Quantimed
User's Guide

Pharmaceutical Quantification and Cost Estimation Tool

.

Quantimed

User's Guide

Version 1.2

About SPS

The Strengthening Pharmaceutical Systems (SPS) Program strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

Acknowledgments

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CHAPTER 1
Introduction to Quantimed

Objectives

- To introduce users to the User's Guide

- To provide an overview of Quantimed

- To outline the quantification methodologies used in Quantimed

OVERVIEW

The Quantimed software program is a practical tool designed to facilitate the process of determining the quantities of medicines and medical supplies required for a health program and to assist in order planning and budgeting. Quantimed allows health planners and directors of essential medicines programs to calculate pharmaceutical and other product needs by making adjustments based on historical consumption patterns or by taking an epidemiological approach that uses patient service/morbidity profiles and standard treatment guidelines (STGs). These two standard procedures are referred to as the consumption and morbidity methods, respectively. If consumption and morbidity data for a system are unavailable, the user can employ the proxy consumption method by entering consumption data from a comparable system.

Quantimed is designed to improve the accuracy of order planning and budgeting by providing a systematic approach to organizing and analyzing data. Quantimed facilitates the calculation of commodity needs using either a single method or a combination of any of the three primary quantification methods: past consumption, morbidity patterns, and proxy consumption. The program also includes an option for scaling up morbidity-based estimates, which is useful for growing programs. Depending on the availability of data, Quantimed can be applied at a single health facility, a national disease-specific program, or a group of geographic or administrative areas.

Quantimed is a powerful tool that can be used to address one of the biggest concerns of primary health care: *essential medicines management*. Its practical utilities are evident in the areas of order planning, training, and supply management, and the program allows the measurement of economic consequences of purchase and medicine-use patterns. For the policy maker, Quantimed shows the budgetary consequences of both individual medication purchases and those by therapeutic class. Quantimed can also directly relate medicines to priority health problems and disease patterns through the analysis of standard and usual treatments.

Quantimed can facilitate **data collection** and be used for **data entry, report analysis,** and **order planning.**

- Quantimed's **data collection** process is virtually the same as the process described in the second edition of *Managing Drug Supply*[1] and is therefore not covered in detail here.

- **Data entry** is described in detail in this User's Guide for each quantification method.

- **Report analysis,** which includes report selection and generation, is described in detail in Chapters 8 and 9 of this User's Guide.

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[1] Management Sciences for Health, in collaboration with the World Health Organization. 1997. *Managing Drug Supply: The Selection, Procurement, Distribution, and Use of Phamaceuticals*. 2d ed. West Hartford, CT: Kumarian Press.

- **Order planning** (also outlined in the User's Guide) requires the individuals responsible for ordering pharmaceuticals to review the analyses generated by the program (including procurement parameters such as lead time and safety stock) and apply their expert judgment in making adjustments to the final order.

Determining pharmaceutical requirements and planning for the use of limited funds can be a tedious, time-consuming, and error-prone process. Several calculations must be performed for each item on an order, each presenting opportunities for miscalculations. Moreover, after a draft order is prepared, it often must be modified because of budget restrictions; in such a case, the entire data entry process and calculation must be repeated. In addition, if requirements are calculated on the basis of epidemiological patterns rather than past consumption, a great deal more information is needed; all these data must be gathered and integrated into the calculation process, thereby further increasing the opportunities for miscalculations.

Using a program such as Quantimed can help minimize errors and facilitate correct calculations. The program encourages consistency in data, and formulas are preprogrammed to eliminate mathematical errors. It quickly recalculates estimates and costs when changes are made, and it organizes the information into useful planning reports. Quantimed is a fast and powerful tool that is invaluable to planners, decision makers, and managers. Be aware, however, that it is only a tool; it cannot reason for itself. All of these functions must be determined using human judgment.

- Quantimed cannot create or collect data, or distinguish between accurate and erroneous data.
- It cannot tell the difference between rational and irrational therapy.
- Most important, it cannot determine which pharmaceuticals should be ordered.

A large-scale quantification often requires several months to complete. The methods in Quantimed are usually used to forecast needs for an annual or semiannual procurement, rather than for a routine order. As noted in *Managing Drug Supply,* "Quantification of drug requirements is inherently imprecise, due to the many variables involved. Useful results depend as much on art as on science" (p. 186). Quantimed helps to organize and analyze data, but it cannot replace experience and judgment in interpreting the results.

USING THIS GUIDE

It is expected that the users of the Quantimed tool will be program managers, procurement staff, supply managers, and other health care professionals. Users are expected to be computer literate; however, additional information is provided for those who do not have a basic understanding of data entry techniques.

This guide will provide Quantimed users with instructions for entering data, which can then be used to generate reports. The guide contains comprehensive information about the Quantimed program and how it can be used to estimate medicine and supply requirements. We assume that the reader already knows the fundamentals of quantifying pharmaceutical requirements, so those are not covered in detail here. However, for more information on quantification, please see *Managing Drug Supply*, 2d. ed., available from Kumarian Press (http://www.kpbooks.com/details.asp?title=Managing+Drug+Supply), and *Estimating Drug Requirements: A Practical Manual* (WHO/DAP/88.2), available from the World Health Organization (http://www.wholibdoc.who.int/hq/1988/WHO_DAP_88.2.pdf).

It may not be necessary for all users to read every section of the Quantimed User's Guide. For example, if a user has sufficient computer skills and a good understanding of relational databases, several sections in Chapters 2 and 3 may be skipped. The figures used in Quantimed to represent screens contain data entered into a data set. These figures will not look the same when the user begins to enter data into a new data set. Most screens will be empty until the user adds data into the screen. Once data has been added, the user's screen will resemble the figures depicted in the User's Guide. Chapters 2 through 12 and the annexes are summarized below:

Chapter 2 – Installing Quantimed This chapter provides detailed information on installing Quantimed. Installation procedures as well as a list of system files and setup procedures are provided.

Chapter 3 – Getting Started This chapter focuses on how to use and navigate the Quantimed tool. An overview of Microsoft Access database concepts is provided, as are instructions for moving between screens and forms in Quantimed. This chapter also includes a summary of the types of data to be collected.

Chapter 4 – Constructing a Quantification Data Set This chapter covers detailed information on how to build validation tables and on the various abbreviations and codes that are used by Quantimed. Validation tables provide continuity throughout the rest of the Quantimed program. In addition, three pharmaceutical references—the International Classification of Diseases (ICD), the WHO Therapeutic Class List, and the WHO Essential Medicines List (EML) categories—are included in the program. In order to use Quantimed, the data set definitions, pharmaceuticals, cost parameters, and facilities/areas must be established. Chapter 4 provides detailed information on these processes, which must be completed before the quantification methods (described in Chapters 5, 6, and 7) can be used.

Chapter 5 – Using the Morbidity-Based Quantification Method Detailed instructions on using the morbidity method to estimate medication and supply item quantities can be found in this chapter. Using the morbidity method requires data entry on STGs and morbidity patterns. The "scaling-up" variant of the morbidity method used to estimate caseload in new or expanding health programs is also described here.

Chapter 6 – Using the Consumption-Based Quantification Method Quantimed will facilitate the estimate of future consumption, either at the global level of the health system or for a set of health facilites for which individual consumption data are available.

Chapter 7 – Using the Proxy Consumption Quantification Method This chapter describes how alternate data sources can be used to prepare a consumption-based estimate when no actual consumption or morbidity data are available. In this case, users can enter medicine and supply item consumption information from a comparable system to generate reports.

Chapter 8 – Data Analysis This chapter provides detailed instructions on using the data analysis function to produce a "best estimate" of pharmaceutical requirements based on one or more of the quantification methods, and subsequently, determine procurement quantities. The analysis information provided by Quantimed is based on information entered into other data fields.

Chapter 9 – Reports Quantimed can generate a series of standard reports based on information entered into the program, as well as produce blank data collection forms. This chapter provides details on using the reports option.

Chapter 10 – Interpretation of Results This chapter provides guidelines and tips on how to interpret the quantification results provided by Quantimed.

Chapter 11 – Tools This chapter provides detailed instructions on the various maintenance and utility options available with the Quantimed program, including options for importing and exporting selected files.

Chapter 12 – Quantimed for HIV/AIDS Programs This chapter expands on the information provided in Chapters 4 and 5 and reviews the process for HIV/AIDS quantification, including information to be gathered. The chapter also discusses tips for making quantification for HIV/AIDS easier.

Chapter 13 – Quantimed for Malaria Programs this chapter expands on the information provided in Chapters 4 and 5 and reviews the process for malaria quantification, including information to be gathered.

Annex 1 – Quantimed Data Collection Forms Annex 1 provides examples of blank data collection forms available in Quantimed.

Annex 2 – Quantimed Sample Reports Annex 2 provides examples of the reports available in Quantimed.

Annex 3 – Body Surface Area Annex 3 provides information on calculating body surface area of pediatric patients.

METHODOLOGIES FOR ESTIMATING PHARMACEUTICAL AND SUPPLY ITEM REQUIREMENTS

Determining pharmaceutical requirements is one of the most difficult tasks faced by physicians, pharmacists, and supply specialists who make decisions on which medicines to buy and use. The three most common quantification methods are the consumption, morbidity, and proxy consumption methods. None of these methods is perfect. Simply continuing to order on the basis of historical usage of individual pharmaceuticals might perpetuate waste or irrational use, and severe shortages and/or overstocks of items can occur if ordering is done entirely on the basis of theoretically determined health needs. Often, the lack of reliable, accessible information can make it difficult to accurately determine either historical usage or theoretical health needs based on service statistics.

The quantification method used to determine requirements is selected on the basis of—

- Medication and health care information available
- Purpose of the estimate
- Nature of the pharmaceutical supply program

Quantimed is intended to make easier a tedious task: forecasting the quantities of a large number of pharmaceutical products needed for a health program, estimating their costs, and then calculating the appropriate order volume. Quantimed allows a comparison between the three methods (or pairs of methods) and assists the user in determining the "best estimate" of needs.

