

HARMONIZED HEALTH FACILITY ASSESSMENT (HHFA)

Data Manager Guide

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World Health
Organization

Harmonized health facility assessment (HHFA)

Data Manager Guide



This is a working document that will be updated intermittently based on implementation experience and feedback from users. Users are invited to submit comments through the HHFA feedback form at: <https://feedback.hhfa.online>

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HHFA overview

The Harmonized Health Facility Assessment (HHFA) is a comprehensive, standardized health facility survey that provides objective information on the availability of health facility services and the systems that facilities have in place to deliver the services at required standards of quality.

Availability and quality of health services are integral to achieving universal health coverage (UHC) and contribute to attaining the health-related Sustainable Development Goals (SDGs). HHFA data support health sector reviews and evidence-based decision-making for strengthening country health services. Developed through multi-stakeholder collaboration, the HHFA is based on global service standards and draws upon existing global facility survey instruments. The HHFA uses standardised indicators, questionnaires, data collection methodologies and data analysis tools. Standardization promotes alignment of facility survey approaches, enables comparability of results over time and across geographic areas, and can support capacity-building through consistent application of global standards.

HHFA modules

The HHFA includes four modules: 1) service availability, 2) service readiness, 3) quality of care, and 4) management and finance.

A module represents a set of questions (in questionnaire format) related to a defined set of indicators in a specific disease, programme or service management area. The modular approach, with core and additional questions, enables countries to adapt the survey to their needs. HHFA questionnaires are provided in two formats: “stand-alone” and “combined”. Each HHFA module includes a set of stand-alone questionnaires that may be designated Core, Core+Additional and/or Supplementary. The Combined questionnaire contains questions from multiple modules, integrated and organized by service site or respondent to facilitate data collection at facility level.

Figure 1: HHFA modules and questionnaires

Module 1 Service availability	Module 2 Service readiness	Module 3 Quality of care	Module 4 Management and finance
<ul style="list-style-type: none"> Facility characteristics Staff Beds Diagnostics Availability of specific services 	Capacity to provide specific services according to defined standards: <ul style="list-style-type: none"> Guidelines, trained staff, equipment, commodities Systems to support quality and safety Provider competency 	<ul style="list-style-type: none"> Adherence to standards in patient care process Patient experience 	Practices to support continuous service availability and quality: <ul style="list-style-type: none"> Management Finance Quality assurance Health worker absenteeism
Questionnaires	Questionnaires	Questionnaires	Questionnaires
<ul style="list-style-type: none"> Availability: Core 	<ul style="list-style-type: none"> Readiness: Core 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Record review* 	<ul style="list-style-type: none"> Management and Finance: Core
<ul style="list-style-type: none"> Availability: Core+Additional 	<ul style="list-style-type: none"> Readiness: Additional/Supplementary - Provider competency† 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Patient experience† 	<ul style="list-style-type: none"> Management and Finance: Core+Additional
<ul style="list-style-type: none"> Availability: Additional/Supplementary - Building structure 			<ul style="list-style-type: none"> Management and Finance: Additional/Supplementary - Health worker absenteeism†
Combined questionnaire			

*Available 2022 †Future development

The HHFA resource package

The HHFA resource package is a comprehensive set of downloadable tools to support countries in adapting, planning, and implementing an HHFA. The package includes:

- **Quick guide:** The quick guide describes the HHFA background and introduces the HHFA concepts, tools and methodologies and well as survey planning and implementation processes.
- **Implementation guide:** The implementation guide provides step-by-step guidance for HHFA planning, implementation, data analysis, interpretation and dissemination of results.
- **Indicator inventory:** An online platform displays all the HHFA indicators, including the survey questions and code needed to calculate each indicator. Core indicators represent the minimum recommended indicator set. Additional indicators can be included based on country priorities. An indicator tabulation plan can be generated from the indicator platform.
- **Questionnaires:** Questionnaires are available in “combined” and “stand-alone” formats. The “combined” questionnaire includes questions from multiple HHFA modules, integrated to facilitate data collection. “Stand-alone” questionnaires are also available for each module. The questionnaires are further termed Core, Core+Additional or Supplementary, based on the types of questions they contain.
- **CSPro electronic data collection tool:** This tool is a CSPro application containing all the HHFA questionnaires and can be used on hand-held devices such as tablets. The tool allows countries to select the questionnaires they want to implement and to adapt the tool to their context.
- **Data manager guide:** The guide defines the data manager’s responsibilities in an HHFA and explains how to adapt and use the CSPro tool.
- **Data analysis platform:** HHFA data are uploaded to the analysis platform that then calculates the HHFA indicators and produces tables and charts in a standard report format. The data analysis platform can also be configured according to country needs.
- **Training resources:** Various training resources support the training of HHFA data collectors, supervisors and data managers, as well as the training of teams conducting data analysis, report-writing and results dissemination.

1. Overview of data manager responsibilities

Data managers play a critical role in preparing in conducting a HHFA. The responsibilities of the data manager are summarized in **Table 1** along with the relevant reference chapter in this manual. The aim of the data manager guide is to provide step-by-step technical guidance for completing the data manager responsibilities.

Table 1: Data manager responsibilities in the HHFA

No.	What?	When?	Chap.
Preparation of CSPro application and tablets			
1	Install CSPro and download the HHFA CSPro application	Before training of data collectors	3&4
2	Setup synchronization method – Dropbox or CSWeb	Before training of data collectors	5
3	Configure the HHFA CSPro application	Before training of data collectors (after questionnaire adaptation)	6
4	Modify HHFA CSPro application (if required)	Before training of data collectors (after questionnaire adaptation)	8
5	Deploy the HHFA CSPro application	Before training of data collectors	9
6	Configure tablets and install the HHFA CSPro application	Before training of data collectors	10
7	Configure handheld GPS devices (if in use)	Before training of data collectors	10
Training			
8	Adapt training materials for data collectors and supervisors	Before training of data collectors	11
9	Manage distribution of tablets	During training of data collectors and field work	11
10	Facilitate training of data collectors on GPS, tablets, and CSPro	During training of data collectors	12
11	Facilitate training of supervisors on CSPro for data validation	During training of supervisors	12
12	Clear data from tablets and server after training/pilot	After training of data collectors	13
13	Make final updates to the HHFA CSPro application	After training of data collectors	13
Data collection			
14	Review data during data collection	During field work	14
15	Track progress towards survey completion	During and after field work	14
Data processing			
16	Review data for completeness	During data processing (after field work is completed)	15
17	Identify and resolve duplicates	During data processing (after field work is completed)	15
18	Compare supervisor validations	During data processing (after field work is completed)	15

No.	What?	When?	Chap.
18	Review key variables	During data processing (after field work is completed)	15
19	Calculate sample weights	During data processing (after field work is completed)	15
20	Edit data and create final dataset	During data processing (after field work is completed)	15
21	Export data for analysis and archiving	During data processing (after field work is completed)	16

While the data manger guide provides substantial detailed information, it is expected that the data manager have the appropriate qualifications in order to fully grasp the complexity of data management and to successfully operationalize the instructions provided in the data manager guide. The ideal data manager will have proven experience as a data manager with a strong understanding of data administration and management functions including data collection, data processing, and data analysis. Successful data managers often possess the following key skills:

- Knowledge of CSPro software (intermediate level knowledge preferred)
- Demonstrated data management experience conducting and supporting surveys using CSPro for electronic data collection in similar contexts
- Demonstrated training and facilitation experience
- Excellent communication and interpersonal skills
- Strong teamwork predisposition and the capacity to work collaboratively with partners
- Ability to interpret, analyze and resolve problems
- Tech-savvy with excellent troubleshooting skills

2. Introduction to CPro for the HHFA

Electronic data collection facilitates the collection of more accurate and reliable data in a more efficient, timely manner than when using paper questionnaires. Handheld data collection devices offer solutions for data collection errors and disorganization. These electronic tools are available in various forms, the most commonly-used devices being handheld computers (i.e., tablets) or smartphones. Global Positioning System (GPS) devices are handheld electronic devices often used in conjunction with handheld computers to determine precise location using geographic coordinates.

Electronic data collection devices have gradually increased in popularity for field surveys due to decreasing costs and increasing computation and functional capacity. Not only does electronic data collection offer an efficient and accurate means of data collection and dissemination, but workers are often eager to use modern technology for practical purposes. Furthermore, the time needed to train staff in the use of electronic data collection devices can be as little as one day.

The advantages of electronic data collection are clear. In order to facilitate the collection of accurate and reliable data, a number of data validation procedures can be programmed into an electronic data collection device, including: skip patterns, range controls, standardized responses, and mandatory question responses. Automatic progression of the questionnaire and standardized responses make it easy for data collectors to administer the survey. Also, time is not wasted in scrutinizing the progression of the questionnaire or writing lengthy responses.

As the size and scope of a survey increases, so do the benefits of electronic data collection. Large volumes of data are subject to the risk of more data collection errors, and the time saved in data collection, data entry, data cleaning, and data dissemination is substantial. With electronic data collection, information can be in the hands of decision-makers in the same day that the data is collected.

For the HHFA, electronic data collection is carried out through the use of the Census and Survey Processing System (CPro) software. CPro is a software package for entry, editing, tabulation, and dissemination of census and survey data. CPro allows the user to create, modify, and run data entry, batch editing, and tabulation applications from a single, integrated development environment. The data are stored in files described by data dictionaries. CPro was developed jointly by the U.S. Census Bureau, Macro International, and Serpro, SA, with major funding from the U.S. Agency for International Development.

CPro is not intended to provide database management capabilities; however, the data generated and/or manipulated by a CPro application may be imported into a database system. While CPro provides some tabulation capabilities, it is not intended to replace more sophisticated statistical analysis software such as SAS, SPSS, Stata, R, etc. In addition, even though CPro includes a module for generating thematic maps, it cannot be considered a geographical information system, as the maps cannot show the multiple layers available in a true geographical information system.

CPro is in the public domain. It is available at no cost and may be freely distributed. It is available for download at <https://www.census.gov/data/software/cspro.Download.html>. More detailed information about the capabilities of CPro is available from the Census Bureau website.

CSPro for the HHFA

As CSPro has been chosen for the implementation of the HHFA, a standard HHFA CSPro application has been developed. This document provides instructions on how to adapt the standard HHFA CSPro application at country level, as well as how to implement the CSPro application for data entry and data processing.

There are a multitude of resources available to support CSPro users including the following useful links:

- U.S. Census Bureau website: <https://www.census.gov/data/software/cspro/Overview.html>
- CSPro User Guide:
 - <https://www.census.gov/data/software/cspro/documentation.html>
 - <https://www.csprousers.org/help/CSPro/>
- Mailing list for CSPro questions: cspro@lists.census.gov
- CSPro Users website: <http://www.csprousers.org>
- CSPro on Twitter: <http://twitter.com/cspro>

The data manager guide does not intend to be a comprehensive guide for how to use CSPro. Instead, the data manager guide draws on the comprehensive resources listed above to provide specific instructions for making adaptations to the CSPro application that has been developed for the HHFA. Please utilize the above sources for additional information about CSPro and troubleshooting CSPro as needed.

PART 1: PREPARATION OF CSPRO APPLICATION AND TABLETS

3. Installing CPro

Hardware and software requirements

The following requirements are necessary in order to use CPro for data collection:

Computer hardware and software specifications

CPro 7.7 runs under Windows Vista, 7, 8, 10, and 11. It does not run under Windows 8 RT. The Android data entry module requires Android version 4.0 or higher.

RECOMMENDED CONFIGURATION FOR QUESTIONNAIRE DEVELOPMENT

- Desktop or laptop computer
- Pentium Processor
- 512 MB of Ram
- SVGA monitor
- Mouse or touchscreen
- 100MB of free hard drive space
- Microsoft Windows Vista, 7, 8, 10 or 11. (Note: CPro does not run on Windows 8 RT)

CONFIGURATION FOR DATA COLLECTORS' APPLICATION

- Android tablet with operating system 4.0 (Ice Cream Sandwich) or higher

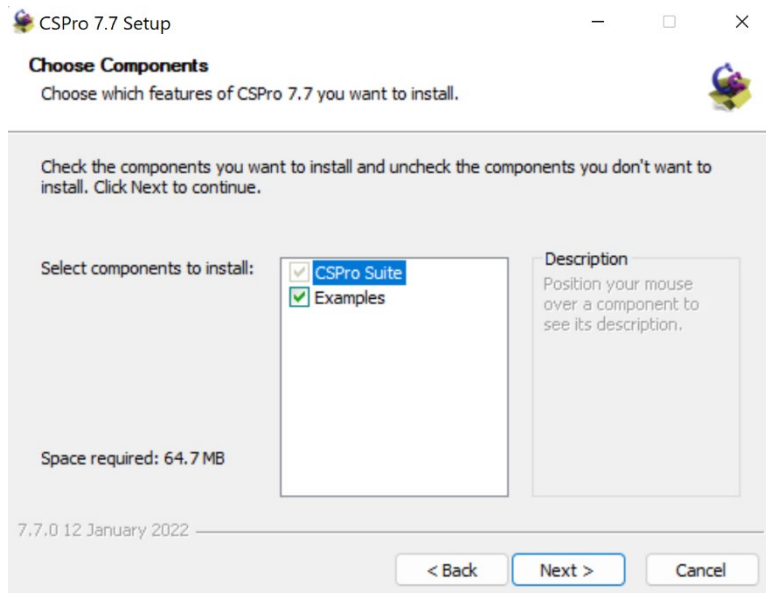
Software installation

Install CPro on a computer/laptop

The following is based on a Windows 10 setup. Your steps may vary if using a different operating system.

1. Download the CPro application from <https://www.census.gov/data/software/cspro.Download.html>

2. Install CSPro 7.7 to your computer by double-clicking on cspro77.exe (the last digit of the version number might change as new releases are published). This will start the installation wizard.
3. Read and accept the U.S. Census Bureau's license agreement.
4. CSPro allows you to select which components of the system you want to install. During the installation you will see the following component screen:



You have the following choices:

- CSPro Suite
- Examples

For the HHFA, ALL COMPONENTS of the CSPro suite must be installed, even on tablets to use in the field, as there are tools in the full application that are required for the program to run properly. For the remaining default settings for the installation, click “next” until finished.

Updating to CSPro 7.7 from CSPro 7.6 or earlier

If you have an older version of CSPro installed on your computer, you can install CSPro 7.7 without affecting the previous version, and both versions can be run in parallel. Please notice, however, that version 7.7 is now the default program to open existing applications, and these are automatically converted to 7.7 format. Due to internal changes within CSPro 7.7, once files have been loaded in CSPro 7.7, you may no longer be able to load them in previous versions of CSPro. You also have the option to remove older versions of CSPro from your computer if you are no longer using them as this will simplify opening CSPro applications.

Install CSEntry for Android devices

The app is called “CSEntry CSPro Data Entry”, and can be found and installed from Google Play store (search for “CSPro”).

Install CSPro on a Tablet PC (Windows 8)

- Reactions to the user interface of Windows 8 have mostly been negative, and in combination with CSPro, it is a rather messy experience. Each CSPro component becomes one tile in the home screen, resulting in 15 to 20 new “tiles” on the start screen. If other programs also are installed, the user soon loses track amongst all the tiles. Hence, we recommend installing a tool called Classic Shell to get back the start menu and the general feel of Windows 7 or 10. Once the Classic Shell is installed, the installation of CSPro 7.7 is the same as for installing on a Windows 10 computer as explained above.
- The Classic Shell can be downloaded from <http://www.classicshell.net/downloads/>. Double click on the installation file and follow the instructions to install.

Uninstall CSPro

There are two ways to uninstall CSPro. The uninstaller will remove all registry entries and CSPro system files. It will not remove any applications or other files that you have created.

You can uninstall the program using the Windows Control Panel:

1. Using the Windows search functionality (Windows Key+S), type Add or remove programs.
2. Select CSPro from the list of programs.
3. Follow the prompts to uninstall the program.

Alternatively, you can:

1. Use Windows Explorer to browse to the CSPro application folder, which will likely be: C:\ProgramFiles (x86)\CSPro 7.7.
2. Run the program uninstall.exe.
3. Follow the prompts to uninstall the program.

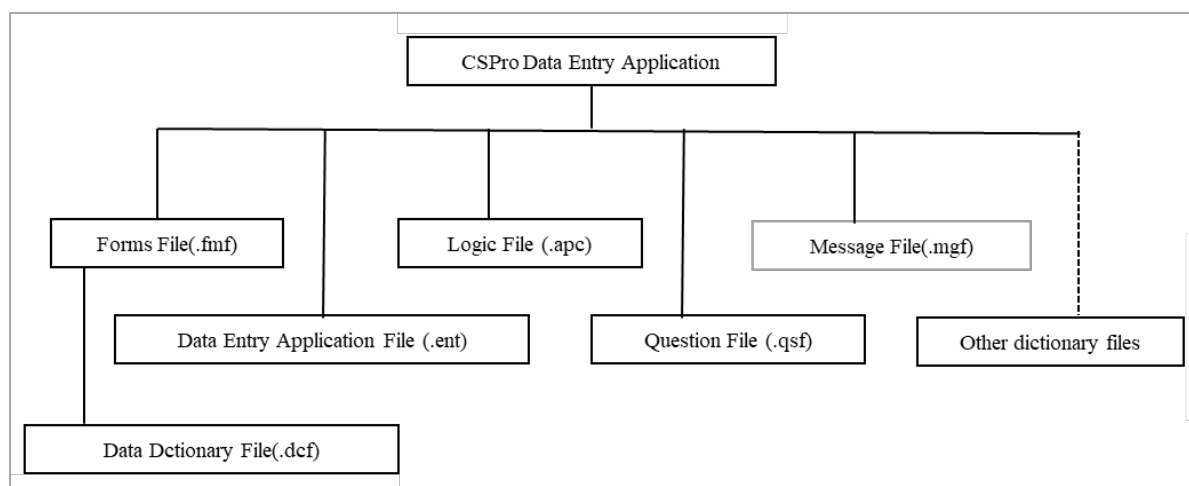
4. The HHFA CPro application

Download the HHFA CPro application

The HHFA questionnaires have been programmed into CPro and the HHFA CPro application is available for download at <https://csprowhha.online/>. The HHFA application can be adapted for each country context and survey implementation. This chapter describes the basics of a CPro data entry application and the file hierarchy of the HHFA CPro application, as well as explaining the uses of the different files.

Basics of a CPro data entry application

A CPro data entry application contains a set of forms (screens) and logic that a data entry operator uses to key data to a disk file. Data entry applications can be used to add new data and to modify existing data. The CPro data entry application consists of the following files:



Data Entry Application File Organization

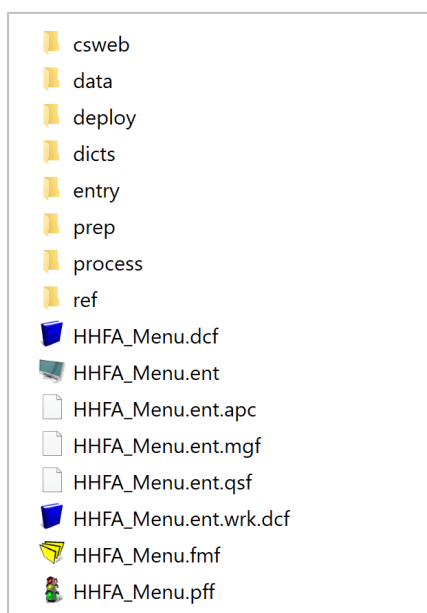
- **Data Entry Application File (.ent):** The data entry application file is the master file for the data entry application. This file specifies all other files contained in the application, along with other information.
- **Form File (.fmf):** The forms file contains information about forms, their fields, text, and rosters. The forms file also contains the name of the associated data dictionary file. The flow during data entry, that is, the order in which forms and fields are entered, is defined in the forms file, not in the data dictionary. There is usually one forms file per application, but there may be multiple forms files. Each forms file contains one Data Dictionary file (.dcf) which represents the primary data file that is being created or modified.
- **Logic File (.apc):** The logic file contains all the CPro language statements which control the application. There is one logic file associated with each application.
- **Message File (.mgf):** The message file is a text file where you can store message text and an associated message number. The message is displayed when an "errmsg" function with the

message number is executed in a data entry application. A message may contain parameters. This is an optional file.

- Question File (.qsf): The question file contains information related to Computer-Assisted Personal Interview (CAPI) data entry applications. Such information includes question text to appear on the screen with each field and when the operator presses the help key.
- Data dictionary file (.dcf): Each file manipulated by CSPro must be described by a data dictionary. The data dictionary file contains information defining the layout of the data file, including levels, records, items, value sets, and values.
- Other Data Dictionary Files (.dcf): Optional, it represents secondary data files (such as lookup files) that are read and/or written to during data entry.
- Program information file (pff): Program information files are used to run applications or tools in production mode.

HHFA CSPro folder structure

The HHFA folder consists of the following folder structure:



When moving around in the hierarchy, many files will be seen. This is because CSPro generates many different kinds of files. Data collectors do not need to know about the files or hierarchy, because a shortcut to launch the data entry application is provided for them. However, an administrator of the application needs to be familiar with several very important folders in order to customize the application and deploy it for data collection.

Please be aware that *none of the folder, subfolder, nor application names can be renamed*. Doing so would "break" numerous pieces of logic within the menu system and elsewhere, rendering the system inoperable. Also, do not change the location in which various files are stored.

The following section presents an overview of the uses of each file in the HHFA folder. When exploring the HHFA CSPro folder, it is highly recommended to configure Windows Explorer to show extensions

for known file types, as a folder with CSPro files becomes confusing when the extensions are not shown. To do this: Open Control panel, and in the upper right corner choose “View by small icons”. Then click on “Folder options”. Choose the tab “View”, and un-tick “Hide extensions for known file types”. Then click OK.

csweb – Contains automated ansible scripts that can be used to configure a CSWeb instance on a cloud Linux server. (See *Chapter 5 - Setup synchronization method* for further information on setting up CSWeb.)

data – Folder where data collected using the HHFA application is stored. All other “data” files related to application functionality are in the ref (reference) folder. All CSPro data files have the file extension .csdb.

- **HFA_Assignments(.csdb):** This is a data file that stores the section assignments for the facilities.
- **HFA_Data(.csdb):** This is the individual data records from the facility audit questionnaire.
- **HFA_COMB(.csdb):** This is combined data records from the facility audit questionnaire.
- **HFA_COMB_DM(.csdb):** This is combined data records from the facility audit questionnaire generated by the data manager interface.
- **training_data:** The training data folder is where data collected using the HHFA data during training and the pilot test is stored.

deploy – Contains an example deployment script to send the full application to CSWeb or Dropbox.

dicts – Contains all the dictionaries that are used in the HHFA application. The following dictionaries are included in the dict folder:

- **chFA_setup:** Used for the HFA_setup application.
- **HFA_Assignments:** This is the application that is run when assigning questionnaire sections.
- **HFA_COMB:** This is a replica of the HFA_DICT file. It is used to generate the HFA_COMB data file which is used for data concatenation.
- **HFA_DICT:** Main data entry application dictionary for the facility audit questionnaire.
- **HFA_Facilities:** Used for the HFA_Facilities lookup file.
- **HFA_Geocodes:** Used for the HFA_AdminAreas lookup file.
- **HFA_Staff:** Used for the HFA_Staff lookup file.

entry – Contains the main HHFA data entry application. This will be used to make most of the country-specific edits to the content of the HHFA questionnaire.

prep – Contains external applications that are used for preparation of the main application.

- **HFA_Setup:** This is run by the data manager to set up/configure HHFA parameters.

process – Contains batch editing files that are used during the set-up and data processing phases.

ref – Contains reference files and lookup files that are used within the applications. The following files are contained within this folder:

- **csv_files folder:** This contains reports in .csv format that can be generated from the data manager menu.
- **reports folder:** This contains custom html reports that are displayed when the user generates reports within the application.
- **HFA_AdminAreas(.csdb):** This a lookup file that contains the administrative units of the HHFA country.
- **HFA_Facilities(.csdb):** This a lookup file that contains the sample list of all the health facilities to be interviewed.
- **HFA_setup(.csdb):** This a lookup file that stores all the survey parameters set by the data manager. This file is **VERY critical** within the HHFA Application. Without it, the HHFA application cannot run.
- **HFA_Staff(.csdb):** This is a lookup file that contains login information for each of the survey staff (data collectors, team leaders, supervisors).
- **QMap(.csdb):** This is a lookup file that contains mappings of the standard HHFA questions. Each question is mapped to a specific module.
- **QMapDict(.dcf):** This is the data dictionary that describes the QMap lookup file. It is used to upload data from an Excel file into the QMap data file.
- **QuestionMapping(.xlsx):** This is the Excel file that is used to generate the question mappings.
- **Sample_Facilities_File(.xlsx):** This is the reference Excel file that is used to generate the list of facilities to be uploaded into the HFA_Facilities csdb file.
- **Sample_Geocodes_File(.xlsx):** This is the reference Excel file that is used to generate the administrative units of the HHFA country.
- **Sample_Staff_File(.xlsx):** This is the reference Excel file that is used to generate login information for the survey staff.

HHFA_Menu – This is the main HHFA application and serves as an entry point to the HHFA data entry application. It contains the central menu system which defines the functionalities for different users of the application (data manager, supervisor, team leader, data collector). Launching of this application allows a user to access all the main functionalities such as setup, sending assignments, collecting data, syncing data, etc. Some time may be needed to open this application because of the number of linked dictionary files. Generally, it is only necessary to open this application on the computer as part of the data manager setup. Otherwise, all other access will be through the tablet interface.

5. Setup synchronization method

There are two options for syncing data using the HHFA CPro application: 1) CSWeb and 2) Dropbox. The HHFA CPro application has been developed to allow for synchronization of data using either method. There are pros and cons to both approaches. The following section provides a brief overview of the differences between and resource requirements for data synchronization using CSWeb and Dropbox. Each survey implementation should select the most appropriate option and then proceed with the configuration steps for their selected synchronization method. **Table 2** contains a comprehensive comparison between CSWeb and Dropbox.

CSWeb: CSWeb is a web server running the CPro synchronization server software. It is best for large surveys and censuses. The server software is written in PHP and can be run on any web server that has PHP and the MySQL database software installed. In a country, the server can be set up at the head office on a computer that is connected to the internet or it may be set up on a hosted website or virtual server in the cloud.

Dropbox: Dropbox is a free cloud-based synchronization service. It is ideal for small and medium surveys. Dropbox requires no server setup or maintenance and avoids the cost and difficulty of setting up a CSWeb server.

Table 2: Comparison between Dropbox and CSWeb

	CSWeb	Dropbox
Survey size	<ul style="list-style-type: none"> Best for large surveys 	<ul style="list-style-type: none"> Best for small and medium surveys
Technical resources	<ul style="list-style-type: none"> Configuration requires some IT system administration skills (knowledge and experience with server administration and website technologies) 	<ul style="list-style-type: none"> Configuration can be done by survey data manager (no advanced IT skills required)
Physical resources	<ul style="list-style-type: none"> Web server that has PHP and the MySQL database software installed Server can be set up on a computer connected to the Internet or may be set up on a hosted website or virtual cloud-based server 	<ul style="list-style-type: none"> Free cloud-based synchronization service Requires a dedicated email account (for example, Gmail)
Cost	<ul style="list-style-type: none"> Server cost is base monthly fee plus usage; however, this is generally very low for a HHFA survey (e.g. USD 5 for monthly fee) Domain name (optional) has a one-time fee; prices vary (e.g. USD 10) 	<ul style="list-style-type: none"> Free of charge
Data security	<ul style="list-style-type: none"> Does not require input of user name and password directly on data collection devices Data resides on your own server (either physical or virtual) 	<ul style="list-style-type: none"> Requires input of user name and password directly on data collection devices Files reside on Dropbox server

	<ul style="list-style-type: none"> Allows definition of user roles and permissions 	
Data downloading/monitoring	<ul style="list-style-type: none"> Easier monitoring of data during data collection More direct data download 	<ul style="list-style-type: none"> Must use intermediary CSPro tools to monitor and download data

If you are unsure about which option to select for data synchronization, it is recommended to make the decision based on your organization's technical resources. If your organization has experience with web server maintenance and cyber security, CSWeb is recommended. It is optimized to handle small to very large surveys and censuses. However, if your organization lacks the experience to work with CSWeb, Dropbox is recommended as it is appropriate for small to medium sized surveys, requires no server setup or maintenance and avoids the cost and difficulty of setting up a CSWeb server.

The next section provides instructions for setting up both Dropbox and CSWeb synchronization. Follow the instructions for the **ONE** approach you have selected.

Setup Dropbox synchronization

The first step in the Dropbox synchronization process is to create a dedicated Dropbox account for the survey. An email address is required for this process and creation of a dedicated email address for the survey is recommended to facilitate creation of the dedicated survey Dropbox account. Take the following steps to set up the relevant accounts:

1. Set up a free email account through Gmail.
 - a. Go to www.gmail.com and click on Create an account.
 - b. Enter First Name, Last Name, Username, Password, Birthday, and Gender. The following can be used: :
 - i. First Name: Country
 - ii. Last Name: HHFA
 - iii. Username: CountryHHFAYear
 - iv. Password: HHFAYearCountry (or other password of choice))
 - v. Birthday: Jan 1, 1990
 - vi. Gender: select any
 - c. This will create the survey Gmail address. Continue to Gmail to open the email account.
2. Set up a free Dropbox account.
 - a. Go to www.dropbox.com and click on Create a new account.

- b. Enter First name, Last name, the email address created in Gmail (CountryHHFAYear@gmail.com), and a password (HHFAYearCountry or other password of choice). Then click on Agree to the terms and create an account.
 - c. This may prompt you to download Dropbox installer. This is not required for the HHFA sync. Navigate to the Dropbox homepage and you will be able to see what files are in the Dropbox.
3. Click on Files → New folder and name the folder “CSPPro”. Then click on Share next to this new folder name.
4. A message will pop-up asking you to verify the new Dropbox account through email. Click on Send email.
5. Return to your survey Gmail account. Check your inbox and click on the link in the email received from Dropbox to verify your email address. If you cannot find it, check your spam folder or ask Dropbox to resend the email.
6. Dropbox should now display a message that your email address has been verified and you can now share folders. Once again, click on Share next to the new folder (CSPPro) that you created in Dropbox.
7. Select ‘Invite people to collaborate’, enter the email address of the survey data manager, and click Share folder.
8. The data manager should now be able to login to their own personal email and accept the folder invitation. Please **limit the number of people invited to this folder** as anyone who has access to this folder will be able to view, edit, and delete the data entry application and the data during and after the data collection process.
9. Your Dropbox account is now ready to synchronize with the HHFA CSPPro application.

Setup CSWeb synchronization

There are many options for setting up CSWeb including:

- **Cloud server:** Amazon Lightsail, Digital Ocean, Linode, Google Cloud Platform, etc.
- **Physical server:** Server located on premises. Use of a physical server requires configuration of a virtual machine that is continuously internet accessible.

The CSPPro documentation provides general guidance on how to configure CSWeb for various technology configurations¹. There are four main steps to setting up CSWeb:

1. Set up server
2. Configure domain name
3. Configure virtual host and copy CSWeb files

¹ CSWeb help documentation: https://www.csprouters.org/help/CSWeb/introduction_to_csweb.html

4. Configure CSWeb server

The first step in setting up CSWeb is to set up a server. In order to connect to the server from devices outside your local network, such as tablets in the field, you will need to register a domain name for your server. While the process for setting up the server and configuring the domain name will be specific to the server platform, the process for the next steps -- configuration of the virtual host and CSWeb server -- will remain the same irrespective of the server platform. As such, the next instructions will start with step 3 which assumes the server has been set up and the domain name has been configured. **Annex 1** includes an example set of instructions for steps 1-2 using one cloud server platform for reference.

The minimum requirements to run CSWeb on an Apache or IIS server include:

- **Apache 2.0** or above or **IIS 7.0** or above
- URL Rewrite Module enabled
- MySQL 5.5.3 or greater
- PHP 7.3 or 7.4
- **Settings in php.ini**
 - enable_post_data_reading on
 - post_max_size=8M
 - **Extensions in php.ini**
 - extension=php_curl.dll
 - or allow_url_fopen=On
 - extension=php_fileinfo.dll
 - extension=php_openssl.dll
 - extension=php_pdo_mysql.dll
 - extension=php_pdo.dll
 - extension=php_zip.dll (necessary with some installations of PHP)
- **Guzzle** (PHP HTTP client) one of the following must be true
 - PHP 7.3 or 7.4
 - or extension=php_curl.dll
 - or The CA bundle is installed
- **Files directory**
 - Must exist and be writeable

The following sections will provide instructions for setting up the minimum required configuration for both Apache and IIS servers.

Configure virtual host - Apache

We are going to use an automation script to configure Apache webserver, MySQL, PHP, and CSWeb. This section, adapted from a tutorial published on Digital Ocean's website², explains how to use Ansible to automate the installation of Apache webserver, MySQL, PHP, and CSWeb.

Locate and explore the csweb folder

Go to HFA_WHO\csweb. Inside the csweb folder, the following is the folder structure:

```
csweb_ansible
├── files
│   ├── apache.conf.j2
│   └── csweb.zip
├── vars
│   └── default.yml
├── csweb-playbook.yml
├── inventory.txt
└── readme.md
```

Here is what each of these files are:

- `files/apache.conf.j2`: Template file for setting up the Apache VirtualHost.
- `files/csweb.zip`: A CSWeb installation zip file downloaded from the CSPro website. It is recommended that you replace this file with the latest version downloaded from the CSPro website. (<https://www.census.gov/data/software/cspro.Download.html>)
- `vars/default.yml`: Variable file for customizing playbook settings.
- `csweb-playbook.yml`: The playbook file, containing the tasks to be executed on the remote server(s).
- `inventory.txt`: An inventory file containing information of which hosts are part of your infrastructure and the connection information.
- `readme.md`: A text file containing information about this playbook.

What does the automation script do?

The automation script will perform the following actions on the server:

- Install aptitude, which is preferred by Ansible as an alternative to the apt package manager.
- Install the required LAMP packages (Linux, Apache, MySQL, PHP).
- Create a new Apache VirtualHost and set up a dedicated document root for that.
- Enable the new VirtualHost.
- Enable mod rewrite.
- Disable the default Apache website, when the `disable_default` variable is set to true.
- Perform MySQL configuration and set root password.
- Create CSWeb MySQL user and MySQL database.
- Set the privileges for CSWeb MySQL user on CSWeb MySQL database.
- Copy and install CSWeb files in the document root.
- Configure folder permissions in the CSWeb folder.

Prerequisites:

In order to execute the automated setup provided, you will need:

² Tutorial - How to Use Ansible to Install and Set Up LAMP on Ubuntu 18.04:

<https://www.digitalocean.com/community/tutorials/how-to-use-ansible-to-install-and-set-up-lamp-on-ubuntu-18-04>

- **One Ansible control node:** a local machine/pc running Ubuntu 18.04/20.04 with Ansible installed and configured to connect to your Ansible hosts using SSH.
- **Ansible host:** a remote server instance running Ubuntu 18.04/20.04.

Before proceeding, you first need to make sure your Ansible control node is able to remotely connect to your Ansible host via ssh commands.

Install Ansible on control node

- To install Ansible on the control node, execute the following commands

```
$ sudo apt update
$ sudo apt install software-properties-common
$ sudo add-apt-repository --yes --update ppa:ansible/ansible
$ sudo apt install ansible
```

Edit the variable file

Edit the automation script variable file to customize the configurations of Apache, MySQL and CSWeb.

- Go to HFA_WHO\csweb\vars and open the default.yml file using your preferred text editor such as Notepad++, or vi/nano on terminal.
- The following variables highlighted in grey must be edited. Instructions for how to edit each variable are below. Save the variables file once you have finished editing.

```
mysql_root_password: "mysql_root_password"
sudo_user: "sudo_user"
http_host: "your_domain"
http_conf: "your_domain.conf"
http_port: "80"
csweb_folder: "csweb"
mysql_csweb_db: "mysql_csweb_db"
mysql_csweb_user: "mysql_csweb_user"
mysql_csweb_pass: "mysql_csweb_user_password"
disable_default: true
```

- Instructions for editing the variables are as follows:
 - `mysql_root_password`: The desired password for the **root MySQL account**. It is recommended that you provide a strong password for the root user. If you would like to generate a strong password, you can use a password generation site such as <https://passwordsgenerator.net/>
 - `sudo_user`: A remote non-root user on the Ansible host that will be set as the owner of the application files.
 - `http_host`: Your domain name. e.g., *example.com*
 - `http_conf`: The name of the configuration file that will be created within Apache. Usually prefer, defaulting to domain name i.e., *example.com.conf*
 - `http_port`: HTTP port for this virtual host, where 80 is the default.
 - `csweb_folder`: The folder on the document root where CSWeb files will be copied to.
 - `mysql_csweb_db`: The name of the csweb MySQL database to be created

- `mysql_csweb_user`: A non-root MySQL user that will have access rights to the `mysql_csweb_db`.
- `mysql_csweb_pass`: The desired password for **MySQL csweb user**. It is NOT recommended to use the same password as the `mysql_root_password`. Again, it is recommended to provide a strong password. If you would like to generate a strong password, you can use a password generation site such as <https://passwordsgenerator.net/>
- `disable_default`: Whether or not to disable the default website that comes with Apache.

Edit the inventories file

- Go to `HFA_WHO\csweb` and open the `inventory.txt` file using your preferred text editor such as Notepad++, or `vi/nano` on terminal.
- Edit and fill in the values highlighted in grey below.
- Save the file after editing.

```
[hosts]
hhfa_svr ansible_host=[domain name/IP address] ansible_user=[sudo_user]
ansible_ssh_private_key=[server private key]
```

Execute the automated script

- To execute the script, run the following commands:

On terminal

```
$ cd /path/to/csweb/csweb_ubuntu
$ ansible-playbook csweb_playbook.yaml -i inventory.txt
```

- When all the configurations are done correctly, you will get an output similar to the image below:

```
PLAY [all] *****
TASK [Gathering Facts] *****ok: [hhfa_server]
TASK [Make sure pymysql is present] *****ok: [hhfa_server]
TASK [Create CSWeb database] *****ok: [hhfa_server]
TASK [Create CSWeb DB user/Grant privileges to csweb db] *****[WARNING]: Module did not set no
ok: [hhfa_server]
TASK [Create csweb installation directory] *****ok: [hhfa_server]
TASK [Unzip CSWeb.zip] *****changed: [hhfa_server]
TASK [Change folder permissions] *****changed: [hhfa_server] => (item=
changed: [hhfa_server] => (item=/var/www/cspiro-hhfa.com/demo2/files)
changed: [hhfa_server] => (item=/var/www/cspiro-hhfa.com/demo2/setup)
changed: [hhfa_server] => (item=/var/www/cspiro-hhfa.com/demo2/src)
changed: [hhfa_server] => (item=/var/www/cspiro-hhfa.com/demo2/var)
PLAY RECAP *****hhfa_server : ok=
ppped=0 rescued=0 ignored=0
```

- You have now configured the virtual host.

Virtual host - IIS

Instructions for configuring an IIS virtual host are available as part of the CSWeb User Guide available at: https://www.csprousers.org/help/CSWeb/iis_server_setup.html

Configure CSWeb Server

- Once the virtual host has been configured, go to your web browser and access the host domain or IP address of the server, as configured in the playbook variables, followed by /csweb_folder, e.g.,

`http://domain-name.com/csweb_folder`

You will see a page like this

Requirement	Status
PHP version 7.3 or above	✓
PHP file_info extension	✓
PHP pdo extension	✓
PHP dom extension	✓
PHP pdo_mysql extension	✓
PHP curl extension or allow_url_fopen in php.ini	✓
PHP openssl extension	✓
PHP zip extension	✓
CA bundle (for PHP < 5.8 and no curl)	✓
enable_post_data_reading on in php.ini	✓
post-max-size >= 8M in php.ini	✓
Apache mod_rewrite enabled	✓

Your server meets all the requirements. Click next to begin configuration.

Next

- The green check marks show that all the server requirements for CSWeb installation have been met. Click Next to proceed. You will be redirected to the following page:

CSWeb: Configuration

Database name:

Hostname:

Database username:

Database password:

CSWeb admin password:

Timezone:

Maximum execution time:

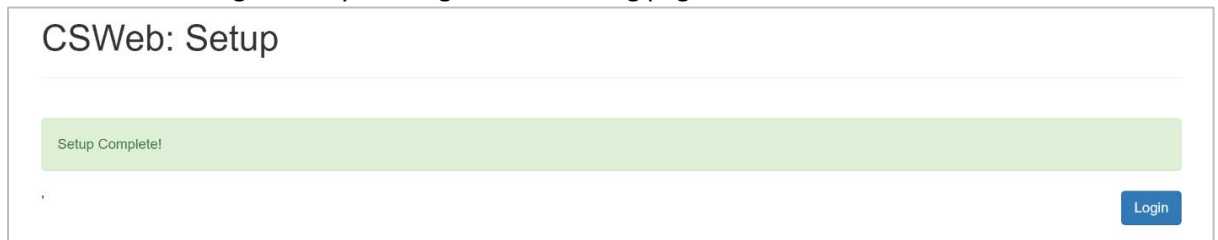
Path to files directory:

CSWeb API URL:

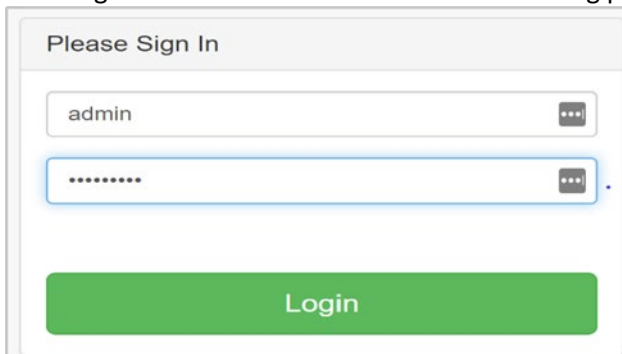
Back Next

- Use the information contained in the **vars/default.yml** to populate the database information
Database name: Name as defined in the default.yml i.e., *demo2*
Hostname: usually **localhost**
Database username: `mysql_csweb_user` as defined in default.yml
Database user password: `mysql csweb password` as defined in default.yml
CSWeb admin password: Enter the admin password for CSWeb admin user. This will be used for initial CSWeb browser login. **Please note this password.** If you forget this password, it cannot be retrieved and you will have to reconfigure the CSWeb installation.

- Select the appropriate time zone and leave the rest of the fields with default settings. Click Next to continue.
- On successful configuration you will get the following page



- Click Login. You will be redirected to the following page:



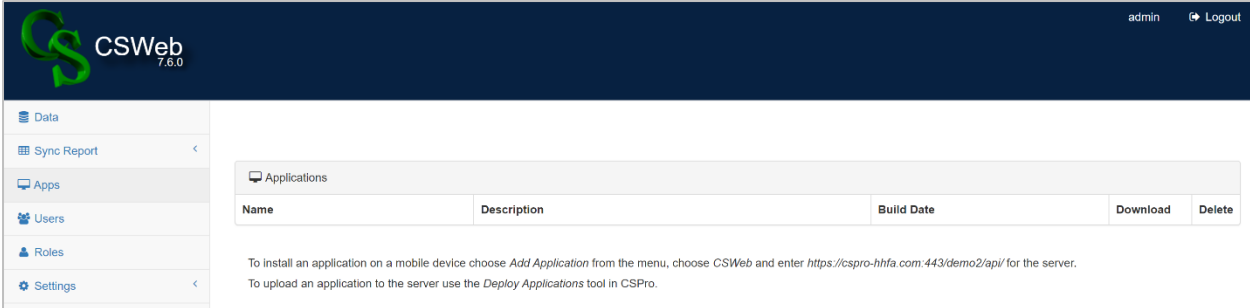
- Login using the following credentials:
 - Username: admin
 - Password: CSWeb admin password set above
- On successful login you will be redirected to the CSWeb dashboard.

CSWeb Dashboard

- The data tab shows list of dictionaries and submitted cases. Use this option to download the data



- The Applications tab lists applications that have been installed on CSWeb. Usually these are the applications deployed through the Deploy Applications tool which is a part of CSPro software.



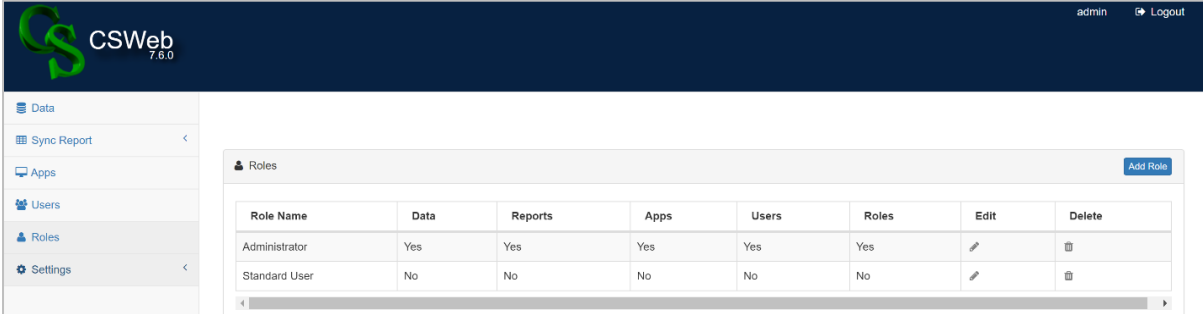
The screenshot shows the CSWeb 7.6.0 interface with the 'Applications' tab selected. The left sidebar contains links for Data, Sync Report, Apps, Users, Roles, and Settings. The main content area displays a table with columns: Name, Description, Build Date, Download, and Delete. Below the table, there is instructional text about installing applications on mobile devices and uploading to the server.

Name	Description	Build Date	Download	Delete
To install an application on a mobile device choose <i>Add Application</i> from the menu, choose CSWeb and enter https://cspro-hhfa.com:443/demo2/api/ for the server. To upload an application to the server use the <i>Deploy Applications</i> tool in CSPro.				

- The Roles tab is where user roles and permissions are defined. There are two pre-defined roles within the application (administrator and standard user) upon initial configuration. Additional roles can be added as needed.

Administrator: Has full access to all the system resources

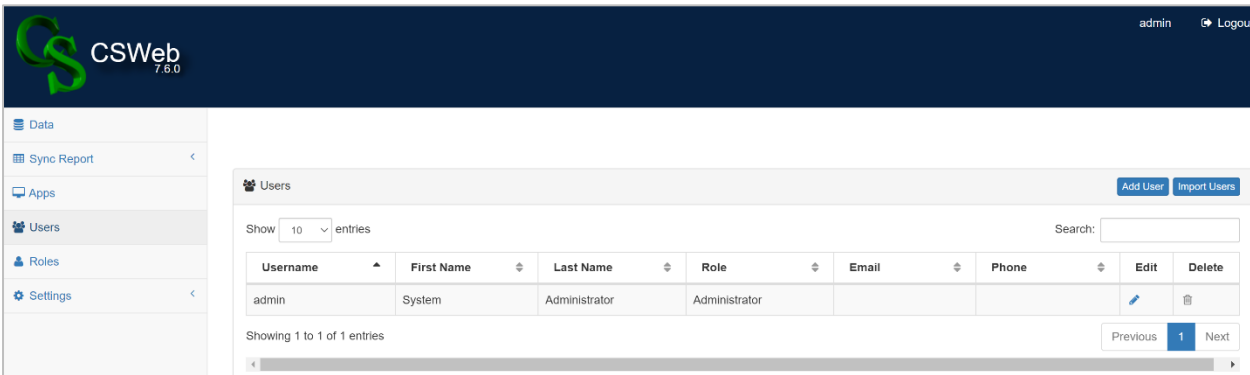
Standard User: Has no access to browser-based interface. Can only download the CSPro application to a tablet and send data to the server from a tablet.



The screenshot shows the CSWeb 7.6.0 interface with the 'Roles' tab selected. The left sidebar is the same as the previous screenshot. The main content area displays a table with columns: Role Name, Data, Reports, Apps, Users, Roles, Edit, and Delete. There are two rows: Administrator and Standard User. An 'Add Role' button is visible in the top right corner.

Role Name	Data	Reports	Apps	Users	Roles	Edit	Delete
Administrator	Yes	Yes	Yes	Yes	Yes		
Standard User	No	No	No	No	No		

- The Users tab lists all the users and their roles. An admin user will automatically be created when CSWeb is initially configured. For security purposes, it is recommended to create at least one standard user that can be shared with field teams if needed. For example. If the QR code scan isn't working for installing the CSPro application, a user name and password can be used instead. In this case, a standard user login credential (which has limited permissions) can be shared as opposed to an admin.



The screenshot shows the CSWeb 7.6.0 interface with the 'Users' tab selected. The left sidebar is the same as the previous screenshots. The main content area displays a table with columns: Username, First Name, Last Name, Role, Email, Phone, Edit, and Delete. There is one row for the 'admin' user. Above the table, there is a search bar and a 'Show 10 entries' dropdown. Below the table, there is a pagination bar showing 'Showing 1 to 1 of 1 entries' and 'Previous 1 Next'.

Username	First Name	Last Name	Role	Email	Phone	Edit	Delete
admin	System	Administrator	Administrator				

6. Configuring the HHFA CPro application

The HHFA application must be configured before it can be used in a survey – without this configuration, it will not work. Detailed instructions for each step in the configuration process are found in the following sections.

Create administrative areas lookup file

The administrative areas lookup file defines the administrative areas that will be used when defining the locations of health facilities. Two levels of administrative areas can be specified, for example:

- Region or province
- District

To create the administrative areas lookup file, take the following steps:

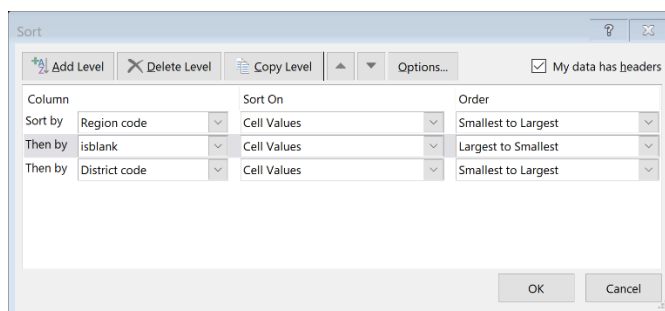
1. Define the administrative areas that will be used to identify facilities in your survey. Determine if a country-specific numeric coding system exists to uniquely identify each administrative area. If such a numeric coding exists for administrative areas, it is preferred to use the existing system. If a system does not exist, each unique administrative area will need to be assigned a numeric code.
2. Open the example administrative areas Excel lookup file called `Sample_Geocodes_File.xlsx`, located in the **ref** folder. This is a hierarchical file consisting of two levels of administrative units.
3. Edit the `Sample_Geocodes_File.xlsx` to reflect the administrative hierarchy in your country. Column A of the spreadsheet (called Region Code in the example file) should contain the code for the highest administrative level. Column B of the spreadsheet (called District code in the example file) should contain the code for the second administrative level. Column C of the spreadsheet (called Geocode/Area name in the example file) should contain the name of each unique administrative level. For the second administrative level (e.g. district), column C should contain the name of the district, followed by a backslash, and the name of the first level administrative unit in which the district is nested.

The following example illustrates how to convert a small administrative data set into an administrative areas lookup file. For this example, we will begin with a set of administrative units that looks like the following:

Region	Region code	District	District code
Northern	1	Chitipa	101
Northern	1	Karonga	102
Northern	1	Nkhata Bay	103
Northern	1	Rumphi	104
Northern	1	Mzimba	105
Northern	1	Likoma	106
Northern	1	Mzuzu City	107
Central	2	Kasungu	201
Central	2	Nkhotakota	202
Central	2	Ntchisi	203
Central	2	Dowa	204
Central	2	Salima	205
Central	2	Lilongwe	206
Central	2	Mchinji	207
Central	2	Dedza	208
Central	2	Ntcheu	209
Central	2	Lilongwe City	210
Southern	3	Mangochi	301
Southern	3	Machinga	302
Southern	3	Zomba	303
Southern	3	Chiradzulu	304
Southern	3	Blantyre	305
Southern	3	Mwanza	306
Southern	3	Thyolo	307
Southern	3	Mulanje	308
Southern	3	Phalombe	309
Southern	3	Chikwawa	310
Southern	3	Nsanje	311
Southern	3	Balaka	312
Southern	3	Neno	313
Southern	3	Zomba City	314
Southern	3	Blantyre City	315

Notice that this data set has columns for the region name, region code, district name, and district code. Also, notice that the number of digits for the region code is 1 while the number of digits for the district code is 3. To convert this dataset to a format matching the Sample_Geocodes_File.xlsx file, take the following steps:

- In column E, add a column called Geocode/Area name. For each row, complete this column with the District name/Region name.
- Move column C (District name), to immediately next to column A (Region name).
- For each unique region, add a row at the bottom of the list that includes the Region code in column C, and the Region code and Region name in column E (Geocode/Area name). These rows should contain no information in column D (District code).
- Delete columns A and B (Region name and District name).
- Next, we will sort the columns to integrate the regions. To do this, add to column D the header "isblank". Then add the formula "`=B2=""`" in cell B2 and drag it down the rest of the column. Next, select columns A to D, go to the data tab, and select sort. Make the following selections:



Note: sorting the columns is an optional step but is helpful in improving readability and in providing the ability to ensure all administrative areas are in your final listing.

- f. The data are now correctly sorted and you can delete column D, “isblank”.

Region code	District code	Geocode/Area name
1		Northern
1	101	Chitipa/Northern
1	102	Karonga/Northern
1	103	Nkhata Bay/Northern
1	104	Rumphi/Northern
1	105	Mzimba/Northern
1	106	Likoma/Northern
1	107	Mzuzu City/Northern
2		Central
2	201	Kasungu/Central
2	202	Nkhotakota/Central
2	203	Ntchisi/Central
2	204	Dowa/Central
2	205	Salima/Central
2	206	Lilongwe/Central
2	207	Mchinji/Central
2	208	Dedza/Central
2	209	Ntcheu/Central
2	210	Lilongwe City/Central
3		Southern
3	301	Mangochi/Southern
3	302	Machinga/Southern
3	303	Zomba/Southern
3	304	Chiradzulu/Southern
3	305	Blantyre/Southern
3	306	Mwanza/Southern
3	307	Thyolo/Southern
3	308	Mulanje/Southern
3	309	Phalombe/Southern
3	310	Chikwawa/Southern
3	311	Nsanje/Southern
3	312	Balaka/Southern
3	313	Neno/Southern
3	314	Zomba City/Southern
3	315	Blantyre City/Southern

A note about editing the Sample_Geocodes_File.xlsx file: While the names in the sample file are Region and District, you can edit the names of the columns to reflect the names of your administrative units. However, the HHFA CSPro application is configured for **TWO administrative levels**. Adding additional administrative levels requires advanced skills which are beyond the scope of this guide.

- Save the file as HFA_AdminAreas.xlsx when you have finished editing and all administrative units have been entered.

5. Check the number of digits used for the numeric code for each level of the administrative hierarchy. If more than **two digits** have been used for either administrative level, take the following steps to edit the dictionaries to accommodate the additional digits:
 - a. Go to the folder HFA_WHO\dicts.
 - b. Open the dictionary file HFA_Geocodes.dcf.
 - c. In the tree on the left, click on the record called “_IDS0”. On the right are two items, one called REGION and one called District. For each of these items, there is a field called “Len” which corresponds to the number of digits allocated to the variable. Change the “Len” field to match the number of digits required for each administrative level. Save and close the dictionary.

