Chitwan Valley Family Study Household Registry: Paper to Computer-Assisted Interview

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1. Abstract

The Chitwan Valley Family Study (CVFS) is a longitudinal data collection effort conducted by the Institute for Social & Environmental Research – Nepal (ISER-N). The CVFS has been conducted since 1996 and includes full life histories for more than 10,000 individuals. The study investigates the influence of social contexts on population processes and the relationships between the environment and population processes (http://spe.psc.isr.umich.edu/research/cvfs.html). For more than 15 years, the ISER-N staff used complex paper questionnaires, where monthly household data were collected for individual members living, marital, pregnancy, and education status. The paper instrument included extensive hand transferring of data between forms and from wave to wave.

In 2013, a team at the University of Michigan's Survey Research Center began a collaborative effort with an ISER-N team to convert their CVFS Household Registry's paper instrument to a Computer-Assisted Interview (CAI) application. This paper discusses the challenges and complexities of converting a multi-member multi-component longitudinal household registry paper instrument into a fully dynamic CAI application. This paper will include:

- An overview of the CVFS Household Registry paper questionnaires and the advantages and disadvantages of using paper vs. moving to CAI.
- Unique CAI features including: 13 Blaise parallel blocks with a household status tab offering the flexibility to update family composition and collect individual monthly member information seamlessly while bringing survey components online or offline as eligibility criteria are met.
- The ability to "spawn" up to three additional Blaise data models on the fly from the main Blaise application to collect an individual's away status, marital status, or childbirth within any given month.
- Obstacles encountered and review of areas where efficiencies could be applied to the CAI application to aid in the administration of the CVFS.
- Future developments based on the success of the CVFS Household Registry conversion to CAI and lessons learned from this complex multi-member and multi-component application that can be applied to future projects.

2. The Chitwan Valley Family Study

The Chitwan Valley Family Study (CVFS) is a longitudinal study conducted in Nepal by the Institute for Social and Environmental Research – Nepal (ISER-N) since 1996 and includes full life histories for more than 10,000 individuals and tracks continuous measurement of community change both within the original study neighborhoods as well as with respondents who move out of those neighborhoods regardless of where they go. The study investigates the influence of social contexts on population and the relationships between the environment and population processes.[1] ISER-N and the CVFS (along with other studies) are directed by researchers within the Population Studies Center (PSC) and the Survey Research Center (SRC) at University of Michigan's Institute for Social Research.

For over 16 years the ISER-N staff used complex paper questionnaires to collect monthly household roster data as well as the living, marital, pregnancy, and education status of each individual household member. This "paper and pencil interview" (PAPI) included extensive editing and manual transferring of information from form to form, and from wave to wave. In 2013, a team at the

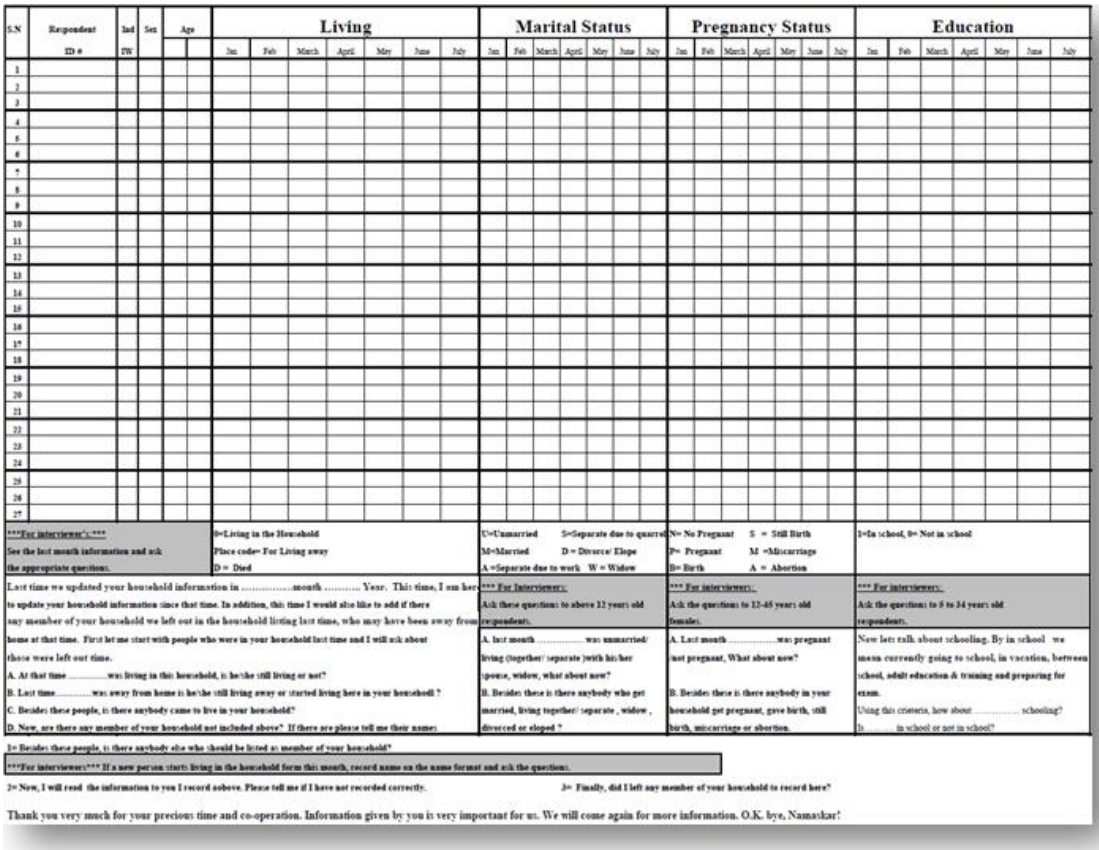
University of Michigan's Survey Research Center's Survey Research Operations (SRO) unit began a collaborative effort with ISER-N to convert their CVFS Household Registry's PAPI instrument to a Computer-Assisted Interview (CAI) system. This paper discusses the challenges and complexities of converting a multi-person multi-component longitudinal household registry paper instrument into a fully dynamic CAPI system – in a non-U.S. setting.

As in other longitudinal studies, interviewers visit the panel households regularly to update the family composition and collect contact information on individuals who have moved out or in. Following CVFS's complex rules, the SRO team's task was to develop a multi-module Blaise application to allow the interviewers to seamlessly move from the family roster module to customized follow-up interview modules with eligible household members. In addition to the Blaise application, SRO used its proprietary "SurveyTrak International" system, an electronic sample management system modeled after the domestic SurveyTrak. Standard SurveyTrak functionality allows the interviewers to manage their caseload, transfer cases between interviewers, record the outcome of every contact attempt, access the Blaise questionnaire, and transmit completed survey data and process data. SurveyTrak International has the added feature of selecting language for display and simplifies some of the structure and code. For the CAPI CVFS Household Registry project, interviewers in Nepal collect the interviews on laptops and then transmit the encrypted data via the internet to a server designated for international projects housed at SRO in Michigan.