Morbidity-Based Method

This method requires information about the frequency of common health problems, treatment guidelines, regimens, and the number of people who will be treated. Refer to Chapter 5 for more information on this quantification method. Chapter 5 also discusses morbidity-based estimates for programs that are scaling up. The morbidity method can be summarized as follows.

- **Data entry** involves the collection of the following sets of data:

  o Medicine/supply item listing (same as for the consumption method)
  o Health care category and conditions
  o Standard treatments or regimens
  o Incidence or estimates of caseload for each condition (including projected growth, if using the scaling-up estimate)
  o Procurement parameters such as lead time and safety stock

- **Report analysis** involves creating some or all of the following reports for review by planners:

  o Estimate of Medicines Requirements (Morbidity-Based Method)
  o Estimate of Supply Items Requirements (Morbidity-Based Method)
  o Estimate of Medicines Requirements—Scaled-Up
  o Estimate of Supply Items Requirements—Scaled-Up
  o ABC Analysis (Morbidity-Based Medicines Estimate)
  o ABC Analysis (Morbidity-Based Supply Items Estimate)
  o Comparison of Morbidity and Consumption Medicines Estimates
  o Comparison of Morbidity and Consumption Supply Items Estimates
  o Comparison of Morbidity, Consumption, and Proxy Data Set Medicines Estimates
  o Comparison of Morbidity, Consumption, and Proxy Data Set Supply Items Estimates

- **Order planning** involves use of the following reports to calculate medicines and supply item needs for the tender or final order:

  o Estimate of Medication Procurement Quantities
  o Estimate of Supply Items Procurement Quantities
  o Estimate of Scaled-Up Medicines Procurement Quantities
  o Estimate of Scaled-Up Supply Items Procurement Quantities

Consumption-Based Method

This method relies on analysis of past consumption data gathered from existing inventory records or surveys of pharmaceutical consumption. Chapter 6 goes into greater detail on this method. The consumption method can be summarized as follows.

- **Data entry** involves the collection of the following data:

  o Medicine/supply item listing (same as for the morbidity method)
  o Facilities listing
  o Previous medicines consumption figures, including time out of stock
  o Procurement parameters such as individual product lead time and safety stock

- **Report analysis** involves creating some or all of the following reports for review by planners:

  o Estimate of Medicines Requirements (Consumption-Based Method)
  o Estimate of Supply Items Requirements (Consumption-Based Method)
  o Comparison of Morbidity and Consumption Medicines Estimates
  o Comparison of Morbidity and Consumption Supply Items Estimates
  o Comparison of Morbidity, Consumption, and Proxy Data Set Medicines Estimates

- o Comparison of Morbidity, Consumption, and Proxy Data Set Supply Items Estimates
- o ABC Analysis (Consumption-Based Medicines Estimate)
- o ABC Analysis (Consumption-Based Supply Items Estimate)

- **Order planning** involves use of the following reports to arrive at a figure of medication and supply item needs for the tender or final order:

  - o Estimate of Medicines Procurement Quantities
  - o Estimate of Supply Items Procurement Quantities

Proxy Consumption Method

This quantification method relies on analysis of past consumption data gathered from existing inventory records or surveys of medicines consumption in a pharmaceutical supply system similar to the one being analyzed. Chapter 7 goes into greater detail on this method. The proxy consumption method is very similar to the consumption method, except that the data are from another system. It can be summarized and described as follows.

- **Data entry** involves the collection of the following data:

  - o Medicine/supply item listing (same as for the morbidity method)
  - o Facilities and/or population information
  - o Previous medicines consumption figures, including time out of stock
  - o Procurement parameters such as individual product lead time and safety stock

- **Report analysis** involves the creation of some or all of the following reports for review by planners:

  - o Comparison of Morbidity, Consumption, and Proxy Data Set Medicines Estimates
  - o Comparison of Morbidity, Consumption, and Proxy Data Set Supply Items Estimates
  - o Extrapolate Medicines from Proxy Data Set
  - o Extrapolate Supply Items from Proxy Data Set
  - o ABC Analysis (Proxy Consumption-Based Medicines Estimate)
  - o ABC Analysis (Proxy Consumption-Based Supply Items Estimate)

- **Order planning** involves use of the following reports to arrive at a figure of medicines and supply item needs for the tender or final order:

  - o Estimate of Medicines Procurement Quantities
  - o Estimate of Supply Items Procurement Quantities

COMPARING METHODS

Using at least two estimation methods will likely improve the quality of the estimates. Chapter 8 discusses method comparisons in more detail, and Chapter 10 provides guidelines for interpreting results. All three methods of forecasting needs can produce valid estimates, but each has specific strengths and advantages, as well as specific limitations and disadvantages. The accuracy of each method, of course, depends on the quality of data available, which may vary.

Table 1-1 outlines important considerations in using each method. Because data are often problematic or incomplete, using more than one method and comparing the results may produce the most accurate estimates. This assumes that the estimates are conducted with the same set of data (e.g., matching TB medicine consumption figures with TB STGs and morbidity figures for the same population group).

Table 1-1. Comparison of the Three Primary Quantification Methods

	Consumption Method	**Morbidity Method**	**Proxy Consumption Method**
Advantages	• Most efficient from a management perspective. • Most compatible with conventional inventory control. • Most commonly used method in long-standing pharmaceutical supply systems. • Most reliable predictor of future consumption. • Does not require epidemiological data or standard treatment guidelines.	• Useful for estimating needs for new or rapidly expanding programs. • Useful in planning ration kit distribution systems. • Based on rational prescribing and can support efforts to improve medication and supply demand/use by prescribers, dispensers, and patients. • Does not require accurate and complete consumption data. • Helpful for developing and justifying budgets.	• Can be used when consumption or morbidity methods are unreliable. • Compares use with that of other supply systems. • Can be used to cross-check results of other methods.

Table continues

Table 1-1. Comparison of the Three Primary Quantification Methods *(continued)*

	Consumption Method	Morbidity Method	Proxy Consumption Method
Data Issues	• Ideally, the list of medicines and supplies used should be an officially accepted list. • Medicines must be explicitly identified. • Information on stock-outs and lead times must be included. • Stock records must be up-to-date and accurate. • Medicines should be organized in therapeutic classifications. • Data must be consistent. • Supply system should be stable. • If stock-outs have been widespread for long periods, it may be impossible to get accurate results with this method.	• Requires more information than consumption method. • Ideally, the list of medicines and supplies used should be an officially accepted list. • Accurate and up-to-date service population estimates are required. • STGs for each clearly defined health problem are needed. • Must have accurate and up-to-date estimates of the incidence or prevalence of health problems. • Results will cover only health problems included in the estimate; therefore, some needs will be overlooked. • Useful when estimates are being prepared for a relatively small number of health problems. • Data must be consistent.	• Need comparison area or a system with good per capita data on consumption, patient attendance, service levels, and morbidity. • Requires estimation of local- and comparison-user populations, broken down by age.
Consequences of Weak Data	• Needs may be underestimated if shortages are not considered. • Can serve to perpetuate irrational prescribing or use. • Consumption data from central-level or sentinel facilities may not reflect entire system. • May or may not reflect rational prescribing or use.	• Inaccurate population or health problem estimates can misdirect medicine or supply purchases. • Can lead to significant shortages and overstocks if health problem profile is inaccurate or if STGs are not followed. • Can lead to costly procurement delays if accurate health problem data and STGs don't exist.	• Questionable comparability of patient populations, morbidity, and treatment practices.

OTHER USES FOR MEDICINES AND SUPPLY ITEM REQUIREMENTS ESTIMATES

In addition to providing procurement estimates for an existing program, the consumption and morbidity method estimates can be used to—

- Determine the annual requirements and costs of medications and supply items

- Determine order quantities based on estimated requirements, stock and inventory control procedures, and procurement timelines

- Plan and support budgets

- Identify possible ways to improve the cost-effectiveness of medicines and supply item utilization

- Provide cost comparisons to assess the impact of alternative procurement patterns, supply sources, and stock management systems

- Compare utilization of medicines and supply items among facilities

- Promote the concept of STGs

- Provide information for formulary committees

- Involve prescribers in the ordering process

- Train managers and prescribers

CHAPTER 2
Installing Quantimed

Objectives

- To review computer system requirements

- To provide installation instructions

- To provide networking information

SYSTEM REQUIREMENTS

Ensure that the computer system meets the minimum requirements for installing Quantimed as described in the table below.

Table 2-1. System Component Requirements

Component	Requirement
Computer CPU	Pentium based; Pentium 233 MHz recommended
Memory	128 MB of RAM
Hard disk space	100MB free disk space
Additional Drives	CD-ROM drive
Accessories	Mouse or other pointing device and keyboard
Operating System	Microsoft Windows–based operating system—Windows 98 or a later version (Windows 2000 or Windows XP recommended)
Printer	Any Windows-compatible printer in order to print data collection forms and reports
Networking	Network adapter card and cabling required if Quantimed is to be accessed by multiple users on a network

USING THE QUANTIMED CD

Insert the Quantimed compact disc (CD) in the CD-ROM drive to begin to installation. The Quantimed CD Start screen (Figure 2-1) will appear once the CD has been inserted. This screen provides two options for installing Quantimed depending on whether the user has Microsoft Access available on his/her computer. The user may also view the User's Guide by selecting the User's Guide tab on the screen. It is recommended that the user follow the directions in this chapter when installing Quantimed and/or print out and follow the guidance under the How to use this CD tab on the screen.

