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# **Household Registration System 2 (HRS2)**

## **USER'S MANUAL**

**Version 3.0**

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## ***Acknowledgment***

This manual documents the principles and procedures for the computerized component of the HRS. This document has been adapted from manuals prepared for ongoing projects of the International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) and the Navrongo Health Research Center (NHRC), Ghana. This research is supported by grants from the Thrasher Foundation, The Rockefeller Foundation to the Navrongo Health Research Center (NHRC) and The Population Council, New York

# Chapter 1 - Introduction

The HRS2 software system maintains a consistent record of significant demographic events that occur to a population in a fixed geographic region. In addition, the HRS2 generates up to date registration books, which are used by the field workers, and it can compute basic demographic rates (births/age, deaths, etc.).

The HRS2 has been designed to be easy to modify and extend to new longitudinal systems. Investigators can add to and sometimes modify the *core* set of data and software to tailor the HRS2 to their particular projects. In particular, data fields can be added, logic and consistency checks can be written, and the screen layout can be easily specified for a new longitudinal system. The HRS2 *core* data and code specification, and the ability to modify and add to this *core* specification, all combine to give the user the flexibility to develop a site-specific household registration program. While this manual will focus on how to use the HRS2 in it's site-independent form, it is important to keep in mind that this software is meant to evolve and be adapted to new situations and circumstances.

The HRS2 has been structured, designed, and programmed through the relational database package, Visual FoxPro version 5.0 (Microsoft Corporation). No knowledge of Visual FoxPro is needed to run the HRS2, but any modifications or inclusion of additional modules e.g. for consistencies in the data collected, require some basic knowledge of the FoxPro language. Knowledge of RBASE, dBASE or other XBASE languages can also be useful. The HRS2 should not be considered complete. The database maintained in the HRS2 has many uses beyond which were originally envisioned, and FoxPro features make it possible and easy to access this database as well as incorporate additional data sets into the database, and other features into the whole system.

In this document, we describe:

- *general principles and procedures on the data, users entries, error trapping, information screen messages, and exiting the system;*
- *starting up the HRS and the menu structure;*
- *a tutorial with a step-by-step walk through of each currently implemented menu/sub-menu option.*

# Chapter 2 - HRS Principles and Procedures

## *A Model for Longitudinal Household Studies*

The HRS2 is a software application that records information about households and the individuals within households over a period of time. The underlying model assumes a baseline survey with information collected from households and a longitudinal event history of some significance (e.g. child survival, marriage duration, migrations, and mortality). Information that does not change (e.g. sex and birth date) are compiled in the baseline survey, while those that change over time are included in the longitudinal system.

The design of the HRS2 is based on the observation that certain characteristics of households, members, relationships, and demographic events are common to all longitudinal studies of households. The logic for these relationships is embedded in the HRS2. Data for the HRS2 is structured and logical integrity is maintained on the following basic elements of a household:

- *All households have defined members. Non members of households are excluded from all rules governing members of particular households.*
- *All households have a single head, and members relate to one another and to the head in definable ways.*
- *Members have names, dates of birth, permanent identification code, and other characteristics that do not change.*
- *Dynamic events include births, deaths, in- and out-migration, and marital status change.*
- *Longitudinal events occur to individuals at risk (i.e., active members) and follow simple logical relationships. Observation of a household defines the person-days of risk that accrue to all members.*
- *Dynamic events can change household memberships or relationships according to laid down rules.*

An individual is active if they can be observed in the field and can logically experience a demographic event. The HRS2 supports the inclusion of inactive individuals. These can be individuals who are somehow related to active individuals but who are not resident in the study. In addition, an active individual can move to an inactive state by a death or out-migration.

Each individual has a unique identification code - Individual ID. The Individual ID. being a code given during the enumeration or when an individual is first registered into the study area.

# ***The HRS Field System***

The HRS2 operates in conjunction with a field system for collecting household data. While the broader system of household data collection and management in which HRS2 operates is beyond the scope of this document, it is instructive, nonetheless, to review basic concepts embodied in previous systems that transfer to the present system.

Longitudinal household studies require periodic visitation of households by a cadre of trained interviewers. Visitation cycles differ from study to study, but the basic research staff management task involves insuring that study households are visited regularly, that interviewing conforms to set rules, and that information is recorded on a standardized instrument.

The design of HRS2 field work and data collection is informed by database concepts. Workers are equipped with a register, printed from a population database that is arranged in the order that households are visited and designed to facilitate data management in the field. Rows in the register correspond to individuals in the households, and page headings separate households by the name of the household head with information printed about characteristics that household members share as a group. Rows for individuals list names, ages, and relationships and other basic information about individuals. Columns in the worker register correspond to visit cycles, and space is provided for workers to enter codes corresponding to vital events or households' status changes (Births, Deaths, Migrations and Marriages).

This configuration of the field data registers permits preparation of manuals and interviewing guidelines that enforce logical relationships; since event data are recorded together with data on the individuals at risk. The hand-held register of the worker implicitly links records in a database design and permits a consistent linking of records in the computer database.

Data entry into the computer is quite simple. After each round of interviewing, registers are passed to the data entry clerk who keys in the household numbers, event codes, and other requisite transactions with the database. The entry of only the events that affect the structure of a household (births, deaths, marriages, migrations) represents one of the fundamental differences between the HRS2 and other batch oriented systems.

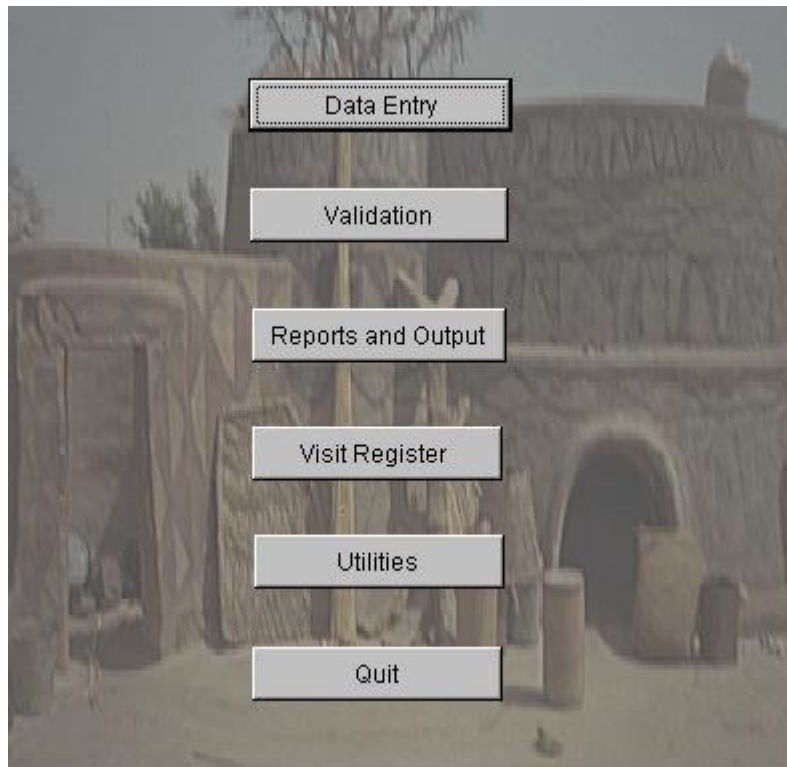
From past experience, approximately one-seventh of the population has some event associated with it on a given interview round. Rather than completely re-interview the sample population, then with the computer, link those records back to previous interviews (an error prone process), individuals in the study area are linked to households and past event histories with the paper registers carried by the interviewer (mirroring the linkages in the relational database). This substantially reduces the quantity of data entry and the subsequent costs of consistency checking. Most data inconsistencies are caught at data entry and reports of these inconsistencies are printed for supervisory action.

These field operations are deemed sufficiently well developed at this point to be generic to any longitudinal study of demographic dynamics.

# ***The HRS User Interface***

## **The Functional Components of the HRS Software**

The initial screen will help illustrate the main components of the HRS2 system:



The options in this main screen are:

### **Data Entry:**

Allows for the entry, deletion, and editing of the baseline and longitudinal data.

Baseline household information includes a Location ID, a Family ID, the registration date of the household, the head of the household, and the current validity status of the household information (valid, warning, failed, ...). Baseline individual information includes Individual ID, name, birth date, sex, relation to the household head, the registration date of the individual, mother ID, father ID, and individual validity status (valid, warning, failed, etc.).

Longitudinal information includes basic information related to births, deaths, migrations in and out of the study area, and marriages. (Individual IDs, dates, types' of events)

## Validation:

Subsets of households and members can be checked for logical consistency in the validation option. The results of a consistency check can either be valid (v), warning (w), or fatal (f). The values returned from a consistency check are stored in the "validity status" variable in the household and Individual tables.

## Reports and Output:

This option is used to calculate and display the demographic events and rates. The tables include births, deaths, marriages, divorces, and widowing, entry and exit events. Age specific and overall rates are computed.

## Visit Register:

This is used to print the household record book. The household record book is used by the field workers to record information during their household interviews. The household record book is a computer printout of basic data about households and their members: name, age, and some previous event histories. There is space left in the printout for field workers to enter new information about the household and its members. Data entry operators transfer the new information in the household record book into the computer through the HRS2 system.

## Utilities:

This option is used to make backup copies of the databases or to pack the databases. Packing is needed to permanently remove all deleted records. In FoxPro, deletion is a two-staged process; first records are marked for deletion and then pack does the actual removal. This option also allows for the entry of background information (user ID's, region names, etc.) and the generation of reconciliation reports.

Collectively, these functions are a part of every application generated from the HRS2. Furthermore, most of the functions are designed to anticipate additional user-defined variables and databases.

## Network Capability

The HRS2 software runs either as a single centralized system (i.e. for one user) or as a network system allowing multiple users to access the software at the same time. When installed in an environment using a local area network (LAN) e.g. **Novell** or **Lantastic**<sup>2</sup>, the software automatically invokes network capabilities such as file sharing and locking.

