works on all fields included in the "person" or "place" document such as patient name or patient ID. The exact fields depends on which information you've configured your app to collect.

After entering a search term, the list filters to show matching items. Searching will only return items that are lower than you in the hierarchy and that you have permission to view.

To clear the search and return the default view, click on the refresh icon located to the right of the search box.
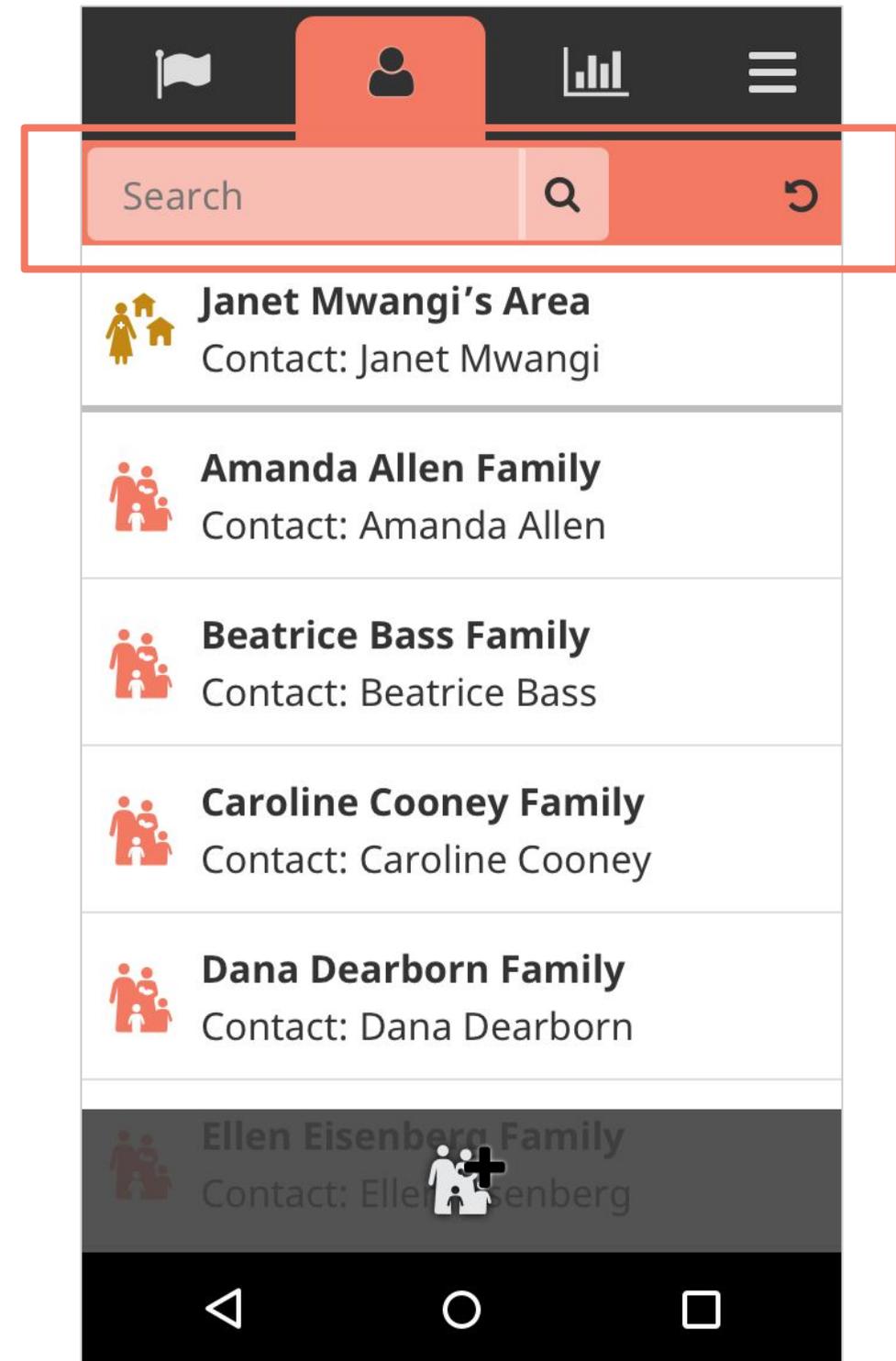
# People: Profiles

Clicking an item on the main list will open a profile where you can see detailed information about that person or place. At the top is general information like name and phone number.

If you're viewing a place profile, you'll see a list of people or places that belong to this place in the app hierarchy, such as family members. The star signifies the primary contact.

Beneath that, you will find tasks for this person or place. At the very bottom is a history of submitted reports for this person or place.

From profiles, users can edit contact information, take actions, and, if viewing a place profile, add new people and assign a primary contact person. If a place is not at the bottom of the hierarchy, a user can add new places to the level below this.
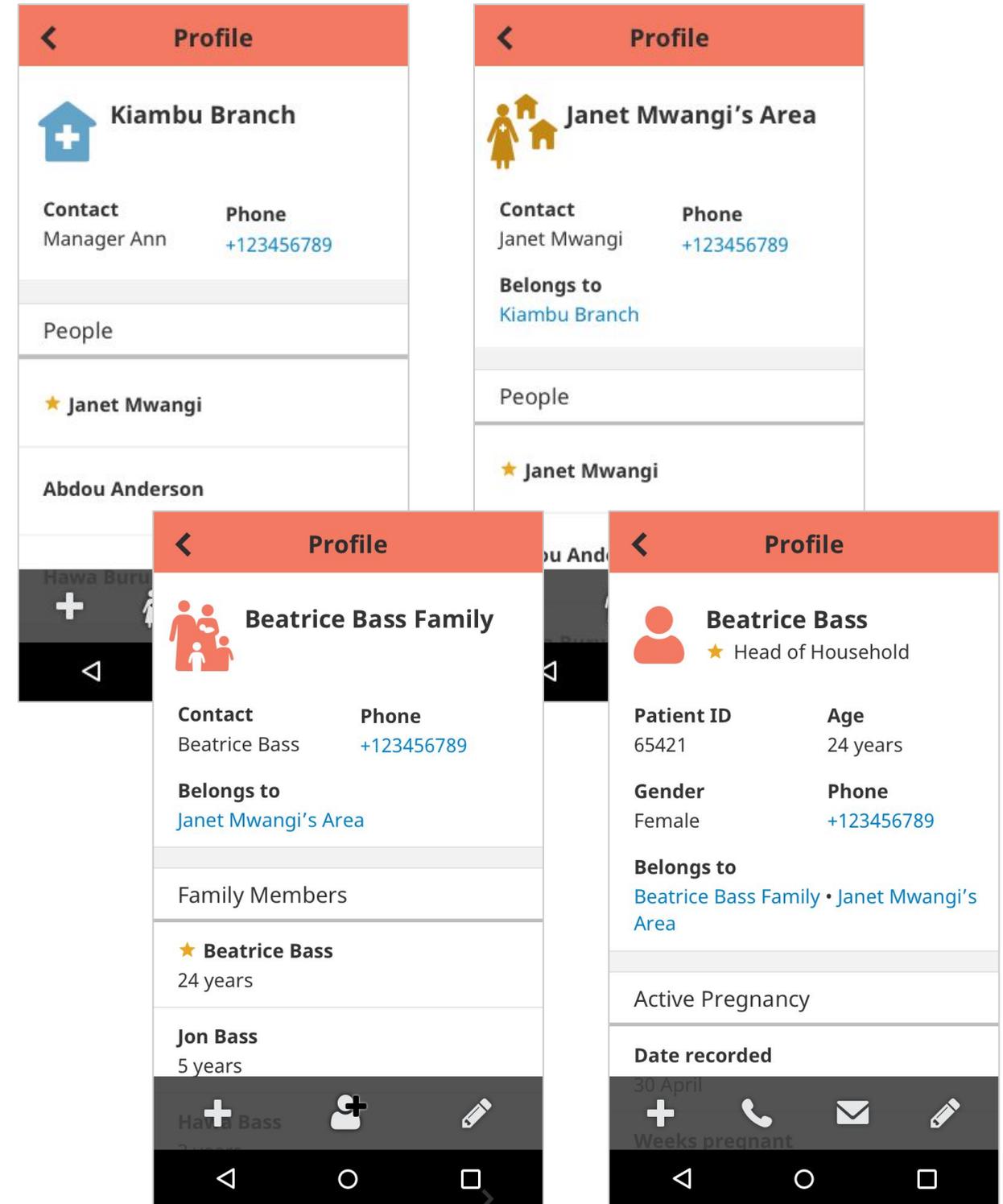
# People: Condition Cards

A "condition" card displays data on a profile that's been submitted in a report about that person or place. Data can be pulled from one report or summarize many reports.

Condition cards can be permanent or conditional; set to appear only when a specific type of report is submitted. They can also be set to disappear when a condition is resolved or a certain amount of time has passed. You can have as many condition cards as you like, though we recommend keeping the user's experience in mind. Configurable elements include:

- Title
- Label for each data point displayed
- Data point for the field
- Icon for the field, if desired
- Length of time to display

### Immunizations

**Pentavalent**
0 of 3

**Rotavirus**
0 of 3

**Hepatitis A**
0 of 2

**Influenza**
Yes

**Oral Polio**
0 of 4

### Active Pregnancy

**Date recorded**
30 April

**Weeks pregnant**
15

**Estimated delivery date**
11 December

**Completed ANC visits**
1 of 4

**Status**
High risk

### Reported death

**Date of death**
March 15, 2017

**Place of death**
At home

**Other relevant info about death**
Cause was malaria

# People: Care Guides

"Care Guides" are dynamic forms that you can fill out for a person or place. You can access Care Guides by clicking on the + button at the bottom of a profile. For more info, see the "Decision Support for Care Guides" section of this overview.

You'll see different forms here depending on which person or place you're viewing. For example, forms for families might include a "Family Survey." Forms for adult women might include "New Pregnancy." Forms for adult women who have had a pregnancy report, and no delivery yet reported, would also see "ANC visit." Forms for children might include "Under-5 Assessment" or "Growth Monitoring."

Health workers can use these Care Guides at any time. If the app has scheduled a care visit or follow up, it will be listed under "Tasks."
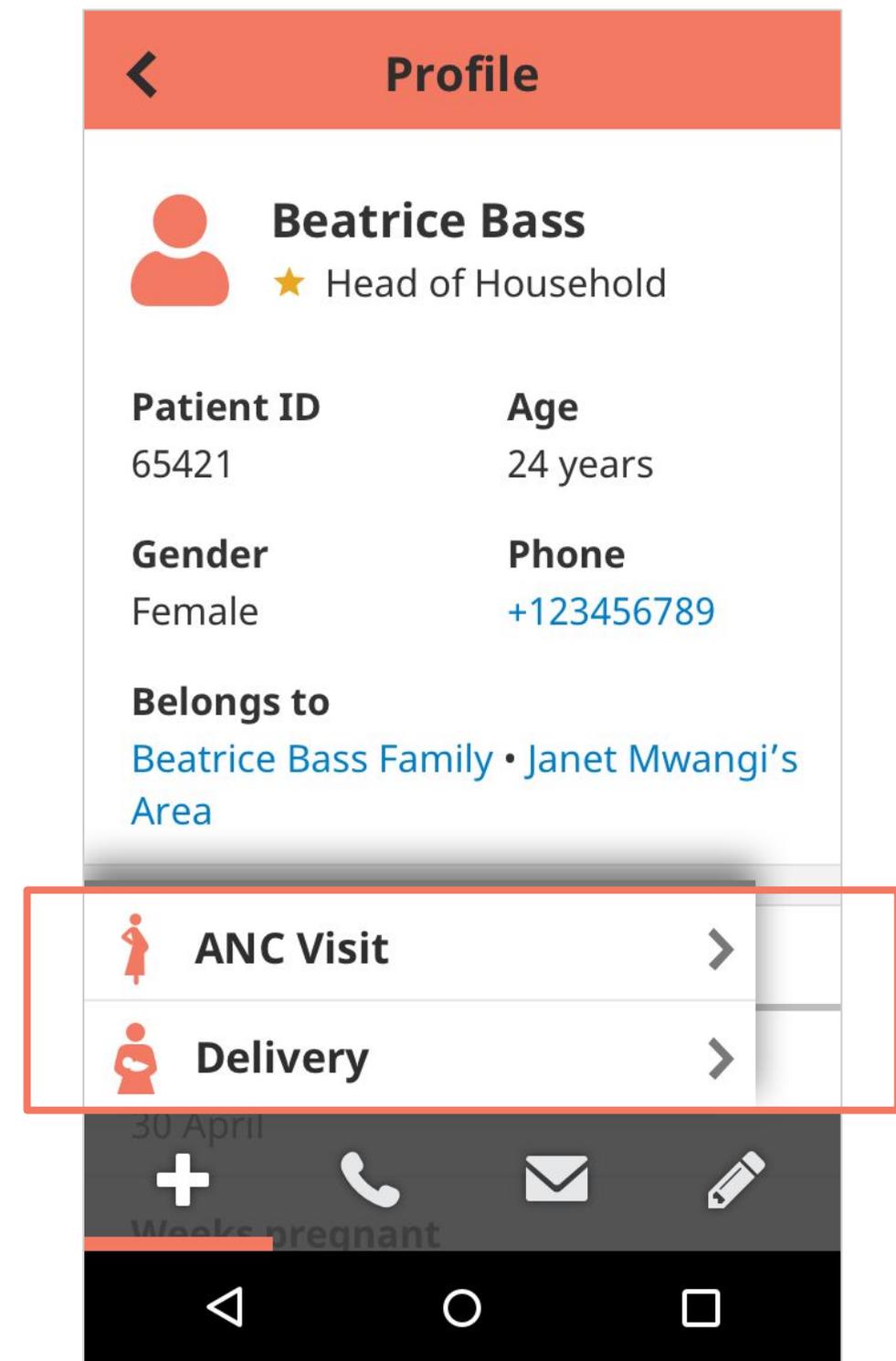
# Care Follow-Up Tasks

# Tasks: Overview

Tasks help CHWs plan their day by prompting them to complete follow-up visits and other activities. The list might include upcoming scheduled ANC or Immunization visits, treatment or referral follow-ups, or other required activities such as a household survey.

Tasks ensure that the right actions are taken for the right people at the right time.



**Beatrice Bass**                    Today
ANC Visit

**Dana Dearborn**                    Today
Newborn Visit

**Jonah Eisenberg**              Tomorrow
Immunization Visit

**Amanda Allen**                 In 3 days
ANC Visit

**Hawa Bass**                    In 3 days
Referral follow up

**Gina Gorman**                  In 1 week
Growth Monitoring

# **Tasks:** Accessing

Tasks are accessed from a few different locations in the app.

On the People tab (Image 1), tasks for a particular person or place can be viewed on the contact's profile in the "Tasks" section. Filters allow you to choose how many tasks you'd like to view for each due date.