Installing the Quantimed Tool

Before starting installation, exit all other programs running on the computer. If the Quantimed CD Start screen (Figure 2-1) does not display when the Quantimed CD has been inserted into the CD-ROM drive, click on the My Computer icon on the Windows desktop and double-click the CD-ROM drive to display the contents of the disk. Double-click on the file titled Startscreen to display Quantimed CD Start screen (Figure 2-1).
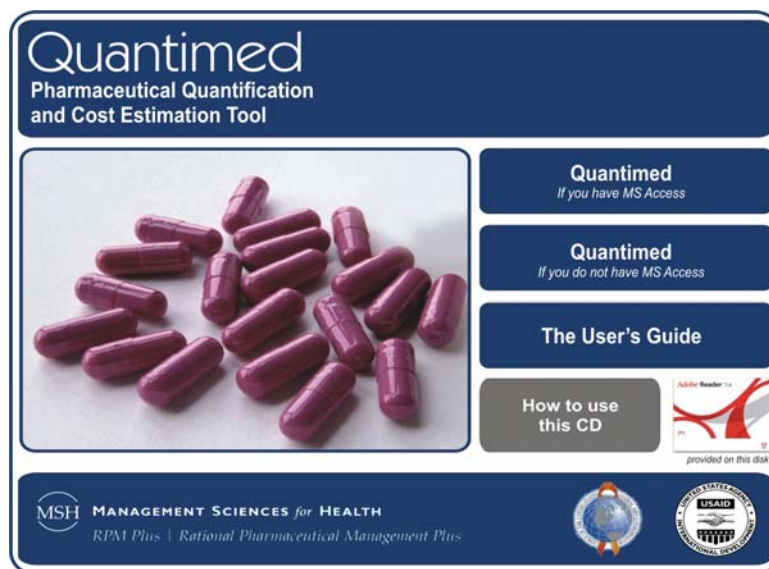

Figure 2-1. Quantimed CD Start screen

To install Quantimed, complete the steps under either of the two different installation options, discussed in the installation section of this chapter. The option used will depend on whether the user has the Microsoft Access program installed on his or her computer. If unsure of having Microsoft Access, check under Start >All Programs >Microsoft Office.

Quantimed is based on Microsoft's Access database program. If the user does not have Microsoft Access, by selecting the corresponding installation option, the installation program will install a run-time version of Microsoft Access program. This run-time version of the Microsoft Access will be used only for running Quantimed and cannot be used on its own. If the user has Microsoft Access it is recom-

mended to use the "Quantimed: If you have Microsoft Access" option when installing. Quantimed will then use the MicrosoftAccess already installed on the computer. This installation option will not install the run-time version of Microsoft Access software and will take up less storage space on the hard drive. Directions for these two installation options are provided in the "Installation" section in this chapter.

Note: Quantimed works best when Microsoft Office has been updated. If it is not, the user will receive a message when first opening the tool. For further guidance and links for Microsoft updates, refer to How to Use This CD on the CD itself.

Viewing the User's Guide

An electronic file of the print version of the Quantimed User's Guide is available on the CD by selecting the User's Guide button on the Quantimed CD Start screen. This CD uses a presentation tool called Adobe Reader that uses a special file format known as PDF (Portable Document Format). PDF files cannot be displayed unless Adobe Reader is installed. Adobe Reader may already be installed. If not, this CD contains Adobe Reader.

The PDF version of the Quantimed User's Guide is exactly the same as in the print version, except that the computer screen shots are presented in color. As with any PDF file, the pages can be viewed using the full capacity of Adobe Reader, or specific sections can be selected for printing.

INSTALLATION

"If you have Microsoft Access" Installation Option

Select the Quantimed: If you have MS Access button and proceed through the installation Setup Wizard as directed. The Quantimed Setup screen for this option (Figure 2-2) will appear next. The user is prompted to close all other programs and click Next to begin the installation. The setup can be canceled at any point in the installation if the user is not ready to complete the installation. Selecting Next in the Quantimed Setup screen begins the installation process.

Figure 2-2. Quantimed Setup screen

The default installation location is the C:\Program Files\Quantimed directory. The user may change the location in the Select Destination Location screen (Figure 2-3) by clicking on the Browse button and selecting a new directory. Press the Next button to continue.

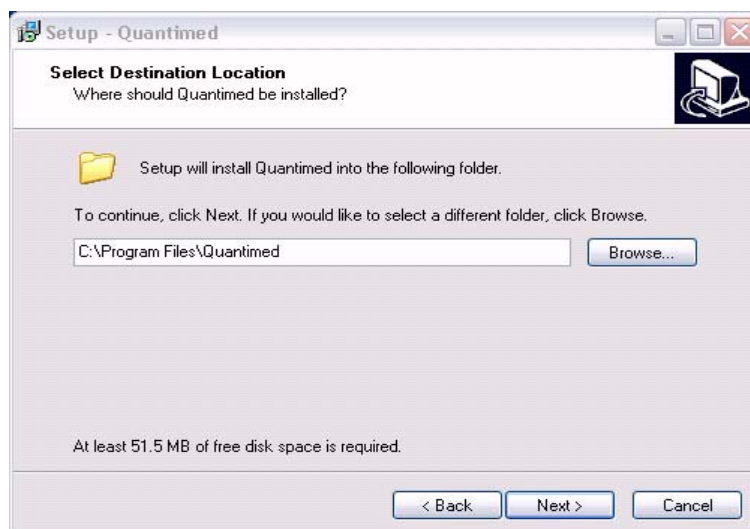Figure 2-3. Select Destination Location screen

Accept the default to create a folder in the start menu named Quantimed in the Select Start Menu Folder screen (Figure 2-4). Press the Next button to continue.
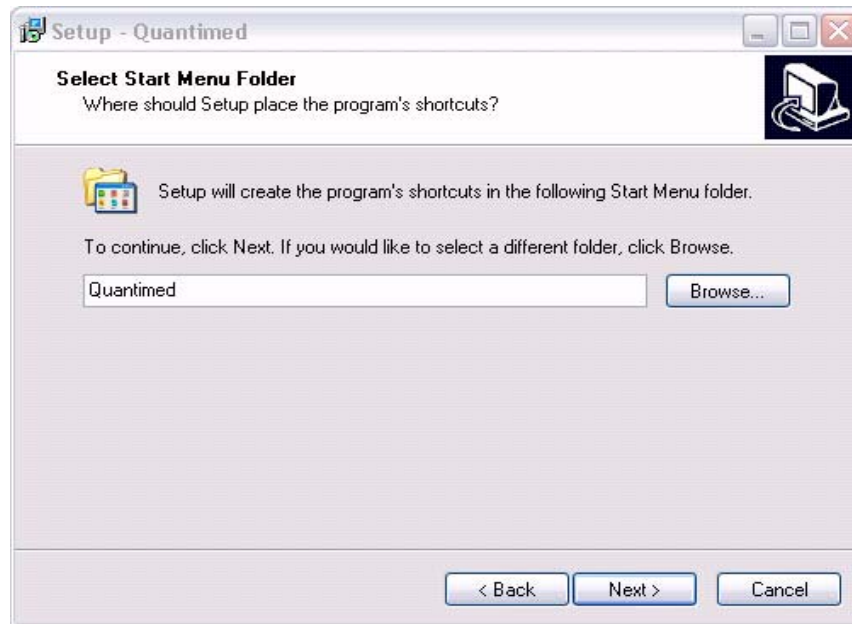

Figure 2-4. Select Start Menu Folder screen

Click the box to create a Quantimed icon on the desktop in the Select Additional Tasks screen (Figure 2-5).
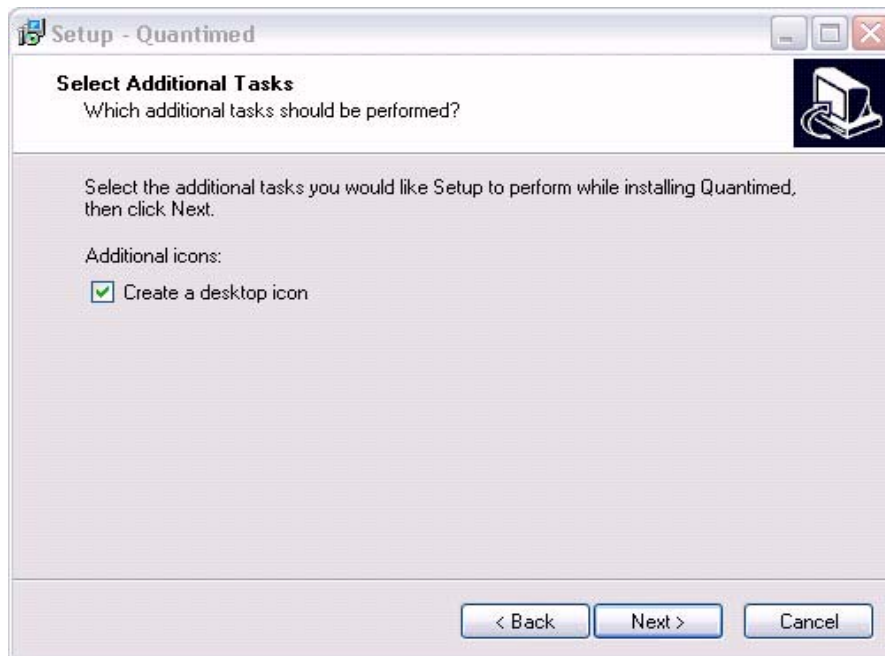
Figure 2-5. Select Additional Tasks screen

Review settings and press Install to complete the installation in the Ready to Install screen (Figure 2-6). Press Back to change and Cancel to abort.