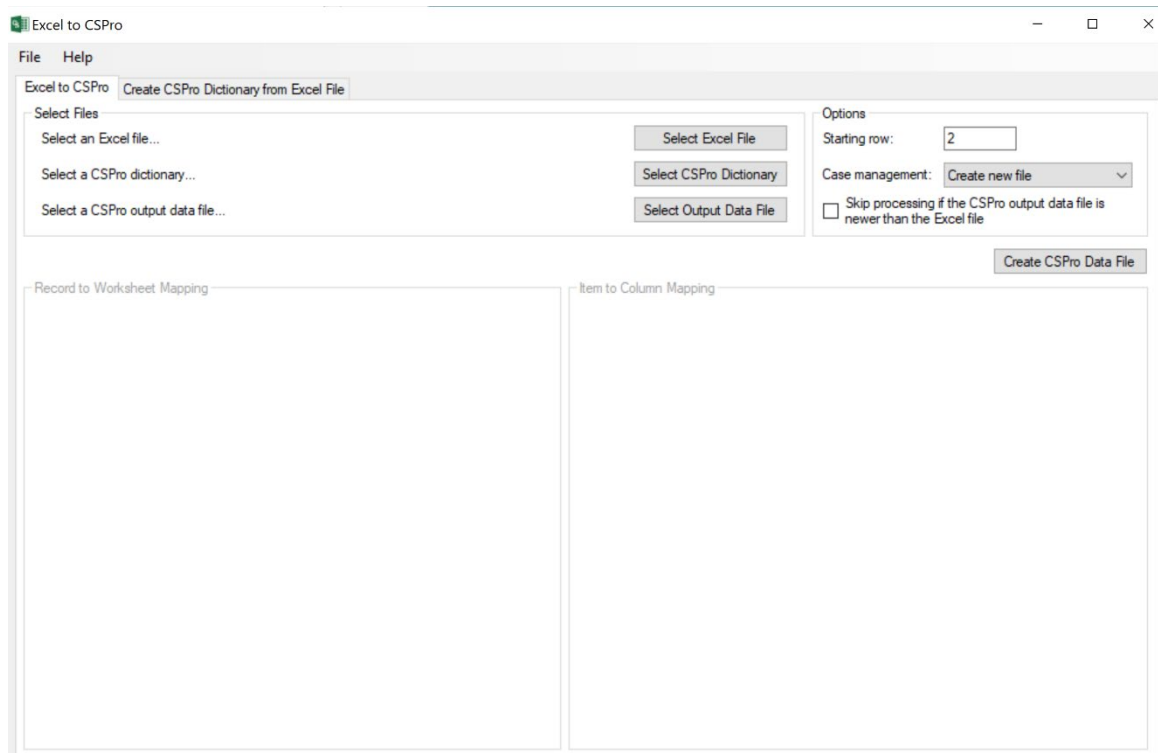
Item Label	Item Name	Data Type	Start	Len	Item Type	Occ	Dec	Dec	Zerc
(record type)		Alpha	0	0					
REGION	REGION	Numeric	1	2	Item	1	0	No	Yes
District	DISTRICT	Numeric	3	2	Item	1	0	No	Yes

- d. Repeat this process for the HFA_DICT.dcf and HFA_COMB.dcf dictionaries. In the HFA_DICT.dcf and HFA_COMB.dcf dictionaries, the region and district variables are in the record called “SECT01” and are called Region/Province code and District code.

Item Label	Item Name	Data Type	Start	Len	Item Type	Occ	Dec	Dec	Zerc
(record type)		Alpha	1	1					
Facility Code	Q100	Numeric	2	9	Item	1	0	No	Yes
Supervisor validation	Q101	Numeric	11	1	Item	1	0	No	Yes
Team Leader	ID_TEAML	Numeric	12	5	Item	1	0	No	No
Facility Weight	WGT	Numeric	17	7	Item	1	5	Yes	No
Facility Name	Q102	Alpha	24	100	Item	1			
Facility known by other name	Q103	Numeric	124	1	Item	1	0	No	No
Q103 if other, specify	Q103T	Alpha	125	50	Item	1			
Facility location	Q104	Alpha	175	40	Item	1			
Region/Province code	Q105	Numeric	215	2	Item	1	0	No	No
Region/Province name	Q105T	Alpha	217	30	Item	1			
District code	Q106	Numeric	247	2	Item	1	0	No	No
District name	Q106T	Alpha	249	30	Item	1			
Final Visit	FVISIT	Alpha	279	14	Item	1			
Day of visit	FVDAY	Numeric	279	2	Subitem	1	0	No	No
Month of visit	FVMO	Numeric	281	2	Subitem	1	0	No	No
Year of visit	FVYR	Numeric	283	4	Subitem	1	0	No	No
Interviewer code	FVINT	Numeric	287	5	Subitem	1	0	No	No
Final visit result code	FVRES	Numeric	292	1	Subitem	1	0	No	No
Q107 Other visit specify	FVRES_OTHER	Alpha	293	100	Item	1			
Waypoint name	Q108	Numeric	393	6	Item	1	0	No	No
Altitude (meters)	Q109	Numeric	399	7	Item	1	1	Yes	No

Note: Administrative codes used in the HHFA CPro application must be numeric; alpha or alphanumeric codes cannot be used. If national codes are alpha or alphanumeric, please devise a numeric coding system for the administrative levels to use for the purpose of the survey implementation.

6. The HFA_AdminAreas.xlsx file will now be converted to a .csdb data file using the CPro tool **Excel to CPro**. Open the Excel to CPro tool by clicking on Start → CPro 7.7 → Excel to CPro. The following window will open. Make sure you are on the 'Excel to CPro' tab of the tool.



7. Click on Select Excel File. Select the Excel file, HFA_AdminAreas.xlsx, that you created above.
8. Click on Select CPro Dictionary. Select HFA_Gecodes.dcf CPro dictionary from the folder HFA_WHO\dicts. This dictionary was previously created to match the Sample_Geocodes_File.xlsx file.
9. Click on Select Output Data File. Select the HFA_AdminAreas.csdb data file from the folder HFA_WHO\ref. If this file already exists, you can replace it.
10. Now you are ready to complete the 'Record to Worksheet Mapping'. This maps the Excel HFA_AdminAreas.xlsx that you created to the CPro dictionary. On the left side of the window where it says GEOCODES_RECORD, select the worksheet from the Excel file (Sheet1). This should allow a mapping window to open on the right side of the window.
11. On the right side of the window, first look at the Options. Starting Row should say 2 as our HFA_AdminAreas.xlsx file has a header row in the first row that does not need to be mapped. Case management should be set to 'Create a new file' as opposed to 'Overwrite an existing file'. Next, under 'Item to Column Mapping' map the columns in the HFA_AdminAreas.xlsx file to the corresponding item names in the CPro dictionary. When all fields are complete, the window should look like the image below:

12. Click 'Create CSpPro Data File'. This will create and save the **HFA_AdminAreas.csdb** file which has now been updated with the administrative units for the survey. Note: it is important to use this exact file name as the application will expect to find this specific file in the ref folder.
13. If you think you may need to recreate the admin file, you can save the specification for reuse to avoid having to repeat the mapping steps using the Excel to CSpPro tool. To save your specification, Click on File → Save Specification and give your specification a name such as HHFA_admin_specification.

Create staff lookup file

The HHFA CSpPro application has been designed for multiple user roles, with different functionality assigned to each role. The staff file is used to define the individuals that will have access the HHFA data collection application and assigns a role to each person.

Four roles can be assigned in the staff file:

- **Data manager:** The data manager is primarily responsible for configuring the HHFA CSpPro application for country implementation. Data managers also are able reset the device registration for all devices.
- **Supervisor:** Supervisors serve two main functions: 1) to generate facility reports to assess survey completeness for ALL data and 2) to collect data for supervisor validations. To complete these two functions, supervisors are given functionality to assign themselves questionnaire sections for the facilities they will visit for the 10% validation revisits, collect data at those visits, and sync data to the central database. In addition, supervisors have functionality to download data and view reports to check on the progress of the survey. Supervisors do NOT have functionality to collect data for general data collection activities. They do have the functionality to reset a team leader or data collector's device registration or individuals they are supervising.

- **Team leader:** Team leaders serve a vital function during data collection as they are responsible for assigning sections for data collection to each data collector on their team for every facility that will be surveyed. They are also responsible for receiving data from data collectors, creating a complete data record, and syncing data. Team leaders can themselves also participate in data collection. There are also tools available to assist team leaders in understanding progress towards survey completion. The team leader can also transfer the data collection application files to a data collector over Bluetooth in the case of problems updating the application via internet and has functionality to reset a data collector's device registration.
- **Data collector:** The data collectors' primary responsibility is to collect data at health facilities. They receive section assignments from team leaders, collect data, and send data to the team leader. Data collectors also have functionality to sync their data for back-up and to view reports to monitor their own progress towards completion of assigned sections.

The staff lookup file defines the staff user roles and log-in codes that will have access to the HHFA CPro application. To create the staff lookup file, take the following steps:

1. Generate a list of the names of all the data collectors, team leaders, supervisors, and data managers that will participate in the HHFA. The list should include how teams will be nested (i.e. which data collectors report to which team leader; which team leaders report to which supervisor).
2. Open the example staff Excel lookup file called Sample_Staff_File.xlsx located in the **ref** folder (see example image below). The Sample_Staff_File.xlsx file contains five columns: Staff Code, Staff Name, Role, Supervisor, Team Leader. The names of these columns should NOT be changed, as this may cause difficulty in mapping the columns to the associated dictionary.

Staff Code	Staff Name	Role (1 = Data Manager, 2=Supervisor, 3=Team Leader, 4=Data Collector)	Supervisor	Team Leader
1234	Data Manager	1		
1207	Supervisor 1	2		
1901	Team Leader 1	3	1207	
1943	Interviewer 1	4		1901
1978	Interviewer 2	4		1901
1767	Interviewer 3	4		1901
1060	Interviewer 4	4		1901
1074	Team Leader 2	3	1207	
1082	Interviewer 5	4		1074
1893	Interviewer 6	4		1074
1380	Interviewer 7	4		1074
1028	Interviewer 8	4		1074
1091	Supervisor 2	2		
1675	Team Leader 3	3	1091	
1287	Interviewer 9	4		1675
1778	Interviewer 10	4		1675
1397	Interviewer 11	4		1675
1261	Interviewer 12	4		1675
1204	Team Leader 4	3	1091	
1384	Interviewer 13	4		1204
1867	Interviewer 14	4		1204
1692	Interviewer 15	4		1204
1606	Interviewer 16	4		1204

3. We will now edit the Sample_Staff_File.xlsx file to replace the existing content with your list of staff.

- a. In column B (Staff name), starting in row 2, replace the information with the names of your staff members by placing one staff member name on each row.
 - b. In column C (Role), enter the code corresponding to the role that should be assigned to each staff member. The codes for each role are as follows:
 - i. Data manager = 1
 - ii. Supervisor = 2
 - iii. Team leader = 3
 - iv. Data collector = 4
 - c. In column A (Staff code), enter a unique numeric code for each staff member. This will serve as the login code to the HHFA CSPro application for each individual. The CSPro application accommodates a numeric code of up to five digits for the staff code. You can choose to use a 2-, 3-, 4- or 5-digit code for each staff member as long as each code uniquely identifies a staff member and all codes are numeric. (Alpha or alphanumeric codes cannot be used).
 - i. If you want to autogenerate random four-digit codes in Excel, you can use the following formula to generate unique four-digit codes in Excel. Remember to copy/paste the codes as values after generating them as these numbers will recalculate when you reopen the workbook if left as a formula.
 - d. $=\text{TRUNC}((\text{RAND()}*(9999-1000)+1000),0)$ In column D (Supervisor) record the Staff code of the Supervisor to which team leaders report. The Supervisor column should only be completed for staff who have been assigned the role of team leader.
 - e. In column E, Team leader, record the Staff Code of the Team leader to which the data collectors report. The Team leader column should only be completed for staff who have been assigned the role of data collector.
4. Save the file as HFA_Staff.xlsx when you have finished editing and all survey staff have been entered.
 5. Check the number of digits used for the numeric codes in the Staff Code, Supervisor and Team leader columns. If more than five digits have been used in any of these columns, take the following steps to edit the dictionaries to accommodate the additional digits. In addition, check the number of characters used for Staff names. If any Staff names are longer than 30 characters, the following steps should also be taken to edit the dictionaries to accommodate the additional digits.
 - a. Go to the folder HFA_WHO\dicts.
 - b. Open the dictionary file HFA_Staff.dcf.
 - c. In the tree on the left, click on the record called “_IDS0”. On the right you will see one item called STAFF_CODE. Similarly, click on the record called “STAFF_REC”. On the right you will see four items called STAFF_NAME, STAFF_ROLE, SUPERVISOR, and TEAM_LEAD. For each of these items, there is a field called “Len” which corresponds

to the number of digits allocated to the variable. Change the “Len” field to match the number of digits required for each item. Save and close the dictionary.

Item Label	Item Name	Data Type	Start	Len	Item Type	Occ	Dec	Dec	Zerc
(record type)		Alpha	1	1					
Staff Code	STAFF_CODE	Numeric	2	5	Item	1	0	No	Yes

Item Label	Item Name	Data Type	Start	Len	Item Type	Occ	Dec	Dec	Zerc
(record type)		Alpha	1	1					
Staff Code	STAFF_CODE	Numeric	2	5	Item		0	No	Yes
Staff Name	STAFF_NAME	Alpha	7	30	Item	1			
Staff Role	STAFF_ROLE	Numeric	37	1	Item	1	0	No	No
Supervisor Staff Code	SUPERVISOR	Numeric	38	5	Item	1	0	No	Yes
Team Lead	TEAM_LEAD	Numeric	43	5	Item	1	0	No	Yes

- The HFA_Staff.xlsx file will now be converted to a .csdb data file using the CSPro tool **Excel to CSPro**. Open the Excel to CSPro tool by clicking on Start → CSPro 7.7 → Excel to CSPro. The following window will open. Make sure you are on the ‘Excel to CSPro’ tab of the tool.

Excel to CSPro

File Help

Excel to CSPro Create CSPro Dictionary from Excel File

Select Files

Select an Excel file... Select Excel File

Select a CSPro dictionary... Select CSPro Dictionary

Select a CSPro output data file... Select Output Data File

Options

Starting row:

Case management: Create new file

☐ Skip processing if the CSPro output data file is newer than the Excel file

Create CSPro Data File

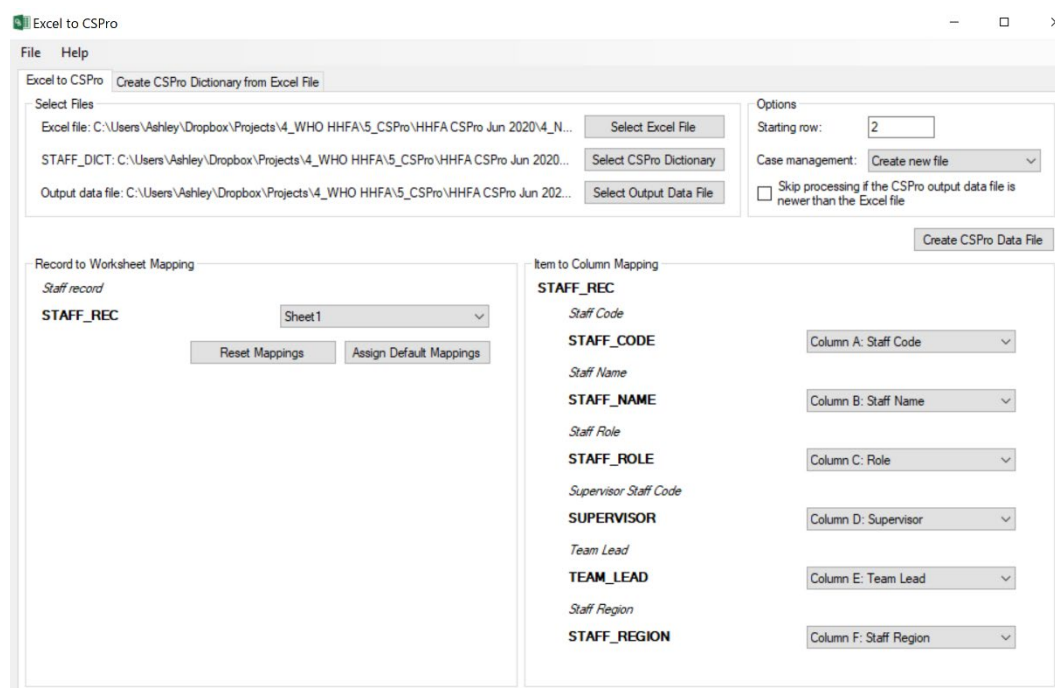
Record to Worksheet Mapping

Item to Column Mapping

- Click on Select Excel File. Select the Excel file, HFA_Staff.xlsx, that you created previously.
- Click on Select CSPro Dictionary. Select HFA_Staff.dcf CSPro dictionary from the folder HFA_WHO\dicts. This dictionary was previously created to match the Sample_Staff_File.xlsx file.
- Click on Select Output Data File. Select the HFA_Staff.csdb data file from the folder HFA_WHO\ref. If this file already exists, you can replace it.
- Now you are ready to complete the ‘Record to Worksheet Mapping’. This maps the Excel HFA_Staff.xlsx that you created to the CSPro dictionary. On the left side of the window where

it says STAFF_RECORD, select the worksheet from the Excel file (Sheet1). This should allow a mapping window to open on the right side of the window.

- On the right side of the window, first look at the Options. Starting Row should say 2 as our HFA_Staff.xlsx file has a header row in the first row that does not need to be mapped. Case management should be set to 'Create a new file' as opposed to 'Overwrite an existing file'. Next, under 'Item to Column Mapping' map the columns in the HFA_Staff.xlsx file to the corresponding item names in the CSPro dictionary. When all fields are complete, the window should look like the image below:



- Click 'Create CSPro Data File'. This will create and save the **HFA_Staff.csdb** file which has now been updated with the staff for the survey. Note: it is important to use this exact file name as the application will be expecting to find this specific file in the ref folder.
- If you think you may need to recreate the staff file you can save the specification for reuse to avoid having to repeat the mapping steps using the Excel to CSPro tool. To save your specification, click on File → Save Specification and give your specification a name such as HHFA_staff_specification.

Create facility lookup file

The HHFA CSPro application is designed to be pre-populated with a list of health facilities that will be visited during the survey. This list should be generated based on the Master Facility List (MFL) and will consist of either the facilities sampled for inclusion in the survey or all the facilities in the country in the case of a census.

The facility lookup file defines the facilities for which data will be collected. To create the facility lookup file, take following steps:

- Obtain the list of facilities to be included in the survey from the survey manager. Ask the survey manager to ensure that the list includes information on the facility ID, the facility name,

and the location in terms of the first two administration levels (e.g. region, region code, district, and district code). Often, the survey manager will provide this information in the form of the Master Facility List (MFL), which may include additional information. Below is an example of what a MFL may look like:

County	Admin District	Health District	HF ID	HF Name	HF Type	F_Type by EPHS classification	Population (2011)	Owershhip	Status	Lat	Long
Montserrado	District 5	Somalia Drive	LRO048	Peace Home Medical Clinic	CLINIC	PHC Level 1 clinic		Private for profit	functional	6.299608776	-10.70441321
Montserrado	District 14	Bushrod	LRO158	Trinity Maternity Clinic	CLINIC	PHC Level 1 clinic		Private for profit	functional	6.336356162	-10.79201179
Lofa	Zorzor	Zorzor	LRO1X8	Konia HEALTH CENTER	HEALTH CENTER	HEALTH CENTER	9195.44173	public	Functional	7.962725348	-9.54335918
Bomi	Senjeh	Senjeh	LRO608	Sackie Town Clinic	CLINIC	PHC Level 1 clinic	1538.963783	public	Functional	6.975728399	-10.93008338
Lofa	Voijama	Voijama	LRO338	Bondi Clinic	CLINIC	PHC Level 1 clinic	3061.952163	public	functional	8.26956	-9.76002
Montserrado	District 17	St. Paul River	LRO8J8	Arthington Clinic	CLINIC	PHC Level 2 Clinic	4901.253514	public	functional	6.507268944	-10.67576992
Grand Kru	GrandCess/Wedabo	Barclayville	LROG68	Rally Time Hospital	HOSPITAL	HOSPITAL	4089.703063	public	functional	4.574845794	-8.221701964
Bomi	Klay	Klay	LROGT8	Malema Clinic	CLINIC	PHC Level 1 clinic	3305.843309	public	functional	6.674965681	-10.97354975
Grand Bassa	District #3 A&B	District #3 A&B	LROGZ8	Barseegiah Clinic	CLINIC	PHC Level 2 Clinic	10279.63905	public	functional	6.340218997	-9.635583507
Bong	Zota	Zota	LROHF8	Naama Clinic	CLINIC	PHC Level 2 Clinic	7038.76238	public	functional	7.26155	-9.35127
Montserrado	District 17	St. Paul River	LROK28	Mariama Z Brown Clinic	CLINIC	PHC Level 2 Clinic	10274.31392	Private for profit	functional	6.435623571	-10.79941402
Montserrado	District 8	Central Monrovia	LROK08	SDA Cooper Memorial Hospital	HOSPITAL	HOSPITAL	30777.1456	private_not_profit	functional	6.29649078	-10.78059654
Montserrado	Central Monrovia	Central Monrovia	LROKX8	SOCIAL ORGANIZATION SOCIETY	HEALTH CENTER	HEALTH CENTER	6.275335532	Private for profit	functional	6.275335532	-10.74949798
Grand Bassa	District #4	District #4	LROL58	Compound # 4 Clinic	CLINIC	PHC Level 2 Clinic	5.90557	public	functional	5.90557	-9.71038
Montserrado	District 9	Central Monrovia	LROMV8	FIAMAH COMMUNITY CLINIC	CLINIC	PHC Level 1 clinic	6801.261395	Private for profit	functional	6.290820534	-10.77315914
Montserrado	District 8	Central Monrovia	LROQ78	Capital Medical Clinic	CLINIC	PHC Level 1 clinic		Private for profit	functional	6.3043337	-10.7947899
Sinoe	Cabada	Pynes Town	LRORA8	Payne Town Clinic	CLINIC	PHC Level 1 clinic	1810.545627	public	functional	5.69374	-8.40083
Montserrado	District 16	Bushrod	LRO578	Liberia Coast Guard Clinic	CLINIC	PHC Level 1 clinic		public	functional		
Sinoe	Dugbe River	Dugbe River	LRO558	Karakekpo Clinic	CLINIC	PHC Level 2 Clinic	4260.107357	public	functional	4.98445355	-8.64896523
Bong	Fuamah	Fuamah	LROUJ8	Degei Clinic	CLINIC	PHC Level 2 Clinic	3882.022829	public	functional	7.097913189	-10.16662887
Montserrado	District 5	Somalia Drive	LROV08	Ma- Bea Community Clinic	CLINIC	PHC Level 1 clinic		Private for profit	functional		

- Open the example facility Excel lookup file called Sample_Facilities_File.xlsx located in the ref folder (see example image below). The Sample_Facilities_File.xlsx file contains six columns: Facility ID, Facility Name, Region Name, Region Code, District Name, District Code. The names of these columns should NOT be changed as this may cause difficulty in mapping the columns to the associated dictionary. It is also important to make sure that you do not have extra columns in the final Sample_Facilities_File.xlsx file as extra columns can make it difficult to correctly map the columns to the associated dictionary. In addition, the administrative levels should be consistent with the administrative levels used in the Admin lookup file.

Facility ID	Facility Name	Region Name	Region Code	District Name	District Code
100001	National Referral Hospital #1	Region 11	11	District 1/Region 11	1
100002	National Referral Hospital #2	Region 11	11	District 1/Region 11	1
100003	National Referral Hospital #3	Region 11	11	District 2/Region 11	2
100004	National Referral Hospital #4	Region 12	12	District 1/Region 12	1
100005	National Referral Hospital #5	Region 12	12	District 2/Region 12	2
200001	Regional (Provincial) Referral Hospital #1	Region 11	11	District 1/Region 11	1
200002	Regional (Provincial) Referral Hospital #2	Region 11	11	District 2/Region 11	2
200003	Regional (Provincial) Referral Hospital #3	Region 12	12	District 2/Region 12	2
200004	Regional (Provincial) Referral Hospital #4	Region 12	12	District 2/Region 12	2
200005	Regional (Provincial) Referral Hospital #5	Region 12	12	District 1/Region 12	1
700001	Health Centre #1	Region 11	11	District 1/Region 11	1
700002	Health Centre #2	Region 11	11	District 1/Region 11	1
700003	Health Centre #3	Region 12	12	District 2/Region 12	2
700004	Health Centre #4	Region 12	12	District 2/Region 12	2
700005	Health Centre #5	Region 11	11	District 2/Region 11	2

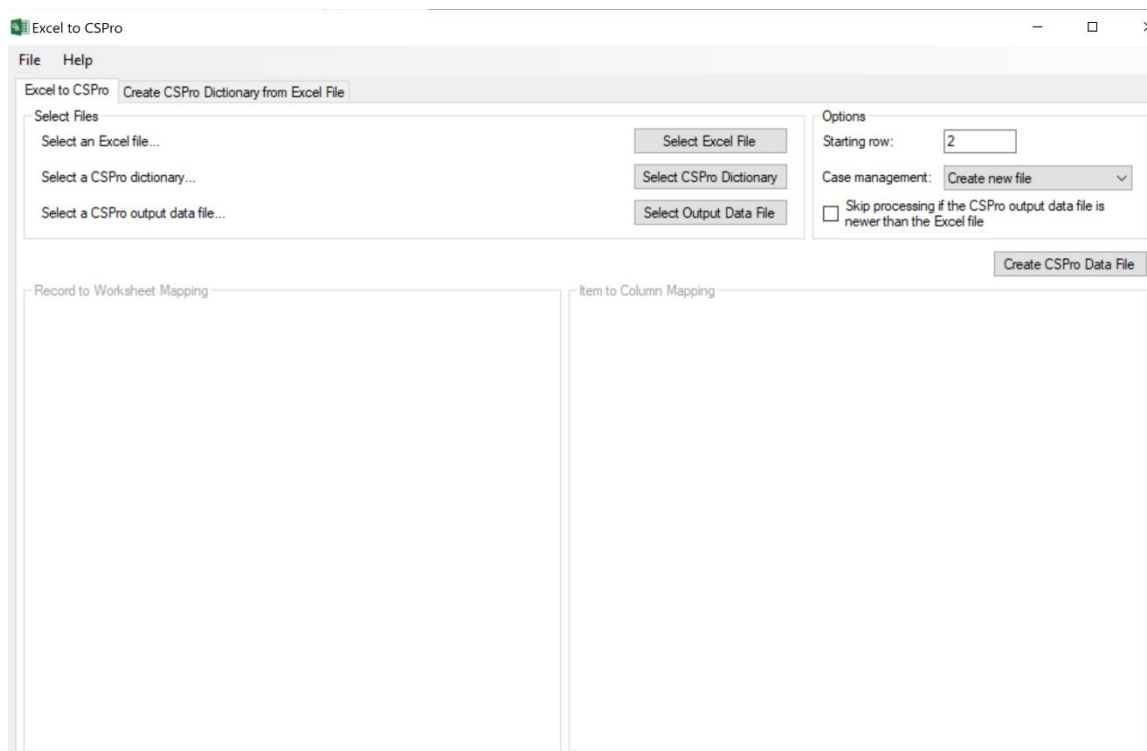
- We will now use the Sample_Facilities_file.xlsx file as a reference template and either edit the MFL of sampled facilities to match this format or use the Sample_Facilities_file.xlsx file and replace the existing content with your list of facilities. If you choose to edit/adapt the MFL of sampled facilities, in most cases the MFL will contain additional columns that will need to be removed in order to remain with only the six required columns.
- Save the file as HFA_Facilities.xlsx when you have finished editing and all facilities have been entered.
- Check the number of digits used for the numeric codes in the Facility ID, Region code and District code columns. If more than nine digits have been used for the Facility ID or more than two digits have been used for the Region code or District code, take the following steps to edit the dictionaries to accommodate the additional digits. In addition, check the number of characters used for Facility names. If any Facility names are longer than 60 characters, the

following steps should also be followed to edit the dictionaries to accommodate the additional digits.

- a. Go to the folder HFA_WHO\dicts.
- b. Open the dictionary file HFA_Facilities.dcf.
- c. In the tree on the left, click on the record called “_IDS0”. On the right you will see one item called FACILITY_ID. Similarly, click on the record called “FACILITIES_REC”. On the right you will see three items called FAC_NAME, REG_CODE, and DIST_CODE. For each of these items, there is a field called “Len” which corresponds to the number of digits allocated to the variable. Change the “Len” field to match the number of digits required for each item. Save and close the dictionary.

Item Label	Item Name	Data Type	Start	Len	Item Type	Occ	Dec	Dec	Zerc
(record type)		Alpha	0	0					
Facility ID	FACILITY_ID	Numeric	1	9	Item	1	0	No	Yes
Facility Name	FAC_NAME	Alpha	10	100	Item	1	0	No	Yes
Region/Province Code	REG_CODE	Numeric	110	2	Item	1	0	No	Yes
District Code	DIST_CODE	Numeric	112	2	Item	1	0	No	Yes

- d. Repeat this process for the HFA_DICT.dcf and HFA_COMB.dcf dictionaries. In the HFA_DICT.dcf and HFA_COMB.dcf dictionaries, the region and district variables are in the record called “SECT01” and are called Region/Province code and District code. These should already have been edited when you adapted the Admin level lookup file. In both the HFA_DICT and the HFA_COMB dictionaries, the facility code is called Q100 and is in the “_IDS0” record, while the facility name is called Q102 and is in the “SECT01” record.
 - e. Repeat this process for the HHFA_Menu.dcf dictionary for the item called SELECT_FACILITY in the “HHFA_MENU_REC”.
6. The HFA_Facilities.xlsx file will now be converted to a .csdb data file using the CSPro tool Excel to CSPro. Open the Excel to CSPro tool by clicking on Start → CSPro 7.7 → Excel to CSPro. The following window will open. Make sure you are on the ‘Excel to CSPro’ tab of the tool.



7. Click on Select Excel File. Select the Excel file, HFA_Facilities.xlsx, that you created previously.
8. Click on Select CSPro Dictionary. Select HFA_Facilities.dcf CSPro dictionary from the folder HFA_WHO\dicts. This dictionary was previously created to match the Sample_facilities_file.xlsx file.
9. Click on Select Output Data File. Select the HFA_Facilities.csdb data file from the folder HFA_WHO\ref. If this file already exists, you can replace it.
10. Now you are ready to complete the 'Record to Worksheet Mapping'. This maps the Excel HFA_Facilities.xlsx you have created to the CSPro dictionary. On the left side of the window where it says FACILITIES_RECORD, select the worksheet from the Excel file (Sheet1). This should allow a mapping window to open on the right side of the window.
11. On the right side of the window, first look at the Options. Starting Row should say 2 as our HFA_Facilities.xlsx file has a header row in the first row that does not need to be mapped. Case management should be set to 'Create a new file' as opposed to 'Overwrite an existing file'. Next, under 'Item to Column Mapping' map the columns in the HFA_Facilities.xlsx file to the corresponding item names in the CSPro dictionary. When all fields are complete, the window should look like the image below:

12. Click 'Create CSPro Data File'. This will create and save the **HFA_Facilities.csdb** file which has now been updated with the health facilities for the survey. Note: it is important to use this exact file name as the application will expect to find this specific file in the ref folder.
13. If you think you may need to recreate the facility file, you can save the specification for reuse to avoid having to repeat the mapping steps using the Excel to CSPro tool. To save your specification, Click on File → Save Specification and give your specification a name such as HHFA_facilities_specification.

Replacement facilities: On occasion a Master Facility List will erroneously include a facility that is closed, non-operational, etc. If a closed or non-operational facility ends up in the sample, it may be replaced. However, the replacement must be controlled by the data manager at the central level. The data manager must respect the random sampling procedures to select a replacement facility and then the replacement facility must be added to the facility lookup file and the HHFA application redeployed. Data collection teams can then update their tablet application and will have access to the updated list of facilities.

Configure the HHFA setup menu

The setup menu allows data managers to specify a set of parameters for country-specific implementation. This includes key features such as:

- default display language,
- module selection,
- synchronization method, and

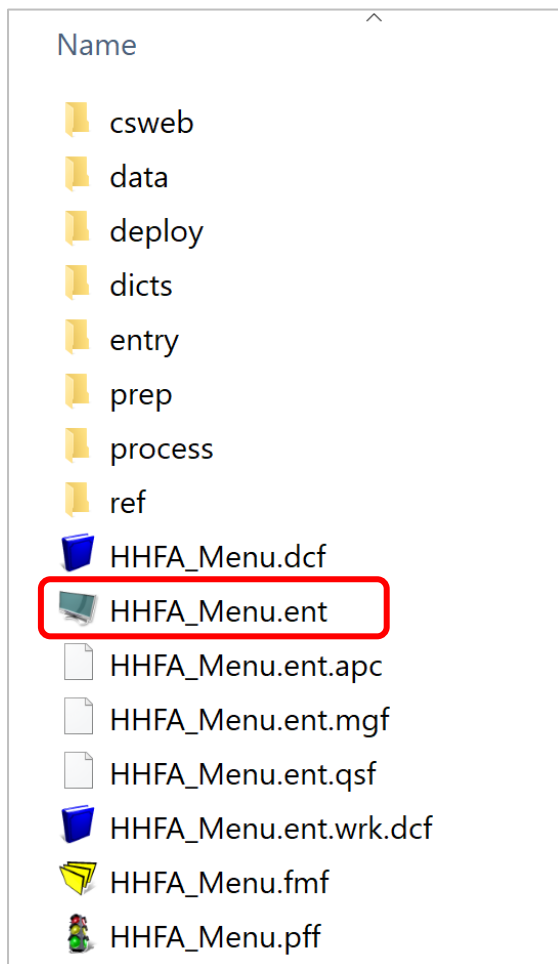
- additional options to turn on/off questions.

This section reviews the steps for configuring the setup menu. Before running the HHFA setup menu, make sure that you have generated the following lookup files. Each of these should be a .csdb file that is saved in the folder HFA_WHO\data:

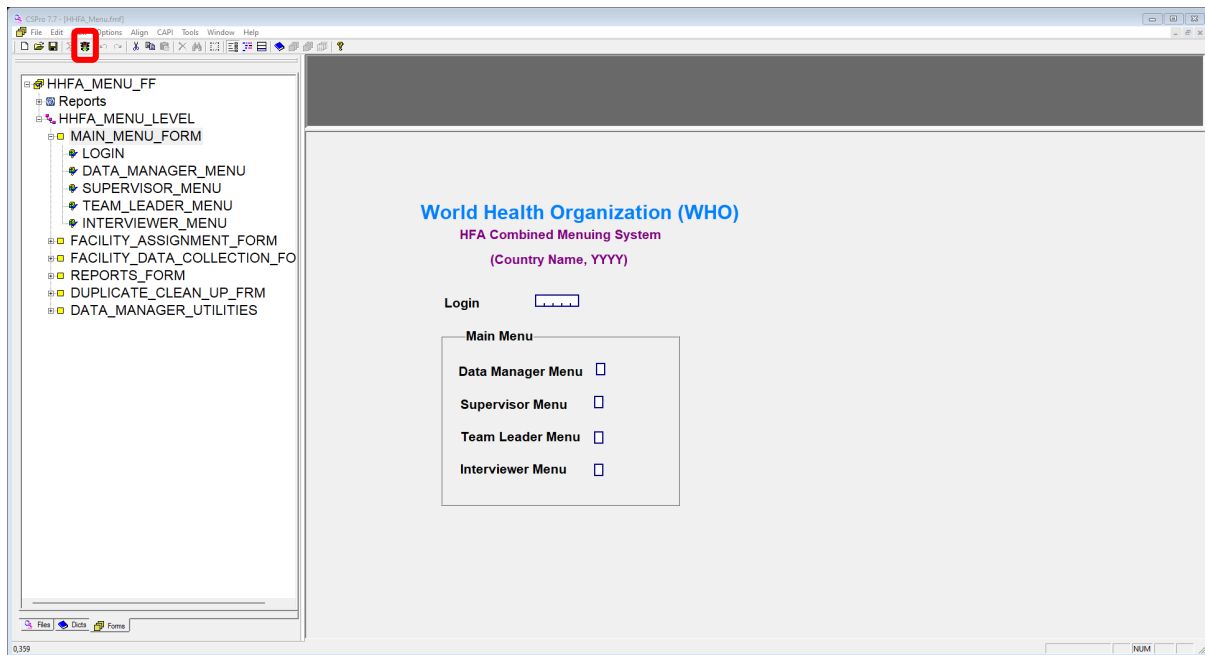
- administrative areas lookup file (HFA_AdminAreas.csdb)
- staff lookup file (HFA_Staff.csdb)
- facility lookup file (HFA_Facilities.csdb).

To configure the HHFA setup menu, take the following steps:

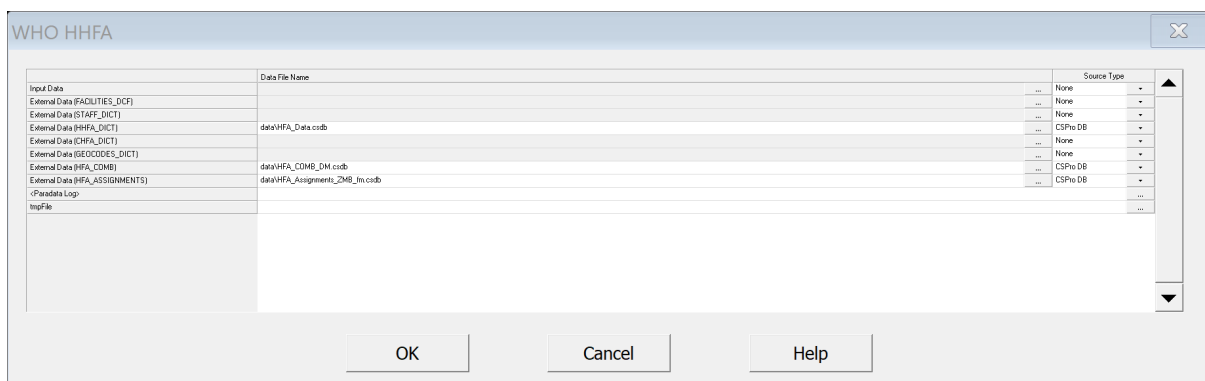
1. Open the HFA_WHO folder, double-click to open the HHFA_Menu.ent file as shown in the image below.



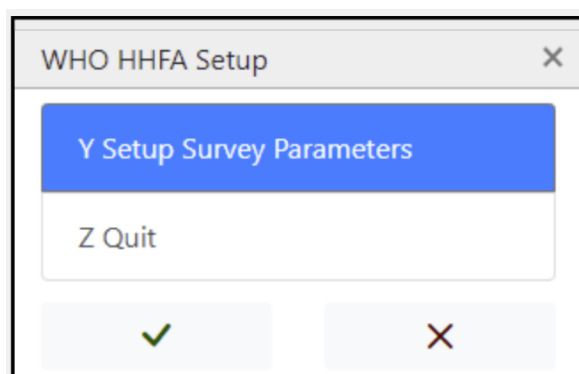
2. The following window will open up. Click on the traffic icon at the top left of the screen to run the application.



- Click OK to proceed when the next window pops up as in the image below.



- Click OK in subsequent pop-up windows until the following window appears. Select “Y Setup Survey Parameters” and click on the green tick icon to proceed with the HHFA setup.



Note: If this is not the first time you have run the setup menu, you will not see this screen. Instead, you will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities.

5. When prompted for the HFA password, enter “Geneva”. The following setup screen will open. This is where you will begin entering information specific to the survey in your country.

World Health Organization
Health Facility Assessment (HFA) Combined Setup

Survey Basics

Country Code (UN M49)

HFA START Date / (YYYY / MM)

HFA END Date / (YYYY / MM)

Survey Language

Country Currency

Exchange Rate with USD

Data Synchronization Setup

Synchronization Method ☐

CSWeb Server URL

CSWeb Server Username

CSWeb Server Password

Module Selection

Module 1: Service Availability ☐

Module 2: Service Readiness ☐

Module 3: Quality of Care ☐

Module 4: Management & Finance ☐

Question Activation/Deactivation

Question #	Label	Question Module	Question Activated
1			<input type="checkbox"/>
2			<input type="checkbox"/>
3			<input type="checkbox"/>
4			<input type="checkbox"/>
5			<input type="checkbox"/>
6			<input type="checkbox"/>
7			<input type="checkbox"/>
8			<input type="checkbox"/>
9			<input type="checkbox"/>
10			<input type="checkbox"/>
11			<input type="checkbox"/>
12			<input type="checkbox"/>
13			<input type="checkbox"/>
14			<input type="checkbox"/>
15			<input type="checkbox"/>
16			<input type="checkbox"/>
17			<input type="checkbox"/>
18			<input type="checkbox"/>
19			<input type="checkbox"/>
20			<input type="checkbox"/>
21			<input type="checkbox"/>
22			<input type="checkbox"/>
23			<input type="checkbox"/>
24			<input type="checkbox"/>
25			<input type="checkbox"/>
26			<input type="checkbox"/>
27			<input type="checkbox"/>
28			<input type="checkbox"/>
29			<input type="checkbox"/>
30			<input type="checkbox"/>
31			<input type="checkbox"/>

Module Legend

AC : Availability Core
AA : Availability Core + Additional
AAS : Availability Additional - Building Infrastructure (Supplementary)
RC : Readiness Core
QAS : Quality of Care Additional (Supplementary)
MC : Management & Finance Core
MA : Management & Finance Core + Additional
AC_RC : Availability Core / Readiness Core
RC_MC : Readiness Core / Management & Finance Core

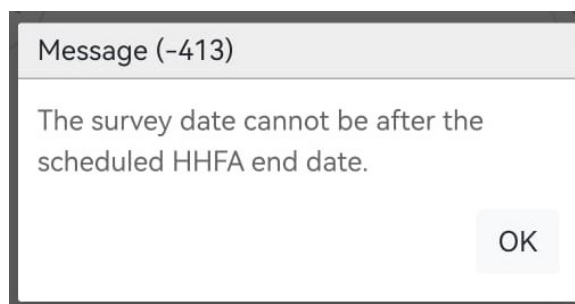
Press **CTRL + E** To Skip to the end of the roster
CTRL + S To Skip to the beginning of the roster

6. Enter the **Survey Basics**:
- Select the country of survey in the **country code** field
 - HFA start date**: Enter the HFA Start Year and Month. By default, the current year and month are preselected.
 - HFA end date**: Enter the HFA End Year and Month
 - The survey start date and end date are important fields because this controls the period during which data collectors will be able to enter data on tablets. Data collection on tablets will not be permitted outside of the defined survey time period. If data collection is attempted outside of the defined survey period one of the below error messages will be displayed.

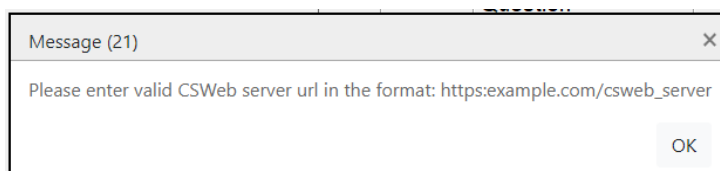
Message (-410)

The survey date cannot be before the scheduled HHFA start date.

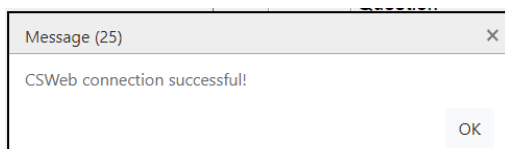
OK



- d. Select the default **survey language**. This sets the default language for the HHFA CSPro application to run on the tablets. Chapter 8 (Modifying the HHFA application) explains where to add the relevant translated text. While some language options are provided here, additional languages can be added. You will need to do this in the modification of the HHFA application (Chapter 8) and then return to the setup menu to select the language you have defined as the default.
 - e. Select the **country currency** and enter the current exchange rate with the US dollar. This information will be used in the data analysis phase of the survey and is important to document for the survey.
7. Enter the **Data Synchronization Setup**: In this section you will setup the server synchronization method to be used with the application.
- a. Select the data synchronization method – either Dropbox or CSWeb.
 - b. If you have selected CSWeb, enter a valid server URL. Please enter the URL of the CSWeb configured above with /api at the end, i.e. <https://csprowhfa.com/demo/api>. The URL field contains a regex expression checker that validates the entered URL. If the URL is not valid, the following error message will appear:



- c. If you have selected CSWeb, enter the CSWeb username and password. The application will attempt to validate the CSWeb credentials entered. If the connection is successful, the following message will appear:



8. Enter the **Module Selection**: This section enables selection of the modules selected for the survey. The HHFA questionnaires are provided in two formats: “stand-alone” and “combined”. Each of the four HHFA modules has a set of stand-alone questionnaires that may include “core”, “core+additional” and/or “supplementary” questionnaires. The “combined” questionnaire contains questions from the three facility audit questionnaires (Availability, Readiness, and Management and finance), integrated and organized by service site or respondent to facilitate data collection at facility level. The figure below details the HHFA

modules and questionnaires. Each country may select to implement one or more modules for their HHFA. In addition, countries may select Core, Core+Additional, and/or Supplementary questionnaires within each module selected. The module selection in CSPro should be completed to align with the questionnaires a country has selected for survey implementation.

HHFA modules and questionnaires

Module 1 Service availability	Module 2 Service readiness	Module 3 Quality of care	Module 4 Management and finance
<ul style="list-style-type: none"> Facility characteristics Staff Beds Diagnostics Availability of specific services 	Capacity to provide specific services according to defined standards: <ul style="list-style-type: none"> Guidelines, trained staff, equipment, commodities Systems to support quality and safety Provider competency 	<ul style="list-style-type: none"> Adherence to standards in patient care process Patient experience 	Practices to support continuous service availability and quality: <ul style="list-style-type: none"> Management Finance Quality assurance Health worker absenteeism
Questionnaires	Questionnaires	Questionnaires	Questionnaires
<ul style="list-style-type: none"> Availability: Core 	<ul style="list-style-type: none"> Readiness: Core 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Record review* 	<ul style="list-style-type: none"> Management and Finance: Core
<ul style="list-style-type: none"> Availability: Core+Additional 	<ul style="list-style-type: none"> Readiness: Additional/Supplementary - Provider competency† 	<ul style="list-style-type: none"> Quality of care: Additional/Supplementary - Patient experience† 	<ul style="list-style-type: none"> Management and Finance: Core+Additional
<ul style="list-style-type: none"> Availability: Additional/Supplementary - Building structure 			<ul style="list-style-type: none"> Management and Finance: Additional/Supplementary - Health worker absenteeism†
Combined questionnaire			

*Available 2022 †Future development

The selection (or not) of a module in CSPro determines whether a set of related questions will be activated (i.e. turned on) or deactivated (i.e. turned off). Selection of “Core” deactivates additional questions while selection of “Core+Additional” activates all Core and Additional questions. Additional Supplementary will activate the supplementary questions. Activating a question means that the question will be visible in the data entry application and data can be collected for that question. Deactivating a question means that the question is entirely skipped within the data entry application and no data will be collected for that question.

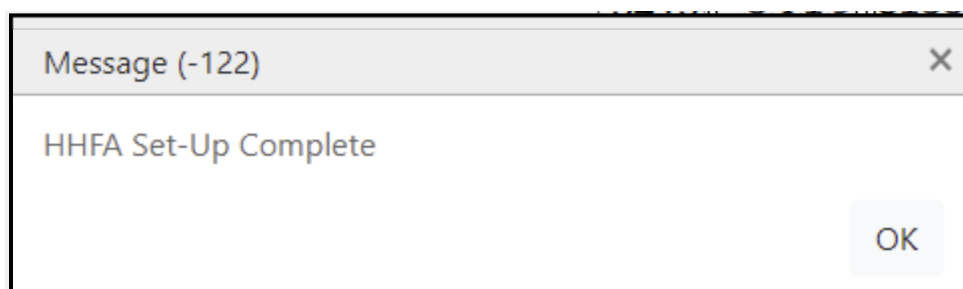
Activation/Deactivation: The concept of activating/deactivating is used to help minimize the amount of effort required when you want to delete questions from the data entry forms, as the process of permanently deleting a question from the form requires adjusting/removing the associated syntax logic. The activate/deactivate concept means that you do not need to worry about the logic behind the questions. The program will check the status of each question and automatically readjust the skips.

- Enter the **Question Selection**: After the module selection, the question mapping roster will be populated with all the WHO standard HHFA questions. Each question is mapped to its respective module and information on whether each question is expected to be activated or deactivated (based on the module selection) is displayed. At this stage, the question selection enables manual activation or deactivation of individual questions. This enables country-specific customization. For example, a country may choose to exclude a section of core questions if a disease area is not applicable to the country. In this case, those questions will need to be manually deactivated in the Question Selection phase using the question mapping roster. Similarly, a country may want to implement a core questionnaire but include a subset of additional questions. The additional questions will need to be manually activated in the Question Selection phase using the question mapping roster.

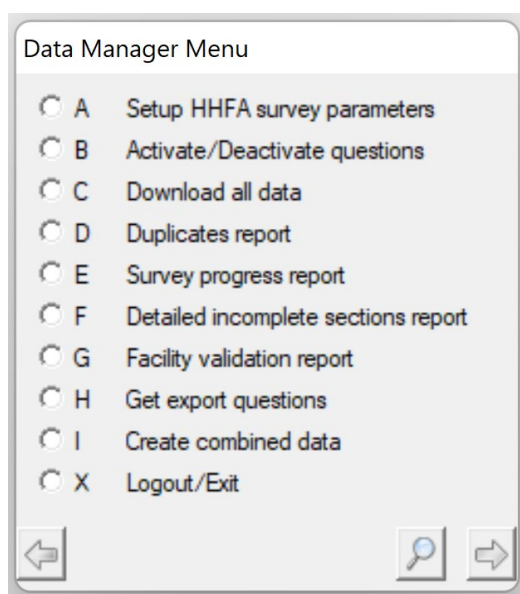
- a. After completing the module selection, the CSPro application may take a few minutes to populate the question mapping roster. Please wait for the question mapping roster to populate before proceeding.
- b. If no additional changes need to be made to question selection, press CTRL + E to skip to the end of the roster. Click Enter on the last question of the question mapping roster to complete the question selection mapping process. This also completes the entire setup menu configuration.
- c. If you would like to manually turn questions on or off, navigate to the applicable questions and change the response for “Question Activated” to Yes/No as appropriate.

Note: Any country specific questions that have been added to the HHFA CSPro application will not show in the question mapping roster. However, by default, any questions that are added to the HHFA CSPro application are **activated**. No further actions are required to ensure these country specific additions are fielded with the HHFA application.

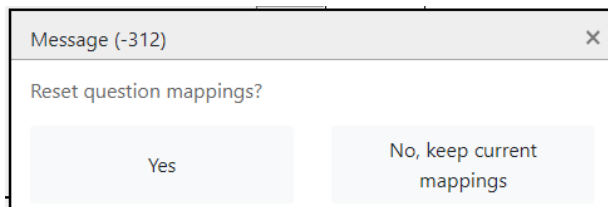
10. When the setup menu configuration is complete, you will receive the following message:



11. The setup menu will close and you will be returned to the menu system where you will be prompted for your login code. Enter your data manager login code to access the additional data manager functionalities. You should now see the Data manager menu which looks like this:



12. If you reenter the Setup HHFA survey parameters to make further adjustments to the question mapping, you will be given the option to keep the current question mapping settings or to reset them based on the module selection. If you do not want to lose any previous manual changes made to the question mapping roster, please make sure to select “No, Keep current mappings”.



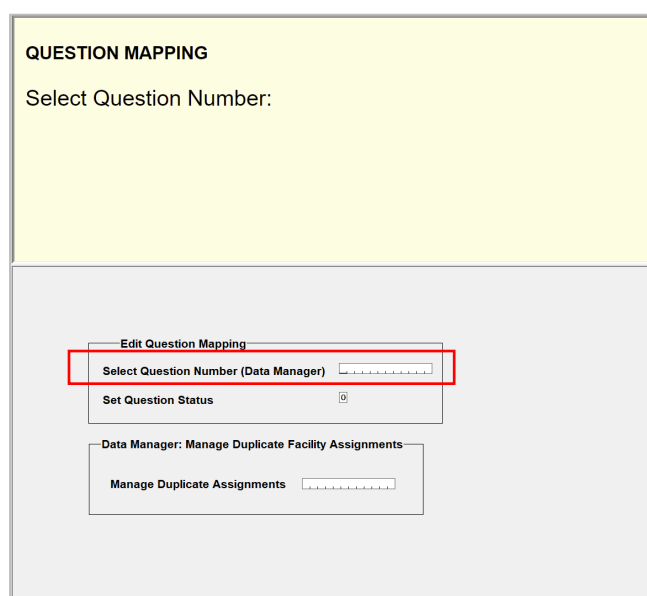
Message (-312) X

Reset question mappings?

Yes No, keep current mappings

13. Most of the data manager functionalities will be discussed in Chapter 15, Reviewing and editing data. However, the following function is useful for configuration of the HHFA application: Activate/Deactivate questions. From the Data manager menu, click on option B, **Activate/Deactivate Questions**.

- After completing the initial setup, you may find that there are a few questions that need to be activated/deactivated. The activate/deactivate questions tool provides an easy way to look up individual questions by question number and change the activation settings one question at a time. Since the HHFA questionnaire has several thousand questions, this tool can be useful to easily manage a small number of activations/deactivations.
- Type in the question number you would like to activate/deactivate. Please be sure to enter the question number as it appears in the CSPro dictionary (i.e., item name) including the prefix “Q”.



QUESTION MAPPING

Select Question Number:

Edit Question Mapping

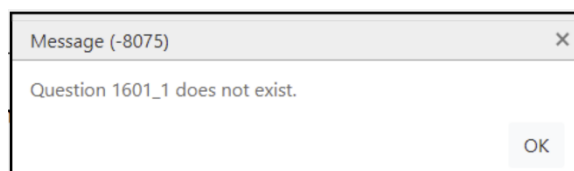
Select Question Number (Data Manager) [Text Input Field]

Set Question Status [Dropdown Menu]

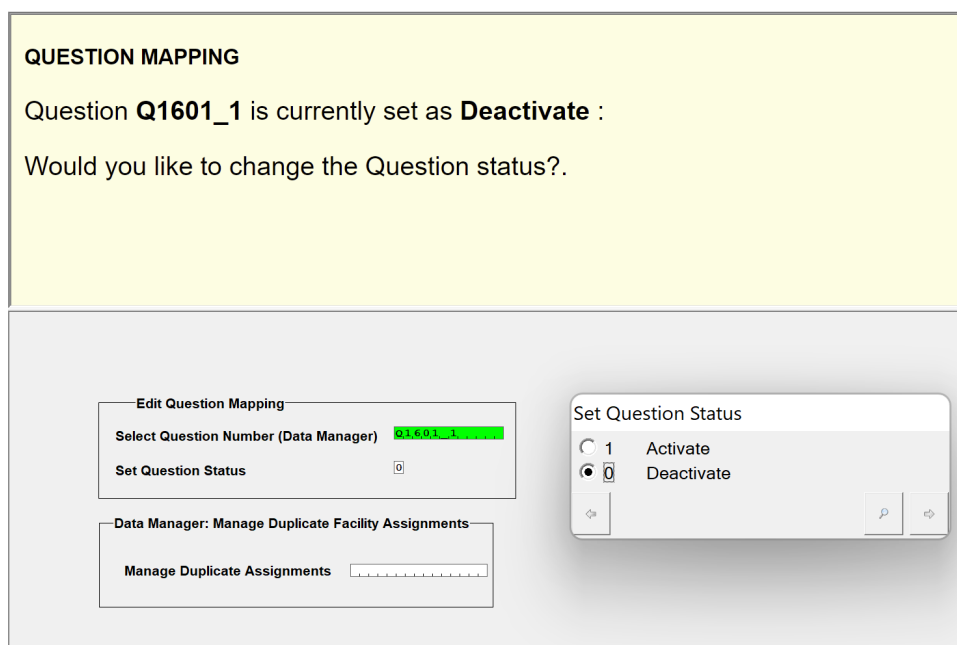
Data Manager: Manage Duplicate Facility Assignments

Manage Duplicate Assignments [Text Input Field]

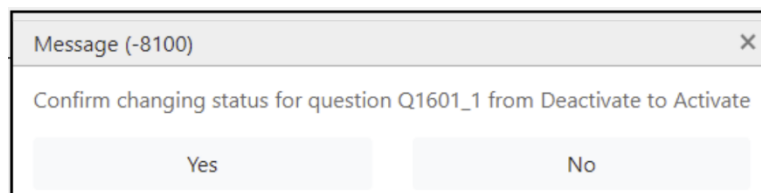
- If you enter an invalid question number you will get an error message letting you know the question number you entered does not exist. You will then be prompted to reenter the question number



- c. Set the question status and press enter.



- d. If you change the question status, you will get a message box asking you to confirm the change. Click on 'Yes' to confirm.

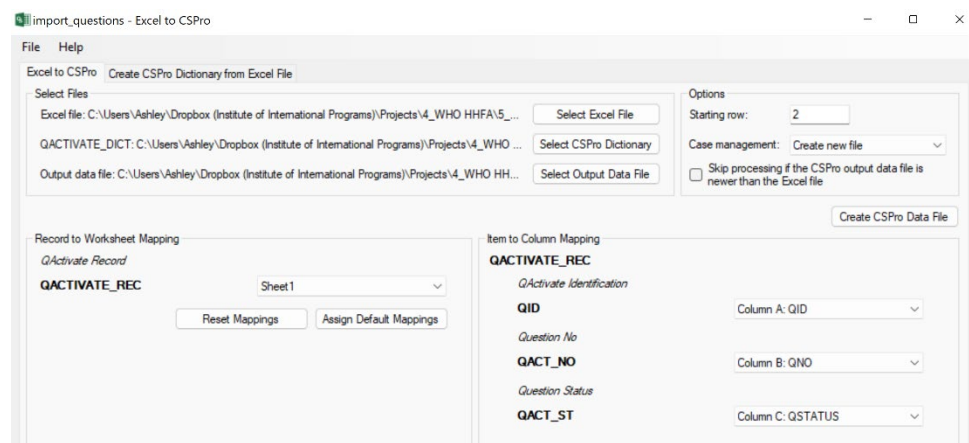


- e. The next message will ask if you would like to continue activating/deactivating additional questions. Click 'Yes' to continue using the tool. Click 'No' to return to the data manager menu.