On the Tasks tab (Image 2) is a consolidated list of tasks for all people and families that the user looks after. The task definition determines how long the task will show on this list before and after it is due.
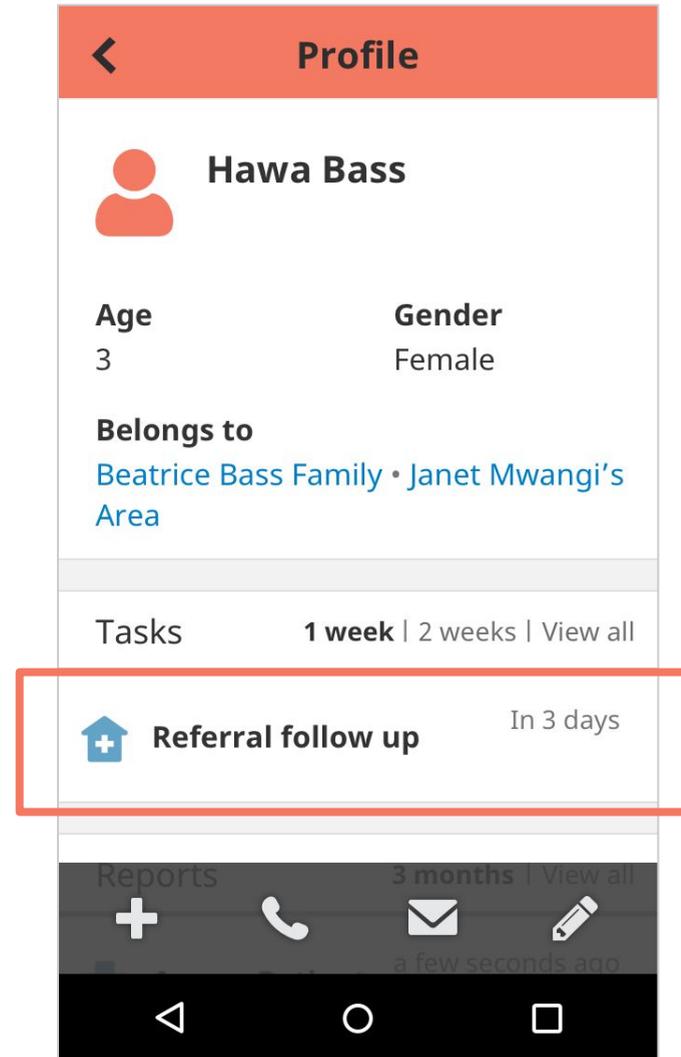
Image 1
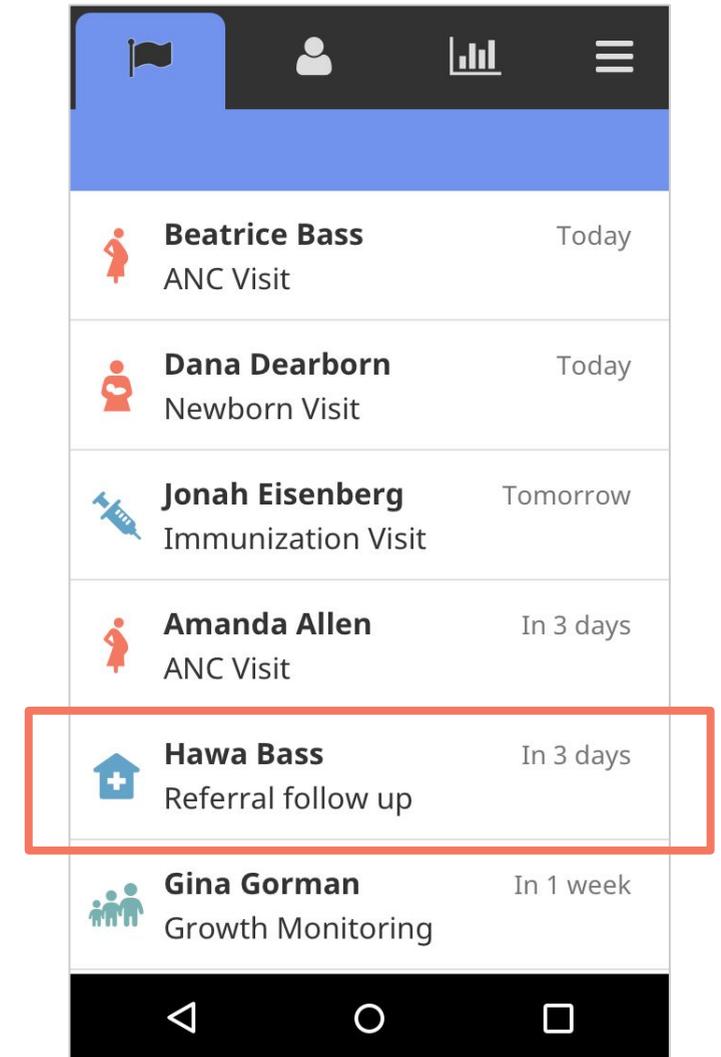
Image 2

# Tasks: Main List

Each task has an icon on the left side which indicates which type of task it is. The first bold line of text is the person or family that the task is about. The second line of text is the name of the task. The due date for the task is located in the upper right hand corner. If a task is overdue, the due date will be red.

Tasks are listed in order of due date. Tasks that are past due will appear at the top of the list. CHWs should strive to complete tasks before they are overdue. Many programs add targets to track task completion and timeliness.
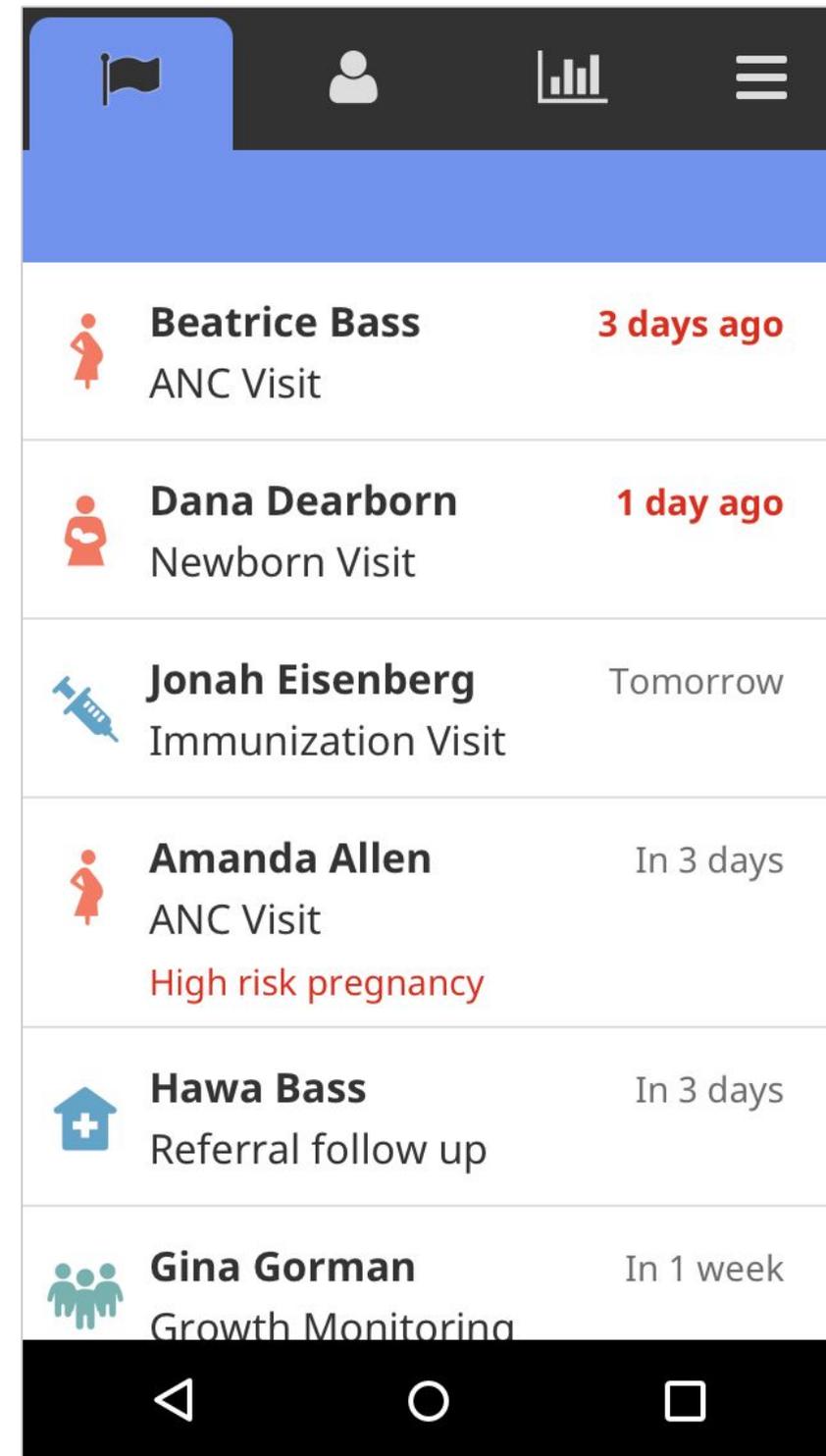
# Tasks: Care Guides

When a CHW clicks on a task, the care guide configured for that task displays. CHWs are then guided through questions for that specific workflow.

For more information on Care Guides, see the "[Decision Support for Care Guides](#)" section of this overview.

When the user completes the care guide, the task will be cleared from the Tasks tab, and the report will be accessible from the Reports page or on the profile of the person or place whom the report is about.

**✕ Assess Patient**

**Diarrhoea**

**\*Does the patient have diarrhoea?**

○ Yes

○ No

< Prev

**✕ Assess Patient**

**Diarrhoea**

**\*Does the patient have diarrhoea?**

◉ Yes

○ No

**\*How long has the diarrhoea lasted?**

◉ less than 4 days

○ 4 days - 1 week

○ 1 - 2 weeks

○ 2 - 3 weeks

○ 3+ weeks

# Data & Report Management

# Reports: Main List

The Reports tab is where you can access any data that was submitted. Depending on how often you anticipate a user needing to access this tab, you can configure it to show in the main tabs list (preferable for admin users) or in the secondary hamburger menu (preferably for CHW users).

The permissions set for your role and your placement in the hierarchy will determine which reports you're able to see on this tab. As a rule, you can only view reports submitted by yourself or those below you in the hierarchy. Therefore, CHWs will only see reports that they submitted on this tab, while supervisors will see reports that they submitted as well as those submitted by their CHWs.
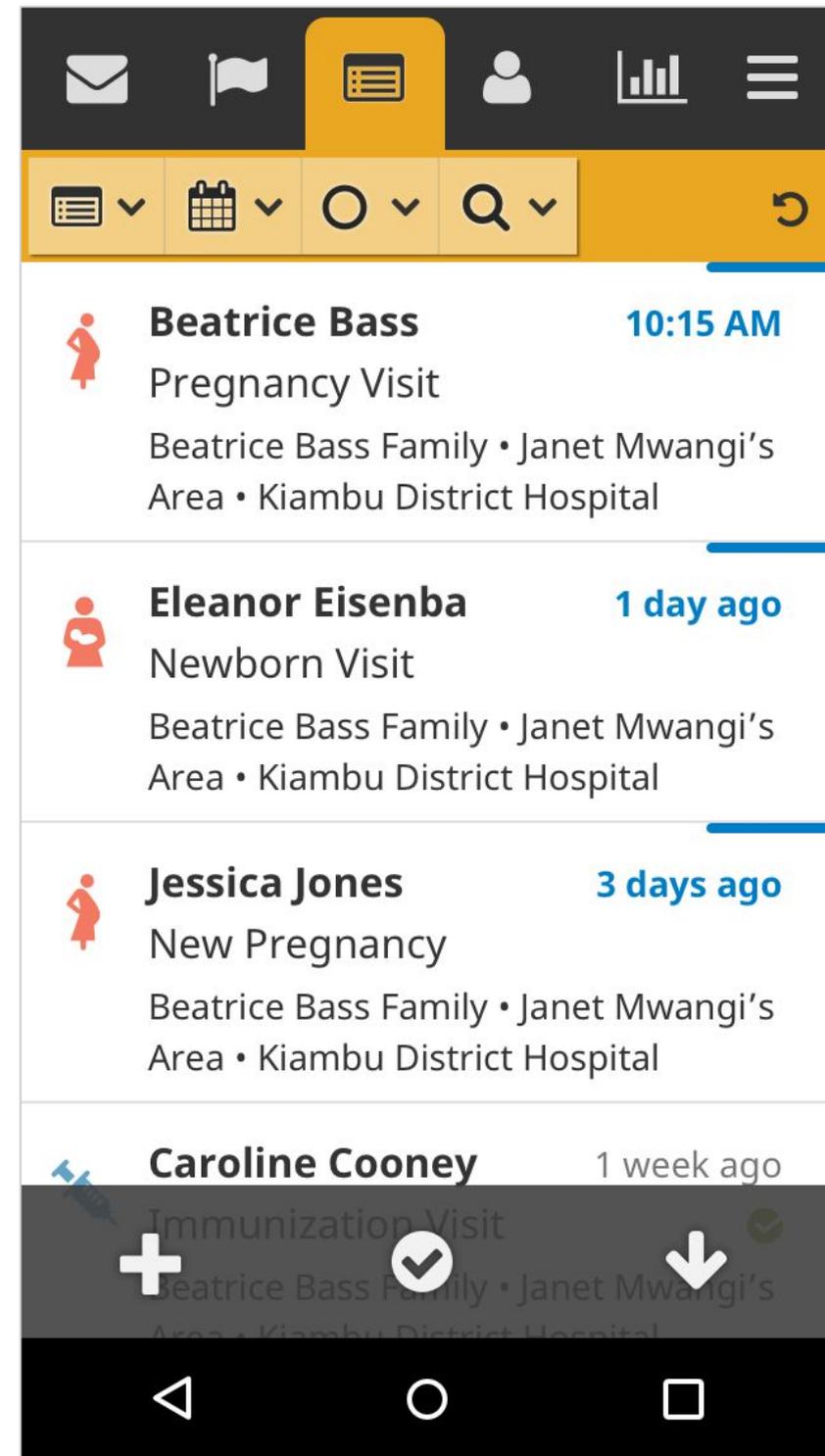
# Reports: Main List

The first line of bold text is the name of the person whom the report is about. The second line of text is the name of the report, and the third line of text is the hierarchy of place to which that person belongs. In the upper right corner, a timestamp displays when the report was submitted. Reports are sorted by submission date, with the most recent reports at the top. If a report is unread, the timestamp will be bold blue and there will be a horizontal blue line above it.

We have a "review" feature that allows managers to indicate whether a report has been reviewed and if it contains errors. If a manager has marked a report as "correct," a green checkmark will show below the timestamp. If a report is marked as "has errors," a red 'X' will show. This same icon is used for invalid SMS messages.
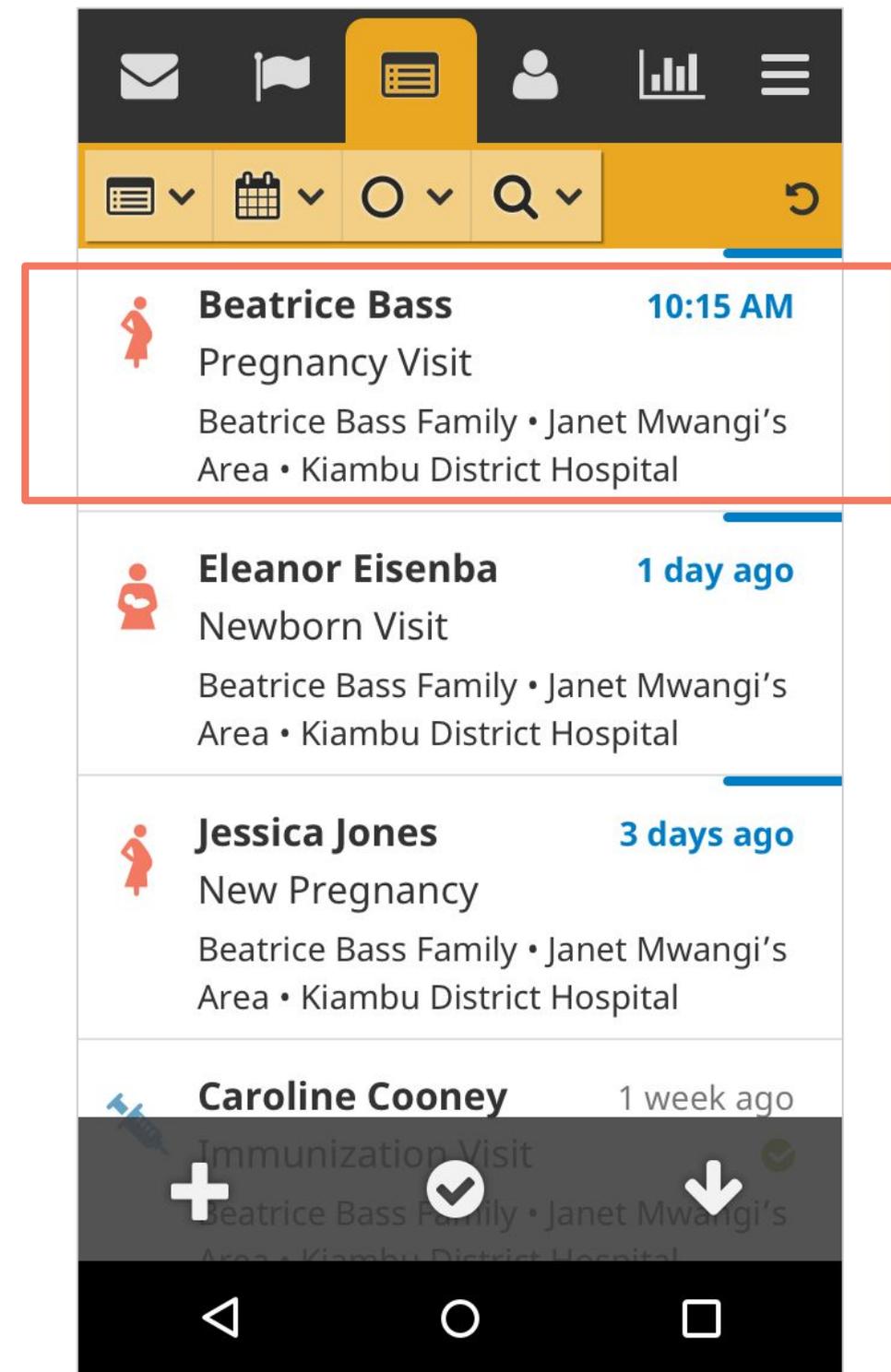
# Reports: Filters & Search

