

A close-up, low-angle view of a globe. The globe is tilted, showing the Atlantic Ocean in the center, with North America to the north and South America to the south. The text 'ATLANTIC OCEAN' is visible across the top half of the globe. The background is a clear blue sky. The globe's surface is detailed with latitude and longitude lines, and various geographical features are visible, though slightly out of focus.

Epi Info Training Session

Using Epi Info in an Outbreak Investigation,
Advanced Analysis & Mapping

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Module 1

Welcome to Using Epi Info in an Outbreak Investigation

In this Module:

- Overview of Training
- Target Audience & Prerequisites
- Training Objectives
- Resources & Time Required
- About this Training Manual
- Installing Epi Info for Windows

Level of Difficulty	Beginner
Estimated Time to Complete	½ Hour
Additional Resources Required	Training Materials

Welcome to the Using Epi Info in an Outbreak Investigation training provided by the Centers for Disease Control in Atlanta, Georgia. The purpose of this training is to introduce you to the features and functionality of Epi Info as it pertains to outbreak investigations.

Overview of Training Activity

Using a case study based on an actual investigation of an outbreak of cholera in Uganda, you will use Epi Info for Windows (Version 3) software to perform data entry and analysis activities commonly encountered in an outbreak investigation.

This training is not intended to cover every function of Epi Info for Windows but rather introduce the beginning user to the features that are required of a basic outbreak investigation.

The training is designed as a self-study activity but also works well in a classroom setting.

Target Audience

The intended audience for this training activity is first-year Field Epidemiology Training Program (FETP) and Public Health Schools Without Walls (PHSWOW) trainees; however, anyone with the following prerequisites will benefit from the training.

Prerequisites

You should have an understanding of the following:

- ▶ Basic epidemiology
- ▶ Basic biostatistics
- ▶ The steps taken in outbreak investigations
- ▶ How to develop questions for an investigation
- ▶ Basic functions of Windows-based computers

It is not necessary, but may be helpful, to have experience with Epi Info 6 or any other database or spreadsheet software.

Training Objectives

Using Epi Info for Windows, a summary of an original outbreak investigation, and a set of questions to be used in a questionnaire, you will be able to

- ▶ Recreate a questionnaire form
- ▶ Program code to check for inaccurate data entry or to facilitate data entry
- ▶ Enter data in a questionnaire
- ▶ Manage the data entered
- ▶ Analyze the data entered
- ▶ Read data from and write to other database formats
- ▶ Create reports using Epi Report
- ▶ Create a menu
- ▶ Map data using Epi Map

Resources & Time Required

You will need the following items to participate in this training. If you are participating in a classroom-based course, these items are typically provided by the instructor/training coordinator of the training course.

- ▶ This training manual
- ▶ Computer with MS Windows software
- ▶ Epi Info for Windows Software (included on the CD-ROM or accessible from the Internet at <http://www.cdc.gov/epiinfo/>)
- ▶ Files: database files and supplemental files provided on CD-ROM or downloaded from the Internet

Using the Training CD-ROM

An electronic copy of the training manual and the database files are all on the CD-ROM. After you have completed Module 3: Recreate the Questionnaire in Epi Info, you may wish to copy all the database files (*Check Code_Cholera in Rwenshama.MDB*, *Enter Data_Cholera in Rwenshama.MDB*, *Analysis_Cholera in Rwenshama.MDB*, *epi6chol.rec*, *Case Studies English.xls*) and the Back Up and Advanced Analysis folders to a Training folder to complete the training. Directions on how and where to create the Training folder are included in Module 3. In addition, you should find a folder containing the install files for the Epi Info for Windows software. If not, you can download the software from the Internet (see page 18 for installation instructions).

Using Training Files Downloaded from the Internet

The Internet site (<http://www.cdc.gov/epo/dih/materials.html#EpiInfo>) has three files to download:

- ▶ The training manual which you are now reading.
- ▶ A Database folder (which contains *Check Code_Cholera in Rwenshama.MDB*, *Enter Data_Cholera in Rwenshama.MDB*, *Analysis_Cholera in Rwenshama.MDB*, *epi6chol.rec*, *Case Studies English.xls*, *Uganda_Cholera.jpg* files and the Back Up and Advanced Analysis folders).
- ▶ A Trainer folder containing materials for Epi Info trainers.

You will only need the training manual and the Database files to complete the training. The Database folder and the Trainer folder are self-extracting zip files.

To open a Self-Extracting Zip File from the Internet

Use the following steps to open the self-extracting zip file from the Internet.

1. **Click on the Internet link.**
2. **When the dialog box appears, select SAVE.**
3. **Choose a folder to which you want to save the Zip file (save to your computer Desktop).**
4. **Click SAVE.**
5. **When the file is saved, click OPEN.**
6. **You must select a folder to which you will "unzip" the file. Click on BROWSE and select the folder (save to the Desktop).**
7. **Then click the UNZIP button. When you receive a prompt that your files have been unzipped successfully, click OK.**
8. **Click CLOSE to exit the dialog box. Later, you will move these files to another folder to continue the course.**

Time Requirements

This training is designed to be used either as self-study or in an instructor led, classroom setting. As self-study, the complete training takes about 18 hours. In a classroom setting, the training typically takes approximately 3 – 3 ½ days to complete. Time required may vary depending on the prior experience with computers, Epi Info, programming, or other technical/professional backgrounds of the attendees.




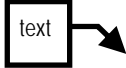
About this Training Manual


While some things may be self explanatory, others take a bit of guidance. This guide is designed to provide you with an overview of the Epi Info Using an Outbreak Investigation.

Conventions and Icons Used in this Document

Through out this guide, several standardized icons and conventions are used to help make things stand out or to help you follow a series of steps. Each standardized item is briefly described below:

Convention	Description
<input checked="" type="checkbox"/>	Check boxes indicate the topics to be covered in a module. These are located at the right of the module heading in a box named " In this Module ".

Convention	Description
	Notes and other useful information, including Hints, are found with a book icon and bordered by two blue lines.
<p>1. Step</p> <p>  Specific Action</p> <p> Step Info</p>	<p>Steps are numbered and bolded to provide generic guidelines (a source of reference). These steps are NOT specific to the Cholera in Rwenshama outbreak investigation. You can see that if you were to read through the bold text only, you would have a basic explanation of the process for completing the activity.</p> <p>The text following a gray arrow gives specific information (Specific Action) that you will need to complete the step for the <i>Cholera in Rwenshama</i> example.</p> <p>The indented text under the Steps provides alternative directions or additional information. (Step Info)</p> <p>Any applicable graphics will follow to reinforce where in the process the user should be at that step.</p>
Text	Bolded text that does not come directly after a numbered step and is indented indicates that the text is related to programming syntax, or another form of code, or information following a training question.
<u>Text</u>	When text displays with an underline, this is a hyperlink or cross reference. Basically, if you click on the link, it will take you to a related topic or section in the document or to a website and will open in your Internet browser. In some versions of Word (if this is how you will view this guide), you may have to hold the Ctrl key while you click on the hyperlink text to “jump” to the related information.
	Boxes appear on screens to help point the way to where you need to look, click, or make a change. Many will be accompanied by a callout.
	Callouts point out items, such as fields on a screen, to reinforce the item being discussed at hand or to provide additional notes, comments, etc.
?	Indicates there is a question you will either answer on your own or which your instructor may ask you to share in class. Answers are in Appendix F: Answers to Training Questions .
Save!	Serves as a reminder to Save Early – Save Often.
Try It! <hr/>	The Try It! sections are where you gain additional practice to reinforce the concept introduced.

Convention	Description
 Mini Reference	The Mini Reference sections are designed to provide additional information that assists with the training as a look into a reference manual.

How is this Guide Organized

To give you an idea of what information is included in this training manual each of the modules build on each other. Each module represents a learning concepts to utilize Epi Info Using an Outbreak Investigation. The individual modules are briefly described here to provide you with a sense of what lies ahead.

How to Use This Training Manual

This material is presented so that you can perform each step in creating a questionnaire, creating code to check data entry, entering data, and managing and analyzing data. Each action is listed in this text so that you can follow along and so that, in the future, you can return to this material and use it in your own outbreak investigations or studies. If you are using this training in a classroom, your instructor may demonstrate and explain major steps in the process. Here is an example of the instruction.



Example Instruction



Note: You will not perform this instruction now.

Try It!

Group Fields

- Select the set of fields you want to make into a group by clicking on the screen just to the upper left of the first field. Hold down the cursor and drag until you have covered the entire set of fields.**
 -  Click just above the Select all that apply title, then drag down and to the right until you cover the cramps in arms and legs checkbox. You can now see that there is a selection box around the five fields.
- Click FIELDS in the menu at the top of the Make/Edit View screen.**
- Select GROUP.**
- Under Group Description, type in the name that describes the group.**
 -  Type "Symptoms of illness".
- Select a color for the group.**

You can choose the same color as the background, but it is easier to read if you select a color that stands out on your background. Choose any light color on which the text can be read.

How to Install Epi Info

To install Epi Info, there are two common methods for installation: From a CD-ROM or downloading from the Internet. Epi Info updates are available via the Internet as well.



Note: If Epi Info is already installed, first UNINSTALL the existing Epi Info and reboot your machine BEFORE installing the new Epi Info version.

From the Training CD-ROM:

Use the following steps to install Epi Info from a CD-ROM.

1. **Insert the training CD-ROM in the CD-ROM drive.**
2. **From the computer desktop or START menu, open your CD-ROM drive so that you can see all the files available on the training CD-ROM.**
3. **Find the *Epi Info for Windows* folder and open it.**
4. **Find the SETUP.EXE file. Double click it.**
5. **Follow the directions to install *Epi Info for Windows*.**

From the Internet:

Use the following steps to install Epi Info from the Internet.

1. **Create a temporary folder to store your Download files.** You can either place this file on the desktop or on your C: drive. Remember where you have set up this folder, so you can go to it after the download and complete the installation.
2. **Go to this web address:** <http://www.cdc.gov/epiinfo/epiinfo.htm>.
3. **Next to Web Install, click on the *Download* button if you have good Internet speed and software to open .zip files. If not, next to Multi-Part, click on *Download* button and download the individual files to your temporary folder.**
4. **Follow the directions on the website to open either set of files.**

For Updates:

Periodically, the Epi Info for Windows team updates the program. You can download these "patches" from the internet.

1. **Create a temporary folder to store your Download files.**
2. **Go to this web address:** <http://www.cdc.gov/epiinfo/downloads.htm>.
3. **Check to see if the Internet site lists any update patches.**
4. **Follow the installation instructions on the Internet site.**

You may wish to check for updates every six months or so at <http://www.cdc.gov/epiinfo/>. If you have received this training product on CD-ROM, you may find that we have added recent patch

installation files for you. If you have a folder that reads "Patch Epi Info for Windows," you can run the patch by opening the folder and clicking on EpiPatch.EXE.

Uninstall Epi Info

You can uninstall Epi Info using the Add/Remove Programs option provided by Windows. You may or may not have authorization to Add/Remove Programs depending on your Windows profile access.

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Module 2

Introduction to Cholera in Rwenshama

In this Module:

- Cholera Case Study
- Case-Control Study Design
- Paper Questionnaire for Cholera

Level of Difficulty	Beginner
Estimated Time to Complete	½ Hour
Additional Resources Required	Training Materials

Learning Objectives

After completion of [Module 2: Introduction to Cholera in Rwenshama](#), the student will have reviewed the case study, *ANOTHER CHOLERA OUTBREAK IN RWENSHAMA IN RUKUNGIRI DISTRICT* by Dr. John Brian Obuku, MPH Officer 1 and covered the:

- ▶ Cholera Case Study Design
- ▶ Study Area & Population in Case Study
- ▶ Data Collection Methods Used.
- ▶ Next Steps

Cholera Case Study

This instruction is based on the case-control study:

ANOTHER CHOLERA OUTBREAK IN RWENSHAMA IN RUKUNGIRI DISTRICT

By

Dr. John Brian Obuku, MPH Officer 1,
Institute of Public Health, Makerere University
Field Supervisor: Dr. Z. Karyabakabo, DDHS Rukungiri.

The following introduction is an excerpt from the report of that study.

CHOLERA

Cholera is an acute enteric infection caused by ingestion of large doses of *Vibrio cholerae* serogroup 01. It is transmitted through polluted water, contaminated food, or person-to-person contact.

The disease is characterised by sudden onset of profuse painless watery diarrhoea and occasional vomiting. In severe cases patients complain of cramps in the abdomen and limbs.

In many outbreaks severe cholera affects only 10% of the victims, and in the other 90% the infection is mild or asymptomatic. Patients with untreated severe disease develop severe dehydration, acidosis and stop passing urine. Case fatality rate (CFR) may exceed 50% in such instances. With proper treatments however, CFR should be less than 1% (Abraham, 1995).

HISTORY OF CHOLERA IN THE AREA

Cholera epidemics have been reported in many districts in Uganda in recent years. In the period July 1999 to May 2000 up to 19 districts from all the four regions of the country registered cholera outbreaks. A total of 4,388 cases with 219 deaths were recorded giving case fatality rate of 5% (Hon. Kiyonga C, 2000).

In Rukungiri district there have been several epidemics in the past two decades. In 1978 a severe outbreak occurred in Rwenshama. This was a period of serious socio-economic problems in Uganda. Although hard data were difficult to come by, reliable sources put the case fatality rate at over 40%.

In the period December 1997 to January 1998, an outbreak occurred in Rujumbura and Rubabo counties. It affected six subcounties: Nyakagyeme, Kagunga, Rukungiri Town Council, Buyanja, Ruhinda and Bugangari. Thirty-two people were taken ill and the case fatality rate was 12.5%. In 1998 from April to June an epidemic occurred in Rwenshama. It affected 76 people with a case fatality rate of 7.9%. Another outbreak in Rwenshama occurred again from November to December 1999 attacking 22 people with case fatality rate of 18%.

RECEIVING REPORT OF AN OUTBREAK

Information about the present outbreak came on the 16.05.2001 from the health worker in Rwenshama Government Health Centre II.

The index case was a soldier who first presented at Rwenshama Health Centre II on the 06.05.2001 with profuse watery diarrhoea and vomiting. He was severely dehydrated. Because of logistic constraints he had to be referred to Bwambara Health Centre III some 30 km away.

VERIFYING THE DIAGNOSIS

The causative organism could not be isolated in the preliminary culture at the Central Public Health Laboratory. Also, it took more than a week for the specimen to arrive in the laboratory.

ESTABLISHING A CASE DEFINITION

A case was defined as any patient above the age of two years who had acute watery diarrhoea with or without vomiting.

IDENTIFYING CASES

Other cases were identified in the following weeks. A total of thirty-three (33) cases were treated by the end of the epidemic. There was one death. This was a patient who was brought to the health unit late after the onset of illness in the early days of the epidemic.

DESCRIBING THE EPIDEMIC BY TIME, PLACE, AND PERSON

Here is where you would design an epidemic curve and analyse the cases by place and person. This often can be done with paper and pencil and would have been completed prior to beginning a case control study. However, in this instruction, we are going to show you how to analyze this information with Epi Info for Windows.

IMPLEMENTING IMMEDIATE PREVENTION AND CONTROL PROCEDURES

Several immediate prevention and control procedures were put into place.

- A treatment centre was set up in the ward of the local health centre. All cases received oral rehydration salt solutions, and severely dehydrated patients received intravenous Ringer's Lactate until their dehydration was corrected. Adult cases were given tetracycline orally while children and pregnant mothers received co-trimoxazole.
- More staff persons were deployed in Rwenshama health center.
- Supplies and other logistics were provided.
- The Ministry of Health was informed. More supplies were requested and obtained.

DEFINING THE HYPOTHESIS FOR WHY THE OUTBREAK OCCURRED

It is important to determine how the disease was transmitted in this epidemic so that interventions can be taken to both stop the current epidemic and to prevent future epidemics. As previously mentioned, cholera is typically transmitted through polluted water, contaminated food, or person-to-person contact. Factors related to these should be studied. At this point, you might have information that would lend credibility to one particular mode of transmission, but often there seems to be little that is similar between the cases.

A very simple hypothesis for the cholera epidemic might be: The cholera epidemic occurred in Rwenshama due to polluted water, contaminated food, or person-to-person contact.

EVALUATE THE HYPOTHESIS

In this outbreak, a clear mode of transmission was not evident. Therefore, a study was conducted to identify the risk factors that would cause an individual to become ill with cholera.

Two types of studies typically chosen for outbreak investigation are the cohort study and the case-control study. Cohort studies work best for well-defined population (for example, an outbreak that occurs among people who attended a wedding), while case-control studies work best for outbreaks where the population is not well-defined. The relationship among the cases in this cholera outbreak was not easily defined, so the method chosen was the case-control study.

Case – Control Study Design

This was a case-control study employing both quantitative and qualitative methods of data collection.

Study Area

The study was conducted in Rukungiri district in southwestern Uganda. The district covers an area of 1376 sq. km. and has two counties, Rubabo and Rujumbura, with a total population of 341,112 (MOF&ED 2001). The location of this epidemic was in Rwenshama parish in Bwambara subcounty in Rujumbura county. It is a fishing village on Lake Edward, 65 km northeast of Rukungiri town and demarcated within the Queen Elisabeth National Park. The area covers 1 sq km, has 3 cells (villages) with a population of 2,376. The cells are Rwenshama, Rwebinyonyi, and Ncwera. There is a large trading center together with two churches, one mosque, one primary school, one health centre II, a police station and a military detach.

The main economic activity is fishing. The people use simple hand powered canoes and ordinary nets. Fishing is done at night and catches are hauled in during day. The products are either sold fresh, smoked, or salted and sun dried before being taken to markets in surrounding towns. Salted fish particularly commands a big market on the Democratic Republic of Congo (DRC) side

of the border town of Ishasha. There is regular communication between Rwenshama and Ishasha. In April to May of 2001, there was a cholera outbreak on the DRC side of Ishasha (Kinkizi West HSD Report May, 2001).

Study Population

The study involved cases of cholera and controls. A case was defined as any patient above the age of two years who had acute watery diarrhoea with or without vomiting. A control was defined as a person above the age of two years without watery diarrhoea and vomiting (WHO, 1992). Cases and controls were matched for age, sex, and area of residence.

Data Collection Method

A standard questionnaire was administered to both cases and controls (review the standard questionnaire in Appendix A on page 100). An environmental survey of the households of cases and controls was undertaken. A survey of eating places, water sources, and general environment was also done. Stool specimens were taken from two patients and sent to the Central Public Health Laboratory in Makerere Medical School.

For more information on cholera surveillance and response, see Appendix B on page 100 (Summary Guidelines for Specific Priority Diseases and Conditions – Cholera).

Next Steps

Now that we have administered the questionnaire to both cases and controls, we need to determine which risk factors appear to be the modes of transmission of cholera. Using the data we collected, we must look at the statistical significance that any one risk factor is the cause or mode. To assist us in this task we are going to use Epi Info for Windows. We will also show you how to analyze the data by person, place, and time.

Module 3

Recreate the Questionnaire in Epi Info

Level of Difficulty	Beginner
Estimated Time to Complete	2 Hours
Additional Resources Required	Training Materials, Module 3

In this Module:

- Open Epi Info
- Start a new project
- Create a new view
- Create, Revise, and Resize Fields
- Create Pages
- Create a Code Sheet
- Complete a Questionnaire

Learning Objectives

After completion of [Module 3: Recreate the Questionnaire in Epi Info](#), the student will be able to:

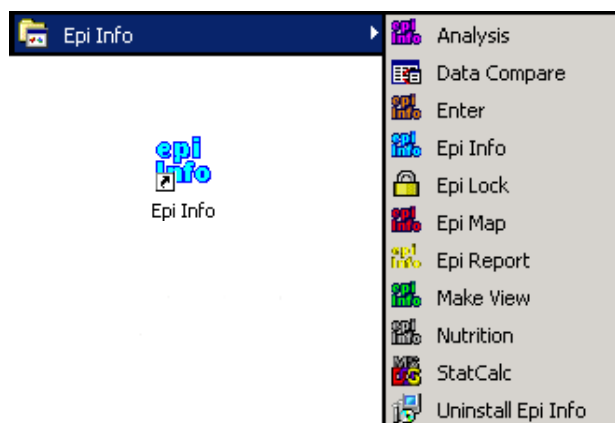
- ▶ Start a new project
- ▶ Create a new view
- ▶ Create, revise, and resize fields
- ▶ Create Pages

Epi Info for Windows is a tool that public health professionals use to *create questionnaires (forms)* for disease outbreak investigations, studies or surveillance activities, *enter data, manage data,* and *analyze data* both statistically and geographically. Advanced users can develop applications for use by others. In this module you will start by developing a questionnaire for the cholera outbreak investigation.

Open Epi Info Main Menu

You can open the Main Menu in **two** ways: from the desktop or from the Windows Start button.

1. **Either double-click on the Epi Info icon on your computer's desktop, or Click on the Start button on your desktop. Under Programs, choose Epi Info. You should see these choices available from Epi Info for Windows.**
2. **Choose Epi Info.**



3. This is the Epi Info for Windows main menu.



Five (5) Epi Info Programs

The large buttons located in the Epi Info for Windows main menu are for the most frequently accessed features. A brief description of each follows.

Button	Description
Make View	Questionnaires or forms (called "views") are created here. Code used to check data entered or calculate variables (Check Code) is created here in the Program Editor.
Enter Data (Enter)	Data are entered and edited here. The data entry screen displayed is the one created in Make View.
Analyze Data (Analysis)	This is where data are analyzed. Analysis has many commands that perform common statistical calculations, particularly those relevant to epidemiology. Graphing and mapping of data is also done here.
Create Maps (Epi Map)	A mapping program that displays data variables from Epi Info for Windows files by using ShapeFiles from popular GIS programs.
Create Reports (Epi Report)	A program to design and generate reports. A data source can be bound to the report to allow for easy updates.

There is also a button to access the Epi Info Website and another to Exit the menu.

To learn more about the items listed in the menu at the top of the Epi Info screen (Programs, Edit, Settings, Utilities, and Help), see Appendix C on page 100.

Parts of an Epi Info Project

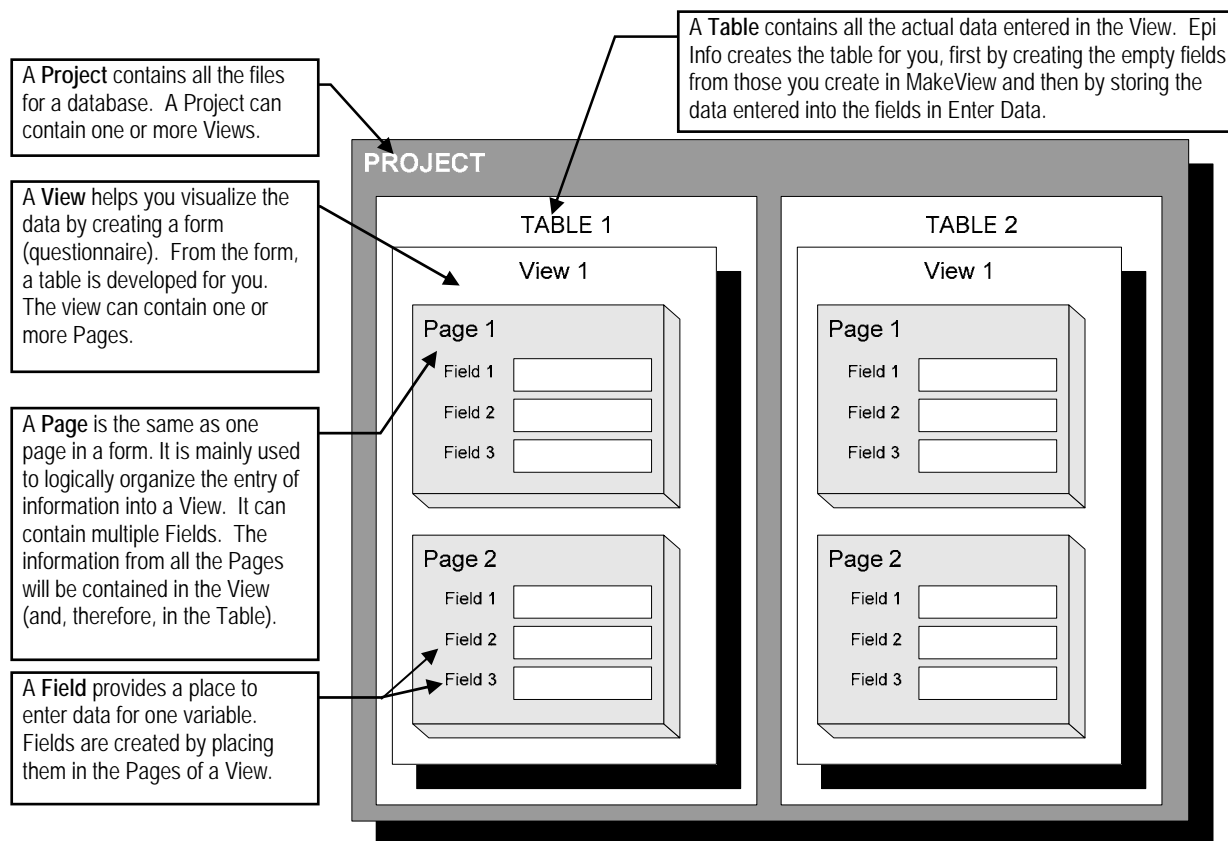
Epi Info uses the Microsoft Access file to store all the elements that make up an Epi Info Project. An Epi Info Project is made up of several parts.

- ▶ View(s) that contain
 - Page(s)
 - Field(s)
 - Data Table(s)
- ▶ Check Code - an Epi Info Project will also contain the code created to facilitate or check data entry and
- ▶ Program Files - any programming files you create to analyze data.

If you are familiar with Epi Info 6, you will recognize these as the .qes, .rec, .chk, and .pgm files. They are now all contained in the Microsoft Access .mdb file that is created by Epi Info.

Epi Info for Windows Database Organization

The diagram below provides a brief look at the database organization of an Epi Info View.



Start a New Project

Epi Info organizes databases in projects. A new project can be created at the same time a questionnaire is set up. A project contains many views, and each view shows information about one data table.

Create a Folder for Your Files

The first step in creating a project is to create a folder. You can create a folder for your project anywhere you like on your computer; you do not have to create one in the same drive as the Epi Info for Windows program files. For this training, we will create a folder on the Desktop of your computer called "Training."

- 1. Create and name a new folder on your computer Desktop.**

- ➡ Create a new folder by right-clicking anywhere, choosing NEW, and then FOLDER. A new folder will appear. Name the folder "Training".



Note: Always create a separate folder for each project. When you analyze data in Epi Info, the Analysis program automatically produces "output" files that are saved in the same folder as your project file. In order not to mix output files from different projects, keep each project in a separate folder.

What is a Questionnaire/View?

Questionnaires are electronic replications of paper forms or other information sources that are created to allow users to enter data and store the data in database projects. Questionnaires are created in the Epi Info Make View application.

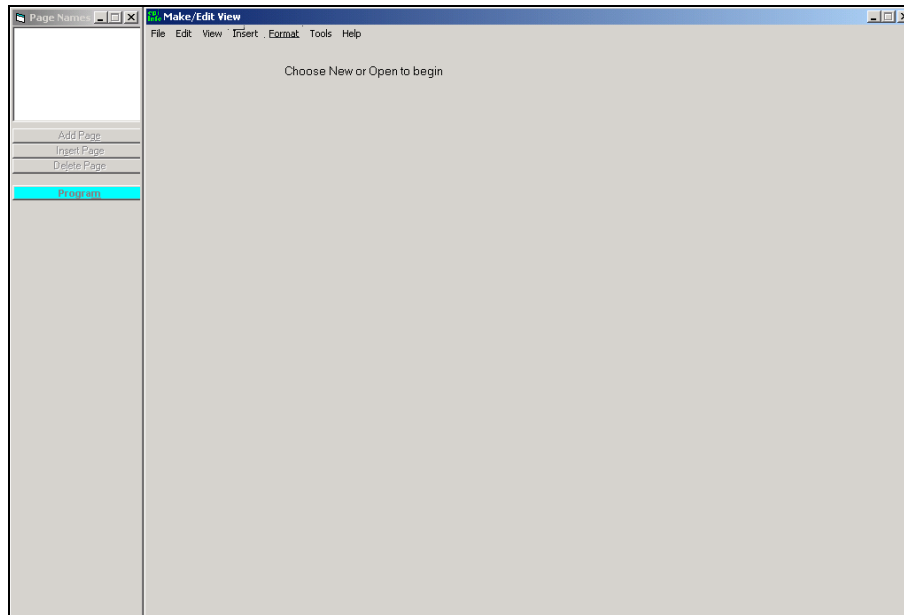
The Make View application is used to place one or more data entry fields and prompts on a questionnaire, or view. The process of creating a questionnaire, or view, creates and defines the database(s) for a project. In this regard, the Make View application creates views and databases in a database design environment.

In this module, you will create a new project and questionnaire for the Cholera Outbreak in Rwenshama. This will be our first step in Epi Info.

Create a New Project File and View

The next step is to create a new project by creating a questionnaire in Epi Info. Questionnaires are also referred to as "Views" and are created by using the Epi Info Make View program.

- 1. Open MAKEVIEW from the Epi Info main menu screen; click on the MakeView button or click on the Programs menu and select MakeView. The MakeView screen should look like the one on the following page.**

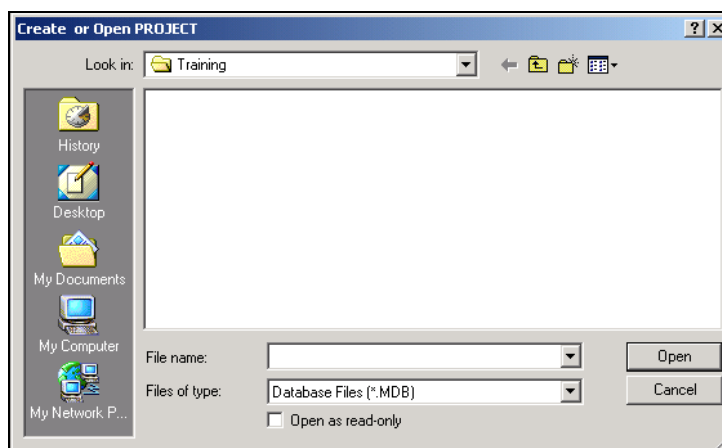


Create a New View

Creating a new view is also a method for creating a new project. Views can be added to existing projects if desired.

1. **Right-click on the blank area of the screen and select MAKE NEW VIEW or go to File and select New.**
2. **In the Create or Open PROJECT dialog box, select the folder for your project. You may need to use the drop-down box next to Look In to navigate to the appropriate folder.**

For this project, you should click on the drop-down button next to Look In, select Desktop, and then select the TRAINING folder.



3. **Next to File Name, type the name you want to give to the project.**
 ➤ Type "Cholera in Rwenshama". This is the Project name.

4. **Click OPEN.**
5. **In the *Name the View* dialog box, type the name you want to give to the view.**
 ➤ Type "Questionnaire". This is the View name.
6. **Click OK.**
 ➤ A new view is created.

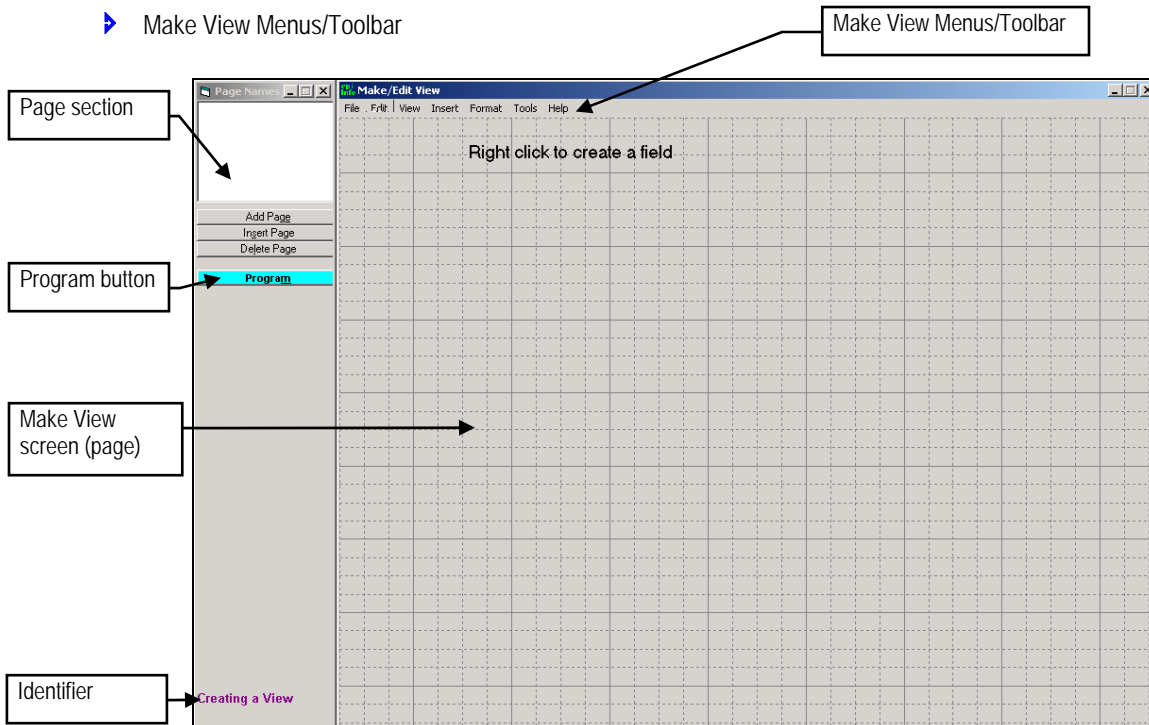


Note: In Make View, the screen displays with a grid to assist with designing the view. To turn off the grid, select **Format | Settings** and uncheck the **Visible grid on** checkbox on the Snap to Grid dialog. See the Mini Reference section for more on changing grid options, page 41.

Elements of the Make View Window

The Make View window is where projects, questionnaires/views are created. The Make View window has the following elements.

- ▶ Make/Edit View screen (page)
- ▶ Page section
- ▶ Program Button
- ▶ Identifier (bottom left corner should say "Creating a View")
- ▶ Make View Menus/Toolbar



Create Fields

We are going to create five types of fields: Label/Title, Variables with a common pattern, Text, Text with Legal Values, and Yes/No. For additional information on variable types refer to the Mini Reference section located at the end of the module, page 55.

Label/Title Fields

A Label/Title is a field on the form used to display items such as a form title. A Label/Title field will not have any input accepted when entering data in the questionnaire.

1. Right-click on the page to open a *Field Definition* dialog box.

- On the screen, click close to the area where you would like your field to appear. You can also open the *Field Definition* dialog box by clicking Insert | Field. Do not click directly on the title "Right click to create a field;" the dialog box will not open. Also, this title will disappear after you create your first field.

2. Type the Question or Prompt for the data entry field.

- Type "QUESTIONNAIRES: CHOLERA CASES IN RWENSHAMA – 2001".

3. Create font for the Question or Prompt.

- Click on the FONT FOR PROMPT button.

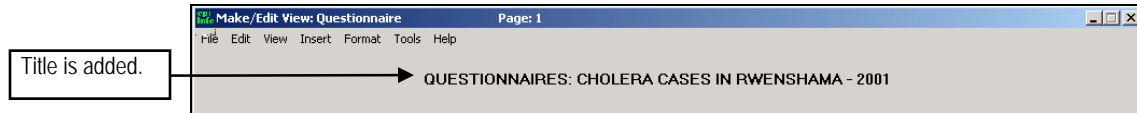
4. Choose font, font type, and point size.

- For this title, select Font – *MS Sans Serif*, Font Style – *Bold*, Size – 10.



Note: Most people use a larger font for the titles of pages and sections. You do not have to choose a font for the prompt/question for any type of field you create; however, for this training, we will only change the font for a Label/Title. If you do not choose a font, the prompt/question will appear in the default font (MS Sans Serif, Bold, 8 point) or you can change the default font by going to Format>Set Default Font.

5. **Click OK.**
6. **Choose type of field or variable.**
 - ☞ Click on the *Field or Variable: Type* drop-down box. Select Label/Title. You will not select a font for the variable since there is no data entry field for a label or title.
7. **Click OK.**



Save! It is not necessary to SAVE after creating each field, but you want to remember to save often.

Moving a Field

If you do not like where your field is located, you can easily move it. Moving a field is a simple “click and drag” method.

1. **Left-click once and hold the mouse button down on the field’s title.**
 - ☞ Click on the QUESTIONNAIRES: CHOLERA CASES IN RWENSHAMA – 2001 field.
2. **Drag the field to the desired location.**
 - ☞ While holding down the left mouse button, you can move the field around to different locations. Release the mouse button once you have moved the title to the desired location. Make sure to leave the *QUESTIONNAIRES* title near the top of the page.

Fields with a Common Pattern

Certain data entered will have a common pattern. For this field type, you will choose both the type of variable and the pattern. Examples of these variables include:

- ▶ Number (the number of people in a household),
- ▶ Phone Number (404-123-4567)
- ▶ Date (05-08-2001)
- ▶ Time (11:23:01)
- ▶ Date/Time (05-08-2001; 11:23:01)

Use the following steps to create a variable.

1. **Right-click on the page to open a *Field Definition* dialog box.**
2. **Write Question or Prompt for the data entry field.**
 - ☞ Type “Questionnaire No”.

3. Choose type of field or variable.

☞ From the *Field or Variable: Type* drop-down box, select *Number*.

4. Choose the pattern for the variable.

☞ From the *Field or Variable: Pattern* drop-down box, select *###*.

5. Choose field name.

☞ Under Field Name, type "Question".



Note: If we never used this database in another statistical program, we would not need to worry about the field name. However, some other programs can only use variable names with eight (8) characters or less.

6. Determine if field should be Required.

☞ We want all our questionnaires to have a Questionnaire No. Check *Required*. If the *Required* box is checked, it means that the person entering data must fill in the data entry field.

7. Click OK.

You will see a field like the one below that contains both a prompt/question (in this case Questionnaire No.) and a data entry box.

Try It!

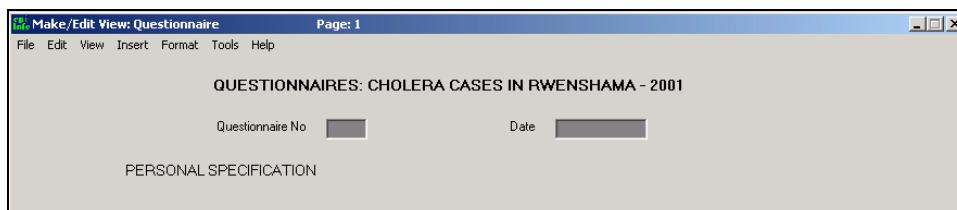
You are going to create another field that uses a common variable type – the date that each questionnaire was completed. Create the variable using the steps listed above and the information below. We want the Date to be Required.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Date	Date	DD-MM-YYYY	Date

Now, we are going to create a title for the next section. Follow the directions for a Label/Title and use the information below.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
PERSONAL SPECIFICATION	Label/ Title	Regular, 10	PERSONAL SPECIFICATION

The results should look similar to the following:



Text and Multiline Fields

There are four types of text variables.

- ▶ Text (e.g., name of the patient)
- ▶ Text[Uppercase] (e.g., country codes that will appear in capital letters)
- ▶ Multiline (e.g., description of treatment given at home)
- ▶ Text with Legal Values (e.g., sex – male or female)

First, we are going to create a text variable. (The steps are the same for Text[Uppercase] and Multiline.)