Preparing the PAPI CVFS Household Registry interview required transcribing by hand all the previous waves' household members and relationships into the paper questionnaire. This is similar to how one would programmatically preload data into a CAPI instrument, and would be an entire operation from the field office before data collection begins. The pre-filled paper questionnaires were given to interviewers, and interviewers would take the correct questionnaire to each household. The interviewer begins the interview by updating the Household Registry, updating the columns with each person's status, and capturing information on newly added members, and their individual status. Depending on each individual's situation, various follow-up modules may be asked (e.g., if there were a marriage or birth). Where some parts of the interview are completed by a household-level reporter, others are completed by the individuals within the household.

The main PAPI Household Registry instrument is represented below in Figure 1. This is where the interviewer would hand-transfer the data on the right-side and capture the current wave's information about each household member's living, marital, pregnancy, and education status by month.

Figure 1. CVFS PAPI Household Registry instrument



S.N	Respondent ID #	Ind IW	Sex	Age		Living							Marital Status							Pregnancy Status							Education						
						Jan	Feb	March	April	May	June	July	Jan	Feb	March	April	May	June	July	Jan	Feb	March	April	May	June	July	Jan	Feb	March	April	May	June	July
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For interviewers: See the last month information and ask the appropriate questions.

0=Living in the Household; Place code= For Living away; D = Died

U=Unmarried; S=Separate due to quarrel; M=Married; D = Divorce/ Elope; A =Separate due to work; W = Widow

N= No Pregnant; S = Still Birth; P= Pregnant; M =Miscarriage; B= Birth; A = Abortion

1=In school, 0= Not in school

Last time we updated your household information in .....month ..... Year. This time, I am here to update your household information since that time. In addition, this time I would also like to add if there any member of your household we left out in the household listing last time, who may have been away from home at that time. First let me start with people who were in your household last time and I will ask about those were left out time.

A. At that time .....was living in this household, is he/she still living or not?

B. Last time.....was away from home is he/she still living away or started living here in your household ?

C. Besides these people, is there anybody came to live in your household?

D. Now, are there any member of your household not included above? If there are please tell me their names

*** For Interviewers: Ask these questions to above 12 years old respondents.

A. last month ..... was unmarried/ living (together/ separate)with his/her spouse, widow, what about now?

B. Besides these is there anybody who get married, living together/ separate , widow , divorced or eloped ?

*** For interviewers: Ask the questions to 12-45 years old female.

A. Last month .....was pregnant not pregnant, What about now?

B. Besides these is there anybody in your household get pregnant, gave birth, still birth, miscarriage or abortion.

*** For interviewers: Ask the questions to 5 to 34 years old respondents.

Now lets talk about schooling. By in school we mean currently going to school, in vacation, between school, adult education & training and preparing for exam.

Using this criteria, how about ..... schooling?

Is ..... in school or not in school?

1= Besides these people, is there anybody else who should be listed as member of your household?

For interviewers: If a new person starts living in the household form this month, record name on the same format and ask the questions.

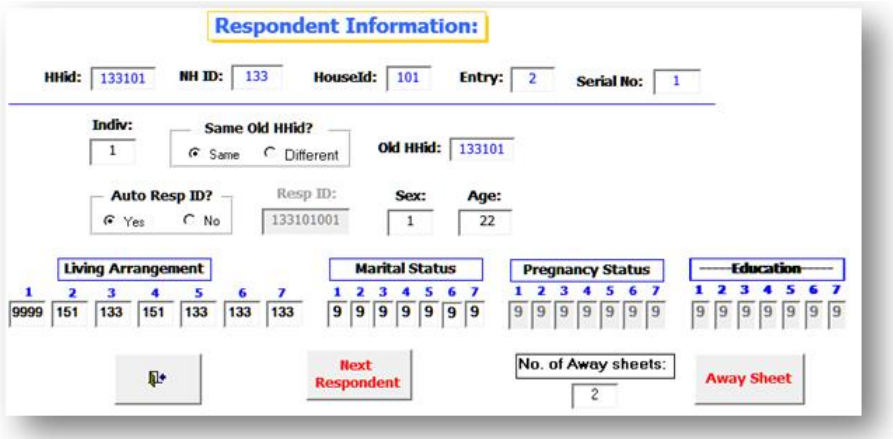
2= Now, I will read the information to you I record above. Please tell me if I have not recorded correctly.

3= Finally, did I left any member of your household to record here?

Thank you very much for your precious time and co-operation. Information given by you is very important for us. We will come again for more information. O.K. bye, Namaskar!

If any of the household members living status (or location) or marital status changes, or they give birth to a child in a given month during that wave of data collection, then supplement questions are asked in the months where these events have been reported. The supplement questions are a separate series of survey items, also recorded in paper questionnaires. After the interview, data entry of these PAPI cases was done using a series of forms in Microsoft Access. Figure 2 below offers an example of one of these Access forms where the data entry staff would capture the individual information about a given household member from the paper questionnaire.

Figure 2. CVFS PAPI Data Entry Form



Although the process of collecting multiple waves of household data on paper questionnaire is cumbersome, there are both advantages and disadvantages of PAPI vs. CAPI. The team felt strongly that transitioning to CAPI methods made sense, for a number of reasons. One unique driver to move

to CAPI for the CVFS Household Registry was the cost of printing the PAPI instrument – paper is extremely expensive in Nepal, and regular interviewing of approximately 5000 households was very paper intensive. The alternative was to print the questionnaires at the University of Michigan and then ship them to Nepal – also very expensive! A trade-off was the need for hardware to conduct CAPI interviews. An easy solution was to re-purpose laptops that had been fully amortized and retired from other SRC studies; it was more cost-effective to wipe them clean and re-load them with required software then ship them to Nepal than to keep printing paper questionnaires.

Many of the other reasons are consistent with the experiences of other organizations and studies that have already made the transition from PAPI to CAPI in the last two decades. Chief among them: the reduction of interviewer-introduced error within an extremely complex instrument, and increased speed of data processing and the ability to eliminate logistical steps of shipping questionnaires to the main office in Chitwan and then data entry. Another important factor is the ability to use an electronic sample management system to increase the availability of timely paradata to effectively manage and report on production. Perhaps the most compelling is ISER-N striving to be a leader in Southeast Asia for adopting best practices and techniques, and the ability to explore multi-modal options for the study moving forward (for example, ISER-N is currently experimenting with mobile and text messages for data collection).