Figure 2-6. Ready to Install screen

The Setup Wizard will begin to copy the Quantimed files to the destination location, as seen on in the Installation screen (Figure 2-7).
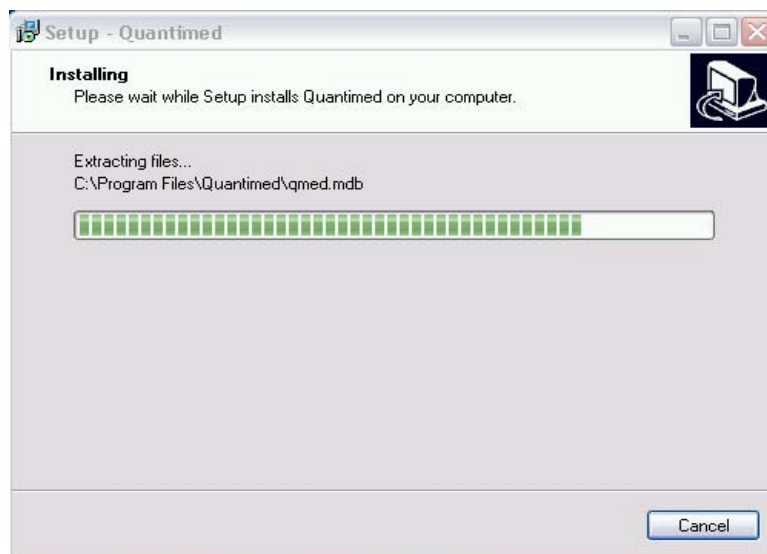
Figure 2-7. Installation screen

When installation is complete, click on the Finish button in the Completing Quantimed Setup screen (Figure 2-8) to exit the installation procedure. The Launch Quantimed box is checked by default and will launch Quantimed upon selecting Finish. If this is not desired click on the Launch Quantimed box to deselect this option.

Figure 2-8. Completing Quantimed Setup screen

Start using Quantimed by double-clicking on the Quantimed icon Q on the desktop. Refer to Chapter 3 for further direction on starting Quantimed.

"If you do not have MS Access" Installation Option

Selecting the Quantimed: If you do not have MS Access button will open the Setup Wizard, which will direct the user through the installation process. The Quantimed Setup screen for this option (Figure 2-9) will appear next. The user is prompted to close all other programs and click Next to begin the installation. The setup can be canceled at any time if the user is not ready to complete the installation. Selecting Next in the Quantimed Setup screen begins the installation process.

Figure 2-9. Quantimed Setup screen

The default installation location is the C:\Program Files\Quantimed directory. The user may change the location in the Select Destination Location screen (Figure 2-10) by pressing the Browse button and selecting a new directory. Press the Next button to continue.
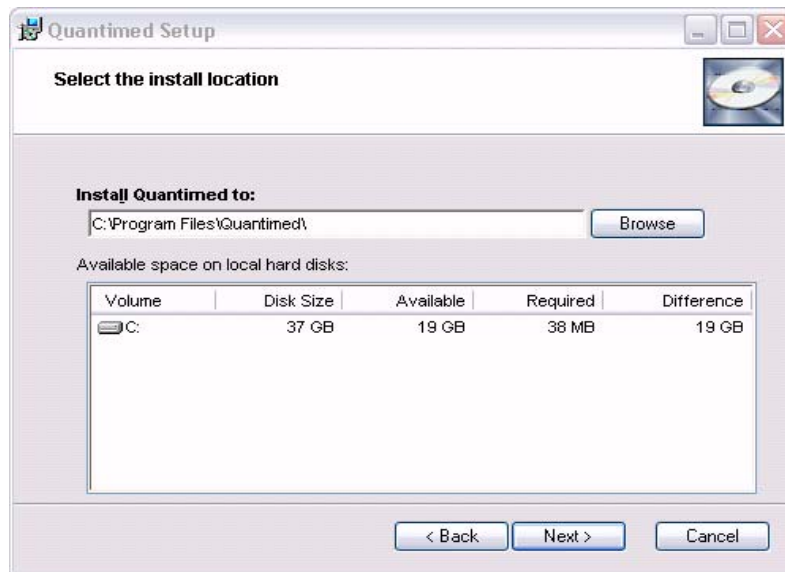

Figure 2-10. Select Destination Location screen

Begin installation by selecting the **Install** button on the Ready to Install screen (Figure 2-11). Make changes by selecting the Back button. Exit without installing by selecting the Cancel button.
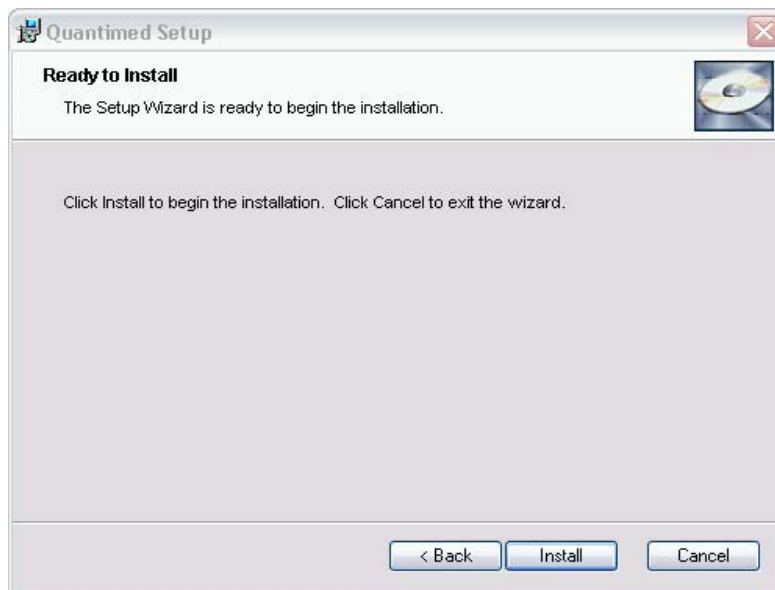
Figure 2-11. Ready to Install screen

The setup program will begin to copy the Quantimed files to the destination location, as seen on the Installation screen (Figure 2-12).
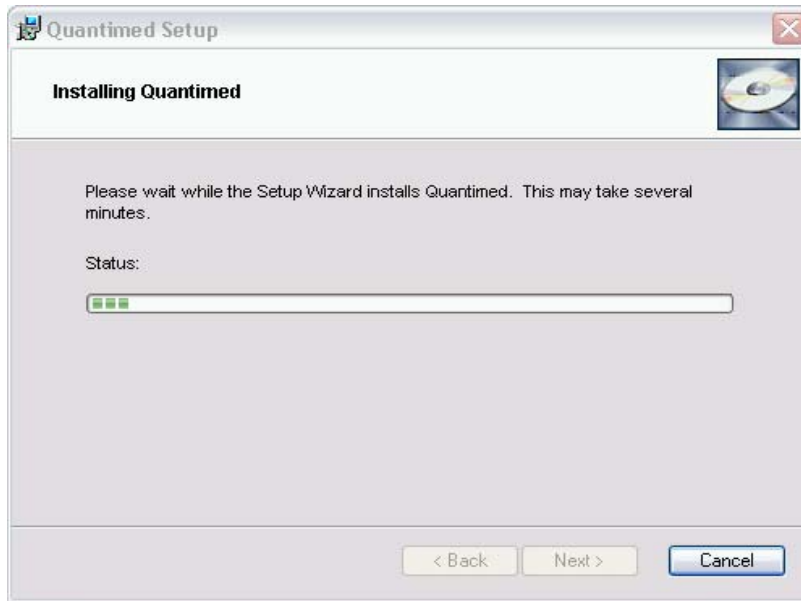
Figure 2-12. Installation screen

When installation is complete, press the Finish button on the Completing Quantimed Setup screen (Figure 2-13) to exit the installation procedure.
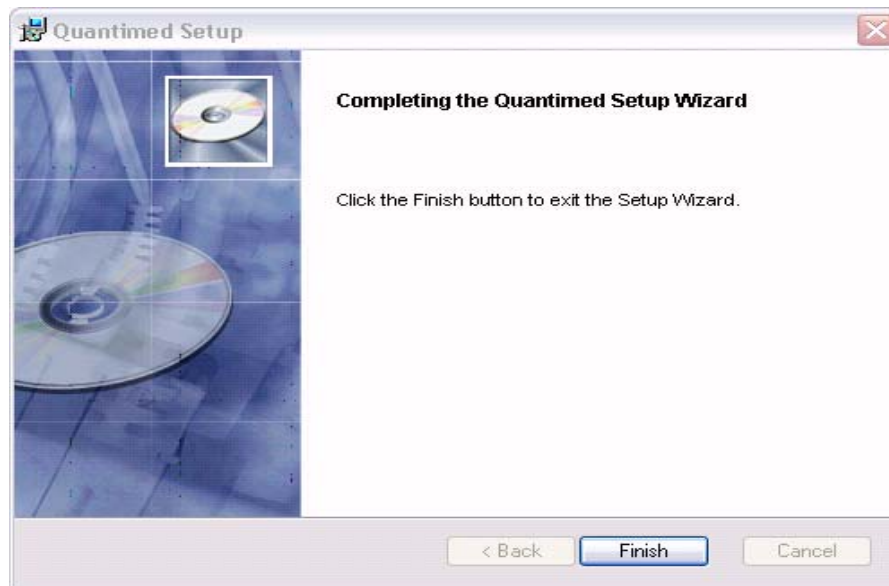
Figure 2-13. Completing Setup screen

Start using Quantimed by double-clicking on the Quantimed icon [Q] on the desktop. Refer to Chapter 3 for further direction on starting Quantimed.

Uninstalling Quantimed

To uninstall Quantimed, open the Start Menu >Control Panel and select Add or Remove Programs. Once this function is selected, a listing of all programs and Windows components will appear. Select Quantimed from the list of programs. Clicking on Quantimed will allow details of Quantimed to be viewed as well as the Change/Review button. Select this button and follow the instructions to uninstall Quantimed.