1. **Right-click on the page to open a *Field Definition* dialog box.**
2. **Write Question or Prompt for the data entry field.**
 - ☞ Type "Name".
3. **Choose type of field or variable.**
 - ☞ From the *Field or Variable: Type* drop-down box, select *Text*.



Note: *Text* is the default choice. (For text requiring multiple lines, you would select *Multiline*.)

4. Choose field name.

☞ Type “Q1Name”.

5. Determine if field should be Required.

Usually you would want each questionnaire to have a name. For this case study, we will later have you enter and work with actual data, so we have eliminated the names from our data set. Do NOT check *Required*.

6. Click OK.

Try It!

On the same line as Name, create a field for the person's age. We will use a two-digit number as the pattern because we assume there would rarely be someone 100 years of age or older. You do not have to select *Required*.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Age	Number	##	Q2Age

The results look similar to the following:

Text with Legal Values

Legal values refer to a limited number of choices, which could be entered in as text, but would be easier to enter if typing were not required. Legal value choices also help eliminate errors, such as typing the name of the same town with different spellings. This field will create a “drop-down box” that lists choices that the person entering data can choose from. In this case, we are going to create legal values for the sex of the person – male or female.

1. Right-click on the page to open a *Field Definition* dialog box.

2. Write Question or Prompt for the data entry field.

☞ Type “Sex”.

3. Choose type of field or variable.

☞ From the *Field or Variable: Type* drop-down box, select *Text*.

4. **Create Legal Value.**
5. **Under Code Tables, click on the LEGAL VALUES button.**

6. **In the dialog box, click on the CREATE NEW button.**


7. **Enter all of the possible choices, pressing ENTER after each one.**
 - Type "Male", press Enter, type "Female", and press Enter again.
8. **Choose to sort or not to sort the list.**
 - Keep our list as it was typed and click the *Do not sort* checkbox.



Note: The list you created will automatically be placed in alphabetical order unless you click on the checkbox next to *Do not sort*. If you would like your entries to appear in the order you typed them, make sure to check this box so the entries will not be resorted.

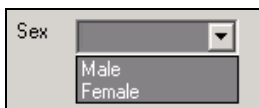
9. **Click OK.**
10. **Choose field name.**
 - Type "Q3Sex".

11. Determine if field is Required.

 We want to know if the sex of the individual is male or female. Check *Required*.

12. Click OK.

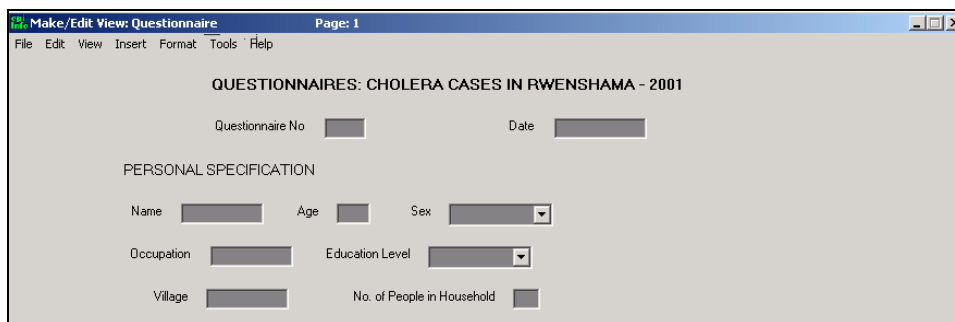
You can now see your drop-down box on the page.


Try It!

Create the next four fields. You do not have to select *Required*.

Prompt/Question	Type	Pattern/Font/Legal Value	Field Name
Occupation	Text		Q4Occup
Education Level	Text (Legal Values)	<ul style="list-style-type: none"> ▪ Nil ▪ Primary 1-4 ▪ Primary 5-7 ▪ Secondary ▪ Tertiary Note: click on Do Not Sort	Q5Educ
Village	Text		Q6Villag
No. of People In Household	Number	#	Q7House

The results should look similar to the following:


Yes/No and Checkbox Fields

These two types of fields are similar in function and are created by using the same steps. The Yes/No type is, of course, used for yes/no questions. The Checkbox is best used for asking about a series of items that relate to one common question for which more than one answer will apply.

For instance, when the type of illness you are investigating is commonly spread through contaminated food, you might ask a person answering the questionnaire if he or she ate any items from a list of common foods. You would create a checkbox for each of the foods. When completing the questionnaire, checking the box indicates that yes, the food was eaten, whereas leaving the box unchecked indicates no, the food was not eaten. Use the following steps to add Yes/No and Checkbox fields.

1. **Right-click on the page to open a *Field Definition* dialog box.**
2. **Write Question or Prompt for the data entry field.**
 ↪ Type "Ill?".
3. **Choose type of field or variable.**
 ↪ From the *Field or Variable: Type* drop-down box, select *Yes/No*.
4. **Choose field name.**
 ↪ Type "Q8Ill".
5. **Determine if field should be Required.**
 ↪ *Ill?* should definitely be required. Check *Required*.
6. **Click OK.**

Try It!

On the same row, create the next field.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
If yes, date of onset	Date	DD-MM-YYYY	Q9Onset

Then create a Label/Title field that states "(If not ill, skip to page 3 - Risk Factors)". The result should look like the following:

The screenshot shows a window titled "Make/Edit View: Questionnaire" with a menu bar (File, Edit, View, Insert, Format, Tools, Help) and a page indicator "Page: 1". The main content area is titled "QUESTIONNAIRES: CHOLERA CASES IN RWENSHAMA - 2001". It contains several data entry fields: "Questionnaire No" and "Date" (both text boxes); "PERSONAL SPECIFICATION" section with "Name" (text box), "Age" (text box), "Sex" (dropdown menu), "Occupation" (text box), "Education Level" (dropdown menu), "Village" (text box), and "No. of People in Household" (text box); and "Ill" (checkbox) and "If yes, date of onset" (text box). At the bottom, there is a label "If not ill, skip to page 3 - Risk Factors".

Changing Alignment (Grid) Options

Notice that there is a grid on your screen. This grid is set up to help you place and align your fields. We are going to look at the possible grid options. You can change these to suit your preference.

1. **Click on FORMAT in the menu at the top of the Make/Edit View screen.**
2. **Select SETTINGS.**
3. **In the dialog box, choose the desired options.**

Button	Description
Snap to Grid	This option will make the field position itself (snap) on a grid line, which generally helps keep your fields aligned.
Visible Grid On Screen	This option makes the grid appear or disappear as you create a questionnaire. This does not affect the Snap to Grid function; if the Snap to Grid function is on, the fields will snap to the grid whether or not you can see the grid.
Character Widths Between Grid Lines	This option increases or decreases the number of characters between grid lines.
Snap Left Side Of	These two options work when the Snap to Grid option is turned on. You can choose to either "snap left side of prompt to grid" or "snap left side of entry field to grid."

We want the *Snap to Grid* option on with "snap left side of entry field to grid" selected. To see what your screen looks like without a grid, turn off the Visible Grid On option by clicking the checkbox to delete the checkmark.

4. **Click OK.**

Revising Fields

Sometimes you will want to make changes to a field you have already created. For example, you have realized that there are a limited number of villages that have been reported and they have long names to type.

1. **Right-click on the prompt of the field you want to change. The *Field Definition* dialog box will open up.**
 - Right-click on the word Village.
2. **Make the desired changes.**
 - Create these legal values Rwenshama, Rwebinyoni, Ncwera. Leave the Do Not Sort box unchecked.
3. **Click OK.**

After you finish creating the legal values, look at the Village dropdown list. You will note that the village names have now been placed in alphabetical order because, without the Do Not Sort box checked, the names were sorted.

Resizing the Field's Data Entry Box

When you create text fields, the data entry box appears in a default size. You may want to lengthen the data entry box, so that you can see all the data entered. We want to create a longer text box for the Name field.

1. Click once inside the data entry box you want to lengthen.

- ☞ Click inside the data entry box next to Name. (For Legal Value fields, you must hold down the ALT key first, and then click inside the box.). Blue handles display around the field.



Note: These numbers are only temporary; they help to show the number of characters that will be allowed to display in the entry box. Once you finish resizing the field, they will disappear.

2. Click and hold the mouse on the handles.

- ☞ Click on the handles on the right side of the box.

3. Drag the mouse to change the size of the box.

- ☞ While holding down the mouse button, drag the mouse toward the *Age* field.

Save!

You should **SAVE (File | Save)** each time you finish creating a page.

- ☞ The first page of the questionnaire/view should look similar to the following:

Make/Edit View: Questionnaire Page: 1

File Edit View Insert Format Tools Help

QUESTIONNAIRES: CHOLERA CASES IN RWENSHAMA - 2001

Questionnaire No Date

PERSONAL SPECIFICATION

Name Age Sex

Occupation Education Level

Village No. of People in Household

Ill If yes, date of onset

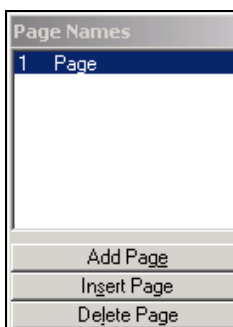
If not ill, skip to page 3 - Risk Factors

Creating and Naming Pages

We are finished with creating the first page of the questionnaire. Now, we are going to name the first page then add a second page.

Naming a Page

Look in the upper left corner. You will see a section of the screen titled Page Names. You will see *1 Page* listed in the blank field. The default name for a page is *Page 1, Page 2, etc.*



To change *Page 1* to a name that describes the information on the page use the following steps.

1. **To the left of the screen, right-click on the name of the page.**
 - Right-click on 1 Page.
2. **Type the desired title.**
 - Type "Personal Specification".
3. **Click OK.**

Adding a New Page

If persons we interviewed indicated they were ill, we asked them more questions about their illness. We are going to create a page to enter data about their illness.

1. **To the left of the screen, click on the ADD PAGE button.**
 - We will change the name of this page, too, but it can only be done after we have entered at least one field.
2. **Add the title to the page.**

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Illness	Label	Bold, 12	Illness

3. **Rename the Page (optional)**
 - Now rename page 2, "Illness".
4. **Add the new fields to the page.**
 - Create the following fields in a horizontal line on this page. Not everyone in our survey was ill, so DO NOT select Required for these fields or any of the following fields.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Diarrhoea	Checkbox		Q10Diarr
Vomiting	Checkbox		Q11Vomit
Cramps in abdomen	Checkbox		Q12Abdom
Cramps in arms and legs	Checkbox		Q13Armle

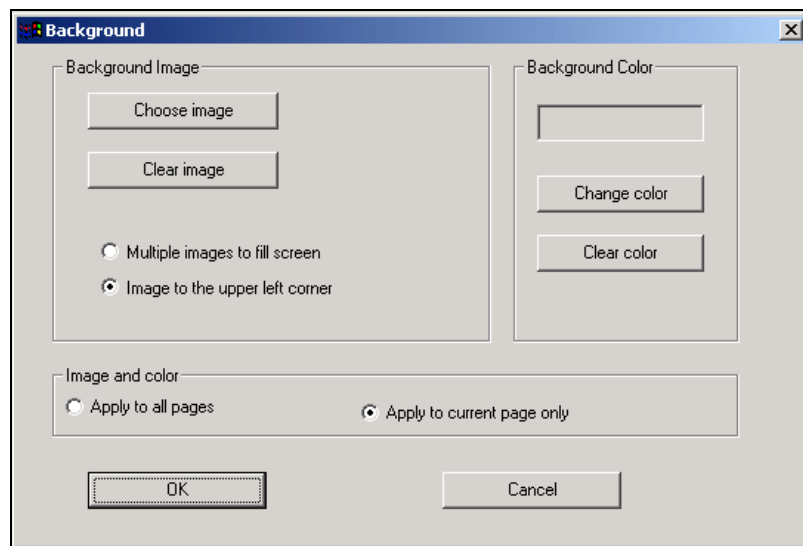
5. Create a title.

☞ Create a title above these four options that states “Select all that apply”.

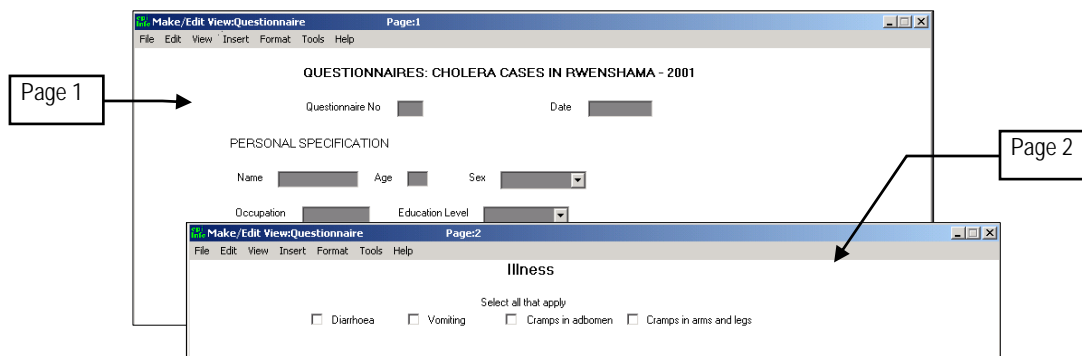
Changing Background Color of a Page

You can change the appearance of the page. Let’s change the background color of the Illness page.

1. Click on **FORMAT** in the menu at the top of the **Make/Edit View** screen.
2. Select **BACKGROUND**.



3. In the **Background Color** section, click on the **CHANGE COLOR** button.
4. **Select a color.**
☞ From the color palette, select the white color block.
5. **Click OK to close the color palette dialog box.**
6. **Under Image and color, choose to either Apply to current page only or to Apply to all pages.**
☞ We are going to apply the background color to all pages. Select *Apply to all pages*.
7. **Click OK.**
☞ All pages now have a white background.

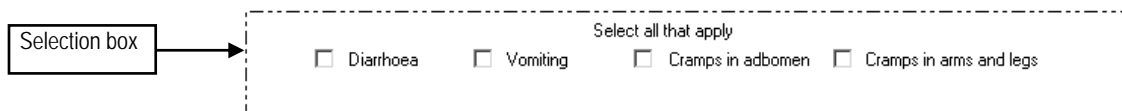


Group Fields

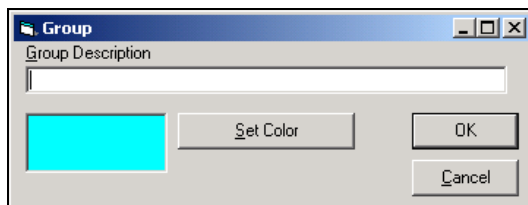
One way to organize a page is to group a set of related fields. The grouping is visual, but it also allows you to move the fields together around the page and, most importantly, analyze the fields as a group (in Analysis).

1. **Select the set of fields you want to make into a group by clicking on the screen just to the upper left of the first field. Hold down the cursor and drag until you have covered the entire set of fields.**

☞ Click above the Select all that apply title, then drag down and to the right until you cover the "cramps in arms and legs" checkbox. You can now see there is a selection box around the five fields.



2. **Click INSERT in the menu at the top of the Make/Edit View screen.**
3. **Select GROUP.**

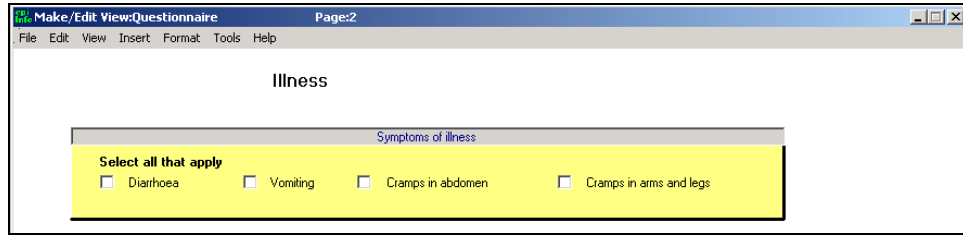


4. **Under Group Description, type in the name that describes the group.**

☞ Type "Symptoms of Illness".
5. **Select a color for the group.**

☞ You can choose the same color as the background, but it is easier to read if you select a color that stands out on your background. Choose any light color on which the text can be read.
6. **Click OK.**

☞ The results should look similar to the following:



You can move the group by left-clicking and holding down the mouse on the title of the group and dragging the group to a different place on the screen.

Ungroup a Set of Fields

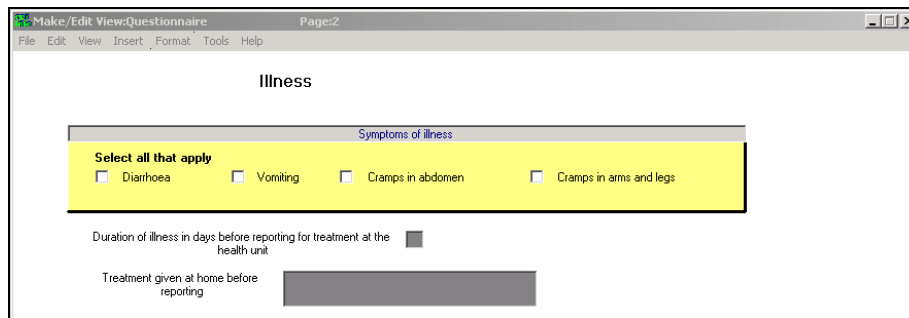
If you need to ungroup a set of fields, you can right-click on the title of the group and select the Ungroup Variables option, then click OK. You can also use this dialog box to change the group name, change the color of the group, or delete the entire group and all its variables.

Try It!

Create two more fields below the Symptoms of Illness group.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Duration of illness in days before reporting for treatment at the health unit	Number	#	Q14Durat
Treatment given at home before reporting	Multiline		Q15HomeT

Make the data entry box for the multiline variable larger. Your screen should now look similar to the following:



Now you are going to enter questions about the patients' health signs upon presentation at the health unit. Create three more fields. Create *Dehydration* and *Fever* on the same line and put *Other (specify)* right below.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Dehydration	Text (Legal Value)	nil some severe (click on Do Not Sort)	Q16Dehyd
Fever	Yes/No		Q17Fever
Other (specify)	Text		Q18Sign

Group the three fields under the heading “*Signs on presentation at health unit*”. The result should look similar to what appears on the following page:

The next set of questions is related to the treatment the patient received at the health unit. First, create a title that states “*Select all that apply*”. Create these five fields (the first four in a horizontal row, and *Other (specify)* on a row underneath).

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Oral fluids	Checkbox		Q19Oral
I-V fluids	Checkbox		Q20Iv
Tetracycline	Checkbox		Q21Tetra
Co-trimoxazole	Checkbox		Q22Cotri
Other (specify)	Multiline		Q23UnitT

Group these five fields and the “*Select all that apply*” title under the heading “*Treatment given at health unit*”.

The last variable on this page is for the patients’ outcome.

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Outcome	Text (Legal Value)	Died Improved	Q24Outco

The results should look similar to the following:

Change the Tab Order

During data entry, the automatic tabbing feature of Epi Info moves the cursor according to the layout of the screen (left to right). You want the tab to move in the order that is clear for the person entering data. This may be different than the tab order assigned. We are going to check the tab order of both the pages we have created. Let's go back to the *Personal Specification* page. Use the following steps to check the tab order:

1. **Click on EDIT and select ORDER OF FIELD ENTRY (TABORDER).**
2. **Click on the field you wish to move.**
 - After *Question* and *Date*, all the remaining fields should be in order from Q1 to Q9. If you see a field out of order, you may change it now.
3. **Choose UP or DOWN to move the field in the tab order.**
4. **Click OK.**

Save!

It's a good idea to save your file after you have changed the tab order.

Try It!

Now go to the *Illness* page. You will want all the questions to be in order from Q10 to Q24. The ease with which we can place the tab order is another benefit to naming the questions by number.

Exiting Makeview

We have two more pages to create, but first you need to know what choices to make should you exit a MakeView screen before your View is finished.

1. **Click on File | Exit.**
2. **If a dialog box appears, you can either choose to create a data table (OK) or cancel (CANCEL) creation of a data table.**
 - ☞ Select CANCEL

As you may recall, the View is a visualization of a form from which a data table will be created. If you are exiting MakeView and you have either not created a data table previously or have added fields, you will be prompted to create a data table. Creating a data table will finalize your field names, so you do not want to create the data table until you are completely finished with your View.

Delete a Data Table

We are not going to delete any data tables at the moment, but if you accidentally create a data table and need to delete it, go to TOOLS | DELETE DATA TABLE. Do not use this option if you have already entered data that you would like to keep.

Opening a Previously Created File

To complete the rest of our View, we need to reopen the *Cholera in Rwenshama* project:

1. **Open Epi Info for Windows's MakeView screen.**
2. **Click FILE | OPEN.**
3. **Select the project and click OPEN.**
 - ☞ The file we want to open is *Cholera in Rwenshama.MDB*.
4. **Select the View and click OK.**
 - ☞ Select the *Questionnaire* view.

Creating a Code Sheet

When you create your questionnaire, you will want to keep track of the names that you gave each of your variables and the question or prompt that accompanied it. You will not need to do this now for this training, but this is a step you would normally take at this point. As you will soon see, a code sheet can make it easier for you to recognize variable names when you create check code, manage data, and analyze data.

The sample code sheet displayed here is created in Analysis, which you will cover in Module 6. The code sheet includes:

- ▶ Variable – the field name
- ▶ Table - the name of the table where the field is located
- ▶ Field Type
- ▶ Format/Value – displays the patterns chosen
- ▶ Question/Prompt
- ▶ Special Info – displays fields included in groups
- ▶ Prompt – the prompt or question for the field

Here is a sample from the questionnaire we created.

Variable	Table	Field Type	Format/Value	Special Info	Prompt
Date	Cholera	DATE	DD-MM-YYYY		Date
Q10Diarr	Cholera	CHECKBOX			Diarrhoea
Q11Vomit	Cholera	CHECKBOX			Vomiting
Q12Abdom	Cholera	CHECKBOX			Cramps in abdomen
Q13Armls	Cholera	CHECKBOX			Cramps in arms and legs
Q14Durat	Cholera	NUMBER	#		Duration of illness in days before reporting for treatment at the health unit

The Label/Title field names are excluded from the code sheet since you will not use them to check code, manage data, or analyze data. You will find a similar code sheet for the outbreak investigation questionnaire in Appendix D on page 100.

Completing the Questionnaire

At this point, we have covered all the aspects of creating a questionnaire in Epi Info for this training. However, our Cholera Outbreak questionnaire has two more pages, both related to Risk Factors for cholera.

If you are taking this training in a classroom, your instructor may ask you to create one or both of the additional pages now or for practice later. If you are using the training activity as self-study, you may use these pages as additional practice.

If you do not create the questionnaire for these two pages, then for the next section, you will need to open and use the **1_Cholera in Rwenshama.MDB** file. If you are using the Epi Info for Windows Outbreak Investigation training CD-ROM, the file is located in the **Back Up** folder.

Try It!

Below are the names of the pages you need to create page 3 & 4 of the questionnaire, a sample layout and the fields for each.



Note: Checkbox items should not have the **Required** checkbox selected, since we want the user to have the option of leaving them blank (indicating No).

Page: Risk Factors Sample Layout:

RISK FACTORS

History of eating outside home within past 5 days

If yes, specify

Did you take any of these foods in the last five days?

Hot matooke Hot posho Hot peas

Cold matooke Cold posho Cold peas

Hot sweet potatoes Hot mandazi Hot meat

Cold sweet potatoes Cold mandazi Cold meat

Hot rice Hot cassava Hot milk

Cold rice Cold cassava Cold milk

Hot irish potatoes Hot beans Hot fish

Cold irish potatoes Cold beans Cold fish

Obushera

Sugar cane

Sweet bananas

Salads (raw cabbage, tomatoes)

The field information is listed on the following page.

Fields:

Note: This page has many checkbox items. They will be easier to arrange on the screen if your alignment grid is "On" and is set to "align by entry box".

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
RISK FACTORS	Label/title	Bold, 12	Risk Factors
History of eating outside home within past 5 days	Yes/No		Q25Eat
If yes, specify	Text (Legal Value)	hotel bar neighbor roadside	Q26Place
Did you take any of these foods in the last five days?	Label/title	Default font	Default
Hot matooke	Checkbox		Q27Hmato
Cold matooke	Checkbox		Q28Cmato
Hot sweet potatoes	Checkbox		Q29Hswee
Cold sweet potatoes	Checkbox		Q30Cswee
Hot rice	Checkbox		Q31Hrice
Cold rice	Checkbox		Q32Crice
Hot irish potatoes	Checkbox		Q33 Hiris
Cold irish potatoes	Checkbox		Q34Ciris
Hot posho	Checkbox		Q35Hposh
Cold posho	Checkbox		Q36Cposh
Hot mandazi	Checkbox		Q37Hmand
Cold mandazi	Checkbox		Q38Cmand
Hot cassava	Checkbox		Q39Hcass
Cold cassava	Checkbox		Q40Ccass
Hot beans	Checkbox		Q41Hbean
Cold beans	Checkbox		Q42Cbean
Hot peas	Checkbox		Q43Hpeas
Cold peas	Checkbox		Q44Cpeas
Hot meat	Checkbox		Q45Hmeat
Cold meat	Checkbox		Q46Cmeat
Hot milk	Checkbox		Q47Hmilk
Cold milk	Checkbox		Q48 Cmilk
Hot fish	Checkbox		Q49Hfish
Cold fish	Checkbox		Q50Cfish
Obushera	Checkbox		Q51Obush
Sugar cane	Checkbox		Q52Sugar
Sweet bananas	Checkbox		Q53Banan
Salads(raw tomatoes, cabbage)	Checkbox		Q54Salad

Page: Risk Factors Page 2**Sample layout:**

The field information is listed below.

Fields:

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
RISK FACTORS page 2	Label/title	Bold, 12	Default
Diarrhoea contact at home in the last five days	Yes/No		Q55Conta
Availability of pit latrine in home	Yes/No		Q56Pit
If yes, what is the state of the latrine	Text (Legal Value)	<ul style="list-style-type: none"> ▪ clean ▪ dirty 	Q57State
Where does household get its water?	Text (Legal Value)	<ul style="list-style-type: none"> ▪ lake ▪ river 	Q58Water
How does household prepare its drinking water?	Text (Legal Value)	<ul style="list-style-type: none"> ▪ boiling ▪ not boiling 	Q59Boil
Does household have facility for washing after latrine use?	Yes/No		Q60Wash
Is there a rack for drying plates in the home?	Yes/No		Q61Rack

Prompt/Question	Type	Pattern/Font/ Legal Value	Field Name
Cleanliness around the home	Text (Legal Value)	<ul style="list-style-type: none"> ▪ good ▪ fair ▪ poor (click Do Not Sort)	Q62Clean
Did you attend health education sessions on diarrhoea or cholera in the last 2 years?	Yes/No		Q63HEduc
If yes, who gave it?	Multiline		Q64Who
In your opinion, how does one get cholera?	Multiline		Q65How

Make sure that the tab order for each page is correct.

Save!



Mini Reference

Additional Field Types

Several other field types are available in Epi Info for Windows that we will not use in our questionnaire. The following table gives a brief description of each type and additional information on where you learn more about how to use these field types. For most of these field types, you can find out how to create them by going to **Help | Contents** in Make View.

Field Type	Description	Additional Information
Option	<p>Similar to Checkbox in that a single question is created with multiple response choices, but the person entering data can only select one response (i.e., the responses are mutually exclusive).</p> <p><i>Example:</i> On which continent do you live?</p> <ul style="list-style-type: none"> ▪ Asia ▪ Africa ▪ North America ▪ South America ▪ Australia ▪ Antarctica ▪ Europe 	See "Creating an Option Box" in the Epi Info Help.
Command Button	Creates a button that is activated by check code. Code can be created to open a program, a specific file, or a Help file, or to go to another page or field within the View.	
Image	<p>Allows a person entering data to select an image file from their computer to include in the database.</p> <p><i>Example:</i> You are creating a database for use by an antenatal care clinic. You create an image file so that an image of the patient's ultrasound can be included.</p>	<p>See "Inserting an Image on a Record" in the Epi Info Help.</p> <p>The image file types that can be used are: .JPG, .GIF, .BMP, .ICO, .WMF, .EMF</p>

Field Type	Description	Additional Information
Mirror	<p>Allows a field from another page in the view to be duplicated (mirrored) on another page.</p> <p><i>Example:</i> You create a two-page questionnaire with a Number field on the first page to hold an identification number. In order to see this number on the second page of your questionnaire, you create a Mirror field that will automatically show the same data.</p>	See "Creating a Mirror Field" in the Epi Info Help.
Grid	<p>Creates a grid that holds related information. It creates a separate table for Analysis purposes similar to a Related View.</p> <p><i>Example:</i> You create a database in which each record represents one household/head of household. You create a grid to enter data about each other member of the household to include data for age and sex.</p>	See "Creating a Grid" in the Epi Info Help.
Relate	<p>Creates a button on the data entry screen that will link to a Related View. When the button is created, either a new view can be created or the button can be linked to a previously created table.</p> <p><i>Example:</i> You create an antenatal care database and include a separate view related to each patient that includes information on each office visit.</p>	See "Creating a Related View" in the Epi Info Help.

Module 4

Create Check Code in Epi Info

Level of Difficulty	Intermediate
Estimated Time to Complete	1 ½ Hours
Additional Resources Required	Training Materials, Module 4

In this Module:

- What is a Check Code
- Enter check code in program editor
- Identification of fields that should contain check codes
- Write check codes
- IF – THEN Statements
- GOTO Command
- CLEAR Command
- DIALOG Command

Learning Objectives

After completion of [Module 4: Create Check Code in Epi Info](#), the student will be able to:

- ▶ What is a Check Code
- ▶ Enter check code in the Program Editor
- ▶ Overview of how to identify fields that should contain check code
- ▶ Overview of how to write Check Codes
- ▶ Create an IF – THEN Statement

What is "Check Code"?

Check code is programming created in Epi Info to perform one of the following:

- ▶ Ensure that data is entered correctly by checking the value entered in a field
- ▶ Speed up data processing by calculating variables or skipping fields that do not require entry for a particular record.

Examples of these would be creating code that does the following:

- ▶ Verifies that the person entering data used the correct format for data entry, such as using hyphens in the correct place in an identity number,
- ▶ Calculates the date a pregnant woman is due with her child based on her last date of menstruation, or
- ▶ Skips questions about others in the household being ill if the previous question indicates only the patient lives in the household.

Of course, many uses for check code exist. For simple projects with few records, creating check code is useful, but you should not spend a large amount of time working on it. This project is one that has relatively few records and most of the data in this type of project would be entered by you. Creating check code is most important when you are developing an Epi Info for Windows project into which others may be entering the data.

How do you create check code in Epi Info for Windows?

The basic steps in creating check code include:

- ▶ Identify fields that should contain check code.
- ▶ Write check code statement.
- ▶ Enter check code in the Program Editor.

Identify fields that should contain check code

Fields that commonly contain check code include:

- ▶ Fields with dates or numbers that can be calculated from or compared to other fields in the questionnaire,
- ▶ Fields with yes/no answers that affect the need to respond to questions that follow, and
- ▶ Fields that require a specific pattern in the response.

Much of the need to write check code can be eliminated if the proper type of field is created.

In this project, the person entering data must enter the DATE the questionnaire was completed and the DATE OF ONSET of illness. Logically, the date persons became ill had to occur before they were interviewed by an epidemiologist. We want to create check code to make sure the date of onset entered is before (or the day of) the interview, but not after.

Write Check Code

To write check code, think about the steps that must occur for what you would like to see happen. We want to "make sure that the date of onset is before (or the day of) the interview, but not after" or, in other words,

*if the date of onset (Q9Onset) is after the questionnaire interview date (Date),
then we want to give some signal to the person entering data that they have
entered an incorrect date and require them to reenter the data.*

We are creating what is called an IF-THEN statement. In the statement, we are going to open a DIALOG box to tell the user that the data entered was incorrect and to correct it (the dialog box will have a TITLETEXT statement at the top briefly describing the type of error). We then want to CLEAR the incorrect date and GOTO the same field to reenter the data.

Enter Code in Program Editor

Use the following steps to enter the check code into the Program Editor.

1. From MakeView, open the Epi Info file.

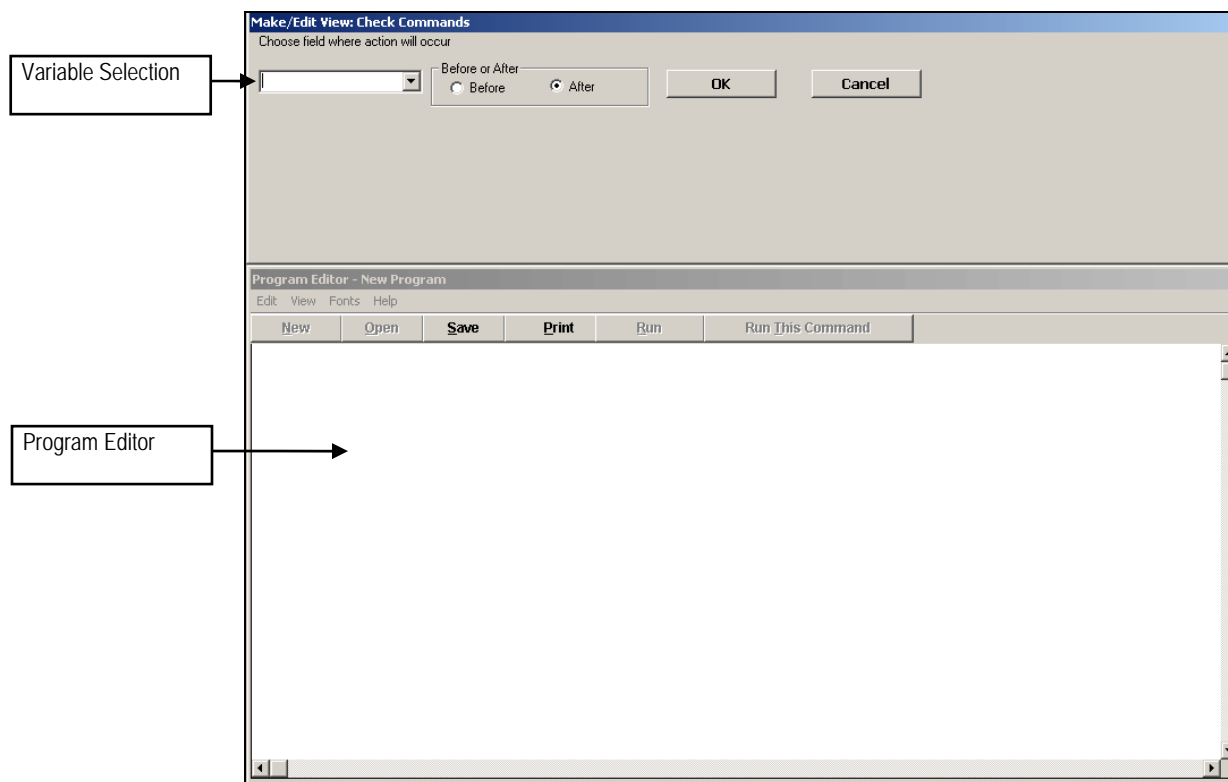
In MakeView, open the *Check Code_Cholera in Rwenshama.mdb* file.



Note: If you have not already done so, you can now copy all the database files, including the Back Up folder, to the Training folder.

2. Click on the PROGRAM button.

You will see the Program button at the left of the screen. Now you are in the Program Editor.



Note: You will notice there is a Check Command window at the top and the Program Editor at the bottom of the screen. Although you could write code directly into the Program Editor, you will use the Check Command window to help you create accurately formatted check code.

3. Choose field where action will occur.

The action we are creating will occur when the date of onset of illness is entered.



In the Check Command window, under Choose field where action will occur, you will see a drop-down box. Click on it and look for the Q9Onset variable. The variables are listed by page and Q9Onset is on the first page. Select the Q9Onset variable.

4. **Select action to occur before or after data is entered in the field.**
 - ☞ We want the action to occur after the date of onset has been entered. Select After.
5. **Create action.**
 - ☞ There are multiple actions that can occur, but for this check code, we are creating an IF-THEN statement. Follow the steps in the Create and IF-Then Statement in the Program Editor section.

Create an IF-THEN Statement in the Program Editor

You can select the IF command in two ways.

- ▶ Click on the Records tab and then click on the IF button.
- ▶ Click on the IF command in the command tree to the left of the screen.

Use the following steps to create an IF-THEN statement for the action in the Program Editor.

1. **Select the IF command.**

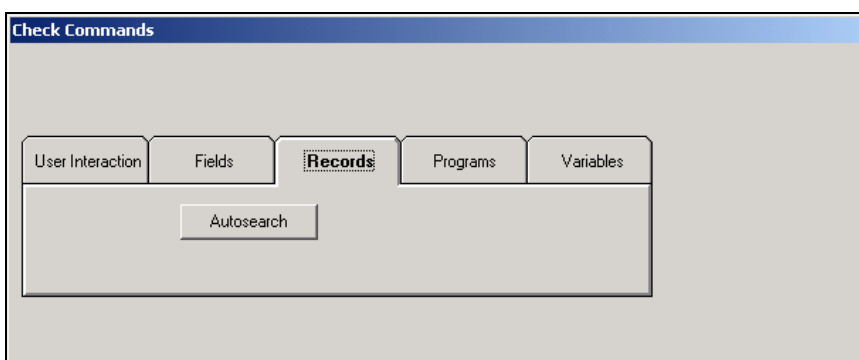
2. **Enter the IF condition.**
 - ☞ The IF part of our code is *"IF Q9Onset>Date"*. When you clicked the IF command, the "IF" part of the statement was already understood, so you will not need to type it. We want to enter *"Q9Onset>Date"*. So we do not risk creating errors in typing, we will use the keyboard as little as possible. Instead, we are going to use the drop-down boxes to select variables and click buttons for symbols.
3. **Select variables for the IF condition from the Available Variables drop-down box.**
 - ☞ Our first variable is Q9Onset. Select this variable from the Available Variables drop-down box. It will automatically appear in the IF condition.

4. Select symbols from the buttons on the IF condition screen.

- ☞ Select the ">" button. It will automatically appear in the IF condition. Now you will want to select the second variable, *Date*, from the Available Variables dropdown box. In the If Condition blank, you should now see "*Q9Onset>Date*".

5. Write the THEN statement.

- ☞ Click on the THEN button.



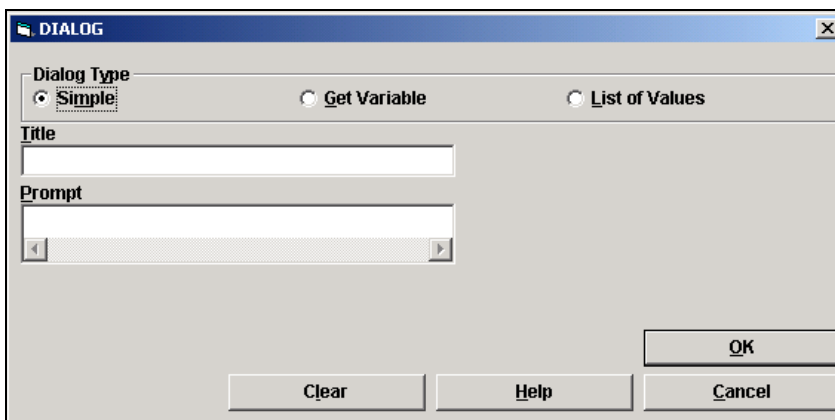
6. Create action.

- ☞ Create a DIALOG Box using the following section's steps.