## User Entries and Responses

The HRS2 is a menu driven software system. The primary inputs to the system involve the entry of baseline information and longitudinal events recorded by field workers in Household Registration Books (HRB). Data is entered manually using the keyboard, with output either directed to the monitor (screen) or to a printer connected to the line printer port of the PC. Each operation is carried out by choosing a particular menu option, which is then followed by other messages that appear on the screen to indicate the type of processing under execution.



Prompts and responses are specified by screen messages or screen displays. Whenever reference is made in this manual or in the program to the user making an entry, the meaning is that the user keys in a response followed by pressing the ENTER key. In certain cases, when the allowed space for keying in a response is filled up, the cursor automatically moves to the next field without the user pressing the ENTER key.

In most situations, a listing or range of valid responses is displayed at the bottom center of the screen, from which the user is expected to make a choice. All non-numeric entries are to be in upper case letters. Messages from the system are displayed at the top right corner of the screen. These messages can be in the form of alerts (e.g. when a record is saved, or when the system is in the middle of a computation that might take some time) or error messages. In the case of error messages the system indicates causes of the problem in the message.

Whenever a user receives a message beginning "Press any key to continue", any key pressed will continue the suspended processing and it should not be followed by the ENTER key. Whenever the message "... please wait" is displayed, the user is expected to wait till the completion of the computation or when the message disappears before continuing with a process.

## **Error Trapping**

There is extensive error trapping on user entries for invalid or inconsistent responses. Whenever a list or range of valid responses is displayed and the user makes an entry not of that list or range, an error message, e.g. "Invalid Input" or "Date later than Current Date", is displayed at the top right corner of the screen and the program waits for the user to re-enter. Entries are always checked against already stored data for consistency. An example of an inconsistency is relating a male member of a household as the mother of another household member. Messages are displayed for all errors, and the user usually is given an indication of the cause of the error through the message displayed. The user then has the option of re-entering the response, substituting the entry with a query value, or aborting/abandoning that section of the processing.

## **Informational Screen Messages**

At various processing points, messages are displayed at the top right corner of the screen to advise the user of the status of the processing. No user action is required unless specifically stated. Messages that are prefaced with the request "... please wait" involve processing or computations that potentially may take a noticeable length of time without any indication to the user that anything is happening. Under such situations, the user is expected to be patient for such computations to be completed. Upon completion, the message is cleared and the results are either displayed on the screen, sent to a printer, or to a file as the case may be depending on the user choice selected. The Validation and Reports/Output menus options in the HRS2 system are examples of the processes that take some time for all computations to be done.

Other messages may be displayed to warn the user of some impending action, such as deleting/undeleting records, editing, updating and appending records to the database. The messages "Record saved", "Record Deleted", or "Record Undeleted", are examples of the prompts given to the user under such processes. These messages are noted where appropriate in the section on updating the database.

## Start up/sign on

Assuming the software was installed in the C Drive (see Appendix A for installation instructions if you have not installed the software), the user ought to change the current directory to C:\HRS (*cd c:\hrs*). There should be an executable file in the directory called *whrs.exe*. Running (double click or Run command on the Start menu) this file will initiate the HRS2 program. A shortcut can also be created to the executable file allowing the user to run HRS2 from the desktop. Alternatively the HRS2 can be run from within FoxPro. Start Visual FoxPro, then in the command window type

```
set defa to c:\hrs  
do whrs
```

After starting the program, an opening screen (the login window) appears with prompts for a User Name and Password. The user is then expected to key in a user id and an access code. If the access code is incorrect, an error message ("Invalid User Name/Password") is displayed and the user is expected to try again. One can abort the sign on procedure at any time by pressing the CANCEL button.

If the user name and password are valid, the main HRS screen (see above figure) is displayed at the top portion of the screen, and the user is then required to select one of the menu options. By default the first menu option "*Data Entry*" is always selected. Depending on the access code, some options will be deactivated. The HRS menu is based on a multi-level user structure, in that the system identifies different user types to access only portions of the whole HRS system. There are four (4) user levels:

- level 1 - for data entry
- level 2 - for data assistants (who check consistencies/cleaning of data)
- level 3 - researches who need to analyze or run the HRS rates/RQBE
- level 4 - for the data manager/database administrator

Users at level 4 have access to all the programs/routines within the HRS. Although some users may have access to only some of the menu options, this document describes all the menu options within the HRS.

## **Main/Sub-menu Options**

Some of the main menu options have sub-menu structures. When such options are selected, their sub-menu options are automatically displayed for the user to make further selections. The main and sub-menu options of the HRS2 system are shown below:

### **Data Entry**

#### **Updates**

#### **BaseLine**

#### **Amendments**

**Location**

**Individual**

**Social Group**

**Location Observation**

**Pregnancy Outcome**

**Death**

**Move In**

**Move Away**

**Pregnancy Observation**

**Marital Status**

**Social Group Status Change**

**Residency Change**

### **Validation**

### **Reports and Output**

**Demographic Rates**

**Life Tables**

### **Visit Register**

### **Utilities**

**Pack Files**

**Reindex Files**

**Enter Staff Codes**

**Enter Rounds**

**Migration Entries Reconciliation**

**Migration Exits Reconciliation**

**Pregnancy Observation Reconciliation**

**Data Entry Summary Report**

**Clean Error Table**

### **Quit**

## Exiting

The only proper way to exit from the HRS software and return to the operating system environment is via the QUIT button. Any exit other than this, such as turning off the computer or using CTRL+ALT+DEL key combination, could cause serious irrecoverable damage to the HRS databases. Even if not damaged, the integrity may be in question as in certain procedures, such as updating, much information is stored in temporary areas or in buffers, and this information is lost when the software is exited improperly. By using the proper exiting procedure, the temporary areas are cleared first.

In the largest and most complex processing module, the module to update a database, the user has frequent opportunities to discontinue the processing and return, through a series of clearly specified responses, to the main menu. Details are contained in later sections of this manual.

## Processing Delays

At times during the update processing, there can be computerized interludes requiring some waiting period. These waits can be caused by the hardware (e.g. slower processor/low RAM) or by the complexity of the consistency checks built into the HRS. The consistency checks require making sure that the data being entered or updated is correct and consistent with the already stored information in the databases. Some of the delays are unavoidable, but the software is structured to minimize such waiting periods during normal usage. Resolution of user errors in some circumstances, however, requires such waits. The careful user can avoid these by inputting the correct information.

## The Control/Navigation Bar

All data entry/editing screens contain a control/navigation bar (usually at the bottom) The control bar has the following control buttons – TOP, PREV, NEXT, BOTTOM, FIND, SAVE, REVERT, ADD, EDIT, DEL/UND, and EXIT.

The TOP button shows the very first record in the current database file. PREV shows the previous record while NEXT shows the next record. BOTTOM shows the last record in the current database file and FIND is used in searching for a particular record based on a defined search criterion. The SAVE button is used in saving a particular record (e.g. information pertaining to an individual or a household). REVERT cancels the current action and restores the database to its previous state. The ADD button confirms the addition of a new record to an existing database. Before one can add a new record, the user must be in the append mode. The EDIT button confirms or begins the editing process (edit mode). Usually before editing begins the user is prompted to enter some key information about the record to be edited, e.g. the Individual ID.

The DEL/UND button complement each other. An undeleted record is deleted when the DEL/UND button is selected. Likewise a deleted record is undeleted when the DEL/UND button is pressed. The EXIT button ends the process of entry/editing and either sends control to the main menu or to the next entry screen.

## The Entry Form

The Entry form is used together with the control bar to enter, display, and/or edit data when updating a database. Most fields in the entry form represent a field in the actual database file. Some fields are displayed automatically by the program. For example, if the ID of an Individual is known, then some baseline information (name, age, ..) can be displayed on the screen. These fields have been designed to

reduce the amount of data entered in cases whereby the information has already been collected or stored in the database. Users are thus expected to just check or compare the information displayed in the field with that on the original form filled by the field workers.

Data entry can be discontinued by pressing the REVERT control button or by pressing the CANCEL button associated with an error message for data entry into a particular field. Fields cannot usually be left blank. If a field on the original form is blank, a query value is to be entered by the user. Dates are entered using the standard two-digit format for day, month, and year (dd/mm/yyyy) and all alphanumeric fields are to be entered in upper case.

The remaining parts of this manual discuss the details of interacting with the HRS software system.

# Chapter 3 - Data Entry

This section describes the process for updating the baseline information (locations, families, family members, and relationships) and the longitudinal event information (location visits, pregnancy outcomes, pregnancy observations, deaths, relationship changes, and migrations).

There are three options in the Data Entry menu that allow baseline or longitudinal event information to be entered. The Updates menu option allows one interviewing round of a location's data to be entered. Typically, this will be the primary method for data entry clerks to enter data. The Amendments menu supports the entry or editing of longitudinal events on an "item-by-item" basis. The user can choose to enter or edit data for any of the longitudinal events. Data assistants or data managers typically use this option to isolate, append or correct inaccurate data. The last option -- Baseline -- is used to add or edit baseline information, which is part of the initial enumeration in the study area.

## BaseLine Data Entry/Editing

The baseline data entry form is used to enter information collected during an initial enumeration of the population. Information about individuals, locations, families, and relationships are entered in the baseline form. A snapshot of the form to enter this information appears below:

The screenshot shows the 'HRS Entry Form' window with a 'BaseLine' title. It contains several input fields for data entry:

- Region: EAB
- Location Number: 7
- Location ID: EAB0007
- Round Number: 0
- Field Worker: LA
- Entry Date: 01/13/1993
- Name of Household: AKUMDAARE ADUGBIRE
- ID of Household Head: EAB0007001
- Number of Individuals at Location: 13

Below the form is a table listing individuals:

Individid	Name	Gender	Birth_date	Motherid	Fatherid	Rltn Head
EAB0007001	AKUMDAARE ADUGBIRE	M	06/15/1947	UNK	UNK	ONE
EAB0007002	AJUA ADUGBIRE	F	06/15/1968	UNK	UNK	WIF
EAB0007003	ABAGNA AKUMDAARE	M	06/15/1949	UNK	UNK	OTH
EAB0007004	ASEBANIA ABAGNA	F	06/15/1957	UNK	UNK	OTH
EAB0007005	KALIRA ABAGNA	F	06/15/1969	UNK	UNK	OTH
EAB0007006	ADETARIMA ADUGBIRE	M	06/15/1983	EAB0007002	EAB0007001	CHD
EAB0007007	ATOLIYA ADUGBIRE	M	07/16/1986	EAB0007002	EAB0007001	CHD

At the bottom of the form are navigation buttons: Top, Prev, Next, Bottom, Find, Add, Edit, Del/Und, Exit.