The toolbar at the top of the page includes filters and search to help users narrow down the list or search for and find a specific report. These filters are configurable and could include:

- **Report Types** (e.g. pregnancy registration, visits, delivery report)

- **Places** (e.g. districts, health centers or CHW areas)

- **Date of Submission**

- **Status** (e.g. not reviewed, has errors, correct, valid SMS, invalid SMS)

Using the search box, you can search for reports by patient name, phone number, ID number and more. To reset the filters or the search and view the full list of forms, click on the reset icon on the right side of the toolbar.
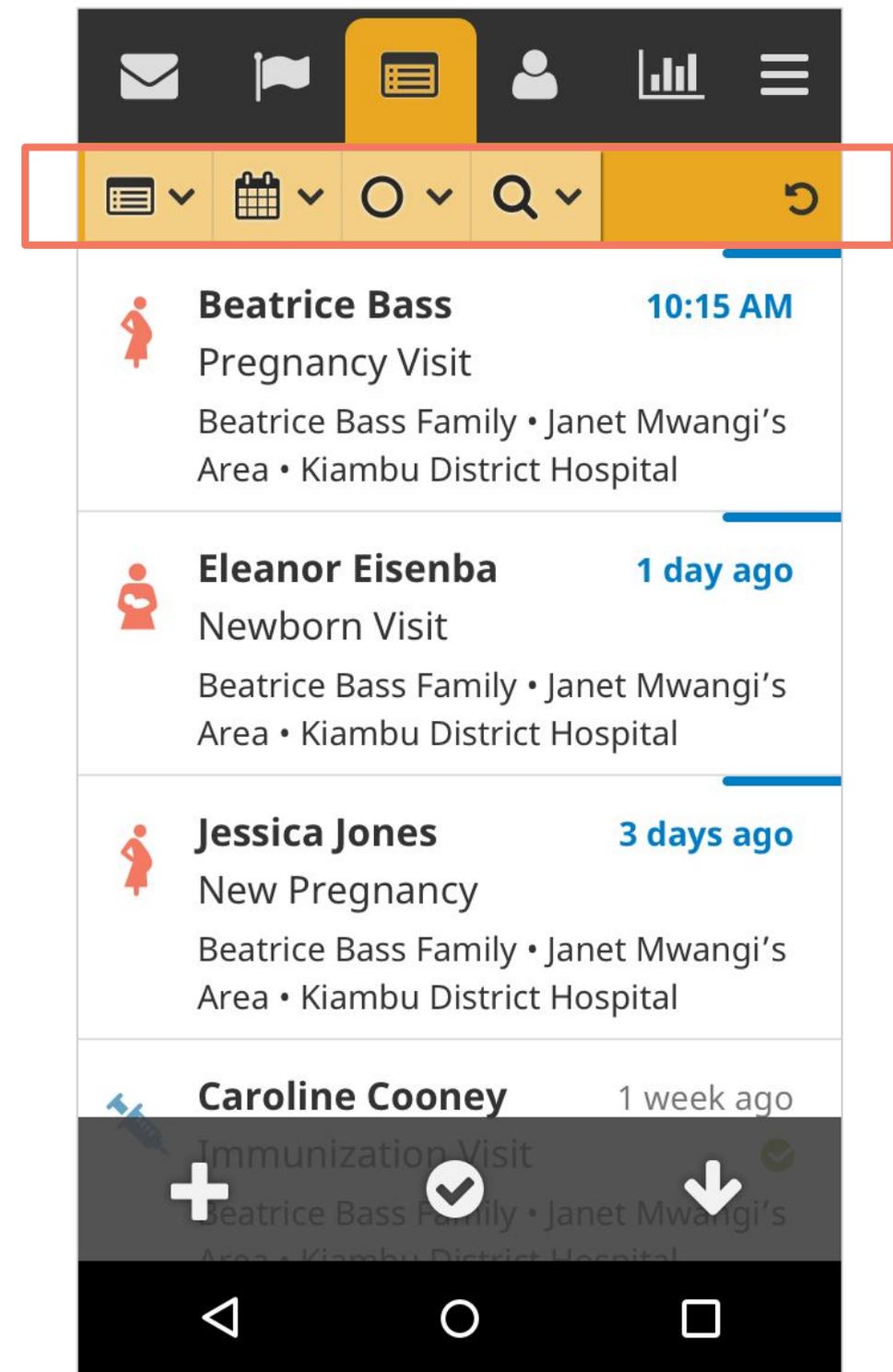
# Reports: Action Buttons

The action buttons at the bottom of the screen are configurable. Options include adding or completing a care guide, bulk select & export.

Clicking the "+" button opens a menu of forms a user can choose to complete. "Bulk Select," represented by a checkmark icon within a circle, allows you to bulk select and delete multiple reports at a time.

**Please Note:** Bulk delete cannot be undone. If in doubt, do not delete! You can restrict a user's access to this feature in the permissions for their role.

Clicking on the "Export" button will download a CSV file with all of the data from the reports.
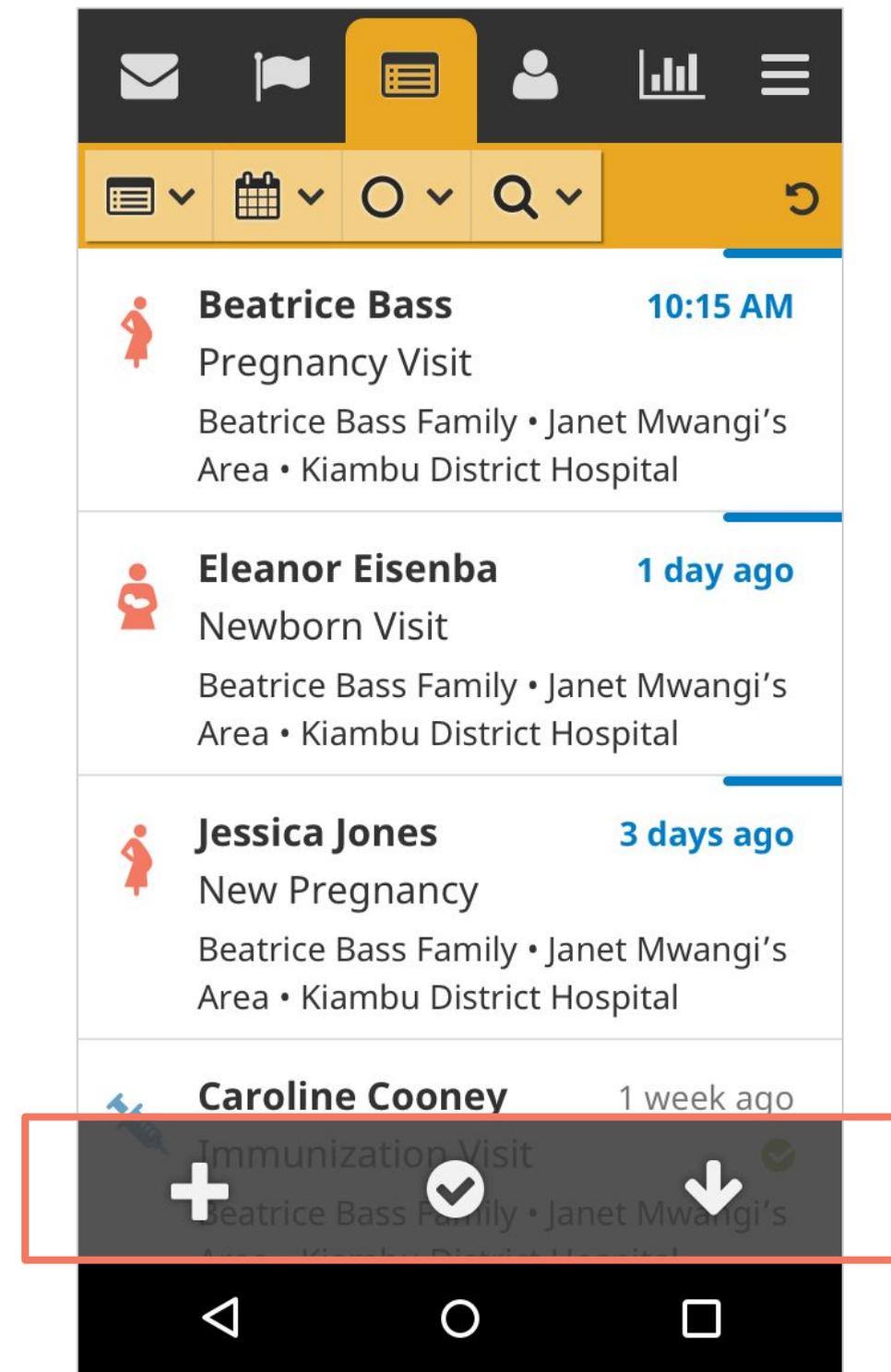
# Reports: Detail Pages

You can click on any report to view a report detail page. Here you'll find the name and phone number of the user who submitted the report as well as responses to the questions within it. If the report initiated a schedule of SMS messages, you will see the messages queued to send.

The buttons at the bottom are configurable. The ones you see will depend on your user role, permissions, and hierarchy.

- **Send a Message**: Opens the Messages page to send a message to the person who submitted the report
- **Review**: Mark as "correct" or "has errors"
- **Edit**: Opens the form to edit it
- **Delete**: Deletes a report ( cannot be undone)
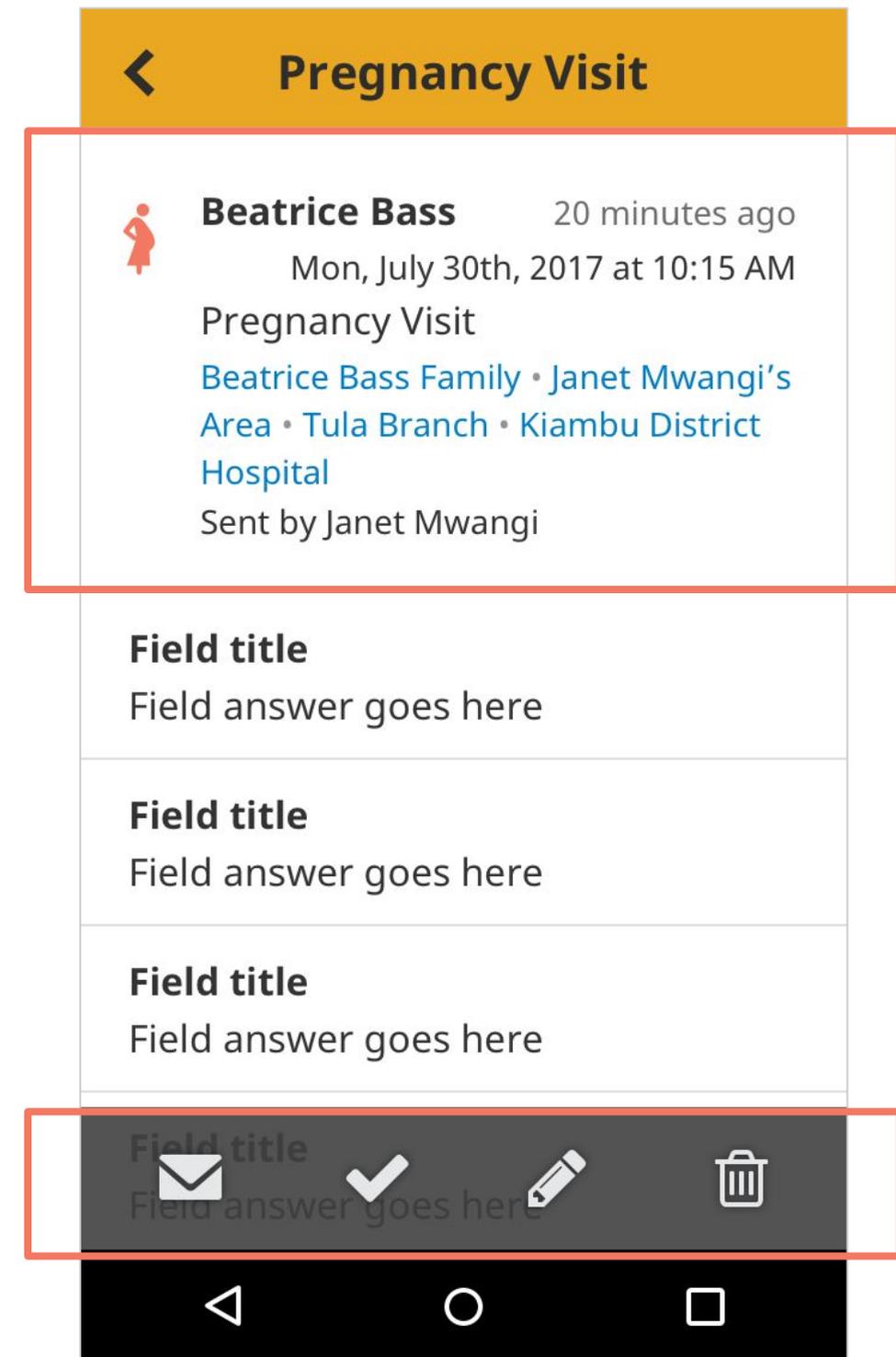
# Performance Targets

# Targets: Main List

Targets is a user dashboard or analytics tab. These widgets provide a summary or analysis of the data in reports that have been submitted. These widgets can be configured to track metrics for an individual CHW or for an entire health facility. Currently, the user must have access to the report in order to generate the widget with its data.

For CHWs, the Targets tab can provide a quick summary of their progress towards their goals. For supervisors, nurses, and other facility-based users, these widgets might display important insights into how their community unit is performing.

Targets can be configured for any user that has offline access.
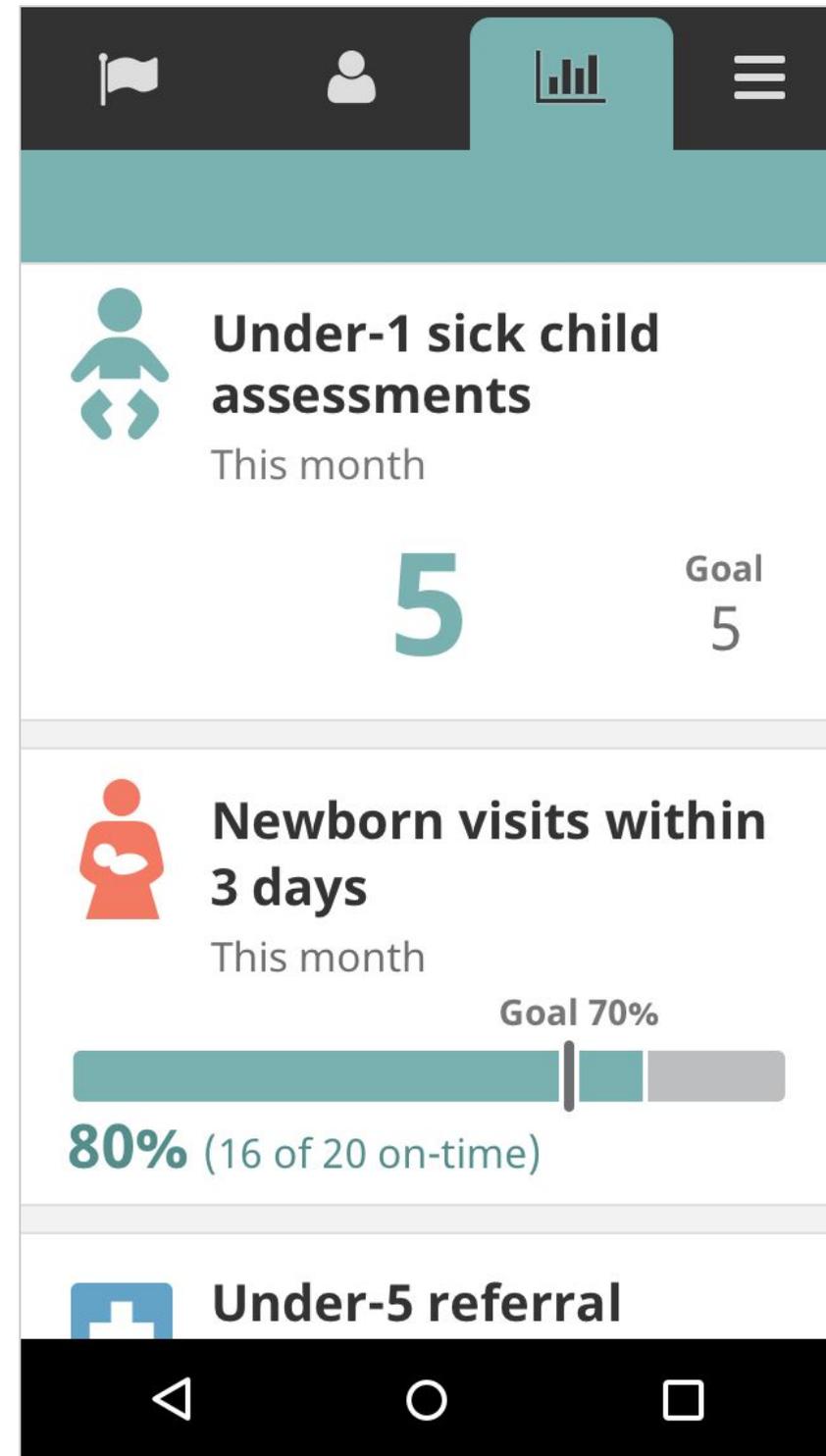
# Targets: Types of Widgets

There are two basic types of widgets: counts and percentages. Count widgets display a number while percentage widgets display a horizontal bar that represents 100%. Every element is configurable, including the text, the icon, the presence of a goal (or not), the value of the goal, the time frame, and the total number of widgets.