Create DIALOG Box

Use the following to create a dialog box for the IF – Then statement.

7. Select the User Interaction tab and then select the DIALOG button.




8. Select dialog type.

- ☞ We are going to create a simple dialog box. Select *simple*.

9. Create title for dialog box.

- ☞ Type "*Error in date of onset*".

10. Create prompt.

 Type "*The date of onset of the illness cannot be after the date the questionnaire was completed. Please enter the correct date of onset.*"

11. Click OK.

You will now see the action listed under the THEN button in the IF dialog box.


12. Create any additional actions within the THEN statement.

In Epi Info for Windows, you must click the THEN button again for each additional part of the THEN statement. We need to add the CLEAR and the GOTO part of the THEN statement.

Create Statement to CLEAR a Field

Use the following to create the code to clear a field.

13. Click on the THEN button.**14. Click on the Fields tab.****15. Select the CLEAR button.****16. Select the variable to be cleared.**


 We want to clear the date of onset. Select *Q9Onset*.

17. Click OK.

Create Statement to GOTO a Field

Use the following to create the code to move the cursor to a specific field.

18. Don't forget to click on the THEN button again!**19. Click on the Fields tab.****20. Select the GOTO button.****21. Select the variable to go to.**

 We want to go back to the date of onset so the user can reenter the date. Select *Q9Onset*.

22. Click OK.

23. Click OK to close the If dialog box.

You have completed writing the IF-THEN statement. You will see that it appears in the Program Editor. You can see that the Program Editor created an END for your statement and the statement looks like:

```
IF Q9Onset>Date THEN
DIALOG "The date of onset of the illness cannot be after the
date the questionnaire was completed. Please enter the correct
date of onset." TITLETEXT="Error in date of onset"
CLEAR Q9Onset
GOTO Q9Onset
END
```

24. Save the check code by clicking the SAVE button.

☞ This code was created for the Q9Onset variable. Each time you create new check code for a variable, you need to save it.

25. Verify the variable was created.

☞ After you click the SAVE button and note that it has finished processing, go back to the "Choose field where action will occur" dropdown box. Click the dropdown list and again scroll through until you see Q9Onset. You will notice there is now an asterisk (*) next to the variable. This indicates check code has been created for the variable.

26. Click OK to close the Program Editor.

Skip Patterns

Let's try another commonly used check code using the IF-THEN statement. In several places within the questionnaire, there are questions that could be left unanswered (skipped) based on the answer to a preceding question.

For example, on the Risk Factors page (page 3), the first question is *History of eating outside home in past five days*. The answer is either yes or no. The next question asks, *If yes, specify*, and gives the person entering data the option of choosing *bar, hotel, neighbor, or roadside*.

If the answer to the first question was "no," then the second question will not be answered and could be skipped.

IF the answer to Q25Eat (History of eating outside home in past five days) is No, THEN skip to Q27Hmato (hot matooke). Use the following steps to create the IF – THEN statement.


1. Click on the PROGRAM button.**2. Choose field where action will occur.**

☞ We want the action to occur when the question Q25Eat is answered. Choose Q25Eat.

3. Select action to occur before or after data is entered in the field.

☞ For all skip patterns, the action should occur *After* the data is entered. Select *After*.


4. Select the IF command**5. Enter the IF condition.**

 Our IF condition is "Q25Eat equals No." From the available variables select Q25Eat. Click on the "=" button. Then, click on the "No" button.

You will notice that the IF statement now reads, "Q25Eat= (-)". The "(-)" is the symbol for No in the IF statement.

6. Write the THEN statement.

If the answer to Q25Eat was No, then we want to *go to* Q27Hmato.

 Select the THEN button. Go the FIELDS tab. Click on the GOTO button. Select Q27Hmato.

7. Click OK to close the dialog box.**8. Click OK to close IF dialog box.**

You should now see this in the Program Editor window.

```
IF Q25Eat= (-) THEN
    GOTO Q27Hmato
END
```

9. Click Save.**10. Click OK to close the Program Editor.****11. Exit the MakeView screen (FILE | EXIT). When asked to create a data table, click CANCEL.**

Module 5

Enter Data in Epi Info

Level of Difficulty	Beginner
Estimated Time to Complete	1 hour
Additional Resources Required	Training Materials, Module 5

In this Module:

- What is a Record?
- Enter Data in Epi Info
- Navigate through records

Learning Objectives

After completion of [Module 5: Enter Data in Epi Info](#), the student will be able to:

- ▶ Understand "What is a record?"
- ▶ Enter data in Epi Info
- ▶ Navigate through records.

What is a record?

All of the data you enter into one questionnaire makes up a record. Since there were 66 questionnaires completed for this project, the total of number of records for this database will be 66. The four questionnaires you will enter into the database are in Appendix E: Data Entry Questionnaires on page 100.

Enter Data

There are two ways to begin entering data, either by clicking on the ENTER DATA button from the Epi Info main menu or from the MakeView screen. We will open Enter Data from the main menu. For directions on opening Enter Data from the MakeView screen, see the Mini Reference section, page 69.

1. **Click on the ENTER DATA button from the main Epi Info for Windows screen.**
2. **Go to FILE | OPEN.**
3. **Select the file and click OPEN.**
 - ☞ Select the **Enter Data_Cholera in Rwenshama.mdb** file. If you would rather use the file you created in Check Code to check your work, open the Check Code_Cholera in Rwenshama.mdb file instead.
4. **Select the view and click OK.**
 - ☞ Select *Questionnaire*.

5. It will tell you that a new data table must be created. Click OK.

- ☛ You will receive a dialog box showing the default data table name (the name of the view) and default start number for unique identification numbers (1). Accept the default name. Click OK.

6. Create the first record.

- ☛ Enter Questionnaire 1 from Appendix E.



Note: We have intentionally left the *Name* field blank on the questionnaires. It is important to include this identifier, but we are using real data, so we have chosen not to include it here. You can just skip that field as you enter data.

7. Click the NEW button (to the left) to add each new record.

- ☛ Enter the next three questionnaires in Appendix E.

8. Save the database (FILE | SAVE).

Working with Records

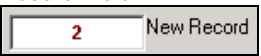




As you enter data, you may want to look at a record you have previously entered. For example, you find that you have made a mistake on entering data and want to return to a record to correct it. There are several ways to look for a record.

Navigation Fields/Buttons


The Navigation Fields/Buttons are located at the bottom left of the Enter window. You can scroll through records, go to the first or last record in the database, or enter a specific record number.



Each field/button is described below:

Field/Button	Description
Record Field 	Enter the record number into the white box then press <Enter> to move to a specific record in the dataset.
First Record 	Click this button to move to the first record in the dataset.
Previous Record 	Click this button to move to one record previous. This will move backward through the records one at a time until you reach the first record.
Next Record 	Click this button to move to one record forward. This will move forward through the records one at a time until you reach the last record.
Last Record 	Click this button to move to the last record in the dataset.

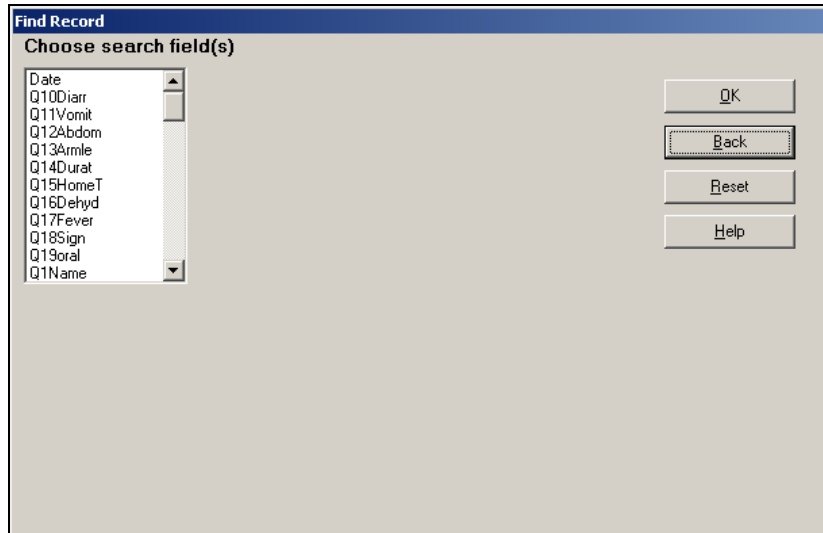
Go to a Specific Record Number

1. **Under the Record section, click in the white box.**
2. **Type in the record number.**
 You will need to type over the current number. Type "2" to go to record number two.
3. **Click ENTER.**
4. **Search for a Record by Field Information**

You may have entered a large number of records and realized that you need to find the record for a particular person with severe dehydration, but you don't remember the record number. We are going to search for anyone who presented with severe dehydration. At the moment, we only have a few records but, in a large database, this information would be difficult to search by scrolling

through the records. Also, because few people would likely exhibit severe dehydration, the search would reveal a short list to sort through.

5. Click on the FIND button (on the left of the screen).



We want to search for all patients who were severely dehydrated.

6. Under Choose Search Field, click on the field to search by.

☞ Select Q16Dehyd. You will see a data entry field titled Q16Dehyd open up.



Note: You can click more than one field. If you click two or more fields to search by, the results you receive will only include those records that meet all your search criteria. If you select the wrong search field, click **Reset**.

7. Type in data to search.

☞ Type "severe".

8. Click OK.

You will see all the files fitting that criteria open up in spreadsheet format. If more fields are in the record than can fit on the screen, you will see a horizontal scrollbar at the bottom of the spreadsheet that you can use to scroll left to right.

9. If you wish to view the data entry screens for a particular record, double-click on the row indicator in the far left column.

☞ You can also double-click on one of the fields in the record and be taken to the data entry screen. Click the Back button to return to the Enter Data screen.

Deleting a Record from the Enter Data Screen

If you accidentally create duplicate records, you can delete one of the records by clicking on **MARK RECORD AS DELETED**. However, this only deletes the record for analysis purposes; it does not actually delete it from the database. See Analysis for deleting records permanently.



Mini Reference

Enter Data from Make View

There may be times where you will already be in MakeView and would like to start entering data from that screen. If your project is already open in MakeView, use the following direction.



Note: You do not need to follow these directions now since we have already entered data.

1. **Click on FILE.**
2. **Select ENTER DATA.**
 - ☞ You will receive a dialog box showing the default data table name (the name of the view) and default start number for unique identification numbers (1). You can change them, but we are going to use the defaults, so just click *OK*.
3. **Click OK.**
4. **Create the first record, etc.**

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Module 6

Manage Data in Epi Info

Level of Difficulty	Intermediate
Estimated Time to Complete	1 ½ Hours
Additional Resources Required	Training Materials

In this Module:

- Open the data file in Analysis
- Display data variables
- Create a line listing
- Sort a line listing by one or more variables
- Create a subset of the data
- Save a subset of data in a new file
- Merge two data files with the same variables

Learning Objectives

Before you analyze your data, you may need to perform some basic data management tasks. After completion of [Module 6: Manage Data in Epi Info](#), the student will be able to:

- ▶ Open the data file in the Analysis window
- ▶ Create a line listing
- ▶ Sort a line listing by one or more variables
- ▶ Create a subset of the data (use Select command)
- ▶ Save a subset of data in a new file (use Write command)
- ▶ Merge two data files with the same variables (using Read and Write commands)

Before you Begin

If you have not already done so, copy these three files to the Training folder on your computer.

- ▶ Analysis_Cholera in Rwenshama.MDB
- ▶ Case Studies English.xls
- ▶ epi6chol.rec

We will use these files for the next three sections of our training.

Open File in Analysis Window (Read a File)

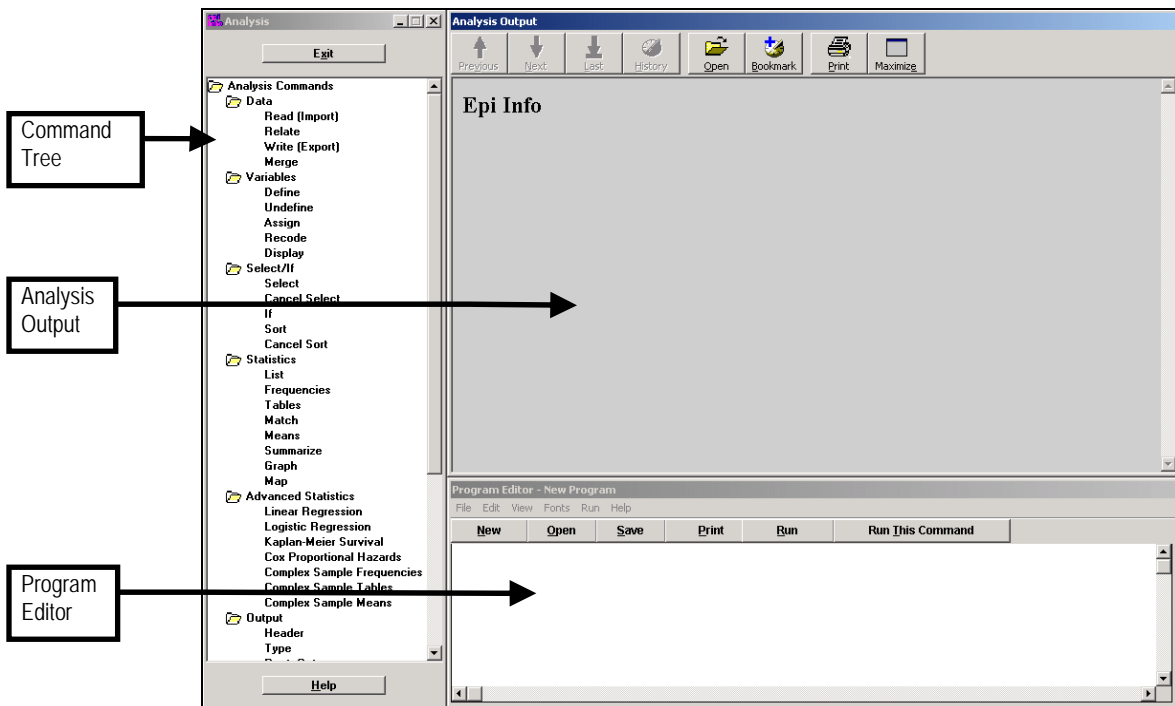
All of the management activities occur in the Analyze Data window. We are going to open a new file (***Analysis_Cholera in Rwenshama.MDB***) that contains all of the data for the cholera outbreak investigation. Opening a database file in Analysis is also referred to as “reading” a file.

1. **From the Epi Info for Windows menu, click on the ANALYZE DATA button.**
You will see the Analysis Window.

Analysis Window

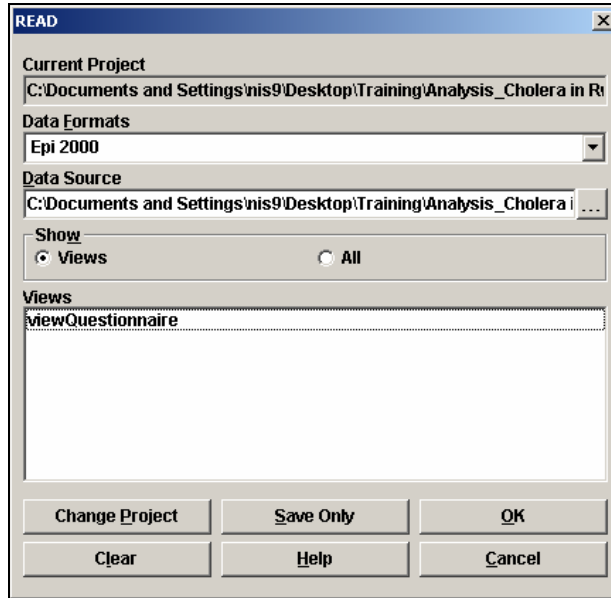
The Analysis window has three distinct characteristics:

- ▶ All commands are shown in the tree view on the left side of the screen, called **Command Tree**.
- ▶ Clicking on a command will bring up a dialog. Responding to the questions and clicking **OK** generates and executes a program command automatically in the **Program Editor** at the bottom of the screen. To read more about the Program Editor, see the Mini Reference section at the end of this module, page 74.
- ▶ Results appear in the **Analysis Output** window above the program editor.



2. Click on the READ command.

Under Analysis Commands in the Command Tree, you will see a folder called Data. Under that folder is a list of commands. Click on **Read (Import)**.



3. If project listed is not correct, click on Change Project button. Select correct file, and click OPEN.

- ☛ If the **Analysis_Cholera in Rwenshama.MDB** file is not listed under Current Project, click on the Change Project button (bottom left). Find the **Analysis_Cholera in Rwenshama.MDB** file in the Training folder, select it, and click OPEN.



Note: Check the Current Project each time you open a file in Analysis.

4. Select the View to be opened. Click OK.

- ☛ We only have one view in our project, but in some cases you may have more. Make sure viewQuestionnaire is selected and click OK.



Note: You must always Read a file when you enter Analysis. Also, each time you wish to analyze data in a new View or Table, even if it is in the same Epi Info Project, you must use the Read command again and select the View or Table to be analyzed.

In the Analysis Output window you will see title and location of your file listed under *Current View*. The browser should be similar to:

Current View: **C:\Documents and Settings\Desktop\Training\Analysis_Cholera in Rwenshama.MDB:viewQuestionnaire**
Record Count: **66** (*Deleted records excluded*) *Date:* **(Today's date and time)**

You will also notice in the Program Editor the command you created was automatically run and displayed.

Program Editor Buttons

You can type commands directly in the Program Editor if you choose, but using the commands in the Command Tree will ensure they are correctly written. In the Program Editor, you can see the Analysis Program Editor button bar to create a New program, to Open a previously created program, to Save the current program, to Print the current program in the editor, to Run the program or run a specific command with Run This Command. A brief description of each button follows.

New	Open	Save	Print	Run	Run This Command
------------	-------------	-------------	--------------	------------	-------------------------

Field/Button	Description
New	Clears the previous commands and start a new series of commands.
Open	Opens a previously saved set of commands (a Program).
Save	Saves a series of commands you have created. This set of commands is referred to as a Program.
Print	Prints out your commands
Run	Runs the current program script displayed.
Run this Command	Runs the command where the cursor is located. This line can be highlighted or the cursor can be at the front of the line.

Display Variable Information (Create a Code Sheet)

In Module 3, we noted that you will want a code sheet that documents the field names (variables) you used and other important information about those variables (see the [Creating a Code Sheet](#) section). Much of this information can be found in Analysis. To display the variables in your View or Table:

1. **Click on the Display command under the Analysis folder.**
2. **Under Information for, select Variables (the default).**
3. **Click on the drop-down box under From and select –Field variables currently available.**
4. **Click OK.**



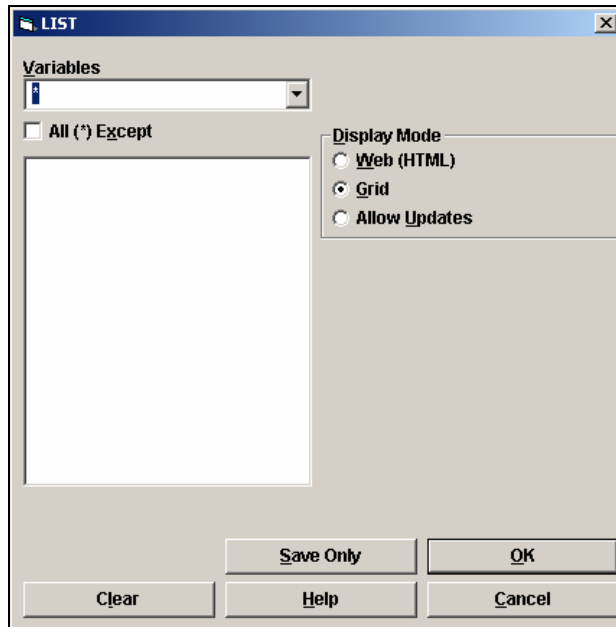
Note: You can print what appears in your Analysis Content window by clicking on the Print button, selecting a printer, and clicking Print. If your computer is hooked up to a printer, you can try this now. In Module 7, you will learn how to save your output to a file.

Create a Line Listing

Each record you entered is now represented as a “line” of data. Each of these “lines” can now be displayed in a list organized by field. All the data entered in MakeView can be read in a *line listing*. Our new file contains 66 records (33 cases and 33 controls), so we will have 66 lines in our list.

1. Click on LIST command.

- ☛ In the Command Tree, the LIST command is under the Statistics folder. Click on it.



2. Choose variables to display.

- ☛ Select from the following options:

Field/Button	Description
Displaying all the variables	Under Variables, choosing the asterisk (*) displays all the variables.
Displaying a few select variables	You can display just a few variables by clicking on the Variables drop-down box and selecting each variable, one at a time, by clicking on it. The variables you choose will be displayed in the blank area.
Displaying all the variables <i>except</i> a select few	In the Variables drop-down box, select the asterisk (*). Click in the box next to All (*) Except. After clicking the box, click again on the Variables drop-down box and choose the variables to exclude. We are going to list all the variables, so you will use the default – the asterisk (*) under the Variables drop-down box.

We are going to list all the variables, so you will use the default – the *asterisk (*)* under the Variables drop-down box.

3. Choose the Display Mode.

- ☛ Select from the following options.

Field/Button	Description
Web (HTML)	Displays in an HTML, web-based format. This is the mode you will use if you would like to print the results screen. Note that the fields may need to be listed in multiple HTML tables, so you will need to scroll down to see your data.
Grid	Displays the data in a format similar to a spreadsheet. The fields are displayed in columns with the field name at the top. Each row represents a single record.
Allow Updates	Displays similar to the grid format. However, in this mode you can update the data in the database. Beware that any check code you created in MakeView will not work in this mode (i.e., if you change the data incorrectly, any check code you have created will not detect the inaccuracy). Also note that if you use this mode, you will close the Allow Updates window by clicking the X in the upper right to close.

We want to view the line listing in Web mode. Select Web.

4. Click OK.

The program will take a moment to generate the line listing and display it in the browser window. Scroll through the line listing. You will see that the Prompt/Question for each field is listed at the top of the column and all the data in that field, for each record, is listed underneath.

Line	Questionnaire No	Date	Name	Age	Sex	Occupation
1	1	5/22/2001	Missing	34	Male	soldier
2	2	5/22/2001	Missing	25	Female	housewife
3	3	5/13/2001	Missing	26	Female	housewife
4	4	5/23/2001	Missing	30	Female	housewife
5	5	5/22/2001	Missing	24	Female	business
6	6	5/23/2001	Missing	26	Male	fishnet drier
7	7	5/22/2001	Missing	25	Male	fishnet drier
8	8	5/23/2001	Missing	16	Male	fishnet drier



Note: While you will not always want to create a line listing with all the variables, it is a good idea to take a quick look through the list after you enter your data. Make sure no fields were unintentionally left blank.

If you should find any duplicate records and need to delete them, you can review how to do so in the Mini Reference section of this module, page 82.

Sort a Line Listing

Usually the data in your table is listed in the order in which records were entered (the order may be changed because of later additions, deletions, and revisions). Sorting allows you to see the list by certain groupings (for example, sorting by Sex would list all the males together in a group and all the females together in a group).

You can sort the data in your list by one or more fields (variables). The sort order you select will remain in effect for the session you are working in, but if you exit Analysis or re-Read the data set, your sort will not be saved.

1. Click on SORT command.

☞ In the Command Tree, the SORT command is under the Select/If folder. Click on it.

2. Under Available Variables, double-click on the variable you wish to sort by.

☞ Double-click on Q8III. The variable will appear in the blank under Sort Variables.

3. Choose Sort Order.

☞ We want to see all those who were ill (those who answered Yes) at the top of the list. While the Q8III variable is highlighted in the Sort Variables window, click Descending (--).

4. Choose additional sort variables. (Optional)

☞ You can sort by additional variables if you like. Double-click on Q2Age.



Question 1: If you wanted to see the list from youngest to oldest, would you choose ascending or descending order? (See Appendix F for the answer).

5. Click OK.

☞ The program will take a moment to run and then the variables will be sorted. You will see this line – SORT Q8III DESCENDING Q2Age – added to the Program Editor. However, sort does not automatically bring up the new line listing.

6. Run the LIST command.

☞ Click on the LIST command. From the Available Variables choose: Q8III, Q2Age, and Q3Sex. This time select Grid as the mode. Click OK.

Cancel Sort

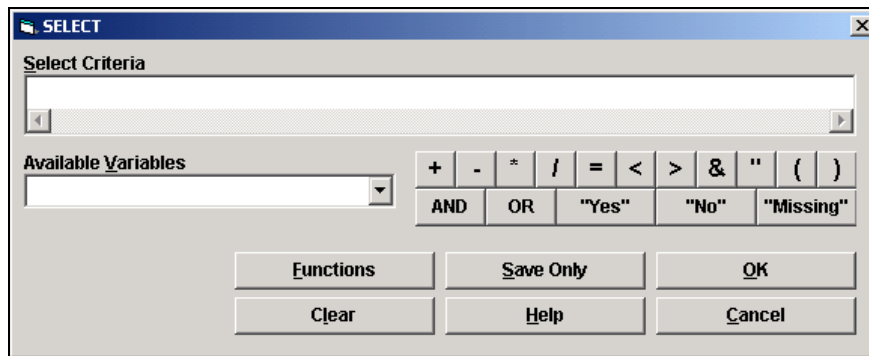
If you wish to cancel a sort, just go to the Command Tree, click Cancel Sort under Select/If folder, and click OK. For this instruction, it does not matter whether we keep the sort we just created or not, so you do not need to cancel it.

Create a Subset of the Data (Use Select Command)

There will be times you would like to create a subset of the records you have created. Previously, we sorted the records by who was ill and who was not. The line listing showed all the records, but listed separately those who answered yes and those who answered no to the question about being ill. Now we want to create a subset of the data that only includes those who were ill (our cases).

1. Click on SELECT command.

- In the Command Tree, the SELECT command is under the Select/If folder. Click on it. The Select command dialog box looks similar to the Program Editor in MakeView.



2. From the Available Variables, choose the variable to select by.

- We only want to select those who were ill, so the variable we want to select by is Q8III. From the Available Variables drop-down box, select Q8III. It will now appear under Select Criteria.

3. Write the criteria for selection.

- First click the "=" button. Then click the "Yes" button.



Note: When you click the "Yes" button, you will notice that "(+)" appears under Select Criteria instead. This is just computer shorthand for a positive answer. The statement under Select Criteria should now read: Q8III= (+)

4. Click OK.



Question 2: How many records do you now have in your current list? Why?

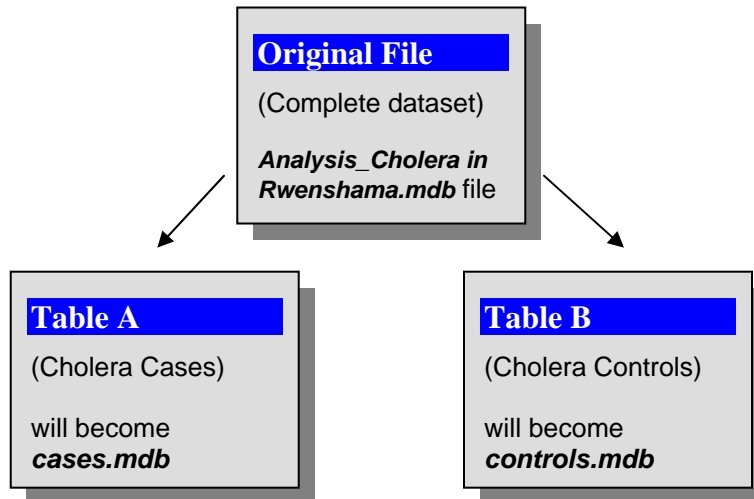
Save a Subset of Data in a New File (Use Write Command)

Any time you Write a new file, you must have first Read an original file. If you have used Select criteria, then only those records selected will be a part of your new file. We have done both, so we are ready to create our new file.

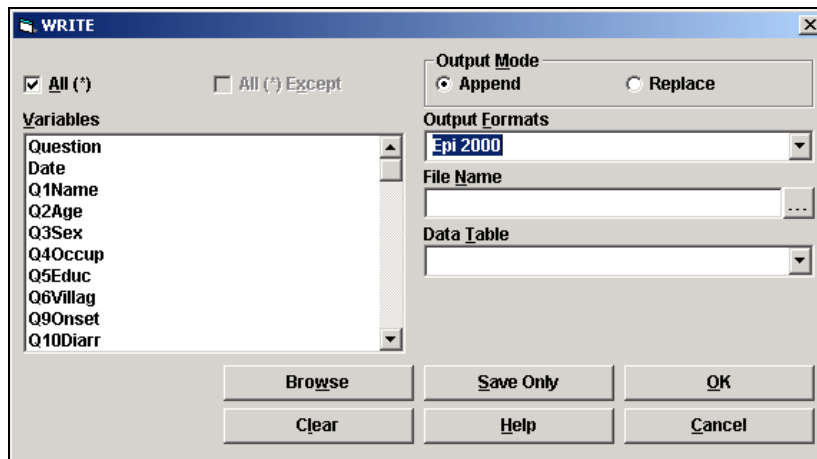
While we could save our new data subset as another table in our *Cholera in Rwenshama* project, we want to create a completely new file (project) that only includes our cases (those who were ill).

What we will be doing is splitting the original database file into two databases that can contain subsets (cases and controls) of the original database. Later, in order to learn the process of

merging files, you will put the two subset databases together, recreating the original database. Note, however, that writing out a table of data creates a file that only includes the table of data but not the View.



1. Click on **WRITE** command under the Data folder.



2. **Select variables to be included in the new file.**
 - Just above the Variables list, you can see a checkbox next to All. Make sure that box is checked.
3. **Select Output Mode (Append or Replace).**
 - We are going to create a new file so select Replace.
4. **Select Output Format.**
 - You can create a file in multiple formats. We have been working with Epi Info 2000 files (in the .mdb format) and we want our new files to be in the same format. Choose the default format, Epi 2000.

5. Select or create File Name.

- ☞ Click on the button next to File Name. In the dialog box, make sure you select the folder where you want your file to be saved. We want to create a new file called `cases.mdb`. Type “cases” next to File Name (you may have to type over Cholera in Rwenshama Database). Click Save.

6. Name the table.

- ☞ Type “CholeraCases” with no spaces.

7. Click OK.

You have now created a new data file with the 33 records (the cases). This new file is an `.mdb` file just like our original file; remember, a file you save with data only will not have the View that you created in the original file, only the data.

Try It!

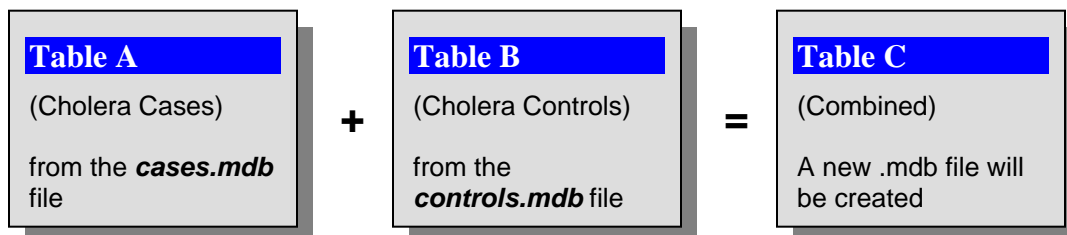
We want to create a new file that contains all the records for our controls (those who were not ill).

1. Clear the previous set of commands by clicking **New** in the Program Editor.
2. Read the view **Questionnaire** from the original file again (*Analysis_Cholera in Rwenshama.MDB*).
3. Select only the records of those who were not ill {Q8III= (-)}.
4. Write a new file, name the database “*controls*”, and name the table “*CholeraControls*”.

Merge two data files with the same variables

Occasions will arise where you will want to merge two data files together. For instance, you may be working with another person on an outbreak investigation. An original questionnaire file may be created that you will each use to enter data or more than one data entry clerk may be entering data for you. Those separate files will need to be merged for analysis. Files with the same variables can be combined using the Read and Write commands.

For clarity, we are actually combining two tables, CholeraCases from the ***cases.mdb*** file and CholeraControls from the ***controls.mdb*** file and creating a Combined table in a new file called ***cases_controls.mdb***.



1. Read Table A (first file).

- ☞ Read **cases.mdb**. (You may have to click Change Project to select the file. If you had any problem with creating these files, you may copy the **cases.mdb** file from the Back Up folder on the CD-ROM to the training folder.)
- ☞ Under Show, select All and choose the CholeraCases table. (If you receive a notice to name a temporary link, check to see that the Current Project is **cases.mdb** and change the project if needed.) Click OK.

2. Write Table A to a new file (which will become Table C).

- ☞ Select Write, choose All variables. Under Output Mode, select Replace.
- ☞ Next to File Name, click the button. In the dialog box that appears, next to File Name, type "cases_controls" and then click Save. When you are back in the Write dialog box, under Data Table, type "Combined". Click OK.

3. Read Table B (second file).

- ☞ Read **controls.mdb**. (Do not forget to Change Project!) Under Show, select All and choose the CholeraControls table.

4. With the Write command, append Table B to Table C.

- ☞ Select Write, choose All variables. Select Append as the Output Mode.
- ☞ Under File Name, click the button to select the cases_controls.mdb file and click Save.
- ☞ Next to Table Name, click on the arrow to select the Combined table. Click OK.

5. Read the new file to be sure the files have been merged correctly.

- ☞ Read Combined table from **cases_controls.mdb**. You should see a file with 66 records.

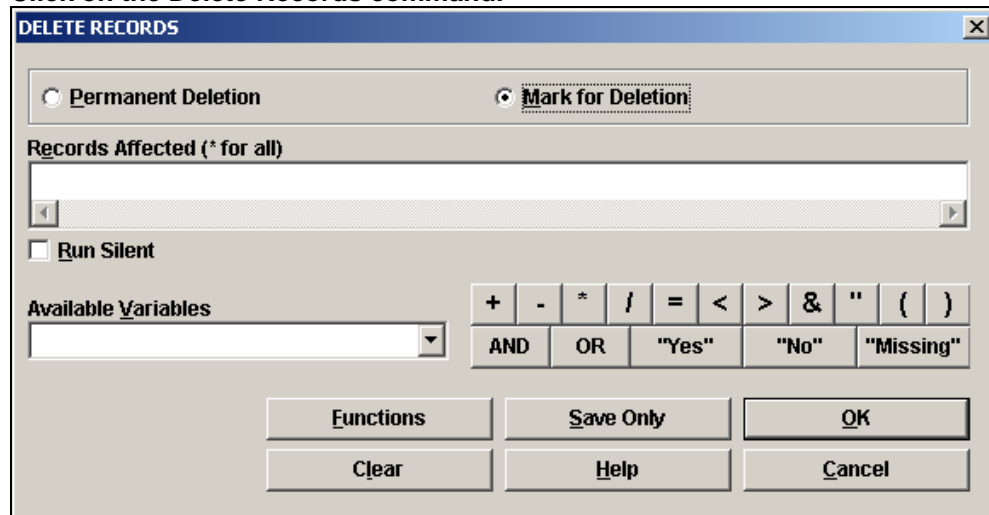


Mini Reference

Delete Records in Analysis

You can delete records in Analysis using the Delete Records command.

1. Click on the Delete Records command.



2. Select the type of deletion: Mark for Deletion or Permanent Delete.

- ↪ Mark for Deletion is the same as in Enter Data. It does not permanently delete the record but the record no longer is used during Analysis. If you were to open Enter Data, you would still see the record, but it would be appear in grey. Permanent Deletion does permanently delete the record so be cautious in using it. Note that Mark for Deletion is only available when your file has a View. If you have a file with only table data, Permanent Deletion will be your only option.

3. Write the criteria for the Records Affected.

- ↪ You can use the Available Variables drop-down box to select variables and the various buttons to create a criteria statement just as you would in the Select or Sort command. For example, you might want to delete all the files of female respondents, so you would create a statement such as *Sex="female"*.

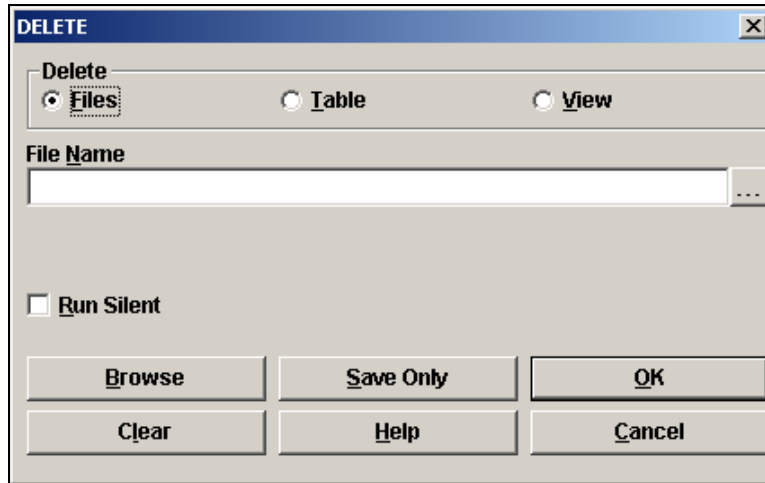
4. Click OK.

If you have used the Mark for Deletion option, you can undelete records by clicking on the Undelete Records command.

Delete Files, Tables, or Views

You can also delete entire files, tables, or Views using the Delete File/Table command.

1. **Click on the Delete File/Table command.**



2. **Select to delete either a File, Table, or View.**
 - ☞ Remember that a View is linked to a data table, but does not contain the data itself. A table in Analysis will contain some type of data. Do not delete either unless you are sure you will not use them.
3. **Select the File Name and, if needed, the Table or View to delete.**
 - ☞ If you select to delete a Table or View, the dialog box will change to allow you to select the file (database) and the name of the Table or View within the file to be deleted.
4. **Click OK.**

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Module 7

Analyze Data in Epi Info

Level of Difficulty	Intermediate
Estimated Time to Complete	2 Hours
Additional Resources Required	Training Materials, Module 7

In this Module:

- Analyze data with Frequencies, Means, and Tables commands
- Display data with the Graph command
- DEFINE and RECODE command
- Save Analysis Output
- Work with Program Files

Learning Objectives

After completion of [Module 7: Analyze Data](#), the student will be able to:

- ▶ Analyze your data with the Frequencies, Means, and Tables command
- ▶ Display your data with the Graph command
- ▶ DEFINE and RECODE new variables to better analyze data
- ▶ Save Analysis output
- ▶ Work with Program files

Describing the Epidemic by Time, Place, and Person


As mentioned earlier, analyzing data by time, place, and person often occurs after you have identified your cases. It can be done by hand, but we are going to show you how to analyze this information with Epi Info for Windows and how to graph the information so you can present your data in reports and presentations.

Normally, we would begin by analyzing the epidemic by time by creating an epidemic curve, but first we need to look at analyzing data frequency and means, and displaying data in simple bar graphs.

Analyze Data Frequency

Next, we will describe the epidemic by Place. In our study, the cases and controls came from three villages – Rwenshama, Rwebinyonyi, and Ncwera. We want to analyze the frequency with which cases came from a certain village.

If Analysis is not open on your computer, open it now by clicking on the ANALYZE DATA button from the Epi Info for Windows menu or by going to Start | Programs | Epi Info for Windows | Analysis.

1. **READ the file you want to analyze.**
 -  Use the READ command to open the **Analysis_Cholera in Rwenshama.MDB**.
2. **Click on the FREQUENCIES command under Statistics.**

3. From the Frequency Of drop-down box, select the variable you wish to analyze.

☞ We want to look at the Village where the cases and controls lived. Select *Q6Villag*.