Ultimately, the process of transforming the PAPI instrument to the present CAPI system took several paths. We began by collecting and understanding all the PAPI materials, and assimilated their content and objectives to begin to create the CAPI and sample management specifications. We also were fully aware of needing to do as much ex-ante harmonization as possible to assist in the PAPI and CAPI data compatibility. In many ways, the CAPI instrument attempts to mirror how the PAPI instrument was administered.

In the beginning, a proof of concept was created and we held a series of prototyping meetings to review if the overall designs would work for the project. Once the overall design was approved by the research team and the look and feel of the instrument was set, we began programming the instrument -- a process that took two separate rounds. The result of the first round was version 1 of the instrument and was used to collect one full wave of data and was considered a six-month pilot. The second round resulted in some significant structure changes to address some features that we not able to incorporate into V1 and to add functionality based on feedback received from the ISER-N interviewing and supervising teams. Version 2 has been in production since March 2014. Work on version 3 will begin in the fall of 2016 and will go into production in 2017. The major change is version 3 is to extend the months available in the system so that data collection can continue through January 2022.

In addition to developing the technical systems, the SRO team provided extensive training to the ISER-N technical lead during a two-week visit in Ann Arbor prior to releasing V1. The training sessions covered the use of Blaise and SurveyTrak, importing translated text into the systems, understanding the structure of the database, how to train their own interviewers on the systems, how to monitor production using our reporting structure, etc.

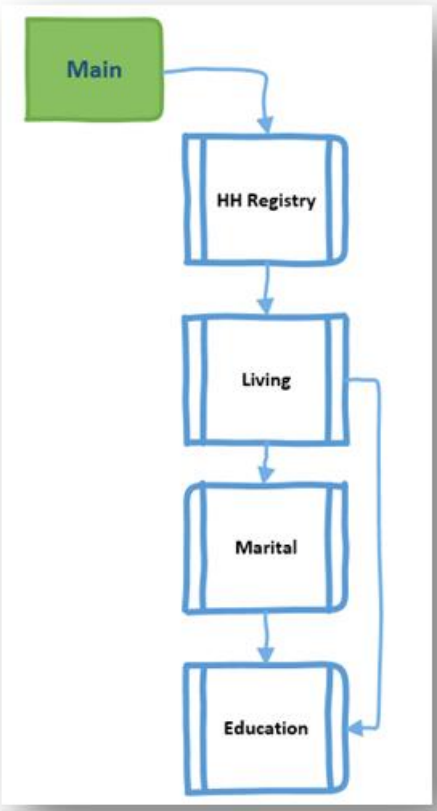
CAPI instrument was designed to mirror the PAPI process, both to maintain the original PAPI data structure and to help the interviewers adapt to the new technology. This design involved using 13 Blaise parallel blocks where one of those blocks served as the household status tab (main household roster). This tab is the first thing the interviewer sees upon entering the instrument and the last thing they see upon completing the survey. The roster tab offers the flexibility to update family composition and collect individual monthly member information seamlessly while bringing survey components (questionnaire supplements) online or offline as eligibility criteria are met.

One of the unique features of the Blaise software is the ability to use parallel blocks. However, not all programmers know about this feature or its uses. The Blaise online help says blocks are taken out of the “sequential processing order as specified in the rules” and “enables one to process one or more

blocks separately from the current route in the Data Entry Program (DEP)." The online help goes on to say this can be used for many situations, including: concurrent interviewing, appointments blocks, nonresponse blocks, notes from previous surveys, etc. Parallel blocks can be displayed on individual tabs, within the same window, accessed from the menu, function keys, using custom onscreen buttons, or via hyperlinks imbedded in text display in the infopane. Any defined block can be defined as a parallel. However, the important difference is once the block is defined as a parallel block, it is taken out of the typical vertical logic presentation and placed in what could be seen as a horizontal logic presentation.

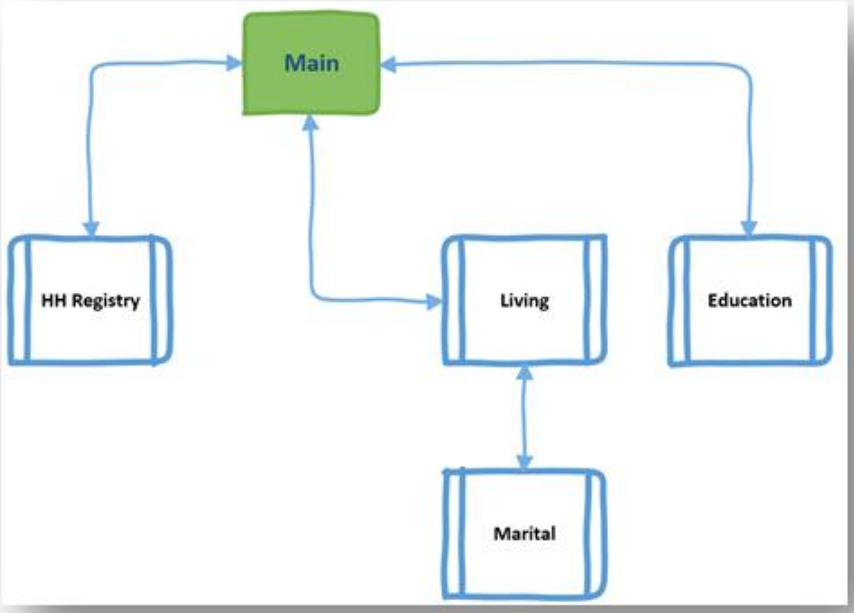
Looking the traditional vertical presentation of the logic within Blaise instruments, sections are asked in in the sequential order they are presented in the logic. Using the CVFS as an example, figure 3.1. below shows this traditional vertical presentation where the sections are asked in successive order until one reaches the end of the instrument.

Figure 3.1. Traditional Blaise Vertical Presentation



However, when we begin to think of Parallel Blocks within Blaise, we have the opportunity to take this vertical logic presentation and transpose it by presenting these blocks in a horizontal structure. Figure 3.2 below shows the same example and how that might look if the modules blocks were defined as Parallel Blocks.