This screen snapshot describes a location and a family resident at that location. The study started keeping track of this location on 01/13/1993 and the name of the family is Akumdaare Adugbire. The ID of the head of the family is EAB0007001 and this family was first found during round 0 (initial enumeration round). There are thirteen individuals that are resident at this location and are a member of the single family at this location. The specific information about each of these members is listed in the table.

## Updates: Aggregate Event Entry for a Location

When a field worker visits a location during an interviewing round, they may observe and record changes in the status of individuals who reside in that location. These changes are entered using the Update option of the Data Entry system. At a minimum, the location visit information is recorded for each location that has been visited. If the field worker determined that some demographic events occurred in this location, then the data entry clerk will enter these. The following screen snapshot illustrates the key components of the location update screen:

**HRS Entry Form**

**Updates**

Field Worker:

Location ID:

Visit Date:

Round Number:

Observation ID:

Individid	Name	Gend	Birth_date	Last Evt
EAB0007001	AKUMDAARE ADUGBIRE	M	06/15/1947	
EAB0007002	AJUA ADUGBIRE	F	06/15/1968	
EAB0007003	ABAGNA AKUMDAARE	M	06/15/1949	
EAB0007004	ASEBANIA ABAGNA	F	06/15/1957	
EAB0007005	KALIRA ABAGNA	F	06/15/1969	
EAB0007006	ADETARIMA ADUGBIRE	M	06/15/1983	

Buttons: Preg Outcome, Death, In Migration, Out Migration, Preg. Obser., Start Relation, End Relation, In Social Gp, Out Social Gp

Navigation: Top, Prev, Next, Bottom, Find, Save, Revert, Del/Und, Exit

In this screen snapshot, the location associated with ID EAB0007 has been visited during round 8 on the 1st day of 1997. The ID of the field worker is 'BB'. The Grid shows all individuals who were ever associated with this location. The last column indicates the individuals last status with respect to the residency in the EAB0007 location. This status can indicate a present (blank), out-migration, or death. In this location, everyone is currently present. The data entry clerk has clicked on individual EAB0007001. Events that are associated with this individual can be entered by clicking on the buttons to the right of the Grid.

Whenever a member status is updated, data checks are made to ensure that the database is consistent. Most of the consistency checks are related to the location in question. If there are no inconsistencies, the update is accepted.

Events should be entered in chronological order. So, for example, a neonatal death will involve recording the birth, then recording the death of the infant. All information collected on a household and its members for a round, must be entered in the update screen. If some events are skipped during a location update, then the Amendments menu can be used to update the databases.

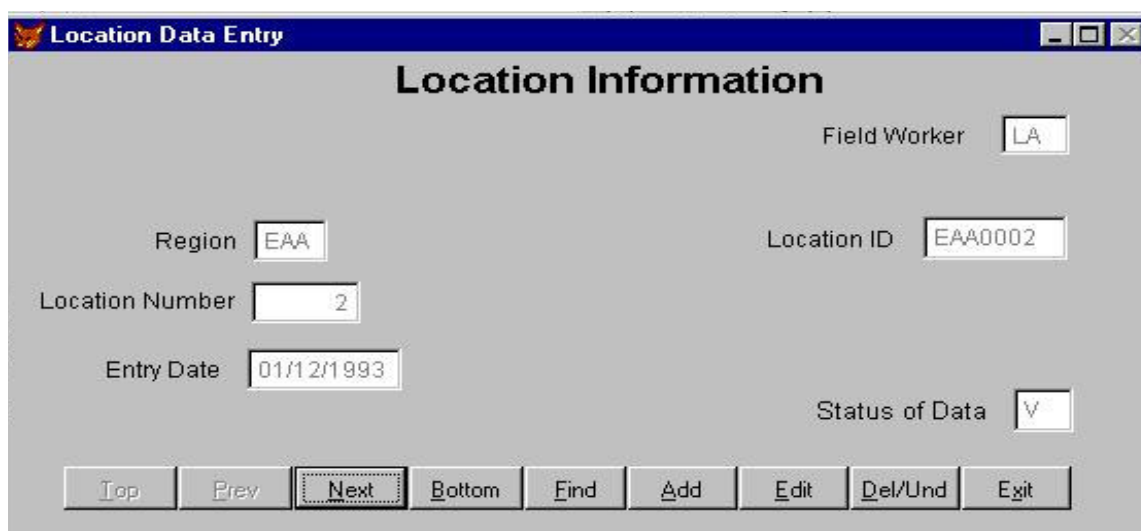
The screens for each of the events in the Update menu option are largely the same as those in the Amendments menu option, therefore we refer the reader to the next section on Amendments for details of how each of the event screens operate.

## Amendments

Events, individuals, families, or locations, which were either skipped or missed during a particular round of visitation, need to be entered as amendments. Events include location observation, migration, birth, death, relationship changes, family changes, and pregnancy observation

## Locations

All distinct locations are maintained in the HRS2. To specify one of these locations the user can enter baseline information or make an amendment to the location table. Amendments may be necessary because of missed information or the specification of non-family locations (health centers, schools, ...) The form that allows the entry of location information appears as follows :



The screenshot shows a software window titled "Location Data Entry" with a sub-header "Location Information". The window contains several input fields and a set of navigation buttons. The fields are: "Field Worker" with the value "LA", "Region" with the value "EAA", "Location ID" with the value "EAA0002", "Location Number" with the value "2", "Entry Date" with the value "01/12/1993", and "Status of Data" with the value "V". At the bottom of the window, there is a row of buttons: "Top", "Prev", "Next" (which is highlighted with a dashed border), "Bottom", "Find", "Add", "Edit", "Del/Und", and "Exit".

The information required for a location is described below. Some of the prompts are skipped when a record is being edited.

- *Field worker code - the code of the field worker who collected the information*
- *Region (code) that the location is in*
- *Location number - A unique value within the Region.*
- *Date of registration - when the household was registered into the HRS system. This date cannot be blank nor can it be after the current date*  
*Query Value: Q*



## Individuals

The HRS2 maintains information about individuals who are part of the study and can also keep track of non-resident individuals. Typically, information about individuals is entered as part of the baseline, in-migration or birth forms. Sometimes it is necessary to enter information about individuals from the amendment menu. It may be necessary because of lapses in data entry or a non-resident individual needs to be entered. The form that allows entry of individual information appears as follows:

The screenshot shows a window titled "Individual Data Entry" with a sub-header "Individuals". The form contains the following fields and values:

- Field Worker: FW
- Individual ID: EAA0003013
- Name: CHANAA ALLOU
- Mother ID: UNK
- Gender: F
- Birth Date: 08/16/1986
- Father ID: EAA0003003
- Status of Data: V

At the bottom of the form, there is a row of buttons: Top, Prev, Next, Bottom, Find, Add, Edit, Del/Und, and Exit.

Information about a female individual named Chanaa Allou with ID EAA0003013 is displayed in this form. She was born on 8/16/1986. We do not know her mother, but we do know the father (EAA0003003).

If information about this individual needs to be changed, then the EDIT button must be selected. If a new individual is to be entered, then the Add button must be selected.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Individual ID - Unique number for a member*
- *Member's name. This field cannot be left blank.*
- *Gender of the member – 'M' or 'F'.  
Query value is 'Q'*
- *Member's date of birth.*
- *Mother's permanent ID – Individual ID. for the member's mother. All mothers should have been registered in the HRS and must have IDs. The following are applicable on the field:*
  - ◆ Mothers in a household must be registered before their new borns are registered.

- ◆ A mothers should be a female member not less than 14 years.
- ◆ A query value ('Q') is accepted if the wrong Mother ID. is indicated in the HRB.  
Valid Code: 'UNK': used if the member's mother is not registered in the HRS or is unknown
- *Father's permanent ID – Individual ID. for the member's father. All fathers should have been registered in the HRS and must have IDs. The following are applicable on the field:*
  - ◆ Fathers in a household must be registered before their new borns are registered.
  - ◆ A father should be a male member not less than 14 years.
  - ◆ A query value ('Q') is accepted if the wrong Father ID. is indicated in the HRB.  
Valid Code: 'UNK': used if the member's father is not registered in the HRS or is unknown

## Family Social Groups

All distinct families are maintained in the HRS2. In the HRS1 families and locations were consider one entity. By separating families and locations, it is possible to keep track of many families in one location. To specify one of these families the user can enter baseline information or make an amendment to the collection of social groups. Amendments may be necessary because of missed information. The form that allows the entry of family social groups appears as follows:

The screenshot shows a software window titled "Social Group Entry Form" with a sub-header "Family Social Groups". The form contains the following fields and controls:

- Field Worker:** A text box containing "LA".
- Family ID:** A text box containing "EAA000400".
- Name:** A text box containing "ADONGBONO AKANSIGLE".
- ID of Head:** A text box containing "EAA0004001".
- Status of Data:** A dropdown menu showing "V".
- Navigation Buttons:** A row of buttons labeled "Top", "Prev", "Next", "Bottom", "Find", "Add", "Edit", "Del/Und", and "Exit". The "Next" button is highlighted with a dashed border.