4. From the Stratify By drop-down box, select the variable by which you want to group your analysis.

☞ We want to group our cases (those who were ill) separately from our controls (those who were not ill). Select *Q8Ill*.



Note: If we had used the *cases.mdb* file, we would not have needed to stratify by illness since that file only contained individuals who were ill. We could have just selected the Frequency Of variable.

5. Click OK.

☞ You should see the following frequency distribution in your Analysis Output window (if not, scroll until you see **Village, Ill?=Yes**).

FREQ Q6Villag STRATAVAR = Q8Ill

[Next Procedure](#)
[Village, Ill?=Yes](#)
[Village, Ill?=No](#)

Village, Ill?=Yes

[Forward](#)

Village	Frequency	Percent	Cum Percent	
Ncwera	4	12.1%	12.1%	<div style="width: 12.1%; height: 10px; background-color: yellow;"></div>
Rwembinyoni	7	21.2%	33.3%	<div style="width: 21.2%; height: 10px; background-color: yellow;"></div>
Rwenshama	22	66.7%	100.0%	<div style="width: 66.7%; height: 10px; background-color: yellow;"></div>
Total	33	100.0%	100.0%	<div style="width: 100%; height: 10px; background-color: orange;"></div>

95% Conf Limits



Question 3: Most of the cases come from which village? What percent of the cases come from this village?

Try It!

We also want to analyze some of the data by person. We want to see what the personal characteristics of some of our cases are.



Question 4: Using the steps 2-5 above, analyze the data by Sex (Q3Sex). Enter the data below for those who were ill (our cases).

Q3Sex	Frequency	Percentage
Female		
Male		



Question 5: Analyze the data by Occupation (Q4Occup). What percentage of the cases are housewives? (Look for the percentage, not the cumulative percentage.)



Question 6: Analyze the data by Education Level (Q5Educ). Among the cases, what level of education is most frequent?



Note: You cannot run a Frequency on a Multiline variable. This is important to consider when deciding what type of fields you wish to use in creating a questionnaire in MakeView.

Analyze Frequency of a Group

Remember that, in MakeView, we grouped some of our fields together (Group). You can analyze the frequency of all the fields you included in a group using the same steps described above. Group names will often be listed at the bottom of the list of field names.

Hint: The Group name is *SignsOnPresentation*.



Question 7: How many people had a fever? Note: You will need to scroll down to see the frequency of Fever.

Graphs: Displaying Data in a Bar Graph

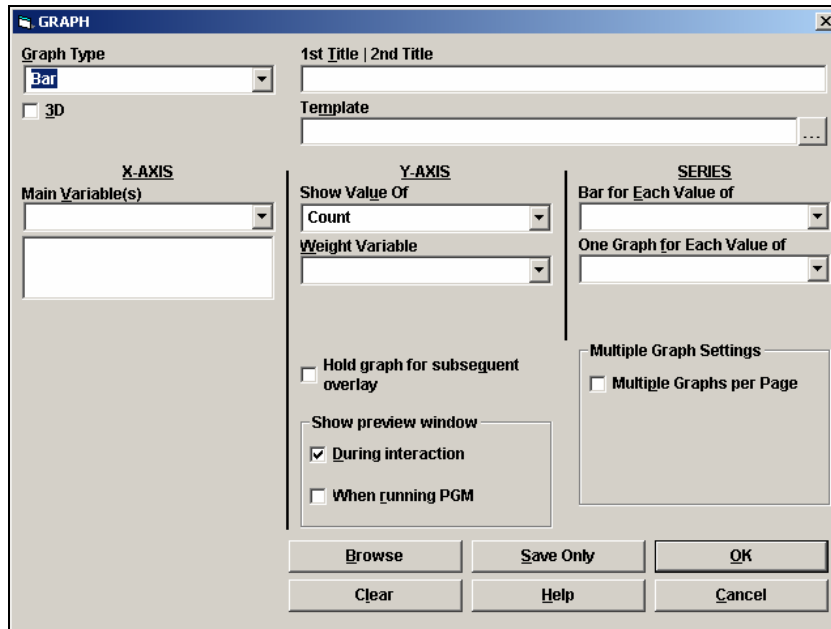
It may be easier for both you and those who will read your reports and view your presentations to see this data presented as a graph. One of the simplest and most commonly used graphs is the bar graph. We will make a bar graph for Occupation.



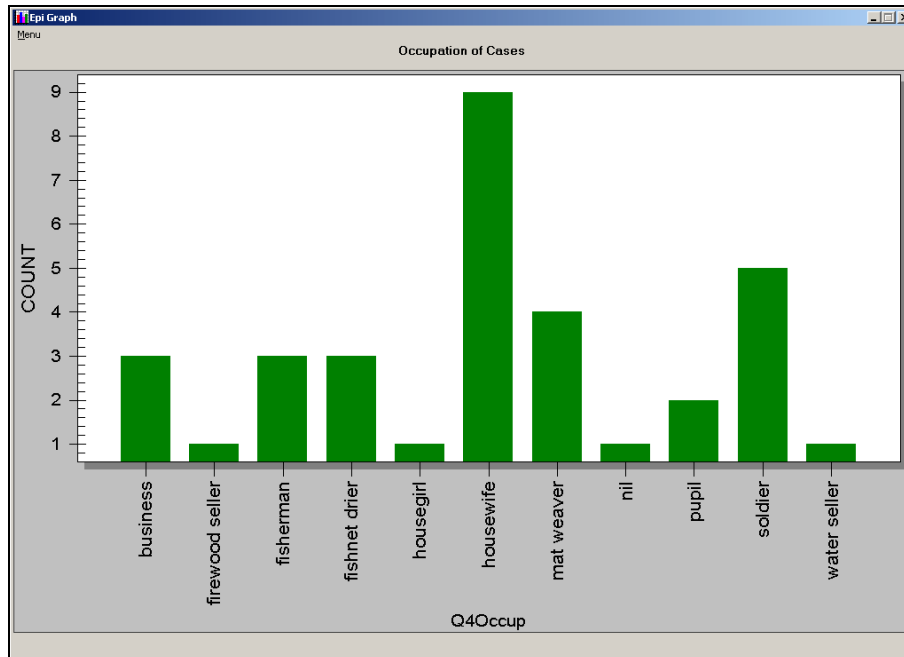
Note: We had the *Analysis_Cholera in Rwenshama.MDB* file open, but now we only want to use data from our cases. It will be easier to do this using the *cases.mdb* file.

1. Read the *cases.mdb* file.

- Click on the GRAPH command under the Statistics folder.



- Under Graph Type, select type of graph you would like to create.
 - Accept the default, *Bar*.
- Under 1st Title | Second Title, write a page title for the graph.
 - Type "*Occupation of Cases*".
- Select the variable you wish to graph from the X-Axis (Main Variables) drop-down box.
 - Select *Q4Occup*.
- Select the value you want to show from the Y-Axis (Show Value of) drop-down box.
 - We would like to show the actual count of cases. Select *Count*.
- Click OK.
 - You should see a graph like the one on the next page in a new window.



8. Keep the Epi Graph window open for the following activity.

Work with Graph Files

We are going to make a few simple changes to make the occupation graph easier to read and save the file so it can be used later in word processing or other presentation software, such as Microsoft Word or PowerPoint.

Changing Labels in the X- and Y-Axes

Use the following steps to change the X- and Y-Axes Labels.

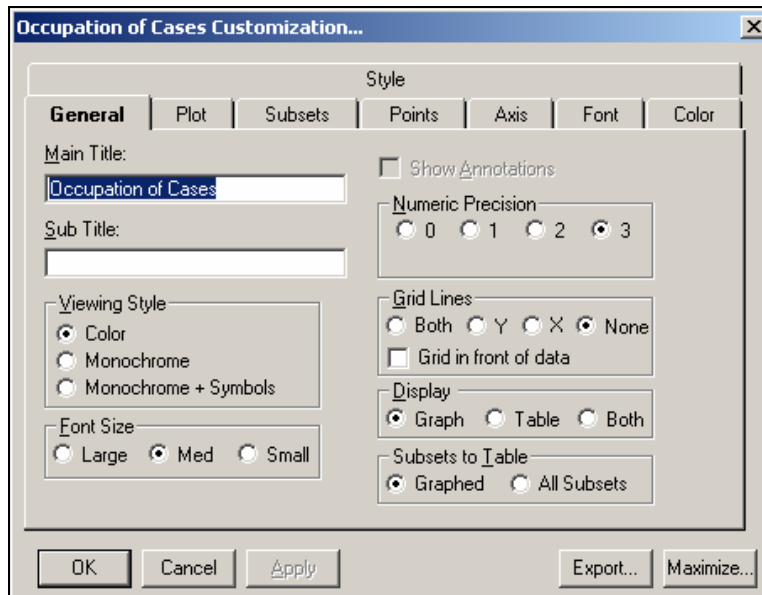
- 1. Put your mouse over the label you wish to change**
 - Put your mouse over the Y-Axis label COUNT to the left of the screen. You should see your cursor turn into a hand symbol.
- 2. Click once on the label.**
 - Click once on COUNT. You should see a small dialog box open.
- 3. Type the name you would like to use for the label.**
 - Type "Number of Cases".
- 4. Click OK.**
 - Do the same for the X-Axis label. Change Q4Occup to "Occupation".

Customize the Graph

You can customize other elements of the Graph by using the Customization menu. Some of these items are also accessible by right-clicking on the graph, but we will use the dialog box to familiarize you with the elements of the graph that can be changed.

1. Select CUSTOMIZATION.

☞ You will see a dialog box like the following.



2. To close the dialog box, click OK.

Title the Graph

On the General Tab, under Main Title, you will see “*Occupation of Cases*,” the title we first chose. You can change the title here, if you wish, or add a Sub Title.

Create Grid Lines

We want to create a Y-Axis grid line so that the value of each bar is easier to read. On the General Tab, under Grid Lines, click the radio button (the circle) next to the letter Y (Y-Axis). To see the changes you made before you have created your final image, click the APPLY button. You can now see the grid lines.

Change Plot Style

Click on the Plot Tab. Under Plot Style, you can see a number of options. We selected Bar when we created the graph and this also is our Plot Style. Click on Line as the Plot Style and then click Apply. To the lower left you can see a checkbox labeled Mark Data Points. Click that checkbox and then click Apply.

We want to keep Bar as our Plot Style, so uncheck Mark Data Points, click Bar, and then click Apply again. You can try other types of Plot Styles as well, but be sure to return to the Bar graph.

Change Point Label Orientation

Go to the Points Tab. Near the bottom of the dialog box, you will see a section called Point Label Orientation. Click on Slanted, and click Apply.

Change Label Font

Go to the Fonts Tab. We want to change the font of the Main Title. Click on the drop-down box under Main Title and select Arial (if you do not have Arial font or if it was already selected, choose another). Click Apply.

Change Bar Color

Click on the Style Tab (a large tab behind all the others). Dark green is the default. Select a different color box and click Apply.

Save the Graph as an Image File

We want to save our graph file for later use. We can save it as a Windows Metafile (*.wmf), a bitmap file (.bmp) or a JPEG file (.jpg) that can be used in a number of software applications. (The Windows MetaFile is typically only used in Microsoft applications). These images can be inserted in those files as Pictures or Images.

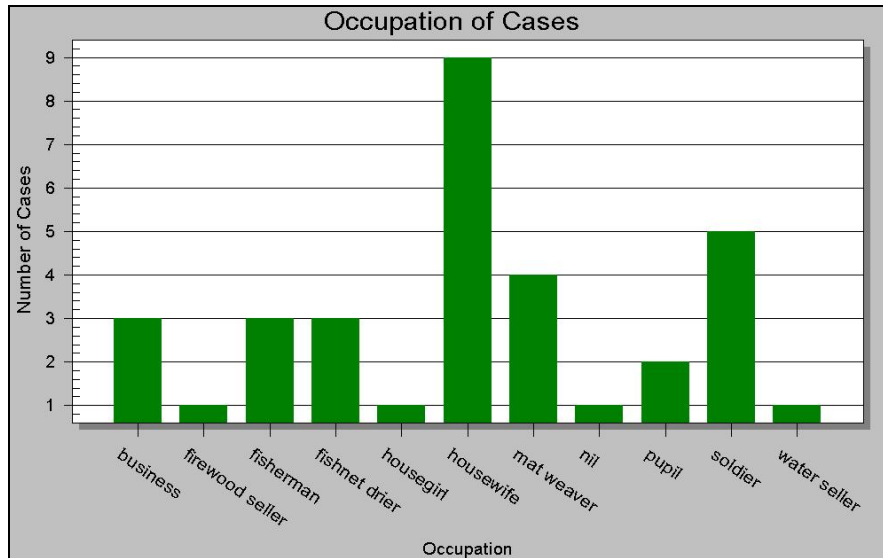
1. **Click on FILE | EXPORT.**
2. **In the dialog box, select the Export file type.**
 - ☞ Select JPG.
3. **Select the Export Destination.**
 - ☞ Under Export Destination, select File and click on the Browse button. Find your Training folder. Next to File Name, type "Occupation".



Note: Different file types can be saved in different ways. The JPG can only be saved as a File on your computer. If you had selected MetaFile, you could also choose Clipboard or Printer as your method of export. When you select Clipboard, the image is copied to your computer clipboard and you can then paste the file into a document, such as a Word. If you select Printer, you then click Print, select your printer, and then click OK.

4. **Click EXPORT to save the graph as a .jpg.**

The *.jpg* file, inserted into this document, appears on the next page.



Close the Epi Graph Window

Use the following to close Epi Graph.

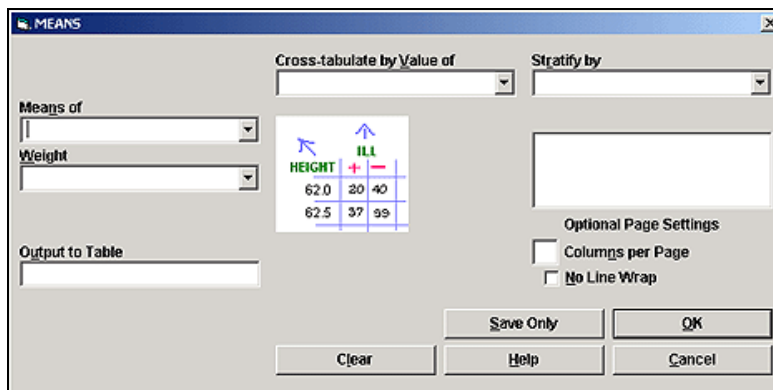
1. **Click on FILE.**
2. **Click on SAVE & EXIT.**
Your image will now be saved to your Analysis Output window.

Analyze Means of a Single Variable

We would like to look at the age distribution of our cases. Using the Means command with a numerical variable will show us:

- ▶ The total sum of the variable
- ▶ Mean (as well as standard deviation and standard error)
- ▶ Median & Mode
- ▶ The minimum and maximum values of a numerical variable

1. **Click on the MEANS command under the Statistics folder.**



2. In the Means Of drop-down box, select the variable.

☞ Select Q2Age.



Note: Since we are using the cases.mdb file, we know we are only getting information about our cases. If we were using the Analysis_Cholera in Rwenshama.MDB file, we would also want to stratify our results by the Q8Ill variable to show separate data for cases and controls.

3. Click OK.

☞ You should see the list of the frequencies by age. Scroll down until you see the Total, Mean, Variance, etc. data.

Obs	Total	Mean	Variance	Std Dev
33	876.0000	26.5455	112.8807	10.6245
Minimum	25%	Median	75%	Maximum
4.0000	20.0000	26.0000	30.0000	56.0000
				Mode
				19.0000



Question 8: What is the range of ages (minimum to maximum) of those who were ill?



Question 9: Rounded to the nearest tenth, what is the mean _____, median _____, mode _____.

Grouping Numerical Data

We would like to display a graph of the ages of those who were ill. If you look just above the data on means, you can see the distribution of ages. Displaying each of those ages in a graph might be overwhelming and not give us useful information. We are going to group those who are between ages 0 and 10 together, between 11 and 20, etc.

In order to create our groupings, we are going to need to DEFINE a new variable to hold our grouped data and RECODE our old data.

- 1. Click on the DEFINE command.**
The Define command is under the Variables folder.
- 2. Enter a new variable name.**
☞ Under Variable Name, type "AgeGroup".
- 3. Select the Scope of the variable.**
☞ We only want our variable to be valid during this exercise, so choose Standard.
- 4. Click OK.**
☞ Review the Program Editor; you should see the words `DEFINE AgeGroup` in the Program Editor.
- 5. Click on the RECODE command.**

Value (blank = other)	To Value (if any)	Recoded Value

- 6. In the From drop-down box, select the original variable you are going to convert.**
☞ Select Q2Age.
- 7. In the To drop-down box, select the new variable name.**
☞ Select AgeGroup.
- 8. Click the Fill Ranges button.**

9. Enter the Start and End values for your range.

Enter "10" as the Start value and "50" as the End value.



Note: This is a bit difficult to think through. You are going to be creating a series of groupings that range FROM one value TO another higher value. The Start number you enter will be: the first TO value (in this example, 10 since we want our first age group to be from birth to 10 years). The End number you enter will be: the last FROM value (in this example, 50 since our oldest person was 56 and we want our last range of values to be from 50 on up). Epi Info for Windows automatically adds the low and high value.

10. Enter the range By which you want the variable to be grouped.

We want our ages grouped by 10-year increments. Enter "10" as the By value.

11. Click OK.

Value (blank = other)	To Value (if any)	Recoded Value
LOVALUE	10	<=10
10	20	>10 - 20
20	30	>20 - 30
30	40	>30 - 40
40	50	>40 - 50
50	HIVALUE	>50

12. Click OK to close the dialog box.

13. Click on the Frequencies command.

14. For Frequency Of, select AgeGroup.

15. Click OK.



Question 10: The largest percentage of cases comes from which age group?

Try It!

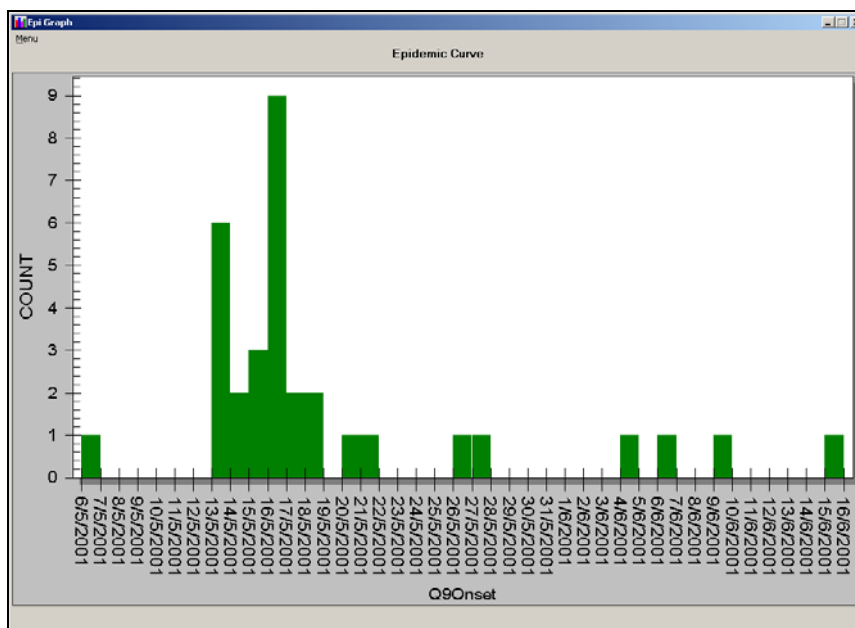
Create a bar graph of the AgeGroup variable.

Graphs: Displaying Data in a Histogram (Epidemic Curve)

We are now going to return to our epidemic curve. The epidemic curve uses the days that the cases became ill (*Q9Onset*) to show the course of the epidemic. For the curve, we need to use a histogram graph, which will allow us to show both the days with cases and the days without.

The steps for creating a histogram are basically the same as creating a bar graph, so we will write them briefly here.

1. **Click on the GRAPH command.**
2. **Select Graph Type.**
 - ☞ Select Histogram. Notice that a section that includes Intervals is added to the dialog box.
3. **Type the Page Title of the graph.**
 - ☞ Type "*Epidemic Curve*".
4. **Under X-Axis (Main Variable) select the variable for the date of illness.**
 - ☞ Select *Q9Onset*.
5. **Choose the Display format.**
 - ☞ Because we used DD-MM-YYYY as our pattern for *Q9Onset*, select d/m/yyyy for the display format.
6. **Select the display Interval.**
 - ☞ We want to display the histogram by one-day intervals. Type "1" in the blank box and select Days from the drop-down box.
7. **Choose the 1st Value.**
 - ☞ We are going to choose the Auto, so the first value displayed will be the first date of onset. If you want to start with an earlier date, type it in.
8. **Click OK.**



Try It!

To see what would happen if you tried to create the epidemic curve with the bar graph, close the current graph of your epidemic curve. Create a bar graph using Q9Onset as the variable. What is different about this new graph?

Analyzing the Risk Factors

At this point in our case-control study, we are hoping to identify risk factors that might indicate the cause and mode of transmission of cholera. We created a questionnaire that asked both persons who were ill (cases) and those who were not but shared similar characteristics with those who were ill (controls) about factors that may indicate the likelihood an individual would be more likely to contract cholera.

Analyzing the Probability that One Data Variable is Associated with Another (using Table command)

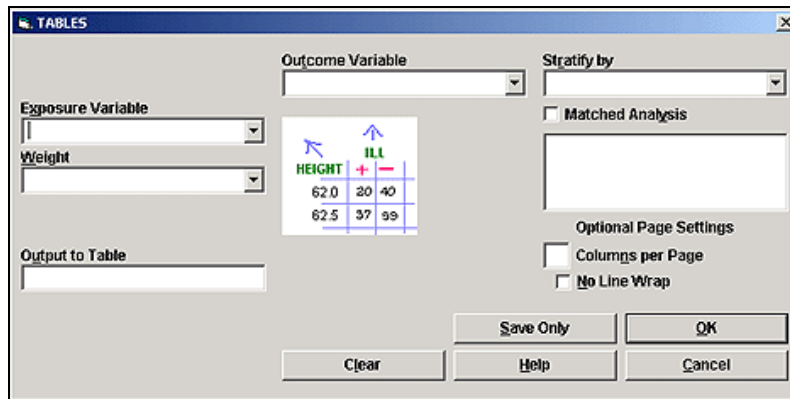
We need to analyze the risk factors by looking at both the case and control data, so select New in the Program Editor and Read the **Analyze_Cholera in Rwenshama.MDB** file. What we are trying to do here is determine the probability that a risk factor (for example, eating hot matooke - Q27Hmato) is linked to some outcome (illness - Q8Ill).

We will do this by creating a **2x2 table** and looking at the **p-value** generated. Remember, the p-value indicates the probability that the association between two variables might be due to chance. For example, if the p-value of two variables equals .75, then the likelihood that the association between them might be due to chance is 75%. On the other hand, a low p-value indicates it is less likely the association between two variables is due to chance. So a low p-value (generally <

.05) may indicate that a risk factor (e.g., eating hot matooke) is closely associated with a certain outcome (illness).

In fact, the tables command in this case is not the probability of one variable being associated with another, but it is the odds that the outcome was caused by the exposure to the variable. We are going back in time to figure out the odds. You have probability when you go forward in time such as prospective study.

1. Click on TABLES command under the Statistics folder.



2. In the Exposure Variable drop-down box, select the risk factor variable.

☛ Select Q27Hmato.

3. In the Outcome Variable drop-down box, select the outcome variable.

☛ Select Q8ILL.

4. Click OK.

Here is what your 2x2 table will look like. You can see that it is a table comparing one variable with two values as possible answers with another variable with two variables as a possible answer; hence, a two-by-two (2x2) table.

Q27HMATO : Q8ILL

		Q8ILL		
Q27Hmato	Yes	No	TOTAL	
Yes	28	26	54	
Row %	51.9	48.1	100.0	
Col %	84.8	78.8	81.8	
No	5	7	12	
Row %	41.7	58.3	100.0	
Col %	15.2	21.2	18.2	
TOTAL	33	33	66	
Row %	50.0	50.0	100.0	
Col %	100.0	100.0	100.0	

This 2x2 table will tell you that: Of the 54 people who ate hot matooke, 28 became ill while 26 did not. Of the 12 people who did not eat hot matooke, 5 became ill while 7 did not. Scroll down and you will see a series of statistical values.

Single Table Analysis			
	Point Estimate	95% Confidence Interval	
		Lower	Upper
PARAMETERS: Odds-based			
Odds Ratio (cross product)	1.5077	0.4252	5.3458 (T)
Odds Ratio (MLE)	1.4984	0.4122	5.7607 (M)
		0.3575	6.7885 (F)
PARAMETERS: Risk-based			
Risk Ratio (RR)	1.2444	0.6075	2.5492 (T)
Risk Difference (RD)	10.1852	-20.7294	41.0997 (T)
(T=Taylor series; C=Cornfield; M=Mid-P; F=Fisher Exact)			
STATISTICAL TESTS			
	Chi-square	1-tailed p	2-tailed p
Chi square - uncorrected	0.4074		0.5232889021
Chi square - Mantel-Haenszel	0.4012		0.5264529161
Chi square - corrected (Yates)	0.1019		0.7496188489
Mid-p exact		0.2724281422	
Fisher exact		0.3754075862	

Usually, when looking at risk factors in a case-control study, you will note these statistics:

- ▶ Odds Ratio (in this example, 1.5077)
- ▶ 95% Confidence Interval – Taylor series (in this example, 0.4252 to 5.3458)
- ▶ 2-tailed p-value – Chi square uncorrected (in this example, 0.5232 rounded)

Since our p-value for eating hot matooke is high (greater than .05), it does not appear that eating hot matooke is closely associated with becoming ill.

Now we are going to look at a case where the association is close.

Try It!

Create a 2x2 table with diarrhea contact (Q55Conta) as the exposure variable and Illness (Q8III) as the outcome variable.



Question 11: Complete these sentences:

Of the ___ people who had contact with diarrhea, ___ became ill and ___ did not become ill.

Of the ___ people who did not have contact with diarrhea, ___ became ill and ___ did not become ill.

Now let's look at the statistics and see which values we should use.

Single Table Analysis			
Warning: The expected values of a cell is <5. Fisher Exact Test should be used.			
	Point Estimate	95% Confidence Interval Lower Upper	
PARAMETERS: Odds-based			
Odds Ratio (cross product)	10.2273	1.1985	87.2743 (T)
Odds Ratio (MLE)	9.8864	1.4574	234.2787 (M)
		1.2040	465.7771 (F)
PARAMETERS: Risk-based			
Risk Ratio (RR)	1.9227	1.3305	2.7786 (T)
Risk Difference (RD)	43.1915	19.7554	66.6276 (T)
(T=Taylor series; C=Cornfield; M=Mid-P; F=Fisher Exact)			
STATISTICAL TESTS		Chi-square 1-tailed p	2-tailed p
Chi square - uncorrected		6.2006	0.0127718232
Chi square - Mantel-Haenszel		6.0918	0.0135820505
Chi square - corrected (Yates)		4.5818	0.0323150440
Mid-p exact		0.0070961489	
Fisher exact		0.0131652237	

Note that there is a warning on your results. It is telling you that you should use the Fisher Exact Test results.

These are the statistics that correspond:

- ▶ Odds Ratio (in this example, 10.2273)
- ▶ 95% Confidence Interval – Fisher Exact (in this example, 1.2040 to 465.7771)
- ▶ 1-tailed p-value – Fisher Exact (in this example, 0.01316 rounded)

Since our p-value for contact with diarrhea is low (less than .05), it appears that contact with diarrhea may be associated with becoming ill.

In a case-control study, you should create a 2x2 table for each risk factor and determine its association with becoming ill.

Save Analysis Output

We are going to do some more analysis, but we would like to create a file in which to save our analysis as an .htm file, which we can later use for reports, etc.

In actuality, all your output will be saved as an .htm file when you exit Analysis, under a file generically name OUTxx.htm. Each new file will read OUT1.htm, OUT2.htm, etc.

We want to designate the file name and also add some text to our file. (There are other things you can do, such as modify the text font and size for headings, but you can check an Epi Info for Windows resource for that information.)

Set a New Output File

As with many of our activities, you would need to make sure that you READ a file first before you create an output file. To start a new file (and in this case, to eliminate previous analyses), click New in the Program Editor and then READ the *Analyze_Cholera in Rwenshama.MDB* file again.

1. Click on the ROUTEOUT command under the Output folder.

2. Enter a name for your file.

☞ Type "RiskFactor" (no spaces).



Note: This file will automatically be saved to the same folder where your data file is located (in this case, in the Training folder). If you do not want the output file to be saved in that folder, click on the button next to Output Filename and select a new folder.

3. Click on "Replace any existing file" check box

4. Click OK.

Create Text in the Output File

In addition to the analysis you are creating, you can add additional text to a report.

1. Click on the TYPE command.

☞ This command is also under the Output folder.

2. In the Text or Filename blank, type the text you would like to add.

☞ Type "Analysis of Three Risk Factors".

3. Select text attributes.

You can select style (bold, italic, underline), font size, and font color.

☞ Select bold, font size of 4, and font color of Blue (Blue +).

4. Click OK.

Try it!

?

Question 12: Create a 2x2 table for each of the following risk factors. Determine the correct p-value (rounded to the nearest ten-thousandth – four decimal places) and whether or not the risk factor is associated with becoming ill. Remember to note which type of p-value you should use.

- ▶ History of eating outside the home in the last five days (*Q25Eat*):
p-value: _____
association: Yes___ No ___


- ▶ Eating sugar cane (*Q52Sugar*):
p-value: _____
association: Yes___ No ___

- ▶ How household prepares drinking water (*Q59Boil*):
p-value: _____
association: Yes___ No ___

Close the Output File

When you have finished creating the output file, you must close it.

1. Click on the CLOSEOUT command.

 This command is under the Output folder.

2. Click OK.



Note: Clicking OK will end the file. If you had wanted to save and continue, you would click SAVE ONLY.

We are now going to open the RiskFactor.htm file. In the Analysis Output window, click on the Open button. This will take you to where you output files are being saved (in our case, the Training folder). Select RiskFactor.htm and click Open.

You could also open this file in Word or PowerPoint, by opening that program, and going to FILE | OPEN and then selecting the RiskFactor.htm file.

Work with Program Files

Program files essentially are the series of commands you have created in the Program Editor. When you have had to work particularly hard at creating a series of commands to get the analysis results you desire, you would not want to have to re-create it. By saving a program file, you can run your analysis again, or use it as a model for a new analysis, perhaps changing the variable names in the Program Editor.

Save Program Files

Use the following to save a program file.

1. **In the Program Editor window, click on SAVE.**
2. **Under Program, name the program.**
 - ☞ Type "Risk Factor Tables".
3. **Create author name and comments.**
 - ☞ You can type your name in as author and create any comment (e.g., "2x2 Table analysis of risk factors").
4. **Click OK.**

Open Program Files

First, exit Analysis and then open it again to make sure the display browser is clear. Since we are opening a Program file from the last .MDB file you worked with, we can immediately select our Program file. Otherwise, you would need to select the correct file by clicking on the Change Project button.

1. **In the Program Editor window, click OPEN.**
2. **Under the Program drop-down box, select the program you wish to run.**
 - ☞ Select Risk Factor Tables.
3. **Click OK.**
 - ☞ The commands you created will appear in the Program Editor window. You must click RUN in the Program Editor window to display the results.

Environmental Survey Findings

In addition to the case-control study, a survey of the environment was also part of the case-control study. As you may have noted, many of the questions in the risk factors section of the questionnaire require the observation of the epidemiologist. Since p-value only indicates likely association with becoming ill, further investigation is required.



Note: The following is an excerpt from the original report of the study.

Food Hygiene

Six out of 9 people (67%) who were sick and had eaten food outside, had eaten from a hotel in Rwebinyonyi. This restaurant was found to be lacking in basic hygiene. Tables, shelves and utensils were dirty. There was no drying rack for utensils. The compound was not cared for and even stool lay about the verandah. This hotel was closed on 04.06.2001.

Salted fish was commonly dried on ground mats. Even people with fish drying racks at times preferred ground. This exposed fish to much contamination.

Water Source

Most people in Rwenshama parish obtained their water from the lake (89.4% of cases and controls) and a few (10.6%) from River Ncwera. Both sources were macroscopically dirty. Children also swam at River Ncwera collection point. Although 69.7% of the respondents indicated they boiled the water before consumption, this could not be verified. There was a piped water system that had broken down and not been repaired for reportedly approximately 10 years.

Latrine Use

Latrine coverage in the fishing village was high at 91% (study by public health unit in Rwenshama, May 2001). The pits however were shallow because of the high water table. The superstructures were of low standard and not kept clean.

Housing

Many residences in the commercial set-ups in Rwenshama and Rwebinyonyi cells were deplorable. They were very small, the walls were rough and heavily cracked, and the roofing corrugated iron sheets were full of holes.

Environmental Cleanliness

Refuse disposal was poor with rubbish heaps near dwellings. Channels of stagnant water were common around buildings. **As you can see, in the case of eating outside the home, the observation that the number of people who had eaten (and, in particular, at one establishment) was followed up in an environmental survey further indicated that this risk factor could be an indication of a mode of transmission of cholera. Many of the other risk factors observed, such as latrine cleanliness may also contribute to conditions that increase the spread of cholera.**

Module 8

Read & Write Other Database Formats in Epi Info

In this Module:

- Read an Epi 6 File
- Write and Epi 6 File
- Read an Excel File/Table

Level of Difficulty	Intermediate
Estimated Time to Complete	1/2 Hour
Additional Resources Required	Training Materials, Module 2-8

Learning Objectives

After completion of [Module 8: Read & Write Other Database Formats in Epi Info](#), the student will be able to:

- ▶ Read & Write Epi 6 Files
- ▶ Read Excel File/Table

You may find in your work that you will need to read or write data from another database format. For instance, someone who did not use Epi Info for Windows may have assisted you in gathering data for this case control study or you may be asked to send your data to someone who requires a different format. Reading and writing other database formats is done in Analysis in Epi Info for Windows. Open Analyze Data for this section of the training.

Read an Epi 6 File

Use the following to Read an Epi 6 File in Epi Info.

1. **Click on the READ command.**
2. **In the Data Formats drop-down box, select Epi 6 Direct Read.**



Note: We chose Epi 6 Direct Read because the file will remain an Epi 6 file. If we had selected Epi 6 as the data format, the file is read into the Epi Info for Windows format and is included as a table within the current project.

3. **Click on the button next to Data Source, select the Epi 6 file, and click OPEN.**
 - ☞ Once you click the button next to Data Source, make sure you are in the Training folder and select the epi6chol.rec file. (This file has the same data as the **Analysis_Cholera in Rwenshama.MDB** file.)
4. **Under Show, make sure Data Files is selected. In the box under Data Files, select the Epi 6 file.**
 - ☞ Once you click on the epi6chol.rec file, you should see it highlighted.
5. **Click OK.**

Write an Epi 6 File

Let's create an Epi 6 file from our *controls.mdb* file.

1. **Click on the READ command.**
2. **Click on the button next to Data Source, select the file you wish to convert, and click Open.**
 - ☞ Select the *controls.mdb* file.
3. **Choose the table you wish to convert. If under Views, no tables appear, click All and then select your table.**
 - ☞ For the *controls.mdb* file, you will need to click all and select CholeraControls.
4. **Click OK.**
 - ☞ If you receive a prompt for a Temporary Link name, click OK again.
5. **Click on the WRITE command.**
6. **Choose the variables to write.**
 - ☞ We are going to write all the variables; make sure All is checked.
7. **In Output Mode, select Replace.**
8. **In the Output Formats drop-down box, select Epi 6.**
9. **Click the button next to File Name, select a folder, name the file, and click Save.**
 - ☞ Make sure you are in the Training folder. Name the file "epi6controls". You will note that Epi 6 creates .rec files.
10. **Click OK.**

Read an Excel Table

We have provided you with the file called *Case Studies English.xls*. This file lists case studies that have been used in epidemiology training.



Note: You must have Microsoft Excel installed on your computer to perform this exercise.

1. **Click New in the Program Editor window first if that screen is getting full.**
2. **Click on the READ command.**
3. **Under Data Format, select the version of Excel the program has been saved in.**
 - ☞ Select Excel 8.0.
4. **Click on the button next to Data Source, select the Excel file, and click Open.**
 - ☞ From your Training folder, select Case Studies English.xls.
5. **Under Worksheets, select the worksheet you wish to open.**
 - ☞ Select Case_Studies_English.

6. **Click OK.**
7. **If the fields names were listed in the first row of the Excel table, make sure the box is checked.**
 - In the Case Studies English.xls file, the field names were listed in the first row, so leave the box checked.
8. **Click OK.**

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Module 9

Create Reports Using Epi Report

In this Module:

- Create a New Report Template
- Work in the Report Design Area
- Work with Report Objects
- Create a Table & Pivot Table
- Save a Report & Report Template
- Display Output & Field Aggregates

Level of Difficulty	Advanced
Estimated Time to Complete	2 Hours
Additional Resources Required	Training Materials, Module 9

Learning Objectives

After completion of [Module 9: Creating Reports Using Epi Report](#), the student will be able to:

- ▶ Insert labels, images, and tables,
- ▶ Draw lines,
- ▶ Insert system variables,
- ▶ Read and display Epi Info Analysis output,
- ▶ Read datasets and generate output as field aggregates, line listings, and pivot tables.

The Epi Report tool can be used to design and generate various reports. An end user can include various elements in the reports generated, and these elements can be bound to various data sources. Record lists, cell replacement, groups, fragments from analysis XML can be included in the report. Data analysis through pivot table is also provided. Apart from these, system variables, permanent variables (created by Epi info) can also be included.

This portion of the training includes four additional files. Three of these files are ones that you created in the Module 7: Analyze Data: *RiskFactor.htm*, *RiskFactor.xml*, and *occupation.jpg*. You may use the files you created, or you can find these same files in the Back Up folder. Additionally, you will use the ***Epi Report_Cholera in Rwenshama.mdb*** for most of the activities in this module.

Open Epi Report

You can access Epi Report in two ways:

- ▶ By clicking on the Create Reports button on the Epi Info main menu or
- ▶ By clicking on the Start button on your desktop and clicking on PROGRAMS | EPI INFO | EPI REPORT.

Create a New Template

Each report you create will be developed as a template. The first time you open Epi Report, a new template will be opened for you. Starting a new template can be done in two ways:



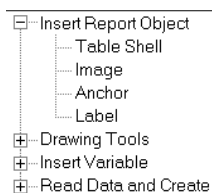
- **From the Menu Bar, click on FILE | NEW, or**
- **In the Toolbar, click on the New Template icon .**


We are going to create a report based on the analysis of data from the Cholera in Rwenshama outbreak.

Create a Label

We want to create a label for our report.

1. **In the Command Tree, click on the  sign next to Insert Report Object to expand it.**



2. **Click and hold your left mouse button on Label and drag to the Design Area.**
3. **Click inside the box and type the label text you choose.**
 Type, "Report on an Outbreak of Cholera."

Working in the Design Area

The Design Area is where the report is built including previewing the page area and working with report objects such as lines, fields, tables, and images.