The data for both widgets is calculated as either "this month" (resets back to 0 at the beginning of each month) or "all time" (a cumulative total). The time frame is per widget level so there can be a mix of date ranges on the Targets page.

Additionally, each widget can have a goal and there can be a mix of widgets with and without goals. If goals are set, the widgets have conditional color styling to show whether a goal is unmet (red) or met (green) based on configured rules.
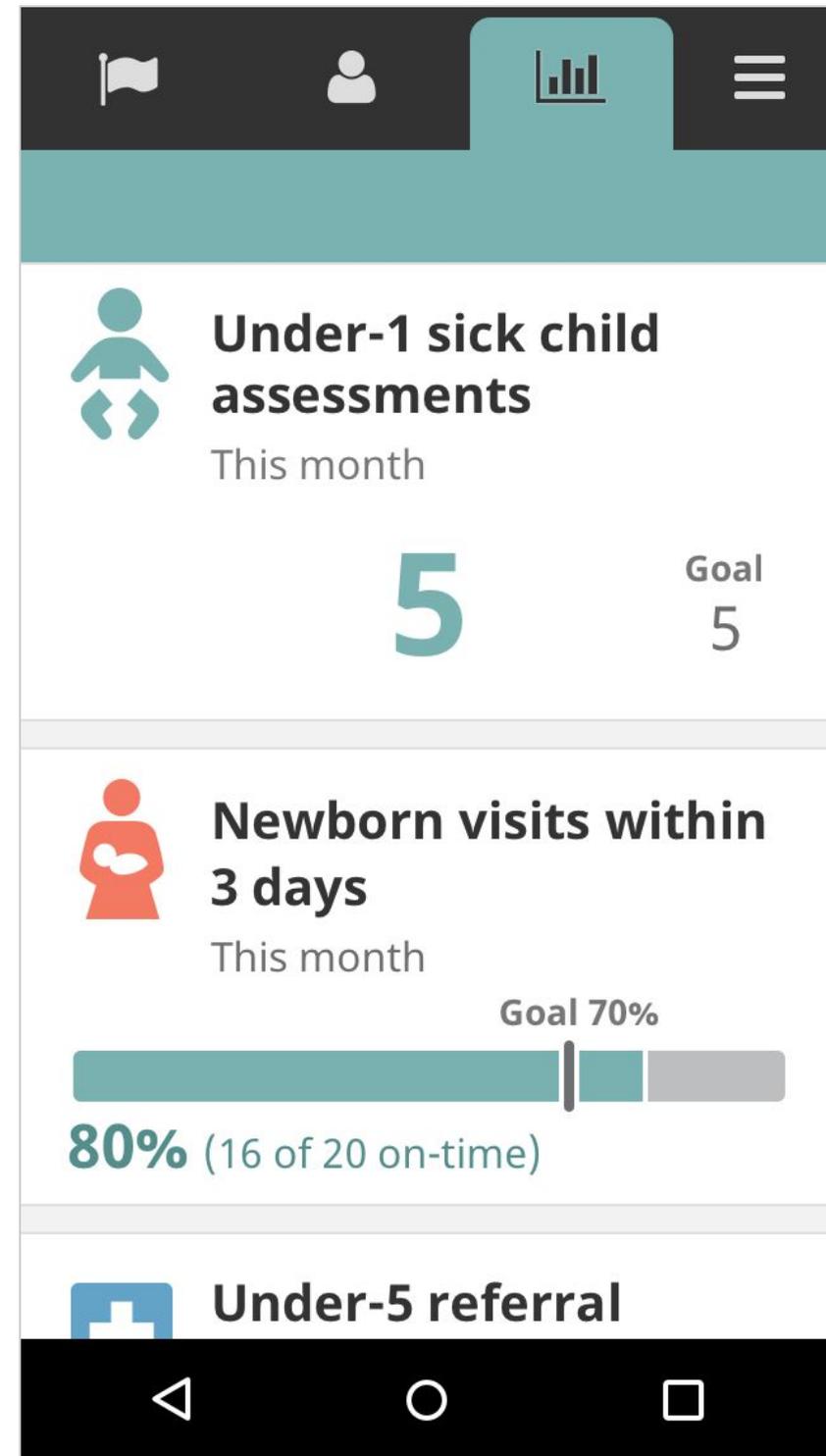
# Targets: Count Widgets

The count widget shows a tally of a particular report that's been submitted or data within a report that matches a set of criteria.

For example, you could count the number of active pregnancies, the number of facility-based deliveries, or the number of households or people registered that month.

Counts without a goal display a simple black number count. Counts with a goal display the value of the goal on the right side and a colored count (green if the count is above the goal, or red if the count is below the goal).

**Pregnancies registered**
This month

16

**Pregnancies registered**
This month

16     Goal
       4

**Pregnancies registered**
This month

3      Goal
       4

# Targets: Percent Widgets

Percentage widgets provide insight into how much data matches a specific criteria against data that does not. This is calculated based on a true / false statement. This is often configured to represent accomplishment. For example, newborns should be visited within the first three days of life ("true") can be displayed next to newborns that were not visited within the first three days ("false").

Next to the percentage, the count of reports used in the calculation are shown (e.g. 16 of 20 [newborn visits] on-time). CHWs have found this helpful in interpreting this information.

An optional goal can be set, such as "70% of newborns should be visited within the first three days." Conditional styling can be configured to show green if a goal has been met and red if the goal has not been met.

**Newborn visits within 3 days**

This month

**80%** (16 of 20 on-time)

**Newborn visits within 3 days**

This month

Goal 70%

**80%** (16 of 20 on-time)

**Newborn visits within 3 days**

This month

Goal 70%

**60%** (12 of 20 on-time)

# Messaging for Care Coordination

# Messages: Main List

Messaging is a quick way to coordinate with other health workers. The Messages tab allows users to send a SMS message to any person or group of people in the app. Common uses of messages are to ask questions, coordinate care logistics, provide encouragement or confirm training times.

The main list is a combination of both outgoing and incoming messages. Messages exchanged with the same person or group are organized into a thread, similar to messages in a phone's messaging app.

The features on the Messages tab are best supported on desktop and most often used by someone in a supervisor role.
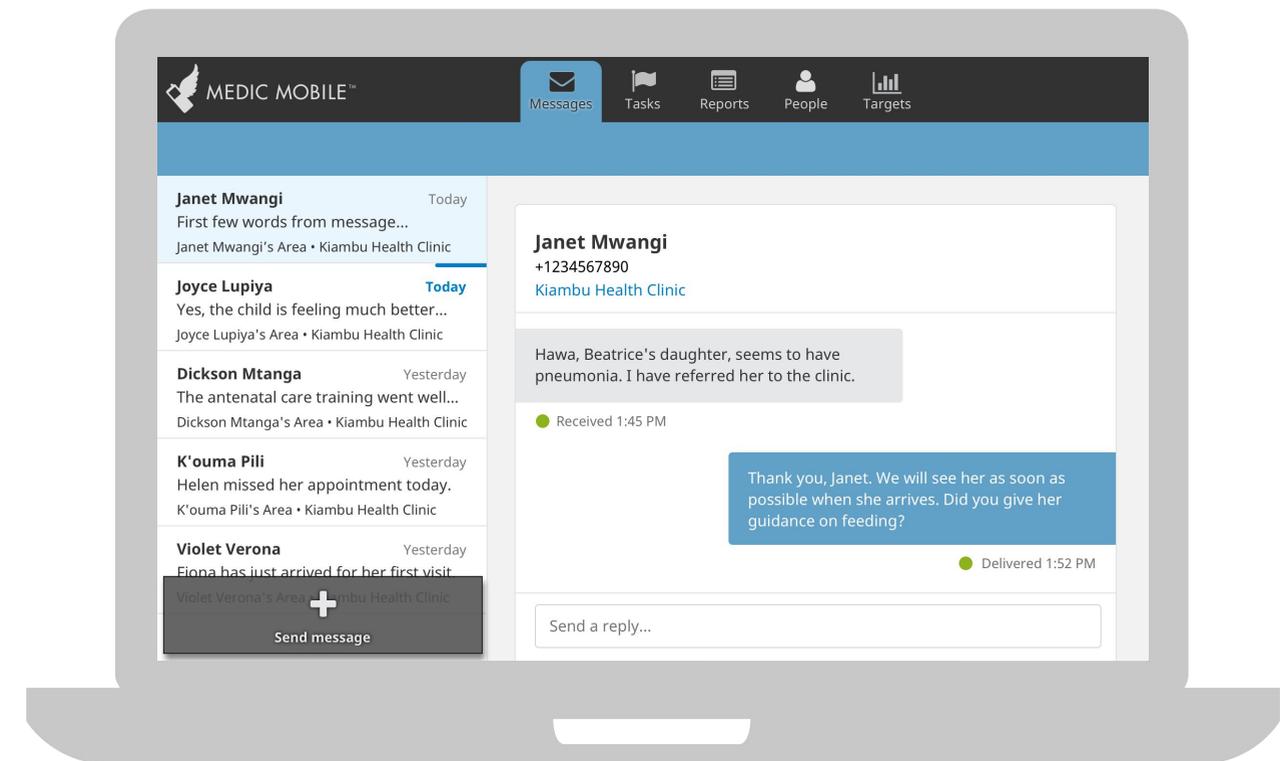
# Messages: Main List

On the main list of messages, the first line of bold text is the name and / or phone number of the sender. The second line is an excerpt from the most recent message, and the third line, if applicable, is the place(s) that the sender belongs to.

In the upper right corner, a timestamp displays when the most recent message was sent. An unread message is indicated by a blue line and bold blue timestamp. Messages are sorted by date with the most recent at the top of the list.

To send a new message that starts a brand new conversation thread, select the "Send Message +" button at the bottom of the screen. On the new message screen, enter the phone number you would like to send the message to or select a person in the app from the drop-down list. Then, type out your message text.
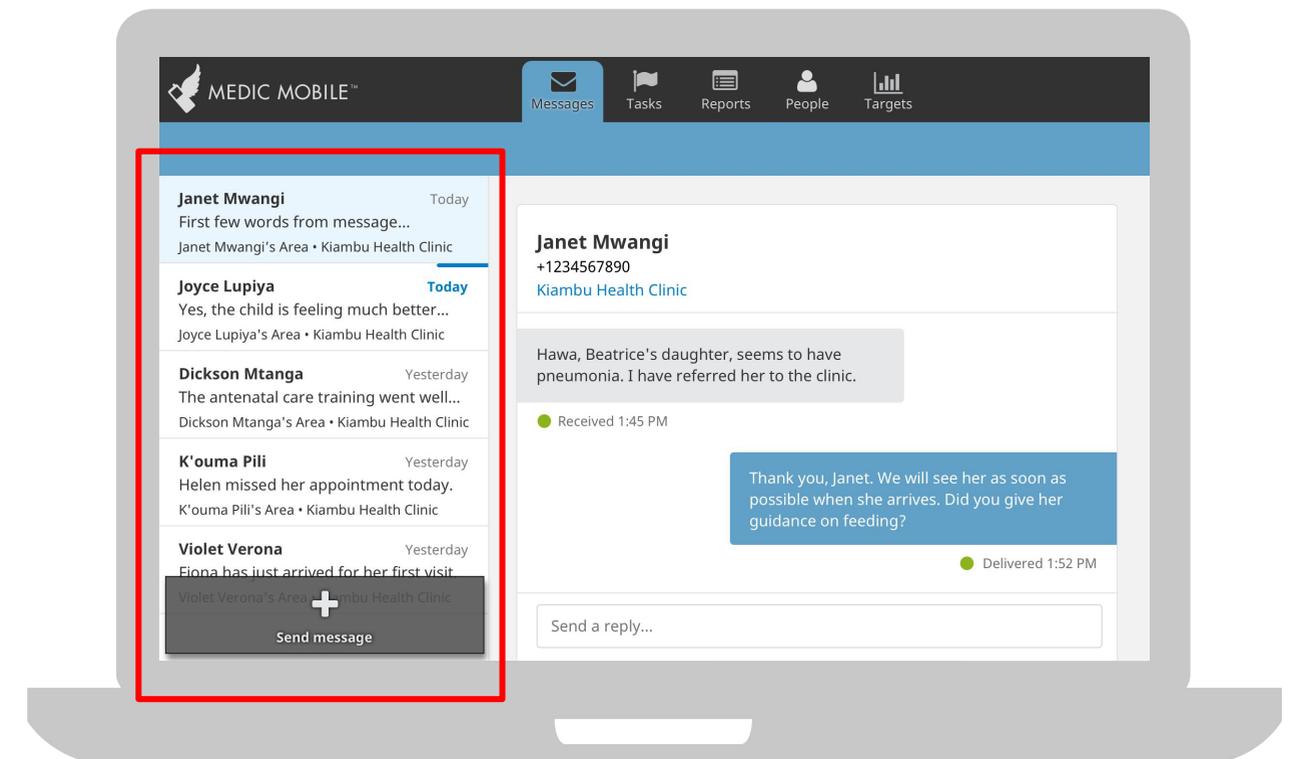
# Messages: Detail Page

Clicking on a message in the main list will take you to a detail tab where you can see the full text of the conversation. Underneath each individual message in the conversation, you will see the message status which tells you whether or not the message was successfully delivered or received and at what time.

To reply to a message, tap or click in the box at the bottom of the conversation that says "Reply to..." and start typing. Each message is limited to 160 characters but you may send more than one message if necessary.

It is also possible to configure auto-responses and for schedules of personalized, automated messages to be triggered upon submission of a form (e.g., a pregnancy registration triggers a schedule of personalized Antenatal care messages).
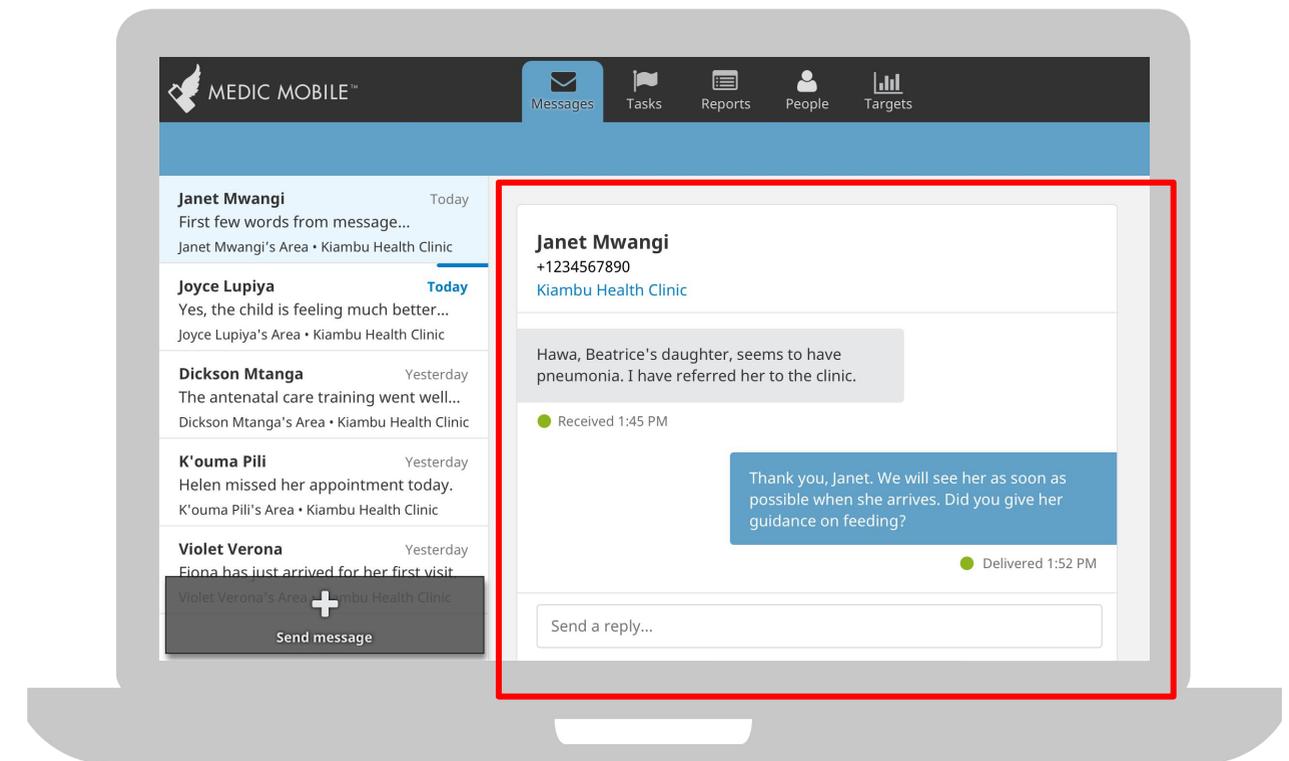
# Decision Support for Care Guides

# Care Guides: Overview

We use forms to build "Care Guides" that take health workers through care protocols and provide decision support for their interactions with patients. App designers can use basic form building functionality in a variety of ways.