If the user tries to re-install Quantimed without first uninstalling as directed above, the Repair or Remove Installation screen (Figure 2-14) or the Folder Exists screen (Figure 2-15) will appear, depending on the installation option chosen. In this situation, the user should select the desired option (Repair/Remove or Yes) and the installation will then proceed as described earlier. If the No option is selected on the Folder Exists screen (Figure 2-15), the Setup Wizard is aborted.
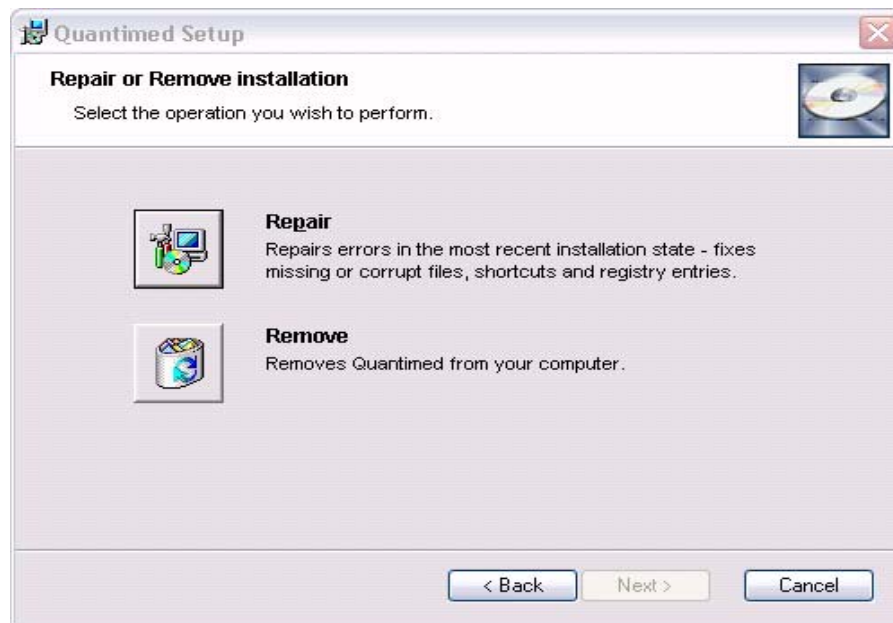
Figure 2-14. Repair or Remove Installation screen
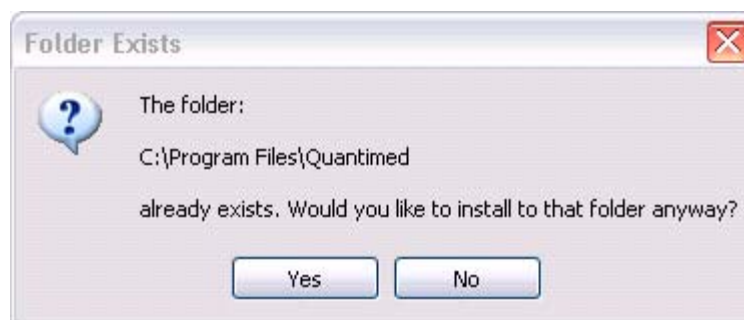
Figure 2-15. Folder Exists screen

NETWORKING IN A WINDOWS ENVIRONMENT

Quantimed can be used on a network to enable multiple users to access the tool from different computers. Installing and using Quantimed on a network is essentially the same as using it from a hard disk on an individual computer. On the network, Quantimed will be available to other users and will allow them to make changes or run reports.

Windows networking configuration is essentially the same as the standard installation. After completing the installation, users can share the folder containing the Quantimed files. In order for the Quantimed program to be used across the network, each machine must have an installation of the program. This copies the necessary run-time application and registry settings to each machine. The network administrator should decide which machine will contain the data file to be used; this machine is typically called the "server." Users should use the Linked Table Manager in the Tools menu to connect to the shared location containing the **qmed_be.mdb file** (the data file). This will ensure that everyone has access to the same data.

If installing the data files to a computer that will not have a user running the program, simply create a directory on the server and copy the **qmed_be.mdb file** to that directory. Delete copies of the **qmed_be.mdb files** that exist on other client computers, to prevent errors when connecting to the data file.

CHAPTER 3
Getting Started

Objectives

- To give detailed instructions for starting Quantimed

- To describe the key features of Quantimed

- To provide instructions for navigating Quantimed

- To define Quantimed's data requirements

To start the Quantimed program, double-click on the shortcut automatically placed on the desktop during installation, or use Windows Explorer to locate the folder in which the Quantimed files were installed (the default folder is C:\Program Files\Quantimed) and double-click on the **Qmed.mdb** file.

Once Quantimed has started, the splash screen (an initial screen identifying the Quantimed program and presenting summary information about the active data set) will be displayed and the Quantimed menu bar opened, usually beneath the standard Access taskbars. See Figure 3-1.

If creating a new data set, select Define Quantification Parameters >Data Set Definition and proceed to define the parameters of the data set. If modifying an existing data set, select Define Quantification Parameters >Data Set Definition and select the required data set.
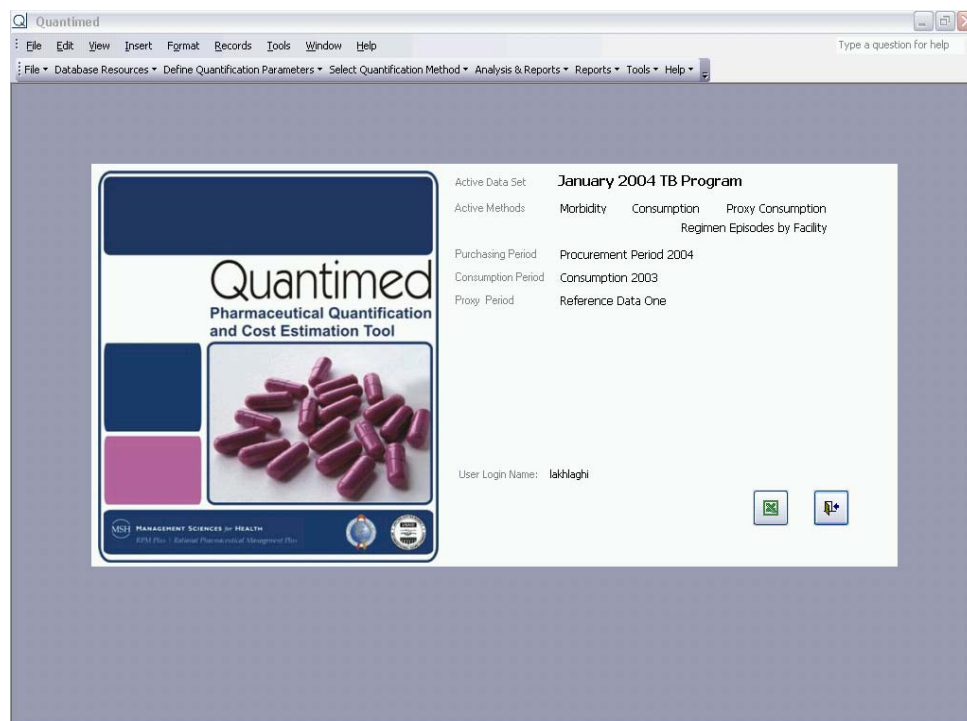
Figure 3-1. Splash screen and menu (application window)

OVERVIEW OF ACCESS RELATIONAL DATABASES

The Quantimed tool is based on Microsoft's Access database program. A database is defined as any collection of information organized into logical groups to make retrieval of this information easy. Electronic databases enable efficient maintenance, manipulation, and extraction of large amounts of data based on specific guidelines that are set.

With the Quantimed tool, the user will use forms to view, enter, and modify information. The program then stores this information in a series of data tables consisting of fields and records. *Fields* represent categories of information. Information entered into a field is stored in columns. A set of fields, which contains information relating to a single entity, is called a *record*. Information in a record appears in a row.

For example, in the Medicine Delivery Route Validation Table (Figure 3-2), the field called *Code* will hold the code that represents how the drug will be delivered to the body (e.g., IM). The field called *Description* is used to describe what the code refers to (e.g., Intramuscular). Together, *IM* and *Intramuscular* form a record.

Figure 3-2. Medicine Delivery Route Validation Table

These records are stored in tables, which the user can view and modify through form windows presented on screen by selecting from various menu and submenu options within Quantimed.

The underlying technology of Microsoft Access adds greater functionality to database management. Access is a relational database, which simply means that it takes large amounts of data and splits it into numerous smaller, connected tables, each representing a subject area, such as Medicine Delivery Route, Strength Units, or Commodity Packaging.

The strength of Microsoft Access is in its ability to analyze these smaller tables, identify fields that may be common between them, and establish a link or a relationship between the tables. This relationship enables the user to pull information from several different tables at once.

This relational database technology is the foundation of the Quantimed program. For example, when Define Quantification Parameters >Commodities >Data Set Medicines List is choosen and the form window is appears, Quantimed pulls data from numerous tables, including the Strength Units, Units, Medicine Delivery Route, ATC Code, Pharmaceutical Form, Currency, and Commodity Packaging tables, as well as others, to display the data as part of one all-inclusive form. Just as information can

WARNING!

Changes made to forms are stored in tables. Making changes to forms will in turn change tables globally, throughout the database.

be pulled from numerous tables, data can also be added to or modified in numerous tables simultaneously. This occurs when a new record is created or an existing record is modified. The information entered into each field is saved to the table that stores this information in the database.

With a relational database, the user can generate reports, filter data to search for specific records meeting certain criteria, and extract information for further analysis.