Preview the Page Area

The Design Area on your screen does not directly correspond to the specific page size that you will see when the page is printed. To preview this area,




1. **Click on the Page Area button on the upper left corner of the Design Area.**
You will now see a blue outline that designates the print area of the template you are creating.
2. **Scroll left-right and up-down to see the full area.**
In Page Area mode, you cannot make any changes to the template. The rulers at the top and to the left of the design area will help you in positioning objects in the Design Area.
3. **Click on the Page Area button again to turn off the preview.**

Positioning Objects in the Design Area

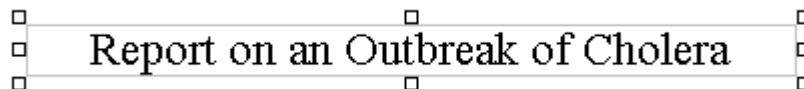
You can position objects by clicking and dragging the object to a new location.

- 1. Move your cursor over the outline that surrounds the report object that to be moved.**

The mouse turns into a four-headed arrow so the object can be moved. 

- 2. Click on the outline.**

You should see small boxes on the corners and edges of the report object.




- 3. Use the arrow keys to move the object in the Design Area.**

Changing the Size of Objects in the Design Area

You can change the size of an object by clicking and dragging the object edges.

- 1. Click on the outline around the object so that you see small boxes on the corners and edges of the report object.**

- 2. Roll your cursor over one of the boxes.**

The mouse turns into a two-headed arrow so the object can be resized. 


- 3. Holding down the left mouse button, drag your cursor to change the size of the object.**

Create a Line


You can create a simple line to visually separate areas of your report.

- 1. In the Command Tree, click on the  sign next to Drawing Tools to expand it.**

- 2. Click and hold your left mouse button on Line and drag to the Design Area.**

 Place the line underneath the title of the report. You will see a small line with boxes at the end points.

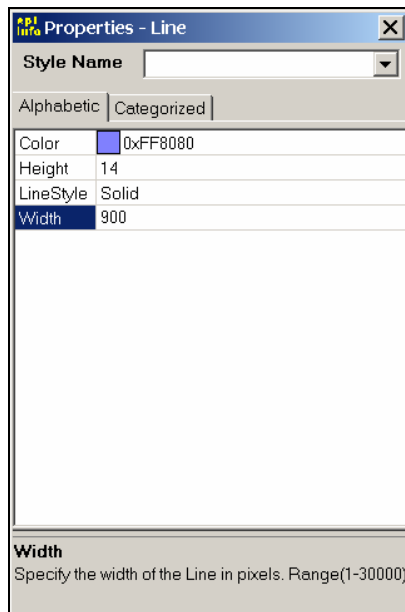
- 3. To change the length of the line, click on one of the boxes on the left or right end point and drag.**

 You can also change the height of the line by clicking on the box in the center and dragging up or down.

Change the Properties of a Line

There are additional tools you can use to change the look of your line.

1. **Right-click on the line.**
2. **From the options that appear, select Properties.**



Change Line Color

Use the following to change the color of the line.

3. **Click on the drop-down box next to Color.**
A color palette will appear.
4. **Choose a color from the palette and click OK.**

Change Line Height or Width

Previously, you manually changed the width and height of the line. You can also change the width and height by selecting a pixel size¹.

5. **Click inside the area next to Height or Width.**
6. **Type the desired number of pixels.**

¹ Epi Report uses a number of features that are related to web pages. Web pages use pixels to designate height or width of an object or image. It may take some experimentation to find the right width or height in pixels, but you can estimate that a report to printed on 8 ½ x 11 paper with ½ inch margins is about 900 pixels wide.

Change Line Style

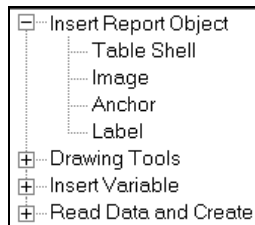
Use the following to change the line style.

7. Click in the box next to Line Style.
8. Click on the drop-down arrow and select a line style.
9. Close the Line Properties dialog box by clicking on the X in the upper right corner.

Create a Table

We want to create a table for our report.

1. In the Command Tree, click on the  sign next to Insert Report Object to expand it.

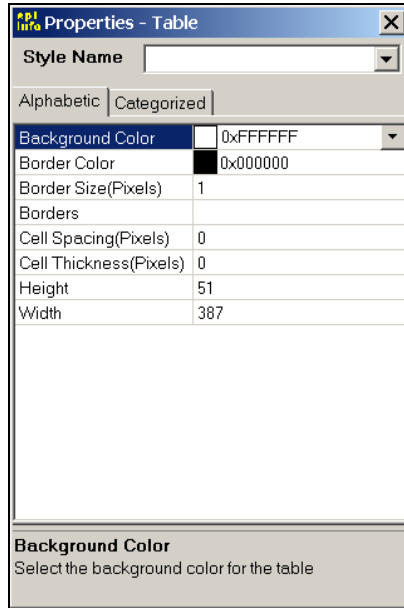


2. Click and hold your left mouse button on Table Shell; drag to the Design Area. You will see a default table size consisting of three columns and three rows.

Change the Properties of a Table

Use the following to change the table properties.

3. Click on the edge of the table so that the small squares appear on the corners and edges.
4. Then, right-click and select Properties.



- 5. Click in the row of the property you wish to change.**
 - Select Background Color, click on the drop-down box and choose any light color from the color palette.
- 6. To close the Properties box, click the X at the upper right of the dialog box.**

Modify the Size of the Table

You can modify the numbers of rows or columns in the table as well as delete an individual cell or split a cell into two or more cells.

For this activity, you will need to make sure that the entire table is NOT selected (i.e., the small squares DO NOT appear).

- 7. Right-click anywhere inside the table.**




Note: The options for modifying the table include inserting or deleting a row, column or cell; merging a cell (when two or more cells have been highlighted using your cursor); or splitting one cell into two (when the cursor is inside one cell).

- 8. Select the modification you wish to make.**
 - We want to delete one column. Click on Delete Col. The right column will be deleted.


Add Content to a Table Cell

Any type of content that can be added to the main Design Area can be added inside each table cell.

9. Click inside the cell.

 Click in the cell in the upper left corner.

10. Type text or drag any content object from the Command Tree into the cell.

 In the upper left cell, type "Date of Report."

Save the Report Template

We are going to continue to work on our report template, but we want to be sure to save what we have accomplished so far.




1. Click on FILE | SAVE or click on the Save button.

2. Navigate to folder on your computer where you wish to save the file.

 Save the Cholera report in the Training folder.

3. Next to File Name, type the name you wish to give the template.

 Type: Cholera Report.



Note: Notice that the file type listed below is listed as an Epi Report (*.ept) file. This type of file will be different than the generated report file you will create later, which will be an HTML file.

4. Click Save.



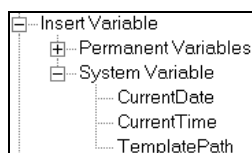
Note: Remember to save anytime you exit Epi Report.

Add a System Variable


System Variables are data that are derived from information contained on your computer.

1. In the Command Tree, click on the sign next to Insert Variable to expand it.

2. Click on the sign next to System Variable to expand it.



3. **Click and hold your left mouse button on System Variable you wish to use and drag to the Design Area.**

 In this case, we want to add the CurrentDate to the cell next to where you have typed "Date of Report." Click and hold on CurrentDate and drag it into the table cell to the right of Date of Report.

Date of Report	{Date}
----------------	--------

Try It!

In the remaining two rows, type a title and include the System Variable for both CurrentTime and Template Path, as show below.

Time of Report
Location of Report

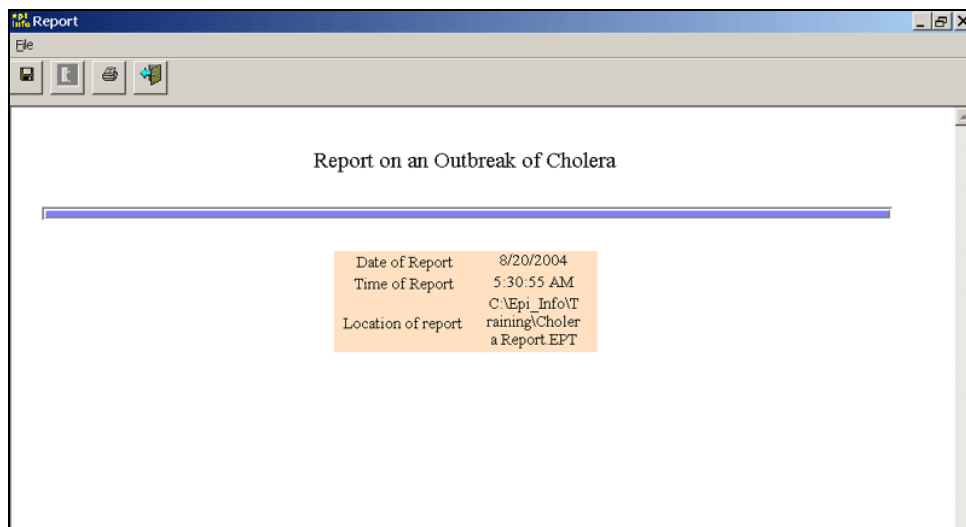
Generate a Report

In order to see the system variables (and other data we will add soon), you must generate a report, which will appear in a separate window.

You can generate a report in two ways:



1. **From the Menu Bar, click on FILE | GENERATE REPORT or click on the Generate Report icon on the toolbar.**



2. **Click the Back button on the toolbar to return to Epi Report.**

You have several options once you generate a report:

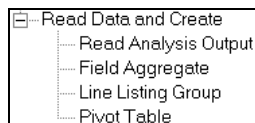
- ▶ **Save** the report by either clicking on FILE | SAVE (or FILE | SAVE AS to rename a previously saved file), or clicking on the Save icon .
- ▶ **Print** the report by either clicking on FILE | PRINT or clicking on the Print icon .
- ▶ Return **Back** to the Epi Report screen by clicking on FILE | BACK or by clicking on the Back icon.
- ▶ **Make a Template Build** by clicking on FILE | MAKE TEMPLATE BUILD. This option can be used when you have images in the file. The HTML output will be saved along with the images in one folder.



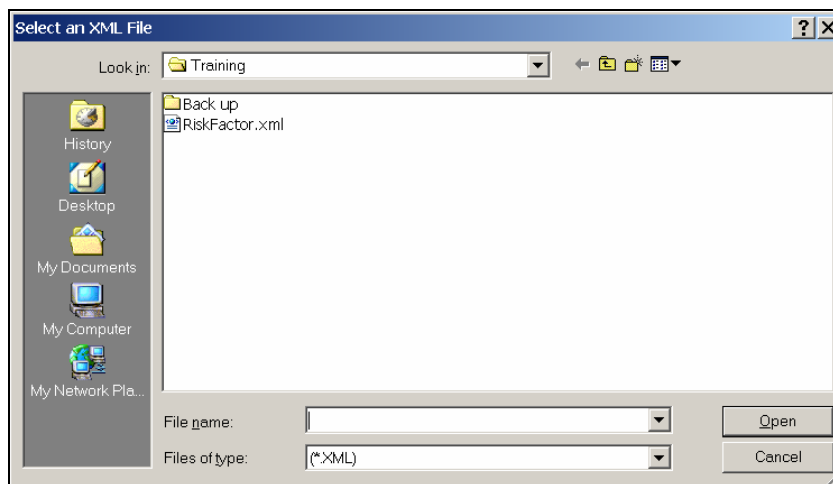
Displaying Analysis Output

When you create an output file in Epi Info Analysis using the ROUTEOUT command, you also create a matching XML file that can be used with Epi Report to display elements of the analysis.

1. **In the Command Tree, click on the + sign next to Read Data and Create to expand it.**

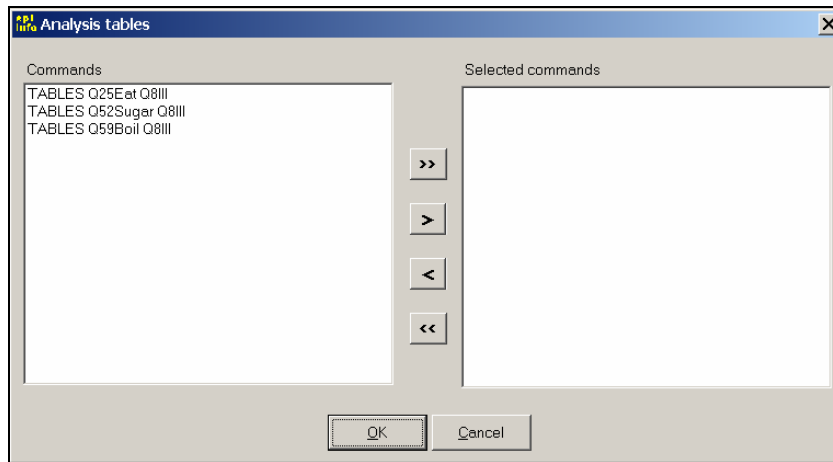


2. **Click on Read Analysis Output.**
A dialog box will appear.



3. Navigate to the XML file, select it, and click OPEN.

☞ The RiskFactor.xml file will be in your Training folder.

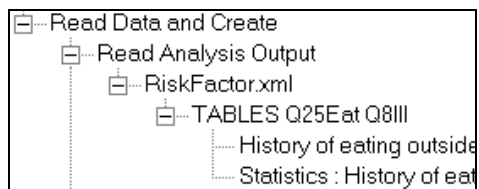


4. Select the Commands you wish to use in Epi Report and use the arrow buttons to move them to the Selected Commands list.

☞ We want to display the data from the analysis done on eating outside the home (Q25Eat), so under Commands click on TABLES Q25Eat Q8III, click on the > button

5. Click OK.

☞ To access the XML file, expand Read Analysis Output. You will see RiskFactor.xml listed with another plus sign. Expand it and expand the TABLES command that you see as well. The two items listed include both the original 2x2 table and the statistics generated.



Try It!

For the next activity, we need to create a title. Create a label/title called "Risk Factors." (See Create a Label on page 100.)

Display Data from the XML File

To display all the data in either the 2x2 table or statistics:

1. Click and hold the left mouse button on the list of data items.

2. Drag to any space on the Design Area.

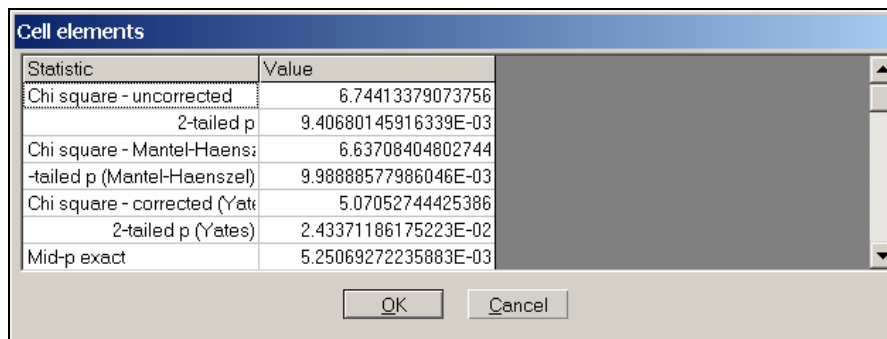
☞ Move the History of eating outside home 2x2 table to the Design Area.

History of eating outside home within past 5 days : III?			
History of eating outside home within past 5 days	(+)	(-)	TOTAL
(+)	9	1	10
(-)	24	29	53
TOTAL	33	30	63

To display only cell elements of the data tables:

3. Right-click on the 2x2 table or statistics.

➤ Right-click on Statistics: History of eating outside home. You will see the Cell Elements dialog box below.



4. Click on any element, including both Statistic (title) or Value to highlight it.

You may click on more than one element. The highlight may be a bit difficult to see.

➤ Under the Statistics column, select Odds Ratio. Under Value, select the corresponding odds ratio value.

5. Click OK.

➤ The elements will now appear under the Statistics in the Command Tree. Now drag both these elements to the Design Area underneath the 2x2 table.

Delete Analysis Output

You can either delete an element that you have selected from the analysis output or you can remove the entire XML file from the command tree. Note that you can delete elements of the XML file, but not the entire XML file if you have used any elements from the file in your template. To remove an element from analysis output:

1. In the Command Tree, right-click on the title containing the element(s) you wish to delete.

➤ Right-click on Statistics: History of eating outside home so that you see the Cell Elements listed again.

2. Deselect the item(s) to be deleted.

➤ Deselecting an item means to click on it again so that it is no longer highlighted. Select both the title Odds Ratio and the corresponding value. Note again that the highlighting may be a bit difficult to see.

3. Click OK.

Remove the XML File

To remove the entire XML file:



Note: Since we want to keep our analysis output information in our template, we will not follow these steps below.

1. **In the Command Tree, right-click on the title of the XML file to be deleted.**
2. **Select Remove Analysis XML.**
3. **In the dialog box, click OK to accept deletion of the XML file.**

All the additional options available in the Read Data and Create section of the Command Tree use a database file (from an MDB file or an ODBC file) to create data for display in the template. Unlike the data from Analysis output files, these data are updated each time the database file is updated and a new report is generated.

Try It!

We want to display some data in the next activity that will require labels.

- ▶ Create a label called "Range of onset dates."
- ▶ Create a table with two rows and two columns. Enter the information below.

First Date of Onset	
Last Date of Onset	

Display a Field Aggregate



A field aggregate is summary data for a field that can be embedded in a template. The type of summary data available is dependent on the field type. All fields will include the following types of field aggregates:

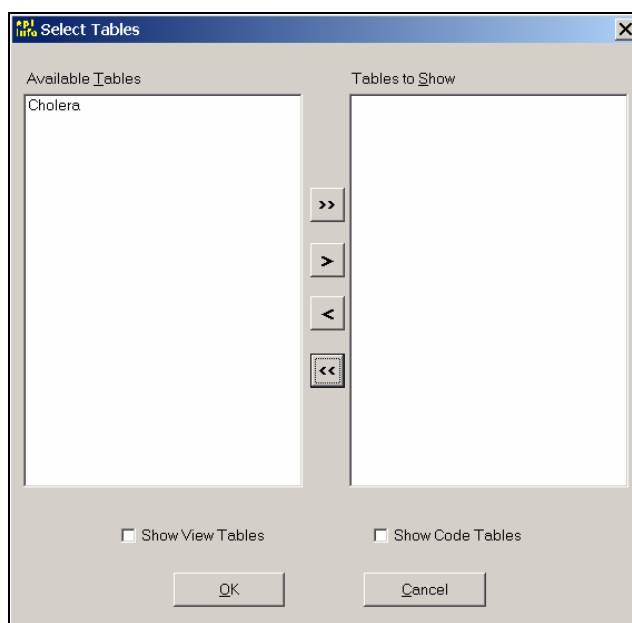
- ▶ Count
- ▶ Minimum
- ▶ Maximum
- ▶ Percent


For numerical data, you will also be able to see:

- ▶ Sum
- ▶ Average

Use the following steps to display a field aggregate.

1. **Click on the plus sign next to Read Data and Create to expand it.**
2. **Click on Field Aggregate.**
You will have two options available, Select ODBC or Select a MDB File.
3. **Select the database type you wish to open.**
 We want to open the Cholera in Rwenshama database, so click on Select a MDB file.
4. **From the dialog box, navigate to and select the database file. Click Open.**
 Inside the Training folder, select the **Epi Report_Cholera in Rwenshama.MDB** file. You will see the following dialog box open.

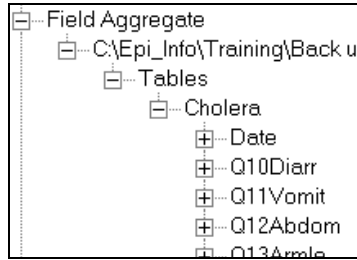


5. **In the dialog box, under Available Tables, select the table of data you wish to use and use the arrows to move it to the Tables to Show column.**
 This database only has one table, Cholera. Click on it to select it and use the > arrow to move it.



Note: You can click on the checkbox next to either the Show View Tables or the Show Code Tables to make these tables available as part of a selection.

6. **Click OK.**
You will now see the MDB file added under Field Aggregate in the Command Tree, represented by the computer location (path) of the MDB file.
7. **Expand the database file until you see the listing of fields in the table.**



8. **Select a Field and expand it to view the aggregate data available.**
 ⚙ Select Date and expand it.
9. **Drag the field aggregate to the Design Area.**
 ⚙ Drag the Minimum field aggregate of Q9OnSet to the upper right cell in the table next to First Date of Onset. Drag the Maximum field aggregate of Q9OnSet to the lower right cell in the table next to Last Date of Onset.

Try It!

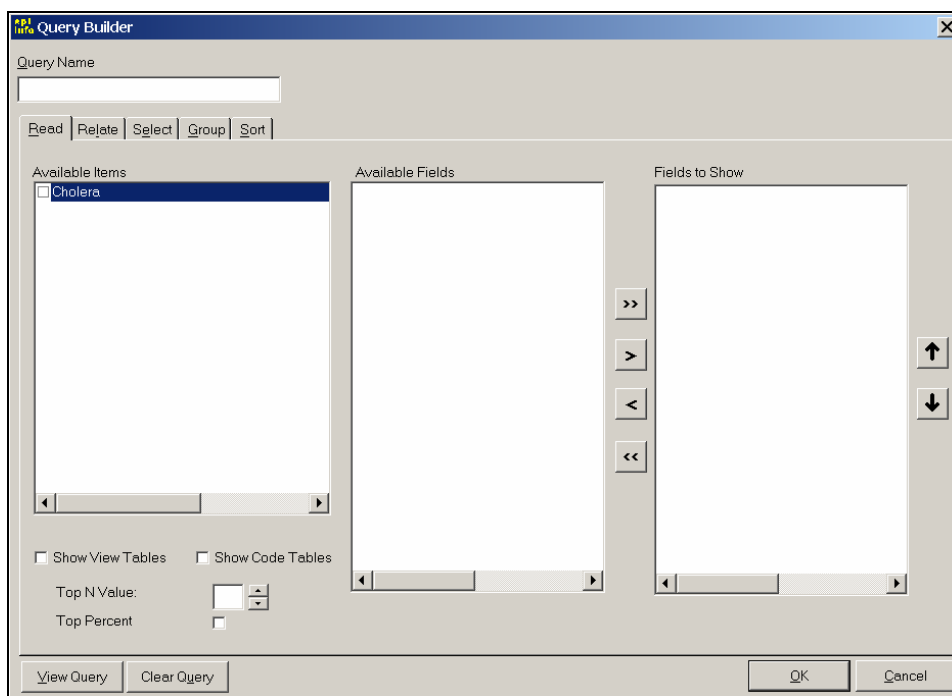
We want to create a label for our next activity. Create a label called "Occupation by Date of Onset."

Add a Line Listing

Next we are going to add data from the same MDB file in the form of a line listing. Make sure Read Data and Create is expanded.



1. **Click on Line Listing Group.**
2. **Select the database type you wish to open.**
 ⚙ We want to open the Cholera in Rwenshama database, so click on Select a MDB file.
3. **From the dialog box, navigate to and select the database file. Click Open.**
 ⚙ Inside the Training folder, select the **Epi Report_Cholera in Rwenshama.MDB** file. You will see the following dialog box open called the Query Builder. The query you create will specify exactly what you would like to appear in the line listing.



4. **Under Query Name, type a name for the query you are about to create.**
 ↗ The query name cannot contain any spaces. Type: OccupationCases.
5. **Under the Read tab, click on the checkbox next to the table you wish to use.**
 Our database only has one table, Cholera. Click on the checkbox next to it. You can also click on the checkboxes next to Show View Tables or Show Code Tables to see more options. You will see all the available fields appear under Available Fields.
6. **Select the fields you wish to use under the Available Fields column by clicking on the field and using the arrow buttons to move it to the Fields to Show column.**
 ↗ We wish to see the fields listed for questionnaire number (Question), date of onset (Q9Onset) and occupation (Q4Occup). Each of these fields will be listed with the name of the table in brackets followed by the name of the field (e.g., [Cholera].[Question]). Select all three fields and use the > button to move them to the Fields to Show column.

There are four additional tabs on the Query Builder: Relate, Select, Group, and Sort. We will use Select and Sort next. For an overview of all the tabs, see the Mini Reference section at the end of this module, page 100.

Select in a Line Listing

We want to select only those records belonging to cases to display in our line listing.

1. **Click on the Select tab.**
2. **Under Field Name, select the field to use in the selection criteria.**
 ↗ Under Field Name, select [Cholera].[Q8III]

3. Select an Operator from the drop-down list.

- ☛ So that we select all our cases, we want Q8III to be equal to Yes. Use the default value, the equal sign (=).

4. Select a Value.

- ☛ In order to see the possible values for Q8III, click on List Possible Values button. In the drop-down list you will now see three possibilities: (.), 0, 1. The symbol in parentheses stands for a missing value. In yes/no questions like Q8III, zero (0) stands for No and one (1) stands for Yes. Select 1.

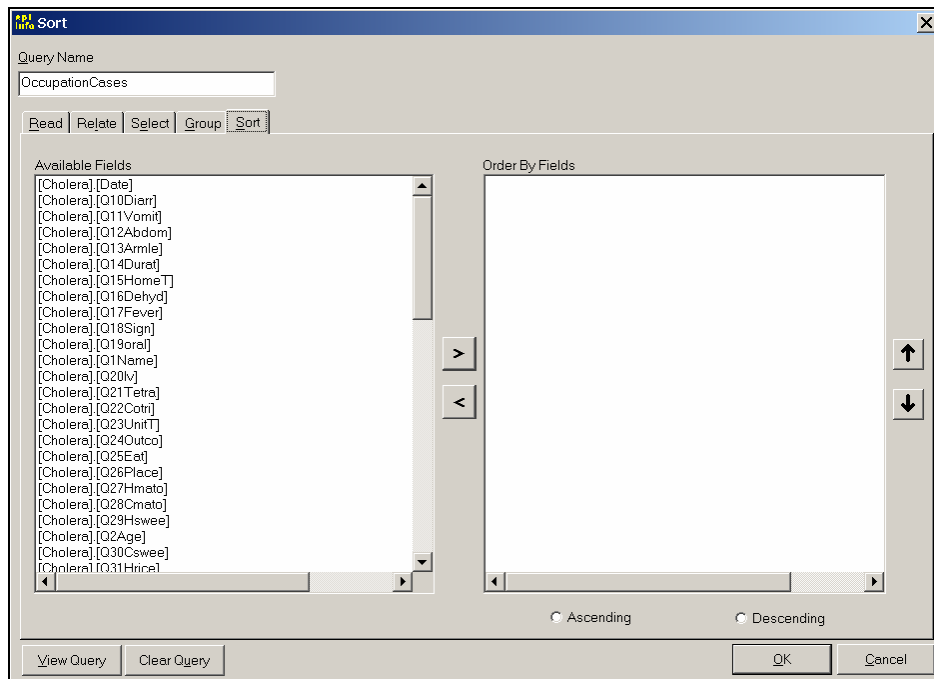
5. Click on the Add Criteria button.

Your criteria will now appear underneath Criteria. Also, you will see that two new buttons are added: *AND into Criteria* and *Or into Criteria*. You can use these buttons to add additional Select criteria, using AND to create criteria in addition to what you have already selected or using OR to select records that use either set of Select criteria.

Sort a Line Listing

Use the following to sort a line listing.

1. Click on the Sort tab.

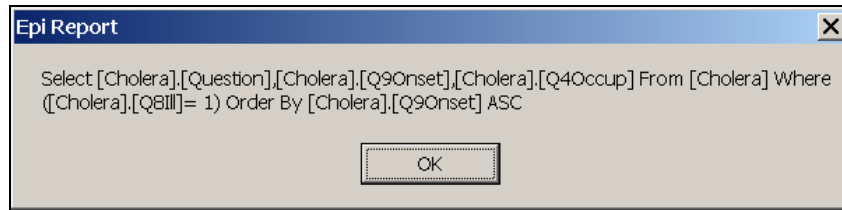


2. Under Available Fields, select fields to Sort by and use the arrow buttons to move them to the Order By Fields column.

- ☛ We want to order by Date of Onset, so click on [Cholera].[Q9Onset]. It should now appear in the Order By Fields column.

3. Choose Ascending or Descending order by selecting the field and then clicking on either Ascending or Descending.

- ☛ We want the data to be listed from first date of onset to the last, so choose Ascending.



4. **Click OK to close View Query.**
5. **Click OK to close the Query Builder.**
6. **In the Command Tree, expand Line Listing until you see the title of the Query you created.**
 - Expand twice until you see the OccupationCases query.
7. **Drag the query to the Design Area.**
 - Click on Generate Report to see the results of the line listing you created.

Insert an Image

In the Training folder, you have an image called Occupation.jpg. This image is a graph of the frequency of occupations of cases.


1. **In the Command Tree, expand Insert Report Object.**
2. **Drag the Image command to the Design Area.**
3. **Navigate to the folder containing the image, select the file type, select the image, and click Open.**
 - Since the file we want to use, Occupation.jpg, is a JPG file, first make sure that under File of Type that Jpg files (*.jpg) is selected. In the Training folder, you will see a file called Occupation.jpg. (If you did not previously do the introductory Cholera in Rwenshama training, you will find this file in the Back up folder). Select the image and click Open.
4. **Move the image underneath the Line Listing.**
 - You can minimize the size of the image by selecting the image so that you notice small white boxes at the corners and sides, placing your mouse over any corner of the image (you will see a diagonal arrow) and holding your left mouse button and dragging diagonally to reduce the image.

Try It!

We want to create a label for our next activity. Create a label called “Cases by Village and Date of Onset.”

Save a Report

Use the following to save a report.

1. In the Generate Report screen, click on **FILE>SAVE** or click on the **Save** button.
2. **Navigate to the folder on your computer where you want to save the file.**
This file should also be saved in your Training folder.
3. **Next to File Name, type the name of the report.**
 Type: Cholera Report Save. Note that this file is an HTML file.
4. **Click Save.**

Report on an Outbreak of Cholera			
Date Of Report		17/10/2004	
Time of Report		19:53:16	
Location of Report		C:\Epi_Info\Training\Cholera Report.EPT	
Risk Factors		Range of onset dates	
History of eating outside home within past 5 days : Ill?			
History of eating outside home within past 5 days	Yes	No	TOTAL
Yes	9	1	10
No	24	29	53
TOTAL	33	30	63
First Date of Onset		15/06/2001	
Last Date of Onset		06/05/2001	

Noting Changes in Data

If you wish to see what changes may be made when data is changed in a dataset, open Epi Info's Enter Data and open the ***Epi Report_Cholera in Rwenshama.mdb*** file. Either add records or make changes in some of the records to the variables we have used in report: Q9Onset, Q8Ill, Q4Occup, or Q6Villag. Then, generate the report and compare it to the one you have just saved. Note that no changes will be made to any data presented using Analysis Output since the XML will not have changed. Only data presented using Field Aggregates, Line Listings or Pivot Tables, which access data through the MDB file, will be changed.

Congratulations! You have completed the Epi Info for Windows and Epi Report training section. Please refer to the Epi Info Help files to learn more about Epi Info for Windows and Epi Report.



Mini Reference

Additional Functions to Organize the Line Listing

There are four other tabs available in the Query Builder.

Option	Description
Relate	If you wish to list data from more than two tables, you can relate them. Refer to the Epi Report Manual on how to do this.
Select	Here you can use criteria to select particular records. This is similar to the Select in analysis. We will use Select shortly.
Group	Here you can group data by a particular field. Again refer to the Epi Report Manual on how to do this.
Sort	Here you can sort data by a particular field. This is also similar to Sort in Analysis and we will use this in our query.

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Module 10

Creating a Menu in Epi Info

Level of Difficulty	Advanced
Estimated Time to Complete	1 Hour
Additional Resources Required	Training Materials, Completion or Knowledge of Basic Epi Info Training

In this Module:

- Create a new menu item & add it to a pull down menu
- Replace buttons
- Add command blocks
- Create a shortcut
- Change Menu background picture

Learning Objectives

After completion of [Module 10: Creating a Menu in Epi Info](#), the student will be able to:

- ▶ Create a new menu item
- ▶ Add a new menu item to a pull down menu
- ▶ Replace buttons
- ▶ Add command blocks to the code
- ▶ Saving the code for the menu item
- ▶ Create a shortcut for the menu item
- ▶ Change the Epi Info background picture

Creating a new menu item allows you to customize the Epi Info menu and buttons to meet the needs of your location. This module discusses how to create and add menu items and replacing buttons to help you with your customization efforts.

Note that in most epidemiologic studies and outbreak investigations, such as the cholera outbreak, menus are not generated. However, for projects where more than one person may access the files, such as in a large survey where multiple people may enter or analyze data, it may be helpful to create a menu. Menus are also used by those who wish to create applications in Epi Info.

IMPORTANT: Because each computer's Desktop has a slightly different computer address, we will need to add files into the Epi_Info folder on the C drive to simplify the Epi Menu training. The files we are going to copy from your Training folder are Analysis_Cholera in Rwenshama.mdb and Cholera_Report.EPT.

- ▶ Find your C:/ drive (usually you can click on the My Computer icon on your desktop and then access the C:/ drive).
- ▶ Open the Epi_Info folder. This contains all the Epi Info program files.
- ▶ You will need to copy two files, Analysis_Cholera in Rwenshama.MDB and Cholera_Report.EPT, from the Training folder on your Desktop to the Epi_Info folder on your C:/ drive. If you did not do the Epi Report module, you can find the Cholera_Report.EPT file in the Training/Back Up folder.

Requirements

The Cholera menu should contain four buttons:

- ▶ Edit Questionnaire
- ▶ Retrieve Database Information
- ▶ Execute Saved Analysis
- ▶ Cholera Report

It should also contain:

- ▶ Background Image

STEP 1 Creating a New Menu

1. From **Start | Programs | Accessories | NotePad** open **EpiInfo.mnu** file from the **Epi_Info** folder on the **C:/** drive.
2. Under the **File** menu item, choose **Save As** to save the file as a new name.
 - ✎ Save the file as **CHOLERA.mnu** in the File Name box, make sure "save as type" selects "All type", and the file saves in the training folder.

STEP 2 Adding Menu Items and Options to the Pull-Down Menu

1. **Create the title for the menu frame.**
 - ✎ Find the first line of the program and change it from **MENU EPI INFO** to **MENU CHOLERA**. This creates a title for the menu frame.
2. **Identify the beginning of the pull-down menu. It is the first BEGIN in the program.**
 - ✎ Right below this first **BEGIN**, add the group of **MENUITEMs** and commands below:

POPUP "&Cholera Programs"

BEGIN

MENUITEM "&Edit Questionnaire", EditQuestionnaire

**MENUITEM "&Retrieve Database Information",
RetrieveDatabase**

MENUITEM "&Excute Saved Analysis", ExecuteSavedPGM

MENUITEM "Cholera Report", CholeraReport

MENUITEM SEPARATOR

MENUITEM "E&xit", Exit

END



Note: **POPUP** command is used to define a main menu that will appear on the top line of the window. The individual **MENUITEM** command is used to define the pull-down menu within the **POPUP** item.

STEP 3 Replacing Buttons

The command **Button** creates a button on the screen with the caption of the display label.

1. Identify the **BUTTONS** section in the menu file and replace all the commands.

➡ Replace all the commands with the following **BUTTONS** below:

BUTTON "Edit Questionnaire", EditQuestionnaire, 95, 70, "Edit the cholera questionnaire"

BUTTON "Retrieve Database Information", RetrieveDatabase, 95, 75, "Retrieve Database Information"

BUTTON "Execute Saved Analysis", ExecuteSavedPGM, 95, 80, "Run the .PGM file"

BUTTON "Cholera Report", CholeraReport, 95, 85, "Run the report"

BUTTON "Exit", Exit, 95, 90, "Exit CHOLERA Program"



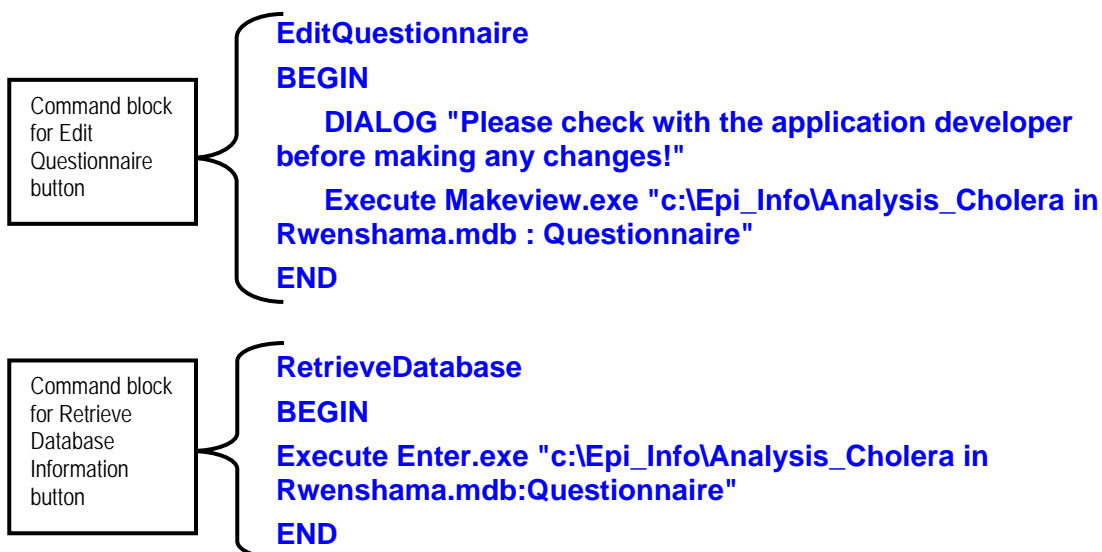
Note: The two numbers (in percentage) in the command are the location of the button on the screen.

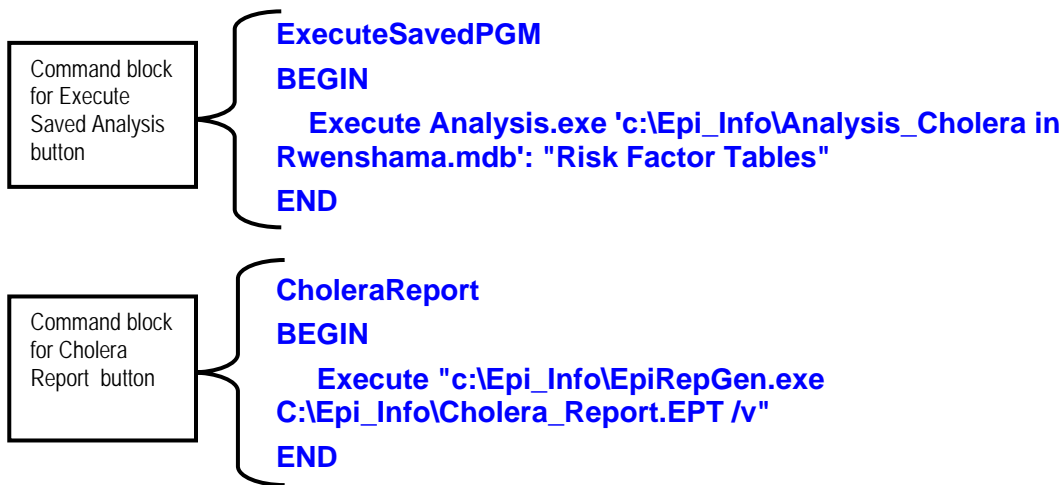
STEP 4 Adding the Command Blocks

The command block starts with the block name, and then the **BEGIN-END** pair encloses the executable commands.

1. Add the command block section.

➡ Add the following command blocks at the top of all the commands in the *Cholera.mnu* file:





STEP 5 Saving Your Work

To save your work on in the menu file, click on **Save** and close the text editor. Otherwise you can go to **FILE | SAVE** and close the text editor. The file will be saved in the C:/Epi_Info folder.