14. While the Activate/Deactivate questions function is helpful for managing a small number of question activations/deactivations, if there are large number of question activations/deactivations, this can still be a tedious process. In the case of a large number of questions to activate/deactivate a batch edit application can be used to handle this process. Take the following steps, to activate/deactivate questions using the batch application.

- a. Go to the HFA_WHO_v2/process/batch_activate folder and open the Activate_Questions.xlsx file. Edit the file as follows:
 - i. Do not edit the column headers in Row 1.
 - ii. Column A – QID: the QID is a required field but the value is not important. Fill this column with 1 for each question you want to activate/deactivate. Do not fill this column if there is not a corresponding question to activate/deactivate in Column B.
 - iii. Column B – QNO: replace the contents of this column with the question numbers you want to activate and/or deactivate. There should be one question number per row.
 - iv. Column C – QSTATUS: replace this column with the activation status for each question where 0 = deactivate and 1 = activate.
 - v. Save and close the file when your edits are complete.
- b. Go to the HFA_WHO_v2/process/batch_activate folder and open the file import_questions.xl2cs in order to convert the Excel file to a .csdb file.
 - i. Ensure the Mapping looks like the image below:



- ii. Click on Create CSPro Data File. You should get a message that says “1 cases were converted”. Close the Excel to CSPro tool.
- c. Go to the HFA_WHO_v2/process/batch_activate folder and open the Activate.bch file in order to run the batch script to activate/deactivate your questions.
 - i. Click on the traffic icon to run the batch application
 - ii. A text window will open once the batch application has run. You can close this window. To confirm your questions have been activated/deactivated, you can return to the Setup HHFA survey parameters and check the activation settings for each question.

Note: There are two dictionaries in the batch_activate folder – QActivate.dcf is used to generate the .csdb file while Activate.dcf is used to run the batch application.

Configure the application name

The name of the generic WHO HHFA application that will show up on the tablet is “WHO HHFA”. This name can be customized to be a country specific name such as “Country Name HHFA”. To change the name of the CSPro application that shows on the tablet:

1. Go to the HFA_WHO folder and locate the Menu.pff file. Open the Menu.pff file with a text editor of your choice (e.g., Notepad ++).
2. Change the Description name on line 4 of the file to a country specific application name. For example:

```
[Run Information]
Version=CSPro 7.7
AppType=Entry
Description=WHO HHFA
```

```
[Run Information]
Version=CSPro 7.7
AppType=Entry
Description=Zambia HHFA survey
```







3. Save your changes and close the Menu.pff file.

7. Getting to know the HHFA CPro application

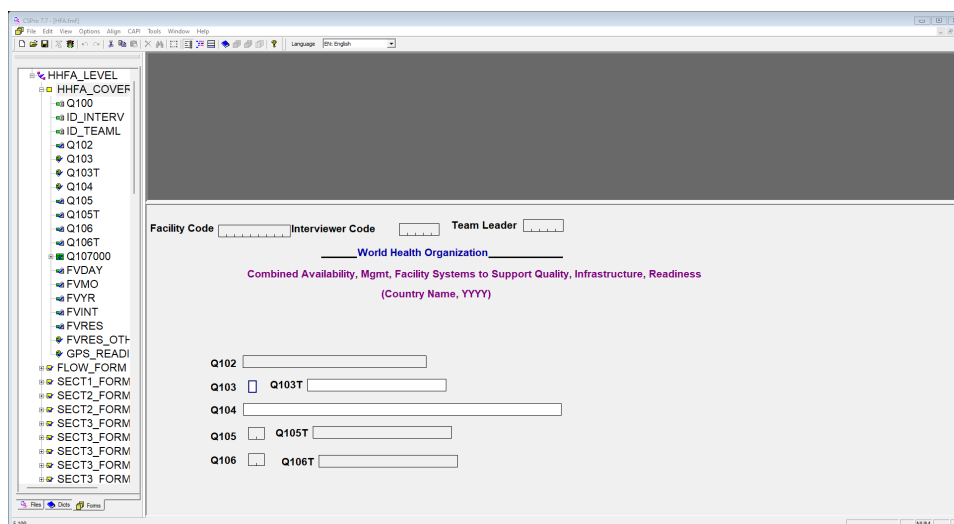
Start CPro and open HHFA application

Now you are ready to start the HHFA application using CPro:

1. Double-click on the desktop's CPro 7.7 icon or select All Programs → CPro 7.7 → CPro 7.7 from the start menu.
2. Select Open an existing application and double click on ...other files to browse to the HFA.ent file located at HFA_WHO\entry.

	HFA.ent	5/4/2022 1:29 PM	CPro Data Entry Application Document
	HFA.ent.apc	5/4/2022 12:23 PM	APC File
	HFA.ent.mgf	5/4/2022 9:01 AM	MGF File
	HFA.ent.qsf	4/21/2022 6:18 AM	QSF File
	HFA.fmf	5/5/2022 6:44 AM	CPro Form Document
	HFA.pff	3/21/2022 12:24 AM	CPro Run Task Document

3. Alternatively, you can double click on the HFA.ent file in the HFA_WHO\entry folder.
4. The Cover page of the HHFA data entry application opens. The screen is subdivided into two parts: the left part displays a files tree; the right part corresponds to the application.



HHFA_LEVEL

- HHFA_COVER
- Q100
- ID_INTERV
- ID_TEAML
- Q102
- Q103
- Q103T
- Q104
- Q105
- Q105T
- Q106
- Q106T
- Q107000
- FVDAY
- FVMO
- FVVR
- FVINT
- FVRES
- FVRES_OTF
- GPS_READI
- FLOW_FORM
- SECT1_FORM
- SECT2_FORM
- SECT2_FORM
- SECT3_FORM
- SECT3_FORM
- SECT3_FORM
- SECT3_FORM
- SECT3_FORM

Facility Code Interviewer Code Team Leader

World Health Organization

Combined Availability, Mgmt, Facility Systems to Support Quality, Infrastructure, Readiness
(Country Name, YYYY)

Q102

Q103 ☐ Q103T

Q104

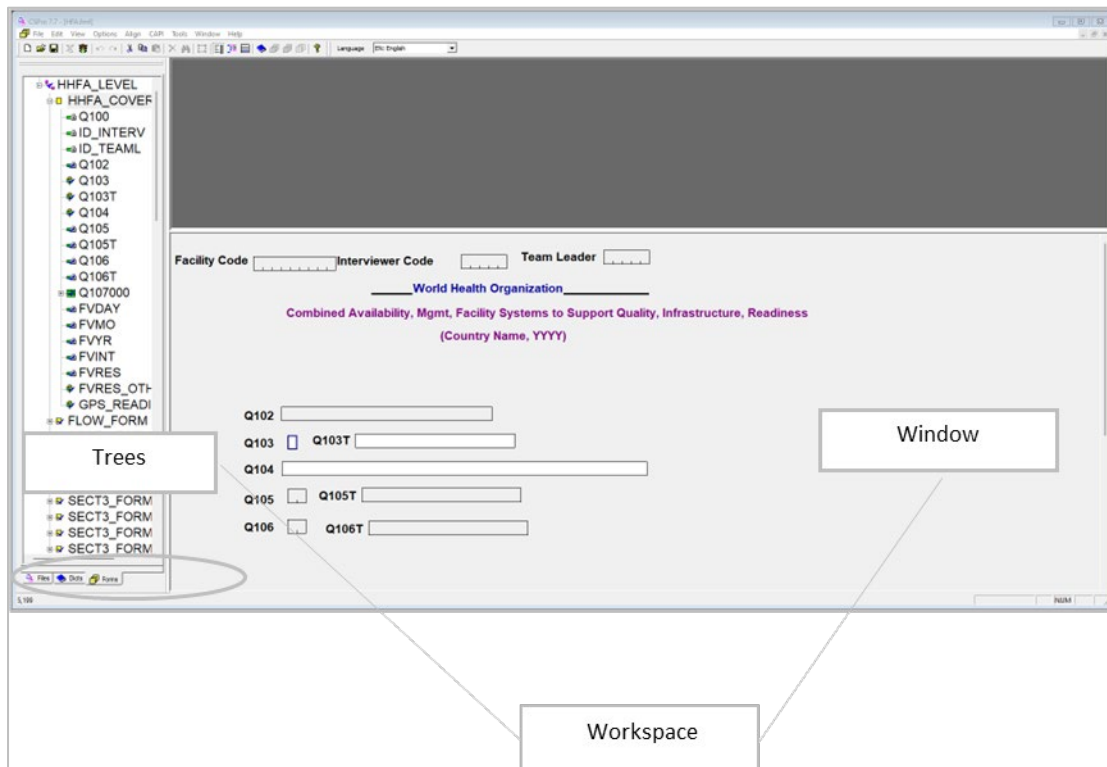
Q105 ☐ Q105T

Q106 ☐ Q106T

Explore the HHFA application

The workspace

The CSPro workspace is divided into two parts: the left is reserved to display file trees; and the right window is reserved to display the actual application.



Trees

Trees are displayed in the left part of the screen and they present the relationship between the different files.


There are three types of trees, corresponding to the three tabs at the bottom part of the left screen (See red outline): the **Files tree (Files)**, the **Dictionary tree (Dicts)** and the **Forms tree (Forms)**.

- **Files:** The files tree shows all the data entry applications that are open, and the files they contain.
- **Dicts:** The dictionary tree shows all the dictionaries the application is using, and their contents.
- **Forms:** The data entry forms tree shows all the forms for the opened application. When clicking on the plus sign in front of a form, the items of the given form are also shown.

You can navigate from one tree to another by clicking on the tab of interest (marked with a red ring above).

In the above picture, the actual names of each of the fields of the form are displayed in the tree (For instance Q102). This is sometimes helpful, but sometimes you need to know more about the field. To alternate between showing the name or the label of the items in the tree, click on View → Names in tree (or use Ctrl+T).

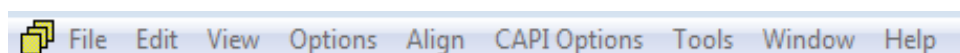
Window

The window on the right side of the screen allows you to modify the contents of a dictionary or a form. Each different window has different functions associated with it (different menu and toolbar). When opening an existing application, CSPro displays the first form of the application as default (as shown above). To see the workspace for the dictionary instead, click on the dictionary icon  above the workspace.


Toolbars

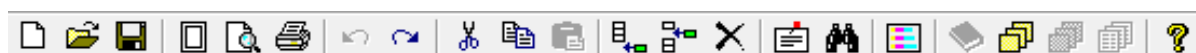
Menu toolbar




















The menu bar includes features common to most Windows applications plus some that are unique to CSPro.

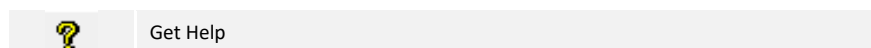


Data Dictionary toolbar


The Data Dictionary toolbar is displayed across the top of the window, below the menu bar. It provides quick mouse access to many features used in the Data Dictionary. It is available whenever the right-hand screen displays dictionary items. If the right-hand screen is not displaying dictionary items, click on the dictionary icon  on the toolbar. The table below provides a description of the function of each icon in the data dictionary toolbar.












Button	Function
	Create a new dictionary
	Open a dictionary
	Save a dictionary
	Set up page margins and headings for printing
	Preview contents of the dictionary
	Print contents of the dictionary
	Undo the last change to dictionary
	Redo last undo
	Cut the selected records, items, or values to the clipboard
	Copy the selected records, items, or values to the clipboard
	Paste the contents of the clipboard to the current position
	Add levels, records, items, values sets, or values
	Insert levels, records, items, values sets, or values
	Delete levels, records, items, value sets, or values
	Edit Notes for dictionary, level, record, item, value set, or value
	Find a label or a name in the dictionary
	Show the Layout window
	Show last Dictionary window
	Show last Forms window



Forms Designer toolbar

The forms designer toolbar is displayed across the top of the window, immediately below the menu bar. The toolbar provides quick mouse access to many of the often-used features found in the Forms Designer. It is available whenever the right-hand screen is displaying forms. If the right-hand screen is not displaying forms items, click on the forms icon  on the toolbar. The table below provides a description of the function of each icon in the forms designer toolbar.



Button	Function
	Create a New application
	Open an application
	Save an application
	Compile the logic (code) of your data entry application
	Run the current data entry application (i.e., start-up CSEntry)
	Undo the latest changes
	Redo the latest changes
	Cut the selected elements to the clipboard
	Copy the selected elements to clipboard
	Paste the contents of the clipboard to the form
	Delete the currently selected item(s)
	Find text in logic
	Toggle between selecting item(s) or drawing boxes
	View the forms
	View the logic
	View the CAPI question
	Show last Dictionary window
	Show last Forms window
	Get Help

8. Modifying the HHFA application

The HHFA resource package consists of several interdependent components including: the questionnaire and data entry application, batch applications for data processing, and a data analysis platform to support data analysis and data visualization. All the parts are dependent on each other. It is therefore **not recommended** to modify the data entry application extensively. However, a limited number of country-specific changes will be needed. Question areas that usually require country adaptation include health facility types, health facility managing authorities, staff categories, trained staff, and medicines as well as any questions which say [COUNTRY ADAPT] in the paper questionnaire. **Table 3** has a list of issues to check for country adaptation. There is generally a country questionnaire adaptation workshop in advance of the survey implementation where these decisions are made. A track changed paper questionnaire should be provided to you with the adaptations that need to be made. However, sometimes not all required adaptations have been made during the questionnaire adaptation workshop and therefore it is also the responsibility of the data manager to review the adaptations and ensure all issues have been addressed.

Table 3: Questionnaire adaptations

Areas	References	Comments
Health facility types	National classification of health infrastructures	The facility types classification should reflect the national classification, including both public and private structures
Health facility managing authorities	National classification of health infrastructures	The managing authority types should reflect the national classification of authorities potentially in charge of a facility
Country specific medicines policy	National drug policy and any other specific drug policies (essential medicines, TB)	Standard lists of tracer items for medicines are proposed in the questionnaire according to international standards. Country-specific medicines, defined as “minimum standard” requirement, can be included in the lists
	ARV national protocol	The ARV section of the questionnaire list all ARV drugs. The ARV section should be customized based on the official recommended first line treatment
Staffing categories	Official categorization of human resources for health	The proposed human resources list available in the questionnaire should be updated according to the official classification of certified health personnel
Trained staff	Official training cycle for health workers	A standard of 2 years interval in training cycle updates for staff is used in the questionnaire. If the timeframe for staff training updates is different according to the official policy it should be reflected in the questionnaire
Clinical guidelines	National guidelines for clinical care	Availability of guideline questions may need to be adapted to align with the official guidelines used by a country. If an overarching guideline document encompasses the topics across several HHFA guideline questions, it is recommended to add a country-specific guideline question that

		encompasses the range of topic areas and then program the CSPro logic to record responses to the individual topics aligned with the availability of the country-specific broader guideline.
Numeric responses related to costs/currency	Align to the country currency	Questions in which the response is a cost or currency related need to be adapted to have enough digits allocated in the response to accommodate the currency of the country.
COUNTRY ADAPT	NA	Any questions which say [COUNTRY ADAPT] in red in the paper questionnaire should be reviewed and adapted.

Before any modification is made to the CSPro application, all edits should first be made on the paper questionnaire to facilitate tracking of country-specific changes. The following should be considered during the questionnaire adaptation process:

- It is important to consider that adding questions to the tool will impact the data collector training, the data collection, and the data analysis. Any question addition should also be considered in term of the analysis outputs, i.e. the related indicators should be defined before adding the questions.
- The **original numbering structure** of the standard questionnaire should be maintained. Changes to the numbering will affect links to the existing tools for automated data processing and results production.
- If a question is added, the number assigned should be the ISO2 code followed by the country specific question number (e.g. SL_01).
- If a question is deleted from the paper questionnaire, the question and question number must both be deleted. Do not reuse the deleted question number nor renumber subsequent questions.

The questionnaire adaptation process is discussed further in the HHFA Quick guide and implementation manual.

The following modifications are commonly made to the HHFA CSPro applications:

- Adding a new question
- Editing an existing question
- Adding languages/translations

The following modifications to the CSPro application are not recommended:

- Deleting a question
- Reordering questions
- Adding a new record

The following section explains how to make basic edits (including the aforementioned types of modifications) to the HHFA application. For this set of modifications, which focuses on questionnaire content, all modifications will be made using the HFA.ent file located in the HFA_WHO\entry folder.

Add a new question

Country-specific questions, that are considered key for measuring service delivery in the country context, can be added to the questionnaire. A country-specific numbering system should be used for all questions added to the HHFA CPro application. A practical and recommended way to number these country-specific questions is to use the country's International Organization for Standardization (ISO.2) code. For example, SL_01: where SL corresponds to the ISO.2 code for Sierra Leone, followed by sequential numbering according to the number of questions added. A country-specific numbering system ensures that new question numbers will not duplicate any existing question numbers in the HHFA application (as this is not permitted by the CPro application).


Adding a new question to the HHFA CPro application requires a series of steps including:

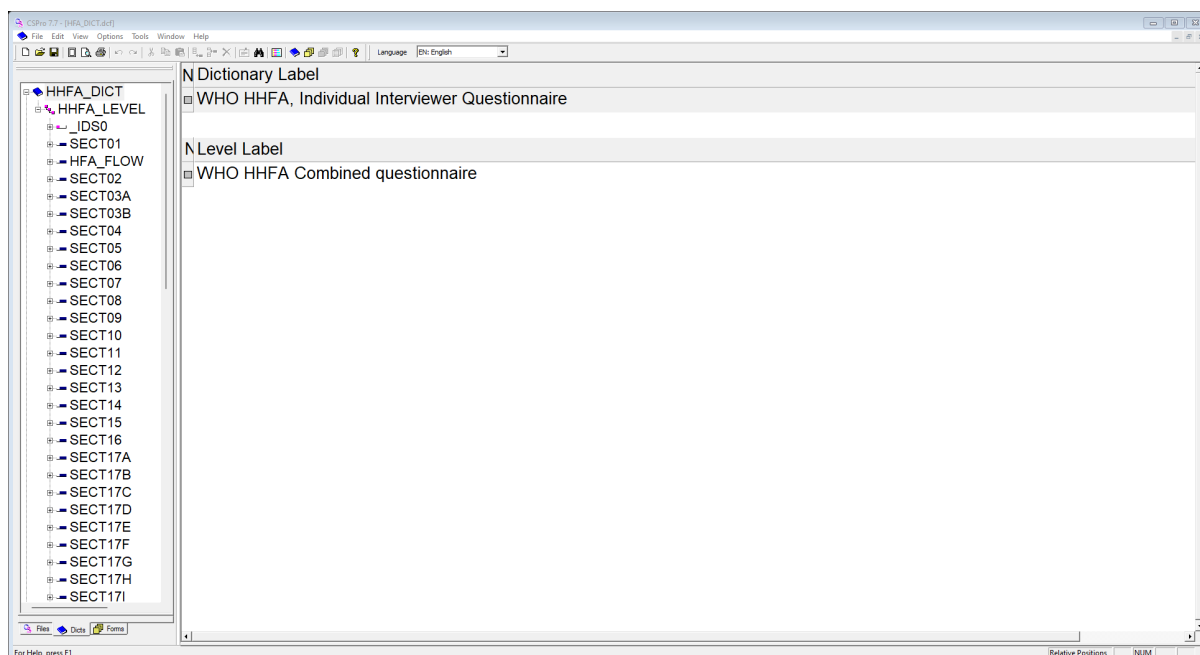
- Add a dictionary item to the dictionary
- Add response options
- Add dictionary item to forms
- Add/adjust logic
- Add CAPI question text
- Add concatenation logic in the menu system
- Copy dictionary item to combined dictionary

The following sections provide instructions for each step required to add a new question to the HHFA CPro application.

Add a dictionary item to the dictionary

The CPro dictionary contains one item for each question in the questionnaire. If adaptations have been made to the paper questionnaire, such as the addition of a question, they must also be made to the CPro dictionary. To add an item to the HFA.ent application, take the following steps:

1. Double click on the HFA.ent file in the HFA_WHO\entry folder.
2. Look at the tree on the left side of the screen and make sure Dictionary is selected. If not, click on the dictionary tab (). The screen should look similar to this:



- Decide on the record to which the new dictionary item belongs (e.g. SECT18E/Section 18.5: Maternal, Newborn, and Child Health Services). In the tree view on the left side, all the records are visible. Click the relevant record.
- Look at the window on the right side of the screen and make sure dictionary items are showing. If not, click on the dictionary icon on the toolbar.
- The screen should now look similar to this:

N Item Label	Item Name	Data Type	Start	Len	Item Type	Occ	Dec	Dec	Zerr
Facility Code	Q100	Numeric	1	9	Item	1	0	No	Yes
Interviewer Code	ID_INTERV	Numeric	10	5	Item	1	0	No	Yes
(record type)		Alpha	15	1					
Does facility offer any family planning se	Q8400	Numeric	16	1	Item	1	0	No	No
Avail of FP svcs: combined estrogen prc	Q8401_1	Numeric	17	1	Item	1	0	No	No
Avail of FP svcs: progestin-only contrac	Q8401_2	Numeric	18	1	Item	1	0	No	No
Avail of FP svcs: combined est. prog. in	Q8401_3	Numeric	19	1	Item	1	0	No	No
Avail of FP svcs: progestin-only injectab	Q8401_4	Numeric	20	1	Item	1	0	No	No
Avail of FP svcs: male condoms	Q8401_5	Numeric	21	1	Item	1	0	No	No
Avail of FP svcs: female condoms	Q8401_6	Numeric	22	1	Item	1	0	No	No
Avail of FP svcs: implants	Q8401_7	Numeric	23	1	Item	1	0	No	No
Avail of FP svcs: emergency contracept	Q8401_8	Numeric	24	1	Item	1	0	No	No
Avail of FP svcs: IUCD	Q8401_9	Numeric	25	1	Item	1	0	No	No
Avail of FP svcs: cycle beads for standa	Q8401_10	Numeric	26	1	Item	1	0	No	No
Avail of FP svcs: male sterilization	Q8401_11	Numeric	27	1	Item	1	0	No	No
Avail of FP svcs: female sterilization	Q8401_12	Numeric	28	1	Item	1	0	No	No
Does facility provide any FP services fo	Q8402	Numeric	29	1	Item	1	0	No	No
Avail of modern FP svcs for unmarried a	Q8403_1	Numeric	30	1	Item	1	0	No	No
Avail of modern FP svcs for unmarried a	Q8403_2	Numeric	31	1	Item	1	0	No	No
Avail of modern FP svcs for unmarried a	Q8403_3	Numeric	32	1	Item	1	0	No	No
Avail of modern FP svcs for unmarried a	Q8403_4	Numeric	33	1	Item	1	0	No	No
Are national guidelines for family plannir	Q8404_1	Numeric	34	1	Item	1	0	No	No

- The following question will be added to the HFA_DICT dictionary:

Number	Question	Result			Skip
	<p>Please tell me if this facility provides the following services for children under 5:</p> <p>IF YES, ASK: For each service, when a child is eligible is the service always provided, provided sometimes, but not always or is the service not provided?</p>	YES, ALWAYS	YES, SOMETIMES	NO	
XX_1	Inpatient treatment of complicated SAM	1	2	3	

7. In the right-hand window of CPro, right click on the dictionary item below which you want to add a new dictionary item. For this example, we want the new item to be placed between Q9002_6 (Malnutrition service avail for children under 5: refer severely mal. child elsewhere in facility for treatment) and Q9003_1 (Service for children under 5, routine Vitamin A supplement). Hence, right click on Q9003_1. Select Insert item and then fill out the following fields. Use the tab key to move between columns.

- **Item Label:** a descriptive label identifying this record. For this example, use the label "Malnutrition service avail for children under 5: inpatient treatment of SAM"
- **Item Name:** the name given to this record for use in the CPro language procedures. For the HHFA, we will use the question number as the item name. For this example, we will use XX_1.
- **Start:** indicates the starting position of the item within the record. This box should be filled in automatically and does not need to be changed.
- **Len:** indicates the length of the data item (i.e. the number of characters necessary to represent the values for the item). This should be the same as the number of digits in the response code. For this example, Len is 1.
- **Data type:** indicates the type of data (numeric or alphanumeric) that will be found in the item. For this example, the choice should be Numeric.
- **Item type:** indicates whether the item is or is not subordinate to, or part of, another item. If the item is part of another item, it is considered a "subitem". If not, it is identified as an "item". Identification items cannot have subitems. For the HHFA questionnaire, use the default option of Item.
- **Occ:** the number of times this item will repeat within the record. The default value is "1". Identification items cannot have multiple occurrences. For the HHFA questionnaire, use the default number of 1.
- **Dec:** the number of decimal places (if any) in the item. The default number of decimals is "0". Identification items cannot have decimals. For the HHFA questionnaire, use the default option of No for any categorical response.
- **Dec Char:** specifies whether the item should be stored in the data file with an explicit decimal character. This applies only to items or subitems which have been defined with the "Dec" property greater than zero (i.e. Dec >= 1). For the HHFA questionnaire, use the default option of No for any categorical response.

- **Zero fill:** states whether the numeric data item should contain leading zeros or blanks. For the HHFA questionnaire, use the default option of No.
8. When all fields are complete, click anywhere in the window to complete the item entry. The result should be a new dictionary item that looks like the following:

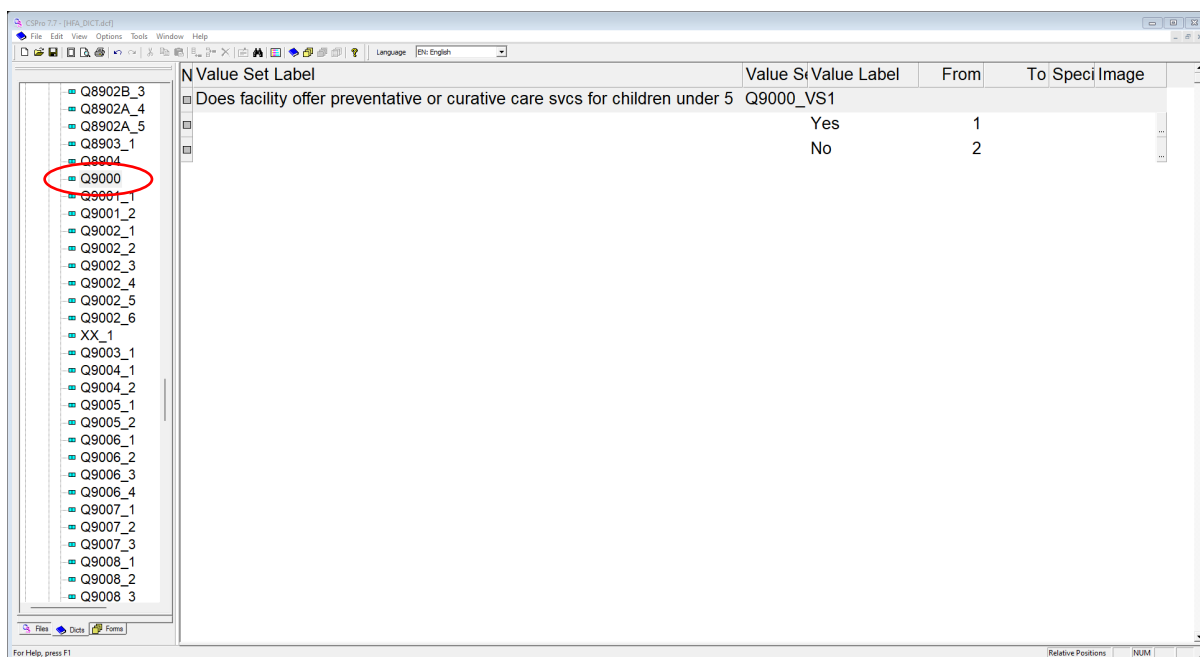
Item Label	Item Name	Data Type	Start	Len	Item Type	Occ	Dec	De
Functioning of post-abortion eqmt: D&C kit	Q8902B_2	Numeric	168	1	Item	1	0	Nc
Availability of post-abortion eqmt: speculum	Q8902A_3	Numeric	169	1	Item	1	0	Nc
Functioning of post-abortion eqmt: speculum	Q8902B_3	Numeric	170	1	Item	1	0	Nc
Availability of post-abortion eqmt: antiseptic for washing vagina & c	Q8902A_4	Numeric	171	1	Item	1	0	Nc
Availability of post-abortion eqmt: sterile gloves	Q8902A_5	Numeric	172	1	Item	1	0	Nc
Are there post-abortion care guidelines in this service area	Q8903_1	Numeric	173	1	Item	1	0	Nc
Has provider of PAC rec'd PAC training in last 2 years	Q8904	Numeric	174	1	Item	1	0	Nc
Does facility offer preventative or curative care svcs for children unc	Q9000	Numeric	175	1	Item	1	0	Nc
Preventive service avail for children under 5: routine child growth mc	Q9001_1	Numeric	176	1	Item	1	0	Nc
Preventive service avail for children under 5: plot weight against hei	Q9001_2	Numeric	177	1	Item	1	0	Nc
Malnutrition service avail for children under 5: diagnosis or treatme	Q9002_1	Numeric	178	1	Item	1	0	Nc
Malnutrition service avail for children under 5: provide fortified protei	Q9002_2	Numeric	179	1	Item	1	0	Nc
Malnutrition service avail for children under 5: provide therapeutic fe	Q9002_3	Numeric	180	1	Item	1	0	Nc
Malnutrition service avail for children under 5: provide/ prescribe fee	Q9002_4	Numeric	181	1	Item	1	0	Nc
Malnutrition service avail for children under 5: diagnose and treat ac	Q9002_5	Numeric	182	1	Item	1	0	Nc
Malnutrition service avail for children under 5: refer severely mal. ch	Q9002_6	Numeric	183	1	Item	1	0	Nc
Malnutrition service avail for children under 5: inpatient treatment of XX_1	Q9002_6	Numeric	184	1	Item	1	0	Nc
Service for children under 5, routine Vitamin A supplement	Q9003_1	Numeric	185	1	Item	1	0	Nc
Anaemia services for children under 5: diagnose & treat	Q9004_1	Numeric	186	1	Item	1	0	Nc
Anaemia services for children under 5: prescribe iron	Q9004_2	Numeric	187	1	Item	1	0	Nc
Pneumonia services for children under 5: diagnose & treat	Q9005_1	Numeric	188	1	Item	1	0	Nc
Pneumonia services for children under 5: prescribe amoxicillin	Q9005_2	Numeric	189	1	Item	1	0	Nc

9. Go to File → Save or Ctrl+S to save your work.

Note: Country-specific questions must be added *within existing records* in the HHFA application, in order for questions to be readily available in the flow control of the application when deployed to tablets. If you are an advanced CSPro programmer and feel comfortable editing the flow control syntax to allow for additional records/sections, you may do so, but this guide does not provide specific instructions on how to do this. Within an existing record, a new question can be added in any location of your choosing.

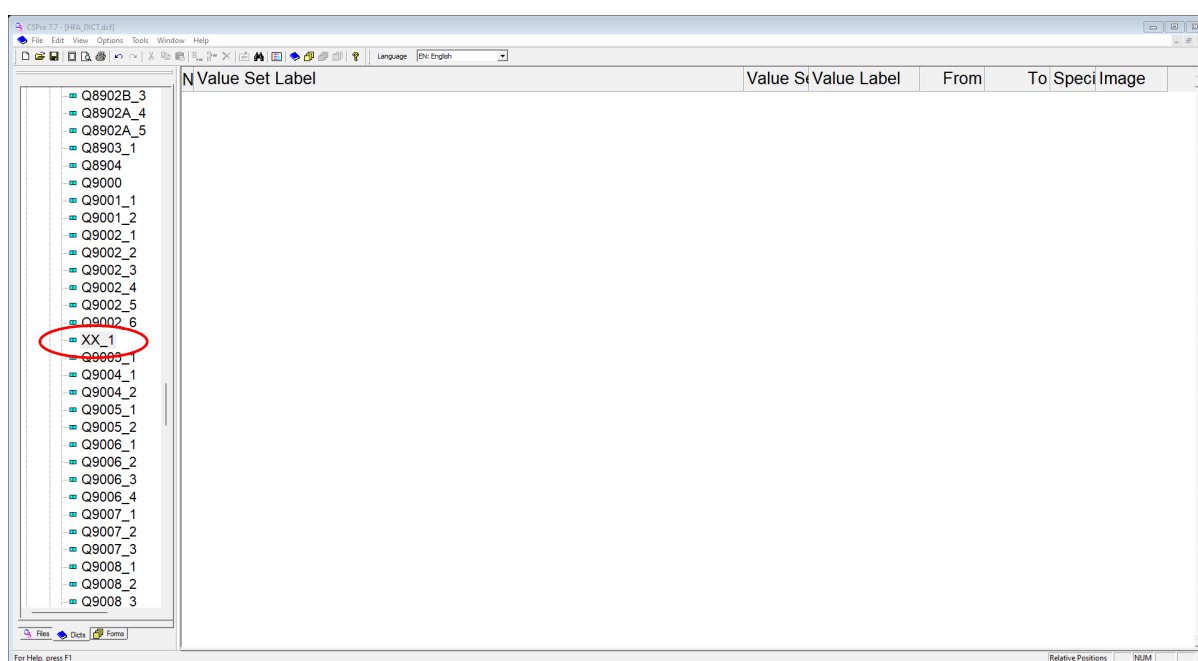
Add response options

A value set contains the numeric responses that are given to each item and are used to define ranges of valid values during data entry. These should correspond to the response options and response codes provided in the paper version of the questionnaire. To access the area where value sets can be edited in CSPro, click on the dictionary icon on the toolbar on top of the CSPro window. By clicking on the items within the records in the tree view, you will get access to the value sets, as shown below.



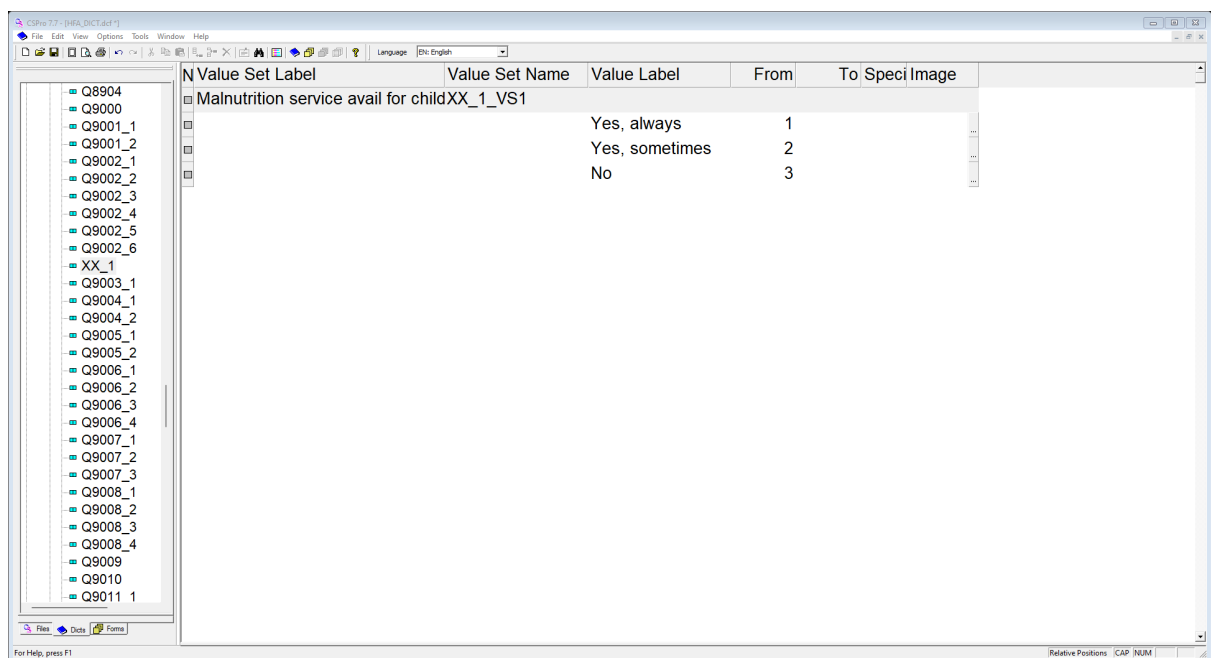
We are going to add a value set to the previously added dictionary item “Malnutrition service avail for children under 5: inpatient treatment of SAM” – or XX_1

1. Double click on the HFA.ent file in the HFA_WHO\entry folder (if you do not have the application open).
2. Make sure you have the dictionary view in the right part of the display of CSPro by clicking on the dictionary icon on the toolbar.
3. Expand the SECT18E/Section 18.5: Maternal, Newborn, and Child Health Services record (click on the plus sign in front of it) and click on the XX_1 item to highlight it.




4. Right click in the right window and select Add Value Set.

- Press Enter to accept the default Value Set Label and press Enter again to accept the default for Value Set Name. The cursor will drop to the line below into the Value Label column. Remember that the Value Set Label is a descriptive text label and the Value Set Name identifies the item for use in CSPro procedures.
- The Value label column corresponds to the descriptive text for a single value. In the HHFA questionnaire, this is the text of a response's options. For example, a question that has "Yes" or "No" as pre-defined response options should have "Yes" and "No" as the Value labels. If the question response does not have a pre-defined answer, such as for "Number of maternity beds", leave the Value label blank. The "From" and "To" columns define the range of possible values for that question's response. The "From" column is for the single value, or starting value of a range associated with the Value label. The "To" column is for the upper limit of the range of values being defined. It must always be greater than the "From" value on the same line. Where only a single value is associated with the Value Label, the "To" value may be blank.
- For this example, we will enter: Yes, always -> 1, Yes, sometimes -> 2, and No -> 3 for the "Value Label" and "From" columns, leaving the "To" column empty. Your screen should look like the following after entering the value set:



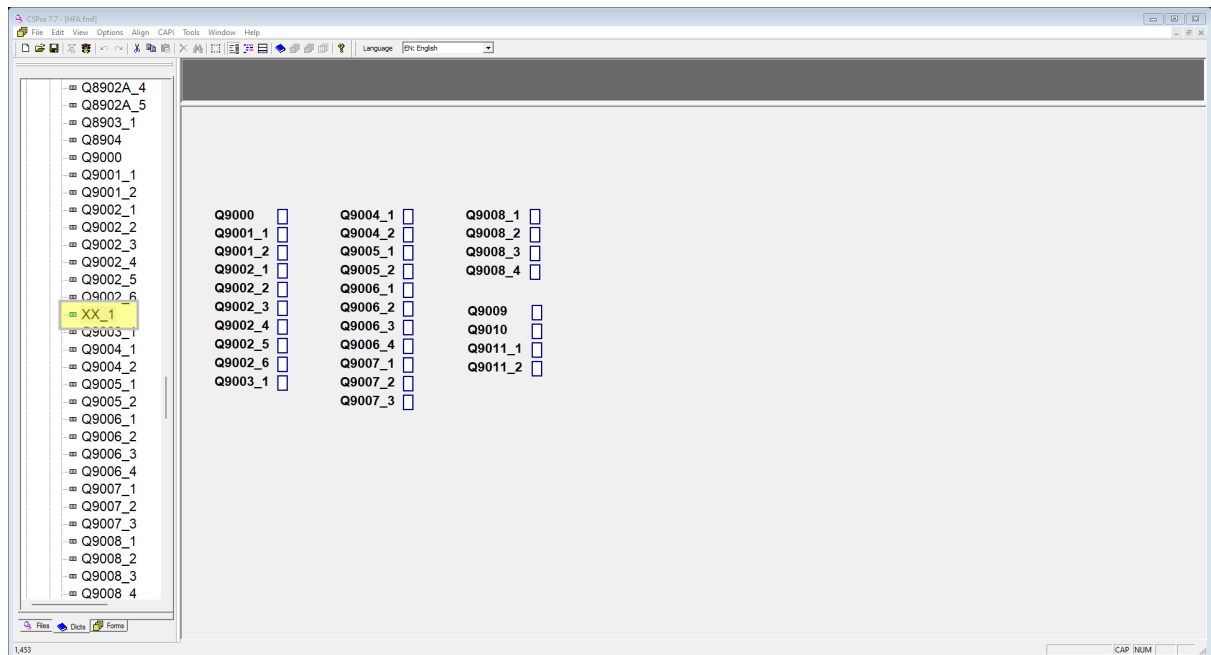
- Go to File → Save or Ctrl+S to save your work.

Add dictionary items to forms

After adding a dictionary item to the dictionary, it must next be added to the form. When opening the form (click on the form icon  on the toolbar), you will see that the new item is not yet added to the form. The next step is to add the item to the form.

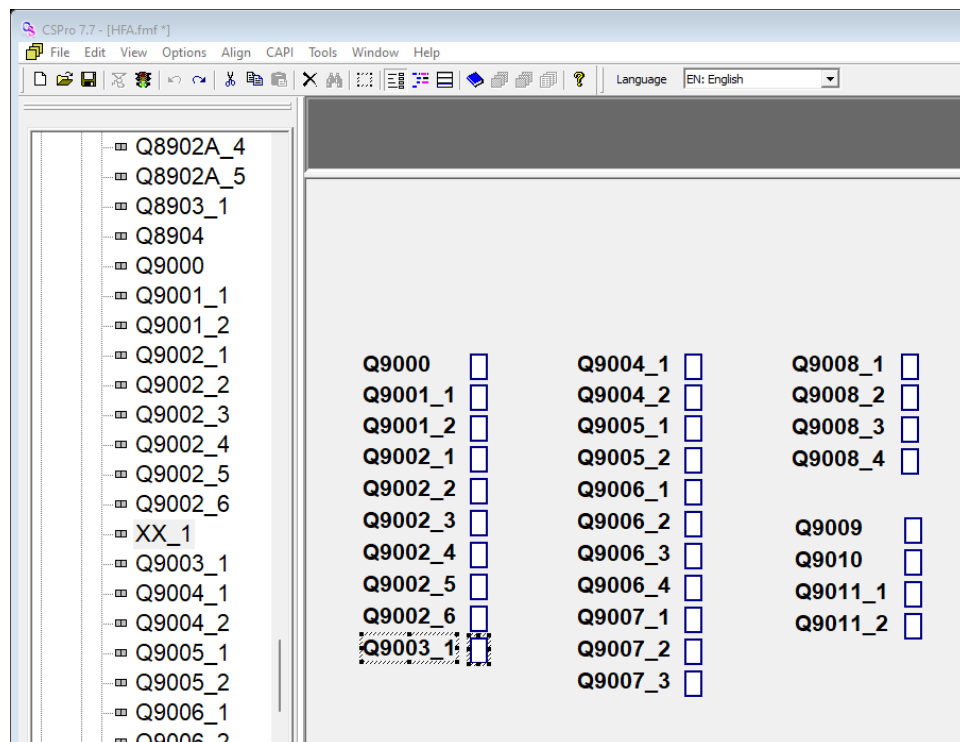
- Double click on the HFA.ent file in the HFA_WHO\entry folder (if you do not still have the application open).
- Make sure that the form is visible on the right side of the CSPro window, and the dictionary in the tree view on the left. (Click on the dictionary item on the bottom left part of the screen.) In the tree view, it is easy to see which elements have not been used in the form, as they have the icon

marked turquoise (see the yellow highlight below). (Use Ctr T to toggle between names and labels in the tree.)

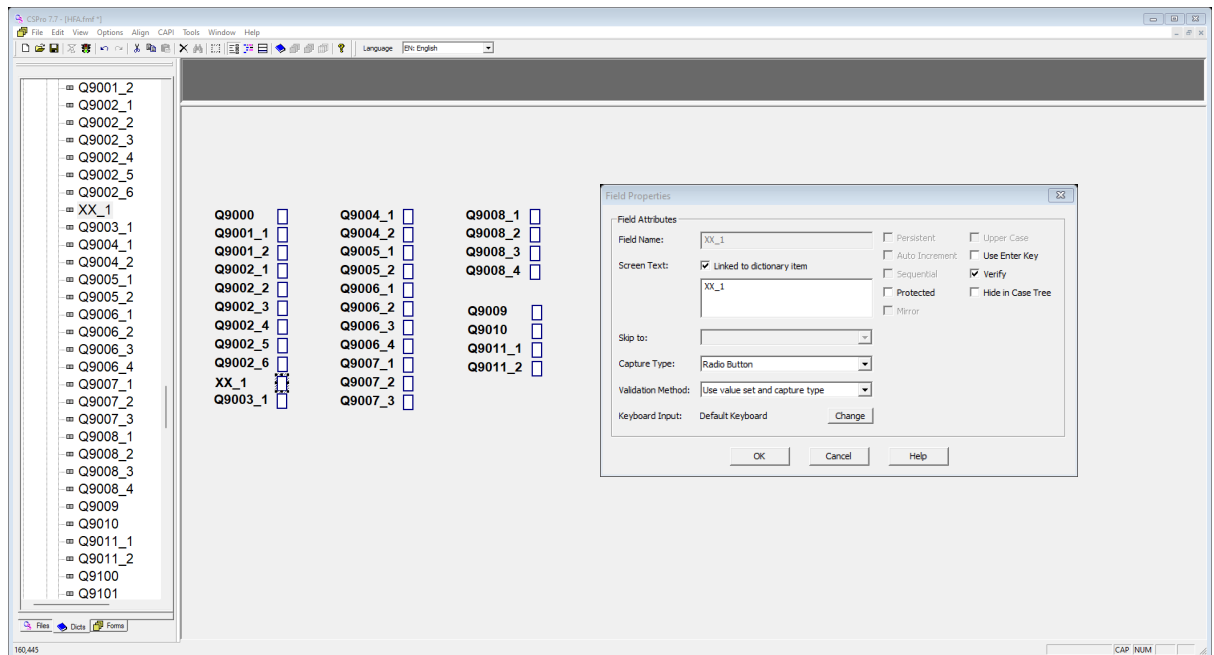


3. Use the mouse to drag the item on to the forms canvas and place it where you want it. It should appear in the same order as is listed in the dictionary.

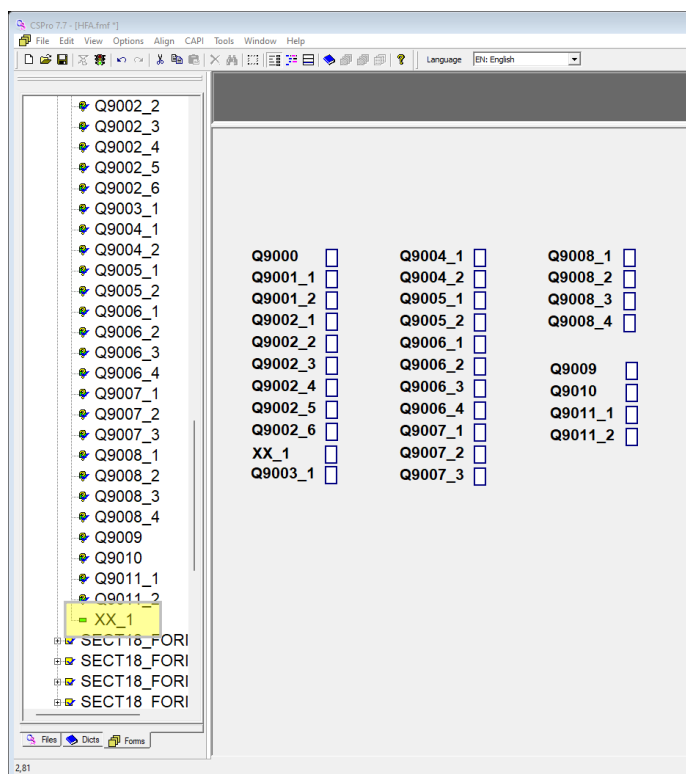
- Click and drag the mouse from just above Q9003_1 to just below Q9003_1, marking the questions you want to move:



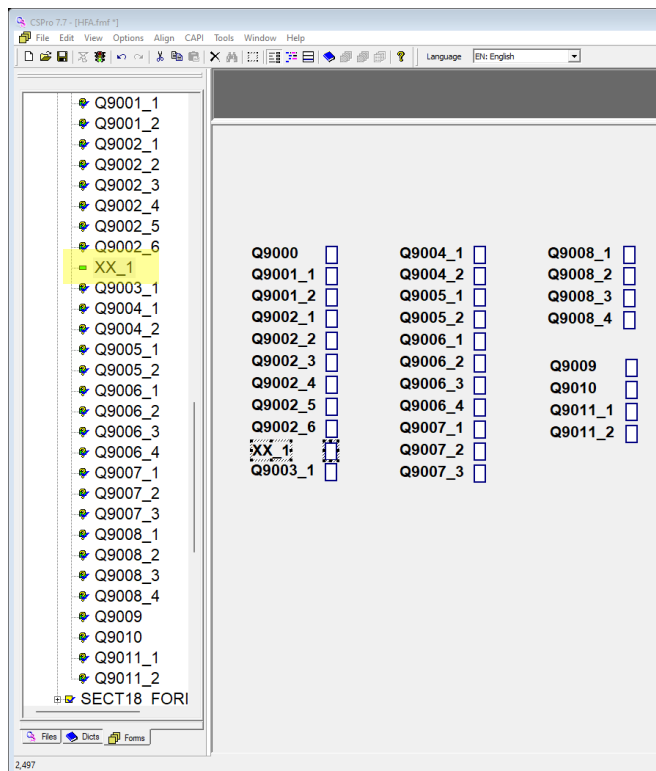
- Now you can use the mouse to drag down the highlighted items to make space for the new item.
- Place the new item between Q9002_6 and Q9003_1.
- Right click on the response box for the new item and select field properties. Click on the button next to Capture type and make sure radio button is selected. Then click ok on the open screens. The HHFA survey uses radio buttons, number pad, text boxes as the main capture types.



4. The order of the questions when the application is running is the same as the order of the items displayed in the forms tree (click on the forms tab in the lower left part of CSPro):

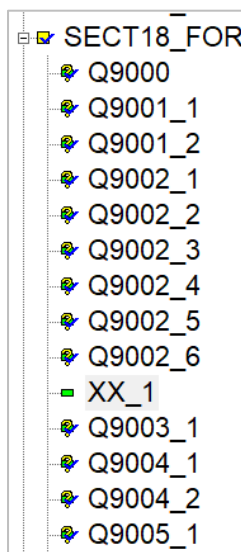


Hence the new item is going to be asked at the very end of this section – even if it appears to be integrated in the middle of the form in the forms view layout. To have it asked in the right order, grab it with the mouse in the tree view, and drag it up to the right place in the tree:




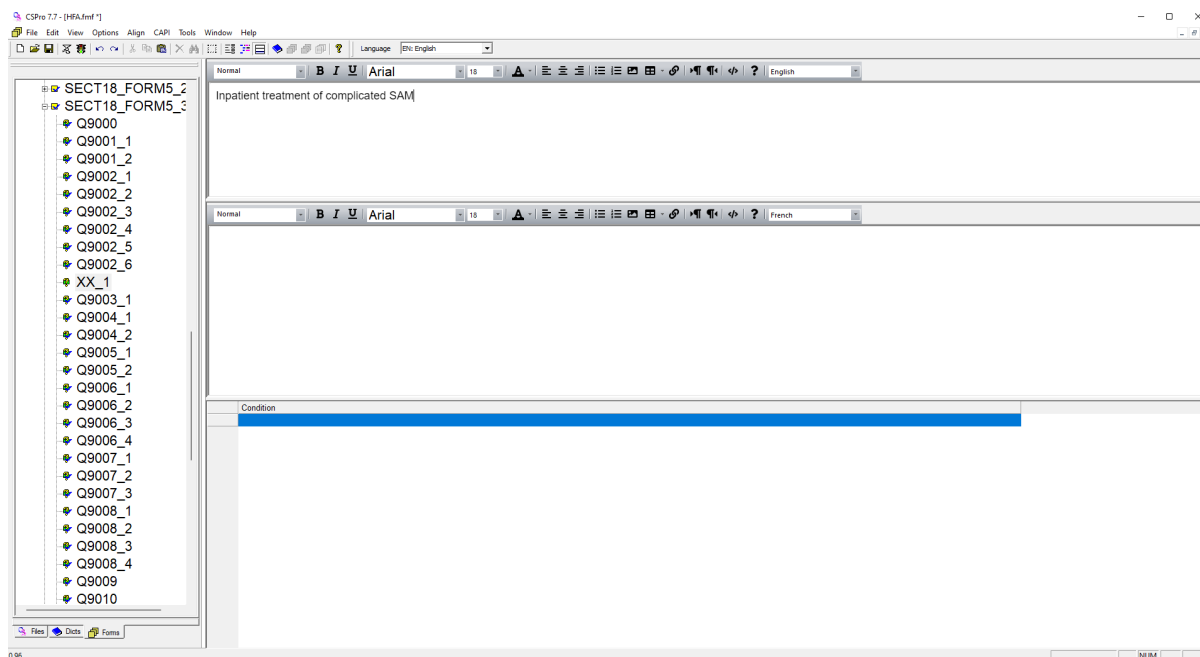
Add CAPI question text

Notice that the icon of XX_1 in the tree view is different from the other icons: It does not have a question mark icon like the other questions.



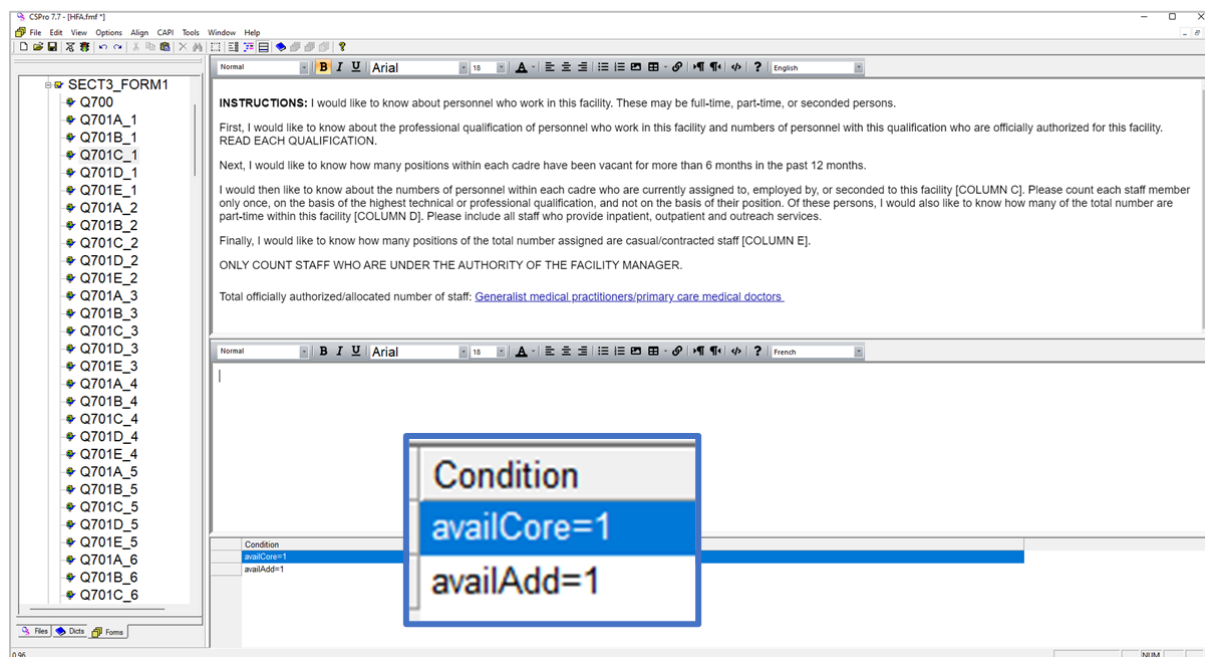
This is because no CAPI question is defined for this item. To add the CAPI question text:

1. Double click on the HFA.ent file in the HFA_WHO\entry folder (if you do not still have the application open).
2. Click on the CAPI question icon  on the tool bar on top of the screen.
3. Make sure the XX_1 item is highlighted in the tree view, and write the question in the upper text box on the right window:



4. Go to File → Save or Ctrl+S to save your work.

Some questions include instructions in the CAPI text along with the question text itself. For some questions, the instructions are different depending on whether the Core or Core+Additional version of a module is being implemented. In these cases, conditional logic can be added to the CAPI text to show different question text depending on the module being implemented. For example, in the Staffing section Q701C_1 has different text depending on if the Availability Core module is being implemented or the Availability Core+Additional module is being implemented. The conditional logic is added just below the CAPI window as shown in the image below.



Clicking on each condition will toggle between the CAPI text windows so you can add the text that should display for each condition. In order to add conditions based on module, the following nomenclature is used to refer to each module:

Module	Nomenclature for CAPI conditions
Availability Core	availCore
Availability Core+Additional	availAdd
Availability Additional/Supplementary – Building Infrastructure	availAddSup
Readiness Core	readCore
Quality of Care Additional/Supplementary – Record Review	qocAddSup
Management and Finance Core	mgmtCore
Management and Finance Core+Additional	mgmtAdd

Add/adjust logic

The CSPro language lets you write programming logic for your Data Entry applications. In Data Entry applications you can write logic to control and check the keying (data entry) operation as it progresses. CSPro logic consists of a collection of events defined as procedures. Each procedure performs the operations you specify using CSPro statements and functions written in the CSPro Language.