NAVIGATING QUANTIMED

Because the Quantimed program is an Access-based program, the user may use the various compo-
nents of Quantimed by selecting items from the Quantimed main menu, which is usually located below
the standard Access and toolbar menus (Figure 3-3).
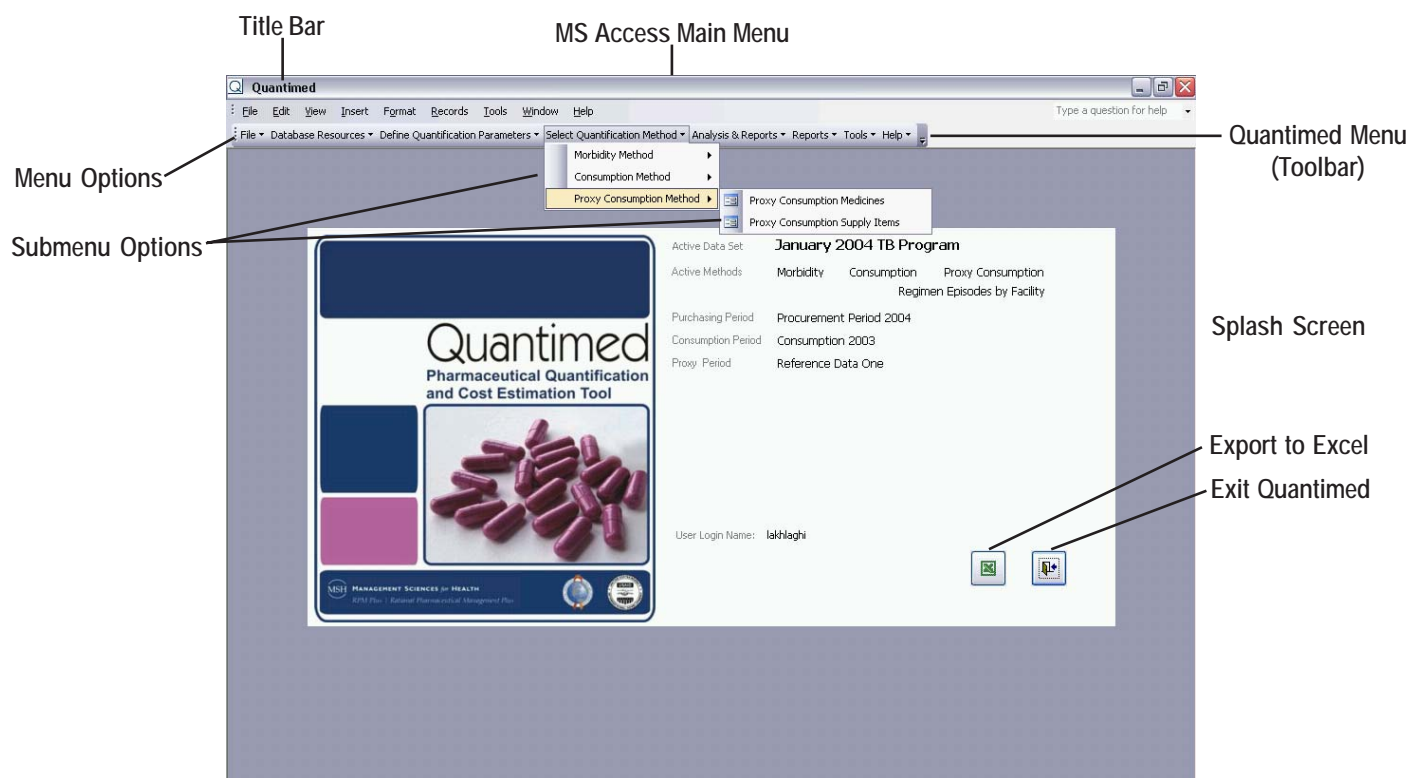
Figure 3-3. Elements of the Quantimed main application window

To navigate to the various functions, simply select the topic from the Quantimed menu and the additional
options available will be displayed in a drop-down list. This is useful if information in different forms is to
be reviewed or compared. However, it should be remembered that, if several related forms are open,
modifying data in one form will not cause the information in another to update. It is necessary to close
and then re-open the appropriate forms in order for the program to refresh the information displayed.
Table 3-1 presents an overview of the elements of the Quantimed main window.

Table 3-1. Overview of the Quantimed Application Window

Component	Function
Splash screen	Displays as background wallpaper when Quantimed is launched. Displays the name of the active data set, the quantification methods chosen, purchasing period, consumption period, and proxy period descriptions for the respective methods chosen once entered under Data Set Definition (covered in Chapter 4). The user login name will also be displayed at the bottom of the screen.
Title bar	Used to identify the name of the program and/or form window being displayed. If a window is impeding the view, simply left-click on the title bar and drag the screen to another area of the window.
Microsoft Access main menu	Grouping of commands by topic. The Microsoft Access menu appears in two versions: short menu and full menu. The short menu appears first and displays the most frequently used commands. The full menu appears when the mouse is held over the menu option.
Quantimed menu	Toolbar with specific topics relating to Quantimed. Each topic item allows the user to access various commands that are relevant to the topic.
Menu options	Commands relevant to the topic under which they are displayed.
Drop-down arrows	Black downward-facing arrows that appear to the right of each topic on the Quantimed menu. Left-clicking on the arrow displays menu options relevant to the selected topic.
Submenu options	Available from menu options displaying a right-facing black arrow. When the mouse is held over the menu option, the submenu appears. To select a submenu option, move the mouse over the desired form/item from the list and left-click.
Scroll bars	These appear on form windows where more information is available than can be displayed at one time. The scroll bar can be utilized to move the contents of a screen or window left, right, up, or down to see additional information.
Screen tips	Screen tips help identify the name/function of the icons on the form view toolbar. This feature works even if the icon is grayed out (which means the function itself cannot be used). To display a screen tip, simply point to an icon with the mouse and a yellow box displaying the name/function of the icon appears.

Using the Form Window

Logically designed forms are utilized for entering information into and extracting information from the Quantimed database. For a form (form window) to be displayed, select a menu and/or submenu item. The form that appears will reflect the data entry fields relevant to the item selected (Figure 3-4).

Record Selector

Figure 3-4. Example of the Quantimed form window

Icons

Quantimed uses icons (graphic images) to aid in the process of entering and modifying data in form windows. The icons available may vary according to the form selected. The Quantimed icons are displayed below.

Open/edit – This icon opens an existing item displayed in the form window. Information relevant to that item may be modified from this window.

Add – This icon opens a blank form where a new item/record can be added to the database.

Delete – This icon is used to delete an item from the form window. When this icon is selected, the user will be prompted to confirm the deletion before the process is completed.

Filter – This icon is used to filter database information to meet specific criteria set by the user. The blank field that appears near this icon can be used to specify the criteria that must be met by the filtering process.

Clear (remove) filter – This icon is used to clear the results of the filter and redisplay all records related to the form window.

Close – This icon is usually located in the lower right-hand corner of a form window and is used to close the active form window and save data. Always close a form by clicking on this icon (*not* by clicking the cross in a red square in the top right-hand corner of the form screen).

Output query to Excel file – This icon appears near the bottom of some report windows. Selecting this icon gives the user the option of sending query results to a Microsoft Excel spreadsheet, where the data can be further manipulated and analyzed.
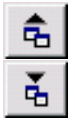
Copy to or from clipboard – These icons are used to copy specific data to or from the clipboard.

The Preview Report icon, if selected, launches Microsoft Excel and allows the user to view the chosen form.

The Print icon, if selected, will send the blank report form directly to the printer. Information can then be manually added to the form.

Navigation Buttons

Quantimed uses navigation buttons on form windows that contain more records than can be displayed on screen at one time (Figure 3-5). These navigation buttons are used to identify the number of the current active record (where your cursor or highlighting appears) and to move quickly to the first, last, next, and previous records in the database window.

Moves to the FIRST record in the table.

Moves to the LAST record in the table.

Moves to the NEXT record in the table.

Moves to the PREVIOUS record in the table.

Record: 6 of 9

Figure 3-5. Navigation buttons and record locator

The number that appears in the white field between the Previous and Next buttons is referred to as the *record locator*. The number in this field indicates which record is currently active. Within an active record, the user can use the <TAB> key to move forward from one field to the next (or <SHIFT + TAB> to move backward).

On the far right side of the navigation buttons is the word *of* followed by a number. The number indicates how many records are stored in the table. For example, if the number *6* and the words *of 9* are displayed in the record locator box, that means that the user is currently viewing record 6 of a total of 9 records.

Selecting Records

To effectively navigate and select records, scroll to the desired record, click in the record indicator area of the screen (gray area to the left of the record), and then left-click. The user can double-click on the existing number in the record locator box and type the number of the specific record to be moved to.

Navigating Fields in the Form Window

When working in a form window that already contains data or entering new information into a blank form, the type of information required appears on the form. To move from one field within a record to the next, click each field using the mouse or use the <TAB> key. Once at the end of the record, hit the <TAB> key again to move to the first field of the next record.

On some forms within Quantimed, a drop-down arrow appears when a field is selected. When the user clicks on the drop-down arrow, Quantimed displays the list of choices that can be used in that field. The user can simply select from the list or type the first letter of the word to choose and modify the record. The source of these lists are the validation tables described in Chapter 4 and specific user-defined lists prepared during the user's application of Quantimed.

Using Filters

Apply Filter – The funnel icon (see p. 3-8) is used to filter database information to meet specific criteria set by the user. The blank field that appears near this icon can be used to specify t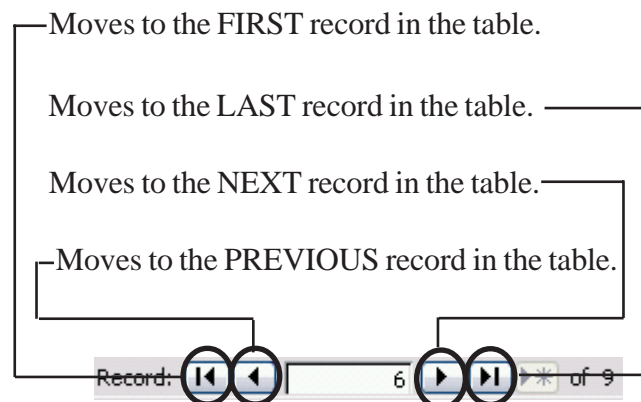he criteria that must be met by the filtering process. A search is conducted for the given string anywhere in the text of the record field being filtered. Typing "sta" in the filter search box finds "nystatin" as well as "stavudine."