STEP 6 Creating a Shortcut

Use the following steps to create a new shortcut for the menu file.

1. From the desktop, right-click and select **New** and then **Shortcut**.
2. Click on the **Browse** button, and find the *EpiInfo.exe* file located in C:\Epi_Info and click on **OK**.
3. Add the text for the shortcut after EpiInfo.EXE.
 - ☞ The command line should read for the menu file created in this module:


```
C:\EPI_INFO\EPIINFO.EXE C:\EPI_INFO\CHOLERA.MNU
```
4. Click on **Next** and then replace the name for the shortcut.
 - ☞ Replace the name with *Cholera*.
5. Click on **Finish**.

STEP 7 Changing the Picture

Use the following to change the picture for the newly created icon.

1. **Open newly created Cholera menu**
 - ☞ Double click on the shortcut icon you just created.
2. In the pull-down menu, click on **Edit** and then on **Picture**.

3. Select the picture.

☞ Select the picture from the Training folder called *Uganda_Cholera.jpg*

4. Click Open.



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Module 11

Conclusions from Cholera Outbreak Investigation

In this Module:

- Conclusion
- Implement Control & Prevention Measures
- Communicate Findings
- Make Recommendations

Level of Difficulty	Advanced
Estimated Time to Complete	.50 Hours
Additional Resources Required	Training Materials

Conclusion

The importance of studying the outbreak is concluding how the disease may have been spread (and this may involve several factors) and then using this information to implement additional control and prevention measures, communicating the findings to stakeholders, and making recommendations to control these factors.



Note: The following is an excerpt from the original report of the study.

Implement Control and Prevention Measures

In addition to the control and prevention measures previously mentioned, arrangements were put in place to provide safe water to Rwenshama and avoid future epidemics.

- ▶ The Parish Cholera Task Force was reactivated. Emphasis was laid on case detection and health education. Local leaders volunteered to support deployed staff and provide water at the health unit.
- ▶ Rainwater harvesting: Following discussion with local leaders, the District Health Inspectorate provided two large water tanks to the parish. Rehabilitation of another big rainwater tank at the health unit was also commenced.

One factor that may have helped control the spread of the outbreak was the health education provided to the community.

The local health workers had gained sufficient experience from past epidemics to treat patients more effectively. Secondly the local task force was already in place and they had fought the same battle before. Their activity in mobilizing the community and health education was more fruitful. The study respondents also showed a high degree of knowledge of cholera prevention. Over 75% of them cited correctly 3 ways by which one can acquire the disease. Half of them had been exposed to health education on cholera in the previous 2 years.

Communicate Findings

It was not possible in this study to identify how this epidemic was introduced into Rwenshama. Nonetheless circumstantial evidence suggested cholera was probably brought by a carrier from DRC through Ishasha.

The epidemic curve demonstrated a common point source, which later became person-to-person spread. The strong association of eating in a hotel and developing diarrhoea supported this theory. Food could have been contaminated through the hands of a hotel worker, for example. It was not possible however, to incriminate a particular food. Seventy per cent of the respondents admitted they did not wash hands after latrine use. Even the 30% who said they did so, no demonstrable hand washing facility could be found in the homes.

Environmental survey revealed that Rwenshama possessed several risk factors for an epidemic. The shallow pit latrines and their dirty state could permit flies to pick and spread faeces. Emusu (1998) found dirty cooking and eating utensils, faeces and rubbish in the compound to be risk factors to the cholera epidemic in Ngoleriet subcounty in Moroto district.

In another study of cholera outbreak in Masha subcounty in Mbarara district Mubiru (1999) found that faeces in the compound and use of unboiled drinking water were risk factors. He also found the following factors to be protective:

- ▶ Presence of a pit latrine
- ▶ Hand washing after defecation or after cleaning a child
- ▶ Storing drinking water with a cover
- ▶ Hand washing before handling food or before meals
- ▶ Washing raw food
- ▶ Clean environment
- ▶ Presence of a drying rack

Rwenshama water sources were plainly dirty. Contaminated water is the commonest source of cholera epidemic (WHO, 1992). Close to 70% of the respondents said they boiled their water before use. This actually is the easiest way to make water safe, but it is expensive. It likely is therefore to be adopted only during the crisis of an epidemic.

The poor housing conditions set the background for unhygienic living. It was hard for residents to maintain cleanliness in such circumstances. Ninety-two per cent of the study subjects had no drying racks for plates in their homes, although 15% mentioned use of dirty or wet plates as one way of contracting cholera.

In conclusion, the mode of transmission was likely through food, though later it evolved into person-to-person spread. Low sanitation and hygiene standard promoted its spread.

The findings were used to develop recommendations and then communicated to the District Health Team.

Make Recommendations

Active Surveillance: This should be scaled up to enable the health workers detect any epidemic early. The capacity of the operational level health workers needs to be strengthened through support supervision.

Case management: This needs streamlining along guidelines of WHO on cholera management to make it rational and cost effective. There was a tendency of over prescribing intravenous fluids and other antimicrobials notably metronidazole.

Rapid Response Team: The Ministry of Health Epidemiological Surveillance Unit has just distributed guidelines for establishing this team. The District Director of Health Services (DDHS) should ensure that the full team is constituted quickly. Each member should be conversant with his role. Arrangements should be in place to mobilise the team at short notice when the occasion arises. Logistics should be set aside for emergency.

Safe water for Rwenshama: Rwenshama needs a permanent safe supply. It appears the old water system can be rehabilitated with modest sum only. District Health Team (DHT) members could lobby for funds from a willing financier.

Housing condition: Discussions should be held between local landlords, local leaders, and health personnel to find ways of improving the standard of the houses in the area.

Food Hygiene: Efforts should be made by health workers to raise the standard of food handling in the parish. Regular inspection of eating places should be carried out. Fish should be dried on rack stands.

Environmental Hygiene: Health workers should closely liaise with local leaders to improve the environmental conditions of the area. Latrines could be made safer without much additional cost.

Continuous community mobilisation and sensitisation: Health education by health workers needs to be kept up in order to achieve and sustain desired behaviour change. Health education materials should be produced in the local language and distributed in the area.

Laboratory service decentralisation: To enable districts obtain quick microbiological guidance in epidemic management, specimen should be examined at a nearby regional laboratory. Mbarara University Hospital Laboratory would be most appropriate to serve southwestern region.

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Module 12

Advanced Analysis & Mapping Using Epi Info

In this Module:

- Analyze Data - FREQ, MEANS, SELECT, SUMMARIZE, RELATE, and MAP Commands
- Create Line & Polygon Maps
- Customize Map Layers
- Save Map as different format file

Level of Difficulty	Advanced
Estimated Time to Complete	5.5 Hours
Additional Resources Required	Training Materials, Completion or Knowledge of Basic Epi Info Analysis

Learning Objectives

After completion of [Module 12: Advanced Analysis & Mapping Using Epi Info](#), the student will be able to:

- ▶ Analyze data using Frequencies, Means, Select, Summarize, and Relate Commands
- ▶ Map Data using the Map Command
- ▶ Create a Line Map
- ▶ Create a Polygon Map
- ▶ Customize Map Layers
- ▶ Save a Map as a MAP file
- ▶ Copy Map image to the Windows Clipboard

The first part of the module is an exercise in using the analysis skills you have already acquired in Epi Info. Only skills that you may not have encountered previously in basic Epi Info training will be explained. The second part of the module will cover Mapping in which all the steps will be fully explained.

Read the Dataset

To begin the Analysis exercise, you must read the Advanced Analysis database located in the Training/Advanced Analysis folder.

1. **Click on the READ command.**
2. **If project listed is not correct, click on Change Project button. Select correct file, and click OPEN.**
 - ☞ You are going to open a file called **Advanced Analysis.MDB**. Click on Change Project, and find the Advanced Analysis folder in the Training folder. Click on the **Advanced Analysis.MDB** file and click OPEN.
3. **Select the View (Table) to be opened. Click OK.**
 - ☞ The **Advanced Analysis.MDB** file does not have a View, only a Table. Select the All radio button, select the Mortality table and click OK.

The **Advanced Analysis.MDB** file is a database with information about diseases and mortality in (fictitious), which contains data from individual death certificates in a limited period in 2002. You can use Epi Info Analysis to answer the following questions. The data dictionary for the table follows for your reference.

Data Dictionary for Mortality Table

Variable	Definition	Comments
Age_Years	Age in years	Numeric
Diag	Diagnosis	Text
Province	Name of the province	Text
Sex	Sex	Male or Female

Questions for Consideration

Advanced Analysis training is designed to recall previously learned concepts in Epi Info. Many of the questions will not have specific instruction, but requires you to use the Epi Info skills you have previously learned to answer the questions.

You will find the answers to the question in Appendix G on page 100. Solutions on how to complete the question are included.



Note: There may be more than one way to complete a task to answer these questions.

- How many deaths are there in total?

Notes:

- What is the distribution of death by sex?

Notes:

- What is the mean age of death?

Notes:

- What is the mean age among children (age less than 18)?

Notes:

- Which province has the highest number of deaths? (Note: If you have previously selected a subset of the data, you will need to Cancel Select.)

Notes:

6. Which province has the highest number of female deaths?

Notes:

7. Which province has the highest number of male deaths?

Notes:

8. What is the leading cause of death according to this database?
(Refer to the Using the Summarize Command section on page 100)

Notes:

9. How many cases of stroke were reported?
(Refer to the Using the FindText Function section on page 100)

Notes:

10. What is the most frequent cancer?

Notes:

11. How many poisonings were reported?



Note: Remember to cancel the previous selection and look for the string "poison" rather than "poisoning".)

Notes:

12. What is the agent most frequently responsible for fatal poisonings?

Notes:

13. What is the mortality rate for each province?
(Refer to the Using the Relate Command section on page 100)

Notes:

14. Map the mortality rate using the shapefile provided.
(Refer to the Using the MAP Command in Analysis section on page 100)

Notes:

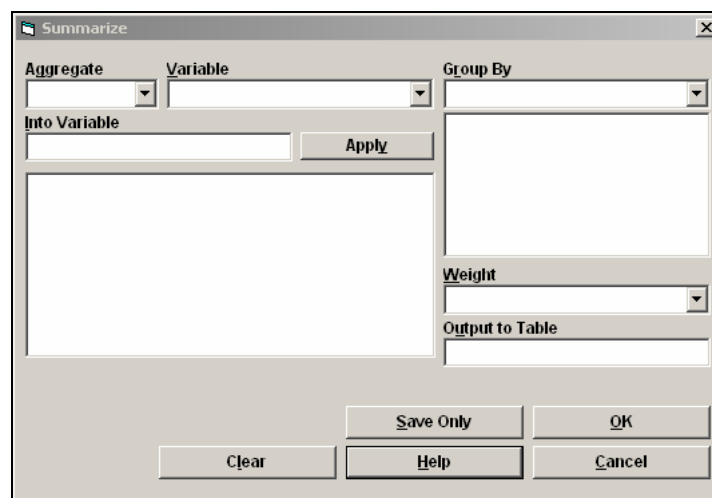
Q8: What is the leading cause of death according to this database?

We could use the Frequency command to check the frequency of diagnoses, but we would not be able to sort the frequency count. To do this we will create a summary table of frequency of various diagnoses, the **SUMMARIZE** command can be used. Use the following to answer Question 8.

Using the Summarize Command

Use the following steps to getting a summary of frequency of various diagnoses.

1. Select SUMMARIZE command.



2. Under Aggregate, select COUNT.

3. Under Variable, select any variable except the one you to into group by.

☞ Do not select DIAG as this is the variable we will group by.

4. Under Into Variable, type a new variable name.

☞ Type DIAGCOUNT.

5. Click on Apply button.

6. Under Group By, select the variable to group by.

☞ Select DIAG. This stratifies the count of records by their diagnosis.

7. Under Output to Table, type a new table name.

☞ Type DIAGCOUNT.

8. Click on OK.

This will create a table with 2 variables – *DIAG* and *DIAGCOUNT*.

9. READ the new table.

☞ Read the DIAGCOUNT table.

10. SORT the new variable in Descending Order.

☞ Sort by DIAGCOUNT.

This allows you to more easily see the diagnosis with the highest count.

11. LIST the data.

You can now answer Question 8.

Q9: How many cases of stroke were reported?

If you have reviewed the list of diagnoses, you may have noticed that, for some diseases, there is more than one specific type. For example, some persons were diagnosed simply with “stroke” while others were diagnosed with “ischemic stroke”. When we summarized the diagnoses in Question 8, these two different diagnoses counts were listed separately. We want to find all instances of stroke. To do this, we will need to use a Function in Epi Info Analysis. Functions simplify complex programming. In order to find the number of cases of stroke, the **FINDTEXT** function can be used.

We want to find all diagnoses in the dataset that include the word *stroke* using the IF command and the **FINDTEXT** Function. The **FINDTEXT** Function looks for a word or ordered set of letters (called a “string”) and returns the position in a variable in which the string is located. For example, **FINDTEXT** (“T”, “STROKE”) will return a value of 2 since the letter T is located at the 2nd position of the STROKE string.

If, instead of a specific string (note STROKE in the function above has quotes), we used a variable name (no quotes), the function would look for instances of the string in that variable and return a value greater than 0 if the string is found.

FINDTEXT will return a value of 0 (zero) if the string is not found. We want to count all the diagnoses that do not return a 0 (zero) as the answer.

Using the FindText Function

To find the number of cases of stroke, we will need to return to the original table with all the records. Use the following to answer Question 9.

1. READ the original table.

☞ Read the MORTALITY table.

2. DEFINE a new variable.

☞ Name the new variable STROKE.

3. Click on the IF command.**4. Under the If Condition, type FINDTEXT function.**


☞ Type **FINDTEXT**(“stroke”,Diag)>0 . This will identify all the diagnoses with the string “stroke” in them.

We are now going to assign values to the new variable.

5. Click on the THEN button.

a. Click on the **ASSIGN** command.

b. Under **Assign Variable**, select the new variable and create the =Expression.


 Select the new variable, STROKE. For the =Expression, click on the Yes button.

c. **Click Add.**

6. **Click on the ELSE button.**

a. **Click on the ASSIGN command.**

b. **Under Assign Variable, select the new variable and create the =Expression.**

 Select the new variable, STROKE. For the =Expression, click on the No button.

c. **Click Add.**

7. **Click OK.**

8. **Click on the Frequencies command and look at the frequency of the new variable.**

 Look at the Frequency of STROKE.

Q13 What is the mortality rate for each province?

To calculate mortality rates we are going to use data from both the **Advanced Analysis.mdb** file and from another database file, **CB.DBF**, provided with the Cambodia shape file (in the Training/Advanced Analysis folder).



Note: This training material uses a population size data from Cambodia, but the disease specific database we have been using in this training is fictitious.


The DBF file contains several variables, including a variable called POP_ADMIN. This variable holds the population size for each province. Another variable in the DBF file, called ADMIN_NAME, contains the name of the provinces, the same as those listed in the Province variable in the Advanced Analysis.mdb file. We will use these two variables, ADMIN_NAME and Province, to **RELATE** the two databases. After relating the databases, we can use the population data from the DBF file and number of deaths data we obtained from the MDB file to calculate mortality rates.

Using the Relate Command

To find the mortality rate for each province, use the following to answer Question 13 and complete the following table.

Remember to CANCEL SELECT from the previous activity, if you have not already done so.

1. **Use the FREQUENCIES command to create a frequency of the number of deaths by geographic area and save the output to a new table.**

 From the Frequency of drop-down box, select Province. In Output to Table, type MORTALITYRATE. This creates a new table with the results of the number of deaths per province.

2. Read the new table.

- ☞ Read the MORTALITYRATE table. This table should have 19 records. LIST to make sure that this table contains the number of deaths for each province.

3. Use the RELATE command to build a relationship between the geographic variable from the first table to the geographic variable in the second table or database.

- a. Click on the RELATE command.
- b. Set the data format to dBase IV and data source to CB.DBF file.
- c. Click on the BUILD KEY button.
- d. From the Available Variables drop-down box, select PROVINCE. This is for the Current Table.
- e. Click on Related Table (to the right of Current Table).
- f. From the Available Variables drop-down box, select ADMIN_NAME.
- g. Click OK. You should see PROVINCE and ADMIN_NAME selected.
- h. Click OK again. You should see under the Key section
PROVINCE :: ADMIN_NAME
- i. Click OK. In the dialog box asking to create a permanent link, type MORTALITYLINK. You have now related the two tables, MORTALITYRATE and CB.DBF.

4. LIST to see the structure of the new table.**5. DEFINE a new variable to contain the output for the mortality rate.**

- ☞ Name the new variable MORTALITY_RATE.

6. Next we will need to calculate the mortality rate and assign the value to the new variable.

We will make this calculation based on deaths per 100,000. Remember that mortality rate = the number of total deaths / the total population (then multiplied times 100,000 to give a value per 100,000 deaths).

- a. Click on the ASSIGN command.
- b. Under Assign Variable, select MORTALITY_RATE.
- c. Under =Expression, select the variable for total number of deaths (COUNT), click on the Divide button (/), select the variable for the total population (POP_ADMIN), select the Times button (*), type 100000 (no commas).
- d. Click OK.

7. LIST to see the results of the mortality rate calculations.

- ☞ LIST but select only the PROVINCE and MORTALITY_RATE variables.

In order to have only this information our MORTALITYRATE table, we want to replace the original MORTALITYRATE table with a new table that includes only the name and mortality rate for each PROVINCE.

8. Click on the WRITE(EXPORT) command.

- a. Under Variables, select the PROVINCE and MORTALITY_RATE variables.
- b. Under Output Mode, select Replace.
- c. Under File Name, select **Advanced Analysis.MDB**.
- d. Under Data Table, select the MORTALITYRATE table.
- e. Click OK.

9. LIST the data in the table.

Fill in the table on the next page. This will serve as your answer to Question 13.

Question 13: Mortality Rates by Province

Province	Mortality Rate
Batdambang	
Kampong Cham	
Kampong Chhnang	
Kampong Spoe	
Kampong Thum	
Kampot	
Kandal	
Kaoh Kong	
Kracheh	
Mondol Kiri	
Phnum Penh	
Pouthisat	
Preah Vihear	
Prey Veng	
Rotanakiri	
Siemreab-Otdar Meanchey	
Stoeng Treng	
Svay Rieng	
Takev	

Q14 Map the mortality rate using the provided shape file.

The MAP Command creates a map in an output window for the data selected.

Using the MAP Command in Analysis

Use the following steps to map the mortality rate for the provided shapefile.

1. **Make sure you have READ the MORTALITYRATE table.**
2. **Select MAP command.**
3. **Check “1 record per geographic entity”**
4. **Geographic Variable is the name of the field that is going to be matched with the shape file’s name.**
 - ↪ Under Geographic Variable in the column to the left, select Province. (Note that the Geographic Variable appears twice, so be sure to choose the one in the left column. You will use the other selection in Step 7.)
5. **Data Variable is the variable that is going to be mapped.**
 - ↪ Select Mortality_Rate variable.
6. **Shape file is the name of the file we will be using.**
 - ↪ Select CB.SHP file.
7. **Geographic Variable is the name of the field that is going to be matched with the data file’s name.**
 - ↪ Under Geographic Variable located beneath Shapefile, select ADMIN_NAME.
8. **You should see a list of province names and confirm that this is the correct name field.**
9. **Select OK.**

Should you see a message stating that there was an “Incomplete Join.” it is because our MORTALITYRATE table did not contain all provinces available in the shape file. If you have an incomplete join, select CONTINUE. Otherwise you should just see a map displaying mortality rate data.
10. **From File, select Map Manager.**
11. **From the Map Manager, click on the “Properties” button.**
12. **Select the Choropleth tab.**

The Choropleth tab contains the properties that will allow you to change the color and the number of breaks.
13. **Change the Number of Classes and select the Quantiles option. Click Reset Legend.**
 - ↪ You can choose any number of classes you like.
14. **Click Apply to see how the map appears.**

15. When you are satisfied with the map, click on OK, close the Map Manager, and exit Epi Map (File | Exit).

You should be taken back to Analysis screen. You should also see the map that was created in the output window.

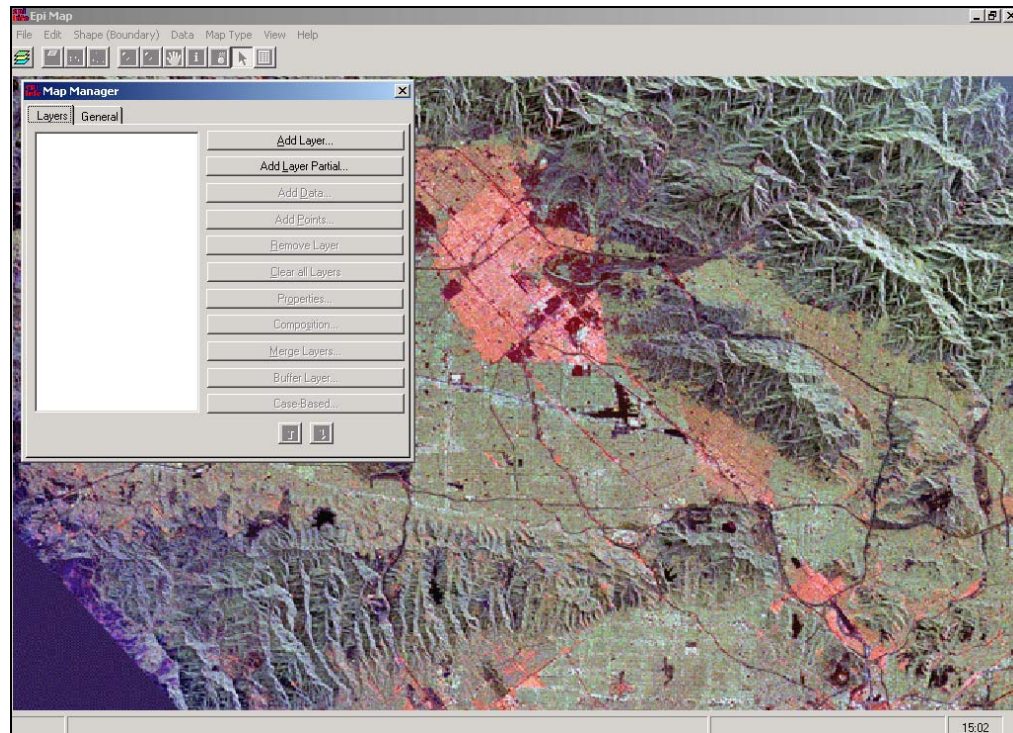
Using Epi Map Interactively

Epi Map, the mapping component of Epi Info, is built around MapObjects software from ESRI, the makers of ArcView and ArcInfo, popular Geographic Information System (GIS) tools. Epi Map displays shapefiles from these two systems, and thus can use the enormous reservoir of map boundaries and geographic data available on the Internet in ESRI-compatible formats.

Opening Epi Map

Use the following steps to open the Epi Map program in Epi Info.

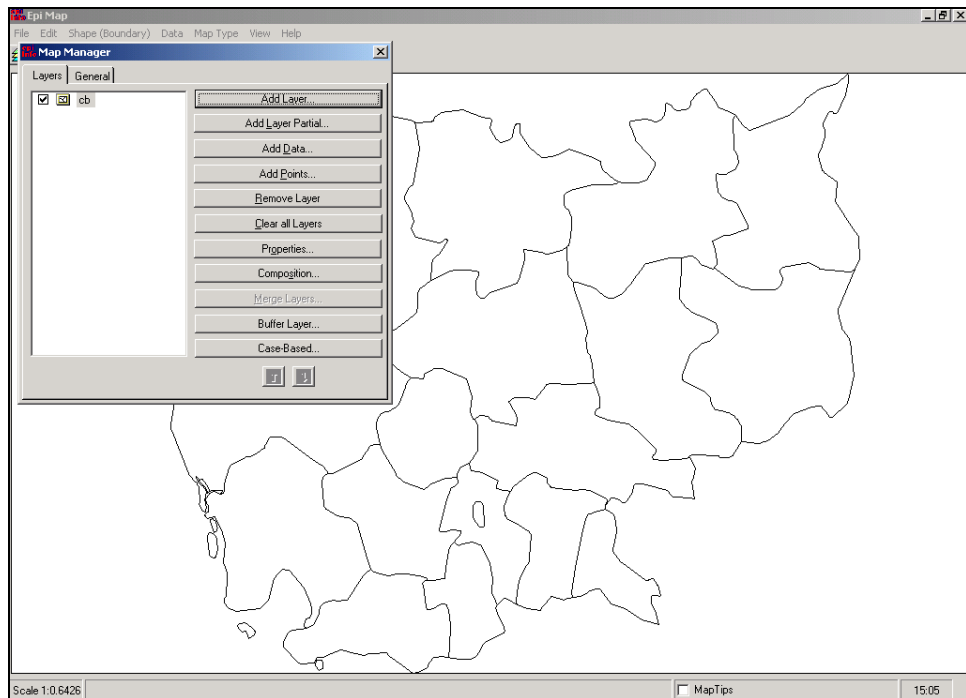
1. **Start Epi Map from Epi Info menu.**
2. **From the main menu, click on the Create Maps button.**
3. **Once the map is displayed, click on the Map Manager - the first button from the left on the task bar or click on File and then on Map Manager.**



Adding Layers to the Map

Use the following to add layers to the map.

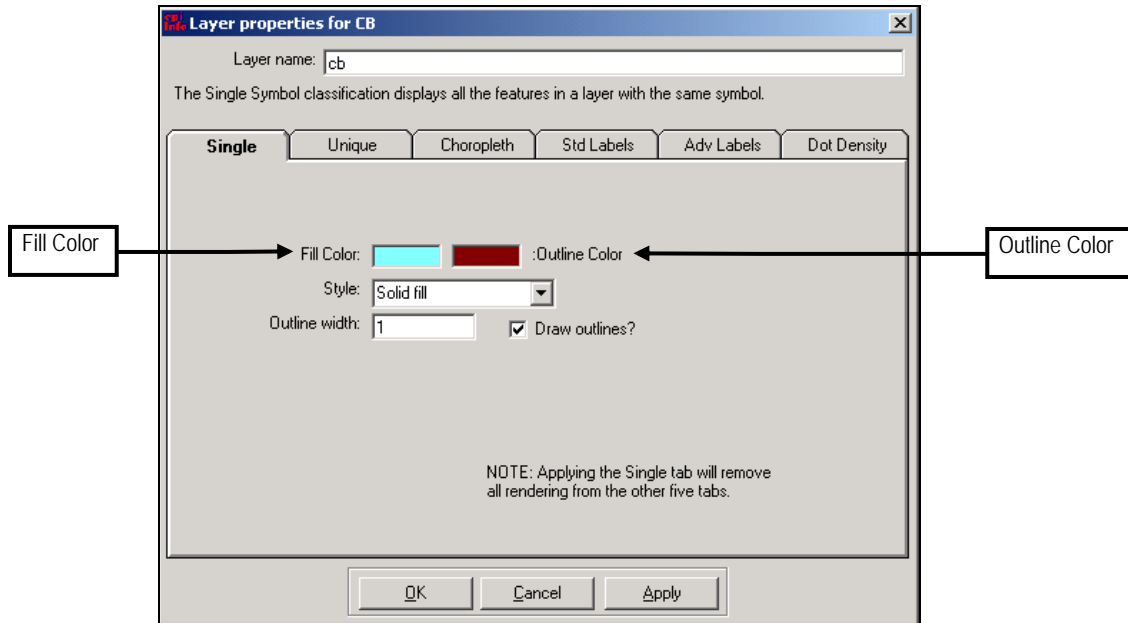
1. Click on the **Add Layer** button located at the top of the Map Manager, the first button on the Map Manager dialog box.
2. From the **Add Layer** dialog box, identify a shapefile and click on **Open**.
 - ☛ Choose the shapefile CB.shp for the Cambodia map.



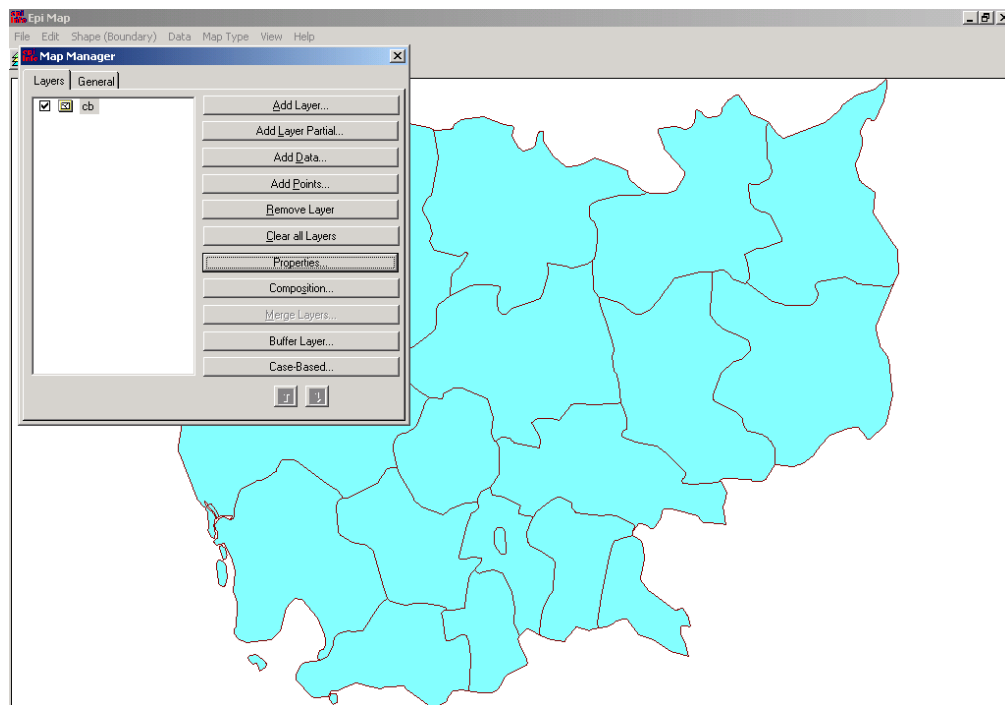
Changing the Color

Use the following to change the color of the map.

1. Click on the **Properties** button of the map manager.
2. Click on the **Fill Color** box and select a different color from the palette. Repeat this step to change the **Outline Color**.
 - ☛ Use contrasting colors such as red and blue to see the differences between both options.



3. Click on OK to implement the color change.

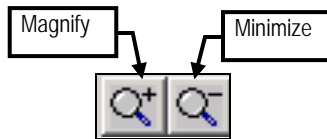


4. Close Map Manager.

➡ Click on the X at the top right of the Map Manager dialog.

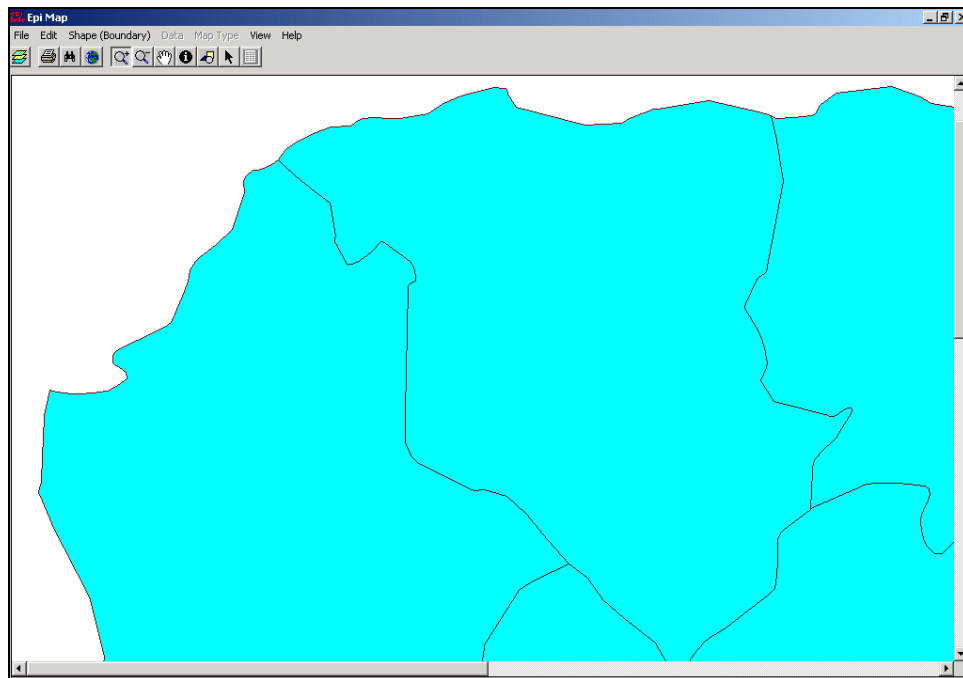
Maximizing/Minimizing the Map

The **Magnify** button (fifth button) is a magnifier with a plus (+) sign and the **Minimize** button (sixth button) is a magnifier with a minus (-) sign. The former enlarges the map and the latter reduces it.



1. Click on the **Magnify(+)** button and then draw a box around the provinces to magnify.

☞ Magnify the top left portion of the map.



Displaying Labels

There are two ways of displaying labels in Epi Map: Non printable labels and printable labels.


Displaying non-printable labels

Use the following to display non-printable labels.


1. **In the lower right border of the map, click on a box labeled Map Tips.**
Two combo boxes will appear. The first one allows selecting the layer and the second selects the field in the DBF component of the shapefile.

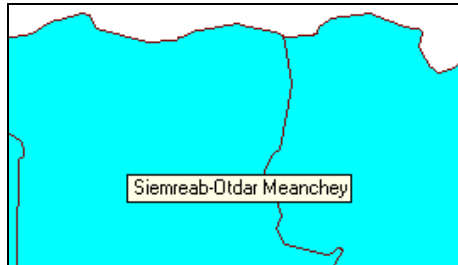


2. Select the field to display.

 Select the Admin_Name as field.


3. Place the mouse over any of the provinces.

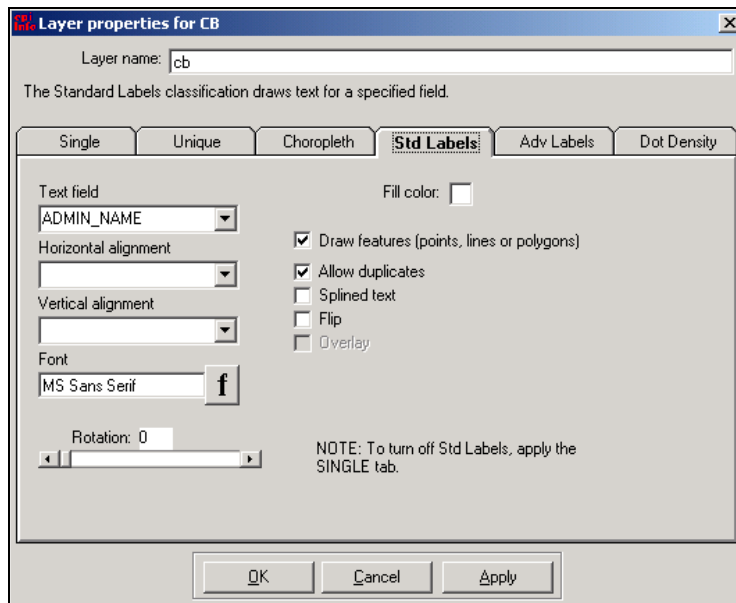
 A tool tip with the name of the province will pop up. Select another field and the data will display the changes.



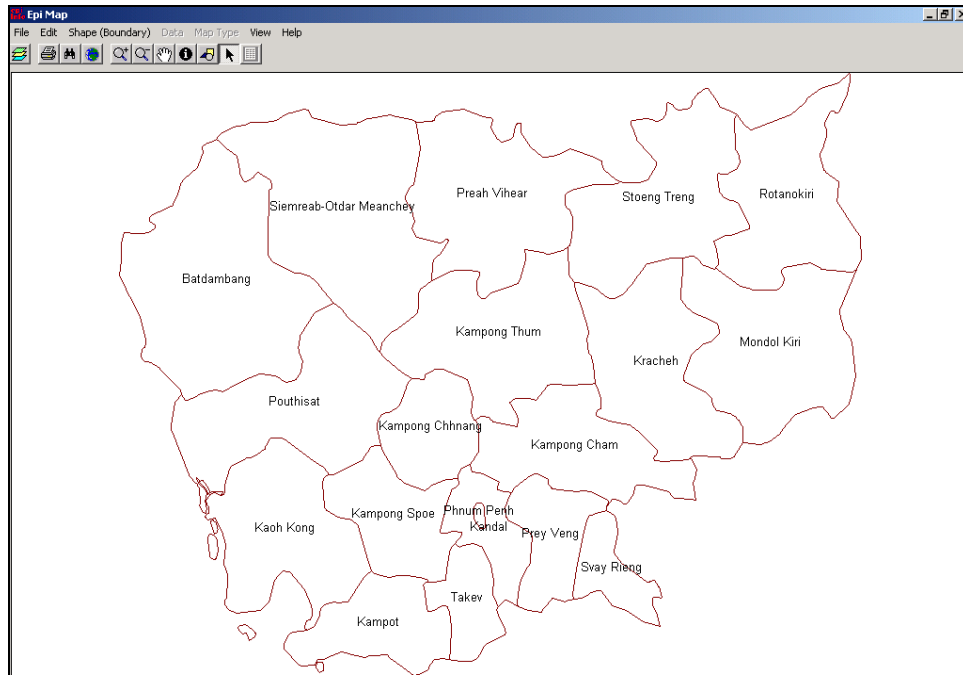
Displaying printable labels

Use the following to display the printable labels.

- To display the county name on the map as label, click the Map Manager button, and select Properties.**
- From the Single tab, change the color of the map to White within the Fill Color box. Click on Apply.**
- Click on the Std Labels tab, and in the box labeled Text Field select the field.**
 -  Verify that Admin_Name is selected.



- Click on Apply and then on OK.**
- Close the Map Manager.**

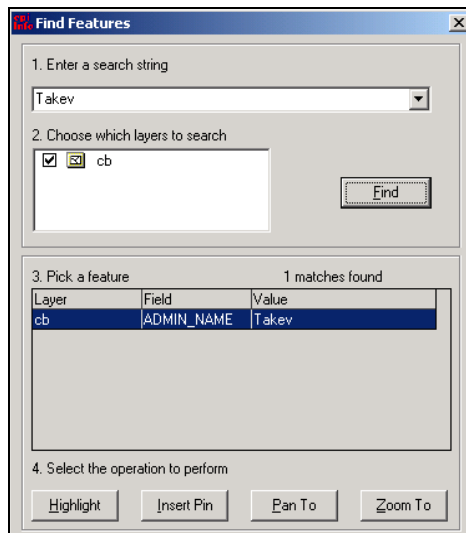


Finding an area

Use the following steps to find an area on the map.



1. On the toolbar there is a set of binoculars, representing the icon for Find. Click on it.
2. The new window contains a box at the top labeled “Enter a search string...”.
 ↵ Type Takev (case sensitive)
3. Click on Find.
 You will see areas with matching name. In this case, there is only one province named Takev.



4. Click on **Highlight** button on the bottom. The province should flash.
5. Click on **Insert Pin** button.
A little marker should be visible to let you mark where the province is located.