Logic has already been programmed into the CSPro application for the HHFA questionnaire. If you have made changes to the HHFA application, you may also have to make changes to the logic. These changes will be specific to the questions added/changed. Below are several examples of how to change the application logic.

User defined functions

Several functions have been written to execute tasks specific for the HHFA CSPro application. You will see these functions used in the logic of the HHFA CSPro application. It is important to have a basic understanding of what they do so that these functions are not mistakenly removed from the logic of a question where edits are being made. In addition, it may be helpful to use some of these functions when adding a country-specific question to the HHFA CSPro application.


- **QuestionIsFielded:** checks the question mapping settings to make sure the question has been activated. If the question is deactivated, it will not be asked. This line of code should not be removed from any question in the HHFA application. If you add a country specific question, this code is not needed as the default is for all country-specific questions to be activated.
- **EndSection:** At the end of every record in the HHFA CSPro application is a question called “section complete”. All questions added to a record **MUST** be placed before this question. When programming skip patterns in the HHFA CSPro applications, skip patterns cannot skip outside of a record. If a skip pattern in the paper questionnaire is designed to skip to the next record, in the CSPro application this will instead skip to the “section complete” question of the record. This allows the data collector to return to the flow control menu and select a new section for data collection. When editing the HHFA CSPro application, you must be careful about the placement of any additional country-specific questions and make sure there is not a question with the “EndSection” logic before the question you have added. If you do find that there is a question with “EndSection” logic before the question you have added, you will need to replace the “EndSection” with a skip to the question you have added. Similarly, if the question you add needs a skip pattern to the next section, please use the “EndSection” function to do this.
- **CheckStrLen:** This function is used for free response/text questions in the HHFA application. For questions that require a text response, a validation check is required to ensure the field is not left blank. This function checks the number of characters in the response to a text field and checks that it meets a minimum number of characters (i.e. the text response has at least 4 characters). If there is no text or the text is less than 4 characters, the following error message will appear: “Text fields must be at least 4 characters.” The user will then be required to reenter a response.

Skip patterns

Depending on the type(s) of question(s) you have added, you may need to add a skip pattern to the HHFA application.

For this example, we will examine logic in the data entry application for a question in the antenatal care section. Question Q8502A_1 asks whether a blood pressure apparatus is available and question Q8502B_1 asks whether this equipment is functioning. The second question should only be asked when the answer to the first question is yes. Hence, we want to skip Q8502B_1 if the answer to question Q8502A_1 is no.

1. Double click on the HFA.ent file in the HFA_WHO\entry folder.

- Look at the tree on the left side of the screen and make sure Forms is selected. If not, click on the Forms tab.
- Look at the window on the right side of the screen and make sure a form is showing. If not, click on the Forms icon on the toolbar.
- Click on the logic icon  on the toolbar, or select View → View Logic from the main menu (or press Ctrl+L).



- Go to View menu and select Names in tree (or press Ctrl+T) to show names instead of labels in the forms tree. You can toggle between names and labels at any time to make sure that you are working with the correct items.
- Click on Q8502B_1 in the Forms tree. The frame on the right-hand side of the screen should show "PROC Q8502B_1 " at the top. Note that "PROC" is short for procedure and Q8502B_1 is the item name corresponding to the question which asks about the functioning of the BP apparatus in the ANC service site. We put our logic in the procedure for Q8502B_1 A because we want it to execute immediately before the operator keys this field.
- Note the logic displayed:

```
PROC Q8502B_1
```

```
preproc
ask if Q8502A_1 in 1,2;
QuestionIsActivated();
```

Notice the use of semi colons at the end of each logic statement. A semi colon tells CSPro that the instruction is finished. If the logic is typed in directly after the PROC statement, the default is that the logic will be applied AFTER the question is answered. If you would like the logic to be applied BEFORE a question is answered, you must type preproc after the PROC statement.

This logic code in CSPro language asks that before Q8502B_1 is asked, check that the response to Q8502A_1 is 1 or 2. In this way, if the response to Q8502A_1 is 3 (i.e. Not available) then Q8502B_1 will be skipped. There is an additional line of code here – QuestionIsActivated(); – which checks the question mapping settings to make sure the question has been activated. If the question is deactivated, it will not be asked. This line of code should not be removed from any question in the HHFA application.

- If you have added a question that requires a skip pattern, add the appropriate logic for the skip pattern.
- Go to File → Save or Ctrl+S to save your work.

Error messages

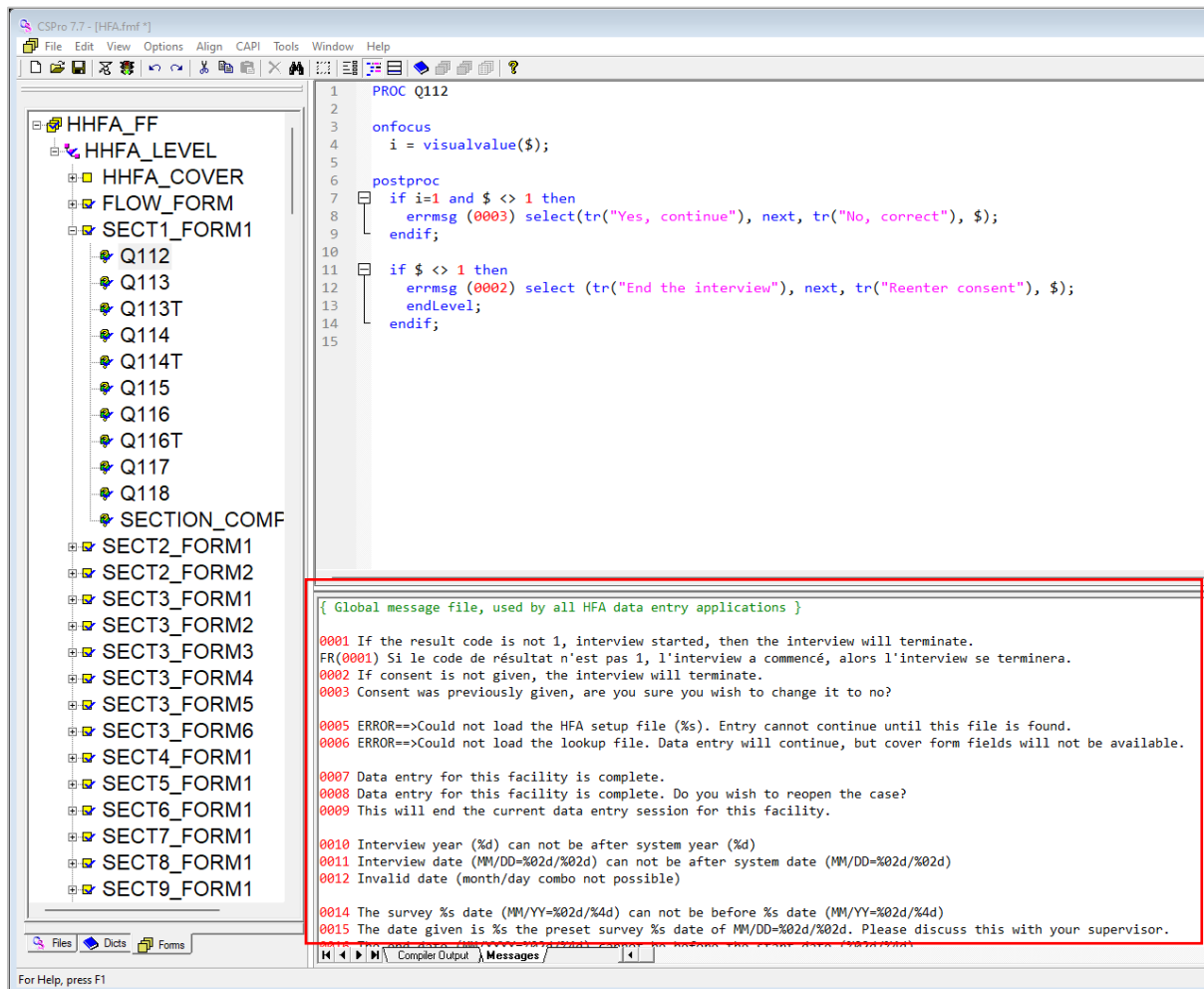
Depending on the type(s) of question(s) you have added, you may need to add an error message to the HHFA application. Error messages are programmed using logic in the same way as for skip patterns. Unique error messages are given a number and then the text for each message is added in the message window. For example,

```

Postproc
if $ <> 1 then
    errmsg (0025) reenter($);
endif;

```

This error message tells us that if the question is not equal to 1, then display error message number 25 and require the respondent to reenter a response to the question. When in the logic view, the message window is the tab in the bottom right window, next to the Compile output window. Click on the Message tab to see the list of error messages in the HHFA application.




Add the unique number for the new error message to the Messages tab and write the text for the error message.

Compile logic

In the previous sections, logic has been entered in CSPro language. As for all procedural languages, the system must check these to make sure that there are no syntax errors. This is called "compiling". Once all logic changes have been entered, the CSPro application must be compiled. To do this, use the following steps:

1. Click on HHFA_FF at the very top in the Forms tree to show all the CSPro logic.

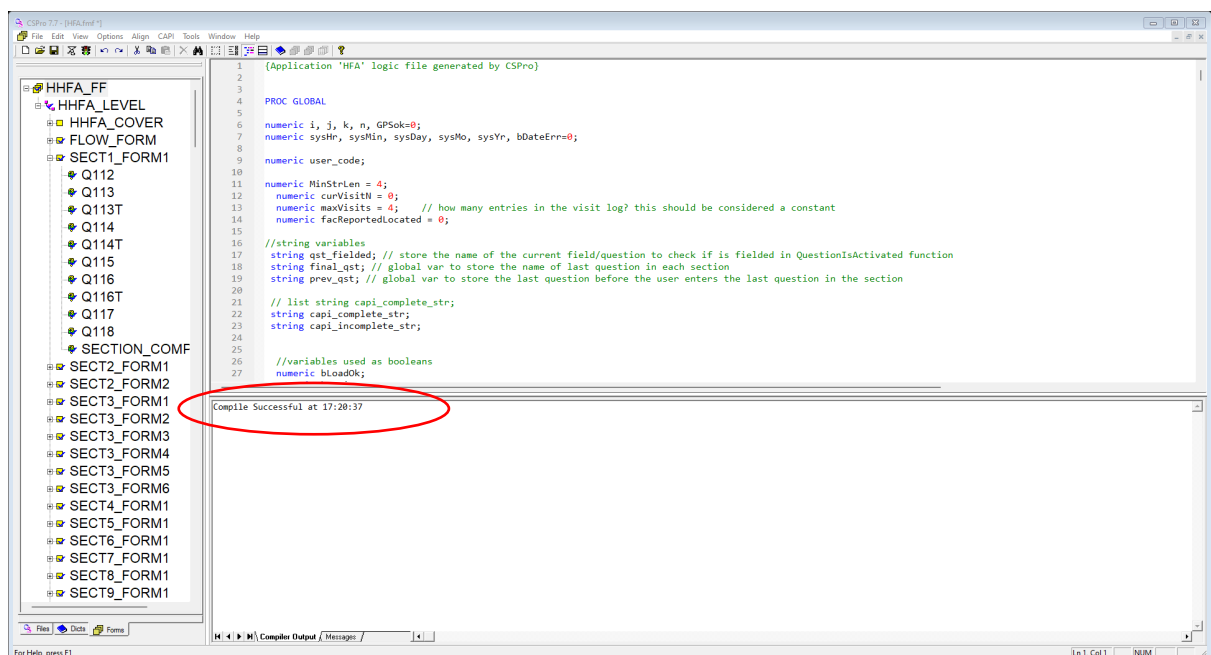
2. Compile the logic by clicking  on the toolbar, or select File → Compile from the main menu (or press Ctrl+K.).

3. 

4. If you typed the logic correctly, you will see Compile Successful in the Compiler Output under the logic.

5. If you see a dialog box that says Compile Failed, you have typed something incorrectly. A red circle will appear in the margin indicating the approximate location of the error. The Compiler Output tab at the bottom of the screen will show you an error message to help you determine the error. Check very carefully to make sure you typed in exactly what was shown in the previous tasks.

6. The screen should look like this:




7. Go to File → Save or Ctrl+S to save your work.

Copy dictionary item to combined dictionary

The HHFA CSPro application is unique in that it allows multiple data collectors to collect data for the same facility at the same time. This is accomplished by assigning different sections of the questionnaire to different data collectors, thus allowing each of them to collect data on tablets, syncing the various data files to a single team leader tablet, and then using a concatenation function to merge the various data files into a single record per facility on the team leader tablet. The process of concatenating the data requires a combined data dictionary which has a few key differences from the HHFA dictionary and uniquely specifies the merged HHFA data file. Any changes made to the HHFA dictionary (HFA_DICT.dcf) must also be made to the HHFA combined dictionary (HFA_COMB.dcf). If you have added a question to the HFA.dcf, you will need to copy that question into the HFA_COMB.dcf using the following steps.

1. Double click on the HFA.ent file in the HFA_WHO\entry folder.

2. Look at the tree on the left side of the screen and make sure Dictionary is selected. If not, click on the dictionary tab ().
3. Look at the window on the right side of the screen and make sure dictionary items are showing. If not, click on the dictionary icon on the toolbar.
4. In the tree on the left, click on the record in which you have added a new question. For this example, we will click on SECT18E/Section 18.5: Maternal, Newborn, and Child Health Services.
5. On the right side of the window, locate the question you have added, click on it to select it, and right click to select Copy (or press Ctrl+C). In this example, select item XX_1.
6. Go to the HFA_WHO\dicts folder and open the HFA_COMB.dcf file.
7. In the tree on the left, click on the record in which you want to paste the new question. In this example, click on record SECT18E/Section 18.5: Maternal, Newborn, and Child Health Services.
8. On the right side of the window, locate the question immediately below the place where you want to add the new question, click on it to select it, and right click to select Paste (or press Ctrl+V). In this example, select item Q9003_1.
9. Go to File, the Save or Ctrl+S to save your work. Repeat this process for all questions added to the HHFA application.

If many changes have been made to the HHFA CSPro application and it is impractical to copy changes between dictionaries for each item, an alternative approach may be used. However, this must be done with great care.


1. Go to the HFA_WHO\dicts folder. Change the name of the HFA_COMB.dcf file to HFA_COMB_old. Copy the HFA_DICT.dcf, paste it, and change the name to HFA_COMB.dcf.
2. Open the HFA_COMB.dcf file and make the following changes:
 - a. Click on the top level in the tree. Change the label to “WHO HHFA, Combined Questionnaire” and change the name to “HFA_COMB”
 - b. ID items:
 - i. Move ID_TEAML and q101 from Section 1 to ID items. The order of the ID items in the HFA_COMB dictionary should be Q100, Q101, ID_TEAML.
 - ii. Delete interviewer code (ID_INTERV).
 - c. Interview status:
 - i. Add the Interview status record
 1. The interview status record includes six variables related to the status of the data collection and duration of data collection. Copy this record from the HFA_COMB_old.dcf.
 2. Check that all six variables are present and the response options associated with these six variables have also been copied over.
 - d. Section 1:
 - i. Remove visit log questions (Q107 – QVRES) and GPS reading (GPS_READING)
 - ii. Add variable: Facility Weight (WGT)

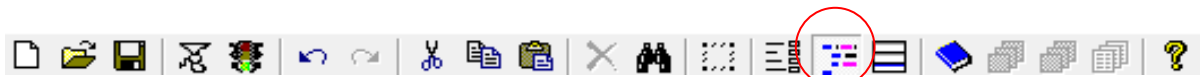
e. Remove Section F: HFA flow control record

- The required changes are now complete. Continue with the adaptation process and test out the deployment of the application. If all is successful, you can delete the HFA_COMB_old.dcf file.

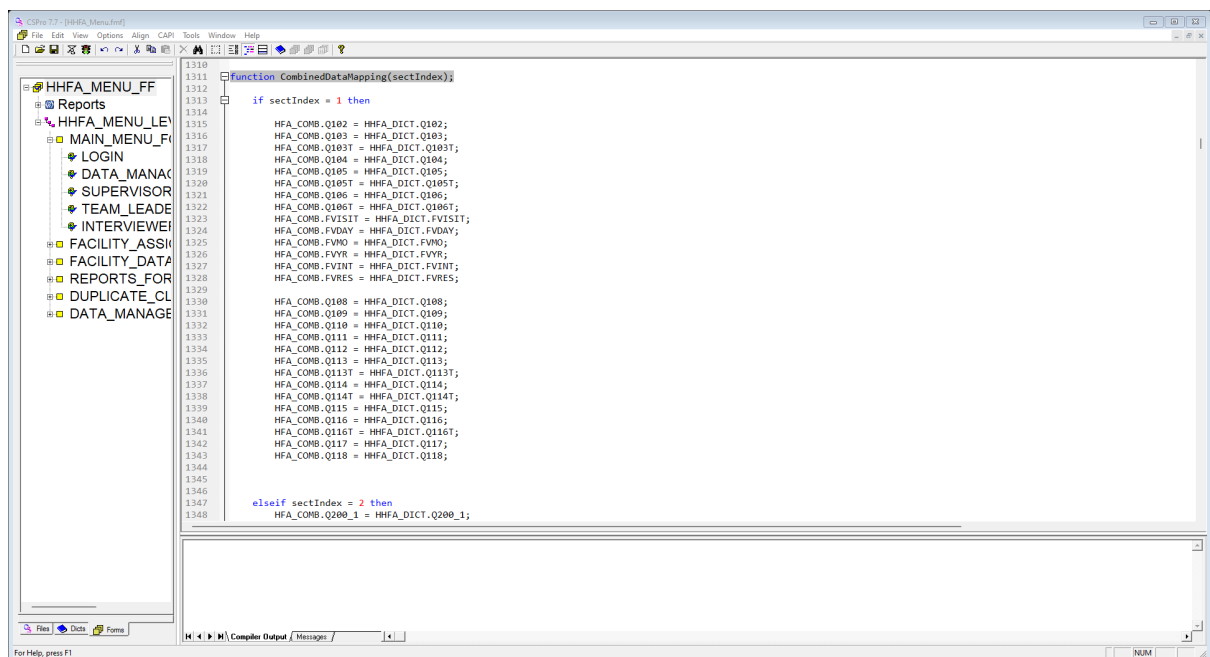
Add concatenation logic in the menu system

The process of concatenating the data also requires a data concatenation function which has been programmed into the HHFA menu system. If any questions are added to the HHFA CSPro application, they need to be added to the concatenation logic in the HHFA menu system. To do this, take the following steps:

- Double click on the HHFA_Menu.ent file in the HFA_WHO folder.
- Look at the tree on the left side of the screen and make sure Forms is selected. If not, click on the Forms tab.
- Look at the window on the right side of the screen and make sure a form is showing. If not, click on the Forms icon on the toolbar.
- Click on the logic icon  on the toolbar, or select View → View Logic from the main menu (or press Ctrl+L).



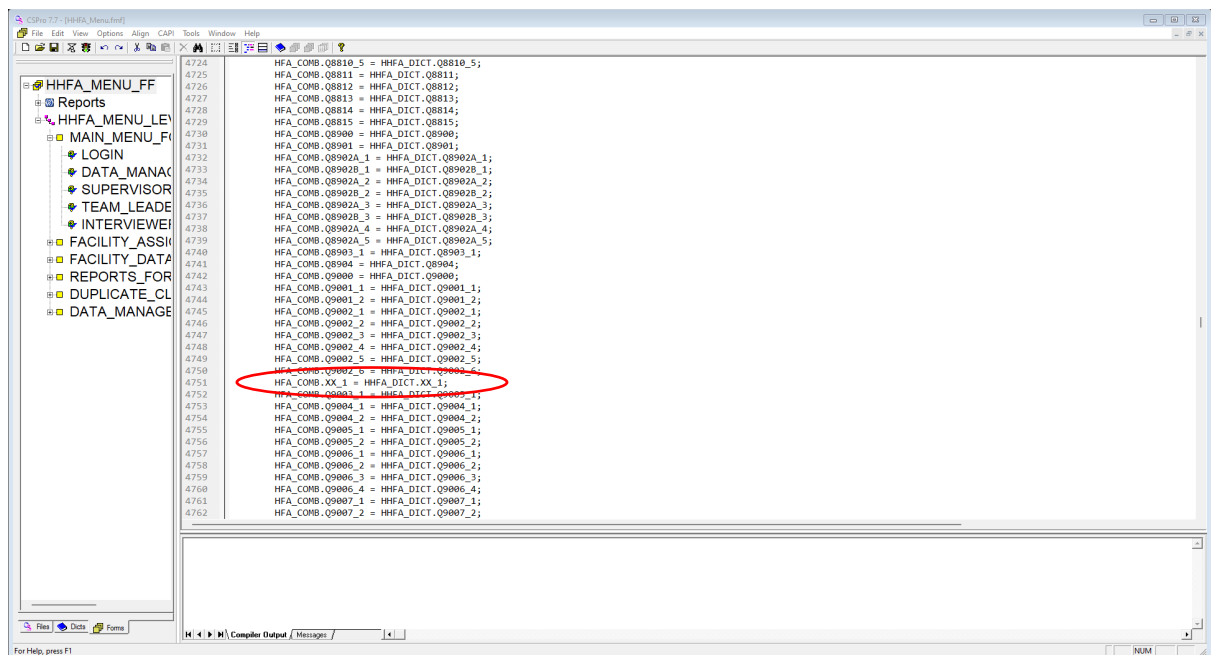
- Click on HHFA_MENU_FF at the very top in the Forms tree to show all the CSPro logic.
- Click in the logic window on the right, press 'Ctrl+F', and type in 'function CombinedDataMapping' to find the concatenation function. You should locate a section of logic that looks like the image below:




7. The concatenation function maps each item/question in the HFA_COMB.dcf to each item/question in the HFA_DICT.dcf. All items/questions are listed in sequential order based on the order in which they appear in the HFA_COMB.dcf dictionary. For each additional question added to the HHFA application, one line of code must be added to the concatenation function to map the corresponding HFA_DICT and HHFA_COMB dictionary items/questions. Each line of code should be inserted in the logic in the appropriate place based on the question number / the place in which the question has been inserted in the questionnaire. Remember to use the following syntax convention for adding logic to the concatenation function:

HFA_COMB.Q108 = HHFA_DICT.Q108;

8. For this example, we will add question XX_1 to the concatenation function immediately after Q9002_6. Your concatenation function should look like the following:



9. Compile the logic by clicking  on the toolbar, or select File → Compile from the main menu (or press Ctrl+K).

10.  The toolbar shows various icons for file operations, editing, and compilation. The 'Compile' icon, which looks like a small gear or compiler symbol, is circled in red.

11. If you typed the logic correctly, you will see Compile Successful in the Compiler Output under the logic.

12. Go to File → Save or Ctrl+S to save your work.

Edit an existing question

Recall that the HHFA resource package makes linkages between the HHFA paper questionnaire, indicators, CSPro electronic data collection application, and data analysis platform, including various automated tools to facilitate the data collection and analysis process. If these tools are to be utilized, some general parameters must be followed when editing existing questions:

- Do not change the existing question numbering: The original numbering structure of the questionnaire should be kept. Changes to the numbering will affect links to the existing tools for automated data processing and results production.
- Modification of response options is permitted: Modifications can be made to the question response options in order to adapt responses to align to the country context. This is particularly relevant for questions such as facility type and managing authority categories. The HHFA questionnaire has a number of questions that require questionnaire adaptation and these have been noted in the questionnaire.
- Minor modification of question text is permitted: Minor modifications can be made to question text for clarification. However, question text should not be replaced entirely by a different question. It is very important to keep each question with its original numbering, therefore it is not permitted to entirely change the content of existing questions. If the intent is to change the question completely, please use the instructions for adding a question (as opposed to modifying questions).


Modify response options

To modify the response options of a question, take the following steps:

1. Double click on the HFA.ent file in the HFA_WHO\entry folder.
2. Make sure the dictionary view is displayed. If not, click on the dictionary item on the toolbar of CSPro.
3. Expand the record that contains the item/question for which you want to change the response options. For this example, we will add the value “9 – do not know” to the value set we previously created for “Malnutrition service avail for children under 5: inpatient treatment of SAM: XX_1”.
4. Right click somewhere on the value set and choose “Add value”. This will add the value at the end of the value set. If you want to place it in somewhere in the middle, right click on the item under which you want it, and choose “Insert value”. Enter the text “Do not know” in the Value label field and “9” in the From field.

If you want to change either the label or the value of an existing value in the value set: right click on the value, and choose “Modify value”. Enter either the new label or the new value.

5. Go to File → Save or Ctrl+S to save your work.
6. Click on the question for which you have edited the value set in the right window to select it and right click to select Copy (or press Ctrl+C). In this example, select item XX_1.
7. Go to the HFA_WHO\dicts folder and open the HFA_COMB.dcf file.
8. In the tree on the left, click on the record for which you want to replace the question you have edited. In this example, click on record SECT18E/Section 18.5: Maternal, Newborn, and Child Health Services.
9. On the right side of the window, locate the question for which you have edited the value set, click on it to select it, and right click to select delete.

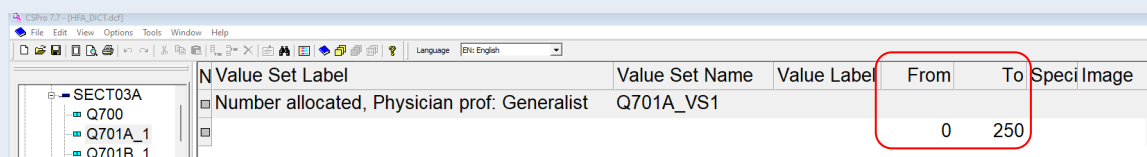
10. On the right side of the window, locate the question immediately below which you want to add the newly edited question, click on it to select it, and right click to select Paste (or press Ctrl+V). In this example, select item Q9003_1.
11. Go to File → Save or Ctrl+S to save your work.
12. Return to the HFA.ent file.
13. Look at the tree on the left side of the screen and make sure Forms is selected. If not, click on the Forms tab.
14. Look at the window on the right side of the screen and make sure a form is showing. If not, click on the Forms icon on the toolbar.
15. Click on the logic icon  on the toolbar or select View → View Logic from the main menu (or press Ctrl+L).
16. Click on the question for which you have edited the response options in the Forms tree. Review the logic for this item/question and make any adjustments required to account for the changes to the response options.
17. Search the logic to determine if the item/question for which you have edited the response options is referenced anywhere else. If found, review the logic and make any adjustments required to account for the changes to the response options.
18. Go to File → Save or Ctrl+S to save your work.

ADDITIONAL NOTES ON CHANGING VALUE SETS

Value sets can be copied and pasted if the same response options apply to multiple questions. To copy a value set, right click on the value set in the right side of the screen and select **Copy**. (Note: you can copy several value sets by highlighting them prior to copying them.) Then click on the item in the left side of the window where you would like to paste the value set. In the window on the right side, right click and select **Paste**.

For some value sets, the length of the response may change. If the number of digits in the response changes, the length field of that item must be adjusted in the dictionary.


For a question in which the response is numeric, such as "Number of allocated generalist physicians", the **Value label** can be left blank, and the **"From"** and **"To"** columns should contain the minimum and maximum response values, in this case 0-250.



Value Set Label	Value Set Name	Value Label	From	To	Spec	Image
Number allocated, Physician prof: Generalist	Q701A_VS1		0	250		

Modify question text

To modify question text, take the following steps:

1. Double click on the HFA.ent file in the HFA_WHO\entry folder (if it is not still open).
2. Click on the CAPI question icon  on the tool bar on top of the screen.
3. Make sure the item/question for which you want to edit the question text is highlighted in the tree view. Edit the question in the upper text box on the right window.
4. Go to File → Save or Ctrl+S to save your work.

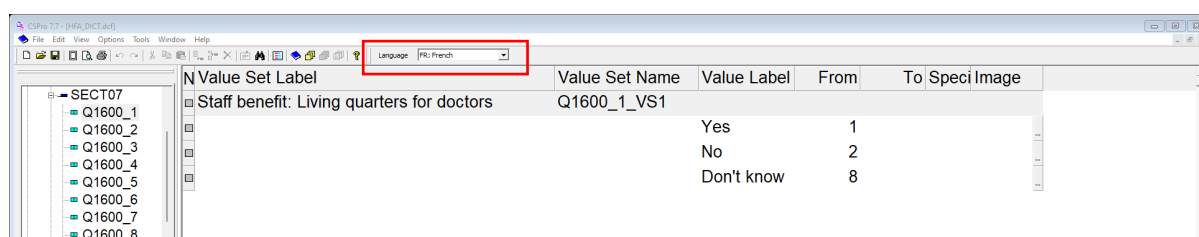
Add language and translations

CSPro supports the creation of applications that target multiple languages. The HHFA CSPro application is currently programmed in English. However, the official UN languages (Arabic, Chinese, French, Russian and Spanish) have been added to the language menu to facilitate the adding these language translations to the HHFA CSPro application. Other languages can be added as described below. Adding translations requires adding translated text for response options, question text, and error messages. To do this, take the following steps.

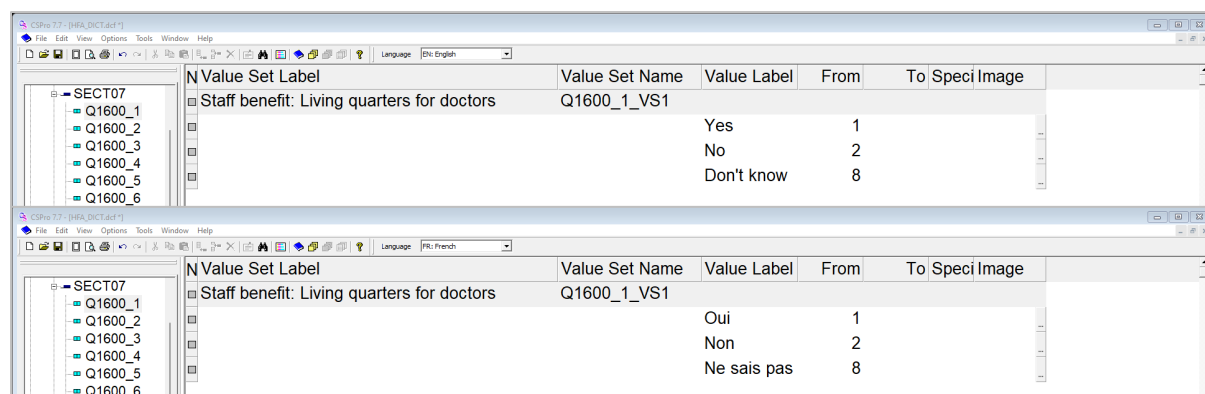
Response options

To add translations for response options:

1. Go to the HFA_WHO\entry folder and double click to open HFA.ent.
2. Make sure you are in dictionary view. Open the tree on the left and click on the question for which you want to add translated response options.
3. On the Menu bar, there is a dropdown box with a list of languages. Select the language you want to use for your translated text. For this example, we will select 'French'.




4. In the response options, write the translated text over the English text. If you toggle between languages in the menu, both languages should now appear for the response options.

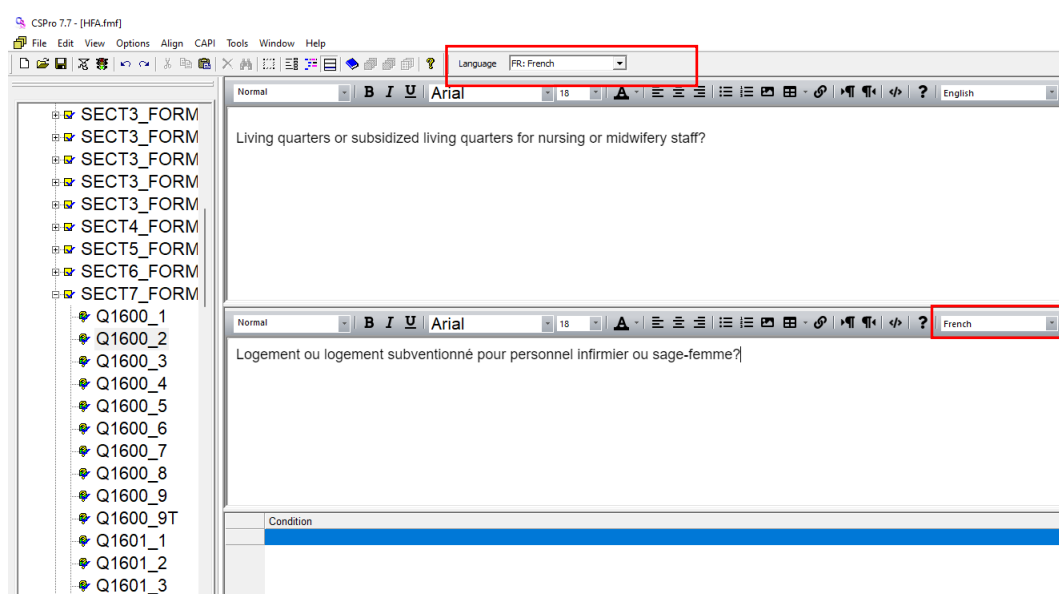


- If you want the translated response option value sets to export with the final dataset, the translated value labels must be copied into the combined dictionary. Refer to the above section on how to copy dictionary edits to the combined dictionary for instructions.

CAPI question text

To add translations for CAPI question text:

- Go to the HFA_WHO\entry folder and double click to open HFA.ent.
- Make sure you are in forms view. Click on the CAPI question icon  on the tool bar on top of the screen.
- On the Menu bar, there is a dropdown box with a list of languages. Select the language you want to use for your translated text. For this example, we will select 'French'.
- Using the tree on the left, navigate to the question for which you want to add translated question text. In the lower CAPI window, there is a dropdown box with a list of languages. Select the language you want to use for your translated text. For this example, we will select 'French'.
- Type the translated text in the lower CAPI window where the language you selected is displayed.



If you have translated text for many questions, there is an option to bulk copy the question text using the following steps:

6. Create an Excel sheet with three columns:

- a. Question number – Enter the question numbers of the questions for which you want to add translated text. You must use the CSPro question numbers (item names). To get a list of the CSPro question numbers, go to the dictionary view, right click on the highest level (HHFA_DICT), and select Dictionary Macros. Under Dictionary Names and Labels select Copy All. Open an Excel sheet and paste. Column O should be a complete list of all questions in the HHFA CSPro application.


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	HHFA_LL	WHO	HHF	WHO	HHF	WHO	HHF	WHO	HHF	WHO	HHF	WHO	HHF	WHO	HHF	WHO	HHF	WHO	HHF	WHO	HHF
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
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28																					

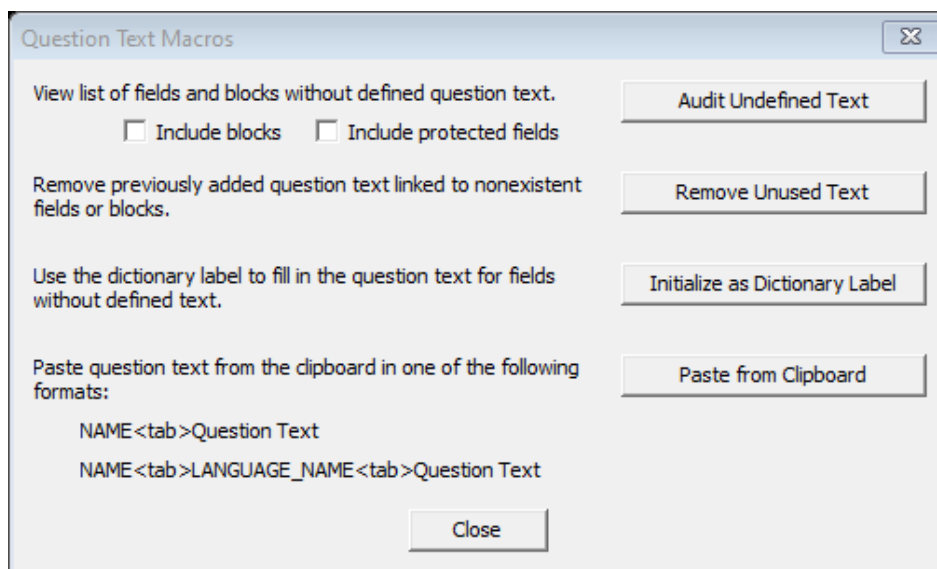
- b. Language – Enter the two-digit code that corresponds to the language of the translated text to be added. The two-digit codes for the pre-specified UN languages are:

- Arabic - AR
- Chinese - CH
- French - FR
- Russian - RS
- Spanish - SP

- c. Question text – Enter the translated text for each question.

	A	B	C
1	Question number	Language	Question text
2	Q200_1	FR	Exemple de texte traduit
3	Q200_2	FR	Exemple de texte traduit
4	Q200_3	FR	Exemple de texte traduit
5	Q200_4	FR	Exemple de texte traduit
6	Q200_5	FR	Exemple de texte traduit
7	Q200_6	FR	Exemple de texte traduit
8	Q200_7	FR	Exemple de texte traduit
9	Q200_8	FR	Exemple de texte traduit
10	Q200_9	FR	Exemple de texte traduit
11	Q200_10	FR	Exemple de texte traduit
12	Q200_11	FR	Exemple de texte traduit
13	Q200_12	FR	Exemple de texte traduit
14	Q200_13	FR	Exemple de texte traduit
15	Q200_14	FR	Exemple de texte traduit

- Highlight the three columns of your Excel sheet except for the header row and copy the text.
- Go to the HFA_WHO\entry folder and double click to open HFA.ent.
- Make sure you are in forms view. Click on the CAPI question icon  on the tool bar on top of the screen.
- Using the tree on the left, navigate to a question for which you want to add translated question text. Right click on a question and select question text macro. The following box will appear:



Question Text Macros

View list of fields and blocks without defined question text.

☐ Include blocks ☐ Include protected fields

Audit Undefined Text

Remove previously added question text linked to nonexistent fields or blocks.

Remove Unused Text

Use the dictionary label to fill in the question text for fields without defined text.

Initialize as Dictionary Label

Paste question text from the clipboard in one of the following formats:

NAME<tab>Question Text

NAME<tab>LANGUAGE_NAME<tab>Question Text


Paste from Clipboard

Close

- Click on Paste from Clipboard. All question text should now be in the CAPI lower window of the application.

Error messages

To add translations for an error message:

1. Go to the HFA_WHO\entry folder and double click to open HFA.ent.
2. Click on the logic icon  on the toolbar or select View → View Logic from the main menu (or press Ctrl+L).
3. Click on the Messages tab at the bottom of the right side of the Window. This will open the Messages window and display the error messages in the HHFA CPro application.
4. For each error message in the application, add a separate line for the translated message. The translated message should start with a prefix using the language followed by the message number in parenthesis and then the translation of the message. For example:

0001 If the result code is not 1, interview started, then the interview will terminate.
FR(0001) Si le code de résultat n'est pas 1, l'interview a commencé, alors l'interview se terminera.

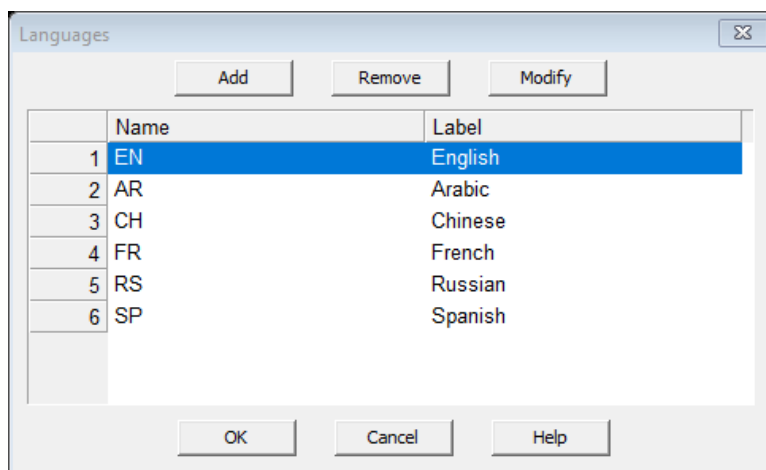
Note: The error messages can be edited within the HFA.ent application or you can open the file HFA.ent.mgf with a text editor of your choice (e.g. Notepad ++) to edit the messages file.

5. In addition to numbered error messages, there are also unnumbered error messages that correspond to options given to users after an error message appears. The English for these error messages is built into the logic. To add a translation, add a separate line for each translated message. The translated message should start with a prefix using the language followed by the English message text in parenthesis and quotations and then the translation of the message. For example:
- FR ("Yes") Oui
FR ("No") Non
6. Repeat this process for the error message text located in the menu application located at HFA_WHO\HHFA_Menu.ent.mgf.

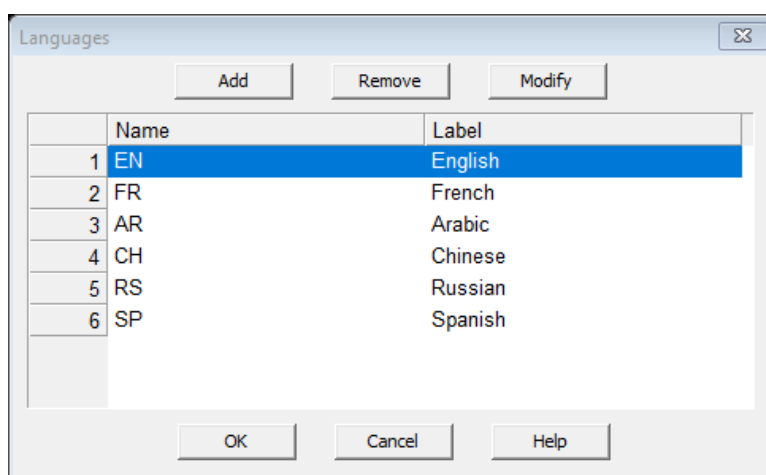
Add a non-UN language

To add a non-UN language to the HHFA CPro application, take the following steps:

1. Go to the HFA_WHO\entry folder and double click to open HFA.ent.
2. Make sure you are in dictionary view. From the menu bar select Edit -> Languages. The following set of options will appear:



- Click on Add. Give your language a two-letter name and then a full label. Then click on OK.
- Go to Forms view. From the menu bar select CAPI, then CAPI languages. The following set of options will appear:



- Click on Add. Give your language the same two-letter name and full label as in the dictionary. Then click on OK.
- You can now use the steps above to add translations in your user specified language to the HHFA CSPro application.
- Now you need to add the language to the setup menu. Browse to the \HFA_WHO\dicts folder and open the CHFA_setup.dcf file. Navigate to the dictionary view. Open the CHFA_CC_REC record in the tree on the left. Click on the Survey language (SURVEY_LANG) item in the tree on the left.
- Right click on the value label on the right window and add the name of your language. Add the two letter language code in the From column.

Delete a question

It is **NOT recommended** to delete any items/questions from the HHFA application. Deleting a question can cause code blocks or failure of the program, as this also requires removing all references to that question in the logic throughout the HHFA logic.

As an alternative approach to deleting questions from the HHFA CPro application, use the configuration menu to activate/deactivate questions. Activating/deactivating is used to help minimize the amount of effort required when you want to delete questions from the data entry forms, as the process of permanently deleting a question from the form requires adjusting/removing the associated syntax logic. However, with the activate/deactivate concept, you do not need to worry about the logic behind the questions. The program will check the status of each question and automatically readjust the skips.

Note: If you have deactivated all core and additional questions in a HHFA section, but then added county specific country questions, those country specific questions will not be included in the survey as the entire section will not show up in the assignments list. There must be at least one core or additional HHFA question activated for a section to appear in the assignments list.

Please think carefully about deactivating individual questions after module selection. Each question corresponds to a particular indicator and deactivating a question will affect the measurement of a given indicator and the analysis of results from the survey. Please be aware of this when deciding to deactivate a question.

Note: If you turn off all questions for a section, the section will be removed from the assignments list automatically.

Reorder questions

It is **NOT recommended** to reorder the existing HHFA questions in the HHFA CPro application. Reordering questions will require extensive work to check that all skip patterns have been adjusted to conform to the new question sequence. This may prove difficult and is prone to error given the scope and complexity of the HHFA questionnaire.

Add a new record

It is **NOT recommended** to add new records to the HHFA CPro dictionary as the number of records is directly linked to the flow control of the application when deployed to tablets. If you are an advanced CPro programmer and feel comfortable editing the flow control syntax to allow for additional records/sections, you may do so, but specific instructions for how to do that are not provided in this guide.

9. Preparing and deploying the HHFA application

Prepare to deploy the HHFA application

When preparing to deploy the HHFA application, three main checks are needed: 1) checking the settings, 2) compiling the logic, and 3) setting the data folder directory.

Check the settings:

1. Open the HHFA_Menu.ent file.
2. Make sure the Forms tab is active. On the Menu toolbar, select Options → Data entry.
3. Ensure the options below are selected:

Data Entry Options

Path Type

☐ Operator controlled ☒ System controlled

Mobile Options

☒ Automatically advance on selection

☐ Show field labels above question text

☐ Display error message numbers

☐ Display value set codes alongside labels

☒ Show only discrete values in combo boxes

Verify Every Nth Case

Frequency: Start: ☐ Random Start

Application Options

☐ Ask for operator ID ☒ Use question text

☐ Confirm end-of-case ☐ Always show refusals

☐ Allow partial save ☐ Center forms on screen

Show case tree:

☐ Decimal mark is a comma


☐ Right-to-left roster entry

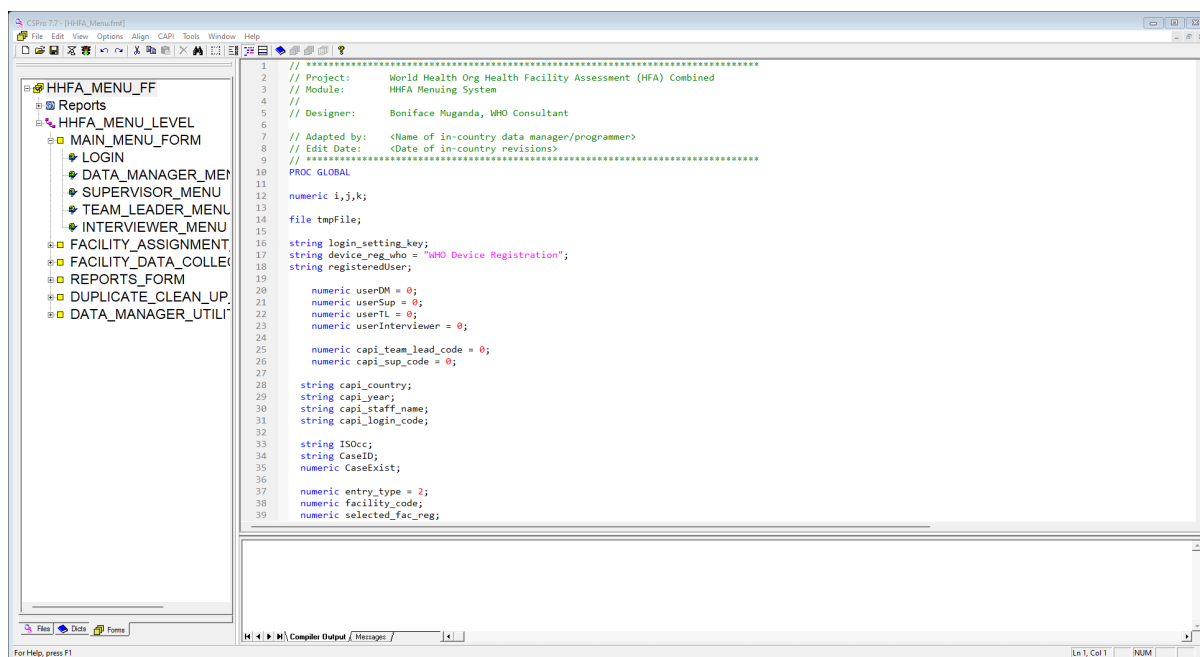
OK Cancel Help


4. Save your application if any changes are made.

Compile the logic:

When CSPro compiles your logic, it checks the logic you have written to see if there are any errors or warnings.

1. Open the HHFA_Menu.ent file.
2. Click on the logic icon  on the toolbar, or select View → View Logic from the main menu (or press Ctrl+L).
3. To compile the entire application, select the topmost entry of the data entry tree on the left side of the screen. The window should now look like this:



4. Compile the logic by clicking  on the toolbar, or select File → Compile from the main menu (or press Ctrl+K).

Note: Compiling the logic may take a long time (e.g. 10 to 30 minutes, depending on your computer). Please give the application time to do this compilation as there is a lot of complex logic within the application that needs to be checked during the compile.

5. The Compiler Output window under the logic will provide a message with the results: either 'Compile Successful' or 'Compile Failed'. If the compile is successful, you are now ready to deploy the HHFA application. If the compile fails, review the error messages to find the error, correct the error messages and repeat the logic compilation process until you get a 'Compile Successful' message.

Set the data folder directory:

When deploying during training, it is important that the data collected be saved in the training data folder located at HFA_WHO\data\training_data. When deploying for official data collection in the field, it is important that the data collected be saved in the main data folder located at HFA_WHO\data. Changing the data folder directory ensures that data collected during training will not be mixed on the tablets with data collected during the official data collection.

1. Open the HHFA_Menu.ent file.
2. Click the traffic icon to run the application.
3. When the next window pops up you will see several fields where the location of data files are specified.
 - a. If deploying the application for training, ensure the location is specified as: data\training_data\[file name].

	Data File Name	Source Type
Input Data		
External Data (FACILITIES_DICT)		None
External Data (STAFF_DICT)		None
External Data (HHFA_DICT)	data\training_data\HHFA_Data.csb	CSPro DB
External Data (OPFA_DICT)		None
External Data (BECODES_DICT)		None
External Data (HFA_COMB)	data\training_data\HHFA_COMB.csb	CSPro DB
External Data (HFA_ASSIGNMENTS)	data\training_data\HHFA_Assignments.csb	CSPro DB
HFA_Log		

- b. If deploying the application for official data collection, ensure the location is specified as: data\[file name].

	Data File Name	Source Type
Input Data		
External Data (FACILITIES_DICT)		None
External Data (STAFF_DICT)		None
External Data (HHFA_DICT)	data\HHFA_Data.csb	CSPro DB
External Data (OPFA_DICT)		None
External Data (BECODES_DICT)		None
External Data (HFA_COMB)	data\HHFA_COMB.csb	CSPro DB
External Data (HFA_ASSIGNMENTS)	data\HHFA_Assignments.csb	CSPro DB
HFA_Log		

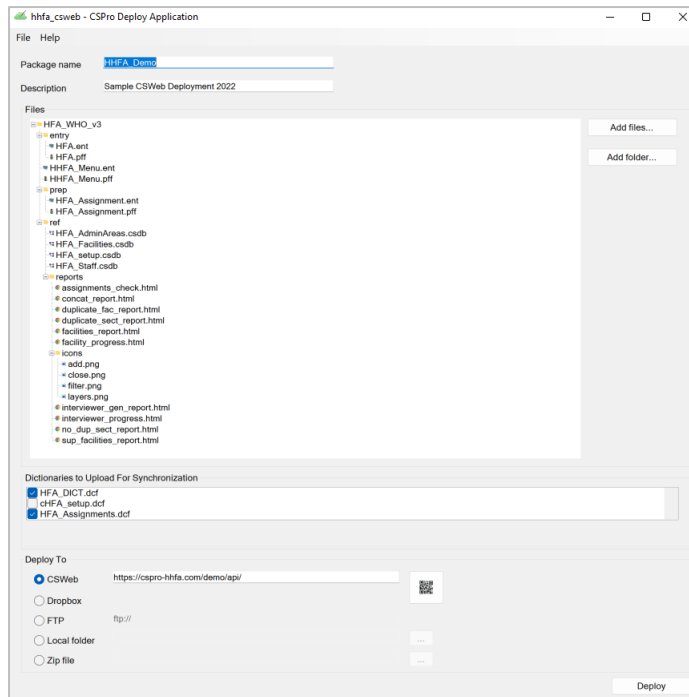
- Click OK to proceed.
- You can now exit the menu set-up by clicking ESC or by logging in and then selecting option X, Logout/Exit. The data file directory location will now be saved for your deployment.

Note: Setting the data folder directory will ensure that data collected on the tablets is not mixed between training and official data collection. This is an additional protective feature if in fact not all tablets were cleared of test data before official data collection begins. However, all data must still be cleared from the server before official data collection begins. Otherwise, there will continue to be a mix of training data and official data in the server.

Deploy the HHFA application

The HHFA application can be deployed on Dropbox or CSWeb using the CSPro Deploy Application. An example deployment script has been prepared for the HHFA application. This script contains all the file configurations required to deploy the HHFA CSPro application. Separate scripts have been prepared for both Dropbox and CSWeb configurations. Take the following steps to deploy the HHFA application using the prepared script:

- In the HFA_WHO\deploy folder, open the deploy script. Select either hhfa_csweb.csd if you are using CSWeb or hhfa_dropbox.csd if you are using Dropbox.



2. Edit the following parameters in the deploy script:

- Package name: recommend country ISO code_ HHFA (e.g. BFA_HHFA)
- Description: This is what data collectors will see on the tablet as the application name (e.g. Burkina Faso HHFA 2020).
- Files: The default structure of the files is what is required to generate a .pen file which is the mobile version of the application. There is no need to edit the file structure (even if you have made edits to these files within your application). The required files include:
 - Entry
 - HFA.ent
 - HFA.pff
 - HHFA_Menu.ent
 - HHFA_Menu.pff
 - Prep
 - Mod_assignment.ent
 - Mod_assignment.pff
 - Ref
 - HFA_AdminAreas.csdb
 - HFA_Facilities.csdb
 - HFA_setup.csdb
 - HFA_Staff.csdb
 - Reports (folder and all files)

- d. **Dictionaries to Upload for Synchronization:** The selected dictionaries are those that correspond to data that is being collected. There is no need to edit the selection of dictionaries as the default is to select the three required dictionaries which includes:

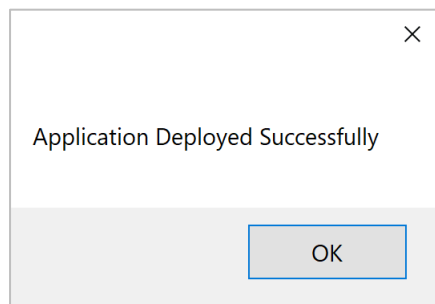
- HFA_DICT
- HFA_COMB
- Mod_Assignment

- e. **Deploy to:**

- CSWeb – indicate the specific URL for your server that you previously configured
- Dropbox – you will be prompted to enter the user name and password when you deploy

3. **Click Deploy:**

- a. For both CSWeb and Dropbox, you will be prompted for your user name and password.
- b. When you click deploy, if the program compiles correctly, it will be deployed and you will get a message that the program has been successfully deployed. If there is an error compiling the program, it will inform you of the error and the program will not be deployed.

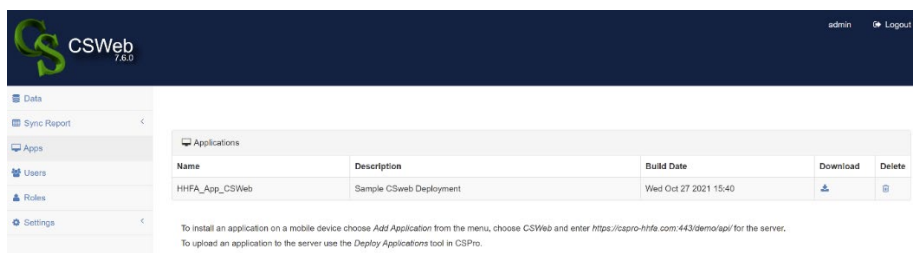


4. **Save Deployment script so that configurations are saved for future deployments:**

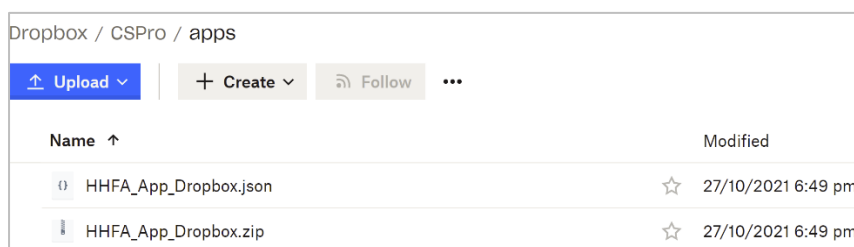
- a. File → Save

5. **To check that your application has deployed:**

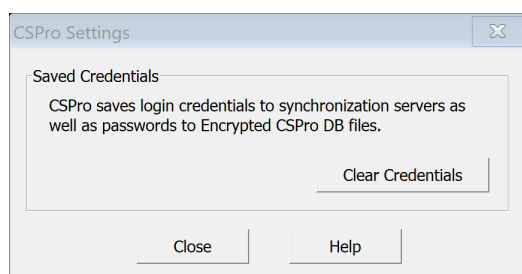
- a. **CSWeb:** login to CSWeb and see latest deployment time.