Field worker LA determined the existence of this family whose name is Adongbono Akansigle. The individual who is the head of the family is EAA0004001.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Social Group ID. - a unique number*
- *Family name - this field cannot blank.*
- *Household head ID – the Individual ID of the household head. This must be an individual who is already registered in the database.*

## Location Visitation

The screen for appending and editing field worker visitations to a location appears below :

The screenshot shows a window titled "Location Visit" with a sub-header "Location Observation". The form contains the following fields and values:

- Field Worker: LA
- Round Number: 6
- Visit Date: 10/08/1994
- Region: EAA
- Location ID: EAA0002
- Location Number: 2
- Observation ID: EAA000206

At the bottom of the form, there is a row of buttons: Top, Prev, Next, Bottom, Find, Add, Edit, Del/Und, and Exit. The "Next" button is highlighted with a dashed border.

The information collected in this amendment form is the same as that collected in the Update form. The difference is that only the information about the location observation can be entered -- events need to be entered separately if you use the location observation amendment form.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Round Number of the update*
- *Visit date - each round of visitation must occur within a specified period of time so the visit date must be within such a period. When the visit date is entered, the round number and visit date are checked against the site specified round numbers and periods of visitation.*
- *Location ID – ID of the location for which updates are to be made.*

## In-migration: Migrations from within the study area and from outside the study area

There are two types of in-migration in the HRS system. The first type is by people who have already been registered in the HRS. Such individuals may be inactive (i.e. they may have migrated out of the study area and are now coming back) or they may be active members moving from one location to another within the study area. The second type of in-migrants are those who have never been registered in the HRS. For such in-migrants baseline information such as sex, date of birth, and name, is collected during the update for the first time.

The immigration screen appears below:

**Migrate In Data Entry**

### Migration Into Location

Field Worker

Type  Date  Observation

Internal Migration ?  If so, Enter Member ID (Q for unknown)

Individual ID  Where did they come from ?

Name of Region

Location Moving To  Household Name

Social Group ID  Relation to Head

---

#### Member Information

Individid	Name	Gender	Birth_date	Motherid	Fatherid
EAA0024044	ATINGAPOKA KAGURI	F	06/15/1964	UNK	UNK

Event ID  Status of Data

If there are in-migrants to a location then select the Add button and press the ENTER key. If the Add button is already selected, then just press the ENTER key.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Migration date – when the individual moved into the household in question. The following are applicable to the field:*
  - ◆ The migration date cannot be blank. If the field is blank in the HRB, a query value

should be entered.

- ◆ The migration date cannot be before the individual's birth date or the individual's ENTRY DATE
- ◆ The migration date cannot be before the location visit date when updates are being done
- *Observation ID.* – an ID associated with the location observation in which this in-migrant was found. For this dataset, the observation ID is the location ID appended with the round number
- *Internal migration* – required a Yes (“Y”) or No (“N”) response to indicate whether the person was ever registered in the system. If a “Y” is entered then the following become applicable to the field:
  - ◆ The Individual ID. must not indicate that the in-migrant is presently active in the household in question.
  - ◆ The Individual ID. must relate to a member who is not dead.
- *Location ID.* – the ID associated with the location observation in which this in-migrant was found. For this dataset, the observation ID is the location ID appended with the round number
- *Social Group ID.* - the social group that the in migrant is to be associated with. If there many social groups associated with one location, then this information needs to be entered. The entered ID is checked against the list of IDs in the social group database.
- *Region Name* - information on where the in-migrant came from. This field helps with the reconciliation of previously registered members migrating in.
- *Household Name* - information on where the in-migrant came from. This field helps with the reconciliation of previously registered members migrating in.
- *Relationship to Head* - how the in-migrant relates to the head of the Social Group (family in this case).

**The following become applicable if the response to the Internal Migration field is "N":**

- *Member Name* – name of new member. Cannot be blank
- *Gender* – gender of the new member.  
Valid codes: "M", "F", and "Q"
- *Date of Birth* – Members birth date. The following are applicable on this field:
  - ◆ the birth date field cannot be left blank. If the field is blank in the HRB, a query value should be entered
  - ◆ BIRTH DATE cannot be after the last location visitation date

- *Date of Birth – Members birth date. The following are applicable on this field:*
- *Mother's permanent ID – Individual ID. for the member's mother. All mothers should have been registered in the HRS and must have IDs. The following are applicable on the field:*
  - ◆ Mothers in a household must be registered before their new borns are registered
  - ◆ A mother should be a female member not less than 14 years.
  - ◆ A query value ('Q') is accepted if the wrong Mother ID. is indicated in the HRB. Valid Code: 'UNK': used if the member's mother is not registered in the HRS or is unknown
- *Father's permanent ID – Individual ID. for the member's father. All fathers should have been registered in the HRS and must have IDs. The following are applicable on the field:*
  - ◆ Fathers in a household must be registered before their new borns are registered.
  - ◆ A father should be a male member not less than 14 years.
  - ◆ A query value ('Q') is accepted if the wrong Father ID. is indicated in the HRB. Valid Code: 'UNK': used if the member's father is not registered in the HRS or is unknown
- *Husband ID. – ID. for husband if the in-migrant is female. The following become applicable to the field:*
  - ◆ The HUSBAND ID. must be either an active or inactive member of the HRS MEMBER database
  - ◆ All new member husbands with in-migrant children and wives who have never been registered in the study area must be registered before their children and wives are registered.
  - ◆ The HUSBAND ID. should be a male member not less than 13 years.
  - ◆ A query value ('Q') is accepted if the wrong Husband ID. is indicated in the HRB. Valid Code: 'UNK': used if the member's husband is not registered in the HRS or is unknown

## **Pregnancy Outcomes (Births, Miscarriages, ...)**

All births, miscarriages, stillbirths, and abortions should be entered into the HRS. This amendment form is chosen if the outcome was not entered as part of the update to a location. The event form associated with pregnancy outcome is illustrated below:

**HRS Pregnancy Outcome Form**

## Pregnancy Outcome

Field Worker

Mother ID  Observation

Type  Date  Father ID

Total children born  Number of live births

---

### Children Information

Individual ID	Name	Gender	Rel. Head	Location	Social Gp.
EAB0007013	AKANWE ADUGBIRE	F	CHD	EAB0007	EAB000700
EAB0007014	AKALOU ADUGBIRE	F	CHD	EAB0007	EAB000700

Event ID  Status of Data

If there are pregnancy outcomes in the household then select the Add button and press the ENTER key. If the Add button is already selected, then just press the ENTER key.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Mother ID - individual ID of the mother*
- *Observation ID – a number associated with the location observation in which this pregnancy outcome was found. For this dataset, the observation ID is the location ID appended with the round number*
- *Pregnancy outcome - this field identifies whether or not a birth occurred. Valid codes: LBR (live birth), STB (stillbirth), MIS (miscarriage), ABT (abortion)*
- *Date – pregnancy outcome date. The following is applicable on the field:*
  - ◆ Date of Pregnancy Outcome cannot be left blank. If the field is blank in the HRB, a query value should be entered.
  - ◆ Date of Pregnancy Outcome must not be before mother's ENTRY DATE (this check takes place when the member ID information is entered).
  - ◆ Date of Pregnancy Outcome cannot be after location visitation date.
  - ◆ Date of Pregnancy Outcome cannot be before location entry date. (This check takes place when household number is entered).

- *Father's permanent ID – Individual ID. for the member's father. All fathers should have been registered in the HRS and must have IDs. The following are applicable on the field:*
  - ◆ Fathers in a household must be registered before their new borns are registered.
  - ◆ A father should be a male member not less than 14 years.
  - ◆ A query value ('Q') is accepted if the wrong Father ID. is indicated in the HRB. Valid Code: 'UNK': used if the member's father is not registered in the HRS or is unknown

**The following become applicable if a live birth is being recorded:**

- *Total number of children born - this includes stillbirths and live births.*
- *Total number of live births - this value is used to create new records in the grid control*
- *Individual ID. – a unique number for the new born*
- *Individual Name – cannot be blank*
- *Gender – gender of the new member. Valid codes: "M", "F", and "Q"*

## Out-migration: Members who have moved away

Out migrations involve the movement of individuals who are resident in the study area moving away. The movement can be to another location in the study area or outside of the study area. The following screen snapshot illustrates the key components of the information to be collected for an out-migration event:

**HRS Entry Form**

### Migration from a Location

Field Worker

Individual ID  Type  Date  Observation

Where are they going to ?

Name of Region

Household Name

Region they are moving to in Study area ? (Y/N)

Event ID  Status of Data



If there are out-migrants in a location then select the Add button and press the ENTER key. If the Add button is already selected, then just press the ENTER key. The append process must be repeated for each out-migrant in the household before the Exit button is finally selected..

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Individual ID. – out-migrant’s permanent ID.*
- *Migration Date - when the member moved out of the household in question. The following are applicable to the field:*
  - ◆ *Date of Migration cannot be left blank. If the field is blank in the HRB, a query value should be entered.*
  - ◆ *Date of Migration must not be before member's BIRTH DATE or member's ENTRY DATE*
  - ◆ *Date of Migration cannot be before location visitation date if one is in the update mode.*
- *Observation ID. – a number associated with the location observation in which this out migration was found. For this dataset, the observation ID is the location ID appended with the round number.*
- *Region Code - the Region where the member is moving to*
- *Household Name - the name of the household in which the member is moving to. There are no checks on this field and it's purpose is to help reconciliation of previously registered members migrating in*
- *Study area migration – response to indicate whether the person is migrating to a region within the study area.  
Valid Codes: "Y" (Yes), "N" (No), "Q"(Query)*

## Deaths

The entry form for registering deaths has title: *Mortality*:

The screenshot shows a software window titled "HRS Mortality Entry Form" with a sub-header "Mortality Events". The form contains the following data:

- Field Worker: FW
- Type: DTH
- Individual ID: EAA0024024
- Observation: EAA002403
- Date of Death: 03/03/1994
- Name: AKAKWARA NYAABA
- Event ID: 312
- Status of Data: P

Navigation buttons at the bottom include: Top, Prev, Next, Bottom, Find, Add, Edit, Del/Und, and Exit.