Care Guides also allow CHWs to register new families and people, assess a sick child, and enroll a new pregnancy into an antenatal care schedule. Care Guides can live in many parts of the app including the Tasks, People, and Reports tabs.

During app development, Care Guides can be written from scratch or based on those from a reference application. These variations are often necessary due to different local requirements, government protocols, etc.
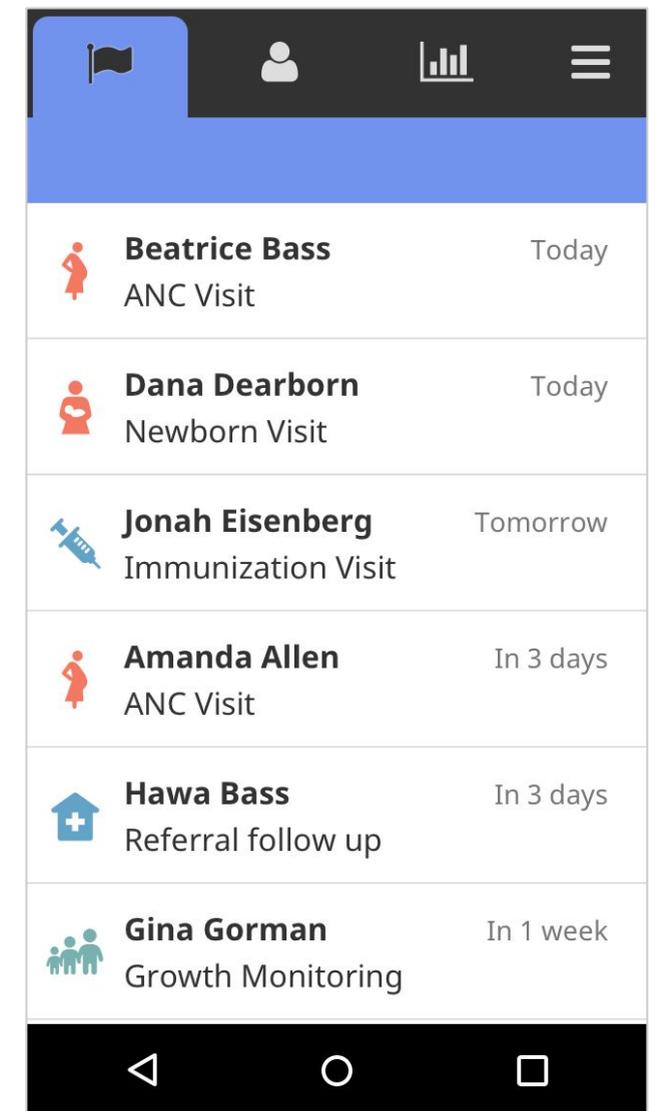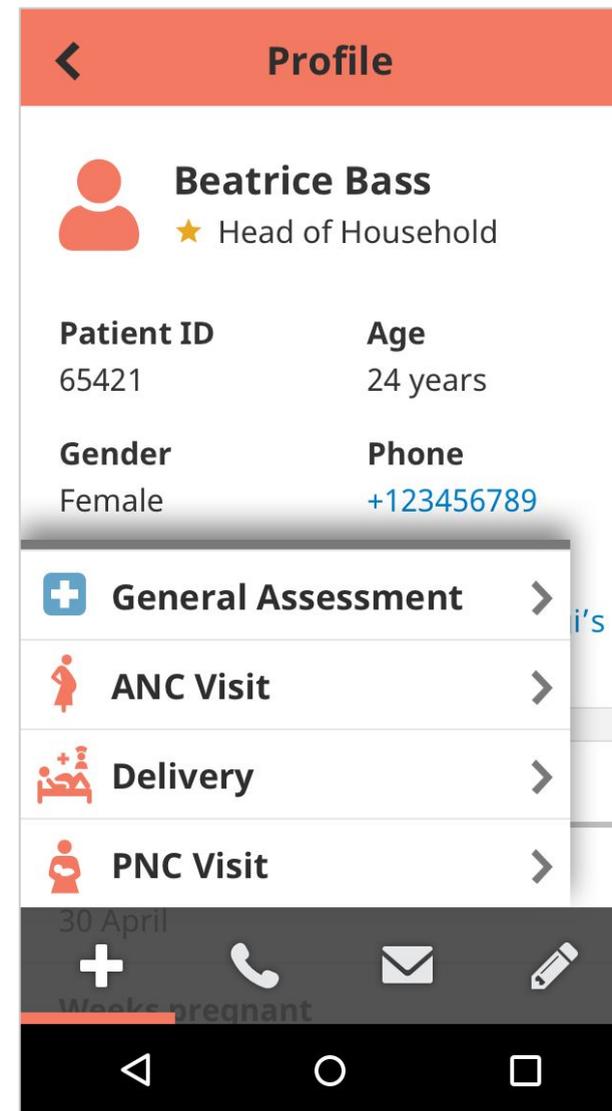
# Care Guides: Functionality

Care Guides consists of questions grouped into pages. They are capable of presenting many different types of questions, skip logic, images, and videos. Validation rules can require certain questions to be answered or restrict answers to a specified type or range.

It's possible to reference previous information that was submitted about the person or household from within the care guide. The interaction can also conclude with a summary that includes assessment results, treatment recommendations, and referral info.

Care Guides can include images for instructional purposes and can access a user's camera to take a photo if needed.

**✖  Assess Patient**

**Diarrhoea**

**\*Does the patient have diarrhoea?**

○  Yes

○  No

< Prev

**✖  Assess Patient**

**Diarrhoea**

**\*Does the patient have diarrhoea?**

⦿  Yes

○  No

**\*How long has the diarrhoea lasted?**

⦿  less than 4 days

○  4 days - 1 week

○  1 - 2 weeks

○  2 - 3 weeks

○  3+ weeks

# Care Guides: Summary

After all of the required questions have been answered, a summary page can be displayed.

Here, health workers can review the information they entered, receive instructions for treatment, care, and referrals, and relay detailed education to the patient.

Please Note: The form is not submitted until the user scrolls to the very end of the summary and clicks the "Submit" button.

✖ **Assess Patient**

**Be sure you Submit to complete this action.**

👤 **Patient Summary**

**Hawa Bass**

3 years old

**Signs & Symptoms**

» Diarrhoea for less than 4 da
» Danger signs

⚠ **Refer to a health fac**

Refer the health facility for Da
Signs.

➕ **Diagnosis & Treatme**

◁ ○

✖ **Assess Patient**

➕ **Diagnosis & Treatment**

**Diarrhoea**

**Give ORS**

Supply with 2 packets.
Instruct caregiver that after each loose stool to give 1/2 cup - 1 cup. Always mix with treated, filtered or boiled water.

**Treat with Zinc**

1 tab once a day
For 10 days
Total of 10

**Special Instructions**

*Help the caregiver give first drink of ORS and dose of Zinc now.*

◁ ○ ☐

# Care Guide Forms: Examples

- While a health worker is going through the form during the care visit, you can include a family planning question *only if* the person who the form is about is a woman and not pregnant.

- You can include on-the-spot conversational prompts and advice for the CHW based on how they answer questions in the form. For instance, if a CHW answers "yes" to the question about a woman's interest in family planning, text can automatically appear to provide information on her options.

- An image showing how to read a rapid test can be displayed within a form, to help health workers to correctly interpret their test results.



**✖  Assess Patient**

*What is the result of the test?

⦿ Positive

◯ Negative

< Prev

**‹  Family Planning**

*Are you pregnant?

◯ Yes

⦿ No

*Have you ever used a modern Family Planning method?

◯ Yes

⦿ No

**Health Education Session:** Provide your client with information about modern family planning and then offer the client the available methods to choose from. Be sure to review risk factors.

# Care Guide Forms: Build Workflows

Forms are the main building block of workflows, because they can be configured to initiate a schedule of tasks, such as follow-up visits for the CHW or a referral to be completed by a nurse.

Data submitted in one form can generate several tasks at once, e.g., multiple ANC visits following one pregnancy registration. Some workflows involve a series of sequential forms and tasks, e.g., a child health assessment form, a follow up task scheduled 48 hours later, a referral form (only if the child's condition hasn't improved), and then a referral follow up task. Tasks are accessible on the Tasks tab, as well as the Tasks section of profiles.

A form can also trigger an SMS to be sent to another user, such as CHW supervisor or nurse, where immediate notification is desired.



1. Routine Home Visit
2. Clinic Pregnancy Test
3. Pregnancy Registration
4. ANC Follow-Up Visit
5. ANC Clinic Visit
6. Delivery Report
7. Delivery Follow-Up Visit
8. PNC, IMM Follow-Up Visits
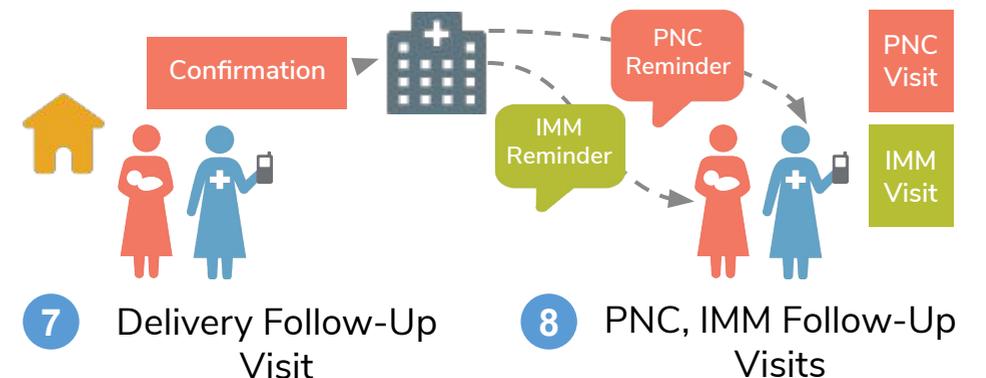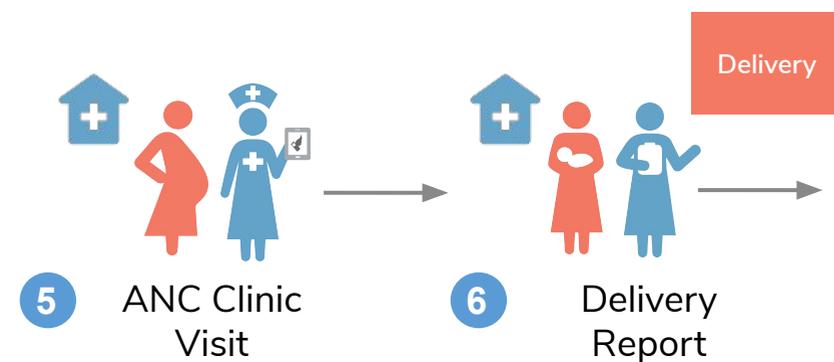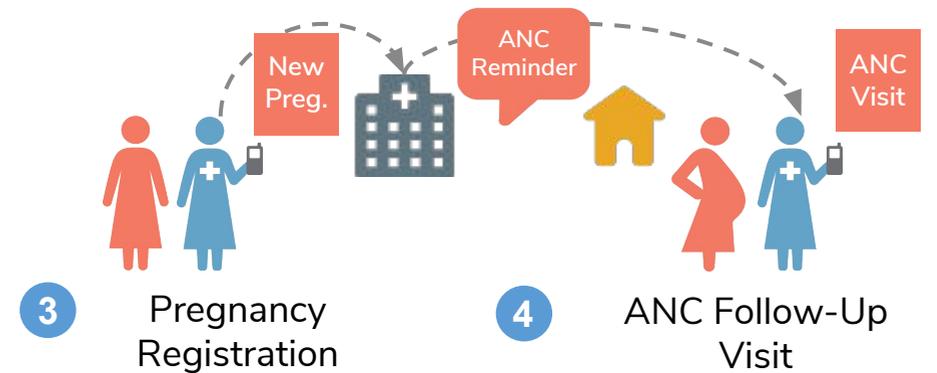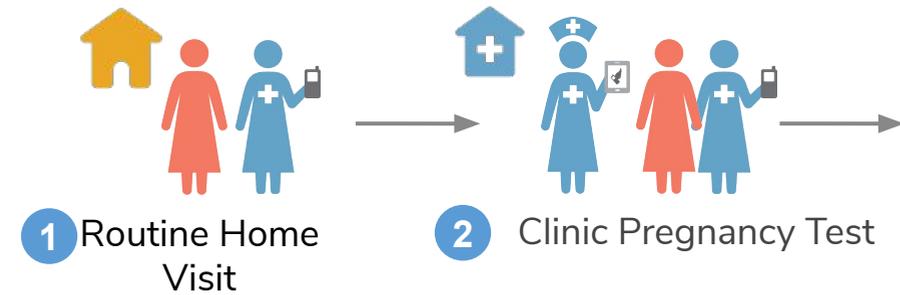
# Admin Console

# Admin Console

The Admin Console is an interface for non-technical administrative users. With it they can manage users and make minor changes to the app, such as setting the SMS gateway phone number, and changing the default language for the app.

The Admin Console is a desktop-only interface meant for users with a reliable internet connection.
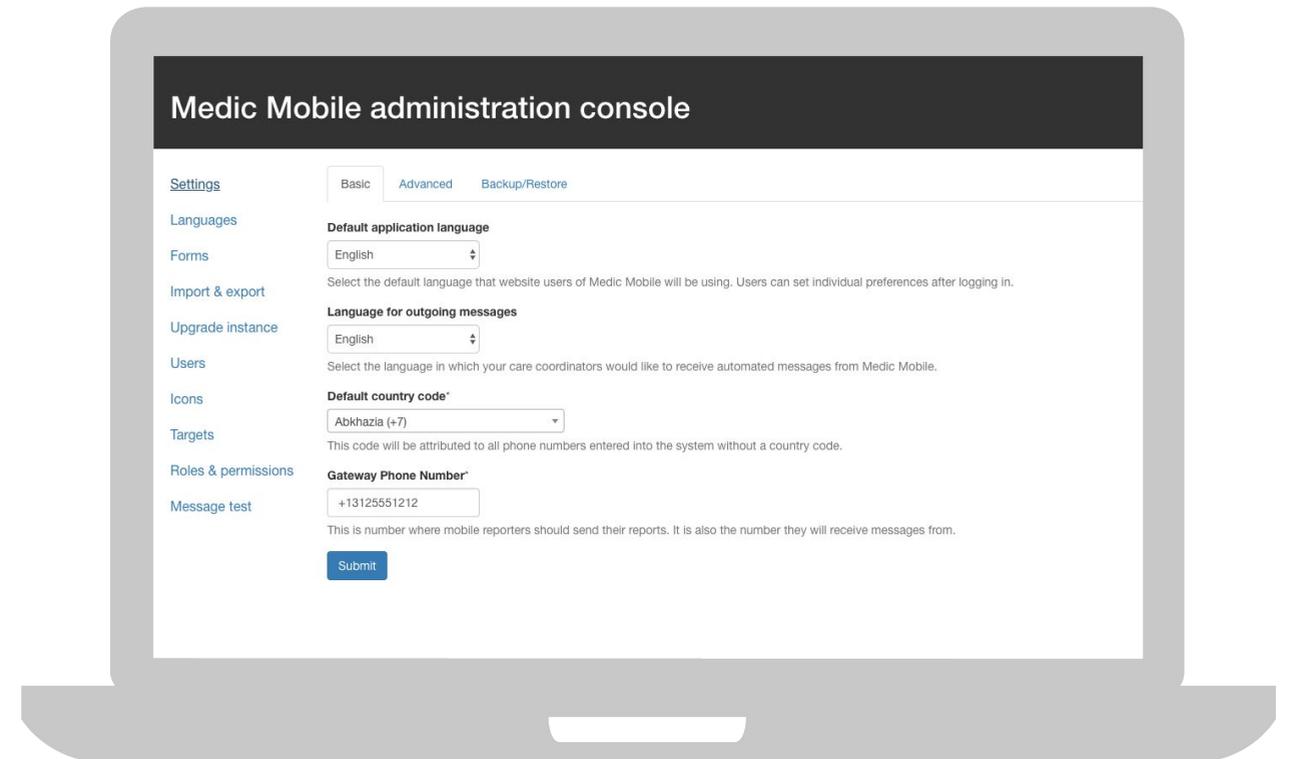
# Admin Console: Page Tabs