6. Click on the **Zoom To** button to get a close view of the province.
7. Close the Find window when done.



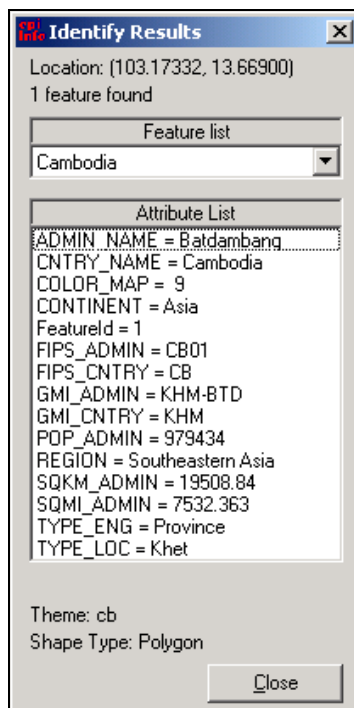
8. The map of will take up the entire screen area. In order to get back to the country map click on the button on the top of the screen below the menu items that looks like the earth.

Obtaining Information about an Area

Use the following to display information about a selected area on the map.



1. The toolbar button for Information is a black dot with an i. Click on it and then click on any polygon.

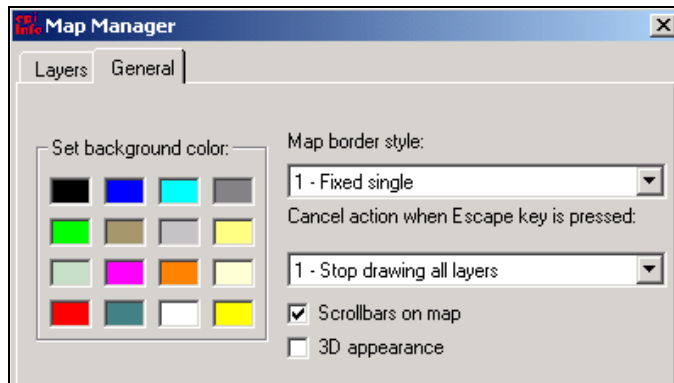


Changing the Background of the Map

At the top section of the *Map Manager*, notice the two tabs, **Layers** and **General**. Currently, the **Layers** tab is on top.



1. At the top section of the Map Manager, click on the General tab and select any color for the background.



2. Return to the Layers tab.

Clearing all Layers

Use the following to clear all map layers

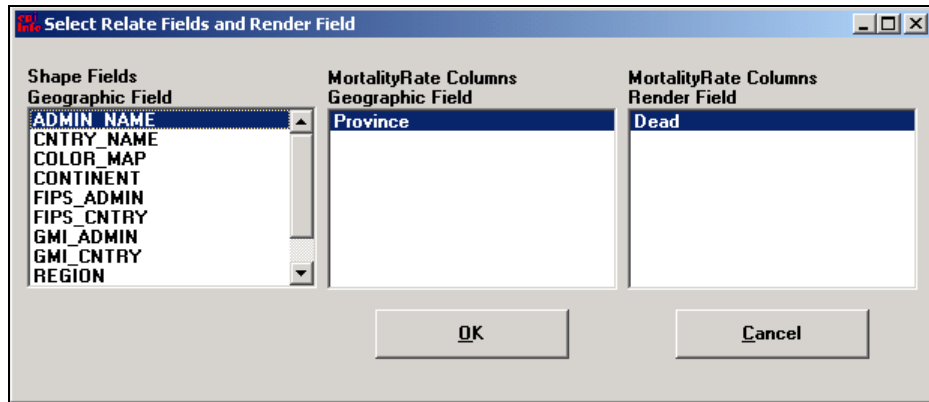
1. Remove all layers at once by clicking on Clear all Layers.
2. Close Epi Map.

Displaying Epi Info Data on Maps

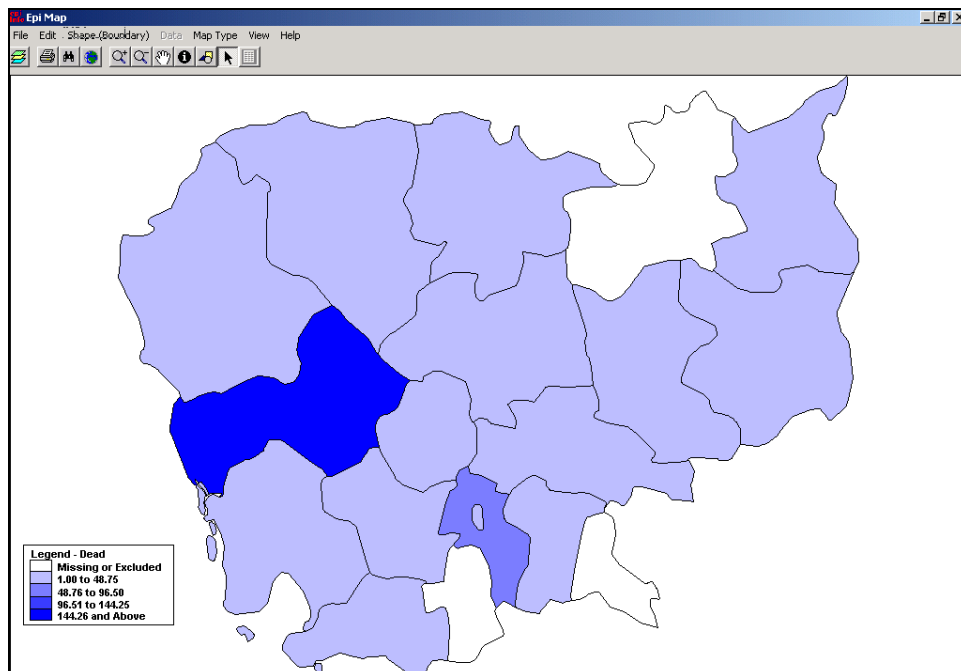
You can display data from an Epi Info database by first starting with Epi Map.

1. From the Epi Info menu, click on Create Maps and load the shapefile from the Map Manager.
 - Select the CB.shp file.
2. Click on the Map Manager and then click on the Add Data button.
 - Select the **AdvancedAnalysis.MDB** file and add data located in the MortalityRate table.
3. On the left-hand side, choose Admin_Name from the Shape Fields Geographic Field column.

- From the middle section, choose Province from the MortalityRate Columns Geographic Field column.
- On the right hand- side, choose Dead from the MortalityRate Columns Render Field column.



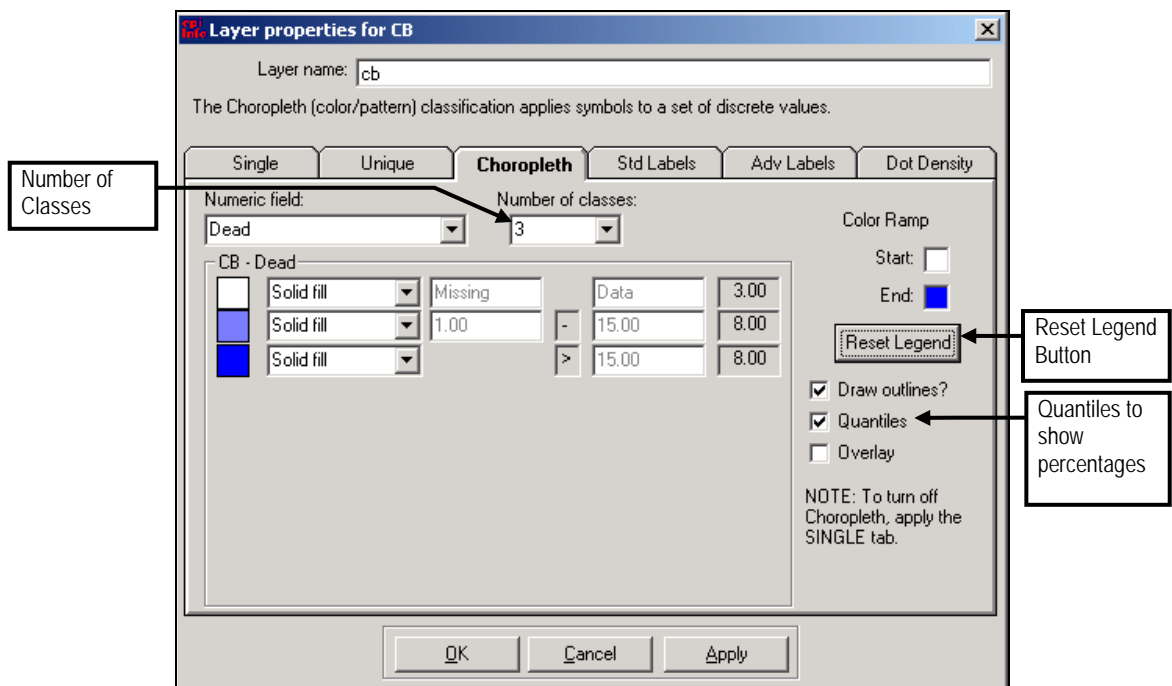
- Click on OK.
- Epi Map will display an Incomplete Join message. Click on Continue.
- Close Map Manager.
- You will see the number of deaths for the provinces displayed.



Changing the Choropleth settings

Data in Choropleth maps can be displayed two ways; one is automatic and the other is customizable.

1. From the Map Manager, click on the Properties button.
2. Click on the Choropleth tab.
The default values are from white to blue, and the default number of classes is five.
3. Epi Map allows displaying data in Percentiles. To activate the percentile distribution, check the box labeled Quantiles located below the Reset Legend button.
4. Left of the Color ramp is a drop-down box labeled Number of classes. Change it to three and click on the Reset Legend button.

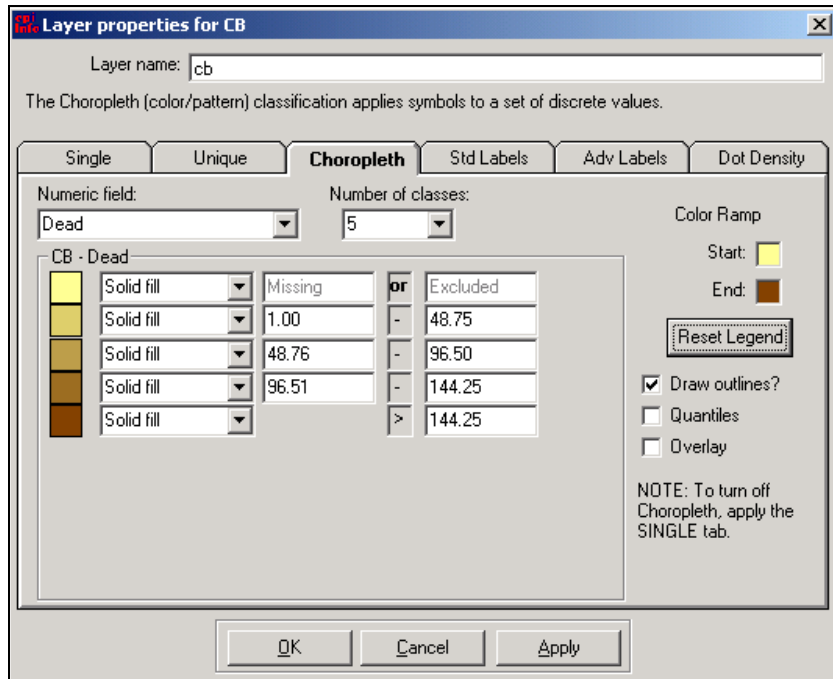


5. Click on Apply to make changes on the map.

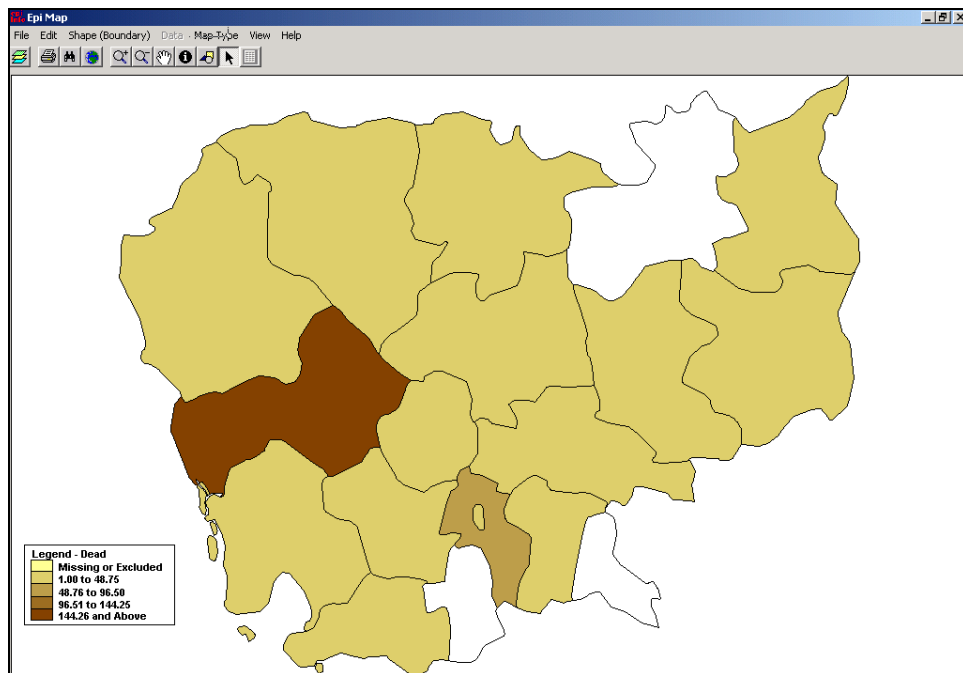


Note: While the option *Quantiles* is checked, the ranges are grayed out. To define your own ranges (customized), uncheck the *Quantiles* option.

6. Change the Number of Classes back to Five.
7. Select the Start color to light yellow and the End color dark brown.



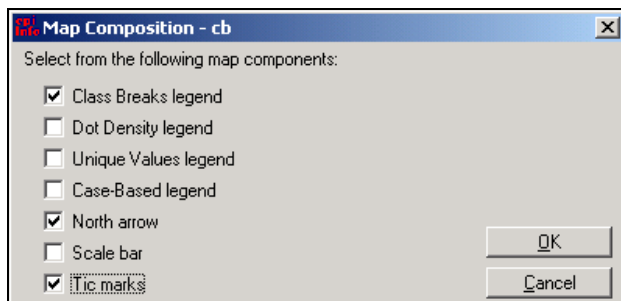
8. Click on the Reset Legend button.
9. Click on OK to make changes on the map.



Changing the properties for the legend

The legend can be modified from the Map Manager using the **Composition** button.

1. Click on Map Manager and Composition button
2. Click on the North arrow and Tic marks boxes and then click on OK.



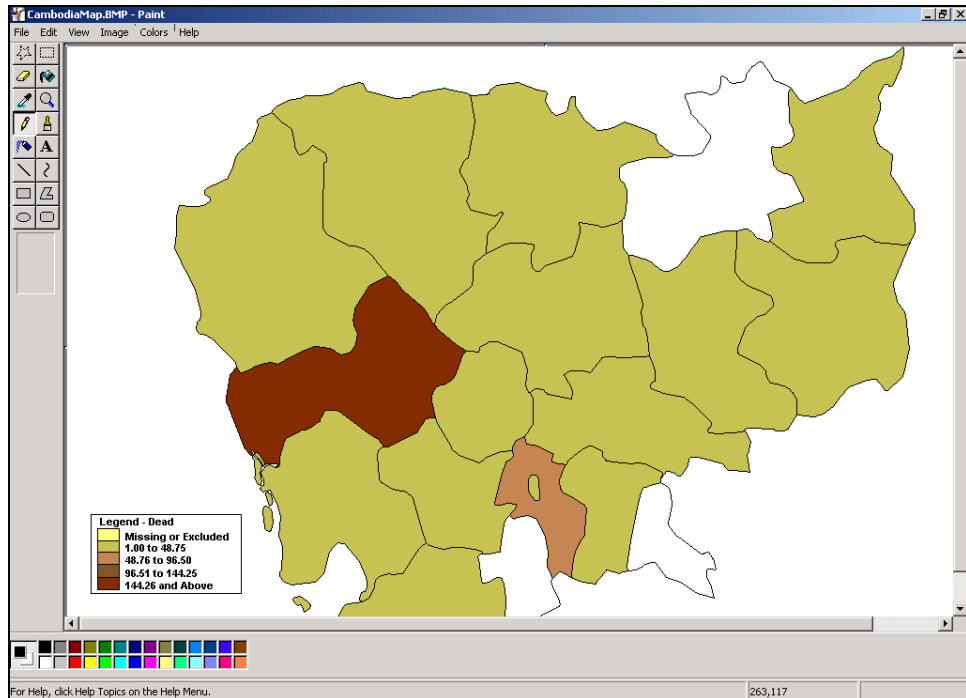
Saving Maps in Different File Formats

Maps can be saved in different file formats such as bitmaps and map files. Maps can also be copied to the Windows clipboard for use in other applications such as Microsoft Word® or Microsoft Excel®.

Saving Map as an Image

You can save the map as a bitmap (.BMP) image. Currently there are no options to save map images as other image file formats directly from Epi Map.

1. Close the Map Manager (if it is open) and from the pull-down menu, click on File | Save as Bitmap file.
2. Assign a name to your map and click on Save.
3. Open Windows Explorer and double-click the BMP to view.



Saving Map as an Interactive (.map)

Map files save the names of the shapefiles and related data files together with properties of the map that may have been set. The advantage of saving a MAP file over a BMP is that Epi Map will update the data on the map every time you open it.

1. To save this map as a MAP file, click on **File** and then on **Save Map File**.
 ↪ Name this map CB_Death.
2. Click on **Save**.

Sending an Image to the Clipboard

It is possible to copy the map to the clipboard and then paste the map into another application (such as Microsoft PowerPoint®, Microsoft Word®, Corel Presentations®, or Harvard Graphics®).

1. Close the Map Manager (if it is open) and click on **Edit | Copy Bitmap to the Clipboard**.
2. Select the target application and paste the image.
3. Close Epi Map.

Creating Titles

The Graphics option on the toolbar adds six additional tools to the toolbar: **Add Text**, **Add Point**, **Add Line**, **Add Rectangle**, **Add Polygon**, **Add Ellipse**, and **Select graphic for Editing**.



1. Click on the Graphics button on the toolbar.

An additional toolbar displays in Epi Map.

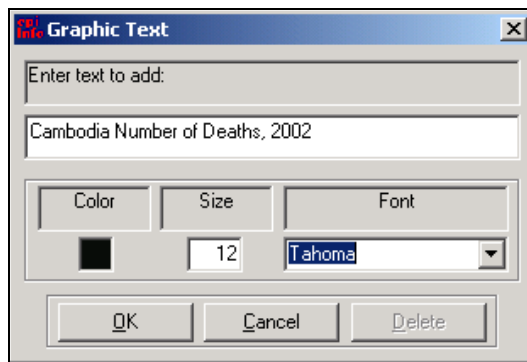


2. Click on the new Add Text button, and the cursor will turn into a plus sign.

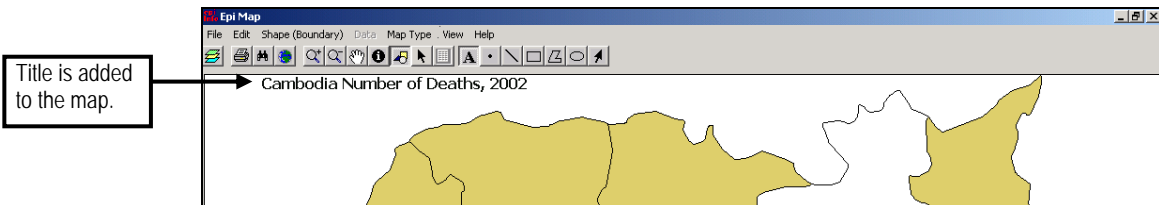
3. Move the cursor to a white area towards the top of the screen and click once to create a title for the map.

↔ At the new dialog box, type Cambodia Number of Deaths, 2002

4. Change the color, size and font type to any style.



5. Click on OK.



6. To edit the title, from the Graphics toolbar, choose the last black arrow button. A lime green plus sign will then appear on the title.

7. Move the cursor over the green plus sign and double-click. Make any changes as needed.

Complex Statistics – C Sample, Linear and Logistic Regression

Complex Sample

The **FREQ**, **TABLES**, and **MEANS** commands in the **ANALYSIS** program in Epi Info perform statistical calculations that assume the data come from simple random (or unbiased systematic) samples. In many survey applications, more complicated sampling strategies are used. These may involve sampling features like stratification, cluster sampling, and the use of unequal sampling fractions. Surveys that include some form of complex sampling include the coverage surveys of the WHO Expanded Program on Immunization (EPI) (Lemeshow and Robinson, 1985) and CDC's Behavioral Risk Factor Surveillance System (Marks et al., 1985).

The **CSAMPLE** functions compute proportions or means with standard errors and confidence limits for studies in which the data did not come from a simple random sample. If tables with two dimensions are requested, the odds ratio, risk ratio, and risk difference are also calculated.

Data from complex sample designs should be analyzed with methods that account for the sampling design. In the past, easy-to-use programs were not available for analysis of such data. **CSAMPLE** provides these facilities, and, with an understanding of sampling design and analysis, can form the basis of a complete survey system.

To use the complex sample statistics, a variable must identify the primary sampling unit (PSU) or clusters identifier. Sample weights and strata can also be specified, but are not required. Weights are usually calculated during the sample design process and, if present, used during the analysis.


Linear Regression

REGRESS can be used for simple linear regression (only one independent variable), for multiple linear regression (more than one independent variable), and for quantifying the relationship between two continuous variables (correlation). Regression is used when the primary interest is to predict one dependent variable (y) from one or more independent variables (x1, ... xk).

Simple Linear Regression



Below is an example of a Linear Regression analysis with graphing to illustrate the result.

Step 1:

1. **Click on the READ command.**
2. **Check to see if the Current Project is correct. If not, click on the Change Project button and select the correct file.**
 -  We want to use the *Sample.MDB* file that is located within the Epi_Info folder on the C: Drive (C:/Epi_Info/Sample.MDB).



NOTE: The *Sample.MDB* file is installed with the Epi Info software.

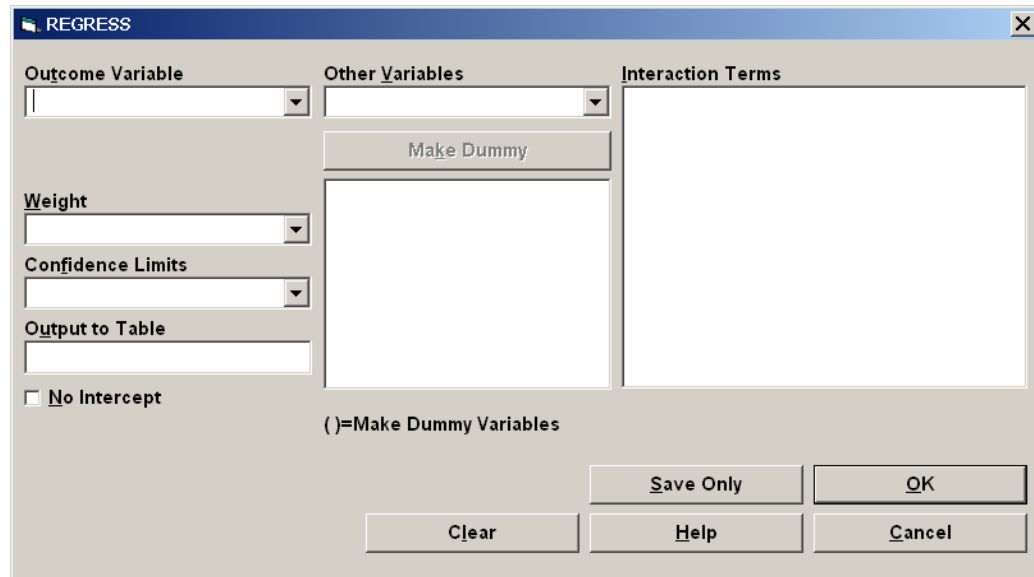
3. **Select the View.**
 -  Select BabyBloodPressure.
4. **Click OK.**
 -  The program editor will show:

```
READ 'Sample.Mdb': viewBabyBloodPressure
```

5. LIST the data to see what it looks like.

Step 2:

1. Click on LINEAR REGRESSION command.



2. Select the Outcome Variable.

Select *SystolicBlood*.

3. Select Other Variables.

We will select both the other variables, *AgeInDays* and *Birthweight*.

4. Name a new table to receive output data in Output to Table.

Type: LNR.

The output from this analysis will be the *SystolicBlood* data plus the Residual data. It will become a new table placed in the same Epi Info Project (.MDB file) as the original file. In this case, the LNR table will become part of the *Sample.MDB* file.

5. Click OK.

☞ This is the results you will see.

Linear Regression

Variable	Coefficient	Std Error	F-test	P-Value
AgeInDays	5.888	0.680	74.9229	0.000002
Birthweight	0.126	0.034	13.3770	0.003281
CONSTANT	53.450	4.532	139.1042	0.000000

Correlation Coefficient: $r^2 = 0.88$

Source	df	Sum of Squares	Mean Square	F-statistic
Regression	2	591.036	295.518	48.081
Residuals	13	79.902	6.146	
Total	15	670.938		

↩ The program editor will show:

REGRESS SystolicBlood = AgeInDays Birthweight OUTTABLE=LNR

Correlation coefficient	The Pearson correlation coefficient, or "r". In this example, the correlation is 0.61, indicating a relatively strong positive correlation between estriol and birthweight. With only a single independent variable, the correlation = square root (R^2).
r^2	Sometimes represented as r^2 or R^2 (i.e., R squared). The R^2 value = Regression Sum of Squares / Total Sums of Squares (in the above example, $248.421/676.968 = 0.367$). The R^2 can be considered the proportion of variance of y (in this example, birthweight) that can be explained by x (in this example, estriol). In this example, 37% of the variance in birthweight can be explained by the women's estriol levels. If $R^2 = 1$, then all of the variability is explained, which would mean that all data points fall on the regression line. If $R^2 = 0$, then no variance is explained.
F-Statistic	The F-statistic is the Regression Mean Square / Residual Mean Square (in the above example, $248.421/14.777 = 16.81$). The F-statistic is calculated to determine if the slope of the regression line is significantly different from 0.
Mean	The average value for ESTRIOL; could also be determined with FREQ ESTRIOL.
Coefficient	The slope in the line, sometimes referred to as the "regression coefficient." In this example, 0.606 can be interpreted as: For every 1 unit increase in estriol (1 mg/24 hr), there is a 0.61 increase in each birthweight unit (g/100). Statistics concerning the slope are also provided: the standard error (Std Error), 0.148. The interpretation would be that we observed for every 1 unit increase in Estriol a 0.61 increase in birthweight.

Y-Intercept

This is where the line intercepts the y line. In this example, the line would intercept the (birthweight) line (y) at 21.5.

The general form of the simple linear regression line is:

$$y = a + bx$$

where y is the dependent variable, a is the intercept, and x is the independent variable.

In the above example, the regression line is:

$$BW = a + b (\text{estriol})$$

$$BW = 21.54 + 0.61 (\text{estriol})$$

For any given value of estriol, a BW value can be predicted. For example, using the mean estriol level of 17.226,

$$BW = 21.54 + 0.61(17.226) = 32.05$$

Step 3:

1. Click on the **READ** command.
2. Select the newly created output table.

Remember that you created a table that did not have a corresponding view. Click on All to see all the tables in the Sample.MDB file and then select LNR.

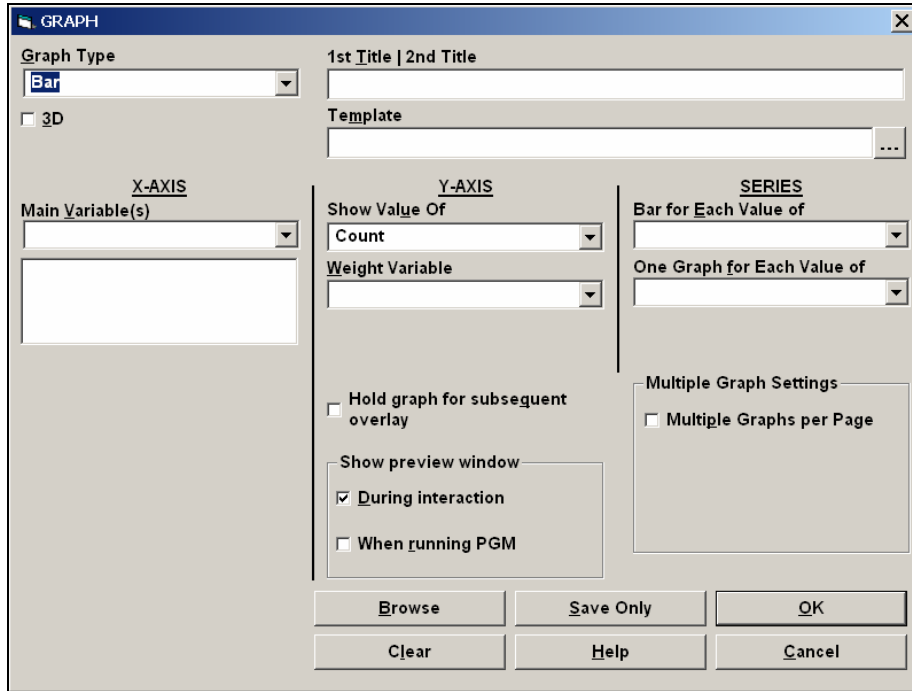
3. Click **OK**.

 The program editor will show: **READ LNR**

4. **LIST** the data to see what it looks like.

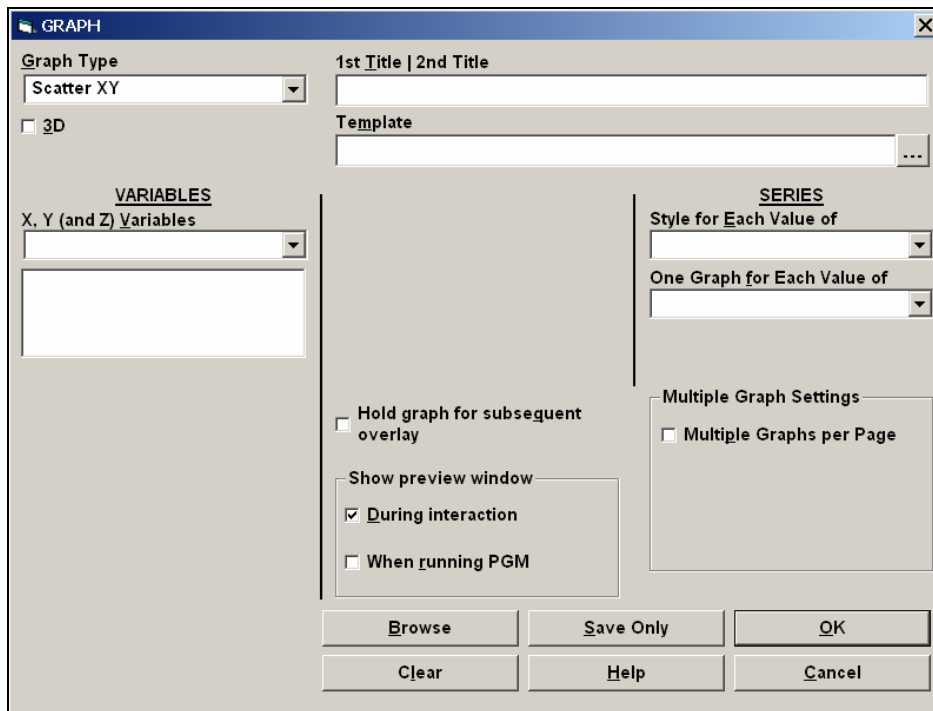
Step 4:

1. Click on the **GRAPH** command.



2. Select Graph Type.

➡ We want to create a scatter diagram of the data. Select "Scatter XY." You will notice that the GRAPH dialog box changes.



3. Select the X and Y variables, selecting the X variable first and the Y variable second.

- ☞ Select the SystolicBlood variable (X variable) first and then select RESIDUAL (the Y variable) second.

4. Click OK.

- ☞ The program editor will show:

```
GRAPH SystolicBlood RESIDUAL GRAPHTYPE="Scatter XY"
```

Logistic Regression

Logistic Regression is more frequently used in epidemiology, because the s-curve on which it is based better represents the extremes than does the straight line of linear regression.

In Epi Info either the TABLES command or logistic regression (LOGISTIC command) can be used when the outcome variable is dichotomous (for example, disease/no disease). Analysis with the TABLES command in Epi Info is adequate if there is only one "risk factor." Logistic regression is needed when the number of explanatory variables ("risk factors") is more than one. The method is often called "multivariate logistic regression." Logistic regression shows the relationship between an outcome variable with two values and explanatory variables that can be categorical or continuous.

For example, we can use logistic regression to analyze the Oswego data to determine which food may have caused the illness. In the Oswego exercise, the dependent (outcome) variable, ILLNESS, is dichotomous (i.e., that the value can be either No [0] or Yes [1]). The independent variables used in the model can be either categorical (Eat potato salad? – Yes or No) or continuous (Age).

In the following illustration, ILLNESS is the outcome variable and AGE, COFFEE, MILK and VANILLA are dependent variables.

Step 1:

1. **Click on the READ command.**
2. **Check to see if the Current Project is correct. If not, click on the Change Project button and select the correct file.**
 - ☞ We want to use the *Sample.MDB* file that is located within the Epi_Info folder on the C: Drive (C:/Epi_Info/Sample.MDB).



NOTE: The *Sample.MDB* file is installed with the Epi Info software.

3. Select the View.

- ☞ Select *Oswego*.

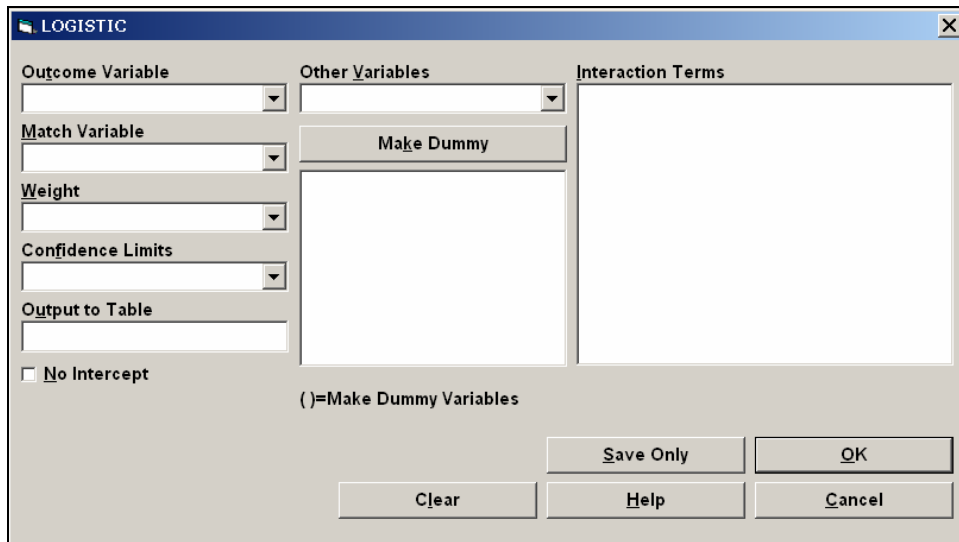
4. Click OK.

- ☞ The program editor will show: **READ 'Sample.Mdb':viewOswego**

5. LIST the data to see what it looks like.

Step 2:

1. Click on the **LOGISTIC REGRESSION** command.



2. Under **Outcome Variable**, select the outcome variable variable.
 ➡ Select *///*.
3. Under **Other Variables**, select the explanatory variables.
 ➡ Select Brownbread, Cabbagesal, Water, Milk, Chocolate, and Vanilla. The explanatory variables (or risk factor variables) will appear in the space below the Make Dummy button.
4. Click **OK**.
 ➡ The program editor will show:

```
LOGISTIC ILL = BROWNBREAD CABBAGESAL WATER MILK CHOCOLATE
VANILLA
```

Unconditional Logistic Regression

Term	Odds Ratio	95%	C.I.	Coefficient	S. E.	Z-Statistic	P-Value
AGE	1.0098	0.9791	1.0415	0.0098	0.0158	0.6205	0.5349
coffee (Yes/No)	0.7953	0.2012	3.1440	-0.2290	0.7013	-0.3265	0.7440
milk (Yes/No)	0.4687	0.0399	5.5074	-0.7577	1.2571	-0.6028	0.5467
VANILLA (Yes/No)	<u>23.0042</u>	<u>5.6400</u>	<u>93.8297</u>	3.1357	0.7173	4.3717	<u>0.0000</u>
CONSTANT	*	*	*	-1.9931	0.7833	-2.5445	<u>0.0109</u>

Convergence: Converged
 Iterations: 5
 Final -2*Log-Likelihood: 70.9659
 Cases included: 75

Test	Statistic	D.F.	P-Value
Score	27.7952	4	0.0000
Likelihood Ratio	29.1192	4	0.0000

Examining the output, one can clearly see that VANILLA is the culprit.

Appendices

- Appendix A: Cholera Paper Questionnaire**
- Appendix B: Summary Guidelines for Specific Priority Diseases and Conditions**
- Appendix C: Epi Info for Windows Menus**
- Appendix D: Code Sheet**
- Appendix E: Data Entry Questionnaires**
- Appendix F: Answers to Training Questions**
- Appendix G: Answers to Advanced Analysis Questions**

Appendix A: Cholera Paper Questionnaire

The following is an example of the paper questionnaire administered to the cases and controls in the study.



NOTE: While the following questionnaire reflects the actual questionnaire used in the Cholera in Rwenshama outbreak investigation, you may wish to refer to your training on questionnaire design when developing questions and their responses. For example, Question 5 is on Education Level. The possible responses to this question are: nil, P1-P4, P5-P7, secondary, and tertiary. Rather than grouping the responses like this, it is often preferable to make the response a continuous variable (0, 1, 2, 3, etc.) in order to allow the greatest flexibility when analyzing the data. Responses can be recoded into desired groupings, if necessary, when analyzing the data. "Recoding" will be presented in

The questionnaire begins on the following page.

CHOLERA IN RWENSHAMA, RUKUNGIRI – 2001

(page 1 of 2)

QUESTIONNAIRE NO.....

DATE.....

Personal Specification

1. Name.....2. Age..... 3. Sex.....

4. Occupation..... 5. Education level: nil
 P1-P4
 P5-P7
 secondary
 tertiary

6. Village..... 7. No. of people in household.....

8. ILL? Yes No 9. If ILL, date of onset.....
(If not ill, skip to question 16.)

Illness

10. Symptoms of illness (select all that apply):

 diarrhoea vomiting cramps in abdomen cramps in arms and legs

11. Duration of illness before reporting for treatment at health unit.....

12. Treatments given at home before reporting:

13. Signs on presentation at health unit:

dehydration (circle one): nil some severe

fever Yes No

other(specify).....

14. Treatments given at health units (select all that apply):

 oral fluids i-v fluids tetracycline co-trimoxazole

other (specify).....

15. Outcome: improved died

Questionnaire No.

(Page 2 of 2)

Risk Factors

16. History of eating in a particular place outside home within past 5 days:

 Yes No17. If Yes, specify: hotel bar neighbour food sold at roadside

18. Have you taken any of these foods hot or cold in the last 5 days?

(Check if the food was eaten.)