If there are deaths at a location then select the Add button and press the ENTER key. The following steps describe the sequence of operations involved in appending or editing a record. Some of these options are skipped when editing a record -- for instance the ID information for an individual. If this information is incorrect, then the record should be deleted and the correct information should be re-entered.

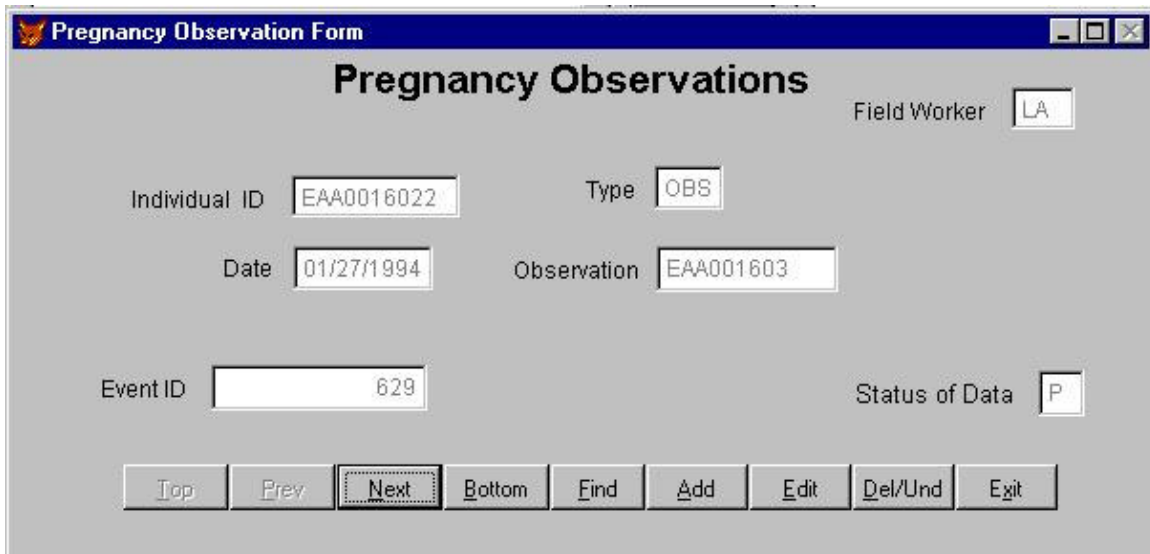
The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code* - the code of the field worker who collected the information
- *Individual ID.* – permanent ID. of the member who died
- *Observation ID.* – a number associated with the location observation in which this out migration was found. For this dataset, the observation ID is the location ID appended with the round number.
- *Date of Death* - when the member died. The following are applicable to the field:
  - ◆ Date of death cannot be left blank. If the field is blank in the HRB, a query value should be entered.
  - ◆ Date of death must not be before member's BIRTH DATE or member's ENTRY DATE

## Pregnancy Observations (Women Pregnant)

The HRS can maintain information about pregnancy observations on an ongoing basis. While pregnancy observation does not directly affect the enumeration of the population, it sometimes helps to record these events, so as to reduce the under reporting of pregnancy outcomes. The HRS can produce a report of all women who should have given birth by a certain date based on the pregnancy observations. If the reporting of pregnancy outcomes is sufficiently accurate, then this module may not be necessary.

The entry screen for reporting pregnancy observations appears as follows:



The screenshot shows a window titled "Pregnancy Observation Form" with a sub-header "Pregnancy Observations". The interface includes several input fields and buttons. The "Field Worker" field contains "LA". The "Individual ID" field contains "EAA0016022", the "Type" field contains "OBS", the "Date" field contains "01/27/1994", and the "Observation" field contains "EAA001603". The "Event ID" field contains "629" and the "Status of Data" field contains "P". At the bottom, there is a row of buttons: "Top", "Prev", "Next", "Bottom", "Find", "Add", "Edit", "Del/Und", and "Exit". The "Next" button is highlighted with a dotted border.

If there are pregnancy observations in the location then select the Add button and press the ENTER key. If the Add button is already selected, then just press the ENTER key. The append process must be repeated for each pregnancy observation in the household before the Exit button is finally selected.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Individual ID. – permanent ID. of the mother*
- *Date - estimated of when the pregnancy began. The following are applicable:*
  - ◆ *Date of Pregnancy Observation cannot be left blank. If the field is blank in the HRB, a query value should be entered.*
  - ◆ *Date of Pregnancy Observation must not be before mother's ENTRY DATE (these checks happen when the member ID information is entered).*
- *Observation ID. – a number associated with the location observation in which this pregnancy observation was found. For this dataset, the observation ID is the location ID appended with the round number*

## Marital Status Changes (Marriage, Divorce, ...)

The HRS can maintain information about marital status on an ongoing basis. While marital status does not directly affect the enumeration of the population, it is an important determinant in many longitudinal studies. Marital status also helps with the determination of mother and father relationships -- especially for children. The HRS records a woman's and man's marital status explicitly during the baseline enumeration. Changes in the marital status may occur throughout the study. These changes include Marriages, Divorces, Widowing, Separations, and Reconciliation. These types of changes are entered in this module. The form to maintain the marital status information appears below:

The screenshot shows a software window titled "Episode Form" with a subtitle "Marital Relationship Episodes". The form contains the following fields and values:

- Wife ID: SAA0001005
- Husband ID: SAA0001001
- Start of Episode: Type: ENU, Date: 06/15/1970, Observation ID: SAA000100
- End of Episode: Type: (blank), Date: //, Observation ID: (blank)
- Episode ID: 3864
- Status of Data: P

At the bottom of the form, there is a row of buttons: Top, Prev, Next, Bottom, Find, Add, Edit, Del/Und, and Exit.

In this form, woman SAA0001005 was married to man SAA0001001 on 06/15/1970 and this was determined during the initial enumeration, which had an observation ID or SAA000100. Since the end of episode information is not filled in, then, as far as the database is concerned, this marriage is ongoing.

Marital relationships are maintained as episodes, which have, begin of interval and end of interval information. If a marital status is to be terminated, then the edit button is pressed and the end of episode information is entered. If a new marital relationship is starting (either through a marriage event or a reconciliation event), then the Add button should be pressed.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Individual ID. – permanent ID. of the wife*
- *Individual ID. – permanent ID. of the husband*
- *Type of marital status – the type marital status change at beginning and end of episode  
Valid Codes: MAR(marriage), SEP (separation), REC (reconciliation), ENU(enumeration)*
- *Start/End of Episode – when the marital status change occurred. The following is applicable:*
  - ◆ *Date of Marital Status Change cannot be left blank. If the field is blank in the HRB, a query value should be entered.*

- ◆ Date of Marital Status Change must not be before either the wife's or the husband's ENTRY DATE (these checks happen when the member ID information is entered).
- *Observation ID.* – a number associated with the location observation in which this pregnancy observation was found. For this dataset, the observation ID is the location ID appended with the round number

## Changes in Location Residency

The HRS2 keeps track of individuals and their residency in locations. For every period of residence, there will be a corresponding record in the database. Unlike the HRS1 where these residencies were inferred by the various migration, birth and death events, the HRS2 maintains an explicit record of residence. Almost all of the times, the updates to the residency table are made automatically by entering a particular event. For example, if a woman gives birth to a child, then a residency record is automatically created for that child. In some special circumstances it may be necessary to make an amendment that requires calling the Changes in Location Residency form. For example, if an individual was missed in the initial enumeration but found on a subsequent round, then a new individual record must be created as well as a new residency record. The form to maintain the residency status information appears below:

	Type	Date	Observation ID
Start of Episode	ENU	01/01/1993	SAA000300
End of Episode	EXT	11/15/1993	SAA000303

In this form, individual SAA0003018 was resident in location SAA0003 from 01/01/1993 to 11/15/1993. The initial residency information was determined during the initial enumeration, which had an observation ID or SAA000300. The end of residency was found by a field worker observation with ID value SAA000303.

Residency information is maintained as episodes, which have a beginning of an interval and an end of interval information. Usually this information is constructed by the associated event. For example, an in-migration of an individual automatically builds the appropriate residency record. In certain, unusual circumstances the residency record needs to be entered directly. In these circumstances, if a residency is to be terminated, then the edit button is pressed and the end of episode information is entered. If a new residency is starting (either through a enumeration, birth, or migration), then the Add button should be

pressed.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Individual ID. – permanent ID. of the member*
- *Location ID – ID for the place the individual is resident*
- *Event Type – the event that prompted the beginning of a residency. Possible responses include an enumeration, birth, or in-migration*
- *Event Start/End Date - date for the beginning or end of the residency.*
- *Observation ID. – a number associated with the location observation in which this pregnancy observation was found. For this dataset, the observation ID is the location ID appended with the round number*

To specify the end of a residency, the appropriate record needs to be edited. The Find button can be used to locate a set of records that satisfy some criteria. Once the record is found, the edit button should be pressed. The end of residency information can then be entered.

## Changes in Family membership

The HRS2 keeps track of individuals and their membership in a family. For every period of membership to a family group, there will be a corresponding record in the database. Unlike the HRS1 where family membership was tied to the residency in a location, the HRS2 maintains an explicit record of family membership. This can allow modeling a situation where an individual belongs to one family, but is resident in another location. The form to maintain the family membership appears below:

The screenshot shows a window titled "Episode Form" with a sub-header "Family Membership Episode". The form contains the following fields and values:

Individual ID	EAA0003008	Social Group ID	EAA000300
Relation to Head of Family	OTH		
Start of Episode	Type: ENU	Date: 01/01/1993	Observation ID: EAA000300
End of Episode	Type: DTH	Date: 01/01/1997	Observation ID: EAA000309
Episode ID	696	Status of Data	V

At the bottom of the form, there is a row of buttons: Top, Prev, Next, Bottom, Find, Add, Edit, Del/Und, and Exit. The "Next" button is currently highlighted.