These sections of the App can be configured from within the Admin Console:

- **Settings**: Change basic settings like gateway phone number & country code

- **Languages**: Set default app language, update translations

- **Forms**: Upload XML and JSON forms

- **Import & Export**: Import and export settings

- **Upgrade Instance**: Install a newer app version

- **Users**: View and edit users of the system

- **Icons**: View and edit icons used in the app

- **Targets**: Modify performance or activity targets

- **Roles & Permissions**: Fine tuned control of user roles and permissions
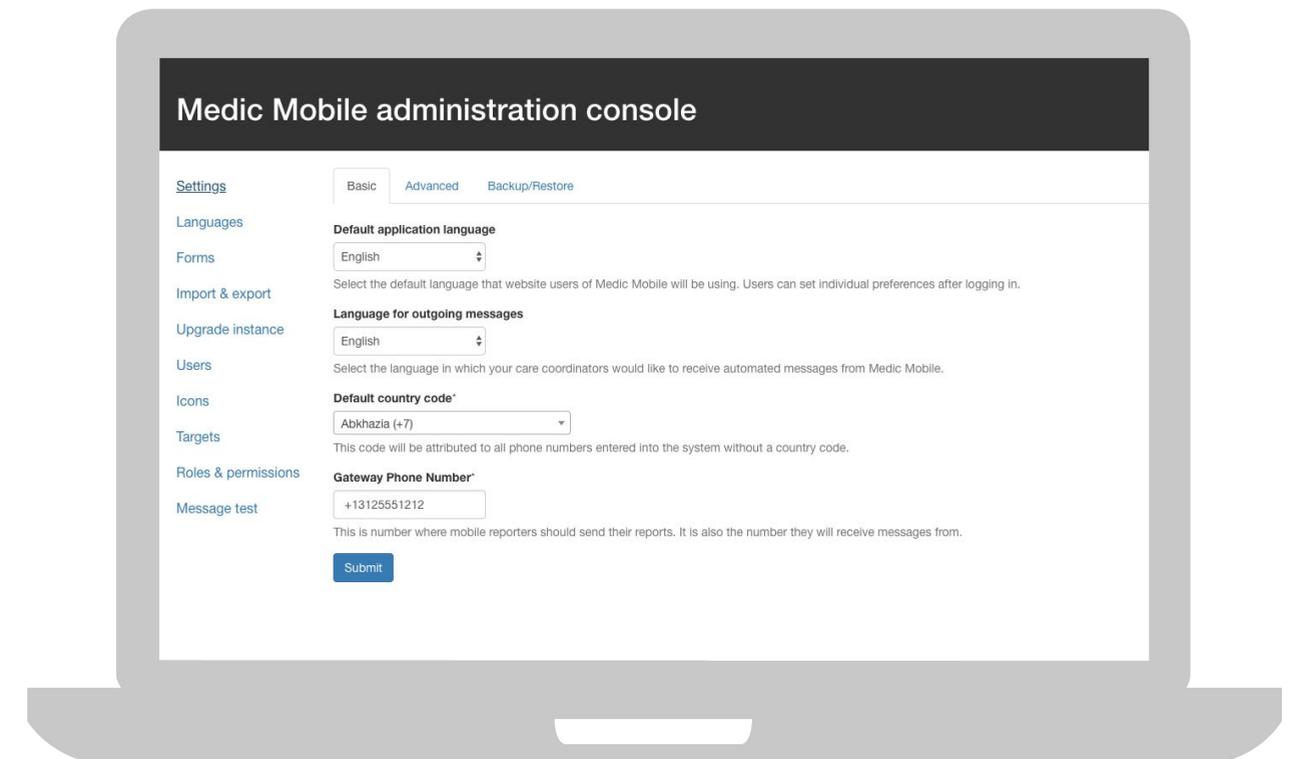
# Admin Console vs. Medic-Conf

In general, everything that can be done in the Admin Console can also be done in command line tools, but not everything in the command line tools can be done in the Admin Console.

The Admin Console does not track changes. For most app development, we recommend using command line tools such as medic-conf and tracking files using a version control system.

**In Admin Console But Not Command Line Tools:**

- User management
- Upgrades

**In Command Line Tools But Not Admin Console:**

- Most of the JSON settings
- XLS → Xform conversion
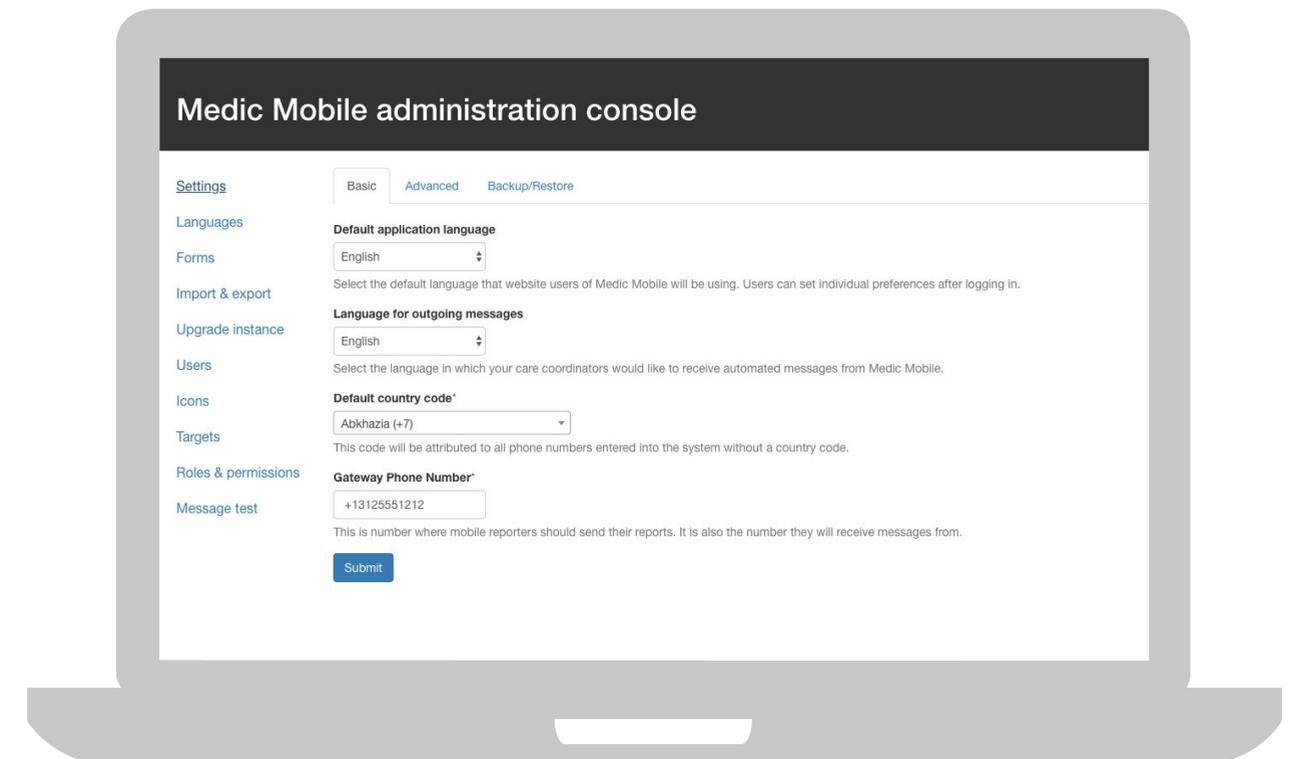
# WORKFLOWS

# Overview

# Uses of the Core Framework

In practice, app designers use these features to build evidence-based workflows for community health workers, facility staff, managers, and even patients and caregivers. These workflows help ensure safe births, track outbreaks, treat illnesses door-to-door, keep stock of essential medicines, communicate about emergencies, and more.

We aspire to increase coverage and improve equity for essential services in health systems, reducing maternal and neonatal mortality, improving child health, and strengthening community health systems. Through years of human-centered design alongside health workers, research, and implementation experience, we have identified specific uses for our software tools that improve health in communities.

# Integrated Care

We know that health workers provide a number of care and services for people in a holistic manner.

By combining a flexible set of use cases, you can design workflows to support health workers in delivering care across a variety of health service areas. When workflows are integrated and combined, tools built with the Core Framework can support comprehensive healthcare delivery.

In addition, we have designed these workflows to support a team-based approach to healthcare delivery and management, allowing users in different roles to work together to deliver care.

# Maternal Health

# Maternal Health

Maternal health is the cornerstone of many community health programs and one of the most widespread uses of tools built with the Core Framework of the Community Health Toolkit.

Maternal health encompasses a holistic set of workflows that include family planning, antenatal care, and postnatal care. Early identification of pregnancy and screening, referral for danger signs, and tasks for regular antenatal care visits and timely postnatal care visits are the building blocks of high-impact care.

# Maternal Health: Antenatal Care

Pregnancy can be a vulnerable time for women living in communities far from medical care. Tools built with the Core Framework have been widely used to ensure that women are safe and supported throughout their pregnancy.

Use cases include:

- Screen women of childbearing age

- Register pregnancies

- Provide on-time antenatal care visits

- Follow-up for missed visits

- Education at each stage of pregnancy

- Screen for danger signs

- Refer to facilities for safe deliveries

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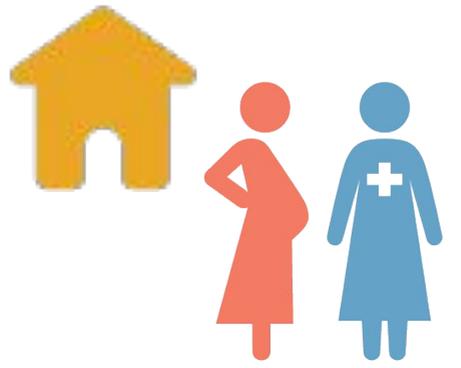
**< Profile**

Active Pregnancy

**Date recorded**
30 April

**Weeks pregnant**
15

**Estimated delivery date**
11 December

**Completed ANC visits**
1 of 4

**Status**
High risk

Past Pregnancies
➕ 📞 ✉
Facility birth

---

**< ANC Visit**

**Danger Signs**

**\*Does the mother have any of the following danger signs?**

*Select all that apply*

☐ Pain, pressure or cramping in abdomen

☐ Bleeding or fluid leaking from vagina or vaginal discharge with bad odour

☐ Severe nausea or vomiting

☐ Fever of 38 degrees or higher

☐ Severe headache or new, blurry vision problems

☐ Sudden weight gain or severe swelling of feet, ankles, face, or hands

# Maternal Health: Postnatal Care

The short window immediately after pregnancy is a critical time for catching life-threatening danger signs for the new mother and baby.

In order to help health workers coordinate effectively to ensure that women are being followed up in a timely manner, tools built with the Core Framework are being used to:

- Remind health workers about PNC visits

- Provide on-time PNC visits

- Follow-up on missed visits

- Screen for danger signs in mothers & newborns

- Guide health workers through PNC visits

## Profile

**Beatrice Bass**
⭐ Head of Household

| Patient ID | Age |
| --- | --- |
| 65421 | 24 years |

| Gender | Phone |
| --- | --- |
| Female | +1234567 |

➕ General Assessment

🤰 ANC Visit

🛏 Delivery

🤱 PNC Visit

30 April

➕   📞   ✉

Weeks pregnant

## PNC Visit

**Delivery Info**

**\*Did the delivery take place in a Health Facility?**

🔘 Yes

⚪ No

**Birth weight in Kg**
*Leave blank if unknown*

[                    ]

< Prev        Next >

# Maternal Health: Family Planning

Family planning is increasingly being integrated into maternal health services. Beginning with a negative pregnancy screening and offered again to mothers during postnatal care and routine health visits for their children, many methods are available at the doorstep or by referral.

A family planning workflow often includes:

- Screening for family planning needs at various touch points, such as after a negative pregnancy test and during a child's immunization visit

- Guide health workers and women through method selection

- Refer clients to facilities

- Ensure timely follow-up visits

# Child Health

# Child Health

Child health workflows focus on a core mission: that children are happy, healthy, and thriving. Health workers are trained to provide a different set of services according to their program model, though the global trend is showing the scope of these services are increasing.

Tools built with the Core Framework have been configured to support a holistic range of child health workflows from birth through age 5, including screening and treatment of malaria, diarrhea, and pneumonia, ensuring timely and complete immunizations, screening for malnutrition and, most recently, screening and education around nurturing care.

# Child Health: Integrated Community Case Management (ICCM)

Integrated Community Case Management (ICCM) is the standard protocol for treating children under 5 with malaria, diarrhea, and pneumonia. The following workflows can support CHWs in ensuring consistency of treatment and diagnosis:

- Register children
- Assess sick children
- Treatment recommendations and education
- Referrals to a health facility as needed
- Timely follow-ups and additional care



**Profile**

**Georgia Bass**

Age
2

Gender
Female

**Belongs to**
Janet Mwangi's Area • Beatrice

Assess Patient

Assess Nutrition

Immunization

Nurturing Care

**Assess Patient**

**Diarrhoea**

*Does the child have diarrhoea?

◉ Yes

○ No

*How long has the diarrhoea lasted?

◉ less than 4 days

○ 4 days - 1 week

○ 1 - 2 weeks

○ 2 - 3 weeks

○ 3+ weeks

# Child Health: Malnutrition

Ensuring that children are receiving appropriate nutrition and growing at a healthy rate is a critical part of child development. Tools built with the Core Framework can be used to support a variety of nutrition workflows, including:

- Screen, treat, and refer for acute malnutrition

- Monitor and promote growth with z-score calculations and decision support

- Remind health workers and families of follow-up visits

- Keep track of important dates for deworming and micronutrient distribution

- Support education for maternal nutrition and breastfeeding practice
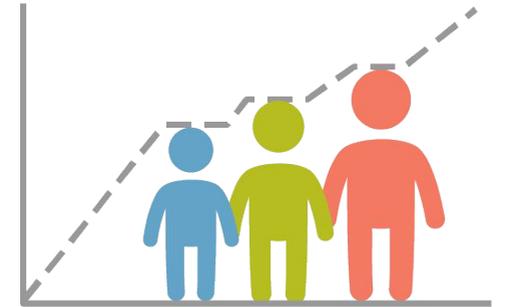
# Child Health: Immunizations

Tools built with the Core Framework have been used to improve immunization rates in communities, and are one of the most important ways to avoid preventable and potentially deadly child illnesses. With these tools, CHWs can:

- Register children

- Remind families about immunization visits

- Follow-up on missed visits

- Track immunization status based on individual vaccines and visits

- Screen for adverse effects caused by some vaccinations



**Profile**

**Georgia Bass**

Age
2

Gender
Female

**Belongs to**
Janet Mwangi's Area • Beatrice

- Assess Patient
- Assess Nutrition
- Immunization
- Nurturing Care

**Immunization**

**Immunization**

**Vaccines already reported:** BCG, Oral polio 1, Oral polio 2, Pentavalent 1, Measles 9 months, Vitamin A, Yellow fever

**Visit details >>**

*Enter date when John was immunized

*Which vaccines did John receive?

☐ Pneumococcal vaccine (PCV 1)

☐ RotaVirus vaccine (Rota 1)

# Child Health: Nurturing Care

Children who are appropriately stimulated in their early years grow up to be healthier, more educated adults, with better economic and social outcomes throughout their lives.

CHWs can integrate nurturing care activities into their doorstep visits in the following ways:

- Sensitize family during pregnancy

- Observe the child-caregiver relationship

- Support age-targeted monitoring of milestones

- Refer children with suspected delayed milestones

- Follow up and counsel the caregiver with activities to engage child

# Universal Health Coverage (UHC)

# Universal Health Coverage: UHC

For many, the term universal health coverage (UHC) represents a commitment to equitable and timely coverage for relevant and effective healthcare services, inclusive of prevention, treatment, rehabilitation, and palliation.