Remove Filter – When removing a filter (see p. 3-9), Quantimed clears the results of the previous filtering action and redisplays all records for that form window.

Unless specifically intended, it is important to remove the filter before another criterion is entered and a second filter applied. If the initial filter is not removed, the database will refilter the results of the first filter process based on the second criterion entered and the results will not be a true reflection of the data.

SPECIAL MOUSE TECHNIQUES

Quantimed is a fully functional Windows program that requires the use of the mouse to complete specific tasks.

Click   Quickly press and release a mouse button.

Left-click   Click the left mouse button to perform the following tasks:

- Select a topic from the Quantimed Menu or use an icon.

- On the title bar of an open form window, left-click and hold to adjust the window's position on the screen.

- Moving the mouse to any edge of an open form window changes the pointer to a double-headed arrow, indicating the direction in which to extend the window. Once the double-headed arrow appears, left-click and drag in the desired direction.

Right-click   Within a table, right-click on a cell to display a shortcut menu in which to select various filtering, sorting, and basic editing options.

Using the techniques presented in Table 3-2, the mouse may also be used to scroll through all the information in a form window.

Table 3-2. Scroll Functions in a Form Window

To Scroll	Do the Following
One line up/down	Click the up or down scroll arrow.
Continuously	Point and hold the left mouse button until the desired information comes into view.
Pan up/down	Click the scroll bar or below the scroll box on the vertical scroll bars.
Pan left/right	Click the scroll bar to the left or right of the scroll box on the horizontal scroll bars.

MORBIDITY-BASED QUANTIFICATION INFORMATION REQUIREMENTS

To create a morbidity-based estimate using Quantimed, the user will need to define and collect data to enter into the tool. This section discusses the types of data required for using Quantimed. Data collection forms found under Reports >Data Collection Forms in the software can be used to assist with gathering information. Examples of these forms can be found in Annex 1.

For the morbidity method (see Chapter 5 for more details), the first step is to determine what health problems, conditions, and services will be included in the estimate. The basis of a morbidity-based quantification is a set of defined STGs or other accepted protocols for the treatment of the health conditions and/or the provision of services of interest. If STGs are not already established, a morbidity-based estimate is more challenging because a consensus must be reached on which guidelines to use.

In general, standard treatment guidelines should include the following.

1. A list of medicines to be administered, including, for example, those given for first- and second-line treatments, or for optional therapies prescribed to subsets of patients or clients, or as alternatives for patients allergic to specific medicines.

    For each drug, STGs should include:

    i.   Generic name
    ii.   Dosage measurement unit (e.g., milligrams, milliliters)
    iii.   Form (e.g., tablet, ampoule)
    iv.   Strength per dosage form (e.g., 250 mg tablet, 40 mg/ml ampoule)
    v.   Route of administration (e.g., by mouth [PO], IM, topical)
    vi.   Treatment dose (the amount given at one time in terms of volume, weight, etc., depending upon form)
    vii.   Number of doses per day
    viii. Number of days of treatment/service
    ix.   Proportion of patients/clients receiving each drug (i.e., given first- or second-line treatment or optional component of therapy)

2. A list of supply items (may include laboratory tests) that support administration of medicines or services.

    For each medical/laboratory supply item, STGs should define:

    i.   Quantity required for each (medicine) administration or test (e.g., one disposable needle/syringe for injection; two pairs disposable gloves; 500 ml saline solution; one alcohol wipe; 2×5 ml drops reagent "X"; 15 ml reagent "Y")
    ii.   Number of administrations (should equal number of doses per day multiplied by number of days of treatment)

    iii.   Proportion of cases treated (or clients provided with the service) requiring the medical supply item

    iv.   Supply pack size (e.g., box of 100 disposable needles; box of 50 disposable gloves; 1l bottles of saline solution; 500 ml bottle of reagent "X")

3. Procurement costs for medicines and supply items, either international prices or local prices. The cost of a unit of a medicine or a supply item (e.g., tablet, milliliter) is used in calculating cost information. However, cost information on purchasing packs (e.g., bottle of 1,000 tablets or box of 50 pairs of gloves) can be directly entered by providing the exact contents of the purchasing pack as detailed.

Using this information, the total quantities needed and their costs can be calculated. Remember that in order to make decisions on procurement quantities, the user will also need to know the quantity on hand and the quantity on order for each medicine or supply item.

To Determine Costs and Quantities for a Selected Population

Quantimed determines the costs and quantities of an item or service for a selected group by multiplying the per case/client cost and quantity by the actual or estimated caseload for the target population. If the actual or an estimated **number** of cases is not known or available, it may be possible for an estimate of the caseload to be determined as a **proportion** of some other known population parameter.

This figure would be obtained by applying to the total selected population (e.g., pregnant women) the proportion that will access a particular service or receive a particular treatment. Caseloads may also be estimated from service delivery statistics. For example, for reproductive health treatments and services, the data required could include:

- Population of the administrative area (country, district, etc.)
  - Total
  - Men
  - Women
  - Women aged 15–49 years (of reproductive age)
  - Infants (aged 0–4 years)
  - Number of births
    - Proportion of births occurring in a health facility
    - Proportion of pregnant women receiving prenatal care
    - Proportion of pregnant women requiring treatment for each reproductive health condition of interest

Similar categories can be identified for other diseases or health issues. More details can be found in Chapter 5.

CONSUMPTION-BASED QUANTIFICATION INFORMATION REQUIREMENTS

To create a consumption-based estimate using Quantimed, the user will need to define and collect data to enter into the tool. This section describes the types of data required. The types of information that need to be gathered for a consumption-based estimate are the same whether the estimate is based on the user's own system or on a proxy system. Data collection forms found under Reports >Data Collection Forms in the tool can be used to assist with gathering information. Examples of these forms can be found in Annex 1.

For the consumption method, the first step is to define the administrative area or set of health facilities for which the quantification will be undertaken. Determine the list of stocked products—medicines, supply items, and laboratory supplies—to be included in the quantification exercise. For medicines, each different formulation of a drug is a separate product: for example, amoxicillin 250 mg capsule, amoxicillin 500 mg capsule, and amoxicillin 500 mg vial are three separate products.

In a well-functioning supply system, if actual consumption figures (patient records are a possible source) are not available, inventory records are an appropriate alternative data source. Remember that in order to make decisions on procurement quantities, the user will also need to know the quantity on hand and the quantity on order for each medicine or supply item.

For each product, the user will need to:

- Identify the unit of measure (e.g., tablet, 1 ml ampoule, 500 ml bottle, 200 g tube [of cream]).

- Obtain information on the quantity consumed in a certain time period or a series of time periods—for example, over a year or for each of 12 consecutive months.

- Determine or estimate the number of days out of stock during the period under review.

- Determine or estimate the percentage of wastage.

- Identify the pack size.

- State the safety stock level in months.

- Note the estimated lead time in months.

- Determine the procurement period in months (number of months that elapse between orders).

- State the current stock balance and quantity on order.

- Include the therapeutic class for additional analysis.

- Enter the procurement costs for drugs and medical supplies, either international prices or local prices. Costs need to be for an individual tablet, vial, or dose, so the contents of a multiunit container (such as a bottle or carton) must be identified.

More details on the consumption method can be found in Chapter 6, and more information on the proxy consumption method can be found in Chapter 7.

TERMINOLOGY IN QUANTIMED

Entering medicines and supply item data consistently can be difficult and is an challenging task for those unfamiliar with the terminology. Before beginning, it is helpful to understand a number of terms used in Quantimed. Table 3-3 lists the major pharmaceutical supply and tool-specific terms used by Quantimed, along with definitions.

Table 3-3. Terms Used in Quantimed

Term	Description
ABC Analysis	An analysis in report form that identifies the medicines or supply items that account for the highest percentage of budgetary costs.
Adjustment Percent	A value that reflects an adjustment made to requirements if medicines or supply items are lost due to damage, spoilage, expiration, or theft, and that may also reflect expected increases or decreases in demand (or need) for the products.
Associated Medicine	Indicates which medicine a supply item is associated with.
ATC	Anatomical Therapeutic Chemical classification system used to classify or group medicines. It is managed by WHO's Collaborating Centre for Drug Statistics Methodology.
Average Monthly Consumption	The calculated average quantity of a medicine or supply item consumed on a monthly basis.
Commodity Packaging	The packaging in which a product is sold.
Comparison Price	Indicates a competitive rate in the marketplace.
Copy Data Set	Procedure by which a user creates a copy of an existing data set.
Currency	The specific monetary unit of a country.
Data Set	A compilation of data entered into Quantimed and used for analysis and report generation. A data set may contain information related to a single or multiple health facilities, to a single administrative area or country, or to a single or multiple health issues.
Data Collection Forms	Blank forms that can be printed from Quantimed and then be filled in by staff members in preparation for data entry into Quantimed.
Days Out of Stock	The number of days a product was out of stock and unavailable for use.
Defined Daily Dose (DDD)	The assumed average maintenance dose per day for a medicine used for its main indications in adults. DDDs are assigned per ATC fifth level (denoting chemical substance) by the WHO Collaborating Centre for Drug Statistics Methodology.
Donated	A field that indicates whether a particular medicine or supply item was donated.
Exchange Rate	The rate at which currency of one county is exchanged for the currency of another country

Table 3-3. Terms Used in Quantimed *(continued)*

Term	Description
Filters	Used by Quantimed to select information based on specific criteria.
Generic Medicines	The approved or nonproprietary names of medicines. Not trade names.
Institutional Code	User-defined identifier for medicines or supply items.
Lead Time	The amount of time, in months, between when an order is placed and when the products arrive.
Pharmaceutical Form	The dosage form in which a medication is dispensed (e.g., tablet or capsule).
Population	Identifies the population covered in the data set. May refer to all people in a country or facility/area or represent a subgroup defined by specific characteristics.
Procurement Period	The number of months for which orders are placed for a medication or supply item.
Product	Identification of a medicine (consisting of generic name, strength, and dosage form) or a supply item.
Proxy Consumption	Used as a data substitute when available data on consumption of medicines or supplies in a program are unreliable or incomplete and therefore unlikely to produce a meaningful estimate. The alternate source of data must be similar to the program for which the proxy consumption data will be used.
Query	A procedure through which the user enters specific criteria to filter data for the purpose of extrapolating a desired result for the selected data set.
Regimen	A specific combination, dose, and quantity of medicines and supply items used for the treatment of a disease or condition.
Safety Stock	The number of months' worth of stock kept in reserve to allow for the possibility that an item becomes unavailable from the supplier or undergoes a sudden increase in demand.
Scaling-Up	A Quantimed feature that allows for morbidity quantification for programs that are expanding.
Strength Units	The units in which the strength of a particular medicine is typically measured (e.g., milligrams or micrograms).
VEN	A system of setting priorities for purchasing medicines and maintaining stock, in which medicines are divided according to their healtlh impact into vital, essential, and nonessential categories.