<u>food</u>	<input type="checkbox"/>	<u>food</u>	<input type="checkbox"/>	<u>food</u>	<input type="checkbox"/>
hot matooke *	<input type="checkbox"/>	hot posho *	<input type="checkbox"/>	hot peas	<input type="checkbox"/>
cold matooke	<input type="checkbox"/>	old posho	<input type="checkbox"/>	cold peas	<input type="checkbox"/>
hot sweet potatoes	<input type="checkbox"/>	hot mandazi *	<input type="checkbox"/>	hot meat	<input type="checkbox"/>
cold sweet potatoes	<input type="checkbox"/>	old mandazi	<input type="checkbox"/>	cold meat	<input type="checkbox"/>
hot rice	<input type="checkbox"/>	hot cassava	<input type="checkbox"/>	hot milk	<input type="checkbox"/>
cold rice	<input type="checkbox"/>	cold cassava	<input type="checkbox"/>	cold milk	<input type="checkbox"/>
hot irish potatoes	<input type="checkbox"/>	hot beans	<input type="checkbox"/>	hot fish	<input type="checkbox"/>
cold irish potatoes	<input type="checkbox"/>	cold beans	<input type="checkbox"/>	cold fish	<input type="checkbox"/>
obushera *	<input type="checkbox"/>				
sugar cane	<input type="checkbox"/>				
sweet bananas	<input type="checkbox"/>				
salads(raw tomatoes or cabbage)	<input type="checkbox"/>				

19. Diarrhea contact at home within the last five days? Yes No 20. Availability of pit latrine in home: Yes No 21. If Yes, what is the state of the latrine? clean dirty 22. Where does household get its water from? lake river

23. How does household prepare its water for drinking? boiling not boiling

24. Does household have facility for hand washing after latrine use? Yes No

25. Is there a rack for drying plates in the home? Yes No (if yes, confirm)

26. Cleanliness around the home: good fair poor

27. Did you attend Health Education sessions on diarrhoea or cholera in the last 2 years?

Yes No

28. If Yes, who gave it?.....

29. In your opinion how does one get cholera?.....

* **Matooke** is a staple food of Uganda made from green plantains. They are eaten like potatoes. **Posho** is boiled maize (corn) meal. **Mandazi** is fried bread, similar to a doughnut. **Obushera** is a thin porridge made from germinated grain.

Appendix B: Summary Guidelines for Specific Priority Diseases & Conditions²

Cholera

<p>Background</p>	<ul style="list-style-type: none"> ▪ Acute illness with profuse watery diarrhoea caused by <i>Vibrio cholerae</i> serogroups O1 or O139. The disease is transmitted mainly through eating or drinking contaminated food or water; that is, cholera is spread through the fecal-oral route. ▪ Cholera causes over 100 000 deaths per year. It may produce rapidly progressive epidemics or worldwide pandemics. In endemic areas, sporadic cases (less than 5% of all non-outbreak-related diarrhoea cases) and small outbreaks may occur. ▪ Incubation period is from a few hours to 5 days, usually in the range from 2 to 3 days. ▪ There has been a resurgence of cholera in Africa since the mid-1980s, where over 80% of the world's cases occurred in 1999, with the majority of cases occurring from January through April. ▪ Cholera may cause severe dehydration in only a few hours. The case fatality rate (CFR) may exceed 50% in untreated patients with severe dehydration. If patients present at the health facility and correct treatment is received, the CFR is usually less than 1%. At least 90% of the cases are mild, and they remain undiagnosed. ▪ Risk factors: eating or drinking of contaminated foods such as uncooked seafood or shellfish from estuarine waters, lack of continuous access to safe water and food supplies, attending large gatherings of people including ceremonies such as weddings or funerals, contact with persons who died of cholera. ▪ Other enteric diarrhoea may cause watery diarrhoea, especially in children less than 5 years of age. Please see <i>Diarrhoea with dehydration</i> summary guidelines.
--------------------------	---

² From: World Health Organization Regional Office for Africa and the Centers for Disease Control and Prevention. *Technical Guidelines for Integrated Disease Surveillance and Response in the African Region*. Harare, Zimbabwe and Atlanta, Georgia, USA. July 2001: 1-229.

<p>Surveillance goal</p>	<ul style="list-style-type: none"> ▪ Detect and respond promptly and appropriately to cases and outbreaks of watery diarrhoea promptly. To confirm an outbreak, collect stool specimens transported in Cary-Blair medium. ▪ Immediate case-based reporting of cases and deaths when an outbreak is suspected.
<p>Recommended case definition</p>	<p>Suspected case: In a patient age 5 years or more, severe dehydration or death from acute watery diarrhoea.</p> <p>If there is a cholera epidemic, a suspected case is any person age 5 years or more with acute watery diarrhoea, with or without vomiting.</p> <p>Confirmed case: A suspected case in which <i>Vibrio cholerae</i> O1 or O139 has been isolated in the stool.</p>
<p>Respond to alert threshold for epidemic-prone diseases</p>	<p>If a single case is suspected:</p> <ul style="list-style-type: none"> ▪ Report case-based information immediately. ▪ Manage and treat the case according to national guidelines. ▪ Enhance strict handwashing and isolation procedures. ▪ Conduct case-based investigation to identify similar cases not previously reported and confirm the outbreak. ▪ Obtain stool specimen from 5 patients within 5 days of onset of acute watery diarrhoea, and before antibiotic treatment is started. See laboratory guidelines for information on how to prepare, store and ship the specimens.
<p>Respond to action threshold for epidemic-prone diseases</p>	<p>If a suspected case is confirmed:</p> <ul style="list-style-type: none"> ▪ Establish treatment center in locality where cases occur. Treat cases onsite rather than asking patients to go to standing treatment centers elsewhere. ▪ Strengthen management and treatment of cases. ▪ Mobilize community early to enable rapid case detection and treatment. Survey the availability of clean drinking water. ▪ Work with community leaders to limit the number of funerals or other large gatherings for ceremonies or other reasons, especially during an epidemic. ▪ Reduce sporadic and outbreak-related cases through continuous access to safe water. Promote safe preparation of food (especially seafood, fruits, and vegetables). Promote safe disposal of human waste.

Analyze and interpret data	<p>Time: Graph weekly cases and deaths and construct an epidemic curve during outbreaks. Report case-based information immediately and summary information monthly for routine surveillance.</p> <p>Place: Plot the location of case households.</p> <p>Person: Count weekly total cases and deaths for sporadic cases and during outbreaks. Analyze age distribution, distribution according to sources of drinking water, assess risk factors to improve control of sporadic cases and outbreaks.</p>
Reference	<p><i>Management of the patient with cholera</i>, World Health Organization, 1992. WHO/CDD/SER/91.15 Rev1 (1992)</p> <p><i>Epidemic diarrhoeal disease preparedness and response--Training and practice</i>. Facilitator and participant manuals. World Health Organization, 1997. WHO/EMC/DIS/97.3 and WHO/EMC/DIS/97.4</p>

Appendix C: Epi Info for Windows Menus

Epi Info Menus

At the top of the screen, you will find menu buttons, which you click once to access.



A brief description of each follows:

Main Menu Option	Sub-menu Options	Description
Programs		
	Make View (Questionnaire)	Used to create "views" or questionnaires.
	Enter Data	Used to enter and edit data.
	Analyze Data	Used to analyze data.
	Create Maps	Used to create maps from data variables with Epi Map.
	Create Reports	Used to create reports with Epi Report.
	Nutrition (NuStat)	Launches an anthropometric calculator.
Edit		
	Picture	Choose a new picture for the Epi Info main menu background. The default is EpiInfo.jpg.
	Edit This Menu	Used when creating applications in Epi Info for Windows.
	Buttons On or Off	Turns the buttons on the main menu off or on.
	Move/Resize Buttons	Allows you to move or resize the main menu buttons. You can either click on this menu item or click on Shift and the F2 buttons <Shift/F2> to see directions.
Settings		
	Choose Language	Choose the language in which you want to use Epi Info for Windows. English is the default and may be the only language installed. You must install other available languages.
	Choose Epi Info Database Version	This allows you to choose which file format your databases will be saved in, either Access '97 or Access 2000.
	Set Working Directory	Set the working directory for the files you save.
	Set INI File Directory	Change the location of the file containing Epi Info settings (epiinfo.ini).

Main Menu Option	Sub-menu Options	Description
Utilities		
	StatCalc	A DOS program that calculates statistics from table values entered through the keyboard.
	Data Compare	A utility to compare the data in two tables.
	Table to View	A utility to view the data in the table.
	Visualize Data	A program used to read data files and examine or change their properties.
	EpiLock	A utility for encrypting files to protect them during transfer.
	Compact	A utility to compact a Microsoft Access MDB file.
	Word Processor	Accesses WordPad, a simple word processor.
Help		
	Contents	All the contents of the Help files.
	Translations	Links to a Help file on how to translate the Epi Info program into other languages.
	How to Edit the Menu	A section of the Help files on how to edit the menu.
	Tutorials	Epidemiology tutorials that use elements of Epi Info for Windows: Oswego, Rhodo, and Surveillance.
	Epi Info Exercises	A complete exercise that illustrates a broad range of Epi Info for Windows functions.
	What's New	New elements and changes in Epi Info for Windows.

Appendix D: Code Sheet

Field Name	Prompt/Question	Type	Additional Information
Question	Questionnaire No.	Number	
Date	Date	Date	DD/MM/YYYY
Q1Name	Name	Text	
Q2Age	Age	Number	
Q3Sex	Sex	Text with Legal Values	<ul style="list-style-type: none"> • Male • Female
Q4Occup	Occupation	Text	
Q5Educ	Education Level	Text with Legal Values	<ul style="list-style-type: none"> • Nil • Primary 1-4 • Primary 5-7 • Secondary • Tertiary
Q6Villag	Village	Text with Legal Values	<ul style="list-style-type: none"> • Rwenshama • Rwebinyoni • Ncwera
Q7House	No. of People in Household	Number	
Q8Ill	Ill?	Yes/No	
Q9Onset	If yes, date of onset	Date	DD/MM/YYYY
Q10Diarr	Diarrhoea	Checkbox	
Q11Vomit	Vomiting	Checkbox	
Q12Abdom	Cramps in abdomen	Checkbox	
Q13Armle	Cramps in arms and legs	Checkbox	
Q14Durat	Duration of illness in days before reporting for treatment at the health unit	Number	
Q15HomeT	Treatment given at home before reporting	Multiline	
Q16Dehyd	Dehydration	Text with Legal Value	<ul style="list-style-type: none"> • nil • some • severe
Q17Fever	Fever	Yes/No	
Q18Sign	Other (specify)	Text	
Q19Oral	Oral fluids	Checkbox	
Q20Iv	I-V fluids	Checkbox	
Q21Tetra	Tetracycline	Checkbox	
Q22Cotri	Co-trimoxazole	Checkbox	

Field Name	Prompt/Question	Type	Additional Information
Q23UnitT	Other (specify)	Multiline	Refers to other treatment
Q24Outco	Outcome	Text with Legal Value	<ul style="list-style-type: none"> died improved
Q25Eat	History of eating outside home within past 5 days	Yes/No	
Q26Place	If yes, specify	Text (Legal Value)	<ul style="list-style-type: none"> hotel bar neighbor roadside
Q27Hmato	Hot matooke	Checkbox	
Q28Cmato	Cold matooke	Checkbox	
Q29Hswee	Hot sweet potatoes	Checkbox	
Q30Cswee	Cold sweet potatoes	Checkbox	
Q31Hrice	Hot rice	Checkbox	
Q32Crice	Cold rice	Checkbox	
Q33Hiris	Hot irish potatoes	Checkbox	
Q34Ciris	Cold irish potatoes	Checkbox	
Q35Hposh	Hot posho	Checkbox	
Q36Cposh	Cold posho	Checkbox	
Q37Hmand	Hot mandazi	Checkbox	
Q38Cmand	Cold mandazi	Checkbox	
Q39Hcass	Hot cassava	Checkbox	
Q40Ccass	Cold cassava	Checkbox	
Q41Hbean	Hot beans	Checkbox	
Q42Cbean	Cold beans	Checkbox	
Q43Hpeas	Hot peas	Checkbox	
Q44Cpeas	Cold peas	Checkbox	
Q45Hmeat	Hot meat	Checkbox	
Q46Cmeat	Cold meat	Checkbox	
Q47Hmilk	Hot milk	Checkbox	
Q48 Cmilk	Cold milk	Checkbox	
Q49Hfish	Hot fish	Checkbox	
Q50Cfish	Cold fish	Checkbox	
Q51Obush	Obushera	Checkbox	
Q52Sugar	Sugar cane	Checkbox	

Field Name	Prompt/Question	Type	Additional Information
Q53Banan	Sweet bananas	Checkbox	
Q54Salad	Salads (raw tomatoes, cabbage)	Checkbox	
Q55Conta	Diarrhoea contact at home in the last five days	Yes/No	
Q56Pit	Availability of pit latrine in home	Yes/No	
Q57State	If yes, what is the state of the latrine	Text (Legal Value)	<ul style="list-style-type: none"> • clean • dirty
Q58Water	Where does household get its water?	Text (Legal Value)	<ul style="list-style-type: none"> • lake • river
Q59Boil	How does household prepare its drinking water?	Text (Legal Value)	<ul style="list-style-type: none"> • boiling • not boiling
Q60Wash	Does household have facility for washing after latrine use?	Yes/No	
Q61Rack	Is there a rack for drying plates in the home?	Yes/No	
Q62Clean	Cleanliness around the home	Text (Legal Value)	<ul style="list-style-type: none"> • good • fair • poor
Q63HEduc	Did you attend health education sessions on diarrhoea or cholera in the last 2 years?	Yes/No	
Q64Who	If yes, who gave it?	Multiline	
Q65How	In your opinion, how does one get cholera?	Multiline	

Appendix E : Data Entry Questionnaires

Questionnaire 1 – Page 1

CHOLERA IN RWENSHAMA, RUKUNGIRI – 2001

(page 1 of 2)

QUESTIONNAIRE NO...1...

DATE...22/05/2001

Personal Specification

1. Name..... 2. Age 34 3. Sex...M...

4. Occupation...Soldier..... 5. Education level: nil
 P1-P4
 P5-P7
 secondary
 tertiary

6. Village...Rwenshama..... 7. No. of people in household...1.....

8. ILL? Yes No 9. If ILL, date of onset...06/05/2001.....

(If not ill, skip to question 16.)

Illness

10. Symptoms of illness (select all that apply):

 diarrhoea vomiting cramps in abdomen cramps in arms and legs

11. Duration of illness before reporting for treatment at health unit...2.....

12. Treatments given at home before reporting: metronidazole.....

13. Signs on presentation at health unit:

dehydration (circle one): nil some severefever Yes No

other(specify)...weak.....

14. Treatments given at health units (select all that apply):

 oral fluids i-v fluids tetracycline co-trimoxazole

other (specify)...metronidazole.....

15. Outcome: improved died

Questionnaire 1 – Page 2

Questionnaire No. 1...

(Page 2 of 2)

Risk Factors

16. History of eating in a particular place outside home within past 5 days:

Yes No

17. If Yes, specify: hotel bar neighbour food sold at roadside

18. Have you taken any of these foods hot or cold in the last 5 days?

(Check if the food was eaten.)

<u>food</u>		<u>food</u>		<u>food</u>	
hot matooke	<input type="checkbox"/>	hot posho	<input checked="" type="checkbox"/>	hot peas	<input type="checkbox"/>
cold matooke	<input type="checkbox"/>	cold posho	<input type="checkbox"/>	cold peas	<input type="checkbox"/>
hot sweet potatoes	<input checked="" type="checkbox"/>	hot mandazi	<input type="checkbox"/>	hot meat	<input checked="" type="checkbox"/>
cold sweet potatoes	<input type="checkbox"/>	cold mandazi	<input type="checkbox"/>	cold meat	<input type="checkbox"/>
hot rice	<input checked="" type="checkbox"/>	hot cassava	<input checked="" type="checkbox"/>	hot milk	<input type="checkbox"/>
cold rice	<input type="checkbox"/>	cold cassava	<input type="checkbox"/>	cold milk	<input type="checkbox"/>
hot irish potatoes	<input type="checkbox"/>	hot beans	<input checked="" type="checkbox"/>	hot fish	<input checked="" type="checkbox"/>
cold irish potatoes	<input type="checkbox"/>	cold beans	<input type="checkbox"/>	cold fish	<input type="checkbox"/>
obushera	<input checked="" type="checkbox"/>				
sugar cane	<input checked="" type="checkbox"/>				
sweet bananas	<input type="checkbox"/>				
salads(raw tomatoes or cabbage)	<input type="checkbox"/>				

19. Diarrhoea contact at home within the last five days? Yes No

20. Availability of pit latrine in home: Yes No

21. If Yes, what is the state of the latrine? clean dirty

22. Where does household get its water from? lake river

23. How does household prepare its water for drinking? boiling no boiling

24. Does household have facility for hand washing after latrine use? Yes No

25. Is there a rack for drying plates in the home? Yes No (if yes, confirm)

26. Cleanliness around the home: good fair poor

27. Did you attend Health Education sessions on diarrhoea or cholera in the last 2 years?

Yes No

28. If Yes, who gave it?.....

29. In your opinion how does one get cholera? *dirty home, drinking unboiled water*

Questionnaire 2 – Page 1

CHOLERA IN RWENSHAMA, RUKUNGIRI – 2001

(page 1 of 2)

QUESTIONNAIRE NO. 2

DATE 22/05/2001

Personal Specification

1. Name..... 2. Age 25 3. Sex F

4. Occupation housewife 5. Education level: nil
 P1-P4
 P5-P7
 secondary
 tertiary

6. Village Rwenshama 7. No. of people in household 2

8. ILL? Yes No 9. If ILL, date of onset 13/05/2001

(If not ill, skip to question 16.)

Illness

10. Symptoms of illness (select all that apply):
 diarrhoea vomiting cramps in abdomen cramps in arms and legs

11. Duration of illness before reporting for treatment at health unit 1

12. Treatments given at home before reporting: nil

13. Signs on presentation at health unit:

dehydration (circle one): nil some severe

fever Yes No

other(specify).....

14. Treatments given at health units (select all that apply):

oral fluids i-v fluids tetracycline co-trimoxazole

other (specify).....

15. Outcome: improved died

Questionnaire 2 – Page 2

Questionnaire No. 2

(Page 2 of 2)

Risk Factors

16. History of eating in a particular place outside home within past 5 days:

Yes No

17. If Yes, specify: hotel bar neighbour food sold at roadside

18. Have you taken any of these foods hot or cold in the last 5 days?

(Check if the food was eaten.)

<u>food</u>		<u>food</u>		<u>food</u>	
hot matooke	<input checked="" type="checkbox"/>	hot posho	<input checked="" type="checkbox"/>	hot peas	<input type="checkbox"/>
cold matooke	<input type="checkbox"/>	cold posho	<input type="checkbox"/>	cold peas	<input type="checkbox"/>
hot sweet potatoes	<input checked="" type="checkbox"/>	hot mandazi	<input checked="" type="checkbox"/>	hot meat	<input type="checkbox"/>
cold sweet potatoes	<input checked="" type="checkbox"/>	cold mandazi	<input checked="" type="checkbox"/>	cold meat	<input type="checkbox"/>
hot rice	<input type="checkbox"/>	hot cassava	<input type="checkbox"/>	hot milk	<input type="checkbox"/>
cold rice	<input type="checkbox"/>	cold cassava	<input type="checkbox"/>	cold milk	<input checked="" type="checkbox"/>
hot irish potatoes	<input type="checkbox"/>	hot beans	<input type="checkbox"/>	hot fish	<input checked="" type="checkbox"/>
cold irish potatoes	<input type="checkbox"/>	cold beans	<input type="checkbox"/>	cold fish	<input checked="" type="checkbox"/>
obushera	<input type="checkbox"/>				
sugar cane	<input type="checkbox"/>				
sweet bananas	<input type="checkbox"/>				
salads(raw tomatoes or cabbage)	<input type="checkbox"/>				

19. Diarrhoea contact at home within the last five days? Yes No

20. Availability of pit latrine in home: Yes No

21. If Yes, what is the state of the latrine? clean dirty

22. Where does household get its water from? lake river

23. How does household prepare its water for drinking? boiling no boiling

24. Does household have facility for hand washing after latrine use? Yes No

25. Is there a rack for drying plates in the home? Yes No (if yes, confirm)

26. Cleanliness around the home: good fair poor

27. Did you attend Health Education sessions on diarrhoea or cholera in the last 2 years?

Yes No

28. If Yes, who gave it?.....

29. In your opinion how does one get cholera? eating cold food.....

contact with infected person

Questionnaire 3 – Page 1

CHOLERA IN RWENSHAMA, RUKUNGIRI – 2001

(page 1 of 2)

QUESTIONNAIRE NO. 3

DATE 13/05/2001

Personal Specification

1. Name..... 2. Age 26 3. Sex F

4. Occupation housewife 5. Education level:
nil
P1-P4
P5-P7
secondary
tertiary

6. Village Rwenshama 7. No. of people in household 3

8. ILL? Yes No 9. If ILL, date of onset 13/05/2001

(If not ill, skip to question 16.)

Illness

10. Symptoms of illness (select all that apply):
diarrhoea vomiting cramps in abdomen cramps in arms and legs

11. Duration of illness before reporting for treatment at health unit 2

12. Treatments given at home before reporting: tetracycline, metronidazole

13. Signs on presentation at health unit:

dehydration (circle one): nil some severe

fever Yes No

other(specify) very weak

14. Treatments given at health units (select all that apply):

oral fluids i-v fluids tetracycline co-trimoxazole

other (specify).....

15. Outcome: improved died

Questionnaire 3 – Page 2

Questionnaire No. 3

(Page 2 of 2)

Risk Factors

16. History of eating in a particular place outside home within past 5 days:

Yes No

17. If Yes, specify: hotel bar neighbour food sold at roadside

18. Have you taken any of these foods hot or cold in the last 5 days?
(Check if the food was eaten.)

<u>food</u>		<u>food</u>		<u>food</u>	
hot matooke	<input checked="" type="checkbox"/>	hot posho	<input checked="" type="checkbox"/>	hot peas	<input type="checkbox"/>
cold matooke	<input type="checkbox"/>	cold posho	<input type="checkbox"/>	cold peas	<input type="checkbox"/>
hot sweet potatoes	<input checked="" type="checkbox"/>	hot mandazi	<input checked="" type="checkbox"/>	hot meat	<input type="checkbox"/>
cold sweet potatoes	<input type="checkbox"/>	cold mandazi	<input checked="" type="checkbox"/>	cold meat	<input type="checkbox"/>
hot rice	<input checked="" type="checkbox"/>	hot cassava	<input type="checkbox"/>	hot milk	<input type="checkbox"/>
cold rice	<input type="checkbox"/>	cold cassava	<input type="checkbox"/>	cold milk	<input type="checkbox"/>
hot irish potatoes	<input checked="" type="checkbox"/>	hot beans	<input checked="" type="checkbox"/>	hot fish	<input checked="" type="checkbox"/>
cold irish potatoes	<input type="checkbox"/>	cold beans	<input type="checkbox"/>	cold fish	<input type="checkbox"/>
obushera	<input type="checkbox"/>				
sugar cane	<input checked="" type="checkbox"/>				
sweet bananas	<input checked="" type="checkbox"/>				
salads(raw tomatoes or cabbage)	<input type="checkbox"/>				

19. Diarrhoea contact at home within the last five days? Yes No

20. Availability of pit latrine in home: Yes No

21. If Yes, what is the state of the latrine? clean dirty

22. Where does household get its water from? lake river

23. How does household prepare its water for drinking? boiling no boiling

24. Does household have facility for hand washing after latrine use? Yes No

25. Is there a rack for drying plates in the home? Yes No (if yes, confirm)

26. Cleanliness around the home: good fair poor

27. Did you attend Health Education sessions on diarrhoea or cholera in the last 2 years?
 Yes No

28. If Yes, who gave it?.....health workers, local leaders.....

29. In your opinion how does one get cholera?.....

Questionnaire 4 – Page 1

CHOLERA IN RWENSHAMA, RUKUNGIRI – 2001

(page 1 of 2)

QUESTIONNAIRE NO. 4

DATE 23/05/2001

Personal Specification

1. Name..... 2. Age 36 3. Sex M.....

4. Occupation Soldier..... 5. Education level: nil
 P1-P4
 P5-P7
 secondary
 tertiary

6. Village Rwenshama..... 7. No. of people in household 1.....

8. ILL? Yes No 9. If ILL, date of onset.....

(If not ill, skip to question 16.)

Illness

10. Symptoms of illness (select all that apply):
 diarrhoea vomiting cramps in abdomen cramps in arms and legs

11. Duration of illness before reporting for treatment at health unit.....

12. Treatments given at home before reporting:

13. Signs on presentation at health unit:

dehydration (circle one): nil some severe

fever Yes No

other(specify).....

14. Treatments given at health units (select all that apply):

oral fluids i-v fluids tetracycline co-trimoxazole

other (specify).....

15. Outcome: improved died

Questionnaire 4 – Page 2

Questionnaire No. 4

(Page 2 of 2)

Risk Factors

16. History of eating in a particular place outside home within past 5 days:
 Yes No

17. If Yes, specify: hotel bar neighbour food sold at roadside

18. Have you taken any of these foods hot or cold in the last 5 days?
 (Check if the food was eaten.)

- | | | | | | |
|------------------------------------|-------------------------------------|--------------|-------------------------------------|-------------|-------------------------------------|
| <u>food</u> | | <u>food</u> | | <u>food</u> | |
| hot matooke | <input type="checkbox"/> | hot posho | <input type="checkbox"/> | hot peas | <input type="checkbox"/> |
| cold matooke | <input type="checkbox"/> | cold posho | <input checked="" type="checkbox"/> | cold peas | <input type="checkbox"/> |
| hot sweet potatoes | <input checked="" type="checkbox"/> | hot mandazi | <input type="checkbox"/> | hot meat | <input type="checkbox"/> |
| cold sweet potatoes | <input type="checkbox"/> | cold mandazi | <input type="checkbox"/> | cold meat | <input type="checkbox"/> |
| hot rice | <input checked="" type="checkbox"/> | hot cassava | <input type="checkbox"/> | hot milk | <input type="checkbox"/> |
| cold rice | <input type="checkbox"/> | cold cassava | <input type="checkbox"/> | cold milk | <input checked="" type="checkbox"/> |
| hot irish potatoes | <input checked="" type="checkbox"/> | hot beans | <input type="checkbox"/> | hot fish | <input type="checkbox"/> |
| cold irish potatoes | <input type="checkbox"/> | cold beans | <input type="checkbox"/> | cold fish | <input checked="" type="checkbox"/> |
| obushera | <input checked="" type="checkbox"/> | | | | |
| sugar cane | <input checked="" type="checkbox"/> | | | | |
| sweet bananas | <input type="checkbox"/> | | | | |
| salads(raw tomatoes
or cabbage) | <input type="checkbox"/> | | | | |

19. Diarrhoea contact at home within the last five days? Yes No

20. Availability of pit latrine in home: Yes No

21. If Yes, what is the state of the latrine? clean dirty

22. Where does household get its water from? lake river

23. How does household prepare its water for drinking? boiling no boiling

24. Does household have facility for hand washing after latrine use? Yes No

25. Is there a rack for drying plates in the home? Yes No (if yes, confirm)

26. Cleanliness around the home: good fair poor

27. Did you attend Health Education sessions on diarrhoea or cholera in the last 2 years?
 Yes No

28. If Yes, who gave it?.....

29. In your opinion how does one get cholera?
*contact with an infected person
 using dirty toilet
 drinking unboiled water*

Appendix F: Answers to Training Questions

Question 1: If you wanted to see the list from youngest to oldest, would you choose ascending or descending order?

Answer: Ascending

Question 2: How many records do you now have in your current list? Why?

Answer: 33. There were only 33 cases (people who were sick and would have answered "Yes" to the question "Ill?").

Question 3: Most of the cases come from which village? What percent of the cases come from this village?

Answer: Rwenshama. 66.7%.

Question 4: Using the steps provided above, analyze the data by Sex (Q3Sex). Enter the data below.

Answer:

Q3Sex	Frequency	Percentage
Female	19	57.6%
Male	14	42.4%

Question 5: Analyze the data by Occupation (Q4Occup). What percentage of the cases are housewives?

Answer: 27.3%

Question 6: Analyze the data by Education Level (Q5Educ). Among the cases, what level of education is most frequent?

Answer: Primary 1-4

Question 7: None. All the answers to Fever were No. ((You may have noticed that there were only 33 No responses instead of 66. This is because only those who were ill (cases) answered this question. Epi Info did not give the frequency of Missing responses.))

Question 8: What is the range of ages (minimum to maximum) of those who were ill?

Answer: 4 to 56

Question 9: Rounded to the nearest tenth, what is the

Answer:

- mean 26.5,
- median 26.0,
- mode 19.0.

Question 10: The largest percentage of cases comes from which age group?

Answer: 20-30

Question 11: Complete these sentences:

Answer:

Of the 10 people who had contact with diarrhea, 9 became ill and 1 did not become ill.

Of the 47 people who did not have contact with diarrhea, 22 became ill and 25 did not become ill.

Question 12: Create a 2x2 table for each of the following risk factors. Determine the correct p-value (rounded to the nearest hundredth) and whether or not the risk factor is associated with becoming ill.

Answers:

- History of eating outside the home in the last five days (*Q25Eat*):

p-value: 0.0098 (Fisher Exact)

association: Yes X No

- Eating sugar cane (*Q52Sugar*):

p-value: 0.0706 (Chi Square Uncorrected)

association: Yes No X

- How household prepares drinking water (*Q59Boil*):

p-value: 0.1080 (Chi Square Uncorrected)

association: Yes No X

Appendix G: Answers to Advanced Analysis Questions

1. <i>How many deaths are there in total?</i>	Answer: 489 Solution: The trainee should have already Read the .MDB file. The number of deaths would be the same as the Record Count because each record in the dataset is a death.
2. <i>What is the distribution of death by sex?</i>	Answer: 177 Female, 306 Male, 6 Unknown Solution: The Frequencies command will show the distribution of a variable. <ol style="list-style-type: none">1. Click on the Frequencies command.2. Under Frequency Of, select Sex.3. Click OK.
3. <i>What is the mean age of death?</i>	Answer: 46.7326 Solution: The Means command can be used to show the mean age. <ol style="list-style-type: none">1. Click on the Means command.2. Under Means of, select Means of select Age_Years.3. Click OK.

<p>4. What is the mean age among children (age less than 18)?</p>	<p>Answer: 3.71</p> <p>Solution: The Select command is used to select all those less than 18 years. The Mean command is then used to get the mean age of those selected.</p> <ol style="list-style-type: none"> 1. Click on the Select command. 2. From the Available Variables drop-down box, select <i>Age_Years</i>. 3. Click on the < button and then type 18 (no spaces). The full command should now read <i>Age_Years<18</i>. 4. Click OK. 5. Click on the Means command. 6. Under Means of, select Means of select <i>Age_Years</i>. 7. Click OK.
<p>5. Which province has the highest number of deaths?</p>	<p>Answer: Kampot with 177.</p> <p>Solution: First cancel the previous selection (Cancel Select). Then do a frequency by province.</p> <ol style="list-style-type: none"> 1. Click on the Cancel Select command. 2. Click on the Frequencies command. 3. Under Frequencies of, select <i>Province</i>. 4. Click OK.
<p>6. Which province has the highest number of female deaths?</p>	<p>Answer: Kampot with 66</p> <p>Solution: Use the Select command to select only the females. Then, run a Frequencies command by province.</p> <ol style="list-style-type: none"> 1. Click on the Select command. 2. From the Available Variables drop-down box, select <i>Sex</i>. 3. Click on the = button, click or type quote ("), type Female, and click type quote (") again. The full command should now read <i>Sex="Female"</i>. 4. Click OK. 5. Click on the Frequencies command. 6. Under Frequencies of, select <i>Province</i>. 7. Click OK.

<p>7. Which province has the highest number of male deaths?</p>	<p>Answer: Kampot with 111</p> <p>Solution:</p> <ol style="list-style-type: none">1. Click on the Cancel Select command.2. Click on the Select command.3. From the Available Variables drop-down box, select Sex.4. Click on the = button, click or type quote ("), type Male, and click type quote (") again. The full command should now read <i>Sex="Male"</i>.5. Click OK.6. Click on the Frequencies command.7. Under Frequencies of, select <i>Governorate</i>.8. Click OK.
<p>8. What is the leading cause of death in the country?</p>	<p>Answer: Head Trauma level III with 36</p> <p>Solution:</p> <p>The solution is listed in the trainee material is repeated here.</p> <ol style="list-style-type: none">1. Click on the Cancel Select command.2. Select the Summarize command.3. Under Aggregate, select <i>Count</i>.4. Under Variable, select any variable except DIAG.5. Under Into Variable, type a new variable name – DIAGCOUNT.6. Click on Apply button.7. Under Group By, select DIAG.8. Under Output to Table, type a new table name – DIAGCOUNT.9. Click on OK.10. Read the new table, DIAGCOUNT.11. Sort the DIAGCOUNT variable in descending order.12. List the data.

<p>9. <i>How many cases of stroke were reported?</i></p>	<p>Answer: 32</p> <p>Solution:</p> <ol style="list-style-type: none">1. DEFINE a new variable – Stroke.2. Click on the IF command.3. Under the If Condition, type <code>FINDTEXT("stroke",Diag)>0</code> . This will identify all the diagnoses with the string "stroke" in them.4. Click on the THEN button.5. Click on the ASSIGN command.6. Under Assign Variable, select Stroke. For =Expression, click on the Yes button. Click Add.7. Click on the ELSE button.8. Click on the ASSIGN command.9. Under Assign Variable, select Stroke. For the =Expression, click on the No button. Click Add.10. Click OK.11. Click on the Frequencies command and look at the frequency of Stroke.
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<p>10. What is the most frequent cancer?</p>	<p>Answer: Lung Cancer with 3</p> <p>Solution:</p> <p>The first part of the solution to this question follows the same logic as Question 9.</p> <ol style="list-style-type: none">1. DEFINE a new variable – Cancer.2. Click on the IF command.3. Under the If Condition, type <i>FINDTEXT("cancer",Diag)>0</i> . This will identify all the diagnoses with the string "cancer" in them.4. Click on the THEN button.5. Click on the ASSIGN command.6. Under Assign Variable, select Cancer. For =Expression, click on the Yes button. Click Add.7. Click on the ELSE button.8. Click on the ASSIGN command.9. Under Assign Variable, select Stroke. For the =Expression, click on the No button. Click Add.10. Click OK.11. Click on the Frequencies command and look at the frequency of Cancer. <p>We can use the new Cancer variable to make this task simpler. Use the Select command to select only those records where the Cancer variable equals Yes. Then look at the Frequencies of the Diag variable to see which type of cancer is the most frequent.</p> <ol style="list-style-type: none">1. Click on the Select command.2. From the Available Variables drop-down box, select Cancer.3. Click on the = button and then select the "Yes" button. The full command should now read <i>Cancer=(+)</i>.4. Click on the Frequencies command.5. From the Frequency of drop-down box, select <i>Diag</i>.6. Click OK.
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<p>11. <i>How many poisonings were reported?</i></p>	<p>Answer: 14</p> <p>Solution:</p> <ol style="list-style-type: none">1. Click on the Cancel Select command.2. DEFINE a new variable – Poison.3. Click on the IF command.4. Under the If Condition, type <i>FINDTEXT("poison",Diag)>0</i>. This will identify all the diagnoses with the string "cancer" in them.5. Click on the THEN button.6. Click on the ASSIGN command.7. Under Assign Variable, select Cancer. For =Expression, click on the Yes button. Click Add.8. Click on the ELSE button.9. Click on the ASSIGN command.10. Under Assign Variable, select Poison. For the =Expression, click on the No button. Click Add.11. Click OK.12. Click on the Frequencies command and look at the frequency of Poison.
<p>13. <i>What is the agent most frequently responsible for fatal poisonings?</i></p>	<p>Answer: Fosfamida and Organophosphate both with 6</p> <p>Solution:</p> <ol style="list-style-type: none">1. Click on the Select command.2. From the Available Variables drop-down box, select Cancer.3. Click on the = button and then select the "Yes" button. The full command should now read <i>Cancer=(+)</i>.4. Click on the Frequencies command.5. From the Frequency of drop-down box, select <i>Diag</i>.6. Click OK.

14. What is the general mortality rate per province?

Answer:

Province	MORTALITY_RATE
Batdambang	2.55249460402641
Kampong Cham	2.88150233298778
Kampong Chhnang	8.96863965666719
Kampong Spoe	1.94320235429761
Kampong Thum	2.32432013636011
Kampot	36.7048576909119
Kandal	0.203916002920077
Kaoh Kong	41.1099691675231
Kracheh	19.6382815568481
Mondol Kiri	105.528791007112
Phnum Penh	1.28467003250215
Pouthisat	23.4911153245969
Preah Vihear	8.38970164123538
Prey Veng	0.327722004347779
Rotanokiri	14.6818923327896
Siemreab-Otdar Meanchey	1.53898953025423
Stoeng Treng	26.3524451304446
Svay Rieng	1.7598242187009
Takev	0.276495912007941

Solution:

1. Click on the Cancel Select command.
2. Click on the Frequencies command. From the Frequency of drop-down box, select Province. In Output to Table, type MORTALITYRATE.
3. Read the MORTALITYRATE table. LIST to make sure the table contains number of deaths per governorate.
4. Click on the Relate command.
5. Set the data format to dBase IV and data source to CB.DBF.
6. Click on the Build Key button.
7. From the Available Variables selection, select Province.
8. Click on Related Table.
9. From the Available Variables drop-down box, select ADMIN_NAME.
10. Click OK.
11. Click OK again. You will see Province::ADMIN_Name in the Key section.
12. Click OK to close the dialog box. For the permanent link, type MORTALITYLINK.
13. LIST to see the new table structure.
14. Define a new variable – MORTALITY_RATE.
15. Click on the Assign command.
16. Under Assign Variable, select MORTALITY_RATE.

<p><i>(Question 14 continued)</i></p>	<ol style="list-style-type: none"> 17. Under =Expression, select COUNT variable, select /, select POP_ADMIN variable, select *, type 100000. 18. Click OK. 19. List the MortalityRate table, using only Province and Mortality_Rate variables to verify the table is correct. 20. Click on the WRITE(EXPORT) command. 21. Under Variables, select the PROVINCE and MORTALITY_RATE variables. 22. Under Output Mode, select Replace. 23. Under File Name, select Advanced Analysis.MDB. 24. Under Data Table, select the MORTALITYRATE table. 25. Click OK. <p>LIST the data in the MORTALITY RATE table.</p>
<p>15. <i>Map the mortality rate using the provided Cambodia shape file.</i></p>	<p>Solution:</p> <p>Make sure you have READ the MORTALITYRATE table.</p> <ol style="list-style-type: none"> 1. Select Map command. 2. Check "1 record per geographic entity". 3. Under Geographic Variable in the column to the left, select Province. 4. Under Data Variable, select Mortality_Rate variable. 5. Under Shape file, select CB.SHP file. 6. Under Geographic Variable located beneath Shapefile, select ADMIN_NAME. 7. You should see a list of governorate names and confirm that this is the correct name field. 8. Select OK. 9. You should see a message stating that there was an "Incomplete Join." Select CONTINUE. <p><i>(Continued on next page)</i></p>

<p><i>(Question 15 continued from previous page)</i></p>	<p><i>(Continued from previous page)</i></p> <p>A map displaying mortality rate should display.</p> <ol style="list-style-type: none">9. From File, select Map Manager.10. From the Map Manager, click on the "Properties" button.11. Select the Choropleth tab. The Choropleth tab contains the properties that will allow you to change the color and the number of breaks.12. Change the Number of Classes and select the Quantiles option.13. Click Apply to see how the map appears.14. When you are satisfied with the map, click on OK, close the Map Manager, and exit Epi Map (File>Exit). <p>You should be taken back to Analysis screen. You should also see the map that was created in the output window.</p>
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