A set of optional, configurable features are being tested to achieve universal health coverage goals by supporting regular proactive home visits. Proactive visits are an important strategy to ensuring that all families are given the opportunity to receive care, and that illness is detected and treated as early as possible.
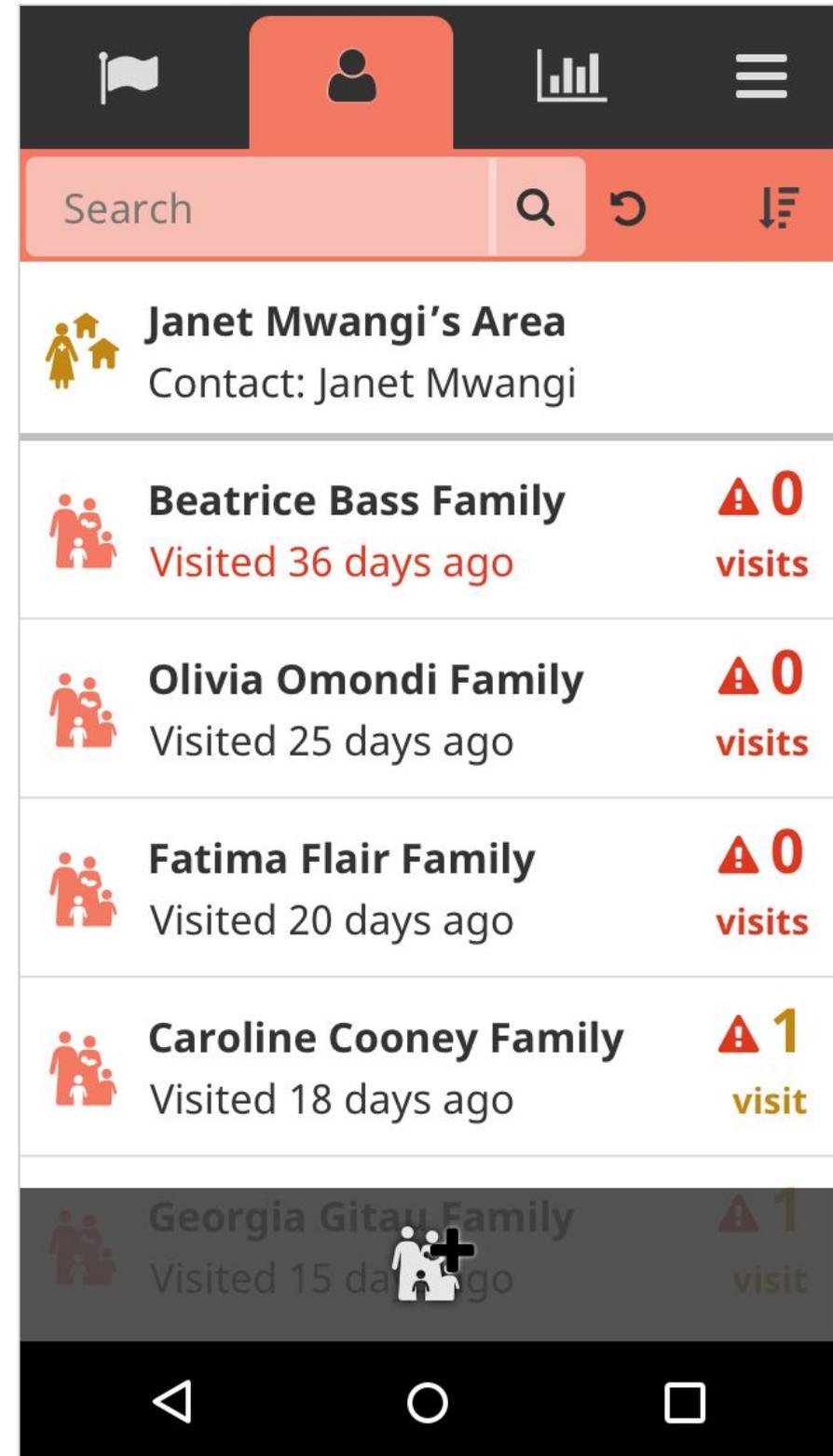
# UHC: Date Last Visited

Date last visited displays the date that the family or area was last visited, based upon the most recent form submission for them. If the date last visited is more than 30 days ago, the date text is styled red.

You can use any forms at the person or family level for this calculation, though it is preferable to limit the number of forms included to the minimal number to avoid performance issues.
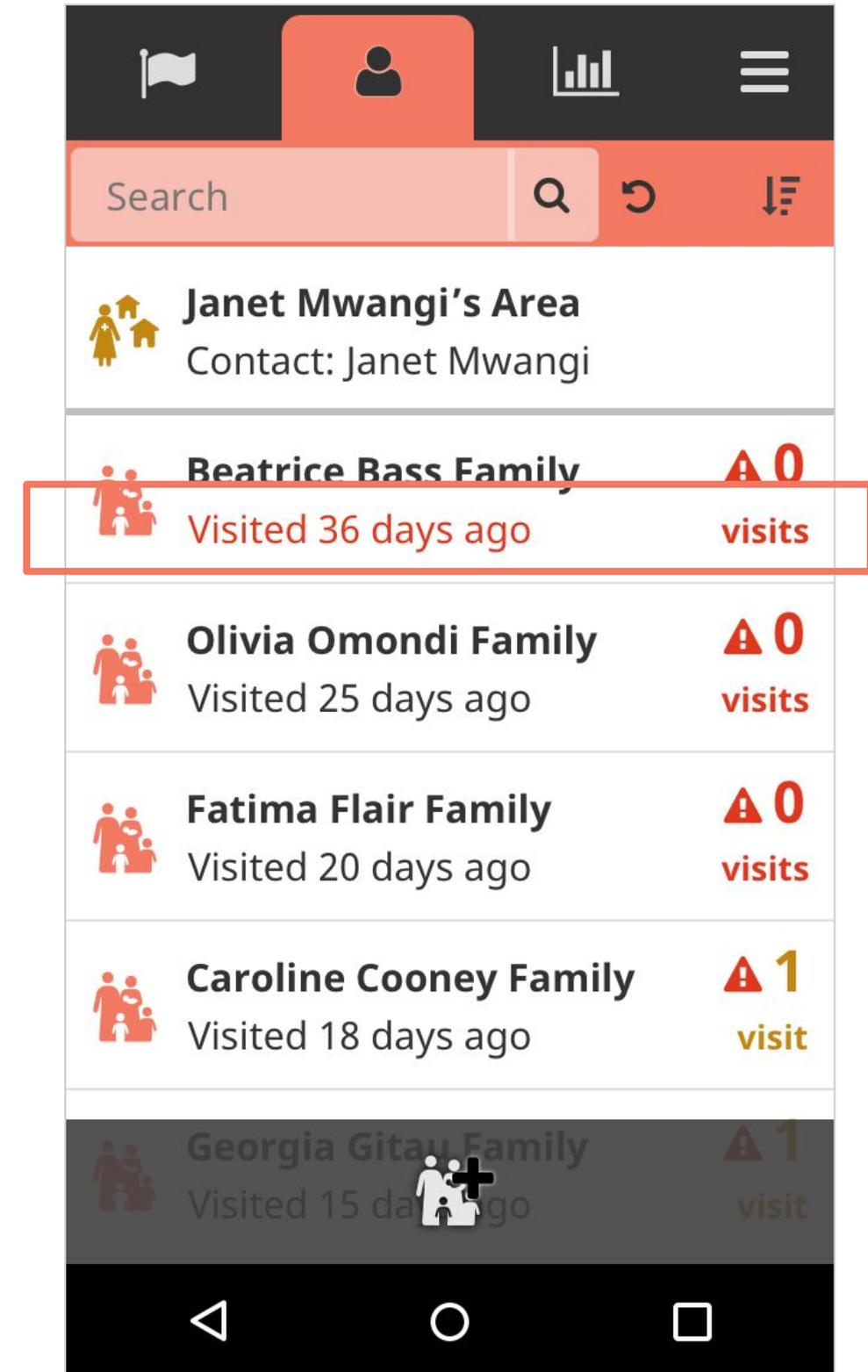
# UHC: Sort By Last Visited

In Universal Health Coverage mode, the default sorting of the list is configurable. We recommend setting the default sort of the page "By date last visited" so that the families that haven't been visited in the longest time are at the top of the list.

If a CHW would like to change the sorting of the page to alphabetical, they may do so using the new sort icon dropdown in the top bar.
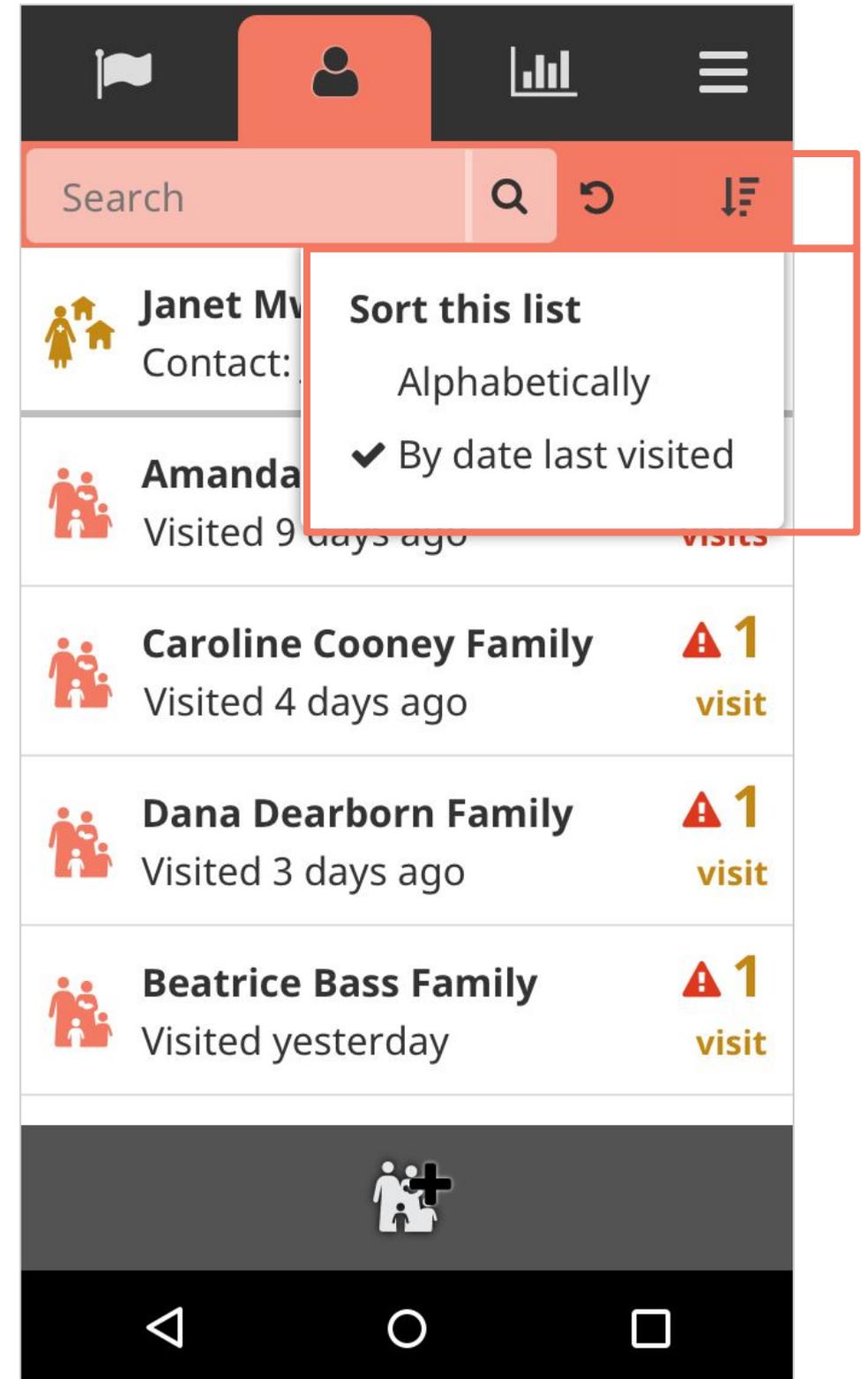
# UHC: Visits This Month

Universal Health Coverage mode also adds large visit count numbers to the right of each family row. The visit count displays the number of times that family has been visited within the current month.

The definition of the calendar month is configurable. Whatever forms have been configured to calculate "Date last visited" will be the same forms used to calculate "Visits this month".

These visit counts may be conditionally styled. If the partner has specific visit goals, we use red to indicate "bad", yellow to indicate "ok" and green to indicate "good" or "goal met." It is also possible to display a warning icon next to the count number. This icon is only available as an option if the organization has set a goal.

# UHC: Date Last Visited Compared To Visits This Month

Although they sound similar, "Date last visited" and "Visits this month" are two different data points.

### Date Last Visited

- Calculated based upon a rolling count of "how many days ago" and is not tied to the calendar
- The date never resets

### Visits This Month

- Tied directly to the calendar month
- Resets back to 0 at the beginning of each month
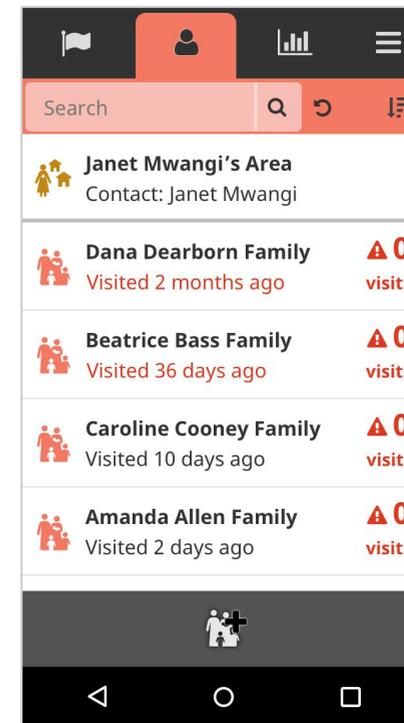


Start of The Month
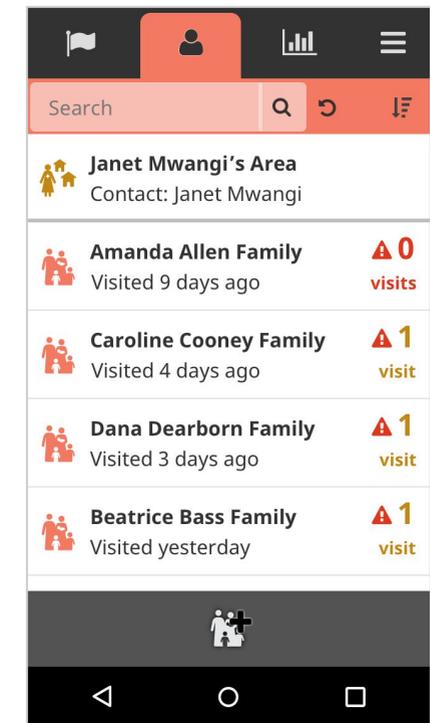


End of First Week
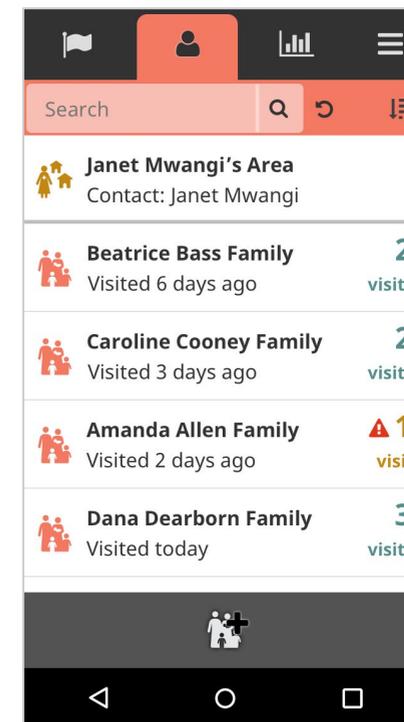


End of Second Week
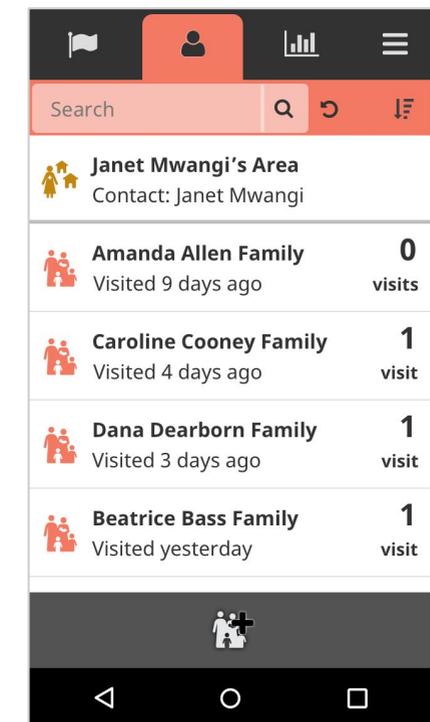


No Visit Goals

# Death Reporting

# Death Reporting

Death reporting workflows allow a user to report a death, another user to confirm that death, and all users to see which family members are deceased on both person and household profiles. Death reports will silence tasks from being generated on behalf of the deceased person as well as from new forms from being filled out about them, with the exception of undoing a accidentally submitted death report.