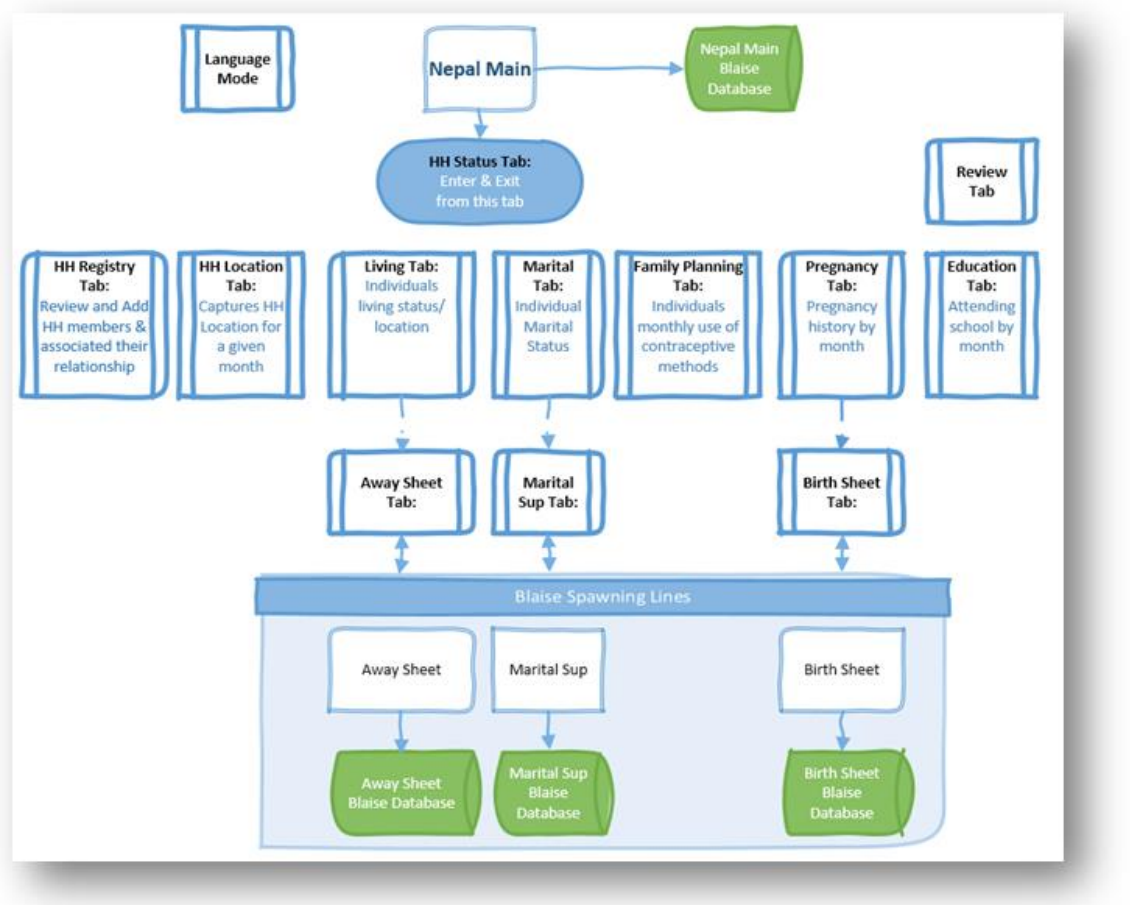
Figure 3.2. Parallel Blocks Presentation in Blaise



Essentially, the horizontal presentation of parallel blocks allows one the ability to bring blocks online or offline as needed within the datamodel. Using the same example, the Household Registry, Living, and Education sections are all online and accessible at the same time. This transposed horizontal structure forms the foundation of how the CAPI Household Registry was created for the Chitwan Valley Family Study Household Registry in Nepal. The use of parallel blocks allowed the best way to replicate how things were done in PAPI for over two decades. While designing the CAPI version of the instrument it was felt users' transition and assimilation to new CAPI instrument would happen faster and their experience would be more enjoyable. Additionally, we needed to allow the interviewer the flexibility to capture the data as needed within a given household (I.e. with the household lever reporter or the individual respondents who were available at a given visit).

Overall the Chitwan Valley Family Study Household Registry Blaise instrument was designed to accommodate several years of data collection where the ISER-N team would reuse the same instrument from wave to wave. Any particular wave asks retrospective information of up to 30 household members for the current month and the previous five months. In addition to "traditional" households, the roster also needed to expand to fit extended families, and larger group quarters. It is designed to accommodate 47 months total. All this flexibility means there are a more than 27,000 variables but only a fraction of them are used in any given survey. Reusing the same application on successive wave's means that logic needs to be dynamic and the instrument makes use of arrays where the household members loop through months using the data collection month index as the array index. Figure 4 below shows an overview of the various parallel blocks with in the CVFS's Blaise instrument.

Figure 4. CVFS Blaise Instrument Overview



There are 14 parallel blocks in total and all but three are displayed in parallel tabs. The three that are not displayed on their own tabs are the main Nepal block, the global status, and language mode blocks. The language block is accessed via a menu command. The only way to complete the instrument is to proceed past the global status block (or the HH Status Tab). All the remaining parallel blocks are routed back to the global status block at the end of the block.

The user always enters the instrument thought the HH Status tab, where they see a snapshot of the sections that on route or have recently become on route as well as the status for each of those sections for each member within the given household. Below are a series images (in figures 5.1 – 5.5) that represent the look and feel of the CVFS CAPI instrument.