- b. Dropbox: check the CPro/apps folder to see the date/time of the application upload.



- c. Tablet interface: the update feature will say if there is an update available.
6. Note on Dropbox credentials: You may want to change the Dropbox account to which you are deploying. To do this, you need to clear the Dropbox credentials associated with CPro: open CPro 7.7. Go to File → CPro settings. Click “Clear Credentials” to remove the saved Dropbox passwords.



7. Create QR code:
 - a. Click on the QR code icon in the Deploy Application.
 - b. For CSWeb, click on the box to include the username and password and complete the fields. If you include the username and password, when the QR code is scanned, the application will immediately be installed and there will not be a requirement to type in the username and password for each installation.

Note, this feature of embedding the user name and password is not available if using the Dropbox sync functionality.

 - c. Click Save, give the QR code a name (e.g. ISO_HHFA_QRcode.bmp) and save to a location of your choice that will be easily accessible for tablet installation. (e.g. you can save this to the HFA_WHO\deploy folder.) You should now have created an image file that looks like the following:



10. Configure tablets and GPS devices

Configure tablets

Basic configurations

All tablets need to be configured before they can be used for data collection in the field. The following are the recommended tablet configuration steps:



1. From the Google Play store, download CSEntry and Android Device ID and install on each tablet.
2. Hide all apps except:
 - GPS
 - CSEntry
 - Device ID
 - Settings
3. Use App Lock to lock all other apps. (Make sure the four apps we will be using are NOT locked.)
4. Check that the date and time are set correctly; reset if incorrect.
5. Check the icons in the top ribbon:
 - GPS - ON
 - WiFi - ON
 - Screen rotate - ON
 - Power save - ON
 - Sound - OFF/MUTE

Disable automatic updates from CSPro



Before sending data collectors into the field, consider what would happen if CSEntry automatically updated during the survey. If you developed a CSPro application for a previous version or the current version of CSEntry, you may not want the next update. Fortunately, it is simple to disable automatic updates for CSEntry or all apps on Android. Before data collectors are sent into the field to begin the survey, it is recommended that automatic updates are disabled for CSEntry on their Android devices, to avoid potential software problems.

To disable automatic updates for CSEntry, take the following steps:



1. Open the Google Play Store .

2. Tap Menu  then My apps & games.
3. Select CSEntry.
4. Tap More .
5. Uncheck the box next to Auto-update.

To disable automatic updates for all apps, take the following steps:

1. Open the Google Play Store .
2. Tap Menu  then Settings.
3. Tap Auto-update apps.
4. Select Do not auto-update apps.

To update apps manually, take the following steps:

1. Open the Google Play Store .
 2. Tap Menu  then **My apps & games**.
 3. Apps with an update available are labeled Update.
 4. Tap **Update All** to update all apps. For individual apps, find the specific app you want to update and tap **Update**.
- Tip:** In some cases, you may need to restart your device to update an app.

Install the HHFA CPro application

Installation of the HHFA CPro application on a tablet requires:

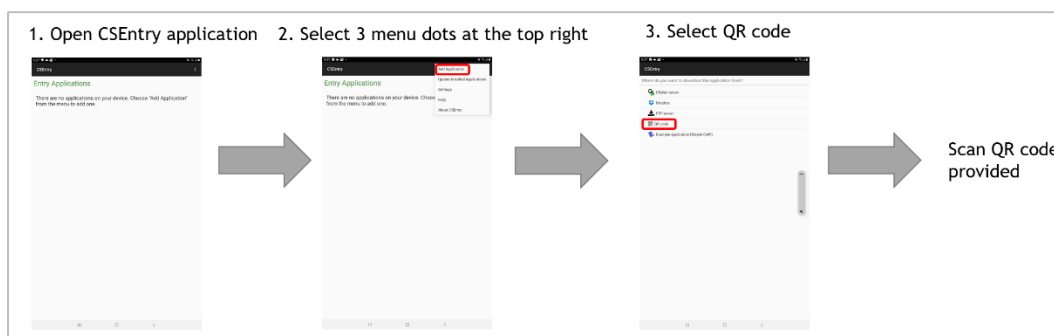
- Android-enabled device with Android OS 4.0 and above
- Active internet connection
- CSEntry application installed from Google Play Store.

To install the HHFA CPro application, take the following steps:

1. Open the CSEntry app on the tablet.
2. Select the three menu dots at the top right and then select Add application.
3. Select QR code as the location from which to download the application.
4. Scan the QR code previously generated in the deploy step.

Once you have scanned the QR code you may be prompted for a user name and password if using the Dropbox sync option – please enter this information. For CSWeb, the username and password are generally integrated into the QR code so it can automatically load the questionnaire.

Upon installation, the HHFA application will be listed in the Entry Application screen.



If you need to change the Dropbox account associated with a tablet, take the following steps:

1. Press the Menu icon (vertical ellipses) on the Entry Applications screen of CSEntry.
2. Press Settings.
3. Press Clear Credentials.

Configure handheld GPS devices (if in use)

If handheld GPS devices will be used, each device must be configured to ensure a standard approach to measuring GPS coordinates. This includes the following parameters:

Both coordinate system (latitude-longitude) and the data must be set for all devices. WGS84 should be the default datum.

These are the settings for the GPS tool within the CSPro application and so they will be comparable between handheld devices and tablets.

- POSITION FRMT: hddd.ddddd
- MAP DATUM: wgs 84
- UNITS: metric
- NORTH REF: magnetic
- VARIANCE: 004.E
- ANGLE: degree

PART 2: TRAINING

Data managers are responsible for several tasks related to preparing for training of survey staff, training of survey staff, distribution of tablets, the data collection pilot exercise, and making final updates to the CSPro application after the pilot, if necessary.

11. Prepare for training

Review and adapt training materials

Data managers are responsible for facilitating the CSPro-related sections of the data collection training workshop for data collection teams. Presentations have been developed to support these trainings, but it is the responsibility of the data manager to:

- become very familiar with the HHFA CSPro data collection system so that they feel confident to train others in the use of the system on tablets for data collection; and
- review the presentations and exercises, make necessary country-specific adaptations, and be prepared to facilitate the CSPro training sessions.

The CSPro-related presentations include the following content:

- GPS
- Tablet basics
- CSEntry basics
- HHFA CSPro application user roles
- HHFA CSPro data collection process
- HHFA CSPro for area supervisors

Required country-specific adaptations include at least the following:

- **How does GPS work:** Choose between the video on slide 5 and slides 6 and 7; the default is for the video to show and slides 6 and 7 to be hidden.
- **Appropriate range for GPS coordinates:** Slide 14 must be updated with relevant ranges and an image for the country where data collection will take place.
- **How to use a GPS device** (slides 18 to 25): These slides should only be presented if the survey will make use of handheld GPS devices and will specifically use the device presented in the slides as an example. If a different make/model of hand-held device will be used, the slides should be modified accordingly. (The default is to skip these slides as many countries will use

tablets with built-in GPS functionality for electronic data collection and therefore will not need a separate handheld GPS device.)

- **Large group practice exercise:** A country-specific set of staff login codes for the HHFA application must be provided.

Manage distribution of tablets

The data manager is responsible for managing the distribution of all tablets and maintaining a record of the individuals that received tablets, the number of tablets in each administrative area, and any notes reported on the status of the data collection. This is important for ensuring that all devices are returned and also for troubleshooting potential data management issues later in the data processing phase. If any data are missing, it will be critical to know if all tablets were returned and all data synced.

Tablets are distributed to data collectors during the data collector training workshop for practice in the classroom setting and for use in the pilot exercise in local health facilities.

After the pilot, the tablets must all be returned to the data manager for clearing of the pilot data. Also, if based on the pilot experience, further modifications are needed to the HHFA CPro application, the data manager must make the changes and ensure that the updated version of the application is loaded onto all the tablets before they are distributed to the data collectors for official data collection in the field.

Deploy HHFA application for training and pilot test

The data manager is responsible for ensuring the HHFA CPro application has been fully configured and deployed and can be used for both training and the pilot test at selected health facilities. This includes uploading a staff listing file which includes all training participants appropriately grouped into teams and uploading a facility file which includes the facilities to be visited for the pilot test. It is strongly recommended that efforts are made to assign participants staff roles that they will have during data collection (i.e. team leader vs. data collector) so that they get appropriate practice executing the functions they are expected to complete in the field. In addition, don't forget to deploy the application with data saved in the training data folder located at HFA_WHO\data\training_data for the training and pilot test.

Do not underestimate the amount of time and advance preparation it takes to coordinate with the survey manager to ensure this level of logistics planning has been completed in advance of the training. It is important to allow sufficient time for this step in the HHFA process.

12. Facilitate training of data collectors, team leaders, and supervisors

During the training of data collection teams, the data manager is responsible for facilitating the training of data collectors and team leaders on the use of GPS, tablets, and CPro. In addition, the data manager is responsible for facilitating the training of supervisors in the use of CPro for conducting data validation visits. Standard HHFA training materials are available, including a training agenda, facilitator guide, training slides and exercises.

As the data manager is responsible for being the on-site expert for the HHFA CPro data collection system, this chapter will review the content that the data manager is responsible for mastering and for providing training on during the training of data collectors, team leaders, and supervisors. The key topics covered include:

- GPS
- Tablet basics
- CEntry basics
- HHFA CPro application user roles
- HHFA CPro data collection process
- HHFA CPro for area supervisors

There are two presentations that accompany the content described in this chapter:

- HHFA_GPS_tablets_CPro for data collection teams.ppt
- HHFA_tablets_CPro for supervisors.ppt

GPS

The Global Positioning System (GPS) is a satellite-based navigation system that consists of at least 24 satellites. The United States Department of Defense (USDOD) originally sent the satellites into orbit for military use, but they were made available for civilian use in the 1980s. GPS works in any weather conditions, anywhere in the world, 24 hours a day, with no subscription fees or setup charges. GPS provides a geographic position in the form of a coordinate. It is a tool that makes information 'mappable' and is therefore part of the process of information flow. GPS has two main uses:

- Information collection (This is the main purpose of GPS for the HHFA.)
- Navigation (Where am I? How do I get to...?)

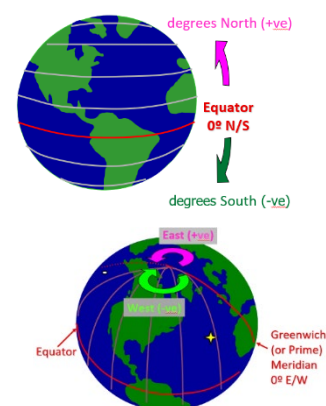
How GPS works

Each satellite transmits an exact time signal by radio. These signals travel at a known speed (the speed of light). The GPS unit compares the time of transmission with the time of reception, and calculates its distance to each satellite. The GPS also knows the exact position of each satellite. When it knows the distance to at least three satellites, the GPS uses trilateration to calculate its own position.

Coordinate systems

A coordinate system provides a means of defining a location by measuring horizontal and vertical distance and direction on a map. Two common coordinate systems are Latitude-Longitude and Universal Transverse Mercator (UTM). Latitude-Longitude is designed for a three-dimensional object such as a globe. UTM is designed for a two-dimensional object such as a map. Neither of these coordinate systems is more or less accurate than another but are simply different methods of positioning a point. The Latitude-Longitude system is used for collecting GPS coordinates during the HHFA.

- **Latitude:** Lines of latitude are imaginary horizontal lines shown running east to west. They express a position in terms of the number of degrees north or south of the equator (between -90 and +90 degrees). Positive values represent positions north of the equator, while negative values are south of the equator.
- **Longitude:** Lines of longitude are imaginary vertical lines shown running north to south. They express a position in terms of the number of east or west of the Prime (Greenwich) meridian (between -180 and +180 degrees). Positive values represent positions east of the Prime Meridian, while negative values are west of the Prime Meridian.



Latitude-longitude is expressed in three basic formats:

- degrees/minutes/seconds (DD MM SS), e.g. 15° 25'20"N, 20°15'4" E
- degrees/minutes/decimal minutes (DD MM.MMM), e.g. 25 10.325, 30 – 25.0534
- degrees/decimal degrees (DD.DDD), e.g. 25.326, -31.265

For the HHFA, degrees/decimal degrees are used.

Where to collect GPS coordinates

GPS coordinates must be determined outdoors with a clear view of the sky to enable the device to receive the satellite signals. Obstructions such as buildings, thick foliage or narrow valleys must be avoided. To collect the coordinates, move to the main entrance of the building for which the coordinates will be taken and stand within 30 meters of the door in a place where it is possible to have a clear view of the sky.

How to collect GPS coordinates

There are two options for collecting coordinates for the HHFA survey:

- **Built-in GPS functionality in the tablets used for data collection:** This is the preferred option if the survey is implementing electronic data collection. Tablets enable automated capture of GPS coordinates.

- Using a hand-held GPS device: Various devices are available.

What information is collected?

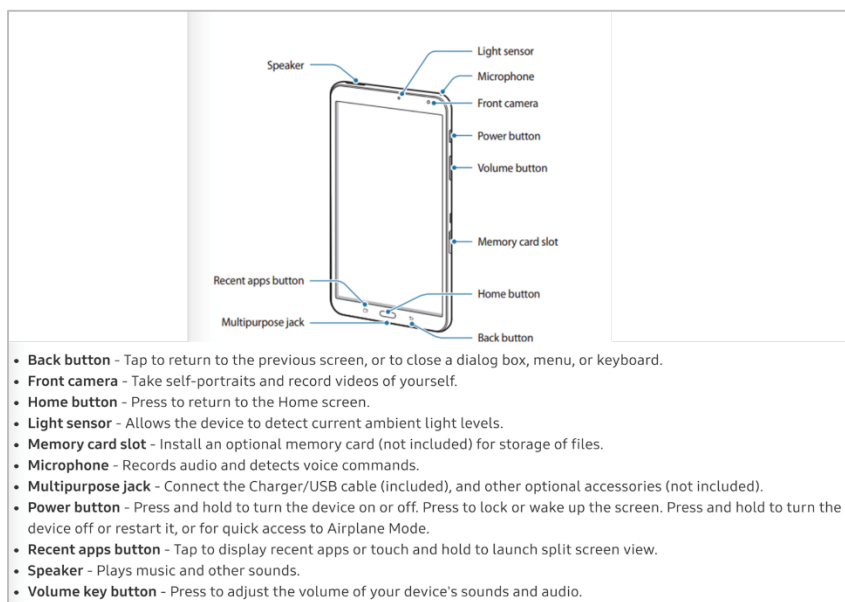
GPS saves the current position (Latitude-Longitude) at the press of a button. Usually it also saves:

- Altitude/height
- Date and time (optional)
- Waypoint number (handheld device only)

Tablet basics

During the training, you will be responsible for training participants on the basic functions of the tablets that will be used for data collection. Be sure to familiarize yourself with the following basic functions on the tablets that will be used for data collection.

- Power on and off
- Main buttons on the tablet - Review the key buttons of the tablets that will be used for data collection. Be sure to familiarize yourself with all of the main buttons such as in the image below. You will need to train data collectors on where to locate the main buttons on the tablet and how to use each of these main buttons.



- Check that GPS, WiFi, and screen rotate, are ON and that volume is OFF
- Check that date and time is accurate; reset if incorrect
- Connect to WiFi
- Access CSEntry app
- Quit app that is not responding

- Hard reset to reboot system
 - holding down the Power button and the Volume-down button at the same time for more than 7 seconds will force a restart

CSEntry basics

Starting CSEntry

To start CSEntry, click on the CSEntry icon on your tablet. This will take you to the Entry applications screen.

Entry applications screen

Upon opening CSEntry, all data entry applications on the device are displayed. Click on an application to open it. If only one application is on the device, it will open automatically.

Login screen

When you open the HHFA application from the Entry Applications List, you arrive at the Login screen which contains the following information:

1. Survey country name and year of survey
2. Application publish date and time; this is used to ensure the user is running the most recent version of the application.
3. Each user should be provided with a login code that enables them to access the application and perform different functions. Enter your login code to access the main menu.

Screen elements

The screen elements in CSEntry are the following:

1. Name of the survey
2. Clicking on the pencil and paper icon displays a screen to type a field-specific note.
3. Clicking on the search icon and typing in a query allows you to filter the response listing.
4. The field label is a short description of the field that you are currently entering; for the HHFA it is the question number.

5. This is the question text for the field that you are currently entering.

6. These are the response labels.
7. These are the left- and right-hand navigation buttons, which correspond to moving forwards or backwards in the data entry application
8. Menu button: clicking on the menu button brings up options including Show case tree.

User input types

There are several user input types that are utilized by the HHFA CPro application:

- **Radio button:** When presented with a list of radio buttons, you must select **only one** response. Click on the response label or the corresponding radio button to enter your selection.
- **Check box:** When shown checkboxes, you can select none, one, or multiple responses. Click on the response label, or the corresponding checkbox, to make a selection. Once you are finished making all selections, you can proceed to the next field.
- **Combo box:** A combo box is used when a question requires a numeric response, but pre-coded responses have been provided for options such as “None” or “Don’t know”. Click on the filter to the right of the numeric response box to see the radio button type responses and select one. A numeric response will be populated in the field based on your selection (e.g. Don’t know = 98)
- **Numeric:** A numeric field allows for a response that is a number only. Often a range will be set so that only valid numeric responses can be submitted (e.g. the number of days per week must be a number between 0 and 7).
- **Text box:** To enter data in a text box field, simply type the response using the keyboard. If a keyboard does not automatically appear, click on the field and a keyboard will appear.

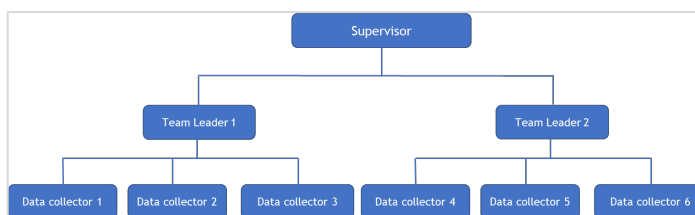
Additional features

- **Search box:** After clicking on the search icon, a space will appear where you can type a search query. The list of responses will automatically filter based on your search query. The full text of each response is searched, but not necessarily starting from the first letter of the response.
- **Case tree:** Clicking on the Menu icon (vertical ellipses) and selecting Show/Hide case tree, controls the case tree. The case tree displays all fields that have been entered in the data entry application, showing the field label and the response. If you click on a field, you will be taken to that field. For the HHFA application, this allows you to move around easily WITHIN a section of the questionnaire. If you want to move between sections, you must exit the current section and use the flow control form to enter the next section.

HHFA CPro application user roles

There are three main user roles within the HHFA CPro system related to data collection:

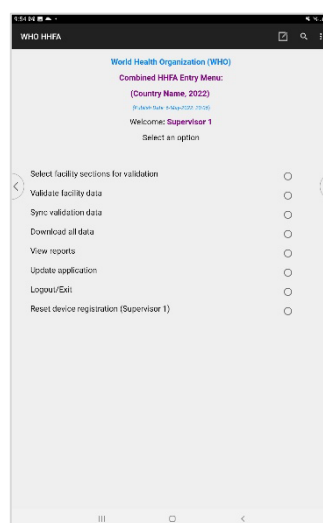
- Area supervisor
- Team leader
- Data collector



A fourth user role, data manger, exists within the HHFA CPro system. Data managers are responsible for configuring the HHFA CPro application for country implementation, deploying the application, and data management during data collection. These functions are covered throughout this guide. The next section will review the main functionalities for each user role with respect to data collection.

Area supervisors – what can they do?

- Select sections for validation
- Collect validation data
- Sync validation data
- Download all data
- View reports
- Update application
- Reset device registration



Area supervisors have two main tasks to complete using tablets:

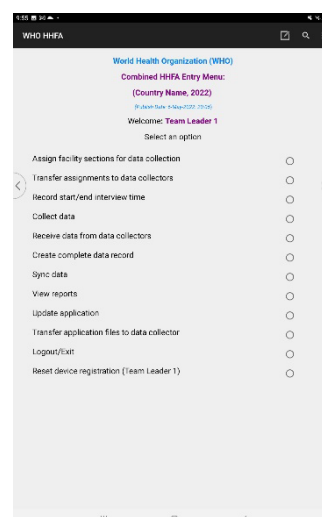
- Collect data for supervisor validations
- Generate facility reports to assess survey completeness for ALL data.

To complete these two tasks, area supervisors have been given functionality to assign themselves questionnaire sections for the facilities they will visit for the 10% validation revisits, collect data at those visits, and sync data to the central database (either Dropbox or CSWeb).

They also have the ability to download all the data collected thus far from the central database to generate reports which provide information on progress towards completion of the survey. This does not let them view individual facility responses and they cannot edit the data and send it back, but they can review the reports and see the progress of the data collection teams.

Team leaders – what can they do?

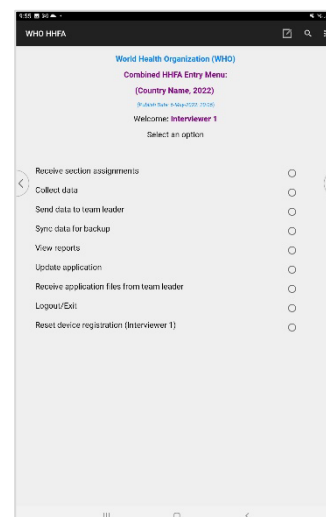
- Assign sections for data collection
- Transfer assignments to data collectors
- Record start/end interview time
- Collect data
- Receive data from data collectors
- Create complete data record
- Sync data
- View reports
- Update application
- Transfer application files to data collector
- Reset device registration



Team leaders play a central role in managing data collection in the field. They are responsible for assigning sections of the HHFA questionnaire to data collectors for each facility visited and have a responsibility to ensure data has been collected for all sections of the HHFA questionnaire. The reporting functionality assists team leaders in tracking progress towards completion for individual facilities as well as across the facilities assigned to them.

Data collectors – what can they do?

- Receive section assignments
- Collect data
- Send data to team leader
- Sync data for backup
- View reports
- Update application
- Receive application files from team leader
- Reset device registration



Data collectors are responsible for collecting data for the sections of the questionnaire assigned to them at each facility they visit. The reporting functionality assists data collectors in tracking progress

towards completion of assigned sections. In addition, data collectors are responsible for sending their data to the team leader as well and syncing data for backup.

When logging into the HHFA CSPro application, the staff code used (as specified in the staff lookup file) will determine the set of functionalities available to the user.

HHFA CSPro data collection process

The table below outlines the steps in the data collection process, the staff responsible for each step, and when each step should take place. The following sections discuss how each of these steps is accomplished with the HHFA CSPro application using tablets.

No.	Who?	What?	When?
1	Team leader	Assign sections for data collection	Before arrival at facility
2	Team leader	Transfer assignments to data collectors	Before arrival at facility
3	Data collector	Receive assignments	Before arrival at facility
4	Team leader	Record interview start time	Upon arrival at facility
5	Data collector	Collect data	At facility
6	Data collector	View reports	At facility
7	Data collector	Update application and/or receive application updates from team leader	As needed
8	Team leader	Record interview end time	Upon departure at facility
9	Data collector	Sync data for backup	End of the day
10	Data collector	Send data to team leader	End of the day
11	Team leader	Receive data from data collectors	End of the day
12	Team leader	Create complete record	End of the day
13	Team leader	View reports	End of the day
14	Team leader	Sync data	End of the day
15	Team leader	Update application and/or send application updates to data collector	As needed
16	Team leader	Reset device registration for data collectors on his/her team	As needed
17	Supervisor	Reset device registration for team leaders or data collectors on his/her team	As needed
18	Data manager	Reset device registration for supervisors, team leaders, or data collectors	As needed

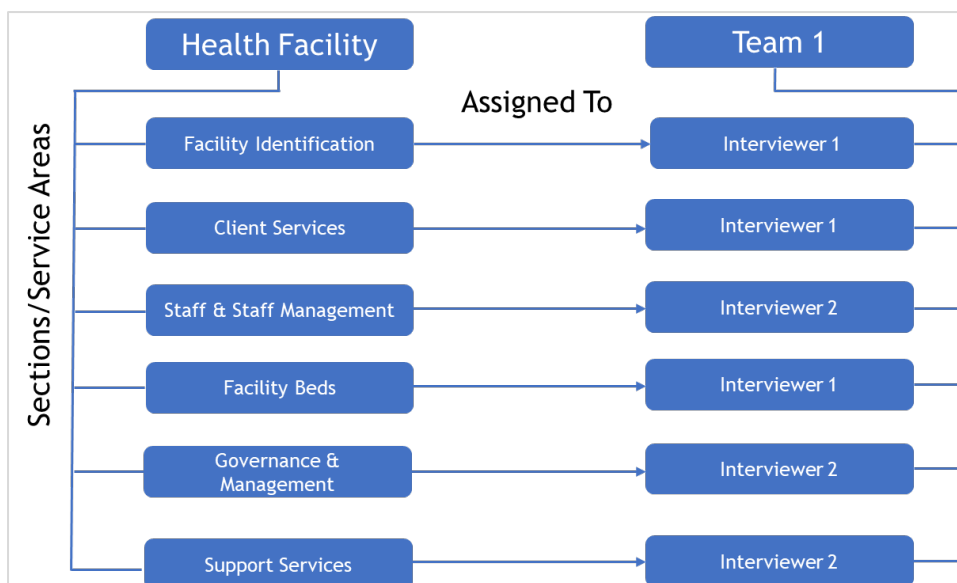
Assign sections for data collection

Depending on the modules selected and the level of the health facility visited, completion of the HHFA survey tool can be very long and time consuming. To improve the efficiency of data collection, the different sections of the questionnaire can be distributed among multiple data collectors and data collection can occur simultaneously. In addition, data collectors have flexibility in the order in which sections of the questionnaire are completed. However, some parameters must be respected for smooth implementation of this process:

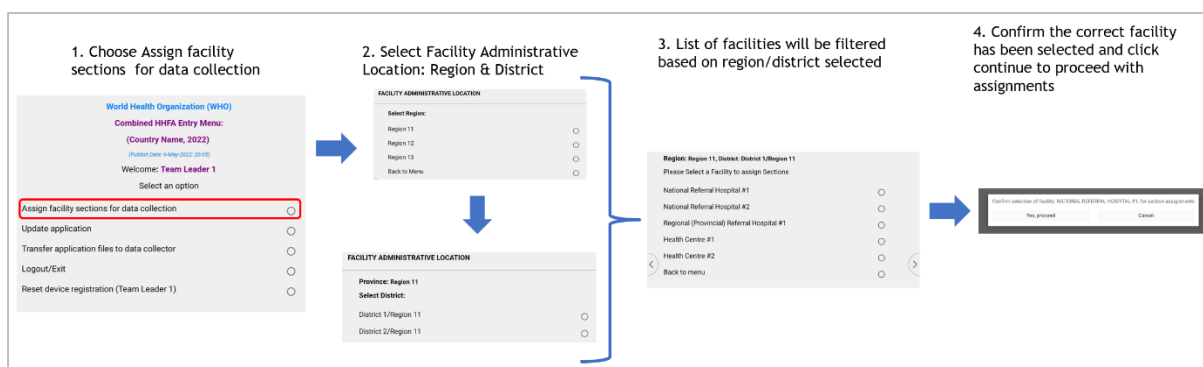
- A single team is in charge of collecting data in a specific health facility.
- A specific section can only be assigned to one data collector.
- Before data collection can commence in a facility, the different service areas/sections within the facility have to be assigned to data collectors.
- Section assignments should be done prior to visiting the facility for data collection. The team leader should check that the assignments have been done correctly before sharing the assignments with data collectors.
- Should the team leader choose to reassign sections for a facility, he/she should share the updated assignments with all the data collectors **before** data collection commences.
- Once data collection in a facility has commenced, the team leader is advised **AGAINST REASSIGNING** sections within the facility.
- Sections for which the data collection has already started **CANNOT** be reassigned.
- The section assignments can be shared via Bluetooth if the team leader and data collectors are within close proximity or via internet if they are far apart geographically.
- Due to interlinked skip patterns, some sections must be assigned to the same data collector if they are both being implemented. The CSPro application will require this when making assignments. This includes:
 - 18.6 Delivery and newborn care + 18.7 Inpatient postpartum/postnatal care
 - 22 Pharmaceutical commodities + 23 Medicine price data
- It is important to ensure that data collection teams are well trained and understand the importance of selecting the correct facility name when selecting the facility for which they will be collecting data. Some facilities may have similar names and incorrect facility selection can create the appearance of duplicates in the dataset. This can be time consuming and difficult to resolve during the data processing stage.

The team leader is responsible for assigning sections to data collectors for each facility. Section assignments should be completed before arrival at the facility. To assign sections on the tablet, take the following steps:

1. Team leader decides how to divide the survey sections/service areas amongst his/her team members.

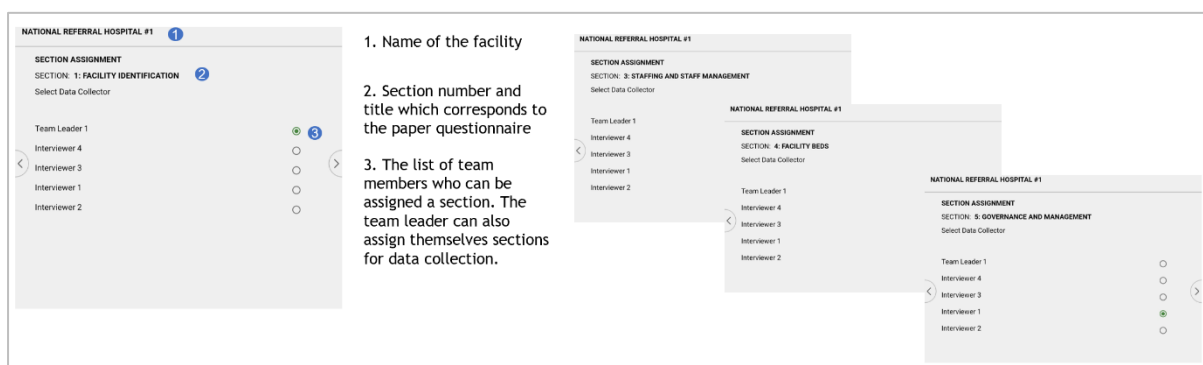


2. Team leader logs in to CSPro and selects the facility for which they want to make assignments.



3. Team leaders assign sections for the facility to the data collectors on their team.

- Once the facility has been opened for section assignments, the user will be presented with various screens where they can assign sections to the data collectors. The application will loop through all the relevant sections. All sections must be assigned, regardless of whether the facility offers the service or not.



4. Team leader confirms assignments.

- Upon completion of the assignments, a report is generated showing how the sections have been assigned.

Assignments report



Press back button to confirm assignments

Do you confirm Section Assignments for Facility: NATIONAL REFERRAL HOSPITAL #1, have been correctly assigned

Yes, Proceed No, Reassign

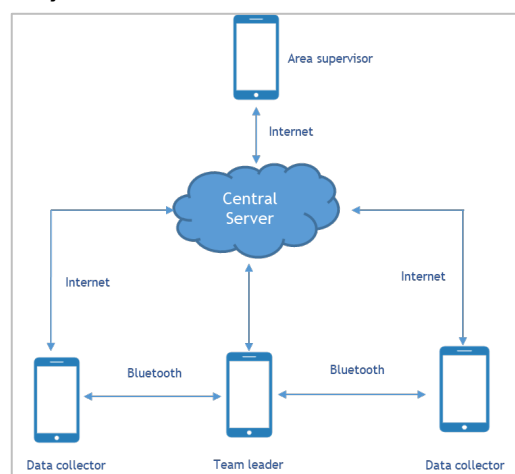
If you would like to confirm the assignments, click “Yes, Proceed” to continue to the main menu. The “No, Reassign” option will loop through the assignments again so that you can make any necessary corrections.

Transfer assignments to data collectors

There are two options for syncing HHFA data: Bluetooth and Internet. Each approach has different requirements and may be useful in different contexts. Transferring data using Bluetooth requires both team leader and data collector to be in close proximity and both team leader and data collector actions must be done simultaneously. It does not require an internet connection. Transferring data using Internet requires an active internet connection. However, the team leader and data collectors do not need to be in the same place and the team leader and data collector actions can be done independently.

Summary of differences between Bluetooth and Internet sync

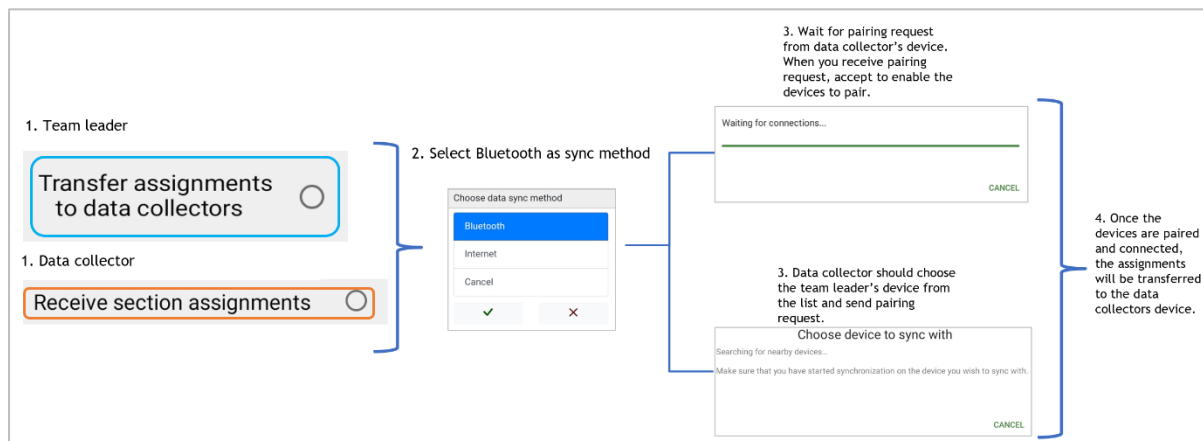
Bluetooth	Internet
<ul style="list-style-type: none"> Does not require internet connection 	<ul style="list-style-type: none"> Requires active internet connection
<ul style="list-style-type: none"> Devices must be in close proximity 	<ul style="list-style-type: none"> Devices do not need to be in close proximity
<ul style="list-style-type: none"> Devices must be paired 	<ul style="list-style-type: none"> Devices do not need to be paired
<ul style="list-style-type: none"> Data sharing options must be selected simultaneously 	<ul style="list-style-type: none"> Data sharing options are selected independently



To transfer assignments from team leader to data collector using Bluetooth:

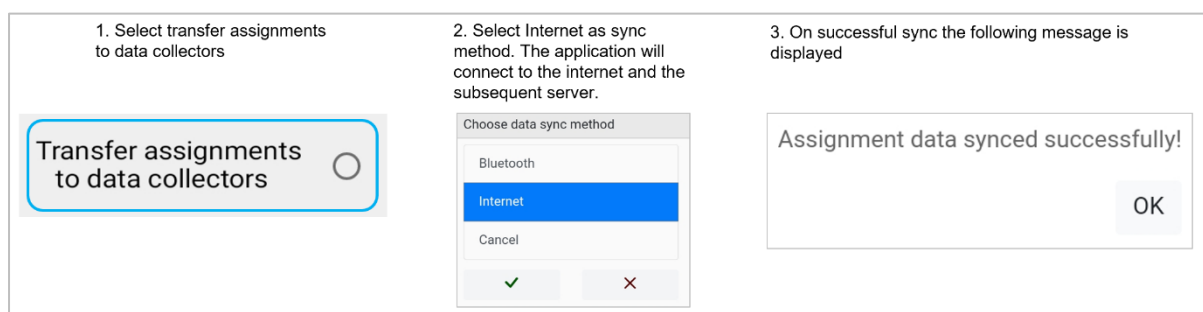
- Team leader selects Transfer assignments to data collectors. At the same time, data collector selects Receive section assignments.
- Both team leader and data collector select Bluetooth as the sync method.

- Both team leader and data collector wait for pairing request. When pairing request is received, both accept to enable the devices to pair.
- Once the devices are paired and connected, the assignments will be transferred to the data collector's device.

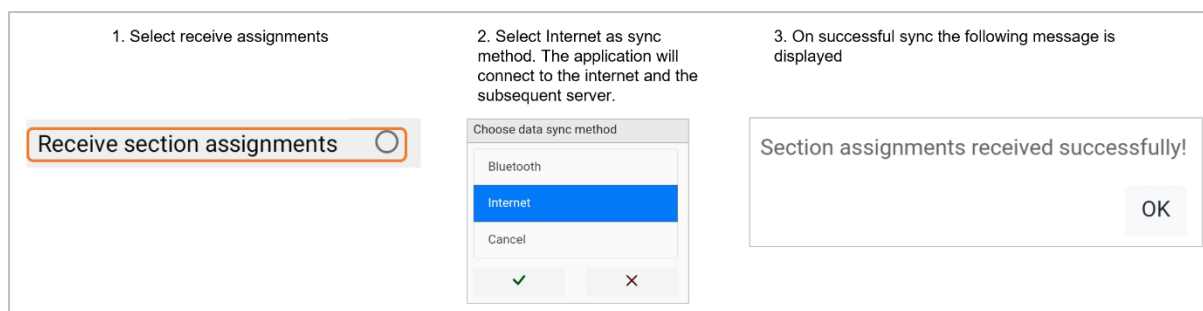


To transfer assignments from team leader to data collector using Internet:

- Team leader selects Transfer assignments to data collectors.
- Team leader selects Internet as the sync method.
- On successful sync to the cloud, a message will appear informing the team leader that the section assignments were uploaded successfully.



- When the data collector is ready to receive the assignments, the data collector selects Receive section assignments.
- Data collector selects Internet as the sync method.
- On successful sync from the cloud, a message will appear informing the data collector that the section assignments were received successfully.



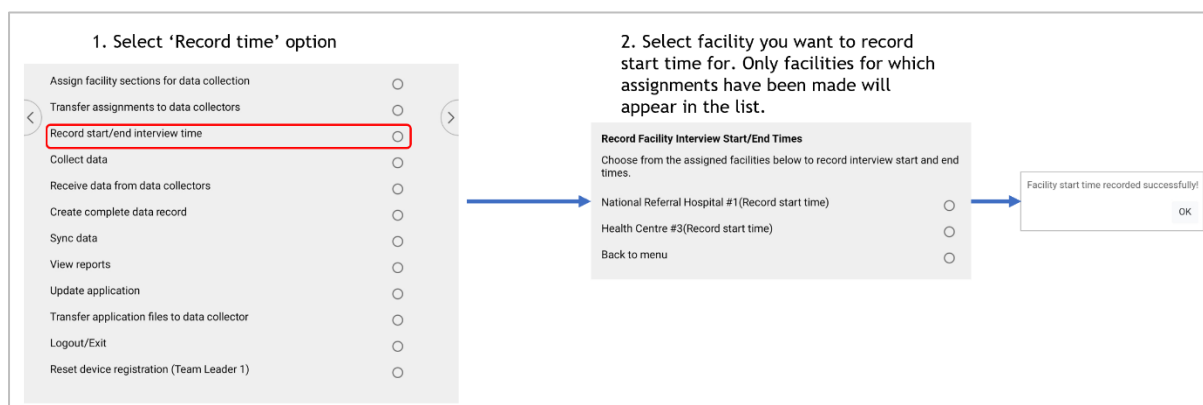
Record interview start/end time

Once the team has arrived at the facility, the team leader can record the start time of the interview. This should be done just before approaching the in-charge so that the time recorded begins before any conversation has occurred. Similarly, as the team is leaving the facility, the team leader can record the end time. The goal with recording the time in this way is to have a record of how long overall data collection takes at a facility. There are other built in mechanisms to record the amount of time spent on each individual section of data collection.

Note: The facility reports will display information on the duration of the interview. This is derived from the built in mechanism to record the amount of time spent on each individual section of data collection, not this Record interview start/end time function.

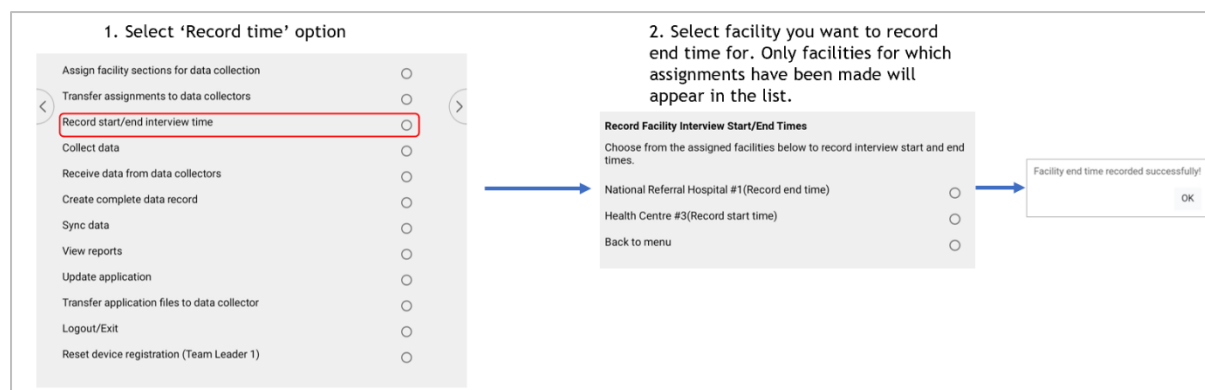
To record the interview start time:

1. Team leader selects Record start/end interview time.
2. Select the facility for which you are visiting and would like to record the start time. Only facilities for which assignments have been made will appear in the list.
3. You will receive a confirmation message that the start time was recorded successfully.



To record the interview end time:

1. Team leader selects Record start/end interview time.
2. Select the facility for which you are visiting.
3. You will receive a confirmation message that the end time was recorded successfully.



Collect data

Once data collectors have received their assignments, they can begin collecting data. Note, team leaders are also able to assign themselves sections so that they can participate in the data collection process. If a team leader has been assigned sections, they will follow the same steps for collecting data as the data collectors. To collect data, take the following steps:

1. Data collector selects the Collect data option from the main menu.
2. A list of the facilities for which the data collector has been assigned sections will appear. Select the facility you will be visiting for data collection.
3. A message will appear asking you to confirm the selection of the facility. Press Continue to confirm or Cancel to go back to make a different facility selection.
4. Next, the interview result question will appear. This is used to record the status of the interview. Select Facility located and open if you arrive at the health facility and are able to begin data collection. Select one of the other options if you arrive at the health facility and are not able to collect data because the facility is closed today, closed permanently, destroyed, cannot be found, or for some other reason. Note, the data collector who has been assigned Section 1: Facility identification, will receive some additional initial questions before arriving at the interview result question. If an option other than Facility located and open is selected, the data collector will be asked to confirm the selection. Then, for all options except Facility not found, the data collector will be given the option to collect GPS coordinates before data entry closes.

1. Select 'Collect Data' option

2. Facilities for which the user has section assignments will be listed. Select the appropriate facility.

3. Upon selection of a facility, the user is prompted to confirm the selection. Select continue to open the facility for data collection.

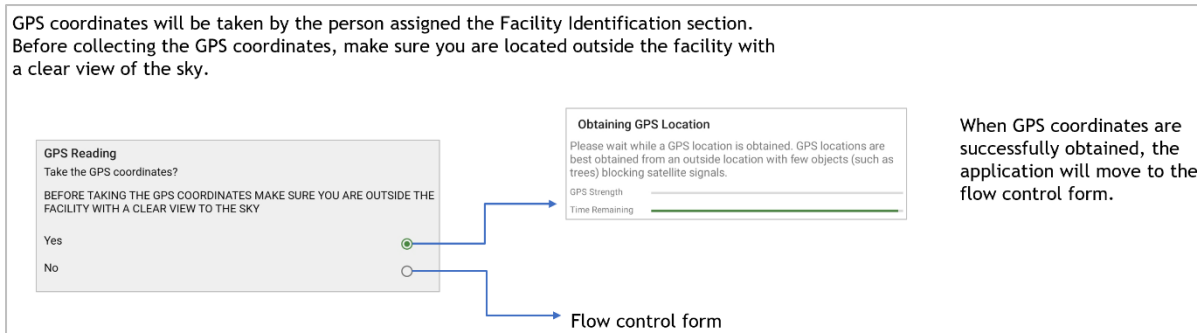
4. The interview result question is used to record the status of the interview visit. If you have been assigned the Facility Identification section, there are some additional initial questions asked before getting to this question.

Facility is available for data collection

Facility not available for data collection. You will be asked to confirm this selection and then given the option to collect GPS coordinates before data entry closes.

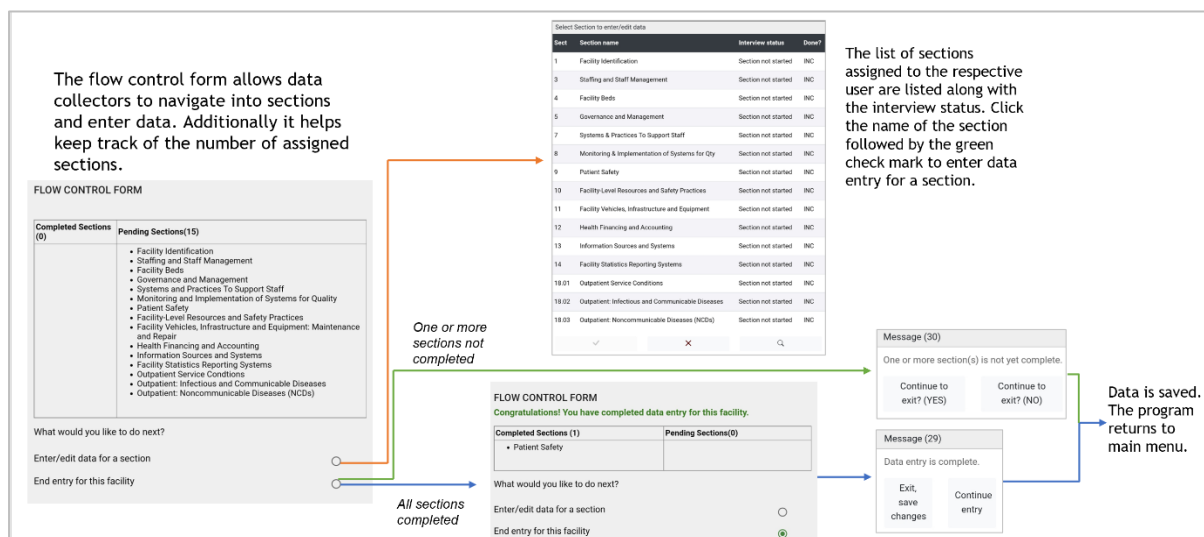
5. The data collector assigned Section 1: Facility identification, is required to complete that section before entering the flow control form and having the option to complete other sections.

6. GPS coordinates will be taken by the data collector assigned the facility identification section. The GPS question will prompt the data collector to ensure he/she is outside with a clear view of the sky before attempting to capture the GPS coordinates. When ready to capture coordinates, the data collector should select 'Yes'. A message will appear saying Obtaining GPS location. After GPS coordinates are successfully obtained, the application will continue on to the flow control form.



Next you will arrive at the flow control form. The flow control form allows data collectors to navigate into sections and enter data. Additionally, it helps them keep track of the number of assigned sections and how many have been completed. To enter data for a particular section, take the following steps:

7. Click on the radio button next to Enter/edit data for a section.
8. This takes you to the list of sections you have been assigned. For each section, you should be able to see the interview status (Section not started, Section incomplete, Section complete) and a column indicating if the section is done (DONE, INC). Click on the name of the section followed by the green check mark to enter the section and collect data.
9. When you have completed the data collection for a facility, click on End entry for this facility from the flow control main form. If all sections are complete, you will get a message saying Data entry is complete, with the following options: Exit, Save changes, and Continue entry. Click Exit, Save changes to end data entry. If one or more sections are incomplete, you will get a message saying One or more sections are not yet complete with the options: Continue to exit? (YES) and Continue to exit? (NO). Click on Continue to exit? (YES) to end data entry. For either of these options, the data are saved and the program returns to the main menu.



10. Once a section has been selected, the questions are displayed sequentially as they appear in the paper version of the questionnaire. When data entry for a section is complete, a message appears giving the data collector the option to return to the flow control form or to stay in the section. It is mandatory that for all assigned sections the data collector is required to go through all the questions until they arrive at the Section completion page. Skip patterns / filter questions have been introduced to reduce the data collection burden if a facility does not offer a particular service. However, the section must still be opened, the filter question must

be asked (e.g., Does this facility offer xx service) and then the skip patterns will appropriately skip to the next section.

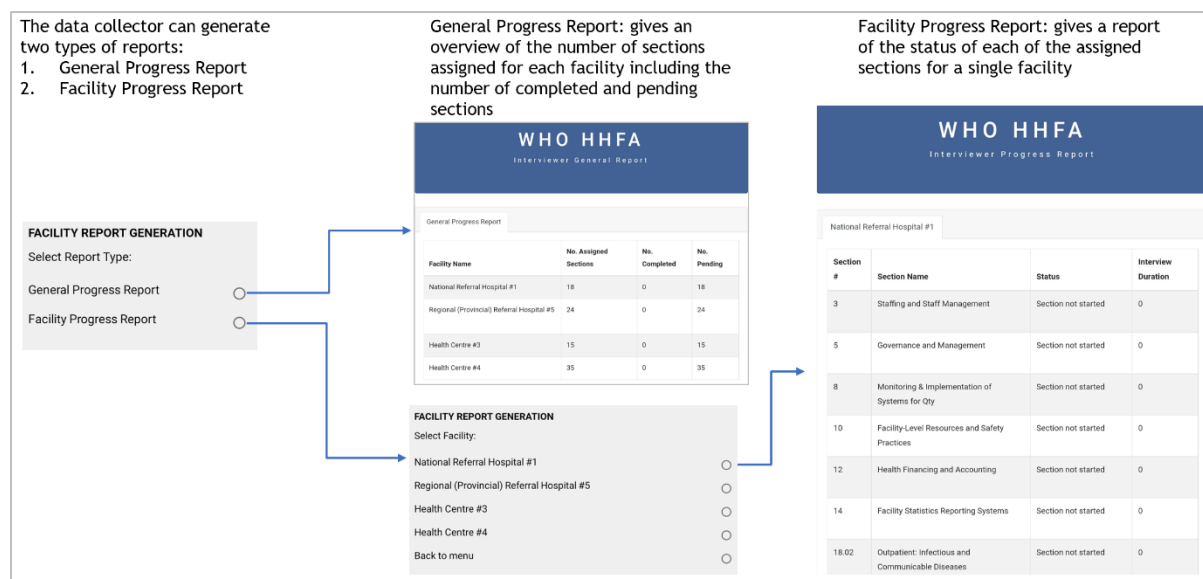
11. The HHFA CPro application allows for partial saving during data entry. During data entry in a section, if a data collector wants to partially save the data and exit data collection, they can press the back button on the tablet. A message should display saying You are attempting to exit from this section, with the options: Save data and exit or Continue entry. Select Save Data and exit to exit the section. When reentering a partially-saved section, the application will ask the data collector if they prefer to resume entry from the last saved question or from the beginning of the section.

Entering section data	Partial saving/resuming from partially saved section
<p>1. After a section has been selected, the questions are displayed starting from the first question in each section.</p> <p>2. Upon completion of data entry for each section the following screen is displayed:</p> <div> <p>SECTION COMPLETE YOU ARE AT THE END OF SECTION: FACILITY BEDS</p> <p>Continue to flow control form <input type="radio"/></p> <p>Stay in Section <input type="radio"/></p> </div> <p>It is MANDATORY that for all assigned sections the data collector is required to run through all questions until they land on the section completion page.</p>	<p>1. During data entry in a section, should you want to partial save the data, press the back button on your device, the following message is displayed:</p> <div> <p>Message (31)</p> <p>You are attempting to exit from this section.</p> <p>Save data and exit Continue entry</p> </div> <p>2. If you resume data entry into a partially-saved section the application will prompt you to resume entry from the last saved question or enter data from the beginning:</p> <div> <p>Message (36)</p> <p>This section was partially saved. Do you wish to go to the last saved question?</p> <p>Go to the last saved question Enter data from beginning</p> </div>

View reports: data collector

The data collector can generate two types of reports: 1) a general progress report and 2) a facility progress report. The general progress report gives an overview of the number of sections assigned per facility as well as the number of completed and pending sections. The facility progress report provides the status of each of the assigned sections for a single facility. To generate a report, data collectors take the following steps:

1. Select the View reports option from the main menu.
2. Select report type, either General Progress Report or Facility Progress Report:
 - a. If General Progress Report is selected, the report will be displayed.
 - b. If Facility Progress Report is selected, the facility must then be selected before the report is displayed.
3. Use the Back button on the tablet to return to the data collector menu.



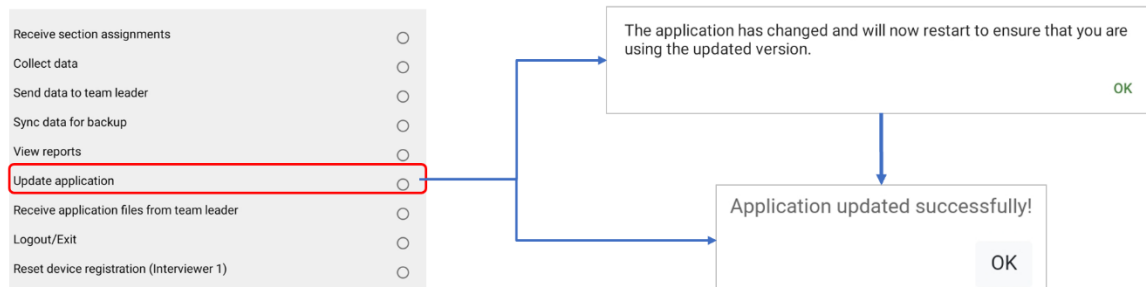
Update application and/or receive application updates from team leader

There are two options for data collectors to update the HHFA application: internet and Bluetooth.

Updating the application via the internet requires an active Internet connection. To update the HHFA application using the internet, the data collector takes the following steps:

1. Select the Update application option from the main menu.
2. When the update is complete, one of two messages will appear. If no changes have been made, the message will say Application updated successfully. If changes have been made, the first message will say The application has changed and will now restart to ensure that you are using the updated version. The second message will say Application updated successfully.
3. The application publish date shown at the top of the data collector menu should now be updated to reflect the recent update.

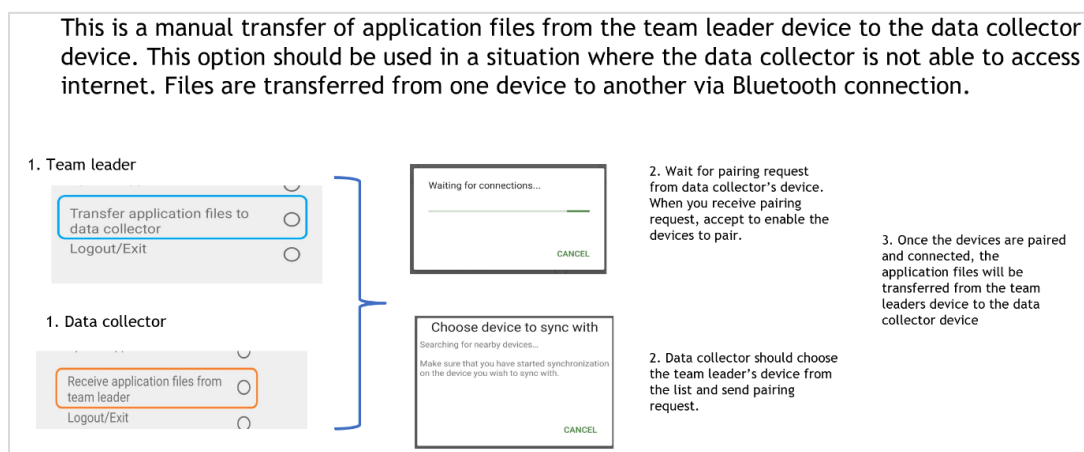
Update Application: This option allows the user to pull the latest version of the questionnaire from the server. It requires an active internet connection on the device



After the update, the application publish date changes to the version pulled from the server.

Updating the application via Bluetooth is a manual transfer of application files from the team leader device to the data collector device. This option should be used if the data collector is not able to access an internet connection. To update the HHFA application using Bluetooth, take the following steps:

1. Data collector selects the Receive application files from team leader option on the main menu. At the same time, team leader selects Transfer application files to the data collector.
2. Both team leader and data collector select Bluetooth as the sync method.
3. Both team leader and data collector wait for the pairing request. When the pairing request is received, both individuals accept it to enable the devices to pair.
4. Once the devices are paired and connected, the application files will be transferred to the data collector's device.