We also support an optional two-step verification of the death report if you'd like a supervisor to confirm the death before the changes are reflected within your app.
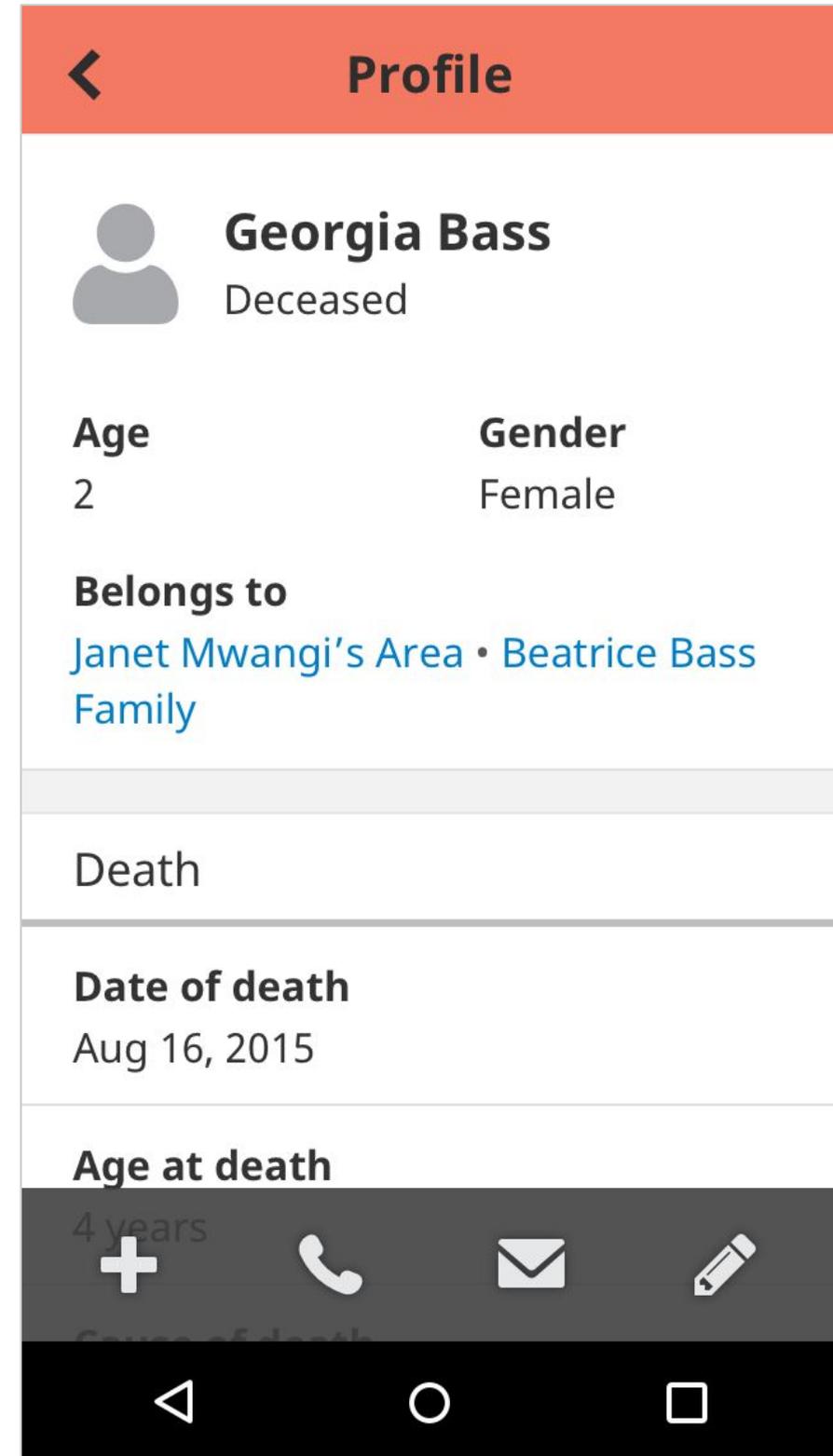
# Death Reporting

First, a death report is submitted by the CHW via SMS or the mobile app.

Once the death report is submitted, the manager or nurse can get an SMS notification or a task to follow up with the community to confirm the death (the manager / nurse would need access to patient reports in order to get this task).

The manager or nurse then confirms the death and submits a death confirmation report.

Once the death is confirmed, the person is marked as deceased in the app.
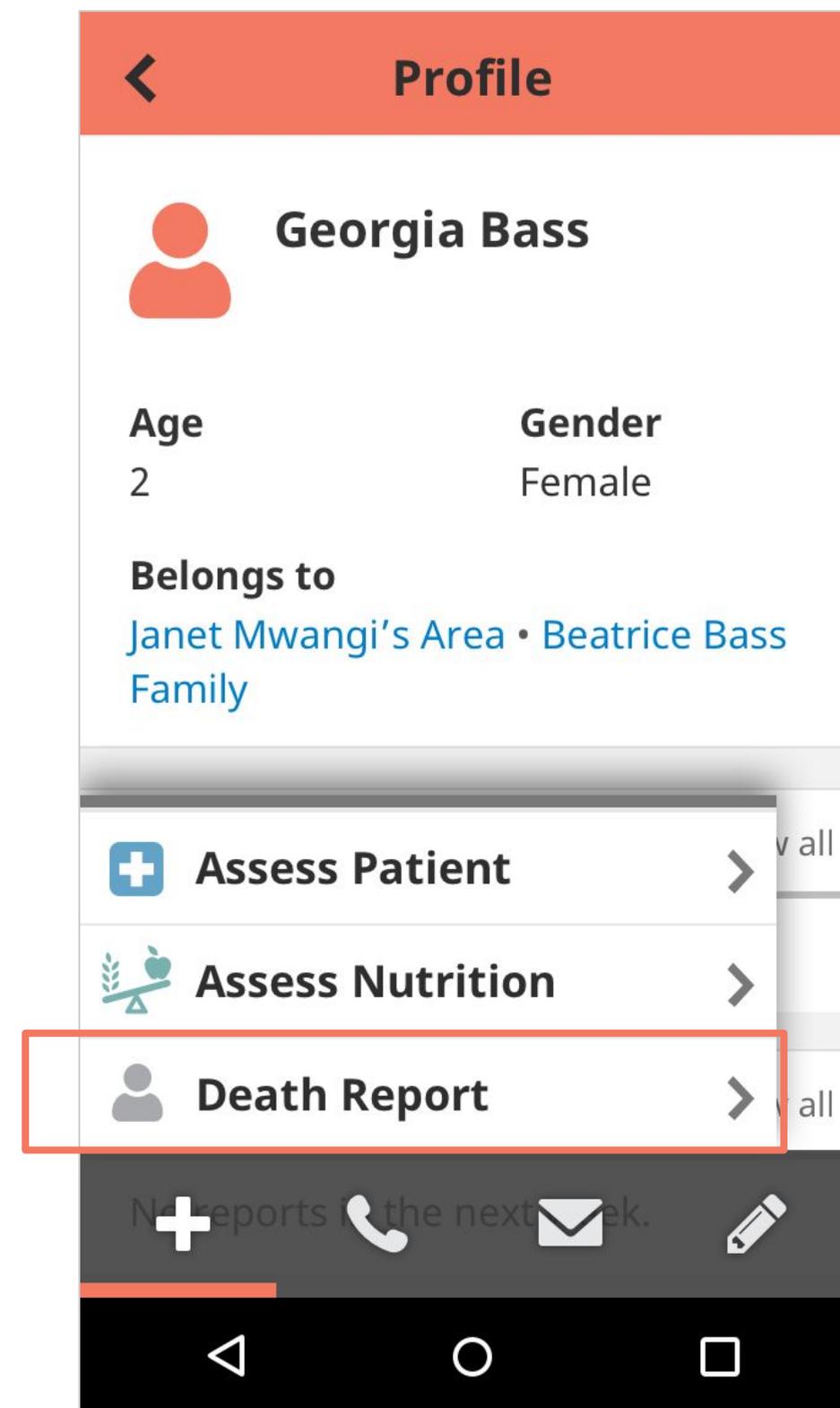
# Death Reporting

There are a few things that will happen when someone is marked as deceased. First, the app will update a person's profile to make it clear the person is deceased.

The icon changes to grey, a label "Deceased" is added underneath the person's name, and a "Death" condition card can be added with additional details about date of death etc.

It will also automatically update the place profile to group deceased people in that family or area. Finally, deceased people will appear at the bottom of search results.
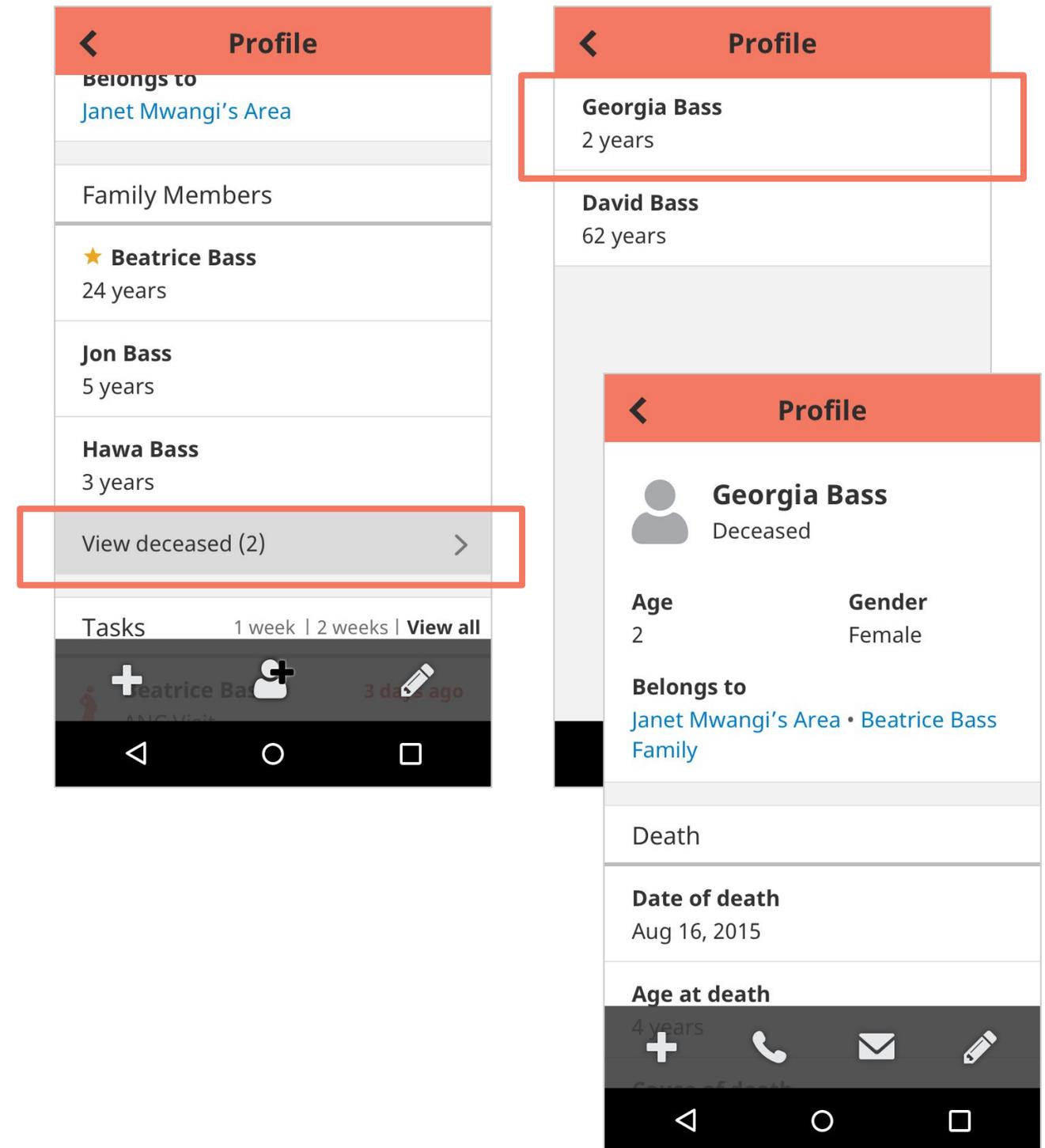
# Death Reporting

If a death is confirmed but it turns out to have been done in error, we also support a workflow for undoing a death.

A CHW can submit a form reporting the mistake. This form reverses all of the profile changes noted in the previous page of this overview.

A two-step approval may be implemented here as well if desired. In that case, the CHW would submit a request form for a correction. The death will be undone when the supervisor or nurse approves it.
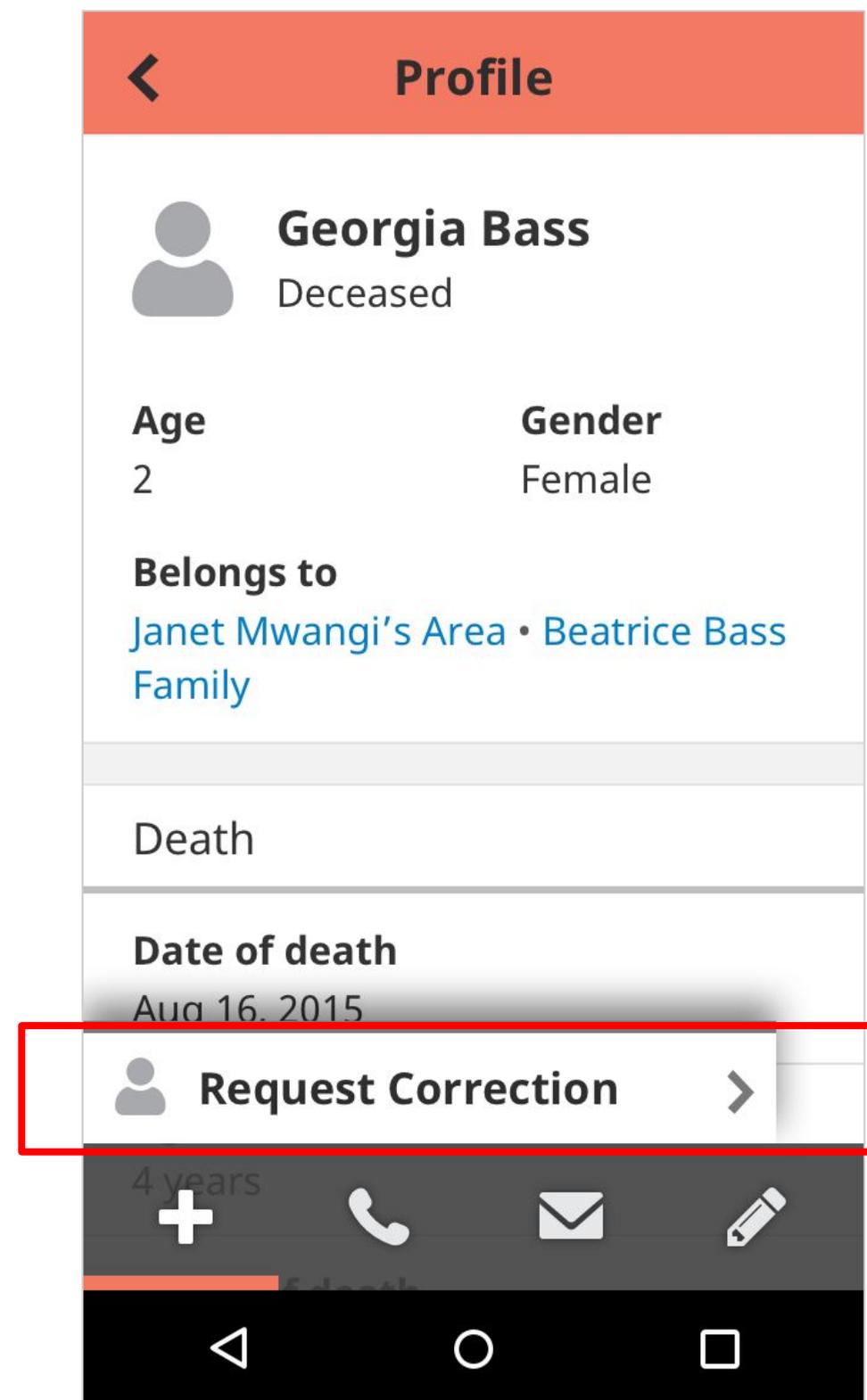
# CONCLUSION

# How to Learn More

The Community Health Toolkit is constantly evolving, with better documentation and hundreds of new contributions to the Core Framework every month.

If you didn't find what you were looking for in this overview of the Core Framework, or if you have questions about how tools built with the Core Framework might work for your community, we'd like to hear from you!

To find more documentation and to contact us, please visit [communityhealthtoolkit.org](communityhealthtoolkit.org).