Figure 5.1a. Household Status tab in Nepalese

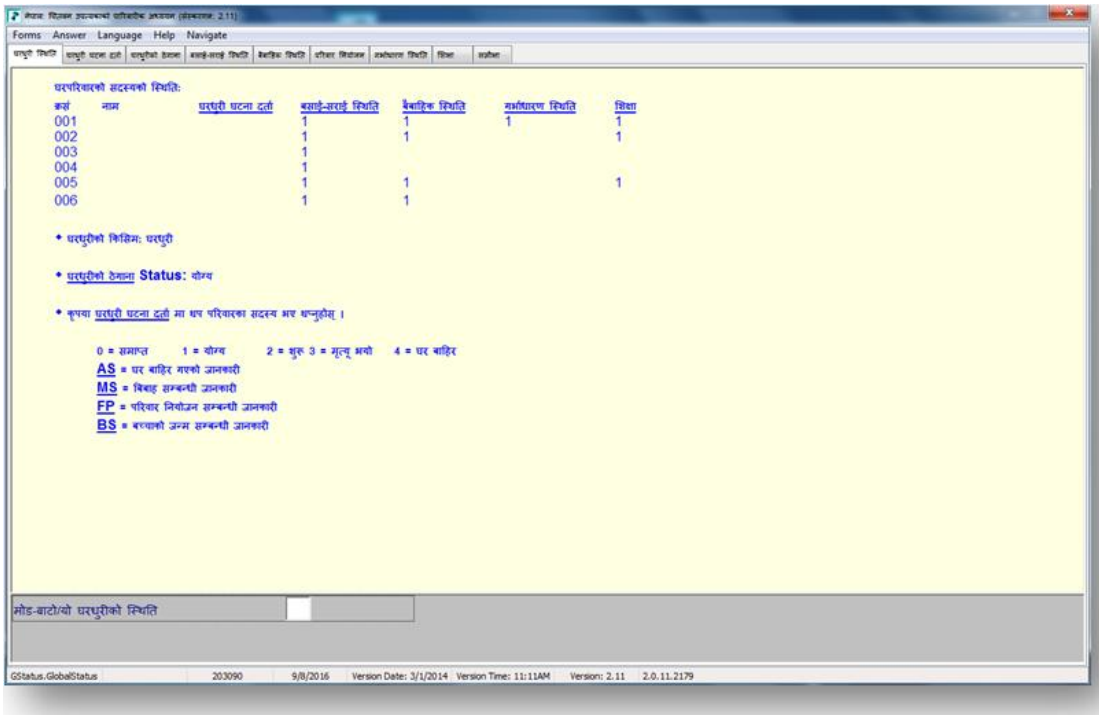


Figure 5.1.b. Household Status tab in English

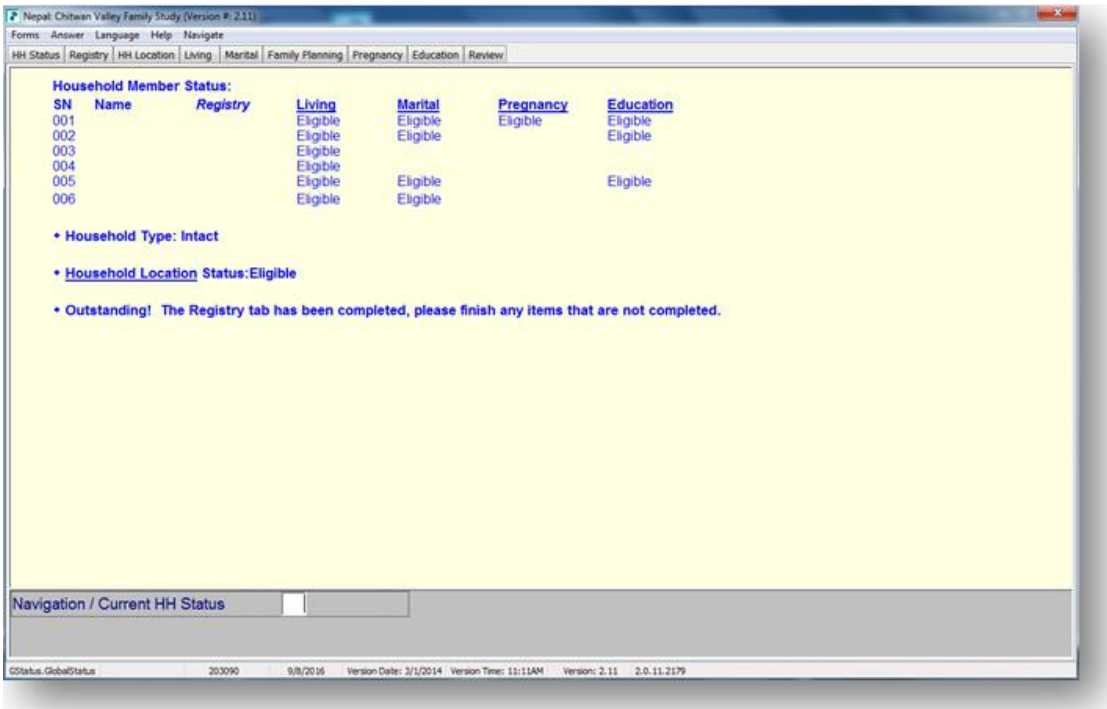
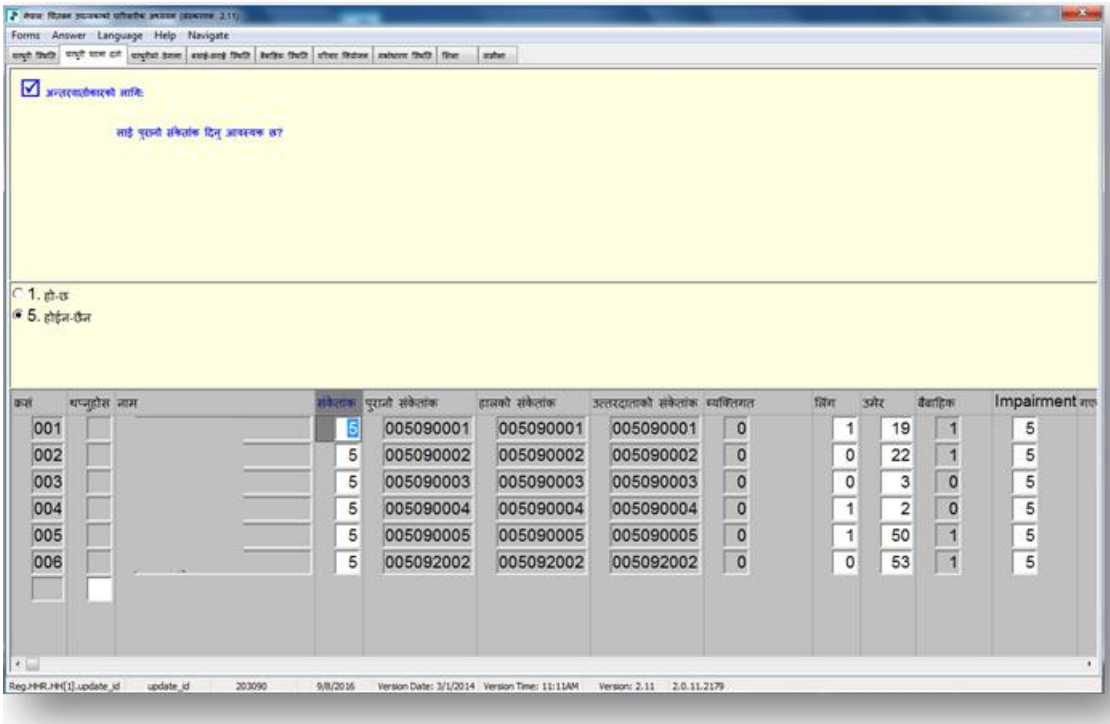


Figure 5.2. Household Registry Tab



Each block ends with a checkpoint to allow us to keep track of the status of the given blocks:

Figure 5.3. Completion Block Checkpoint

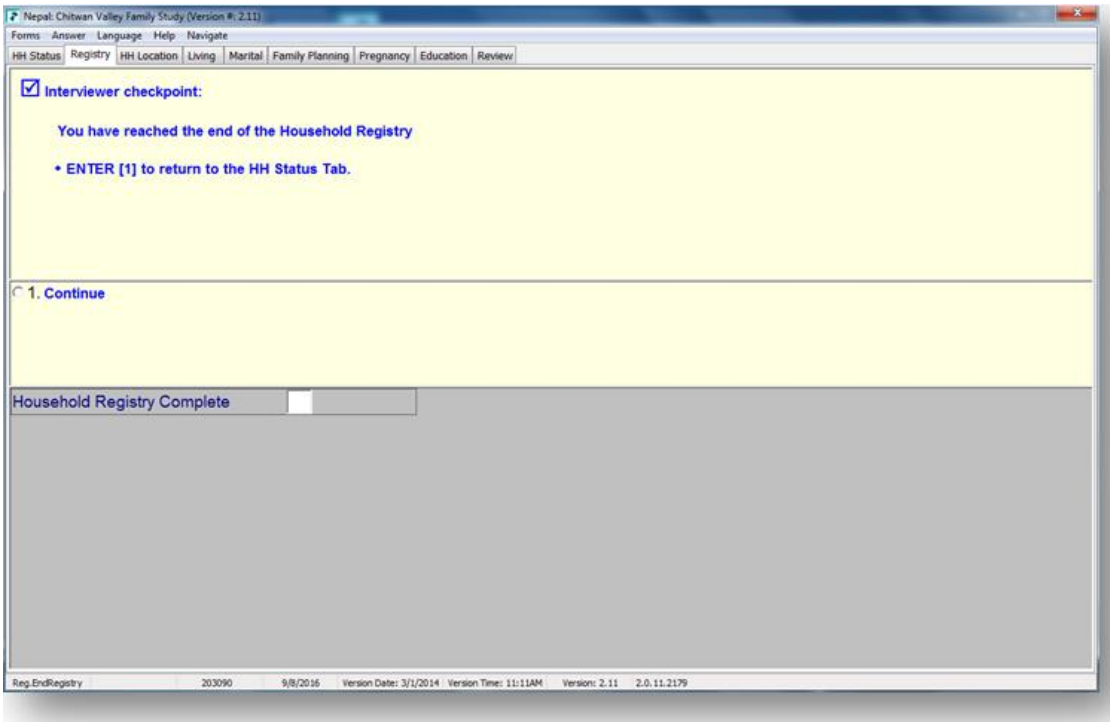
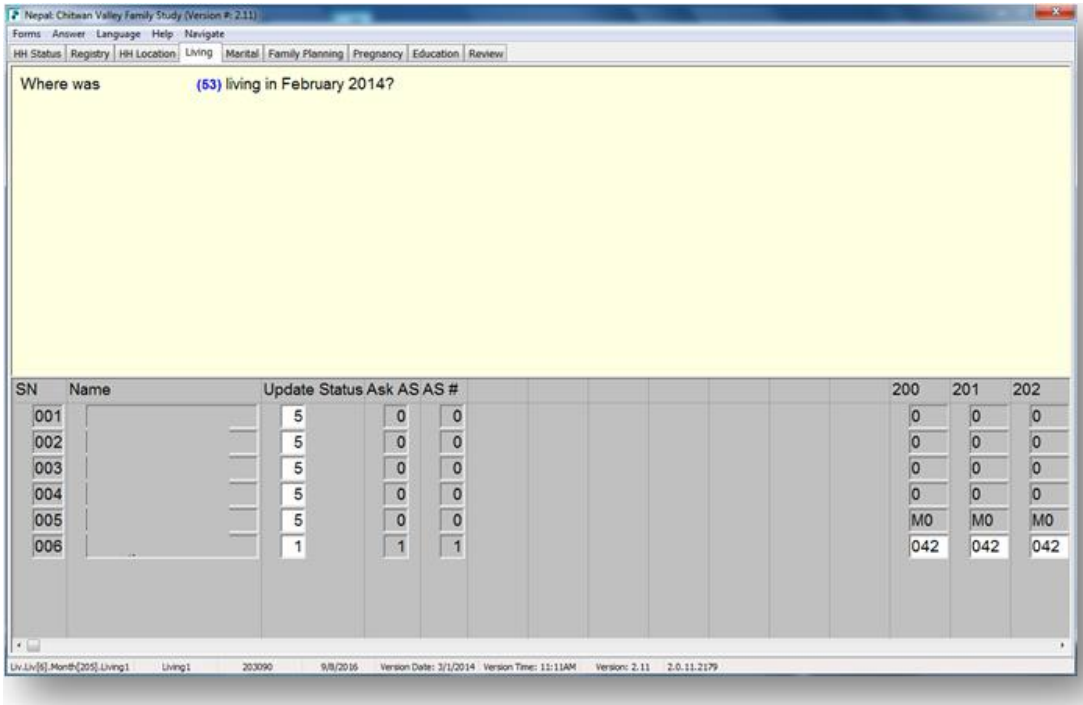
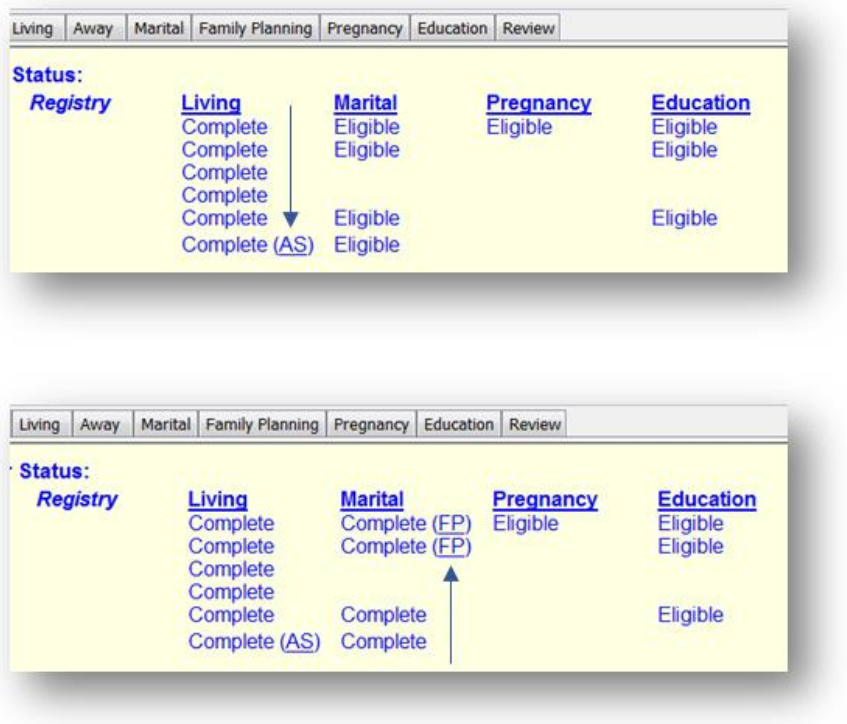


Figure 5.4. The Living Status Block



After every section has been completed, the interviewer returns to the HH Status tab where the status of the sections is updated. The top of figure 5.5 shows what this looks like as the living section is completed and person 6 is away and has supplemental Away Sheets to fill out (indicated by the "(AS)" which is hyperlinked to jump to the Away Parallel tab. The bottom of figure 5.5 shows what this looks like after completing the Marital section and two follow up family planning sections are needed (indicated by the newly inserted "(FP)").