In this form, individual EAA0003008 belongs to a family represented by ID EAA000300 which was determined during an initial enumeration round on 01/01/1993. A death terminated the membership to the family on 01/01/1997.

Memberships to families are maintained as episodes which have begin of interval and end of interval information. If a membership is to be terminated, then the edit button is pressed and the end of episode information is entered. If a new membership is starting (either through a birth in migration or enumeration), then the Add button should be pressed.

The information required on the above form is described below. Some of the prompts are skipped when a record is being edited:

- *Field worker code - the code of the field worker who collected the information*
- *Individual ID. – permanent ID. of the member*
- *Family ID.*
- *Relationship to head - Many relationships are possible including head, wife, brother, sister, child, ...*
- *Event Type – the event that prompted the beginning of a residency. Possible responses include an enumeration, birth, or in-migration*
- *Event Start/End Date - date for the beginning or end of the residency.*
- *Location ID – ID for the place the individual is resident*
- *Observation ID. – a number associated with the location observation in which this pregnancy observation was found. For this dataset, the observation ID is the location ID appended with the round number*

To specify the end of a membership to a family, the appropriate record needs to be edited. The Find button can be used to locate a set of records that satisfy some criteria. Once the record is found, the edit button should be pressed. The end of membership information can then be entered.

# Chapter 4 - Validation

## *Overview*

The VALIDATION menu option is generally used at the end of a particular round of visitation to verify and check inconsistencies that may have been recorded in the HRS database. Though there are checks at the time of data entry through FoxPro snippets included in the entry screens (see HRS How-To Technical Manual), some errors, invalid information, or general inconsistencies may have been recorded. This menu option is also used in generating a report of all records with "Query Values" in the HRS database.

The Validation Screen has code which searches through all HRS database files and generates a simple report of any record with inconsistent information as related to other information already collected in the HRS. As an example, the validation program will check if the mother of a particular household member is female. If the sex of the mother is 'M' (male) then the final generated report will have a record with details of the member, i.e. INDIVIDUAL ID. and a short message of the problem e.g. "Member's mother is not female". The generated report includes cases where:

- fields have a query value
- parents are younger than 14 years
- male members have husbands
- mothers are not females
- mothers are not found in the database
- fathers are not males
- fathers are not found in the database
- husbands are not males
- husbands are not found in the database
- the member's current household does not exist
- active households with no current members
- current members of a household are only children (below 15 years)
- households have no household head or the head is dead
- households have no household names

All the above errors are coded with numbers in the report, which is stored in a FoxPro database, file such that it is possible to group the records with problems by the error code or Region code.



# Processing Steps

1. After selecting the VALIDATION option from the main menu, a window pops up with title "VALIDATION". The user is prompted to select the type of output for the generated report. There are three options for output:

- PREVIEW - The report is displayed on the screen
- TO FILE - The report is sent to a file on disk
- TO PRINTER - the report is sent to the line printer.

One can make a selection by using the cursor keys or TAB key and pressing the SPACE BAR or ENTER KEY to confirm the selection. If the user selects TO FILE, processing continues to step 2, otherwise processing continues to step 3.

2. The user is prompted for a file name. A default filename (HRSVALID) appears and the user can either accept the default name or enter a new file name with a valid PATH on the hard disk. The default file name HRSVALID is found in the directory C:\HRS\OUTPUT. The user confirms the entry with the SAVE option or aborts the process with the CANCEL option.

3. The user is prompted for a selection criteria through the FOR clause. The FOR clause filters records that are to be checked for validation. A FoxPro expression can be made up to define the selection criteria through the expression dialogue screen. For details, users are to consult a FoxPro manual for a description of writing valid FOR clause expressions. If the expression is valid, then processing continues to step 4 otherwise an invalid expression message is displayed. One can VERIFY, OK, or CANCEL the FOR clause expression.

4. The user can now select the OK button to begin the validation process or the QUIT button to cancel the validation process and return control to the Main menu. If the OK button is selected, processing continues to step 5.

5. The message "Running the validation..." is displayed. After processing, the results are either displayed on the screen, sent to the printer, or sent to a file depending on the output selected. The user can then press the ESC key to continue. Processing continues to step

6. The QUIT button can be selected to return control to the Main Menu, or another report can be generated by altering the options in the VALIDATION screen. Processing continues to step 1 or control returns to the HRS main menu.

# Chapter 5 - Reports

This portion of the HRS is used to generate various types of reports based on the information collected in the database files. There are two main sections: Demographic Rate reports and Life Table Reports.

## Demographic Rates

The demographic rate section enables the calculation of various rates for the events that have taken place over any period of time for which data has been collected. The demographic rate report calculates rates by computing all events within a specified period and the person years contributed by each individual for the period of observation. The Demographic Rate option also computes the population distribution by sex and 5 year age groups, at the end of the period of observation.

All rate computations are household based and the user has the option of selecting the status of records used in the computations. The Individual table has four status types of records depending on the validity of the information collected. These types are VALID, WARNING, PENDING, and FATAL. Usually it is advisable to include all status types for the initial rate computation. A snapshot of the rates window is shown below:

The screenshot shows a window titled "HRS Rates Computation" with a sub-header "Demographic Rates Module". The window contains several input fields and radio button options. On the left, there are four input fields: "Starting Date of Analysis" (01/01/1994), "Ending Date of Analysis" (01/01/1995), "Smallest Family ID" (EAA0003), and "Largest Family ID" (EAA0006). Below these are checkboxes for "Values of Member Data Status": Valid (checked), Warning, Pending, and Fatal. On the right, there are two groups of radio buttons. The first group includes Fertility (checked), Mortality, Marital, Out-Migration, In-migration, and Population. The second group includes Person Days Observed and Population at Mid-point (checked). At the bottom right, there are three radio buttons for output: Preview (checked), To File (with an empty text box), and To Printer. At the very bottom are "OK" and "Quit" buttons.

In the screen above, demographic rates are to be computed for the fertility event (i.e. fertility rates) for the period 01/01/1994 – 01/01/1995 for households EAA0003 to EAA0006. Entries in the database classified as 'valid' will be used for the computation, with rates being calculated using the population at the mid-point of the period. Results are to be displayed on the screen.

## Processing Steps

1. After selecting the DEMOGRAPHIC RATES option from the main menu, a screen pops up with title "DEMOGRAPHIC RATES MODULE". The user is prompted to enter the "Starting Date of Analysis Period". If an invalid date is entered an appropriate screen message is displayed, otherwise processing continues to Step 2.
2. The user is prompted for the "Ending Date of Analysis period". This date cannot be before the date entered in step 1. If there are errors, the appropriate screen message is displayed.
3. The user is prompted for "Smallest Family ID (household number)". Since the computations are household based, the rates program requires the lower and upper boundaries in terms of households to begin processing on each household member. If the entry is incorrect, the appropriate screen message is displayed.
4. The user is prompted for the "Largest Family ID (household number)". Since the computations are household based, the rates program requires the lower and upper boundaries in terms of households to begin processing on each household member. If the entry is incorrect, the appropriate screen message is displayed.
5. The user is prompted for the "VALUES OF MEMBER DATA STATUS". Within the HRS MEMBER database each household is given a tag that signifies the correctness of the information collected on the member. The valid values are: VALID, WARNING, PENDING, and FATAL. To include all members ever registered the user could for example select all the four data status types.
6. The user now has the option of selecting the event type for which rates are to be calculated. There are six event types - FERTILITY, MORTALITY, MARITAL, OUT-MIGRATION, IN-MIGRATION and POPULATION. The POPULATION option computes the population distribution by sex and 5-year age groups based on whether an individual is present at the "Ending Date of Analysis Period". A screen message is displayed to indicate the computation process. The **HRS Data Analysis Manual** describes in detail the computations for the different event types.
7. The user can then select the output for the results. There are three options for output:
  - PREVIEW - The report is displayed on the screen
  - TO FILE - The report is sent to a file on disk
  - TO PRINT - the report is sent to the line printer.

If TO FILE is selected then the user is prompted for a file name. The default directory for any file is C:\HRS\OUTPUT unless a different valid path is given.

8. The user can then select OK to begin the rates computation, edit already entered fields, or QUIT the rates option. If OK is selected, then a message is indicated as to the status of the computation. If

output is PREVIEW, then the results are displayed on the monitor - and one can use MORE to scan through the results or DONE to cancel the preview. One can also run the rates program again with different values (e.g. different periods) by using the cursor keys to move control to the "Starting Date of Analysis period" field - step 1. Selecting QUIT returns control to the HRS main menu.

## Life Tables

The Life Table portion of the HRS2 enables the calculation of various rates to generate Life Tables. All rate computations are household based and the user has the option of selecting the status of records used in the computations. The Individual database file has four status types of records depending on the validity of the information collected. These types are VALID, WARNING, PENDING, and FATAL. Usually it is advisable to include all status types for the initial rate computation.

The screenshot shows a window titled "HRS Life Table Computation" with a sub-title "Life Table". The window contains several input fields and checkboxes. The "Starting Date of Analysis" field is set to "01/01/1994" and the "Ending Date of Analysis" field is set to "01/01/1995". The "Smallest Family ID" dropdown is set to "EAA0002" and the "Largest Family ID" dropdown is set to "SAA0052". On the right side, there are three radio buttons: "Male", "Female", and "Total", with "Total" selected. Below these, there are three radio buttons: "Preview", "To File", and "To Printer", with "Preview" selected. A text box is next to the "To File" radio button. At the bottom left, there are four checkboxes for "Values of Member Data Status": "Valid" (checked), "Warning", "Pending", and "Fatal". At the bottom right, there are two buttons: "OK" and "Quit".