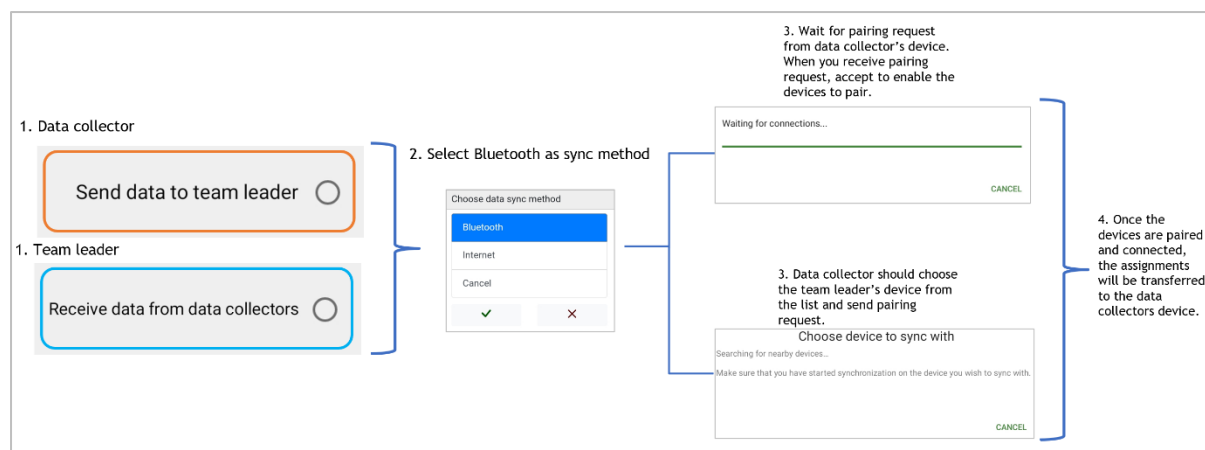


Send data to team leader

At the end of each day of data collection in a facility, data collectors should send their data to the team leader (even if the data are partially complete). There are two options for data collectors to send data to the team leader: internet and Bluetooth.

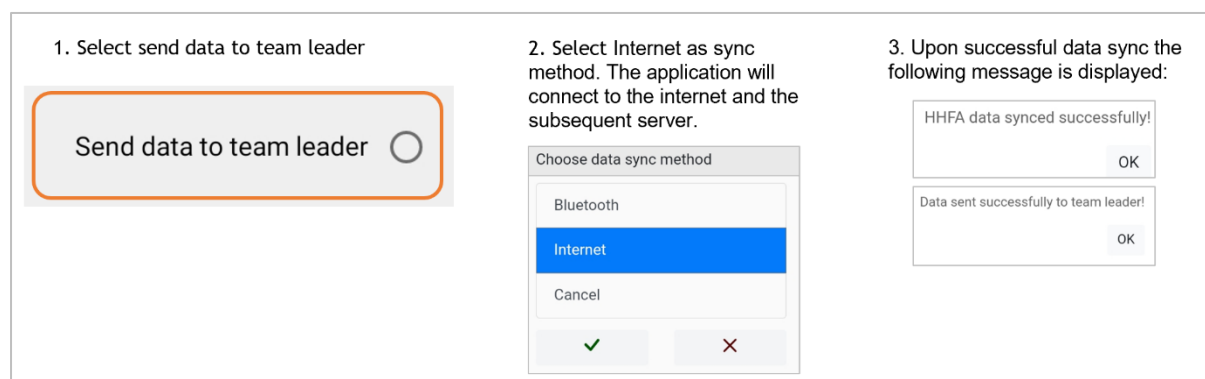
Transferring data via Bluetooth does not require an internet connection, but the team leader and data collector need to be in close geographic proximity. To transfer data from data collector to team leader using Bluetooth, take the following steps:

1. Team leader selects Receive data from data collectors. At the same time, data collector selects Send data to team leader.
2. Both team leader and data collector select Bluetooth as the sync method.
3. Both team leader and data collector wait for the pairing request. When the pairing request is received, both individuals accept it to enable the devices to pair.
4. Once the devices are paired and connected, the data will be transferred to the team leader's device.

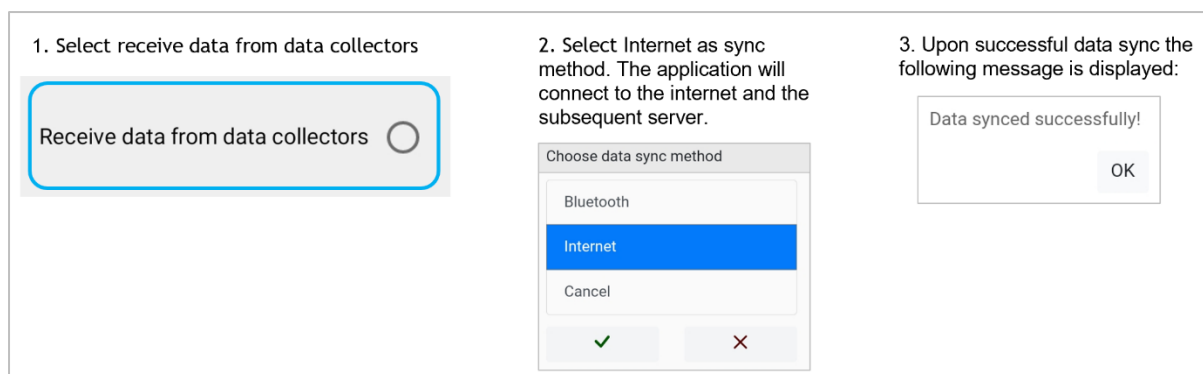


Transferring data via the internet requires an active internet connection, but the team leader and data collector do not need to be in close geographic proximity. To transfer data from data collector to team leader using the internet, take the following steps:

1. Data collector selects Send data to team leader.
2. Data collector selects Internet as the sync method.
3. On successful sync to the cloud, a message will appear informing the data collector that the data was successfully sent to the team leader.



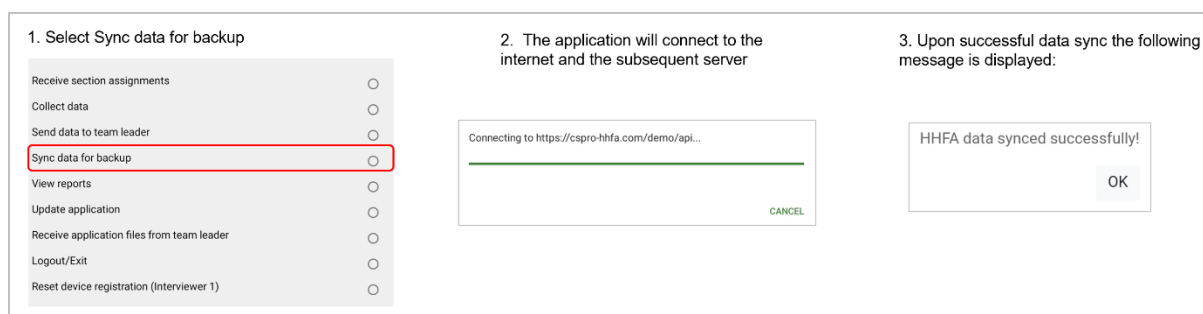
4. When the team leader is ready to receive the data, the team leader selects Receive data from data collectors.
5. Team leader selects Internet as the sync method.
6. On successful sync from the cloud, a message will appear informing the team leader that the data was successfully synced.



Sync data for backup

The sync option allows data collectors to send data directly to the server (CSWeb or Dropbox) as a backup. The process is similar to sending the data to the team leader via the Internet and requires an active internet connection. To sync data for backup, take the following steps:

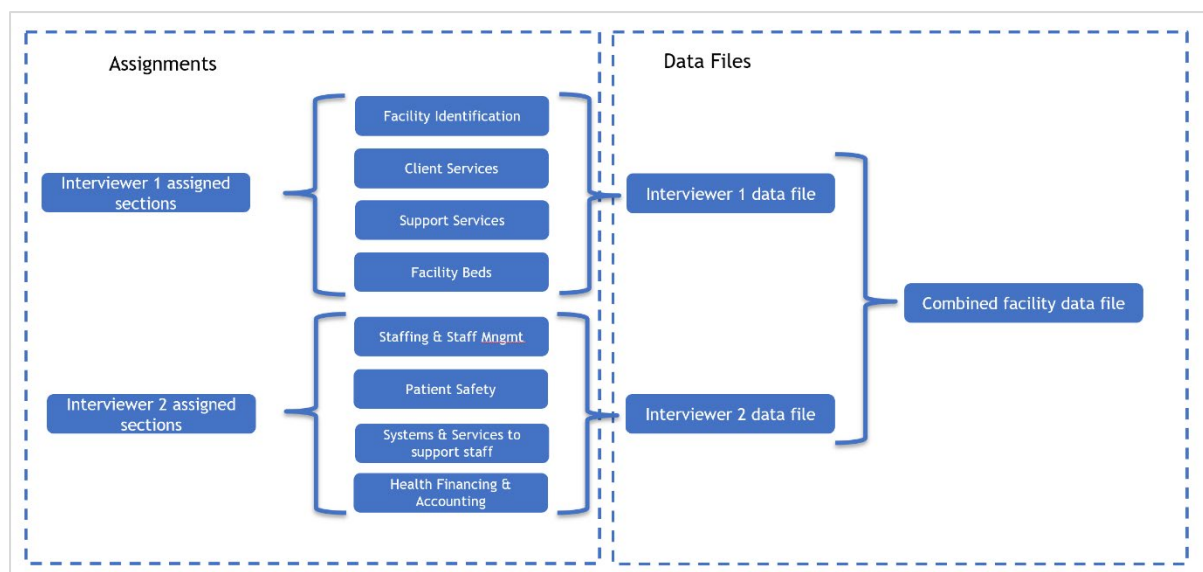
1. Data collector selects Sync data for backup.
2. The application will connect to the Internet and the server. Upon successful data sync, a message will be displayed which says Data synced successfully.



Note: CSPro stores data in a file format called CSPro DB with the file extension **.csdb**. The CSPro DB data source simplifies data collection as all information about cases is stored in a single place and the revision history allows CSPro, when syncing data, to only sync data that has changed. This file format makes it possible to sync partially saved cases as those cases are subsequently updated when additional data is collected and an updated case is synced in the future.

Create complete record

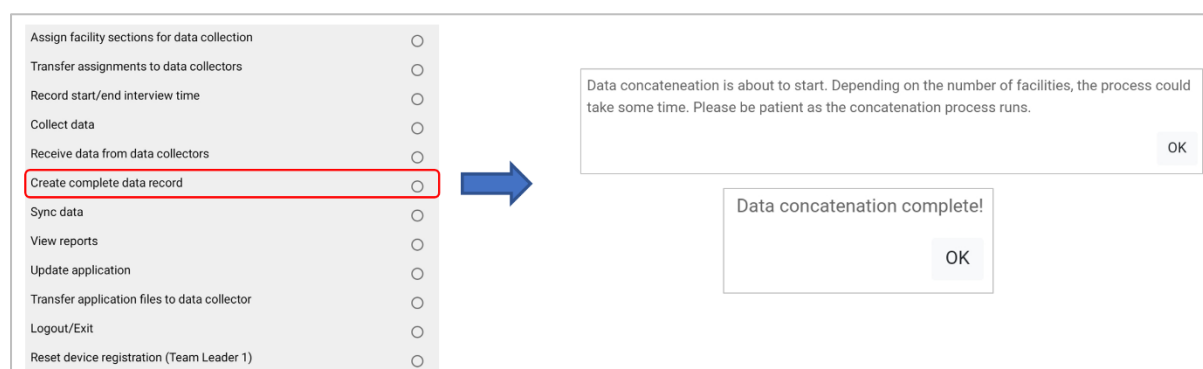
Recall that, based on the section assignments, each data collector will have data for a particular set of assigned sections for a single facility. The data files from all the data collectors who have collected data at a facility must be combined to create a complete record for the facility (see visual below).



After the team leader has received data from the data collectors, he/she is expected to create a complete facility record by combining all the data collectors' files. This process is often called data concatenation. Data concatenation uses the Facility Assignments file to create a complete data record for the facility. The process is automated, hence everything runs in the background. The program checks through all the assignments done by the team leader, retrieves the associated data files, and merges them into a complete facility data file. Depending on the amount of merging required, this process may be quite fast and you may not notice any activity.

To create a complete record, take the following steps:

1. Team leader selects Create complete data record.
2. If the concatenations process is successful, a message will appear that says Data concatenation complete.



The complete record is used for generating reports about survey completeness. If you do not create the complete record, the supervisors and data manager will think you have not completed data collection. At the end of each day, utilize the Create complete facility record and sync data to ensure the most up-to-date information is available for survey progress monitoring!

View reports: team leader

The team leader can generate two types of reports:

- **General Report:** This report outlines the interview status of all assigned health facilities. It also shows whether the GPS coordinates for the facility have been collected.
- **Individual Facility Report:** This report shows the interview status of each of the assigned sections for a single facility.

General report					Individual facility report				
WHO HHFA Facilities Progress Report					WHO HHFA Facility Progress Report				
Facility Progress Report					National Referral Hospital #1				
Facility #	Facility Name	GPS	Interview Status	Interview Duration	Section #	Section Name	Assigned To	Status	Interview Duration(Mins)
100001	National Referral Hospital #1	GPS Not Taken	Interview incomplete	4 minutes	1	Facility Identification	Team Leader 1	Section complete (GPS Not Taken)	0
200005	Regional (Provincial) Referral Hospital #5	GPS Not Taken	Interview incomplete	0 minutes	3	Staffing and Staff Management	Interviewer 1	Section not started	0
700003	Health Centre #3	GPS Not Taken	Interview incomplete	0 minutes	4	Facility Beds	Team Leader 1	Section complete	0
700004	Health Centre #4	GPS Not Taken	Interview incomplete	0 minutes	5	Governance and Management	Interviewer 1	Section not started	0

To generate a report, the team leader takes the following steps:

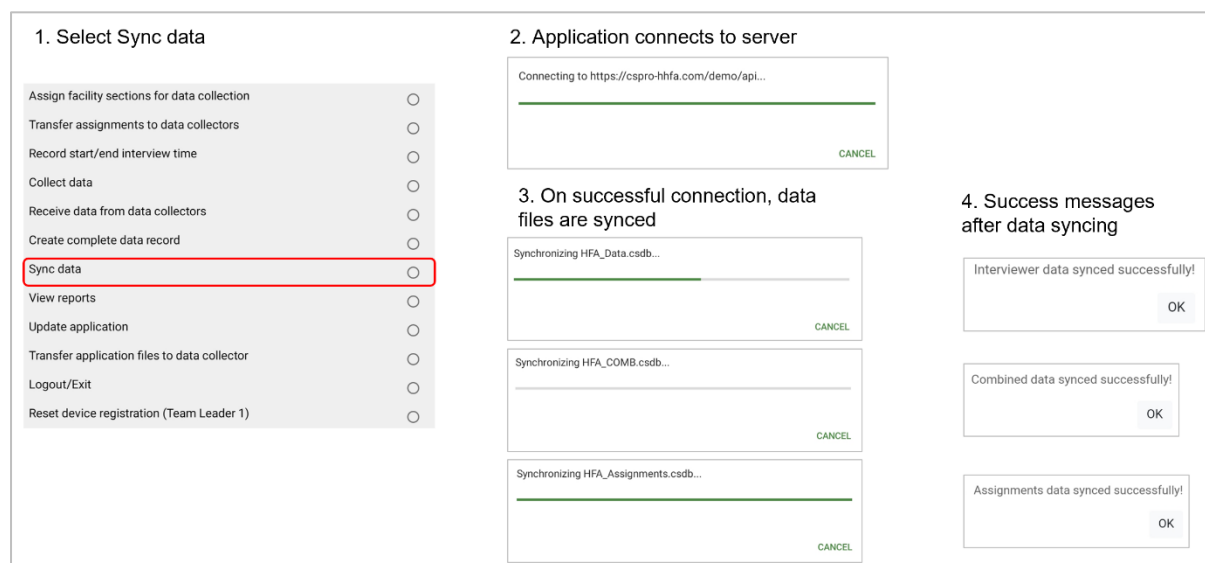
1. Team leader selects the View reports option from the main menu.
2. Select report type, either General Progress Report or Facility Progress Report.
 - a. If General Progress Report is selected, the report will be displayed.
 - b. If Facility Progress Report is selected, the facility must then be selected before the report is displayed.
3. Use the Back button on the tablet to return to the team leader menu.

Sync data

The sync option allows team leaders to send data directly to the server (CSWeb or Dropbox). During this process, three data files are sent to the server: the original data collector data file, the combined dataset, and the assignments file. The process requires an active internet connection. To sync data, take the following steps:

1. Team leader selects Sync data for backup.
2. The application will connect to the internet and the server.

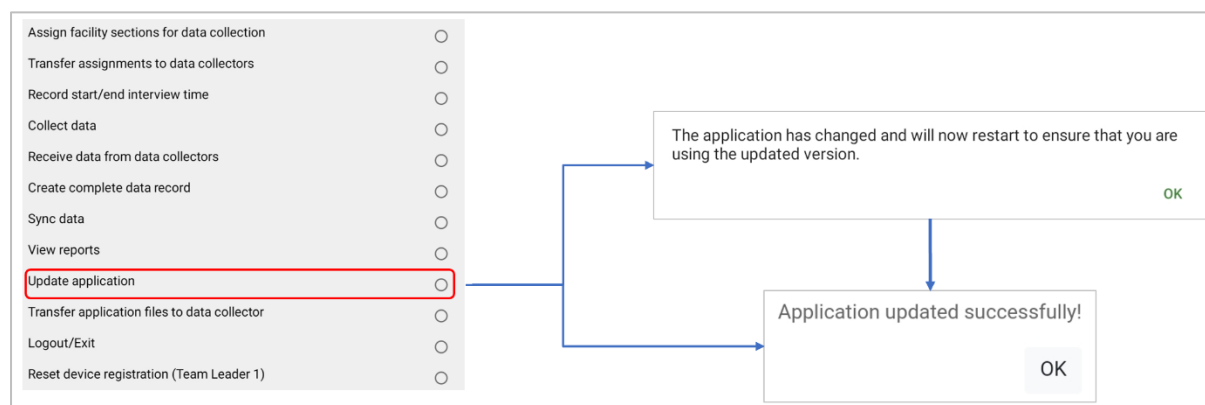
- On successful connection, the data files are synced. Upon successful data sync, a message will be displayed which to confirm the data has been successfully been synced. A total of three files will be synced – HFA_Data.csdb (interviewer data), HFA_COMB.csdb (combined data), and HFA_Assignments.csdb (assignments data).



Update application: team leader

The update application feature for team leaders is the same as for data collectors in that it allows the user to get the latest version of the HHFA CPro application from the server. The team leader update application function requires an active internet connection. To update the HHFA application using the internet, take the following steps:

- Team leader selects the Update application option from the main menu.
- When the update is complete, a message appears informing the team leader that the application has updated successfully and that the application will restart to ensure use of the updated version.
- The application publish date shown at the top of the team leader menu should now be updated to reflect the recent update.



Reset device registration

Device registration restricts a data collection device to a user. If a data collector logs into two different devices to collect data for the same facility, this will result in duplication and/or data loss. During data concatenation, the program might not locate the correct data set, and consequently some sections of data could end up missing in the data set. In addition, if a team leader logs into two different devices and syncs data, this will result in duplication of data on the central server. To avoid this, there is a restriction of one device per user. This applies to data collectors, team leaders, AND supervisors.

On initial login to the device/tablet, the user is prompted to register the device under their code. Once registered, no other user will be able to login to the device unless the registration is reset.

The image displays two side-by-side screenshots of the application interface. The left screenshot, titled 'User 1', shows the initial login screen where the user is prompted to register the device. It includes a message: 'On initial login to the device, the user will be prompted to register the device'. Below this is a dialog box with the text 'This device/tablet is not registered for data collection.' and two buttons: 'Register device under my code' and 'Cancel'. Below the dialog box, it says 'Successful device registration' and shows a message box 'Device successfully registered!' with an 'OK' button. The right screenshot, titled 'User 2', shows an error message: 'When another user attempts to login to a device that has already been registered, they will get the error message below.' Below this is a dialog box with the text 'This device is registered to Interviewer 1. You are not authorized to use this device for data collection. Please consult your team leader to reset the device.' and an 'OK' button.

Resetting the device registration enables a registered device to be reset so that another user can login. However, **SHARING of devices is HIGHLY discouraged!** The reset device registration feature can be used in a situation where the device should be used by another data collector, team leader, or supervisor.

The data manager can reset the device registration for any user. Supervisors can reset the device registration for team leaders and data collectors under their supervision. Team leaders can reset the device registration for data collectors on their team. Resetting device registration must be done in-person and cannot be done remotely. To reset a device's registration, take the following steps:

1. The respective team leader/supervisor/data manager logs into the device that has been registered using the code that the device was originally registered to.
2. Enter the device reset code.
3. A prompt will appear asking for confirmation of the device deregistration. Select Yes to proceed.
4. A message will appear informing that the device has been successfully deregistered. At this point, the next user that logs into the device will be required to register the device before they can use it to collect HHFA data.

The screenshot displays the HHFA Data Manager interface with three main sections:

- Left Panel:** A list of menu items with radio buttons. The item "Reset device registration (Interviewer 1)" is highlighted with a red border.
- Center Panel:** A dialog box titled "Enter the device reset code." with a text input field and an "OK" button.
- Right Panel:** A confirmation prompt: "You will get a prompt to confirm device deregistration." Below it is a dialog box asking "Are you sure you want to reset the device registration from Interviewer 1" with "Yes" and "No" buttons. Below that, a message states "After successful deregistration another user can login to the device" followed by a "Device de-registered successfully!" message with an "OK" button.

Device sharing is not permitted! Do not:

- Use your own device
- Use a second device
- Share devices

If you need to replace your device, talk to the data manager for instructions on how to do so appropriately.

Additional functionalities

Change display language

To change the display language, press the Menu icon (vertical ellipses), and select Change Language. Available languages will be listed and the data collector can select the language of interest. Data collectors can change the language at any point during the data collection process, which may prove helpful if in some countries more than one language is spoken.

Troubleshooting

I've selected the wrong facility name when I made assignments and data collection has already begun – what do I do?

- If data collection has already started, continue collecting data and inform the data manager. This information will be tracked and corrected in the data processing phase.
- This is a larger issue if you are also supposed to collect data for the facility for which you have picked the wrong name. In this case contact the data manager for further instructions. The data manager will likely tell you to collect the second facility under the first facility name and then he/she can change the facility ID for both facilities during data the data processing phase.

HHFA CSPro for area supervisors

Overview of data quality

Why is data quality important?

- Solid data supports solid conclusions & recommendations
- Future public policy decisions may rely on this evidence
- Critics will look for weaknesses & holes
- Results will be publicly accessible
- Project values: honesty & transparency
- Fairness to affected parties

Data quality assurance is an ongoing process throughout the entire survey process. All survey team members have a role to play in ensuring data quality. Data quality assurance procedures include:

- Field supervision by survey coordinators and supervisors
- Data managers downloading data, assessing key fields, and providing teams with feedback
- Team leaders and supervisors monitoring for data completeness and correctness
- Frequent mobile phone communication for rapid problem solving and information sharing
- Electronic data collection with automated skip patterns, range checks, consistency checks, and auto-fills
- Validation through a sample of facilities to be re-surveyed by QA team (generally supervisors or external QA team)

The supervisor has two main roles in ensuring HHFA survey data quality:

1. Conducting supervisor validation visits
2. Tracking progress towards survey completion

Overview of supervisor validation

The supervisor will do a validation visit in 10% of health facilities. They will return to a selection of the sampled facilities (10%; randomly selected) and collect data again, to make sure that the data obtained by the data collectors is accurate and reliable. A supervisor validation may be conducted using either the entire HHFA questionnaire being implemented in a country or selected sections of the questionnaire. This will be decided by the survey coordinating committee. If validation is conducted on selected sections of the questionnaire, it is recommended to select different sections across facilities so all sections are covered across the validation process for a team. There are five main steps in the supervisor validation process:

1. Select facilities for validation at random
2. Conduct the validation visits on the same day as the visits to these facilities by data collectors (or as soon after as possible)

- a. Be sure to use the HHFA CPro application to collect all supervisor validation data. This helps facilitate comparison of data between supervisor validations and data collectors.
3. Compare the data obtained with that collected by the data collectors
 - a. Data managers will support the comparison of supervisor validation data to data collector data and provide a report of discrepancies.
4. Identify and resolve any issues/mistakes and discuss with data collectors
 - a. Remember, not all questions are expected to be an exact match and not all differences are indicative of data quality problems. For example, minor differences in the spelling of facility location, or other text only fields. In addition, differences in issues such as the availability of medicines may be true differences if the data was not collected on the same day as medicine availability is subject to change. The comparison results must be interpreted with a view toward identifying differences that may be indicative of a problem with data quality.
5. The consistency of responses (exact matching) will be analyzed as a measure of quality control

Process of supervisor validation on tablets

The table below outlines the steps in the supervisor validation process, the staff responsible for each step, and when each step should take place. The following sections discuss how each of these steps is accomplished with the HHFA CPro application using tablets. Note that when conducting a supervisor validation visit, ONE person can collect data. The sections cannot be divided amongst multiple supervisors to collect data at a single facility.

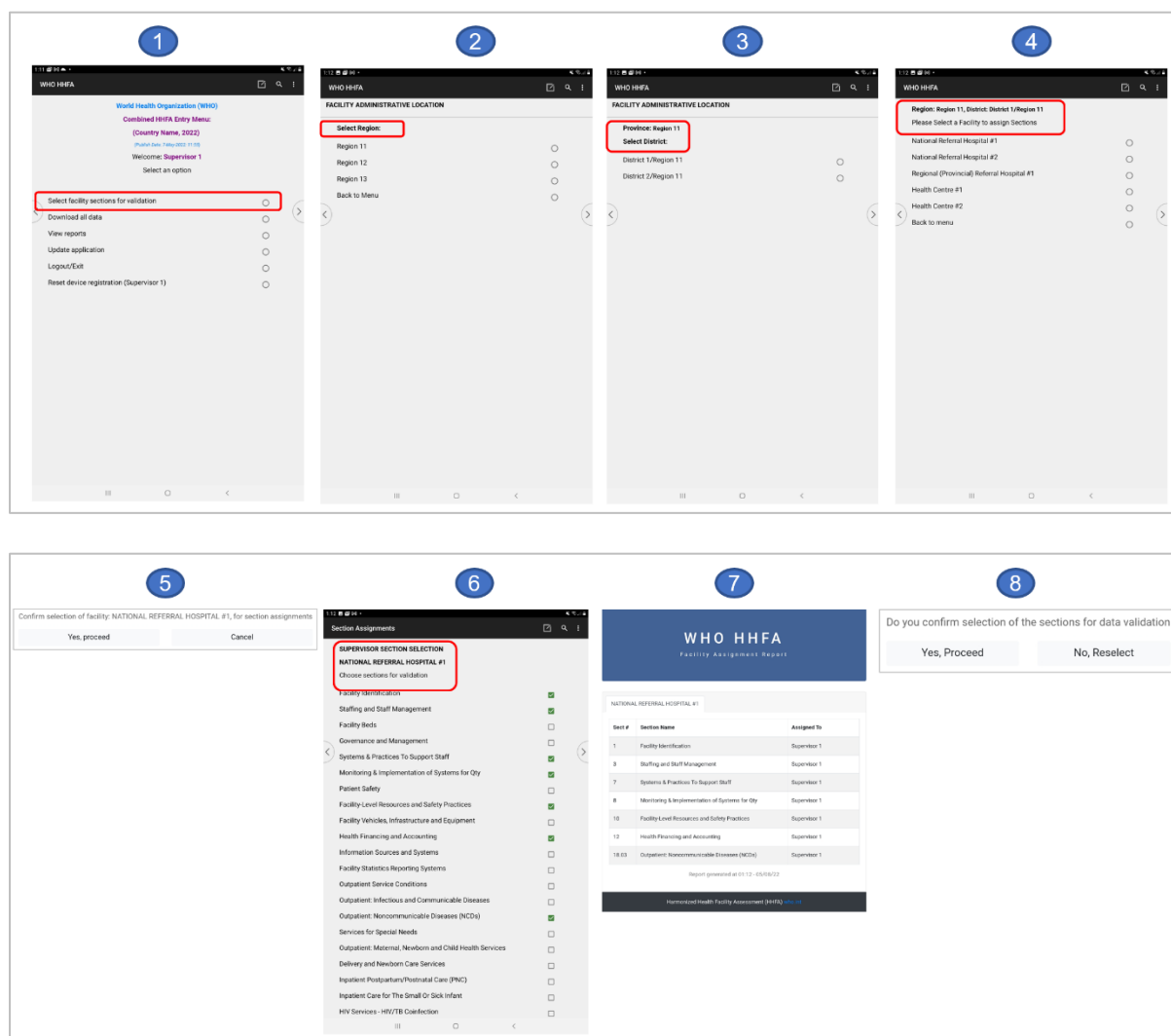
No.	Who?	What?	When?
1	Supervisor	Select sections for validation	Before arrival at facility
2	Supervisor	Validate facility data	At facility
3	Supervisor	Sync validation data	End of the day
4	Supervisor	View reports	End of the day
5	Supervisor	Update application	As needed

Select sections for validation

The supervisor is responsible for selecting sections to validate at each facility. To select sections for validation on the tablet, take the following steps:

1. Supervisor logs in to CPro and selects the facility for which they want to make assignments.
6. Supervisor selects sections to validate at the facility by checking the box next to each section which will be validated. It is required to include section 1 – facility identification.
7. Upon completion of the section selection, a report is generated showing the sections that have been selected for validation for the facility.

8. Confirm the section selection to continue to the main menu.



Validate facility data

Once supervisors have completed section selection, they can begin collecting data. To collect data, take the following steps:

1. Supervisor selects the Validate facility data option from the main menu.
2. A list of the facilities for which the supervisor has made section selections will appear. Select the facility you will be visiting for validation.
3. A message will appear asking you to confirm the selection of the facility. Press Continue to confirm or Cancel to go back to make a different facility selection.
4. Next, the interview result question will appear. This is used to record the status of the interview. Select Facility located and open if you arrive at the health facility and are able to begin data validation. Select one of the other options if you arrive at the health facility and are not able to collect validation data because the facility is closed today, closed permanently, destroyed, cannot be found, or for some other reason. If an option other than Facility located

and open is selected, the supervisor will be asked to confirm the selection. Then, for all options except Facility not found, the supervisor will be given the option to collect GPS coordinates before data entry closes.

1. Select 'Validate facility data' option

2. Facilities for which the user has made validation assignments will be listed. Select the appropriate facility.

3. Upon selection of a facility, the user is prompted to confirm the selection. Select continue to open the facility for data collection.

4. The interview result question is used to record the status of the interview visit. If you have been assigned the Facility Identification section, there are some additional initial questions asked before getting to this question.

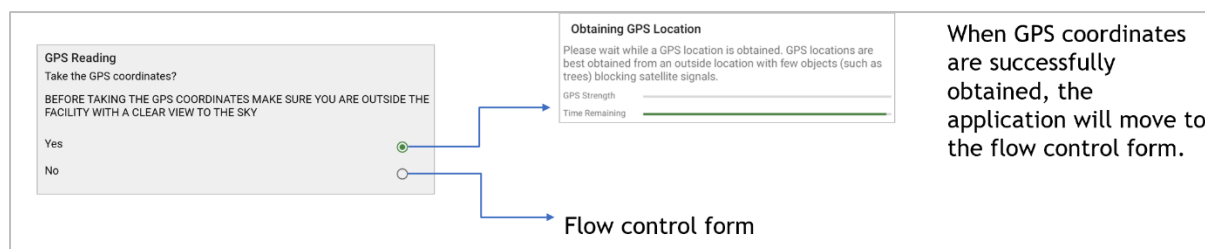
Facility is available for data collection

Facility not available for data collection. You will be asked to confirm this selection and then given the option to collect GPS coordinates before data entry closes.

5. The supervisor will be required to complete section 1 - facility identification before entering the flow control form and having the option to complete other sections.

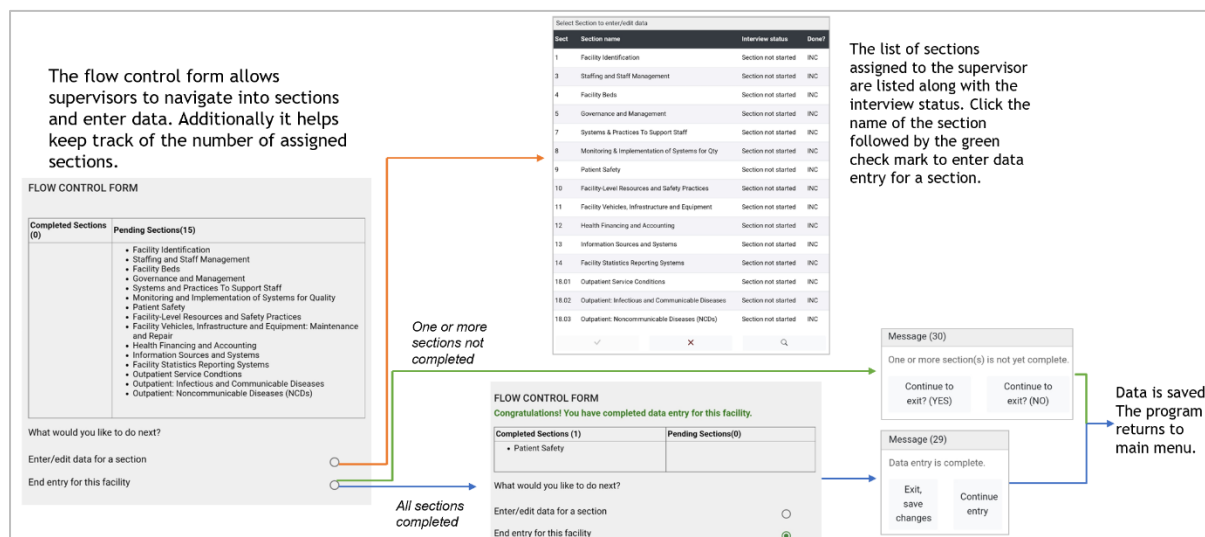
Sect #	Section Name	Assigned To
1	Facility Identification	Supervisor 1
3	Staffing and Staff Management	Supervisor 1
7	Systems & Practices To Support Staff	Supervisor 1
8	Monitoring & Implementation of Systems for City	Supervisor 1
10	Facility Level Resources and Safety Practices	Supervisor 1
12	Health Financing and Accounting	Supervisor 1
18.03	Outpatient: Noncommunicable Diseases (NCDs)	Supervisor 1

6. GPS coordinates will be taken by the supervisor as part of the facility identification section. The GPS question will prompt the supervisor to ensure he/she is outside with a clear view of the sky before attempting to capture the GPS coordinates. When ready to capture coordinates, the supervisor should select 'Yes'. A message will appear saying Obtaining GPS location. After GPS coordinates are successfully obtained, the application will continue on to the flow control form.



Next you will arrive at the flow control form. The flow control form allows supervisors to navigate into sections and enter data. Additionally, it helps them keep track of the number of assigned sections and how many have been completed. To enter validation data for a particular section, take the following steps:

- Click on the radio button next to Enter/edit data for a section.
- This takes you to the list of sections you have selected for validation. For each section, you should be able to see the interview status (Section not started, Section incomplete, Section complete) and a column indicating if the section is done (DONE, INC). Click on the name of the section followed by the green check mark to enter the section and collect data.
- When you have completed the data collection for a facility, click on End entry for this facility from the flow control main form. If all sections are complete, you will get a message saying Data entry is complete, with the following options: Exit, Save changes, and Continue entry. Click Exit, Save changes to end data entry. If one or more sections are incomplete, you will get a message saying One or more sections are not yet complete with the options: Continue to exit? (YES) and Continue to exit? (NO). Click on Continue to exit? (YES) to end data entry. For either of these options, the data are saved and the program returns to the main menu.



- Once a section has been selected, the questions are displayed sequentially as they appear in the paper version of the questionnaire. When data entry for a section is complete, a message appears giving the supervisor the option to return to the flow control form or to stay in the section. It is mandatory that for all selected sections the supervisor is required to go through all the questions until they arrive at the Section completion page. Skip patterns / filter

questions have been introduced to reduce the data collection burden if a facility does not offer a particular service. However, the section must still be opened, the filter question must be asked (e.g., Does this facility offer xx service) and then the skip patterns will appropriately skip to the next section.

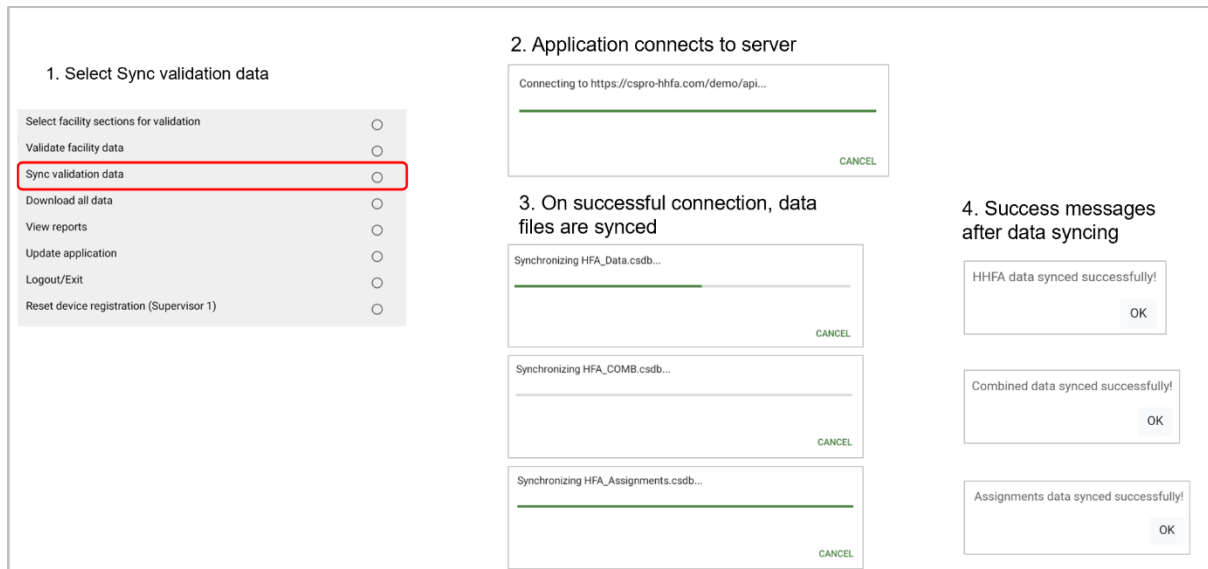
2. The HHFA CPro application allows for partial saving during data entry. During data entry in a section, if a supervisor wants to partially save the data and exit data collection, they can press the back button on the tablet. A message should display saying You are attempting to exit from this section, with the options: Save data and exit or Continue entry. Select Save Data and exit to exit the section. When reentering a partially-saved section, the application will ask the data collector if they prefer to resume entry from the last saved question or from the beginning of the section.

Entering section data	Partial saving/resuming from partially saved section
<p>1. After a section has been selected, the questions are displayed starting from the first question in each section.</p> <p>2. Upon completion of data entry for each section the following screen is displayed:</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>SECTION COMPLETE YOU ARE AT THE END OF SECTION: FACILITY BEDS</p> <p>Continue to flow control form <input type="radio"/></p> <p>Stay in Section <input type="radio"/></p> </div> <p>It is MANDATORY that for all assigned sections the data collector is required to run through all questions until they land on the section completion page.</p>	<p>1. During data entry in a section, should you want to partially save the data, press the back button on your device, the following message is displayed:</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Message (31)</p> <p>You are attempting to exit from this section.</p> <p>Save data and exit <input type="button" value=""/></p> <p>Continue entry <input type="button" value=""/></p> </div> <p>2. If you resume data entry into a partially-saved section the application will prompt you to resume entry from the last saved question or enter data from the beginning:</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Message (36)</p> <p>This section was partially saved. Do you wish to go to the last saved question?</p> <p>Go to the last saved question <input type="button" value=""/></p> <p>Enter data from beginning <input type="button" value=""/></p> </div>

Sync validation data

The sync option allows supervisors to send validation data directly to the server (CSWeb or Dropbox). This option does two functions: 1) creates combined data record and 2) syncs data with the server. Both functions run in the background, so this process to take some time. During this process, three data files are sent to the server: the original supervisor data file, the combined dataset, and the assignments file. The process requires an active internet connection. To sync data, take the following steps:

1. Supervisor selects Sync validation data.
2. The application will connect to the internet and the server.
3. On successful connection, the data files are synced. Upon successful data sync, a message will be displayed which to confirm the data has been successfully been synced. A total of three files will be synced – HFA_Data.csdb (supervisor validation data), HFA_COMB.csdb (combined data), and HFA_Assignments.csdb (assignments data).



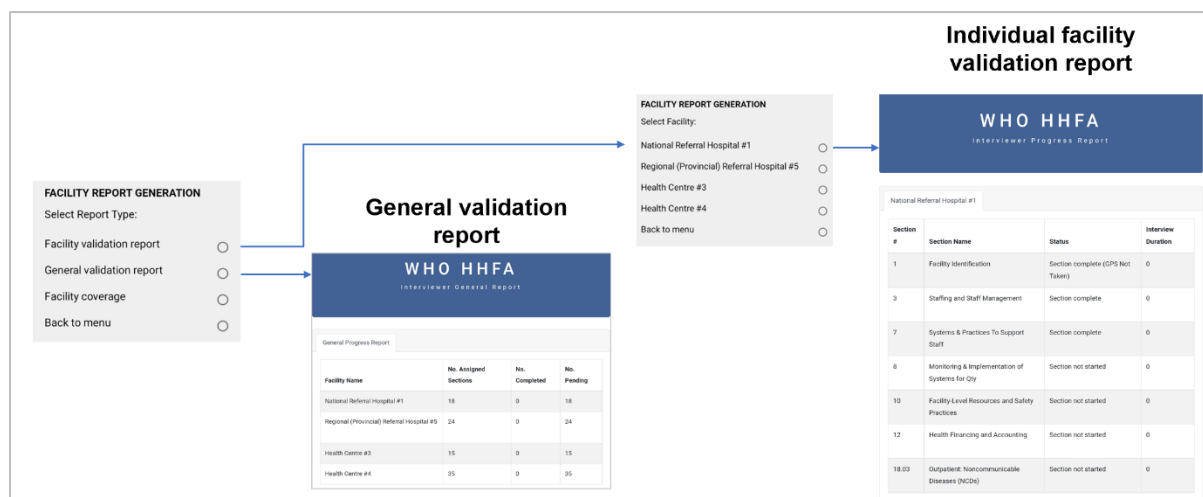
View reports

The supervisor can generate two types of reports to view information about the facility validation data collection:

- **Facility validation report:** Facility progress report for the validated facilities. Gives interview status for each of the assigned sections selected for validation for a single facility.
- **General validation report:** This report outlines the interview status of the assigned health facilities for validation by the supervisor.

To generate a report, supervisors take the following steps:

1. Select the View reports option from the main menu.
2. Select report type, either General validation report or Facility validation report:
 - a. If General validation report is selected, the report will be displayed.
 - b. If Facility validation report is selected, the facility must then be selected before the report is displayed.
3. Use the Back button on the tablet to return to the supervisor menu.

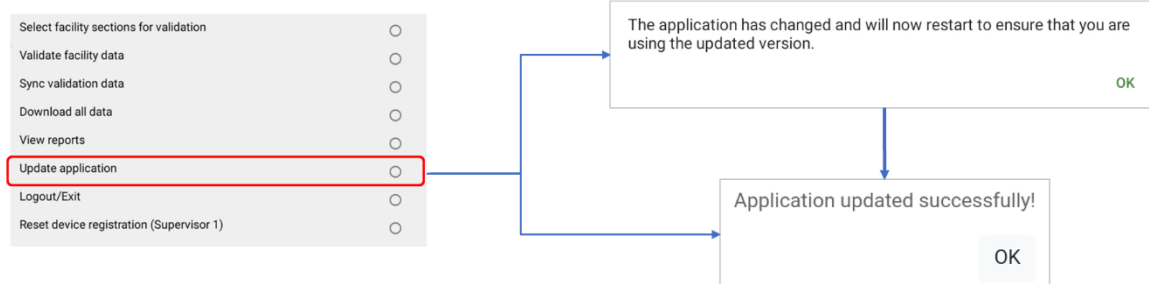


Update application

Updating the application for supervisors is done via the internet and requires an active Internet connection. To update the HHFA application using the internet, the supervisor takes the following steps:

1. Select the Update application option from the main menu.
2. When the update is complete, one of two messages will appear. If no changes have been made, the message will say Application updated successfully. If changes have been made, the first message will say The application has changed and will now restart to ensure that you are using the updated version. The second message will say Application updated successfully.
3. The application publish date shown at the top of the supervisor menu should now be updated to reflect the recent update.

Update Application: This option allows the user to pull the latest version of the questionnaire from the server. It requires an active internet connection on the device



After the update, the application publish date changes to the version pulled from the server.

Reset device registration

Device registration restricts a data collection device to a user. If a data collector logs into two different devices to collect data for the same facility, this will result in duplication and/or data loss. During data

concatenation, the program might not locate the correct data set, and consequently some sections of data could end up missing in the data set. In addition, if a team leader logs into two different devices and syncs data, this will result in duplication of data on the central server. To avoid this, there is a restriction of one device per user. This applies to data collectors, team leaders, AND supervisors.

On initial login to the device/tablet, the user is prompted to register the device under their code. Once registered, no other user will be able to login to the device unless the registration is reset.

User 1	User 2
<p>On initial login to the device, the user will be prompted to register the device</p> <div> <p>This device/tablet is not registered for data collection.</p> <div> <div>Register device under my code</div> <div>Cancel</div> </div> </div> <p>Successful device registration</p> <div> <p>Device successfully registered!</p> <div>OK</div> </div>	<p>When another user attempts to login to a device that has already been registered, they will get the error message below.</p> <div> <p>This device is registered to Interviewer 1. You are not authorized to use this device for data collection. Please consult your team leader to reset the device.</p> <div>OK</div> </div>

Resetting the device registration enables a registered device to be reset so that another user can login. However, **SHARING of devices is HIGHLY discouraged!** The reset device registration feature can be used in a situation where the device should be used by another data collector, team leader, or supervisor.

The data manager can reset the device registration for any user. Supervisors can reset the device registration for team leaders and data collectors under their supervision. Team leaders can reset the device registration for data collectors on their team. Resetting device registration must be done in-person and cannot be done remotely. To reset a device's registration, take the following steps:

1. The respective team leader/supervisor/data manager logs into the device that has been registered using the code that the device was originally registered to.
2. Enter the device reset code.
3. A prompt will appear asking for confirmation of the device deregistration. Select Yes to proceed.
4. A message will appear informing that the device has been successfully deregistered. At this point, the next user that logs into the device will be required to register the device before they can use it to collect HHFA data.

Data manager/supervisor/team leader logs into the device that has been registered

- Receive section assignments
- Collect data
- Send data to team leader
- Sync data for backup
- View reports
- Update application
- Receive application files from team leader
- Logout/Exit
- Reset device registration (Interviewer 1)**

Enter the device reset code.

Enter device reset code

Are you sure you want to reset the device registration from Interviewer 1

Yes No

After successful deregistration another user can login to the device

Device de-registered successfully!

OK

Device sharing is not permitted! Do not:

- Use your own device
- Use a second device
- Share devices

If you need to replace your device, talk to the data manager for instructions on how to do so appropriately.

Tracking progress towards survey completion

In addition to collecting validation data, supervisors are responsible for tracking progress towards survey completion for the teams they supervise. The following sections discuss tracking progress is accomplished with the HHFA CSPro application using tablets.

No.	Who?	What?	When?
1	Supervisor	Download all data	As needed
2	Supervisor	View reports	As needed

Download all data

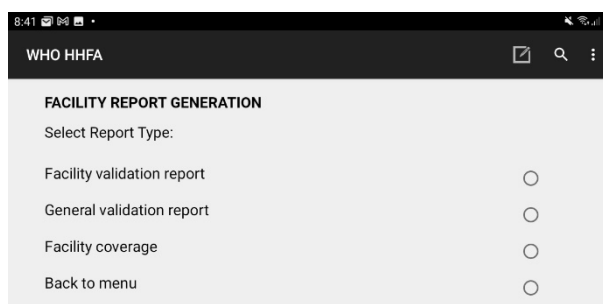
The first step in tracking progress towards survey completion is downloading all the data from the server. This is required to generate and view reports on facility coverage. To download all data, take the following steps:

1. Select the Download all data option from the main menu.
2. If data is downloaded successfully, you will get the message “HHFA data downloaded successfully!”

View reports

Two types of facility coverage reports can be generated by the supervisor to track team data collection progress.

1. **Facilities List:** List of facilities done by the respective teams under the supervisor. The report provides the interview status for each facility.
2. **Map View:** Gives a map showing the exact points on the map where the facilities are located that the supervisor's teams have visited and collected data for.



To view facility coverage report – list view, take the following steps:

1. Select the Download all data option from the main menu. When data is successfully downloaded you will be returned to the main menu.
2. Select the View reports option from the main menu.
3. Select Facility coverage, then choose Facilities list and click on the green check mark.
4. A list of facilities visited by the team will show with the interview status for each facility.
5. Use the Back button on the tablet to return to the supervisor menu.

1. Select Download all data

Select facility sections for validation ☐

Validate facility data ☐

Sync validation data ☐

Download all data ☒

View reports ☐

Update application ☐

Logout/Exit ☐

Reset device registration (Supervisor 1) ☐

2. Select View reports

Select facility sections for validation ☐

Validate facility data ☐

Sync validation data ☐

Download all data ☐

View reports ☒

Update application ☐

Logout/Exit ☐

Reset device registration (Supervisor 1) ☐

3. Select Facility coverage, then choose Facilities list and click on the green check mark

4. List of facilities visited by team will show with interview status for each facility

Facility #	Facility Name	Team Leader	Interview Status	GPS
100001	National Referral Hospital #1	Team Leader 1	Interview incomplete	GPS Not Collected
100001	National Referral Hospital #1	Team Leader 1	Interview incomplete	GPS Not Collected
200003	Regional (Provincial) Referral Hospital #1	Team Leader 1	Interview incomplete	GPS Not Collected
700003	Health Centre #3	Team Leader 1	Interview incomplete	GPS Not Collected
700003	Health Centre #3	Team Leader 1	Interview incomplete	GPS Not Collected
700004	Health Centre #4	Team Leader 1	Interview incomplete	GPS Not Collected

Report generated at 21:04 - 05/05/22

After reviewing the facility coverage report, discuss with your team leaders to make sure:

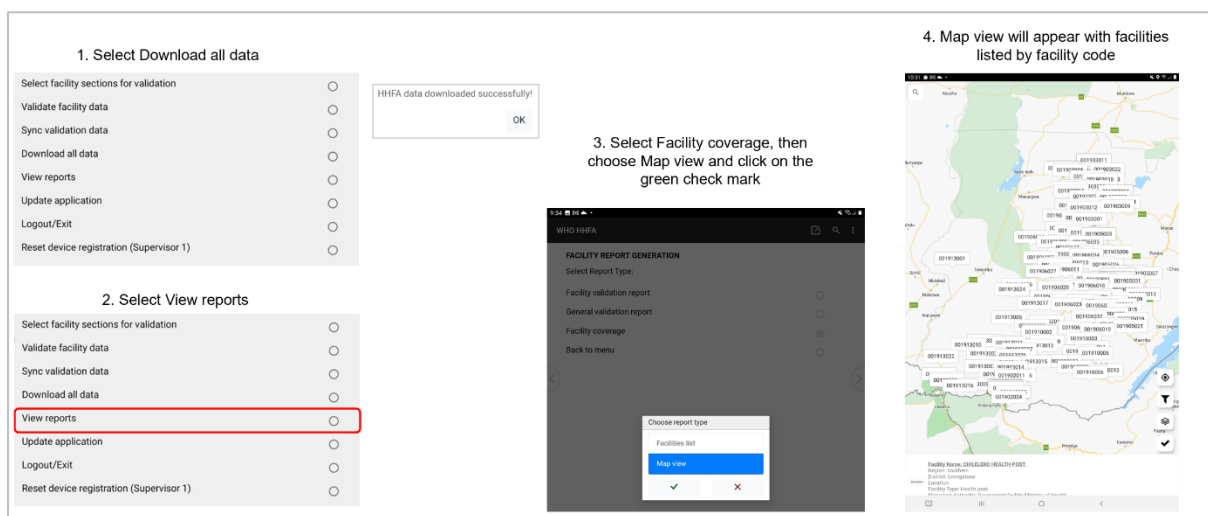
1. The team is on track with data collection
2. The information on facility completion in your report is consistent with the team leader report

The complete record is used for generating reports about survey completeness. If team leaders do not create the complete record, the supervisors and data manager will think data collection is incomplete. If there is a discrepancy between the facility completeness report seen by supervisors/data manager and team leaders, ask the team leader to utilize the Create complete facility record and sync data.

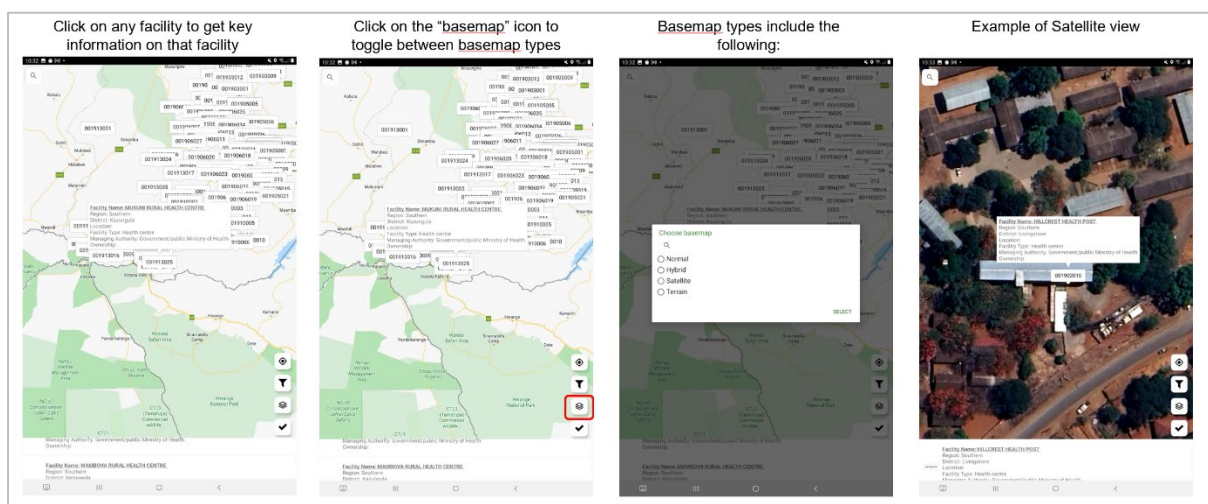
Remind team leaders on an ongoing basis that at the end of each day they should utilize the Create complete facility record and sync data to ensure the most up-to-date information is available for survey progress monitoring.

To view facility coverage report – map view, take the following steps:

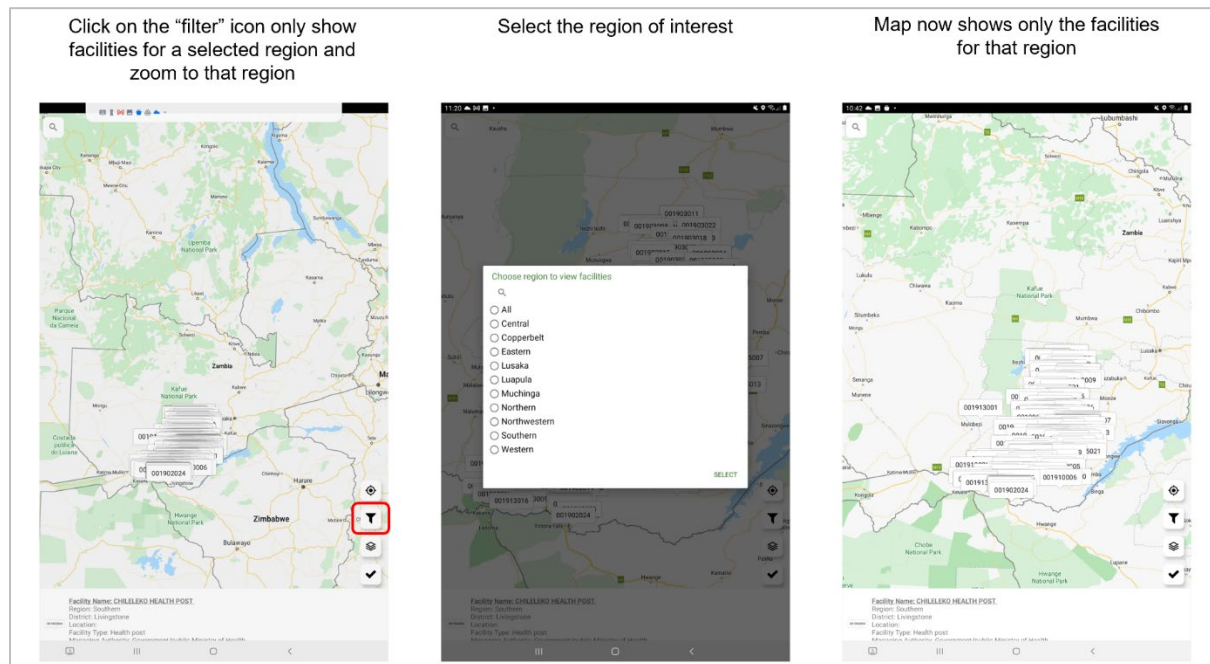
1. Select the Download all data option from the main menu. When data is successfully downloaded you will be returned to the main menu.
2. Select the View reports option from the main menu.
3. Select Facility coverage, then choose Map View and click on the green check mark.
4. A map will show with a point for each facility where data has been collected by your team. Each facility is labelled with the facility code.