Figure 5.5. Example of Supplemental Blocks Coming On-Route



Some new features added to Version 2 of the CVFS was the addition of Blaise Alien procedures that makes a call using Manipula to up to three external Blaise data models. These procedures "spawn" up to three additional Blaise datamodels on-the-fly from the main Blaise application to collect an individual's away status, marital status, or childbirth within any given month. This "spawn" process creates a zero-to-many situation and turns the CVFS Blaise Household Registry instruments into a relational database. If we were to add all the data locations for the 30 members across all the months in the instrument we would be adding in excess of 67,000 variables to the instrument. Since the three supplemental questionnaires are based on a given month for a subsection of individuals, we decided to make them their own Blaise datamodels; where Blaise Manipula creates a unique sample id (secondary key in the main database) and spawns to a secondary Blaise instrument to collect information for the month in question.

One of the more interesting cross-cultural challenges this project faced was the fact that in Nepal they use a different calendar than is used in most of Europe and the United States. The Nepali calendar is based on an official Hindu calendar known as the Bikram Sambat (B.S.) calendar. This is approximately 56 years, 8 months and 16 days ahead of the typical Gregorian calendar date. In figure 6 below, we see a mapping of how the instrument determines dates within the CVFS instrument. The nature of the Household Registry project is extremely date dependent, so understanding the Bikram Sambat calendar and being able to map it to the Blaise structure was critical.

Figure 6. Gregorian and Bikram Sambat Calendar Crosswalk

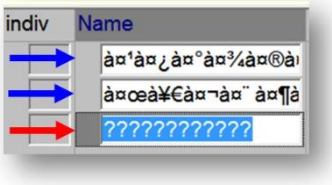
Year	HHR Round	Month Index	Gregorian Month & Year			G-CM	B.S. Month & Year			N-CM
CVFS Year 17	33	193	February	2	2013	1358	Magh	10	2069	2038
		194	March	3	2013	1359	Fagun	11	2069	2039
		195	April	4	2013	1360	Chaitra	12	2069	2040
		196	May	5	2013	1361	Baisakh	1	2070	2041
		197	June	6	2013	1362	Jestha	2	2070	2042
		198	July	7	2013	1363	Asar	3	2070	2043
	34	199	August	8	2013	1364	Saun	4	2070	2044
		200	September	9	2013	1365	Bhadra	5	2070	2045
		201	October	10	2013	1366	Asoj	6	2070	2046
		202	November	11	2013	1367	Kartik	7	2070	2047
		203	December	12	2013	1368	Marg	8	2070	2048
		204	January	1	2014	1369	Poush	9	2070	2049
CVFS Year 18	35	205	February	2	2014	1370	Magh	10	2070	2050
		206	March	3	2014	1371	Fagun	11	2070	2051
		207	April	4	2014	1372	Chaitra	12	2070	2052
		208	May	5	2014	1373	Baisakh	1	2071	2053
		209	June	6	2014	1374	Jestha	2	2071	2054
		210	July	7	2014	1375	Asar	3	2071	2055
	36	211	August	8	2014	1376	Saun	4	2071	2056
		212	September	9	2014	1377	Bhadra	5	2071	2057
		213	October	10	2014	1378	Asoj	6	2071	2058
		214	November	11	2014	1379	Kartik	7	2071	2059
		215	December	12	2014	1380	Marg	8	2071	2060
		216	January	1	2015	1381	Poush	9	2071	2061
CVFS Year 19	37	217	February	2	2015	1382	Magh	10	2071	2062
		218	March	3	2015	1383	Fagun	11	2071	2063
		219	April	4	2015	1384	Chaitra	12	2071	2064
		220	May	5	2015	1385	Baisakh	1	2072	2065
		221	June	6	2015	1386	Jestha	2	2072	2066
		222	July	7	2015	1387	Asar	3	2072	2067
	38	223	August	8	2015	1388	Saun	4	2072	2068
		224	September	9	2015	1389	Bhadra	5	2072	2069
		225	October	10	2015	1390	Asoj	6	2072	2070
		226	November	11	2015	1391	Kartik	7	2072	2071
		227	December	12	2015	1392	Marg	8	2072	2072
		228	January	1	2016	1393	Poush	9	2072	2073

Some issues faced during the CVFS transition to CAPI were situations inherent to Blaise 4.8 and being ANSI (American National Standards Institute) based. An ANSI character set is an extension of the ASCII character set-encoding standard and includes an additional 128-character codes[2]. The problem with ANSI is its inability to handle all languages. In recent versions of Blaise, significant

changes have been made to aid in the display of non-ANSI based character sets. However, three main areas remain ANSI within the Blaise DEP: string fields, open-ended fields, and interviewer remarks.

The Nepalese language is encoded using Unicode. Unicode has the ability to handle majority of the world's languages. Blaise 4.8 can display Unicode in DEP with the exception of asked data entry fields. Figure 7.1 offers two examples how Unicode text appears in an asked string field in Blaise. The blue arrows represent Unicode text that has been preloaded into Blaise and displays correctly in other areas of Blaise. The red arrow show how it looks when one attempts to capture Unicode text within the same field. When a string fields is defined in Blaise using a .SHOW assignment in the rules and is not an asked element the Unicode text is displayed correctly.

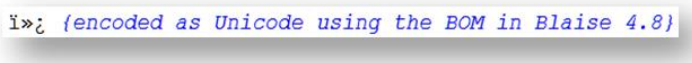
Figure 7.1. Display and Capture of Unicode Text in Blaise 4.8



Fortunately, for the CVFS the ISER-N interviewing staff are proficient in English. Therefore, they capture information in string text (such as names) in English and translate it as part of the post data collection process if the data is needed for preload in the next wave's data collection effort.