## Processing Steps

1. After selecting the LIFE Table option from the main menu, a screen pops up with title "LIFE TABLE". The user is prompted to enter the "Starting Date of Analysis Period". If an invalid date is entered an appropriate screen message is displayed, otherwise processing continues to Step 2.
2. The user is prompted for the "Ending Date of Analysis period". This date cannot be before the date entered in step 1. If there are errors, the appropriate screen message is displayed.
3. The user is prompted for "Smallest Family ID (household number)". Since the computations are household based, the rates program requires the lower and upper boundaries in terms of

households to begin processing on each household member. If the entry is incorrect, the appropriate screen message is displayed.

**4.** The user is prompted for the "Largest Family ID (household number)". Since the computations are household based, the rates program requires the lower and upper boundaries in terms of households to begin processing on each household member. If the entry is incorrect, the appropriate screen message is displayed.

**5.** The user is prompted for the "VALUES OF MEMBER DATA STATUS". Within the HRS MEMBER database each household is given a tag that signifies the correctness of the information collected on the member. The valid values are: VALID, WARNING, PENDING, and FATAL. To include all members ever registered the user could for example select all the four data status types. Selection is by hitting the ENTER key. One can also use the cursor keys to either move up or down through the options to either select or deselect some of the options.

**6.** The user now has the option of selecting the population for which rates are to be calculated. There are three possibilities - Male, Female, and all. Selection is made by using the cursor keys to move either up or down the list and hitting the ENTER key to confirm the selection. A screen message is displayed to indicate the computation process.

**7.** The user can then select the output for the results. There are three options for output:

- PREVIEW - The report is displayed on the screen
- TO FILE - The report is sent to a file on disk
- TO PRINT - the report is sent to the line printer.

If TO FILE is selected then user is prompted for a file name. The default directory for any file is C:\HRS\OUTPUT unless a different valid path is given.

**8.** The user can then select OK to begin the rates computation, edit already entered fields, or QUIT the rates option. If OK is selected, then a message is indicated as to the status of the computation. If output is PREVIEW, then the results are displayed on the monitor - and one can use MORE to scan through the results or DONE to cancel the preview. One can also run the rates program again with different values (e.g. different periods) by using the cursor keys to move control to the "Starting Date of Analysis period" field - step 1. Selecting QUIT returns control to the HRS main menu.

# Chapter 6 - Register

The Register menu option is used to print the household record book (HRB). The household record book is used by the field workers to record information during their household interviews. The household record book is a computer printout of basic data about households and their members: name, age, and some previous event histories. There is space left in the printout for field workers to enter new information about the household and its members. Data entry operators transfer the new information in the household record book into the computer. Two FoxPro report formats have been designed with different paper width and font sizes for printing. The right margin column of the two formats are at 80 and 120 allowing a smaller font and for that matter more text in the latter case.

## *Processing Steps*

*1. After selecting the REGISTER option from the main menu, a window pops up - prompting the user to choose a register report file. There are two files to choose from:*

- ROUND120 - report format with right margin column at 120
- ROUND80 - report format with right margin column at 80

2. The user is prompted to select the type of output for the family register report. There are three options for output:

- PREVIEW - The report is displayed on the screen
- TO FILE - The report is sent to a file on disk
- TO PRINT - the report is sent to the line printer.

If the user selects TO FILE, processing continues to step 3, otherwise processing continues to step 4.

*3. The user is prompted for a file name. By default the filename entered would be stored in the C:\HRS\OUTPUT sub-directory unless a valid different path is given. The user confirms the entry with the SAVE option or aborts the process with the CANCEL option.*

*4. The user is prompted for a selection criteria through the FOR clause. The FOR clause filters records that are to be included in the household register book. A FoxPro expression can be made up to define the selection criteria through the expression dialogue window. For details, users are to consult a FoxPro manual for a description of writing valid FOR clause expressions. If the expression is valid, then processing continues to step 4 otherwise an invalid expression message is displayed. One can VERIFY, OK, or CANCEL the FOR clause expression.*

*5. The user can now select the OK button to begin the generation of the household register book by pages or press the QUIT button to cancel the process and return control to the Main menu. If*

*the OK button is selected, processing continues to step 5.*

*6. Processing continues depending on the selection made in step 2 above - i.e. the output is either display on the screen, sent to a file or to the line printer. If output is to the screen the user can then select the MORE option to preview more pages of the report; use the cursor keys to move in different directions, or select the DONE option to quit previewing the report. Processing continues to step 7.*

*7. The QUIT button can be selected to return control to the Main Menu, or another report can be generated by altering the options in the Family Register Report window. Processing continues to step 1 or control returns to the HRS main menu.*

# Chapter 7 - Utilities

This option is used for system maintenance, updating background information, and for the generation of reconciliation reports. The system maintenance options include packing and re-indexing. Background information includes the definition of interviewing round dates, user codes and passwords. .

Reconciliation reports are meant to help field workers establish the occurrence or precise nature of some key demographic events. Two reports attempt to match members who migrate within the study area and another report displays all pregnant women who should have given birth by a particular date.

## ***Packing Files***

There is a need to regularly pack files after modifying a database. This is because when deletions are made to the database, the areas of the disk formerly occupied by that data cannot be accessed, and are thus unusable, until the database has been packed. In FoxPro, deletion is a two-staged process; first records are marked for deletion and then packing of files does the actual removal. Packing becomes necessary if many deletions take place in the form of requests received from the field workers e.g. indicating duplicate records.

Packing improves average data access time, and thus contributes to reducing disk I/O time. If for any reason your computer loses power during the packing operation, your database can be very seriously damaged and thus it is wise policy to be sure you have a backup copy of the databases before packing. When the pack files option is chosen, a message is displayed on the screen to inform the user of the type of processing. Another message is displayed when the process is completed.

## ***Reindex Files***

Index files contain information to order the database records according to key fields. For example, sometimes the data records are displayed in order of Individual ID. and other times it is ordered by the family number. Sometimes these index files can become corrupted due to power outage, disk drive problem, etc. resulting in an improper ordering of databases. In such circumstances it is necessary to re-index the database files. Re-indexing the database files rebuilds the index structures for the databases. Re-indexing of database files can take place at anytime - it is recommended to re-index files at least once every week.

When the re-index files option is chosen, a screen message is displayed to inform the user of the type of processing.

## ***Update Staff Codes***

The staff codes data entry screen contains all the information for user log-ins and access levels. When the Enter Staff Codes option is chosen, a data entry screen appears which allows the user to add or edit the user log-in and access level fields. If the update involves a change of information, then the EDIT button must be selected. If the update is for entering information for a new user log-in, then the Add button must be selected. If the user chooses the QUIT button, then control returns to the HRS main menu. The append/edit process must be selected for each update before the QUIT button is finally



selected if there are no more updates or changes. DEL/UND deletes or undeletes a record.

The processing steps are as follows:

- 1. The user is prompted for a two-letter staff code. Every user should be assigned a two letter staff code. This code is included in all data records that the staff enters into the system.*
- 2. The user is prompted for a password for the staff member. This password is case-sensitive and can contain up to ten characters (or digits).*
- 3. The user is prompted for an access level of the staff member. The HRS menu is based on a multi-level user structure, in that the system identifies different user types to access only portions of the whole HRS system. There are four (4) user levels:*
  - level 1 - Data entry staff - access to the Data Entry/Editing menu
  - level 2 - Data assistants (who check consistencies/cleaning of data)
  - level 3 - Researches and Analysts - access to run the HRS rates/RQBE packages and thus analyze data
  - level 4 - Data supervisor, data manager, or database administrator - access to all the programs/routines within the HRS.
- 5. The user is prompted for any comments. This may be a good place to enter the staff members full name and/or title*
- 6. At this stage processing will be within the control window with the SAVE button highlighted. The user is expected to either SAVE or REVERT the update (record); or edit the information entered by using the cursor keys to move the cursor through each of the fields entered. By pressing either the UP or DOWN (arrow) cursor key one at a time, the user can loop through the control window and all the fields in the data entry screen back to the control window. If the user chooses to CANCEL the update, control returns to the EDIT mode and processing returns to step 1 with no updates to the main database. If the user chooses SAVE, then a "RECORD HAS BEEN SAVED" message is displayed. If the user chooses DEL/UND then an undeleted record will be deleted with the message "RECORD DELETED" displayed, or a deleted record will be undeleted with the message "RECORD UNDELETED" displayed at the top right corner of the screen - control returns to the EDIT mode.*

## ***Update Interview Round Information***

The Round Information data entry screen contains the dates and round numbers defined for field worker interviews. Each round of field worker household visitation should be within a specified period. This information can be used for consistency checking; especially in the entry of dates associated with events.

When the Enter Round Information option is chosen, a data entry screen appears which allows the user to add or edit the list of rounds and the associated dates. If the update involves a change of information, then the EDIT button must be selected. If the update is for entering information for a new round, then the Add button must be selected. If the user chooses the QUIT button, then control returns to the HRS main menu. The append/edit process must be selected for each update before the QUIT button is finally selected. The processing steps are as follows:

- 1. The user is prompted for a round number. If information for a new round is being entered, then this number must be unique among all round records for a particular household.*
- 2. The user is prompted for the start date and the end date of the interviewing round. The end date must be later than the start date.*
- 3. The user is prompted for any comments. Comments can be brief descriptions of the round, e.g. using newly printed Household Registration Books.*
- 4. At this stage processing will be within the control window with the SAVE button highlighted. The user is expected to either SAVE, REVERT or DEL/UND the update (record); or edit the information entered by using the cursor keys to move the cursor through each of the fields entered. By pressing either the UP or DOWN (arrow) cursor key one at a time, the user can loop through the control screen and all the fields in the data entry screen back to the control screen. If the user chooses to CANCEL the update, control returns to the EDIT mode and processing returns to step 1 with no updates to the main database. If the user chooses SAVE, then a "RECORD HAS BEEN SAVED" message is displayed. If the user chooses DEL/UND then an undeleted record will be deleted with the message "RECORD DELETED" displayed, or a deleted record will be undeleted with the message "RECORD UNDELETED" displayed at the top right corner of the screen - control returns to the EDIT mode.*

## **Reconciliation of Migration Entries**

This option generates a report that displays all members who have migrated in from some other part of the study area and for which their permanent IDs are not known as yet. The report generation features allow you to specify which subset of records you would like to look at -- for instance all males under the age of 30 from the "SEB" region. Used this way, the tool can be very useful for establishing the permanent IDs of members who have moved within the study region. The processing steps are as follows:

- 1. After selecting the "Reconciliation of Migration Entries" option, the user is prompted to select the type of output for the generated report. There are three options for output:*
  - PREVIEW - The report is displayed on the screen
  - TO FILE - The report is sent to a file on disk
  - TO PRINT - The report is sent to the printer.