5. Click on any facility to get key information on that facility.
6. Click on the “basemap” icon circled below in red to toggle between basemap types. There are four basemap types – normal, hybrid, satellite, and terrain. The default map types is “normal”. An example of the satellite view is shown in the image below.



1. Click on the “filter” icon circled below in red to only show facilities for a selected region and to zoom to that region on the map. After selecting the filter button, select the region of interest. The map now shows only the facilities for that region.
2. Use the Back button on the tablet to return to the supervisor menu.



13. Prepare for data collection

Clear data after training / pilot

Clear data from tablets

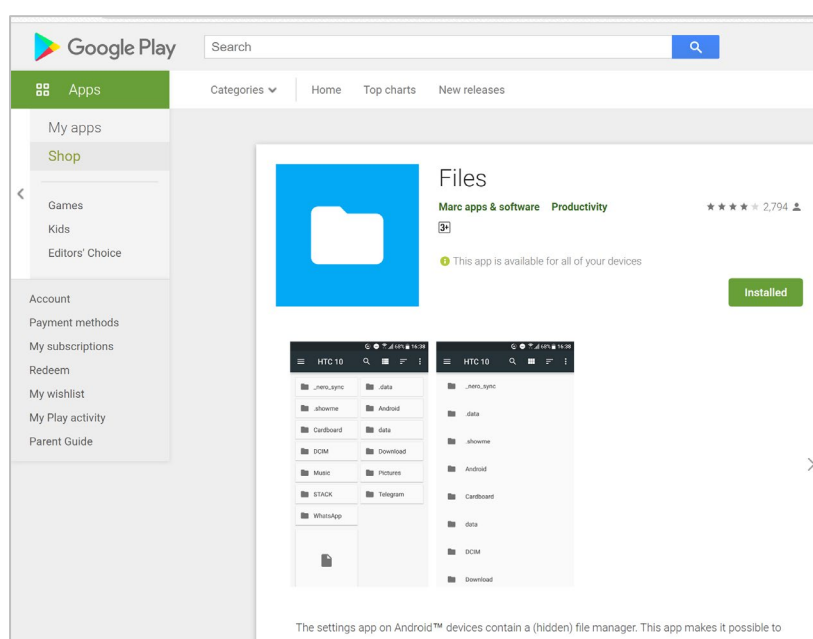
Before the tablets are sent out for official data collection, data **must** be cleared from all tablets that were used for training and piloting the questionnaire. This is a vital step as any training data that remains on the tablets may create problems with data management as duplicate data sections may appear and it can be very difficult to distinguish training data from real data once data collection begins. Ultimately, loss of data may occur if training data remains on the tablets.

To clear data from the tablets, you must access the folder where CSEntry is installed and the data are stored. With a new installation of CSEntry 7.5+, the CSEntry folder will be found at:

`/Android/data/gov.census.cspro.csentry/files/csentry`

To clear data from tablets, take the following steps:

1. Go to the folder `Android/data/gov.census.cspro.csentry/files/csentry/HHFA/data`
2. Open the data folder and delete all files.
3. The folder `Android/data` is a secure folder and some file managers may not allow direct access to this folder. If you cannot access the `Android/data` folder or you open it but do not see any files in this folder, you may need to install an additional file manager application to complete this process. If this is the case, take the following steps to install an additional file manager and delete all data files:
 - a. Install the application 'Files' from the Google Play store.
(<https://play.google.com/store/apps/details?id=com.marc.files&hl=en&gl=US>)



- b. Open the installed Files application. You should be able to access the Android/data/gov.census.cspiro.csentry/files/csentry/HHFA/ folder.
- c. Use the steps outlined above to clear data from the data folder.

Clear data from the server (CSWeb)

If CSWeb is used for data synchronization, all data must be cleared from the CSWeb server. To clear data from CSWeb, take the following steps:

1. Go to the CSWeb server link you have set up and login as an administrator.
2. Click on the data tab on the left.
3. Download any datasets from the pilot that you want to backup/save a copy of.
4. Click delete on all the dictionaries you see on the dashboard. (Note that this will permanently delete the data, so ensure that you have downloaded according to the above instruction.)
5. Use the CSPro deploy tool to deploy a fresh version of the application to CSWeb.

Clear data from the server (Dropbox)

If Dropbox is being used for data synchronization, all data must be cleared from the Dropbox server. To clear data from Dropbox, take the following steps:

1. Use the CSPro Data Viewer tool to download/create a backup of data.
2. Sign-in to Dropbox using a web browser.
3. Go to the folder CSPro/apps and delete the HHFA related files.
4. Go to the folder CSPro/DataSync and delete all the HHFA related files and folders. (e.g., HHFA_COMB, HHFA_DICT, HFA_ASSIGNMENTS_DICT)
 - Note that if you have multiple CSPro surveys deployed to Dropbox, they will all have their data stored here. Be careful about what you are deleting!
5. Use the CSPro deploy tool to deploy a fresh version of the application to Dropbox.

Make final updates to the HHFA CSPro application

The pilot experience during training provides an opportunity to practice the data collection process. During the pilot, often the survey team identifies minor adjustments that need to be made to either the questionnaire content or the CSPro programming. It is the responsibility of the data manager to make final updates to the HHFA CSPro application based on feedback from the pilot experience and decisions by the survey management team.

Note: Making change to the HHFA CSPro application assumes that pilot data will be discarded and not used in the final survey dataset.

Deploy HHFA CPro application for data collection

As part of the HHFA application finalization process, the data manager is also responsible for:

- Checking the staff listing and ensuring data collection teams have been finalized.
- Checking the facility sample file has been finalized.
- Redeploying the final HHFA application, updating all tablets, and redistributing tablets to data collection teams.

Don't forget to deploy the application with data saved in the data folder located at HFA_WHO\data for the data collection! Please ensure you have changed this location as the training data folder should have been used during training/pilot testing.

PART 3: DATA COLLECTION

Ensuring high quality data requires reviewing data in real time during data collection. Multiple individuals have responsibilities for reviewing data over the course of a HHFA. As a general rule for the HHFA CPro application, while data collection is ongoing, all edits to the data must be made on the tablet originally used to collect the data. This section will briefly discuss the process of reviewing data during data collection.

14. Reviewing data during data collection

Review data during data collection

During data collection, reviewing of data is the responsibility of almost all HHFA user roles:

- Data collectors use the View reports feature to review the completeness of the sections they have been assigned for specific facilities.
- Team leaders use the View reports feature to review the completeness of questionnaires for facilities assigned to their team.
- Supervisors use the View reports feature to review the completeness of questionnaires for facilities assigned to several teams, in order to see progress across a district or region.
- Data managers use the tracking sheet (described in the next section) to track the progress across all teams towards completing data collection for all facilities. Data managers are responsible for recording information such as facilities that are replaced, closed, etc. throughout the data collection process. In addition, data managers should use the tracking sheet to record any issues with duplicate facility names/codes observed in the dataset and the resolutions that need to be implemented in the data processing phase based on discussion with field teams.

Regular review of the data helps to ensure that all sections for all facilities are captured. It can also help to identify any missing data and/or challenges with the data collection process in real-time, so that the issues can be addressed while data collection teams are still in the field. It is important to note that all editing of data must be done on the original tablet on which the data were collected until data collection is complete and the data have been handed over to the data manager for the final stages of data processing.

Track progress towards survey completion

Download data

Tracking of progress towards survey completion requires downloading of the HHFA data. Data managers have several options for downloading data:

1. Download from the HHFA setup menu.
2. Download from CSWeb or Dropbox (depending on the sync method used).

A quick recall of the data collection process may help to understand the data download options and the files that are downloaded:

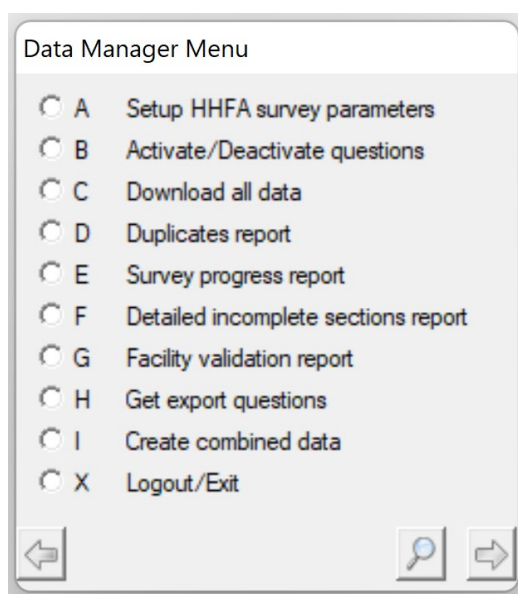
- Team leaders assign sections of the HHFA questionnaire to data collectors. The module assignments are saved in the HFA_Assignments.dcf dictionary (also called the HHFA Section Assignments).
- Data collectors collect data using the HFA_DICT.dcf dictionary (also called WHO HHFA Individual Interviewer Questionnaire).
- Data collectors sync the data they have collected to the server.
- Data collectors also send the data they have collected back to the team leader.
- The team leader has a function on their tablet to merge sections across data collectors for a facility and create a complete record per facility. These data are saved with the HFA_COMB.dcf dictionary (also called WHO HHFA Combined Questionnaire).

Therefore, the data manager can choose to download:

- the combined data file,
- the individual interviewer questionnaire files, and/or
- the modules assignment file.

To download data through the HHFA setup menu, take the following steps:

1. Open the HFA_WHO folder, double-click to open the HHFA_Menu.ent.
2. Click the traffic icon to run the application.
3. Click OK to proceed when the next window pops up asking to specify data files.
4. You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:



5. Select Option 'C' to download all data. You will get three successful download messages and the data will automatically be saved in the HFA_WHO\data folder. This will download the HFA_Data.csdb file, HFA_COMB.csdb file, and HFA_Assignments.csdb file.
6. Select Option 'X' to exit the Data manager menu.

To download data from CSWeb, take the following steps:

1. Go to the CSWeb server link you have setup and login as an administrator.
2. Click on the data tab on the left.
3. Click Download next to the dataset you want to download. This downloads a .pff file to your computer.
4. Open the .pff file. This launches the CSPro data viewer. Enter your user name and password. The csdb file will automatically download.
5. If you want to change the name and/or the location where the file is saved, click File → Save as → Data, and browse to a location of your choice. It is recommended to save the data files in the HFA_WHO\data folder.

CSPro's Dropbox sync does not store a single data file in the Dropbox. Instead, it stores a file in /CSPro/DataSync/ for every synchronization. Therefore, you will not see the data as a single file. In order to obtain the combined data file, use the Data Viewer to download the data from Dropbox. To download data from Dropbox, take the following steps:

1. Go to the start menu and select Programs → CSPro 7.7 → Data viewer.
2. From the file menu of the Data Viewer, select Download.
3. In the resulting dialog box, select Dropbox and click on the Connect button. You will need to enter the Dropbox account that is associated with the survey. CSPro will populate the "Data" dropdown using the data file list from Dropbox. Select the dictionary label associated with the files you wish to download.
4. In Save As, navigate to the folder in which to store the file and give the file a name. Click the Save button. For the HHFA, save the file in the HFA_WHO\data folder.
5. Click Download. CSPro will download the file to the specified folder/file name and will display the contents of the file.
6. After downloading the file, to get updated data, you can open the .csdb file again in DataViewer and choose Synchronize instead of Download. This should be faster since it will only download cases that were updated since the file was last synced.

Note: You do NOT need to have Dropbox installed on the computer to use Dropbox synchronization or DataViewer. CSPro uses the Dropbox web API which is independent of the Dropbox client software that you install on your computer.

If you have problems using the Data Viewer, a few common issues can be checked: 1) Make sure that the internet network you are using has not blocked access to Dropbox. 2) Make sure that your computer has .NET framework version 4.7 or later installed.

If you want to change the Dropbox account associated with the DataViewer synchronization, you must remove the saved username and password. To do this, take the following steps:

On Windows Desktop: Select the File tab in CSPro, click CSPro Settings, and then click Clear Credentials.

On Android: Press the Menu icon (vertical ellipses) on the Entry Applications screen of CSEntry. Press Settings, then press Clear Credentials.

Track progress

Throughout data collection, the data manager is responsible for taking stock of the data, and knowing which facilities have been visited. In addition, the data manager is responsible for recording key information from the field teams about facilities that may be closed, inaccessible, or could not be found so that at the end of data collection all of this information is readily available for the data cleaning and dataset finalization process.

An Excel tracking table such as the following should be maintained by the data manager to facilitate this process:

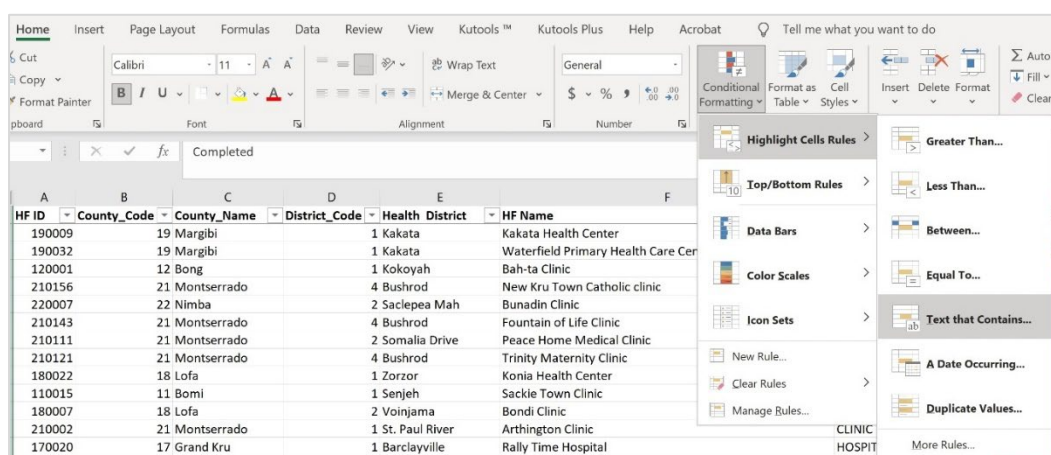
1	HF ID	County_Code	County_Name	District_Code	Health District	HF Name	HF Type	HF Code	Completed	Comments
2	190009	19	Margibi	1	Kakata	Kakata Health Center	HEALTH CENTER	LR2RH4_1	No	Closed
3	190032	19	Margibi	1	Kakata	Waterfield Primary Health Care Center	HEALTH CENTER	LR2RH4_2	Replacement	Replacement for Kalata HC
4	120001	12	Bong	1	Kokoyah	Bah-ta Clinic	CLINIC	LRKLP8_1	No	Closed
5	210156	21	Montserrado	4	Bushrod	New Kru Town Catholic clinic	CLINIC	LRKLP8_2	Yes	
6	220007	22	Nimba	4	Saclepea Mah	Bunadin Clinic	CLINIC	LRVT11_1	Yes	
7	210143	21	Montserrado	4	Bushrod	Fountain of Life Clinic	CLINIC	LRVT11_2	Yes	
8	210111	21	Montserrado	2	Somalia Drive	Peace Home Medical Clinic	CLINIC	LR0048	Yes	
9	210121	21	Montserrado	4	Bushrod	Trinity Maternity Clinic	CLINIC	LR0158	Yes	
10	180022	18	Lofa	1	Zorzor	Konia Health Center	HEALTH CENTER	LR01X8	Yes	
11	110015	11	Bomi	1	Senjeh	Sackie Town Clinic	CLINIC	LR0608	Yes	
12	180007	18	Lofa	2	Voijama	Bondi Clinic	CLINIC	LR0838	Yes	
13	210002	21	Montserrado	1	St. Paul River	Arthington Clinic	CLINIC	LR0818	Yes	
14	170020	17	Grand Kru	1	Barclayville	Rally Time Hospital	HOSPITAL	LR0C58	Yes	
15	110013	11	Bomi	3	Klay	Malema Clinic	CLINIC	LR0GT8	Yes	
16	140001	14	Grand Bassa	3	District #3 A&B	Barsesigah Clinic	CLINIC	LR0GZ8	Yes	
17	120024	12	Bong	2	Zota	Naama Clinic	CLINIC	LR0HF8	Replacement	Replacement for Bah-ta Clinic
18	210069	21	Montserrado	5	Central Monrovia	SDA Cooper Memorial Hospital	HOSPITAL	LR0KD8	Yes	
19	210072	21	Montserrado	5	Central Monrovia	SOCIAL ORGANIZATION SOCIETY	HEALTH CENTER	LR0KY8	Yes	
20	140008	14	Grand Bassa	4	District #4	Compound # 4 Clinic	CLINIC	LR0LS8	Yes	
21	210090	21	Montserrado	5	Central Monrovia	FIAMAH COMMUNITY CLINIC	CLINIC	LR0MV8	Yes	
22	250025	25	Sinoe	3	Payne Town	Payne Town Clinic	CLINIC	LR0RA8	Yes	
23	210028	21	Montserrado	4	Bushrod	Liberia Coast Guard Clinic	CLINIC	LR0S78	Yes	
24	250018	25	Sinoe	7	Dugbe River	Karuekpoo Clinic	CLINIC	LR0SS8	Yes	
25	120009	12	Bong	5	Fuamah	Degei Clinic	CLINIC	LR0UJ8	Yes	
26	180018	18	Lofa	5	Salayea	Gorlu Clinic	CLINIC	LR0VT8	Yes	
27	180020	18	Lofa	3	Kolahun	Kamatahun Clinic	CLINIC	LR1071	Yes	

In this example, the facilities highlighted in green are those that were in the original data set and that have been assessed. The facilities highlighted in yellow are replacement facilities. It is important to indicate which of the facilities from the original sample have been replaced and which facilities have been used as replacements. Finally, the facilities highlighted in red are those that could not be assessed. Information on why the facility could not be assessed should be included in the comments column of the tracking table.

Tips for creating a tracking sheet

- The first tab of the tracking sheet is most easily populated using the facility sample file.
 - Add two additional columns: 'Completed' and 'Comments'

- Name the first tab 'Sample'.
- The second tab of the tracking sheet is most easily populated by downloading your final Combined Questionnaire dataset, exporting to Excel using the CSPro Export tool (see Chapter 16), and copy/pasting the list of facility IDs (Q100) to column A.
 - Add a second column called 'In sample'
 - Name the second tab 'Data_file'
- Use VLOOKUP to populate the 'Sample' column called 'Completed'. This will check the list of facilities from the Data_file tab. If the facility ID is found, the Completed column will say 'Yes'; if not, it will say 'No'
 - =IF(ISNA(VLOOKUP(A5,data_file!A:A,1,FALSE))), "No", "Yes")
- Use VLOOKUP to populate the 'Data_file' column called 'In sample'. This will check the list of facilities from the Sample tab. If the facility ID is found, the In sample column will say 'Yes'; if not, it will say 'No'. This tab is useful for identifying facilities that were not part of the original sample (i.e. replacements).
 - =IF(ISNA(VLOOKUP(A2,Sample!A:I,1,FALSE))), "No", "Yes")
- Apply conditional formatting to the 'Sample' column called 'Completed' to easily identify missing facilities:
 - Select Column, then go to Home → Conditional formatting → Highlight cell rules → Text that contains... to apply conditional formatting colors.



Additional data manager tools useful for tracking survey completeness

Several additional reports can be generated from the data manager menu to assist with tracking survey progress. These include:

- Duplicates report - Checks for duplicate facility IDs in the combined dataset and provides a report of the facility name, facility ID, team leader, and interview status for any duplicate facilities.
- Survey progress report – Provides an overview of the status of data collection for all facilities in the facility sample file.
- Detailed incomplete sections report – Provides information on which sections are incomplete for facilities that have been assigned to data collectors.
- Facility validation report – Provides information on which facilities have had a supervisor validation visit.

Instructions for generating these reports are included in Chapter 15: Reviewing and Editing data.

PART 4: DATA PROCESSING

15. Reviewing and editing data

Ensuring high quality data requires reviewing and editing data in real time during data collection as well as after data collection is complete. Multiple individuals have responsibilities for reviewing data over the course of a HHFA. As a general rule for the HHFA CSPro application, while data collection is ongoing, all edits to the data must be made on the tablet originally used to collect the data. Once all data collection is complete, further data edits can be made to the combined dataset by the data manager using a batch edit application. This section will provide in-depth instructions on reviewing and editing data after data collection is complete.

Track progress towards survey completion

Sync data from all tablets

Once data collection is complete, it is highly recommended that the data manager sync data from all tablets one final time as the tablets are returned from the field. This will ensure that all data that have been collected are reflected in the final dataset and will help in managing issues that may arise with missing data during the data processing phase. Syncing data from all tablets should include:

- Syncing data from data collector tablets to server.
- Syncing data from data collector tablets to team leader tablets.
- Creating complete records on team leader tablets.
- Syncing team leader tablets to server.

These steps may seem time consuming, but they will ensure that all data are included in the final dataset and that any facilities not accounted for in the final dataset are not hidden on a tablet somewhere. Much time can be lost in hunting down missing facility data after data collection is complete.

Download data

Tracking of progress towards survey completion requires downloading of the HHFA data. Data managers have several options for downloading data:

1. Download from the HHFA setup menu.
2. Download from CSWeb or Dropbox (depending on the sync method used).

A quick recall of the data collection process may help to understand the data download options and the files that are downloaded:

- Team leaders assign sections of the HHFA questionnaire to data collectors. The module assignments are saved in the HFA_Assignments.dcf dictionary (also called the HHFA Section Assignments).
- Data collectors collect data using the HFA_DICT.dcf dictionary (also called WHO HHFA Individual Interviewer Questionnaire).
- Data collectors sync the data they have collected to the server.
- Data collectors also send the data they have collected back to the team leader.
- The team leader has a function on their tablet to merge sections across data collectors for a facility and create a complete record per facility. These data are saved with the HFA_COMB.dcf dictionary (also called WHO HHFA Combined Questionnaire).

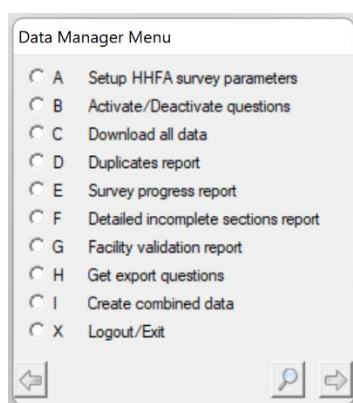
Therefore, the data manager can choose to download:

- the combined data file,
- the individual interviewer questionnaire files, and/or
- the modules assignment file.

In some cases, the data manager may want to download both the combined data file and the individual interviewer questionnaire files. The data manager may then want to use the individual interviewer files to recreate the combined file as a check that the data from all data collectors ended up in the final combined data set (this requires the assignments file). If you want to do this, please download data from the HHFA setup menu as there is some additional functionality in this interface to support this approach.

To download data through the HHFA setup menu, take the following steps:

1. Open the HFA_WHO folder, double-click to open the HHFA_Menu.ent.
2. Click the traffic icon to run the application.
3. Click OK to proceed when the next window pops up asking to specify data files.
4. You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:



5. Select Option 'C' to download all data. You will get three successful download messages and the data will automatically be saved in the HFA_WHO\data folder. This will download the HFA_Data.csdb file, HFA_COMB.csdb file, and HFA_Assignments.csdb file.
6. Select Option 'X' to exit the Data manager menu.

To download data from CSWeb, take the following steps:

1. Go to the CSWeb server link you have setup and login as an administrator.
2. Click on the data tab on the left.
3. Click Download next to the dataset you want to download. This downloads a .pff file to your computer.
4. Open the .pff file. This launches the CSPro data viewer. Enter your user name and password. The csdb file will automatically download.
5. If you want to change the name and/or the location where the file is saved, click File → Save as → Data, and browse to a location of your choice. It is recommended to save the data files in the HFA_WHO\data folder.

CSPro's Dropbox sync does not store a single data file in the Dropbox. Instead, it stores a file in /CSPro/DataSync/ for every synchronization. Therefore, you will not see the data as a single file. In order to obtain the combined data file, use the Data Viewer to download the data from Dropbox. To download data from Dropbox, take the following steps:

1. Go to the start menu and select Programs → CSPro 7.7 → Data viewer.
2. From the file menu of the Data Viewer, select Download.
3. In the resulting dialog box, select Dropbox and click on the Connect button. You will need to enter the Dropbox account that is associated with the survey. CSPro will populate the "Data" dropdown using the data file list from Dropbox. Select the dictionary label associated with the files you wish to download.
4. In Save As, navigate to the folder in which to store the file and give the file a name. Click the Save button. For the HHFA, save the file in the HFA_WHO\data folder.
5. Click Download. CSPro will download the file to the specified folder/file name and will display the contents of the file.
6. After downloading the file, to get updated data, you can open the .csdb file again in DataViewer and choose Synchronize instead of Download. This should be faster since it will only download cases that were updated since the file was last synced.

Note: You do NOT need to have Dropbox installed on the computer to use Dropbox synchronization or DataViewer. CSPro uses the Dropbox web API which is independent of the Dropbox client software that you install on your computer.

If you have problems using the Data Viewer, a few common issues can be checked: 1) Make sure that the internet network you are using has not blocked access to Dropbox. 2) Make sure that your computer has .NET framework version 4.7 or later installed.

If you want to change the Dropbox account associated with the DataViewer synchronization, you must remove the saved username and password. To do this, take the following steps:

On Windows Desktop: Select the File tab in CSPro, click CSPro Settings, and then click Clear Credentials.

On Android: Press the Menu icon (vertical ellipses) on the Entry Applications screen of CSEntry. Press Settings, then press Clear Credentials.

Track progress

When data collection is complete, the data manager is responsible for taking stock of the data and determining what has been collected. It is important to check that all facilities in the sample have been covered and, if not, to keep track of those that are missing, replaced, closed, inaccessible, etc. An Excel tracking table such as the following should be maintained by the data manager to facilitate this process:

	A	B	C	D	E	F	G	H	I	J
	HF ID	County_Code	County_Name	District_Code	Health District	HF Name	HF Type	HF Code	Completed	Comments
2	190009	19	Margibi	1	Kakata	Kakata Health Center	HEALTH CENTER	LR2RH4_1	No	Closed
3	190032	19	Margibi	1	Kakata	Waterfield Primary Health Care Center	HEALTH CENTER	LR2RH4_2	Replacement	Replacement for Kalata HC
4	120001	12	Bong	1	Kokoyah	Bah-ta Clinic	CLINIC	LRKLP8_1	No	Closed
5	210156	21	Montserrado	4	Bushrod	New Kru Town Catholic clinic	CLINIC	LRKLP8_2	Yes	
6	220007	22	Nimba	2	Saclepea Mah	Bunadin Clinic	CLINIC	LRVT11_1	Yes	
7	210143	21	Montserrado	4	Bushrod	Fountain of Life Clinic	CLINIC	LRVT11_2	Yes	
8	210111	21	Montserrado	2	Somalia Drive	Peace Home Medical Clinic	CLINIC	LR0048	Yes	
9	210121	21	Montserrado	4	Bushrod	Trinity Maternity Clinic	CLINIC	LR0158	Yes	
10	180022	18	Lofa	1	Zorzor	Konia Health Center	HEALTH CENTER	LR01X8	Yes	
11	110015	11	Bomi	1	Senjeh	Sackie Town Clinic	CLINIC	LR0608	Yes	
12	180007	18	Lofa	2	Voinjama	Bondi Clinic	CLINIC	LR0838	Yes	
13	210002	21	Montserrado	1	St. Paul River	Arthington Clinic	CLINIC	LR0818	Yes	
14	170020	17	Grand Kru	1	Barclayville	Rally Time Hospital	HOSPITAL	LR0C68	Yes	
15	110013	11	Bomi	3	Klay	Malema Clinic	CLINIC	LR0GT8	Yes	
16	140001	14	Grand Bassa	3	District #3 A&B	Barseeglah Clinic	CLINIC	LR0GZ8	Yes	
17	120024	12	Bong	2	Zota	Naama Clinic	CLINIC	LR0HF8	Replacement	Replacement for Bah-ta Clinic
18	210069	21	Montserrado	5	Central Monrovia	SDA Cooper Memorial Hospital	HOSPITAL	LR0KD8	Yes	
19	210072	21	Montserrado	5	Central Monrovia	SOCIAL ORGANIZATION SOCIETY	HEALTH CENTER	LR0KY8	Yes	
20	140008	14	Grand Bassa	4	District #4	Compound # 4 Clinic	CLINIC	LR0L58	Yes	
21	210090	21	Montserrado	5	Central Monrovia	FIAMAH COMMUNITY CLINIC	CLINIC	LR0MV8	Yes	
22	250025	25	Sinoe	3	Pyne Town	Payne Town Clinic	CLINIC	LR0RA8	Yes	
23	210028	21	Montserrado	4	Bushrod	Liberia Coast Guard Clinic	CLINIC	LR0S78	Yes	
24	250018	25	Sinoe	7	Dugbe River	Karquelpo Clinic	CLINIC	LR0S58	Yes	
25	120009	12	Bong	5	Fuamah	Degel Clinic	CLINIC	LR0UJ8	Yes	
26	180018	18	Lofa	5	Salayea	Gorlu Clinic	CLINIC	LR0VT8	Yes	
27	180020	18	Lofa	3	Kolahun	Kamatahun Clinic	CLINIC	LR1071	Yes	

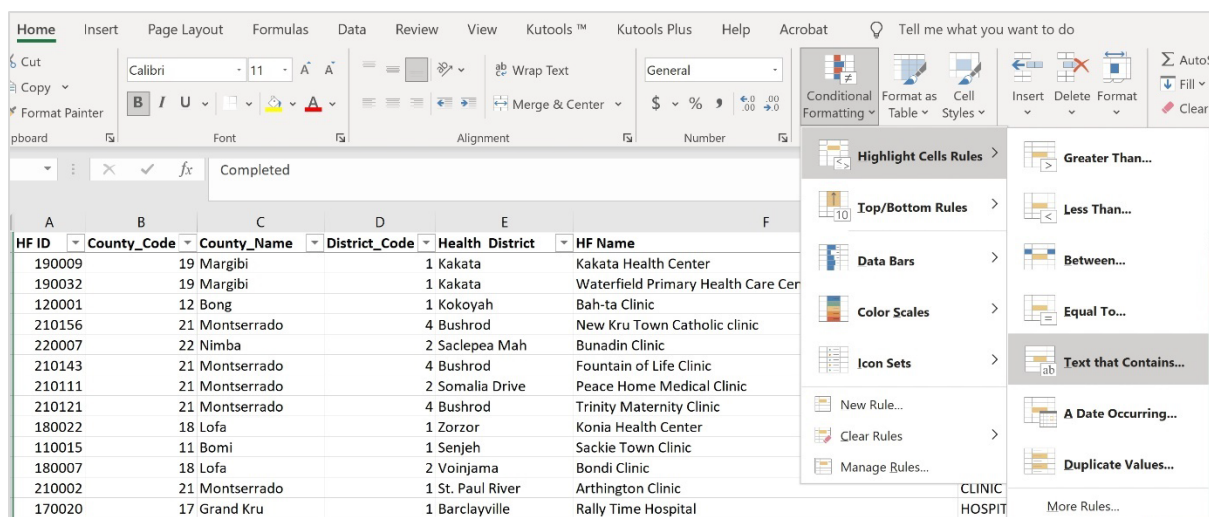
In this example, the facilities highlighted in green are those that were in the original data set and that have been assessed. The facilities highlighted in yellow are replacement facilities. It is important to indicate which of the facilities from the original sample have been replaced and which facilities have been used as replacements. Finally, the facilities highlighted in red are those that could not be assessed. Information on why the facility could not be assessed should be included in the comments column of the tracking table.

The tracking process can help identify issues with duplicate facilities, tablets that did not sync, issues with assignments and syncing of data, etc. Make sure that you can account for all facilities before proceeding with data review and editing of data. Determine the total number of facilities that are missing. Seek out reasons why they were not surveyed from data collection teams. Make all efforts to

capture data before proceeding. This information is extremely useful in understanding what happened during the field data collection and any deviations from the original plan. This information will also be very helpful later when calculating sample weights if a sample survey was conducted.

Tips for creating a tracking sheet

- The first tab of the tracking sheet is most easily populated using the facility sample file.
 - Add two additional columns: 'Completed' and 'Comments'
 - Name the first tab 'Sample'.
- The second tab of the tracking sheet is most easily populated by downloading your final Combined Questionnaire dataset, exporting to Excel using the CSPro Export tool (see Chapter 16), and copy/pasting the list of facility IDs (Q100) to column A.
 - Add a second column called 'In sample'
 - Name the second tab 'Data_file'
- Use VLOOKUP to populate the 'Sample' column called 'Completed'. This will check the list of facilities from the Data_file tab. If the facility ID is found, the Completed column will say 'Yes'; if not, it will say 'No'
 - =IF(ISNA(VLOOKUP(A5,data_file!A:A,1,FALSE)), "No", "Yes")
- Use VLOOKUP to populate the 'Data_file' column called 'In sample'. This will check the list of facilities from the Sample tab. If the facility ID is found, the In sample column will say 'Yes'; if not, it will say 'No'. This tab is useful for identifying facilities that were not part of the original sample (i.e. replacements).
 - =IF(ISNA(VLOOKUP(A2,Sample!A:I,1,FALSE)), "No", "Yes")
- Apply conditional formatting to the 'Sample' column called 'Completed' to easily identify missing facilities:
 - Select Column, then go to Home → Conditional formatting → Highlight cell rules → Text that contains... to apply conditional formatting colors.

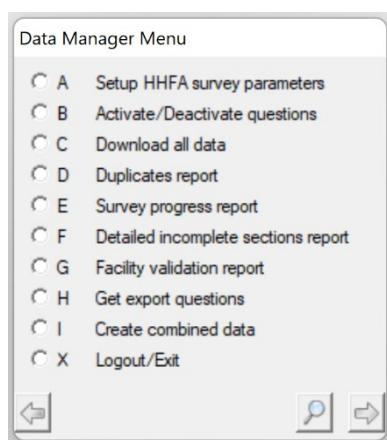


Review data for completeness

Once data managers know which facilities are included in the sample, the next important step is to ascertain the completeness of the data for each facility in the final dataset. The Data manager menu includes several reporting functions to generate information on the completeness of facility records in the final combined dataset. This includes the survey progress report, detailed incomplete sections report, and facility validation report.

To generate the survey progress report, take the following steps:

1. Open the HFA_WHO folder and double-click to open the HHFA_Menu.ent.
2. Click the Traffic icon to run the application.
3. Click OK to proceed when the next window pops up asking to specify data files.
4. You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:



Select Option 'E': Survey progress report. The report will be saved as a .csv file in the HFA_WHO\ref\csv_files folder and is called Survey_Progress.csv. The report will list all the

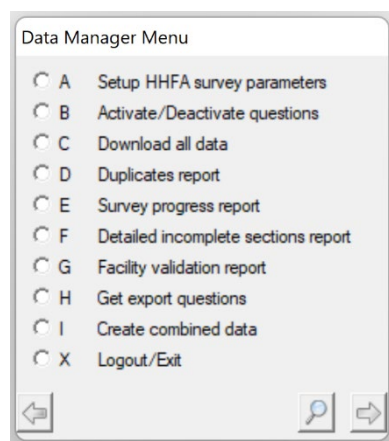
facilities in the facility sample file, the interview status, GPS collection status, and information on the percentage of sections that have been completed.

5. Select Option 'X' to exit the Data manager menu.
6. Go to the HFA_WHO\ref\csv_files folder open the file Survey_Progress.csv. The report will identify the facilities where data collection has not been started and facilities where assignments were made, but still have incomplete data.

Facility Code	Facility Name	Region	District	Team Leader Code	Team Leader Name	Interview Status	GPS	% Completion
100001	National Referral Hospital #1	Region 11	District 1/Region 11	1901	Team Leader 1	Interview incomplete	Not collected	11
100002	National Referral Hospital #2	Region 11	District 1/Region 11	1901	Team Leader 1	Interview incomplete	Not collected	11
100003	National Referral Hospital #3	Region 11	District 2/Region 11			Data not collected	Not collected	0
100004	National Referral Hospital #4	Region 12	District 1/Region 12	1901	Team Leader 1	Interview incomplete	Not collected	5
100005	National Referral Hospital #5	Region 12	District 2/Region 12			Data not collected	Not collected	0
200001	Regional (Provincial) Referral Hospital #1	Region 11	District 1/Region 11			Data not collected	Not collected	0
200002	Regional (Provincial) Referral Hospital #2	Region 11	District 2/Region 11			Data not collected	Not collected	0
200003	Regional (Provincial) Referral Hospital #3	Region 12	District 2/Region 12			Data not collected	Not collected	0
200004	Regional (Provincial) Referral Hospital #4	Region 12	District 2/Region 12			Data not collected	Not collected	0
200005	Regional (Provincial) Referral Hospital #5	Region 12	District 1/Region 12	1901	Team Leader 1	Interview incomplete	Not collected	2
700001	Health Centre #1	Region 11	District 1/Region 11	1901	Team Leader 1	Interview incomplete	Not collected	10
700002	Health Centre #2	Region 11	District 1/Region 11			Data not collected	Not collected	0
700003	Health Centre #3	Region 12	District 2/Region 12	1901	Team Leader 1	Interview incomplete	Not collected	2
700004	Health Centre #4	Region 12	District 2/Region 12	1901	Team Leader 1	Interview incomplete	Not collected	2
700005	Health Centre #5	Region 11	District 2/Region 11	1901	Team Leader 1	Interview incomplete	Not collected	2

To generate the detailed incomplete sections report, take the following steps:

1. Open the HFA_WHO folder and double-click to open the HHFA_Menu.ent.
2. Click the Traffic icon to run the application.
3. Click OK to proceed when the next window pops up asking to specify data files.
4. You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:



Select Option 'F': Detailed incomplete sections report. The report will be saved as a .csv file in the HFA_WHO\ref\csv_files folder and is called Incomplete_Sections.csv. The report will list all the facilities in the combined data file for which there are incomplete sections.

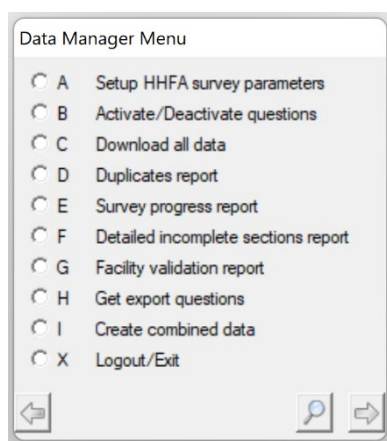
5. Select Option 'X' to exit the Data manager menu.

1. Go to the HFA_WHO\ref\csv_files folder open the file Incomplete_Sections.csv. The report will identify the facilities where assignments were made, but still have incomplete data. Each section that is incomplete will be listed in a separate row. The report ***will not*** say which specific questions have not been answered. For further details on unanswered questions, open the data set in the CSPro DataViewer or Export the dataset to .csv and open it in Excel. Follow-up with team leaders on any incomplete data. All efforts should be made to complete data collection before moving forward with data processing steps.

Facility Code	Facility Name	Team Leader Code	Team Leader Name	Section #	Section Title	Data Collector Code	Data Collector Name	Interview Status
100001	National Referral Hospital #1	1901	Team Leader 1	4	Facility Beds	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	5	Governance and Management	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	7	Systems & Practices To Support Staff	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	8	Monitoring & Implementation of Systems for Qty	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	10	Facility-Level Resources and Safety Practices	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	11	Facility Vehicles Infrastructure and Equipment	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	12	Health Financing and Accounting	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	13	Information Sources and Systems	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	14	Facility Statistics Reporting Systems	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.01	Outpatient Service Conditions	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.02	Outpatient: Infectious and Communicable Diseases	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.03	Outpatient: Noncommunicable Diseases (NCDs)	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.04	Services for Special Needs	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.05	Outpatient: Maternal Newborn and Child Health Services	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.06	Delivery and Newborn Care Services	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.07	Inpatient Postpartum/Postnatal Care (PNC)	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.08	Inpatient Care for The Small Or Sick Infant	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.09	HIV Services - HIV/TB Coinfection	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.13	Surgical Services	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.14	Imaging and Specialty Treatment Services	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	18.15	Emergency (Ambulance or Walk-in) Services	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	19	Blood Transfusion Services	1901	Team Leader 1	Section not started
100001	National Referral Hospital #1	1901	Team Leader 1	20	Laboratory	1901	Team Leader 1	Section not started

To generate the facility validation report, take the following steps:

1. Open the HFA_WHO folder and double-click to open the HHFA_Menu.ent.
2. Click the Traffic icon to run the application.
3. Click OK to proceed when the next window pops up asking to specify data files.
4. You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:



Select Option 'G': Facility validation report. A report will open which lists all the facilities for which a supervisor validation visit has been conducted. It will also include key details about the validation visit including the name of the supervisor who conducted the validation, the interview status, GPS coordinate status, number of sections assigned for validation, and number of sections completed for validation.

WHO HHFA Facilities Validation Report								
Facility Progress Report								
Facility #	Facility Name	Region	District	Validated By	Interview Status	GPS	Assigned Sections	Complete Sections
100001	National Referral Hospital #1	Region 11	District 1/Region 11	Supervisor 1	Interview incomplete	GPS Not Collected	4	0
100001	National Referral Hospital #1	Region 11	District 1/Region 11	Supervisor 1	Facility closed	GPS Not Collected	2	0
100002	National Referral Hospital #2	Region 11	District 1/Region 11	Supervisor 1	Interview complete	GPS Not Collected	3	3
700001	Health Centre #1	Region 11	District 1/Region 11	Supervisor 1	Interview incomplete	GPS Collected	5	4

Report generated at 06:04 - 05/12/22

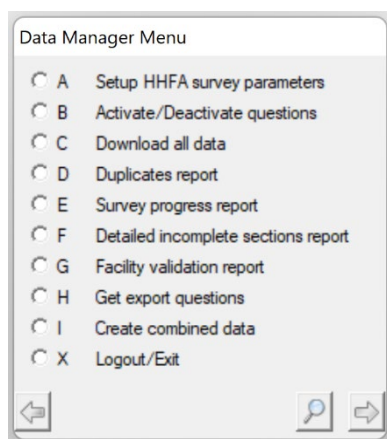
Close

- Click on 'Close' to exit the report.
- Select Option 'X' to exit the Data manager menu.

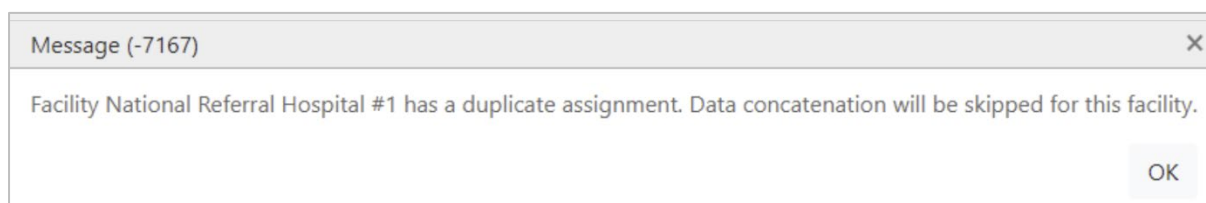
Validate combined dataset from individual questionnaire data

Data collectors sync their individual questionnaire sections as well as sending them to their team leader, who creates the combined data file and syncs the combined data file. In this way the data collectors' individual sections serve as backup data. In some cases, there may be interest in creating a combined dataset from the individual section data (i.e. the backup data) and comparing it to the combined dataset synced by the team leader. An example of where this may be useful is if data collectors report having collected data for a facility, but it does not appear in the combined dataset. To create a combined dataset from the individual questionnaire section data, take the following steps:

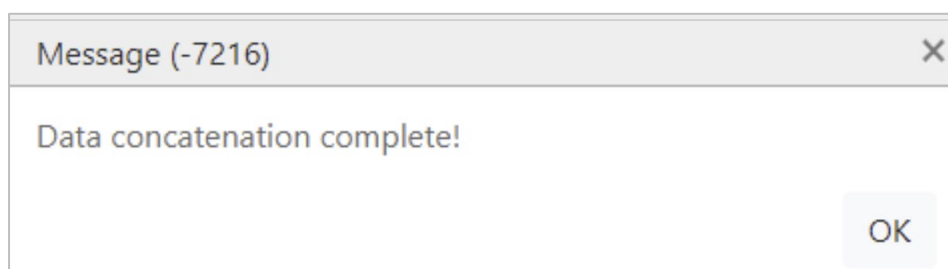
- Open the HFA_WHO folder and double-click to open the HHFA_Menu.ent.
- Click the Traffic icon to run the application.
- Click OK to proceed when the next window pops up asking to specify data files.
- You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:



5. Select Option 'C' to download all data. The data will automatically be saved in the HFA_WHO\data folder and this will download the HFA_Data.csdb file, the HFA_COMB.csdb file, and the HFA_Assignments.csdb file.
6. Select Option 'I' Create combined data. The combined data file will be generated from the individual data files and automatically saved as HFA_COMB_DM.csdb in the HFA_WHO\data folder. The Create combined data checks for duplicate assignments before concatenating the data. If duplicate assignments are present, an error message will be displayed like the one below for each duplicate assignment.



When data concatenation is complete, the following message will be displayed.



7. Select Option 'X' to exit the Data manager menu.
8. Open the HFA_COMB_DM.csdb file using the CSPro Data Viewer and compare it to the combined dataset. Compare the total number of records in the HFA_COMB_DM.csdb dataset to the total number of records in the HFA_Data.csdb dataset.
 - a. If there are more records in the HFA_COMB_DM.csdb dataset than in the HFA_Data.csdb dataset, this may indicate that team leaders did not sync all data.
 - b. In this case, retrieve all tablets that were used by team leaders during field work. Login and rerun the 'Create complete record' function followed by the 'Sync data' function on each tablet.

- c. Once this process has been completed on all tablets, download the HFA_Data.csdb dataset and compare it again to the number of records in the HFA_COMB_DM.csdb dataset. If there are still discrepancies, this may indicate that data collectors did not sync their data with team leaders.
 - i. Retrieve all tablets that were used by data collectors during field work. Login and run the 'Sync data with team leader' function on all tablets.
 - ii. Login as the team leader for each data collector. Repeat the steps to 'Create complete record' followed by 'Sync data'.
 - iii. Once this process has been completed on all tablets, download the HFA_Data.csdb dataset and compare it again to the number of records in the HFA_COMB_DM.csdb dataset. This should resolve any discrepancies between the datasets.

Note: The HFA_Data.csdb dataset will always be used as the “final” dataset. The HFA_COMB_DM.csdb dataset is used only as a check on the completeness of the HFA_Data.csdb file and should not be used for data analysis.

Identify and resolve duplicates

Duplicate cases are cases with the same facility code/name. If two cases appear to be duplicates according to facility code/name, but do not contain the same data, a list of criteria must be used to determine if it is a true duplicate. The following data elements could be used as the criteria for determining duplicates:

- Administrative area (i.e. region and district)
- Facility code/name
- GPS coordinates (if collected)
- Facility type
- Managing authority
- Interviewer's code

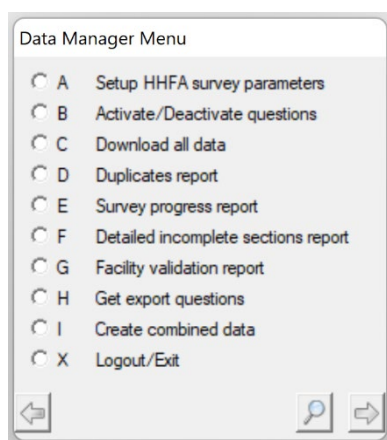
If all of these are the same, it is safe to consider the cases as duplicates. At this point, the most complete case should be kept in the data set. If both cases are complete, the case with latest time stamp should be kept.

Identify potential duplicates

To begin the process of identifying duplicates, first generate the duplicates report. To generate the duplicates report, take the following steps:

1. Open the HFA_WHO folder and double-click to open the HHFA_Menu.ent.
2. Click the Traffic icon to run the application.

- Click OK to proceed when the next window pops up asking to specify data files.
- You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:



Select Option 'D': Duplicates report. A report will open which lists all the facilities for which a duplicate is found in the combined dataset. It will also include key details about the duplicates including facility name, facility ID, team leader, and interview status. Any duplicates located indicate that either two teams surveyed the same facility or a team used the wrong facility code. The data manager will need to further investigate the potential duplicates to determine the cause of the duplicate.

WHO HHFA Facility Duplicate Report				
Facility Progress Report				
Facility #	Facility Name	Team Leader Code	Team Leader Name	Interview Status
100001	National Referral Hospital #1	1901	Team Leader 1	Interview incomplete
100001	National Referral Hospital #1	1901	Team Leader 1	Interview incomplete
100001	National Referral Hospital #1	1901	Team Leader 1	Interview incomplete
100004	National Referral Hospital #4	1901	Team Leader 1	Interview incomplete
100004	National Referral Hospital #4	1901	Team Leader 1	Interview incomplete
200005	Regional (Provincial) Referral Hospital #5	1901	Team Leader 1	Interview incomplete
200005	Regional (Provincial) Referral Hospital #5	1901	Team Leader 1	Interview incomplete
700001	Health Centre #1	1901	Team Leader 1	Interview incomplete

- Click on 'Close' to exit the report.
- Select Option 'X' to exit the Data manager menu.

You can also identify duplicates in the tracking sheet using the following steps:

- Go to your tracking sheet and click on the second tab, 'Data_file', where you stored the facility IDs from your final combined dataset.
- Highlight the column which contains the facility IDs of your dataset and apply conditional formatting to highlight all duplicate values. Sort the column by color.
- Identify any potential duplicates.

Explore data of potential duplicates

If potential duplicates have been identified, the data contained in each record must be examined to decide if these records are true duplicates. To do this, take the following steps:

- View the data for the two records that are potential duplicates. This can be done in one of two ways:
 - Using the CSPro DataViewer tool: Double-click on the .csdb file and it will open in the DataViewer tool. Records can be opened one at a time to view the contents.
 - Export the data to .csv and open with Excel: See Chapter 16 for directions on how to export data. The advantage of this approach is that you can see data for the same question from multiple facilities at the same time, which facilitates direct comparison.
- Compare the responses to the key variables: administrative area (i.e. region, district), Facility code/name, GPS coordinates, facility type, managing authority, and interviewer's code.
 - If the responses to these key variables are all the same and the data for the entire record is largely the same, these are likely true duplicates and one of the records can be dropped.
 - If the responses to these key variables are not all the same, investigate other reasons for the appearance of the duplicate facility code/name. For example, it is possible that one data collection team selected the wrong facility code/name so these are not duplicates but instead one record has an incorrect facility code/name.
- Based on the examination of the data, determine if a record is a true duplicate that should be deleted or if a different edit is required to resolve the issue.

Resolve potential duplicate records

The final step is to resolve the potential duplicate record. This will require either deleting a true duplicate record or editing the dataset to make a correction.

- To delete a true duplicate, first select the record that should be deleted. The best practice is to keep the most complete case in the data set. If both cases are complete, the case with latest time stamp should be kept. Record the unique identifying information of the case to be deleted. We will remove the duplicate when we review and edit key variables in the last section of this chapter.

- To make an edit to the data set, record the unique identifying information of the case to be edited and the required edits. We will make the edits when we review and edit key variables in the last section of this chapter.

Compare supervisor validations

The supervisor validation records should be split from the combined dataset so they can be compared to the data collection records. The Compare Data tool is a CSPro tool that allows you to compare two data files and identify the differences. The data files must have the same structure, that is they must be described by the same CSPro data dictionary. In addition, for comparisons to be made, the original case and the supervisor validation must have the same ID information and be located in different data sets. The process of comparing supervisor validations requires three steps:

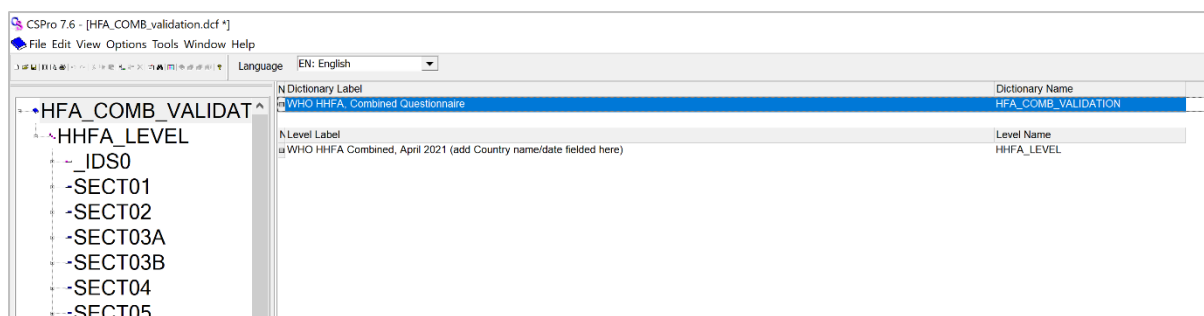
1. Run the Supervisor split batch application to separate the original data collector cases from the supervisor validations.
2. Reformat the datasets to have the same ID items.
3. Use the CSPro Compare tool to compare the original data collector cases to the supervisor validations.

Supervisor split batch

1. Take the following steps to use the Supervisor_split batch application to split the original data collector cases from the supervisor validations:
 - Browse to HFA_WHO\process\edit and click on the file Supervisor_split.pff. This will run a batch application to create two datasets: 2_HFA_COMB_FINALDATA.csdb which includes all the original data collector records and 3_HFA_COMB_SUPERVISORDATA.csdb which contains only the supervisor validations.
 - When it has finished running, a report of the process will open. You can close this window when it is complete. Browse to HFA_WHO\data and check to see that the two files are present.

Reformat datasets

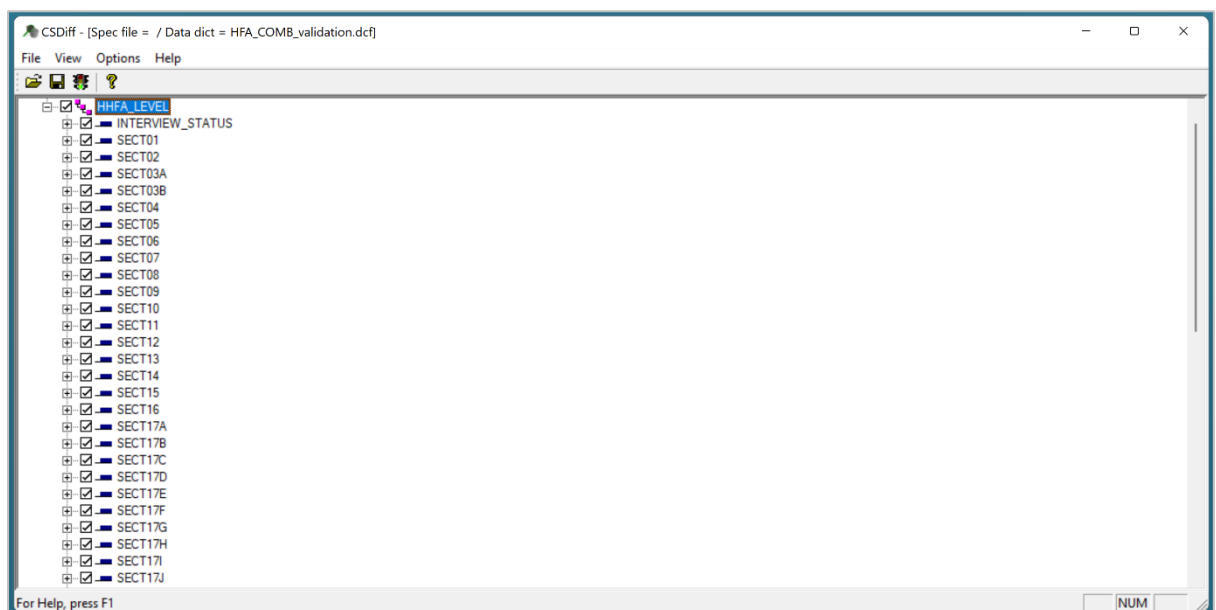
1. Browse to HFA_WHO\dicts and copy the HFA_COMB.dcf dictionary. Go to the HFA_WHO\data\supervisor validation folder and paste the HFA_COMB.dcf dictionary. Change the name to HFA_COMB_validation.dcf.
2. Open the HFA_COMB_validation.dcf dictionary from the HFA_WHO\data\supervisor validation folder. Click on the top level of the dictionary tree on the left. In the right window, change the dictionary name to HFA_COMB_VALIDATION.