Significant testing is required for a Unicode based instrument, as multiple factors can influence if the text is displayed correctly. For example, when interfacing with a Blaise instrument that has Unicode text, the Unicode text needs to be represented as ANSI to allow Blaise to display it correctly. Blaise has added a feature to add the ability to add the Byte Order Mark (BOM) to the beginning of the Blaise source code file. This is important, as one needs to develop their instrument using ANSI and then incorporate the Unicode text using a Unicode aware text editor (such as Notepad++ or Ultra Edit). Figure 7.2 below shows what this looks like within the Blaise source code.

Figure 7.2. Hidden Blaise 4.8 Encoding Feature



The three character BOM (or "ï»¿") is ignored when the Blaise 4.8 parser is compiling an instrument. However, when the same source code is opened within a Unicode aware application it renders the Unicode text correctly. Figure 7.3 below shows how Unicode text looks in the Blaise Control Center and figure 7.4 shows how this looks within the Unicode aware application Ultra Edit.

Figure 7.3. Blaise 4.8 Unicode Source in the Control Center

```
name          (name)
        Eng   "What is this household members name?"
        Nep   "à¤‰à¤¹à¤¾à¤•à¤•à¤• à¤•à¥‹ à¤¨à¤¾à¤®à¥‡ à¤•à¥‡ à¤¹à¥‹ ?"
               / "Name" "à¤¨à¤¾à¤®à¥‡"                                  : Type_NameStr50, NODK, NORF

gender        (Gender)
        Eng   "What is ^name's gender?"
        Nep   "à¤‰à¤¹à¤¾à¤•à¤•  à¤®à¤¹à¤¿à¤²à¤¾ à¤¨à¤¾à¤¨à¤¿ à¤•à¤¸à¥‹ à¤¹à¥‹,à¤· à¤•à¥‡ à¤¹à¥‡ à¤¨à¤¹à¥‹ à¤¨à¤¹à¥‹ à¤¨à¤¨à¥ à¤› ?"
               / "Gender" "à¤²à¤¿à¤�à¤—"                                 : Type_Gender2, NODK, NORF

age           (Age)
        Eng   "And how old is ^name?"
        Nep   "à¤‰à¤¹à¤¾à¤•à¤•  à¤•à¤¤à¤¿à¤¿ à¤¬à¤°à¥‡ à¤·à¤•à¥‡ à¤¹à¥‹ à¤¨à¤¨à¥ à¤–à¤¨à¥‍à¥‹ ?"
               / "Age" "à¤ à¤®à¥‍à¤°"                                   : Type_Age, NODK, NORF

marital       (marital)
        Eng   "What is ^name's marital status?"
        Nep   "à¤ à¤¹à¤¾à¤•à¤•à¤• à¤•à¥‹ à¤¬à¤¿à¤¹à¥‍à¥‡ à¤–à¤•à¥‹ à¤›à¤•à¥‍à¥‹ à¤›à¤•à¤¿ à¤›à¥‍à¥‍à¤¨ ?"
               / "Marital" "à¤¬à¥‍à¤¬à¤¾à¤¹à¤¿à¤• à¤¸à¥‍à¤¥à¤¿à¤¤à¤¿"  : Type_Marital2
```

Figure 7.4. Blaise 4.8 Unicode Source in a Unicode Aware Application

```
name          (name)
        Eng   "What is this household members name?"
        Nep   "उहाँको नाम के होला ?"
               / "Name" "नाम"                                       : Type_NameStr50, NODK, NORF

gender        (Gender)
        Eng   "What is ^name's gender?"
        Nep   "उहाँ महिला पुरुष के हुनुहुन्छ ?"
               / "Gender" "लिंग"                                    : Type_Gender2, NODK, NORF

age           (Age)
        Eng   "And how old is ^name?"
        Nep   "उहाँ कति वर्षको हुनुभयो ?"
               / "Age" "उमेर"                                       : Type_Age, NODK, NORF

marital       (marital)
        Eng   "What is ^name's marital status?"
        Nep   "उहाँको बिहे भएको छ कि छैन ?"
               / "Marital" "वैवाहिक स्थिति"  : Type_Marital2
```

Another factor that can alter the presentation of Unicode text can be any application that interfaces with the text, resulting in changing the underlying encoding and corrupting it. In addition, when authoring instruments with Unicode text, one must consider that textual fills in the instrument take up as much as three times more space than what would be required for traditional ANSI based character sets. This means that the length of defined fills within an instrument need to be increased and tested to ensure the fills are not truncated and the display is not corrupted.

Though the transition of the CVFS Household Registry data collection from PAPI to CAPI has been successful, and we were able to take advantage of the fact that ISER-N in general already followed the standard protocols of SRC data collection – terminology around the survey task itself was familiar to the ISER-N team --, the team has nevertheless encountered some obstacles beyond the expected challenges of implementing a new technology with a staff very experienced with the previous method. Here is one example. As described in detail above, the questionnaire uses parallel blocks to create a flexible structure, with individual questionnaire supplements dependent on data entered into the household roster tab. Each individual member of a household is assigned a unique identification number, and all information about each individual needs to tie back to both the household and the individual. There are times when a household change has occurred that should launch a questionnaire supplement, but the individual needed to answer the supplement questions is not available. The supplement then has missing data, and the protocol on PAPI was to attempt to collect this missing

data during the next data collection. This is much more difficult in a CAPI system, where all contingencies need to be programmed and allowed. The ISER-N team ended up creating new paper-based work-arounds for these unusual situations, and we are thinking through how to better accommodate them within the CAPI system.

Another example of how the CAPI instrument's design resulted in adding unintended burden was not realized until we began working through the post data collection processing phase. This issue surrounds the Family Planning block, where a very small subset of respondents are required to answer this module. However, the instrument was designed to have the ability to capture this data for all 30 respondents, throughout the 48 months, and is captured as a set of 5 enumerated responses (or an "enter all that apply" question). This means there are more than 7,000 variables in the Family Planning section alone and takes up 27% of the total amount of variables within the second version of the CVFS's Blaise HHR application. This adds to a considerable amount of burden on the post data collection cleaning process and is one of the reasons it is being removed from the forthcoming Version 3 of the CVFS Blaise instrument.

In conclusion, the CVFS Household Registry's PAPI instruments conversion to a Computer-Assisted Interview (CAI) system was a success. We continue to look for areas of future enhancements and hope to transition the CAPI instrument to Blaise 5 in the future.

3. References:

[1] http://spe.psc.isr.umich.edu/research/cvfs.html

[2] http://net-informations.com/q/faq/encoding.html

Blaise 4.8 Online Assistant (Version 4.8.4.1915). (2016).