One can make a selection by using the cursor keys or TAB key and pressing the SPACE BAR or ENTER KEY to confirm the selection. If the user selects TO FILE, processing continues to step 2, otherwise processing continues to step 3.

- 2. The user is prompted for a file name. The default directory for the file name is C:\HRS\OUTPUT unless a valid path is entered. The user confirms the entry with the SAVE option or aborts the process with the CANCEL option.*
- 3. The user is prompted for a selection criteria through the FOR clause. It is in this box that we can designate the selection of a subset of the non-reconciled Migration Entries. The FOR clause filters records that are to be checked for Migration Entries. A FoxPro expression can be made up to define the selection criteria through the expression dialogue screen. For details, users are to*

consult a FoxPro manual for a description of writing valid FOR clause expressions.

**4.** The user can now select the OK button to begin the reconciliation process or the QUIT button to cancel the reconciliation process and return control to the Main menu.

**5.** The message "Running the Reconciliation ...please wait" is displayed. After processing, the results are either displayed on the screen, sent to the printer, or sent to a file. The user can then press the ESC key to continue.

**6.** The QUIT button can be selected to return control to the Utility Menu, or another report can be generated by altering the options in the Reconciliation screen. Processing continues to step 1 or control returns to the HRS utility menu.

## **Reconciliation of Migration Exits**

This option generates a report which displays all members who have migrated out; said that they were moving into another part of the study area, and who have not shown up as a migration entry. The report generation features allow you to specify which subset of records you would like to look at -- for instance all males under the age of 30 from the "SEB" region. Used this way, the tool can be very useful for establishing the permanent IDs of members who have moved with the study region. The processing steps are as follows:

**1.** After selecting the "Reconciliation of Migration Exits" option, the user is prompted to select the type of output for the generated report. There are three options for output:

- PREVIEW - The report is displayed on the screen
- TO FILE - The report is sent to a file on disk
- TO PRINT - the report is sent to the printer.

One can make a selection by using the cursor keys or TAB key and pressing the SPACE BAR or ENTER KEY to confirm the selection. If the user selects TO FILE, processing continues to step 2, otherwise processing continues to step 3.

**2.** The user is prompted for a file name. The default directory for the file name is C:\HRS\OUTPUT unless a valid path is entered. The user confirms the entry with the SAVE option or aborts the process with the CANCEL option.

**3.** The user is prompted for a selection criteria through the FOR clause. It is in this box that we can designate the selection of a subset of the non-reconciled Migration Exits. The FOR clause filters records that are to be checked for Migration Exits. A FoxPro expression can be made up to define the selection criteria through the expression dialogue screen. For details, users are to consult a FoxPro manual for a description of writing valid FOR clause expressions.

**4.** The user can now select the OK button to begin the reconciliation process or the QUIT button to cancel the reconciliation process and return control to the Main menu.

**5.** The message "Running the Reconciliation ...please wait" is displayed. After processing, the results are either displayed on the screen, sent to the printer, or sent to a file. The user can then press the ESC key to continue.

*6. The QUIT button can be selected to return control to the Utility Menu, or another report can be generated by altering the options in the Reconciliation screen. Processing continues to step 1 or control returns to the HRS utility menu.*

## **Reconciliation of Pregnancy Observations**

This option generates a report that displays all pregnant women who should have given birth by a particular date. The report generation features allow you to specify a subset of records to look at -- for instance all "due" pregnant women from the "SEB" region. Used this way, the report can be useful in alerting data entry clerks to the possibility of a pregnancy outcome. The processing steps are as follows:

*1. After selecting the "Reconciliation of Pregnancy Outcomes" option, the user is prompted to select the type of output for the generated report. There are three options for output:*

- PREVIEW - The report is displayed on the screen
- TO FILE - The report is sent to a file on disk
- TO PRINT - the report is sent to the printer.

One can make a selection by using the cursor keys or TAB key and pressing the SPACE BAR or ENTER KEY to confirm the selection. If the user selects TO FILE, processing continues to step 2, otherwise processing continues to step 3.

*2. The user is prompted for a file name. The default directory for the file name is C:\HRS unless a valid path is entered. The user confirms the entry with the SAVE option or aborts the process with the CANCEL option.*

*3. The user is prompted for a selection criteria through the FOR clause. It is in this box that we can designate the selection of a subset of the non-reconciled pregnancy outcomes. The FOR clause filters records that are to be checked for pregnancy outcomes. A FoxPro expression can be made up to define the selection criteria through the expression dialogue screen. For details, users are to consult a FoxPro manual for a description of writing valid FOR clause expressions.*

*4. The user is prompted for a selection criteria through the WHILE clause. It is in this box that we can designate the restriction of a subset of the non-reconciled pregnancy outcomes e.g. with dates. The WHILE clause describes record selection criteria based both on record contents and on their position in the processing sequence. A FoxPro expression can be made up to define the selection criteria through the expression dialogue screen. For details, users are to consult a FoxPro manual for a description of writing valid WHILE clause expressions.*

*5. The user can now select the OK button to begin the reconciliation process or the MODIFY button to make changes to the report format, or select the QUIT button to cancel the reconciliation process and return control to the Main menu. If the MODIFY button is selected, one would need skills for using the FoxPro Report Writer - for details, users are to consult a FoxPro manual.*

*6. The message "Running the Reconciliation ...please wait" is displayed. After processing, the results are either displayed on the screen, sent to the printer, or sent to a file. The user can then*

*press the ESC key to continue.*

*7. The QUIT button can be selected to return control to the Utility Menu, or another report can be generated by altering the options in the Reconciliation screen. Processing continues to step 1 or control returns to the HRS utility menu.*

## ***Printing of Data Entry Session***

This option generates a report that displays summary statistics about the number of events that data entry clerks have entered during a specified period. The report is made possible by saving each record appended to any database with the staff code and the date of entry. The processing steps are as follows:

- 1. After selecting the "Data Entry Summary Report" option, the user is prompted to enter the starting date for the period in which the data entry statistics are to be computed.*
- 2. The user is prompted for the ending date for the period in which data entry statistics are to be computed.*
- 3. The user is prompted to select the type of output for the generated report. There are three options for output:*
  - PREVIEW - The report is displayed on the screen
  - TO FILE - The report is sent to a file on disk
  - TO PRINT - the report is sent to the printer.

One can make a selection by using the cursor keys or TAB key and pressing the SPACE BAR or ENTER KEY to confirm the selection. If the user selects TO FILE, processing continues to step 4, otherwise processing continues to step 5.

- 4. The user is prompted for a file name. A default filename (DE\_REPOR) appears and the user can either accept the default name or enter a new file name with a valid PATH on the hard disk. The default file name DE\_REPOR is found in the directory C:\HRS\OUTPUT. The user confirms the entry with SAVE or aborts with the CANCEL button.*
- 5. The user can now select the OK button to begin the report or the QUIT button to cancel the report and return control to the Main menu.*
- 6. The message "Running Data Entry Report ...please wait" is displayed. After processing, the results are either displayed on the screen, sent to the printer, or sent to a file. The user can then press the ESC key to continue.*
- 7. The QUIT button can be selected to return control to the Menu, or another report can be generated by altering the options in the screen. Processing continues to step 1 or control returns to the menu.*

# APPENDIX A

## *System requirements*

Minimum requirements for running the system are as follows:

- IBM PC or IBM compatible PC with 80486 processor
- Windows 95, 98 or Windows NT 4.0 or higher
- 50 MB of hard disk space
- 32 MB RAM
- Colour monitor
- A dot matrix or laser printer

The above are the minimum requirements but it is recommended to have at least a Pentium processor with 100 MB hard disk space. The faster the PC the quicker are the results to the queries generated, and the checking of consistencies during the data entry process of the HRS. More hard disk space is required over time as more information is collected and the database files get bigger.

It is recommended that the HRS be run on a UPS (uninterrupted power supply) with sufficient battery capacity to allow the software to be exited normally in case of a power failure. Abnormal exists can damage database files. A five-minute battery period should be sufficient in most cases for a user to wind up execution and exit normally. As a safety measure, a back-up copy of the HRS software together with all database files should be kept.

The software is distributed with the source code developed under Visual FoxPro version 5.0. The software is provided to make it easy to better understand the system and make it easier to change. It would be very interesting to hear about changes, improvements, and bug fixes. Any queries about the system can be directed to Bruce MacLeod (macleod@usm.maine.edu). Users can also consult a local FoxPro programmer for assistance, or refer to the FoxPro manuals.

## Installation

1. Install Visual FoxPro version 5.0 or higher. While you do not need Visual FoxPro to run the software you will need it to tailor the HRS to your particular circumstances.
2. Obtain a copy of the latest version of HRS2 software. This will be located at the following site on the internet :
3. Create a sub-directory under the root directory called HRS
4. Change directory to the newly created HRS directory:

5. Copy the zip file with the HRS software to the HRS directory
6. Unzip the file with the Winzip program (you can obtain this software at [www.shareware.com](http://www.shareware.com))
7. Among the list of unzipped files you'll find one by name setup.exe. Run or execute the setup program. The setup program will install the HRS software to your PC.
8. After the installation, you can run the HRS directly by running the whrs.exe file. Alternatively, you can start up Foxpro, set the default directory to c:\HRS (set defa to c:\HRS) and type do prog\whrs.prg