3. In the tree on the left, click on the ID items record. In the window on the right, click on the item Supervisor validation / Q101, and cut the item from the record. In the tree on the left, click on the SECT01 items record. In the window on the right click on the item Facility Weight / WGT, and paste the Supervisor validation / Q101 item to the record. Repeat this process for the variable Team Leader / ID_TEAML.
4. Go to File → Save or Ctrl+S to save your work.
5. Press the Start button and navigate to the Programs → CSPro7.7 → reformat data.
6. Make the following selections to populate the tool:
 - a. Input dictionary: HFA_WHO\dicts\HFA_COMB.dcf
 - b. Input data: HFA_WHO\data\2_HFA_COMB_FINALDATA.csdb
 - c. Output dictionary: HFA_WHO\data\supervisor validation\HFA_COMB_validation.dcf
 - d. Output data: HFA_WHO\data\supervisor validation\4_HFA_COMB_FINALDATA_EXTRACT.csdb
7. Select Reformat data. A CSPro text viewer window will open informing you of the changes to the data. You can close this window. You should now see the file 4_HFA_COMB_FINALDATA_EXTRACT.csdb in the HFA_WHO\data\supervisor validation folder.
8. Return to the Reformat Data folder tool and repopulate the tool with the following selections:
 - a. Input dictionary: HFA_WHO\dicts\HFA_COMB.dcf
 - b. Input data: HFA_WHO\data\3_HFA_COMB_SUPERVISORDATA.csdb
 - c. Output dictionary: HFA_WHO\data\supervisor validation\HFA_COMB_validation.dcf
 - d. Output data: HFA_WHO\data\supervisor validation\5_HFA_COMB_SUPERVISORDATA_EXTRACT.csdb.
9. Select Reformat data. A CSPro text viewer window will open, informing you of the changes to the data. You can close this window. You should now see the file 5_HFA_COMB_SUPERVISORDATA_EXTRACT.csdb in the HFA_WHO\data\supervisor validation folder.
10. You can now close the reformat tool.

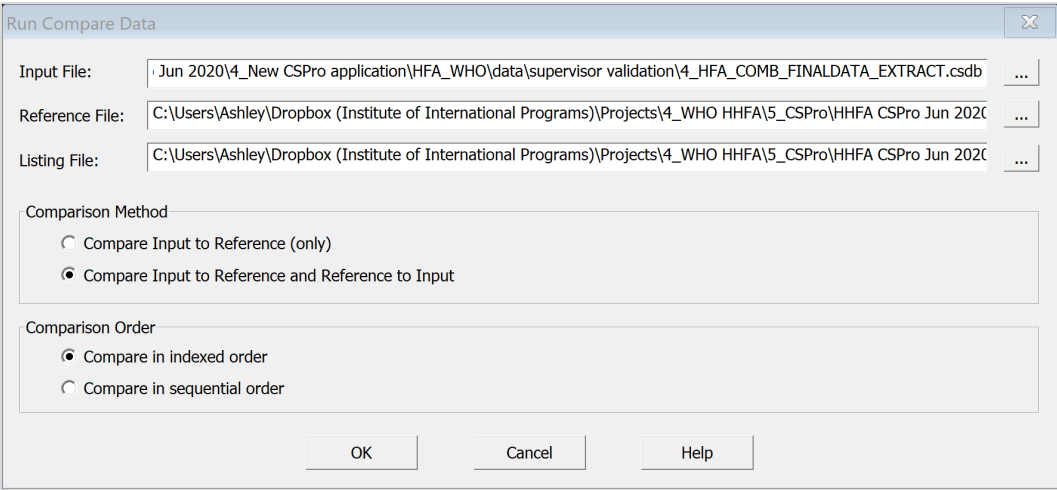
Compare tool

1. The data files are now ready to use the compare tool. Navigate to Programs → CPro7.7 → Compare data.
2. The first screen in the CPro Compare data application will ask you for the Data Dictionary File. Navigate to the HFA_WHO\data\supervisor validation folder, select the HFA_COMB_validation.dcf file, and click Open.
3. The panel on the left should now display the data dictionary's records and items in a selectable dictionary tree. Click on the top box next to the dictionary icon to select all the data. The screen should look like the image below:



Note: If you have systematically selected a sub-set of questions to validate, you can select those variables so that the comparison is limited to those questions. You can then store these selections for future use by going to File → Save and saving the 'Comparisons Specifications File'. You can then use the "Compare Specifications File" at a later date to compare the set of variables specified in this file.

4. To run the Compare function, press  on the toolbar; press Ctrl+R; or from the File menu, select Run. For the input file, select the 4_HFA_COMB_FINALDATA_EXTRACT.csdb file from the HFA_WHO\data\supervisor validation folder. For the reference file, select the 5_HFA_COMB_SUPERVISORDATA_EXTRACT.csdb from the HFA_WHO\data\supervisor validation folder. For the comparison method, make sure that the "Compare Input to Reference and Reference to Input" box is selected. For the comparison method, make sure that the "Compare in Indexed Order" box is selected. The screen should look like the image below.



Run Compare Data

Input File: C:\Users\Ashley\Dropbox (Institute of International Programs)\Projects\4_WHO HHFA\5_CSPRO\HHFA CSPRO Jun 2020\Jun 2020\4_New CSPRO application\HFA_WHO\data\supervisor validation\4_HFA_COMB_FINALDATA_EXTRACT.csdb

Reference File: C:\Users\Ashley\Dropbox (Institute of International Programs)\Projects\4_WHO HHFA\5_CSPRO\HHFA CSPRO Jun 2020\Jun 2020\4_New CSPRO application\HFA_WHO\data\supervisor validation\4_HFA_COMB_FINALDATA_EXTRACT.csdb

Listing File: C:\Users\Ashley\Dropbox (Institute of International Programs)\Projects\4_WHO HHFA\5_CSPRO\HHFA CSPRO Jun 2020\Jun 2020\4_New CSPRO application\HFA_WHO\data\supervisor validation\4_HFA_COMB_FINALDATA_EXTRACT.csdb

Comparison Method

☐ Compare Input to Reference (only)

☒ Compare Input to Reference and Reference to Input

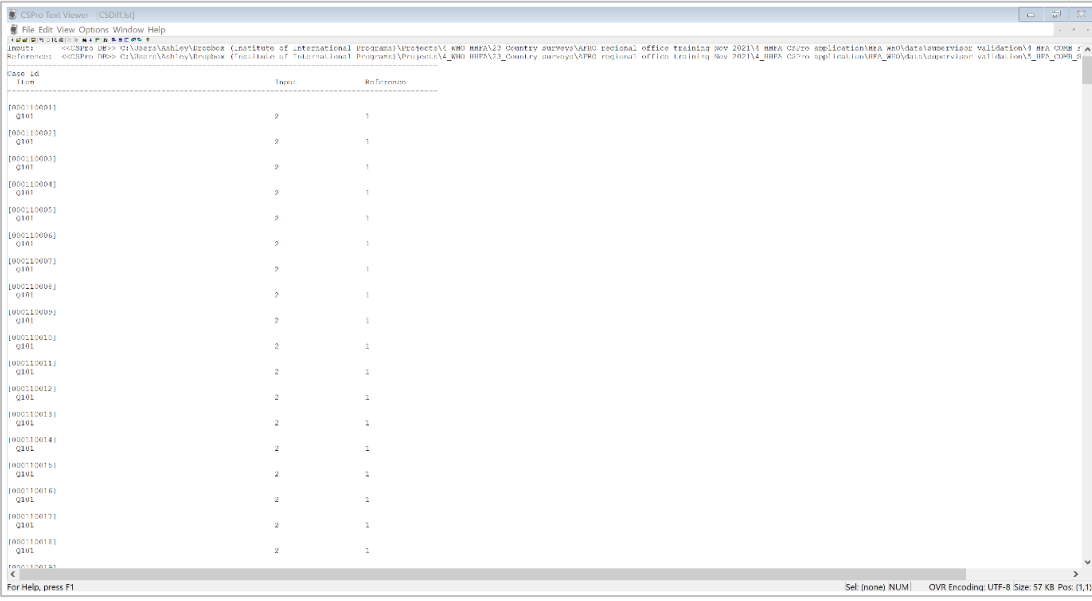
Comparison Order

☒ Compare in indexed order

☐ Compare in sequential order

OK Cancel Help

- Click OK to run the Compare tool. An output summarizing the results of the file comparison will be shown.
- Examine the output. The input file and reference file are listed at the top. Each case in either file appears listed on the left, identified by the facility code. For each case, any difference between the input file and the reference file will be listed, with values for the input file under the column "Input File" and for the reference file under the column "Reference File" (on the far right). If the case exists in one file but not in the other, CSDiff will output "Case missing" in the relevant column.



Case ID	Input File	Reference File
[800110601] Q101	2	1
[800110602] Q101	2	1
[800110603] Q101	2	1
[800110604] Q101	2	1
[800110605] Q101	2	1
[800110606] Q101	2	1
[800110607] Q101	2	1
[800110608] Q101	2	1
[800110609] Q101	2	1
[800110610] Q101	2	1
[800110611] Q101	2	1
[800110612] Q101	2	1
[800110613] Q101	2	1
[800110614] Q101	2	1
[800110615] Q101	2	1
[800110616] Q101	2	1
[800110617] Q101	2	1
[800110618] Q101	2	1

- Save the results from the comparison and share them with the survey coordinator, supervisors, and team leaders, etc. so that feedback can be provided, data updated and data collection practices changed to improve the consistency of data collection. In addition, the results of the comparison may be reviewed and decisions may be taken to reconcile discrepant results in the final dataset. Any edits to the final combined dataset will need to be made using the batch edit application described in the next section.

Note: The results of the comparison will only show differences between the two cases with the same facility ID. Not all differences are indicative of data quality problems. For example, the compare tool will note minor differences in the spelling of facility location, or other text only fields. In addition, differences in issues such as the availability of medicines may be true differences as medicine availability is subject to change. The comparison results must be interpreted with caution and with a view toward identifying differences that may be reasonable and differences that may be indicative of a problem with data quality.

Review key variables

The next step in the data management process is to undertake a review of key variables in the final combined dataset. This section describes the key variables that should be reviewed. Any errors or inconsistencies should be corrected in the final combined dataset that will be used for analysis. Detailed instructions on how to undertake this review are provided in the next section.

Download and export data

See the instructions in the beginning of Chapter 15 for downloading the data and in Chapter 16 for exporting the data to .csv and opening in Excel (or a software of your choice). Export the file 2_HFA_COMB_FINALDATA.csdb (without supervisor validations) as this file will be used to create the final analytical dataset.

Variables to review

The following are the key variables that should be reviewed. For each set of variables, additional information is provided about why these are key variables for the HHFA.

The Consent and the Final result code variables will determine if a facility is included in the analysis.

- **Consent:** Check to see if there are any facilities where consent was not obtained. Verify the status of non-consenting facilities. (Check with the team leader to confirm that the facility declined to participate in the survey). If consent was not obtained, ensure that there is no further data in the record beyond the consent question.
- **Final result code:** All facilities should have a final result code. Check for missing values. If the result code is recorded as “other”, review the reason listed and recode where possible.

Depending on the sampling strategy used, facility type, managing authority, urban/rural, and administrative areas may all be used as a stratifiers for the HHFA analysis.

- **Facility type:** All facilities should have a facility type. Check for missing values. If the facility type is recorded as “other”, review the “other – specify” response and recode where possible.
- **Managing authority:** All facilities should have a managing authority. Check for missing values. If the managing authority is recorded as “other”, review the “other – specify” response and recode where possible.

- **Urban/rural:** All facilities should have an urban/rural designation. Check for missing values. If the urban/rural designation is recorded as “other”, review the “other – specify” response and recode where possible.
- **Administrative areas:** All facilities should have administrative areas assigned. Check for missing values. Check that administrative areas are valid responses and that alignment of administrative areas (e.g. districts within regions) is correct.

GPS coordinates are important for identification of health facilities and for mapping. However, GPS coordinates commonly have errors as it can be easy to introduce an error in the GPS coordinates.

- **GPS coordinates:** All facilities should have GPS coordinates (latitude and longitude). Check for missing values. Check that GPS coordinates are within range for the country.

Facility names should be cross-checked with the facility names in the sample file/MFL to ensure facility codes and facility names are correctly aligned. Misalignment of facility codes and names may indicate a problem with data concatenation.

Some categorical questions in the HHFA allow for an “other” response category. If “other” is selected, the data collector must then record the respondents answer using a text box. It is important to review these “other” responses to determine if they may in fact correspond to a pre-defined response category for the question and should instead be recoded.

- **“Other” response options:** A batch application has been written to identify instances where “other” has been selected and a report has been printed to show what “other” text was specified. These text responses should be compared to the pre-coded responses for each question to determine if any “other” responses in fact need to be recoded to pre-existing response options categories. Please see the separate report to review these. Instructions for running the batch application are as follows:
 - Browse to HFA_WHO\process\report_other and click on the file Writing Other Specify.pff. This will run a batch application to read through the 2_HFA_COMB_FINALDATA.csdb file and identify all instances where “other” was the reported response to a categorical question.
 - When it is finished running, a report of the process will open. You can close this window when it is complete. Browse to HFA_WHO\process\report_other edit and check that the file OtherSpecify.csv has been created.
 - Open the file OtherSpecify.csv using Excel. This file contains three columns: facility code, question, and specified value (see the example image below). Review this report to determine the responses that may need to be recoded to pre-existing response categories.

	A	B	C
1	Facility Code	Question	Specified Values
2	210053	Q113T	HEALTH POST
3	110023	Q114T	SIME Darby CLINIC
4	140030	Q114T	CONCESSIONAL NOT FOR PROFIT
5	210118	Q114T	BOTH PROFIT AND FREE
6	220055	Q114T	NON FOR PROFIT
7	110023	Q116T	PRIVATE CLINIC
8	140030	Q116T	CONCESSIONAL NOT FOR PROFIT
9	180054	Q116T	THE KPAYARKORLLEH COMMUNITY
10	110001	Q2414T	NURSE/OIC
11	110007	Q2414T	RN
12	110012	Q2414T	BSC NURSE
13	110015	Q2414T	NURSE/OIC
14	110022	Q2414T	BSC NURSE
15	120004	Q2414T	VACCINATOR
16	120016	Q2414T	NURSE AID
17	120028	Q2414T	4
18	120029	Q2414T	4
19	120032	Q2414T	HIGH SCHOOL GRADUATE
20	120033	Q2414T	NURSE AID
21	120035	Q2414T	NURSE AID
22	120036	Q2414T	1
23	120037	Q2414T	1
24	120038	Q2414T	1
25	120040	Q2414T	NURSE AID
26	130003	Q2414T	VACCINATOR

Calculate sample weights

If a sample (as opposed to a census) survey has been implemented, weights must be calculated so that they can be applied to the data set in the analysis phase. Refer to the implementation manual for more information on how to calculate sample weights. It is important to calculate the weights at this stage in the HHFA as the weights will be incorporated into the final HHFA dataset in the next step, Edit data.

Edit data and create final dataset

Now that the data have been reviewed and all necessary edits have been identified, you are ready to edit the final combined dataset (2_HFA_COMB_FINALDATA.csdb). To make edits to the final combined dataset, you will need to use the HFA_Edit batch application. Take the following steps to use the HFA_Edit batch application to implement your edits:

1. Browse to the HFA_WHO\process\edit folder and double click on the file HFA_Edit.bch. This will open the HFA_edit batch application.
2. The HFA_edit batch application contains example code for editing each of the key variables reviewed above, including resolving duplicates as discussed in an earlier section. This code serves as an example only. It does not change anything in the data set. You will use this example to write similar logic to implement the changes you have identified that need to be made to your dataset. While most of the logic examples should be self-explanatory, additional information about the logic for the weights is provided below:

- a. For this example, we assume that the sample was stratified by facility type and managing authority, giving the following weights:



- Hospital – public: 1
- Hospital – private: 1.5
- Primary – public: 4.5
- Primary – private: 2.5

- b. Logic must be written to assign the weight to the corresponding facilities. Under the Weights example, you will need to write logic to map the facility types and managing authorities to the weights. An example of the logic required to do this is below:

```

if Q113 in 1,2 and Q114 = 1 then
  WGT = 1
elseif Q113 in 1,2 and Q114 in 2,3,4,96 then
  WGT = 1.5
elseif Q113 in 3,4,5,96 and Q114 = 1 then
  WGT = 4.5
elseif Q113 in 3,4,5,96 and Q114 in 2,3,4,96 then
  WGT = 2.5
endif;

```

- c. When you have finished writing the logic, click on the Compile button to ensure that your statement is valid.
6. Once you have added the logic to implement all your desired edits, compile the logic by clicking  on the toolbar, or select File → Compile from the main menu (or press Ctrl+K).
7. The Compiler Output window under the logic will provide a message with the results: either 'Compile Successful' or 'Compile Failed'. If the compile is successful, you are now ready to run the HFA_edit batch edit application. If the compile fails, review the error messages to help you determine the errors, correct the errors and repeat the logic compilation process until you get a 'Compile Successful' message.
8. To run the HFA_edit batch edit application, press  on the toolbar; press Ctrl+R; or from the File menu, select Run. For the input file, select the 2_HFA_COMB_FINALDATA.csdb file from the HFA_WHO\data folder. For the output file, select 6_HFA_COMB_FINALDATA_EDITED.csdb and save the output file in the HFA_WHO\data folder.
9. The file 6_HFA_COMB_FINALDATA_EDITED.csdb should now contain the final, clean dataset that is ready for data archiving and data analysis.

16. Exporting data for analysis

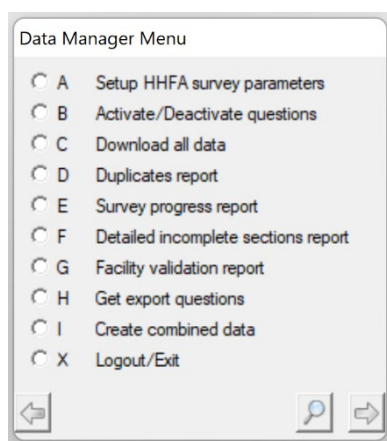
CSPro has a built-in Export Data application that allows you to quickly and easily export data in a variety of formats. The exported data can then be imported into different software programs according to your needs.

In order to be able to use the HHFA data analysis platform, the data can be provided in several file formats (.csv, .xls, .dta). The analysis platform requires the dataset to contain the question number as the variable name in the first row of the dataset and all pre-coded responses must contain numeric values, not labels. The **preferred dataset format for the HHFA analysis platform is a .dta file** which will allow you to see the variable names in the analysis platform. However, the analysis platform will also accept a .csv file if you are unable to create a .dta file. In addition, the analysis platform functions best when questions that were deactivated prior to data collection are excluded from the final dataset.

Export data for the HHFA data analysis platform

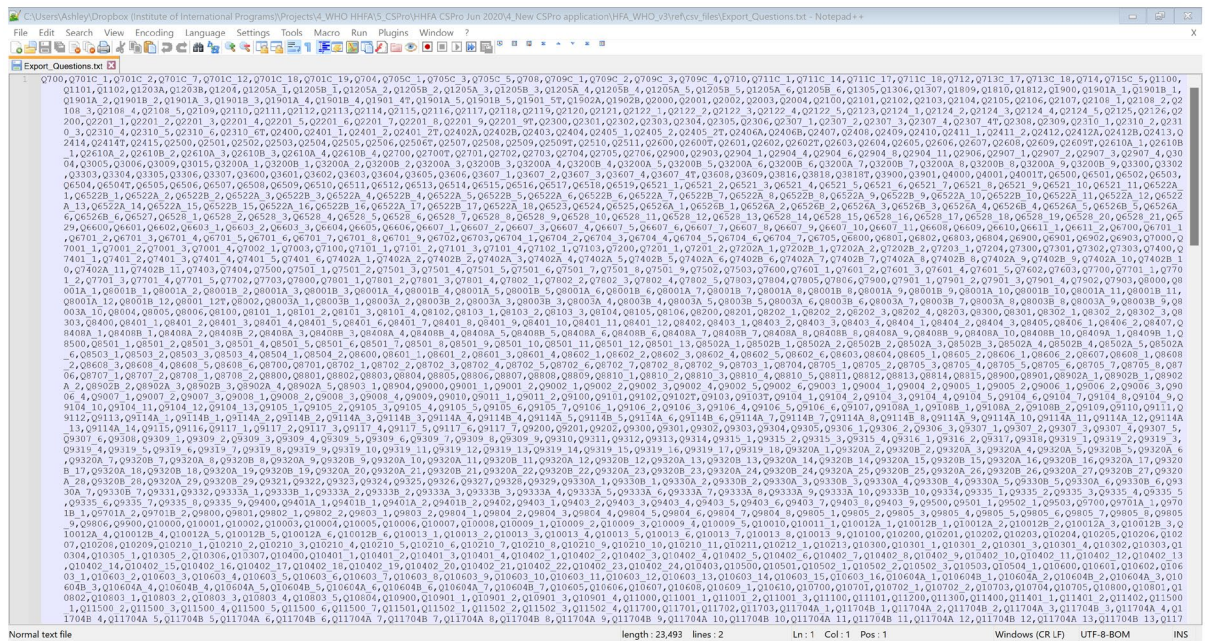
In order to export data for the HHFA data analysis platform (with deactivated questions excluded from the final dataset), take the following steps:

1. Open the HFA_WHO folder and double-click to open the HHFA_Menu.ent.
2. Click the Traffic icon to run the application.
3. Click OK to proceed when the next window pops up asking to specify data files.
4. You will be taken directly to the login screen where you will enter your data manager code to access the data manager functionalities. You should now see the Data manager menu:

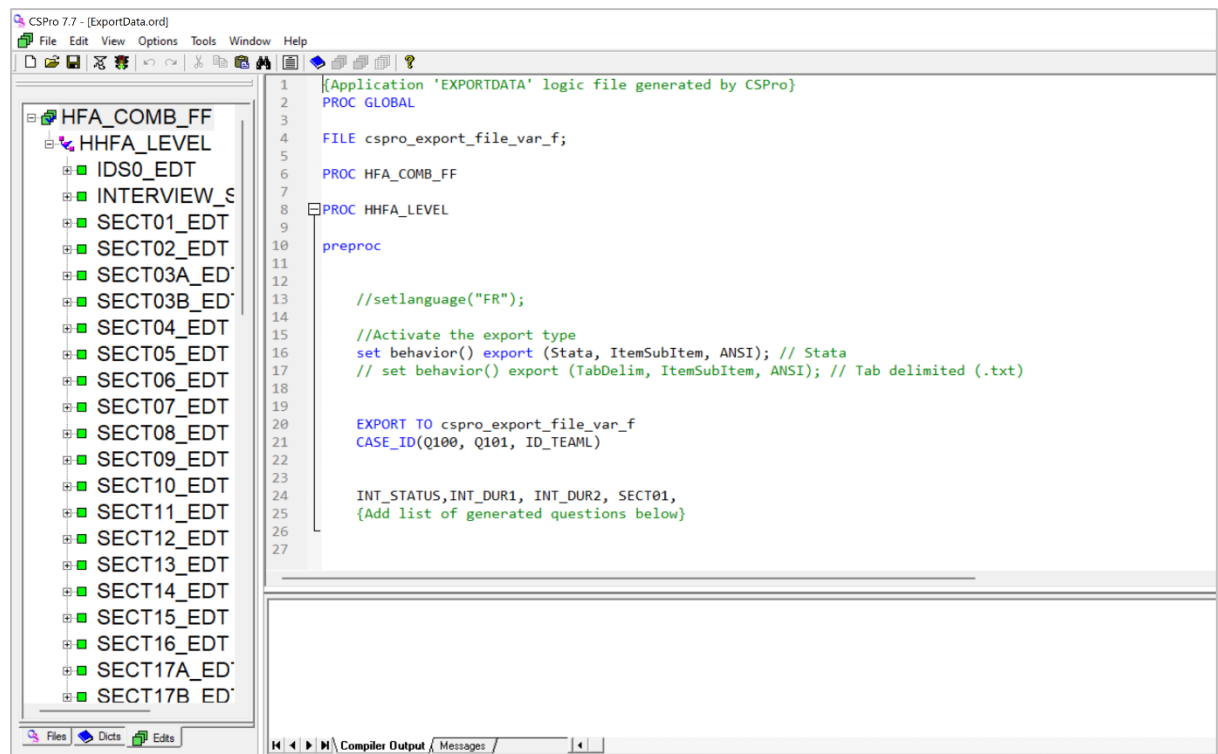


Select Option 'H': Get export questions. A list of all the activated questions will be saved as a .txt file in the HFA_WHO\ref\csv_files folder and is called Export_Questions.txt.

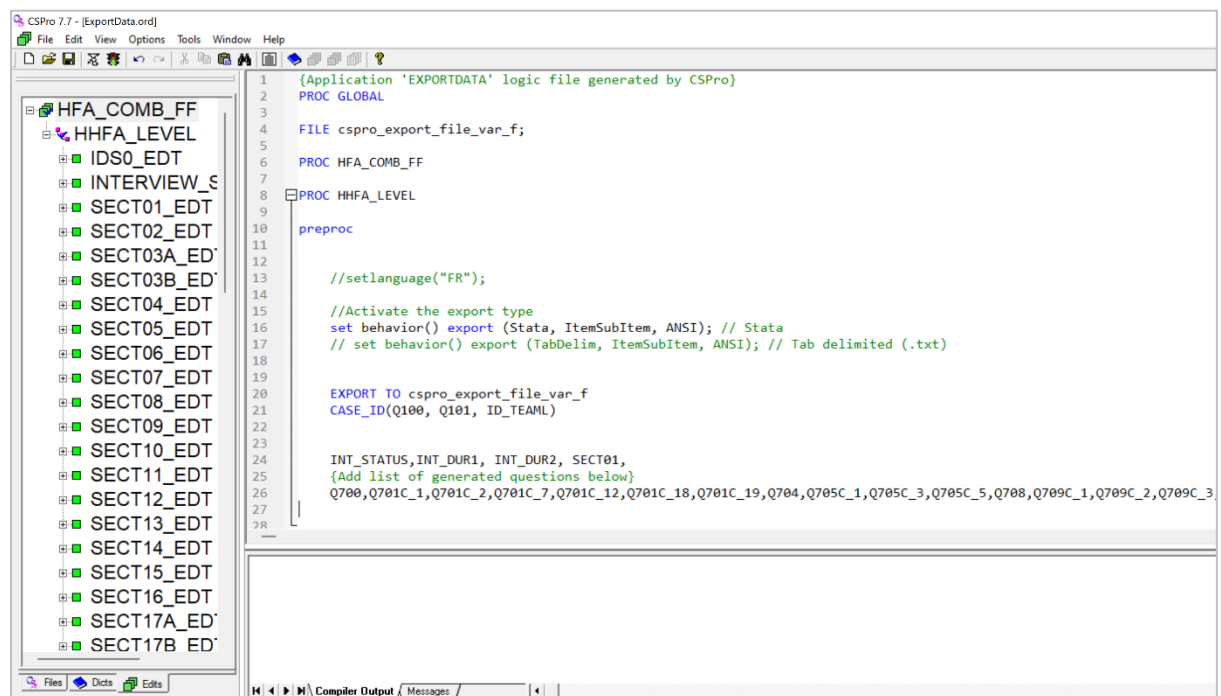
7. Select Option 'X' to exit the Data manager menu.
8. Go to the HFA_WHO\ref\csv_files folder open the file Export_Questions.txt with a text editor such as Notepad. You will see a list of the activated questions with each question number separated by a comma.



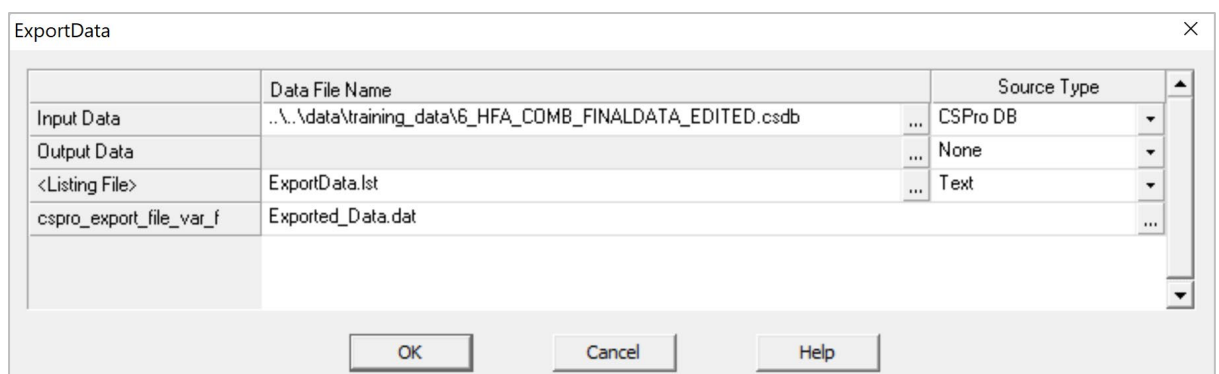
9. At the end of the list, add the question numbers for any country specific questions that were added to the CSPro application. These must be manually added as they are not part of the generic WHO HHFA application question mapping process.
10. After the last question in the list, add a semi-colon (;).
11. Select all of the question text and copy the text.
12. Browse to the ExportData.bch file located at HFA_WHO_v3\process\export and double click to open. The batch program should look like the image below:



13. Paste the question numbers you have copied from the Exported_Questions.text file into the ExportData.bch program beneath the text that says {Add list of generated questions below}.



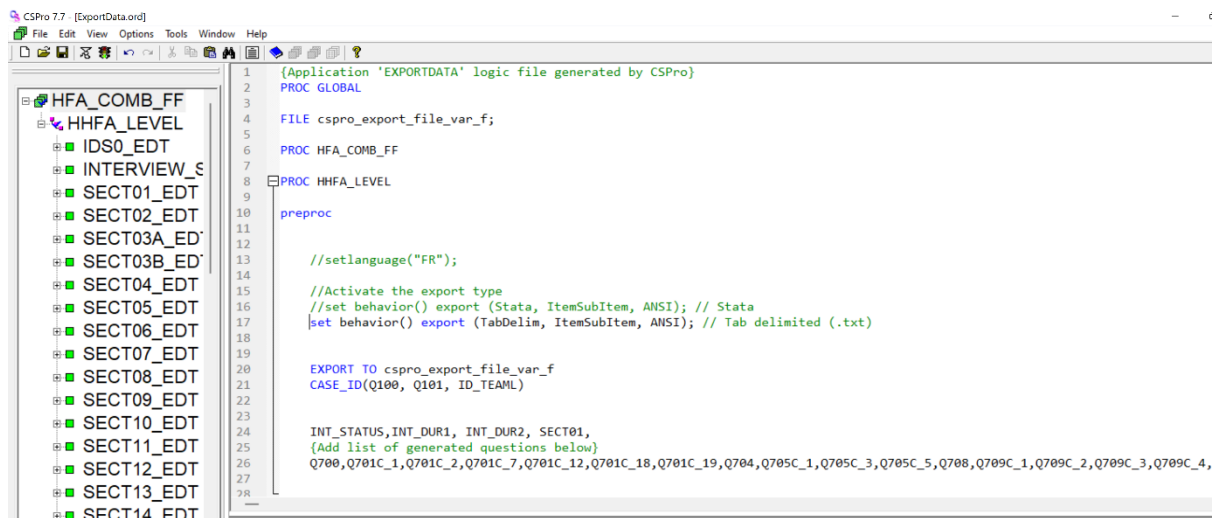
14. Click the traffic icon to run the application.
15. When the next window pops up you will see several fields where the location of data files are specified. Change the input data to your final data file (6_HFA_COMB_FINALDATA_EDITED.csdb). Make sure that under cspro_export_file_var_f the data file has an extension of .dat (this is required to export to STATA). Then click ok.



16. A text window will open once the batch application has run. You can close this window. Go to the HFA_WHO_v3\process\export folder and you should now see three new files: EXPORTED_DATA.dat, EXPORTED_DATA.dct, and EXPORTED_DATA.do.
17. In order to create the STATA dataset, you need to open STATA, click on File → Do and navigate to the EXPORTED_DATA.do file created in the data export process. This will read in the .dat and .dct files to load the data and all the value set labels. Once this is complete, click on File → Save to save the dataset as a .dta file (STATA file format).

If you would like to export the dataset to Excel instead of STATA, follow steps 1-13, then take the following steps:

14. In the EportData.bch application, add two forward slashes (//) to comment out the line that specifies a STATA export (line 16) and remove the two forward slashes (//) on the line that specifies a .txt export (line 17).



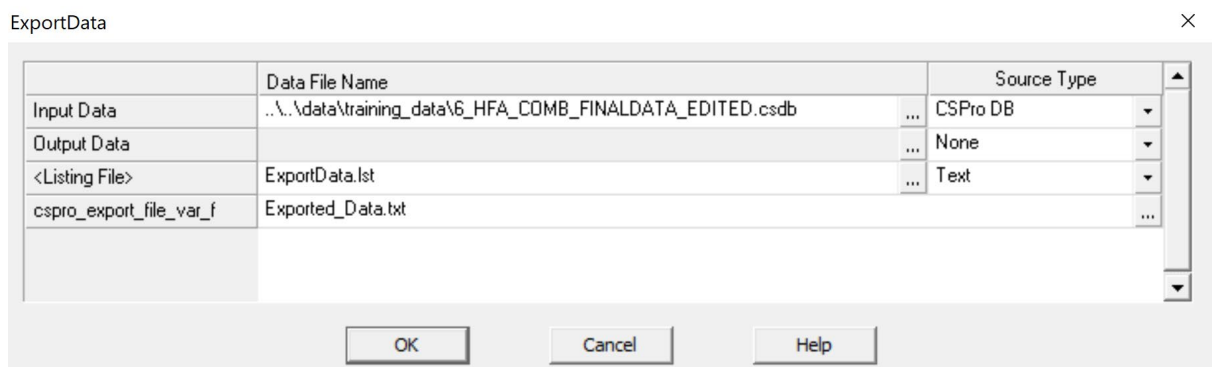
```

1 {Application 'EXPORTDATA' logic file generated by CSPro}
2 PROC GLOBAL
3
4 FILE cspro_export_file_var_f;
5
6 PROC HFA_COMB_FF
7
8 PROC HHFA_LEVEL
9
10 preproc
11
12
13 //setlanguage("FR");
14
15 //Activate the export type
16 //set behavior() export (Stata, ItemSubItem, ANSI); // Stata
17 set behavior() export (TabDelim, ItemSubItem, ANSI); // Tab delimited (.txt)
18
19
20 EXPORT TO cspro_export_file_var_f
21 CASE_ID(Q100, Q101, ID_TEAML)
22
23
24 INT_STATUS,INT_DUR1, INT_DUR2, SECT01,
25 {Add list of generated questions below}
26 Q700,Q701C_1,Q701C_2,Q701C_7,Q701C_12,Q701C_18,Q701C_19,Q704,Q705C_1,Q705C_3,Q705C_5,Q708,Q709C_1,Q709C_2,Q709C_3,Q709C_4,
27
28

```

15. Click the traffic icon to run the application.

16. When the next window pops up you will see several fields where the location of data files are specified. Change the input data to your final data file (6_HFA_COMB_FINALDATA_EDITED.csdb). Make sure that under cspro_export_file_var_f the data file has an extension of .txt (this is required to export to a text file). Then click ok.



	Data File Name	Source Type
Input Data	..\data\training_data\6_HFA_COMB_FINALDATA_EDITED.csdb	CSPro DB
Output Data		None
<Listing File>	ExportData.lst	Text
cspro_export_file_var_f	Exported_Data.txt	

OK Cancel Help

17. A text window will open once the batch application has run. You can close this window. Go to the HFA_WHO_v3\process\export folder and you should now see one new file: EXPORTED_DATA.txt. You have now successfully exported data from CSPro to a text file. You can now open the TXT file, view the data in Microsoft Excel, and import it into the HHFA data analysis platform.

Open a TXT file in Excel

To open a TXT file in Excel, take the following steps:

1. Start Excel and using the menu bar, go to File → Open and browse to the.txt file, select it, and click OK. Make sure 'All Files' is selected so that you can see the txt file.
2. The Text Import Wizard will open. The screens should look like the following as you work through the wizard:

Text Import Wizard - Step 1 of 3

The Text Wizard has determined that your data is Delimited.
If this is correct, choose Next, or choose the data type that best describes your data.

Original data type

Choose the file type that best describes your data:

☒ Delimited - Characters such as commas or tabs separate each field.

☐ Fixed width - Fields are aligned in columns with spaces between each field.

Start import at row: 1 File origin: 437 : OEM United States

☐ My data has headers.

Preview of file C:\Users\Ashley\Dropbox (Institute of International Pro...)\HFA_COMB_test data_12Oct2021.txt.

```

1 Q100Q1011D TEAMLINT STATUSQ102Q103Q103TQ104Q105Q105TQ106Q106TFVISITTFVD
2 -647241231832K7phsGx1wNc1ry 2 fH831af.44EVB08Z
3 8021421813125 y 2.nlswiYn1E 8WK30rHfFe
4 2690091592251tCARc1 1r Y
5 5014332924430IpKhCu 28 3oc8fkKRIySH
6 3905881794561t2UF661x7Qhdj0 1fYe B
7 1301422647726 6eD9gTsKon1 tQTV1B8oc 2

```

Cancel < Back Next > Finish

Text Import Wizard - Step 2 of 3

This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below.

Delimiters

☒ Tab

☐ Semicolon

☐ Comma

☐ Space

☐ Other:

☐ Treat consecutive delimiters as one

Text qualifier: "

Data preview

Q100	Q101	ID TEAML	INT STATUS	Q102	Q103	Q103T
-64724	1	23183	2	K7phsGx1wNc1ry	2	fH831a
802142	1	81312	5	y	2	.nlswl
269009	1	59225	1	tCARc1	1	r Y
501433	2	92443	0	IpKhCu	2	8 3oc8
390588	1	79456	1	2UF661x7Qhdj0	1	fYe B
130142	2	64772	6	6eD9gTsKon1 tQTV1B8oc	2	

Cancel < Back Next > Finish

Text Import Wizard - Step 3 of 3

This screen lets you select each column and set the Data Format.

Column data format

☒ General

☐ Text

☐ Date: MDY

☐ Do not import column (skip)

'General' converts numeric values to numbers, date values to dates, and all remaining values to text.

Advanced...

Data preview

General	General	General	General	General	General	General
Q100	Q101	ID TEAML	INT STATUS	Q102	Q103	Q103T
-64724	1	23183	2	K7phsGx1wNc1ry	2	fH831a
802142	1	81312	5	y	2	.nlswl
269009	1	59225	1	tCARc1	1	r Y
501433	2	92443	0	IpKhCu	2	8 3oc8
390588	1	79456	1	2UF661x7Qhdj0	1	fYe B
130142	2	64772	6	6eD9gTsKon1 tQTV1B8oc	2	

Cancel < Back Next > Finish

3. Your file should now be open in Excel and you can view your data.

Export HHFA data with translated value labels

If you have collected data in a different language and have copied the value labels for your translated response options to the combined dictionary, you can export your data set with translated value set labels. To do this, take the following steps:

1. Browse to HFA_WHO\process\export folder and double click on the file ExportData.bch. This will open the ExportData batch application.
2. The ExportData batch application contains example logic to export all the data in the HHFA combined dictionary to STATA file format, assuming that the data was collected in French. This logic can be edited to the language of your choosing by replacing “FR” with the two digit code corresponding to the language used for data collection and removing the two forward slashes in the beginning of line 13.
3. Run the batch application as per the above instructions for exporting data.

Export HHFA data to other file formats

CSPRO has an Export Data application that can be used to export your data to multiple file formats. The CSPRO export function supports export to the following file formats:

- Tab delimited (.txt)
- Comma delimited (.csv)
- Semicolon delimited (.csv)
- CSPRO (.dat, .dcf)
- SPSS (.dat, .sps)
- SAS (.dat, .sas)
- STATA (.dat, .dct, .do)
- R (.dat, .R)

Using this Export Data application, you can manually select which questions to include in the data export. This is an alternative method of exporting data from CSPRO. If you want to export the data to one of these formats, take the following steps:

1. On your desktop or laptop computer, press Start and navigate to the CSPRO Export Data application. This will most likely be located in Programs → CSPRO7.7 → Export data.
2. The first screen in the CSPRO Data Export application will ask you for the Data Dictionary or Data File you want to export. Navigate to the HFA_WHO\data folder, select the 6_HFA_COMB_FINALDATA_EDITED.csdb file, and click Open.

3. The panel on the left should display the data dictionary's records and items in a selectable dictionary tree. From this dictionary tree, you can select the data you want to export.
4. This screen will also display various export options, such as the export format, the number of files you want the application to create, and whether you want to include XML Metadata. We will keep the default options for everything except the following:
 - Export Format: select the export format you would like to use.
 - Export Items or Subitems: select Both items and Subitems.
5. Select Run from the File menu.
6. CSPro will then ask you to specify the name of the exported file. Specify a file name of your choice and click Save. You have now successfully exported data from CSPro.

Annex 1 – CSWeb synchronization: server and domain name configuration example

This example provides instructions for setting up a server and configuring a domain name using one cloud server platform, Amazon Lightsail. Note: The use of Amazon Lightsail for this example does not serve to promote a specific product. It is simply an illustrative example. This section explains how to set up an Amazon Lightsail server and configure the DNS zone on Amazon Lightsail. Technical instructions were informed by the Amazon Lightsail documentation center³.

Prerequisites

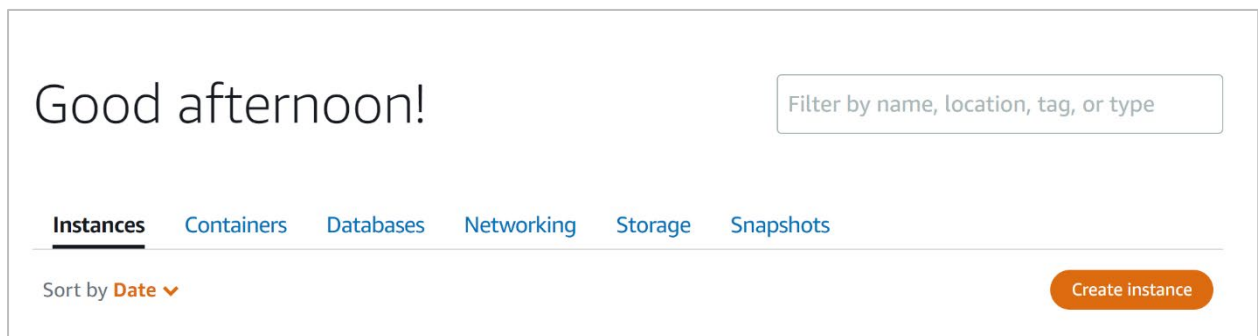
In order to complete the server and domain name configuration you will need the following:

- Amazon Lightsail account
- Purchased/configured a domain of your choice
- Basic understanding of Linux terminal commands
- Local PC running ubuntu 18.04/20.04
 - Alternatively, if you are running a Windows PC, you can configure ubuntu to run on Windows 10 (refer to <https://docs.microsoft.com/en-us/windows/wsl/install-win10>).

Set up Amazon LightSail Instance


Step 1.1 – Creating a Linux instance for Ubuntu 20.04 LTS



- Login to your Amazon Lightsail Instance.
- On the instances tab click create instance. You will be redirected to an instance creation window.




- **Instance Location:** Choose your preferred instance location
- **Instance Image:** Select Linux/Unix.
- **Instance Blueprint:** Choose OS only and select Ubuntu 20.04 LTS as the installation instance.
- You may choose to enable automated snapshots but that comes with additional costs.
- An example of instance setup is shown below.


³ Amazon Lightsail documentation center: https://lightsail.aws.amazon.com/ls/docs/en_us/how-to


Instance location 

 You are creating this instance in **Mumbai, Zone A** (ap-south-1a)
 [Change AWS Region and Availability Zone](#)

Pick your instance image 


Select a platform


 **Linux/Unix**
28 blueprints


 **Microsoft Windows**
4 blueprints


Select a blueprint

[Apps + OS](#)
[OS Only](#)

 **Amazon Linux 2**
2.0.20210617.0


 **Amazon Linux**
2018.03.0.202...

 **Ubuntu**
20.04 LTS

 **Ubuntu**
18.04 LTS

- **Instance Plan:** The minimum recommended instance is the one with the following bundles: 1 GB Memory, 1 CPU, 40GB SSD Storage, 1TB Data transfer.
- **Identify your instance:** Provide a unique name for your instance.

☐ Enable Automatic Snapshots

Choose your instance plan 

New! Check out our new 16 GB and 32 GB RAM bundles!

Sort by: [Price per month](#) [Memory](#) [Processing](#) [Storage](#) [Transfer](#)

First month free!

<

\$3.5

USD

\$5

USD

\$10

USD

\$20



USD

\$40

USD

>

	\$3.50 USD	\$5 USD	\$10 USD	\$20 USD	\$40 USD	
	512 MB	1 GB	2 GB	4 GB	8 GB	Price per month
	1 vCPU	1 vCPU	1 vCPU	2 vCPUs	2 vCPUs	Memory
	20 GB SSD	40 GB SSD	60 GB SSD	80 GB SSD	160 GB SSD	Processing
	512 GB	1 TB	1.5 TB	2 TB	2.5 TB	Storage
						Transfer

 **Plans in Mumbai include lower data transfer allowances than other regions.**
[Learn more](#) 

Identify your instance

Your Lightsail resources must have unique names.

×

- Finally click create instance.

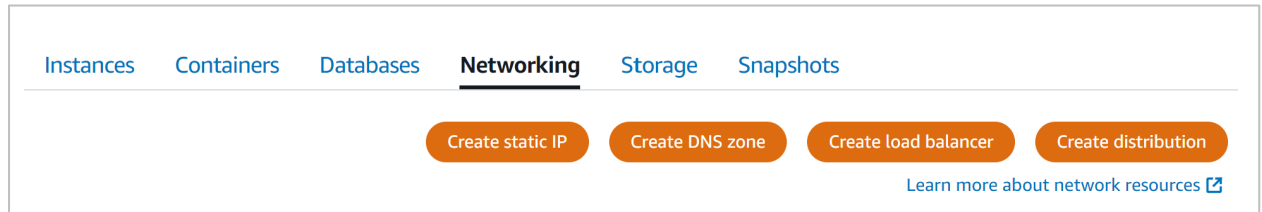
Configure DNS zone on Lightsail

175

By creating a DNS zone, you can use your registered domain with Lightsail and easily map it and its subdomains to your resources, such as an instance or load balancer.

Step 2.1 – Create static IP address

- On the networking tab select create static IP address.



- Select the instance you have created above.
- Enter a unique name for your instance static IP address
- Click Create
- A static public IP address will be created that you can use to access the server remotely.

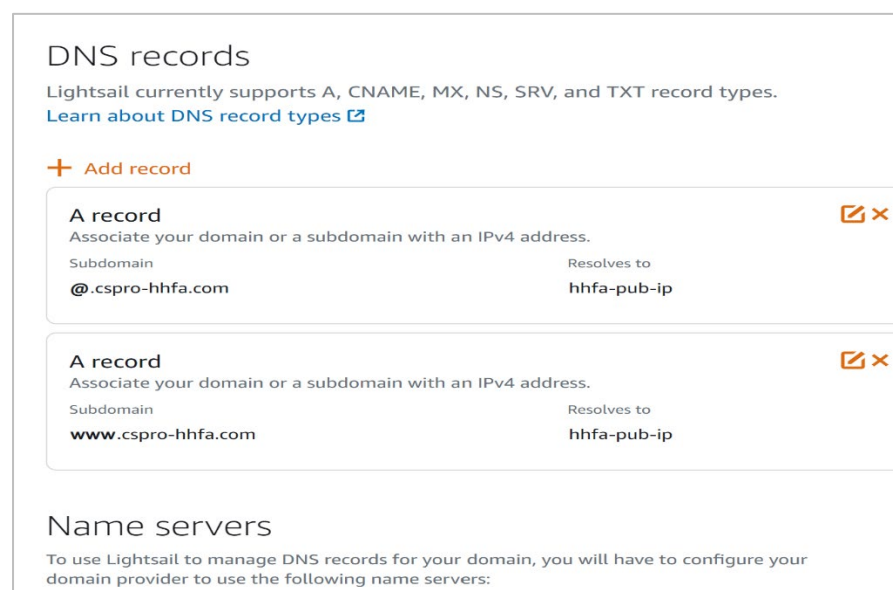
Step 2.2 – Create DNS Zone (Optional)

To configure DNS setup, you must have a domain name registered, using a domain services provider e.g., namecheap.com. However, this comes with an added cost to maintain the domain name.

Below are the steps to configure DNS records on AWS.

- On the networking tab select Create DNS Zones.
- Enter the domain name you have registered, without **www** or **http** prefixes, e.g., *example.com*
- After you choose Create DNS zone, you get a set of AWS name servers.
- You will need to configure your domain provider to use Lightsail name servers.

Note in the example image below, the subdomains and IP addresses are specific to the WHO HQ testing platform [cspro-hhfa.com]. When you create your DNS zones, these fields should be populated with your specific subdomains and associated IP addresses.



Click 

DNS records

Lightsail currently supports A, CNAME, MX, NS, SRV, and TXT record types.
[Learn about DNS record types](#)

A record

— Associate your domain or a subdomain with an IPv4 address.

Subdomain

example.cspro-hhfa.com

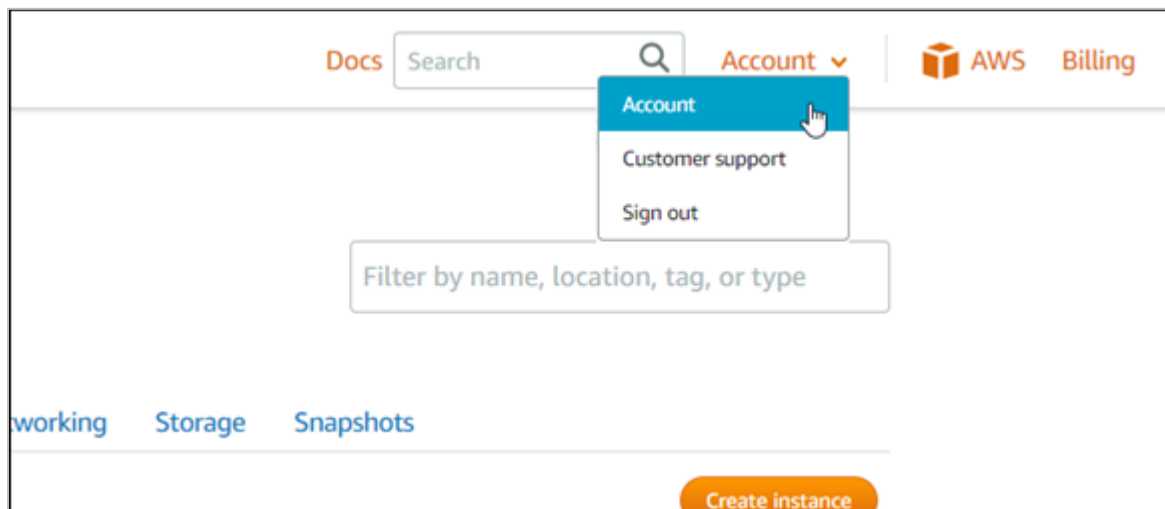
Resolves to

0.0.0.0

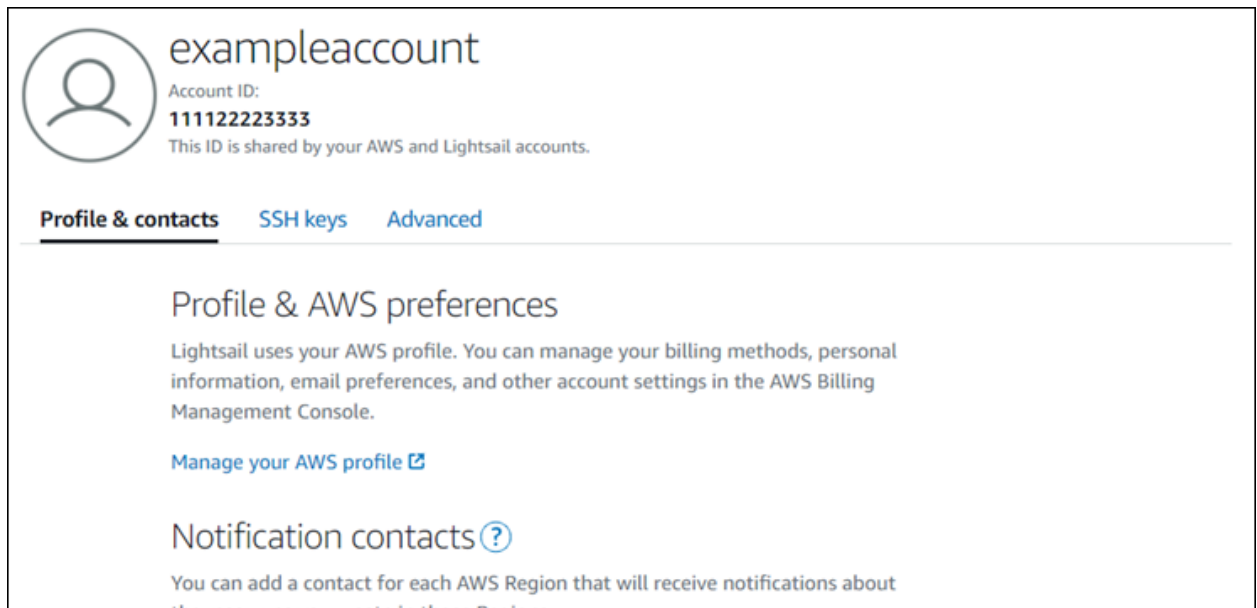
- Select A record.
- In the subdomain enter, @ symbol
- In the “Resolves to” text box, click and select the static IP address created above.
- Repeat the same process of adding another DNS record but in the subdomain enter **www**
- After the DNS zone has been created it will take about 24 hours to propagate the changes. Meanwhile proceed on with the subsequent steps.

Step 2.3 - Configuring SSH access to Amazon Lightsail

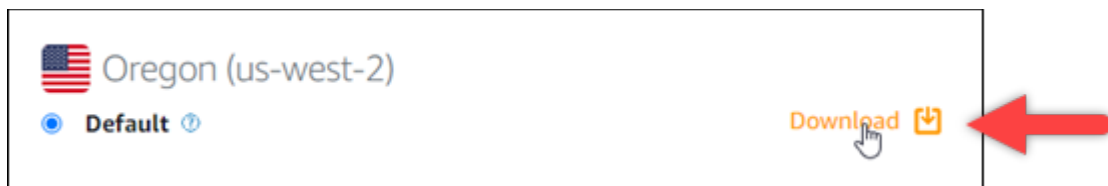
- Choose Account on the top navigation menu, then choose Account.



- The Account management page appears, with various tab options to manage your account settings.



- Choose the **SSH keys** tab.
- Scroll down, and choose Download next to the default key of the AWS Region of the instance that you want to connect to.



- Download the private key pem file to your local machine. It is recommended to store the key in a secure folder. e.g., ~/.ssh/
- Move the private key to secure folder.
- Open a terminal window on your local machine.
- Navigate to the downloaded folder. Type the following:

```
$ cd /path/to/downloaded_folder
$ sudo mv private-key.pem ~/.ssh/
```

- Please note, sudo for Linux commands, means you are running the commands with root privileges, hence you will be prompted to enter your password.
- Change the permissions of your private key and connect to your instance using SSH.

```
sudo chmod 600 ~/.ssh/private-key.pem
```

- Enter the following command to connect to your instance in Lightsail using SSH:

```
ssh -i ~/.ssh/private-key.pem ubuntu@public-ip-address
```

public-ip-address with the public IP address of your instance that you noted from the Lightsail console earlier in this example

- You are successfully connected to your instance if you see the welcome message for your instance.

```
Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-1018-aws x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:        https://ubuntu.com/advantage

System information as of Tue Jul 27 16:55:37 UTC 2021

System load:          0.0
Usage of /:           9.6% of 38.71GB
Memory usage:         69%
Swap usage:           0%
Processes:            122
Users logged in:      0
IPv4 address for eth0: 172.26.3.2
IPv6 address for eth0: 2406:da1a:454:100:c8f3:e463:1946:345a

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-optimisation

138 updates can be installed immediately.
14 of these updates are security updates.
To see these additional updates run: apt list --upgradable

3 updates could not be installed automatically. For more details,
see /var/log/unattended-upgrades/unattended-upgrades.log

*** System restart required ***
Last login: Fri Jul  9 22:55:50 2021 from 52.95.72.101
ubuntu@ip-172-26-3-2:~$
```

- Type `exit` to exit from the Lightsail instance connection.



World Health Organization
20, Avenue Appia
1211 Geneva 27
Switzerland
hhfa@who.int