CHAPTER 4
The Quantimed Database

Objectives

- To explain installed database resources

- To guide the user in defining quantification data set parameters

DATABASE RESOURCES

The Database Resources Menu contains validation tables and additional references. These validation tables are database files containing reference information that will be used repeatedly. Because Quantimed is a relational database, it uses data found in several established tables to standardize the analysis process. Data entered into the various validation tables will be displayed in other data entry and analysis form windows and will be printed in reports.

Validation Tables

The Validation Tables option includes several small databases that will provide standardized choices throughout Quantimed. Validation tables are often accessed through browse windows that contain drop-down lists, which make the process of completing forms easier and more accurate.

Validation tables in Quantimed contain several records of standard information, but the user may add or modify records in order to develop customized data definitions that can be used to consistently enter data in various fields.

To access validation tables from the Quantimed Menu, select Database Resources >Validation Tables, then select the validation table to view or modify.

Each validation table consists of a code/unit as well as a description of each code or unit. This ensures that data being entered into database records are consistent—for example, that TAB will always represent tablet.

Below is an overview of the Validation Tables feature in Quantimed.

Pharmaceutical Form

The Pharmaceutical Form Validation Table (Figure 4-1) is used to maintain a list describing the possible forms of the product. For example, to indicate the form of any drug in the database as a capsule, the code CAP and its associated description "capsule" are used. The user may create a customized pharmaceutical form list based on terminology specific to a particular setting, or the user may add to or modify the list provided. The code for a pharmaceutical form can be up to 20 alphanumeric characters long.

Figure 4-1. Pharmaceutical Form Validation Table

Medicine Delivery Route

The Medicine Delivery Route Validation Table (Figure 4-2) is a database file used to describe how the medicines are administered. For example, if acetaminophen is defined in the medicines list database with a pharmaceutical form of tablet, the medicine delivery route for this item would be PO, or oral.

Figure 4-2. Medicine Delivery Route Validation Table

Strength Units

The Strength Units Validation Table (Figure 4-3) is a database that lists the various strength units of a medicine. For example, milligram (MG), milliliter (ML), international unit (IU), percentage (%), and gram (G) are units used to measure the strength of the medicine or supply item. These strength units are used in regimen calculations. For liquid items, it is important to enter the units by the strength in each ML. For example, the strength for liquids (e.g., ampicillin 25 MG/ml

suspension in a 60 ml bottle) is usually expressed in MG/ml, so the strength unit for this suspension is MG. See the Units section for more about this example.

The Administration Units and Conversion Factor fields, which appear in this table, are used to further define the strength units. The Administration Units field is used to specify a unit of measurement when the drug is administered. For example, a strength unit measured in grams may be measured as milligrams when administered. The conversion factor indicates how the administered unit is measured in comparison to the strength unit. For example, 1 G is equivalent to 1,000 MG. Not all strength units have administration units and conversion factors defined.

Figure 4-3. Strength Units Validation Table

Units

The Units Validation Table (Figure 4-4) provides a list describing the smallest measurable unit in which a medicine/supply item is produced or stocked. Examples of unit measurements include tablet, capsule, milliliter, and ampoule. In the example of ampicillin 25 MG/ml suspension in a 60 ml bottle, the unit is ml (milliliter) (and the pack size for pricing is 60 ml). This is important to understand because if the unit is not set up correctly, the calculations at the regimen level in the morbidity method will be incorrect. When the medicine is entered for a regimen, the dose must also be by weight rather than volume, so the dose for this ampicillin regimen might be 125 MG three times a day. The Quantimed program would then calculate this as equivalent to 15 ml a day. If a four-day course were specified, one 60 ml bottle would be required.

It is very important to understand that the lowest denominator is normally used to define the units, as in the example above. Confusion may arise over a liquid with a strength, for example, of 125 MG/5 ml in a 100 ml bottle. In this case, the user may either convert the strength to the lowest denominator (i.e., 25 MG/ml) and proceed as above, or define the unit as 5 ml. If the unit is defined as 5 ml, it is important to be very careful in entering the packaging for the price. Because the unit will remain 5 ml, the user must divide the number of milliliters in one bottle by 5 before entering that quantity in the packaging field for the medication price. For example, with a unit of 5 ml, a bottle of 100 ml would be defined as 20×5 ml per bottle. If this adjustment is not made, Quantimed's calculation of the number of packs to order will be incorrect.

(see below)

Generic Medicine Name

The Generic Medicine Name Validation Table (Figure 4-6) provides a list of U.S.-accepted names (USANs) or international nonproprietary names (INNs) of a medicine; however, the user may add to or modify the information in the table as needed. This validation table is important for ensuring consistency, so it is important to double check that the name is correctly entered and is not a duplicate. The list of medicines is taken from the *International Drug Price Indicator Guide*.[1]
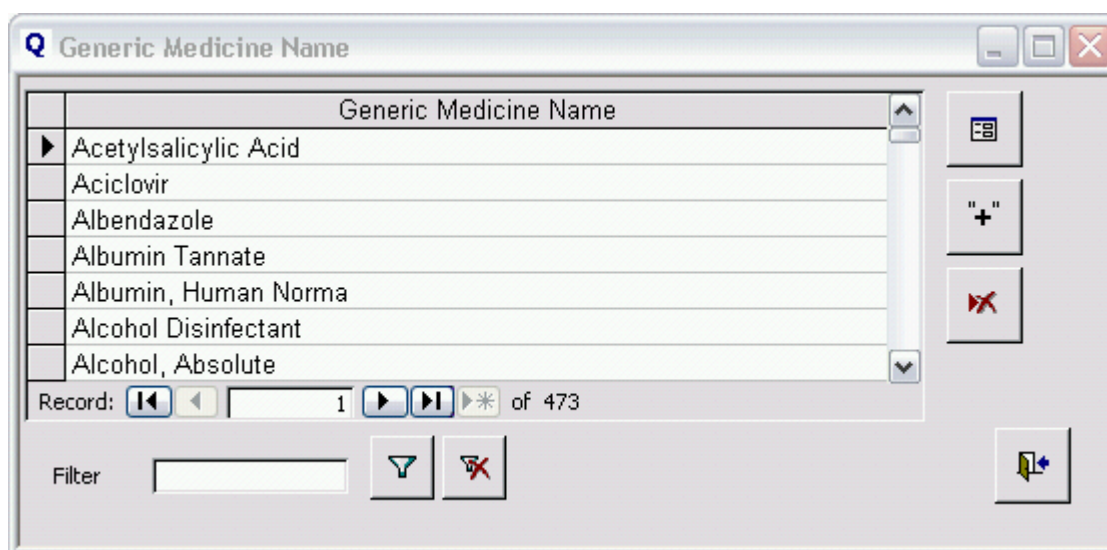
Figure 4-6. Generic Medicine Name Validation Table
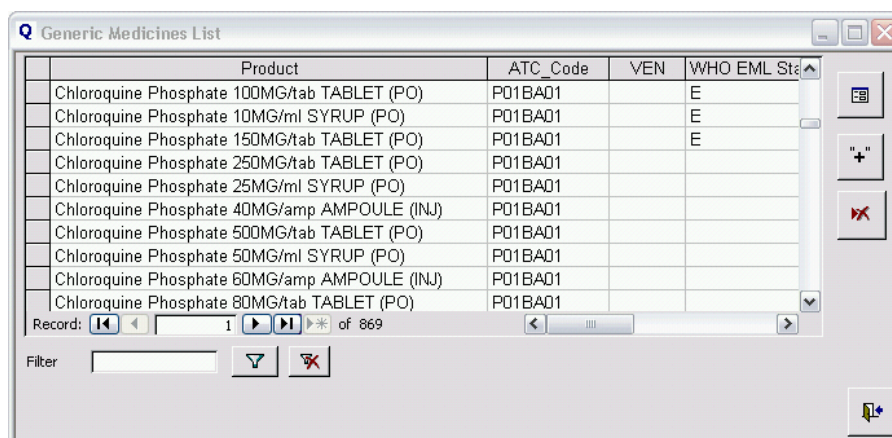
Generic Medicines List

The Generic Medicines List Validation Table (Figure 4-7) is a list of medicines that may be needed to provide treatment for the health issues of interest. Quantimed comes with standard lists, but users may add any item not included in the validation tables. The list of medicines is taken from the *International Drug Price Indicator Guide*.[1] Products added to the Generic Medicines List Validation Table are available to be included in any data set subsequently created by the user.

When the Generic Medicines List Validation Table is selected, the main Generic Medicines List window will be displayed. This window displays the drug formulation, Anatomical Therapeutic Chemical (ATC) code, VEN (vital, essential, nonessential) classification, WHO EML status, WHO therapeutic class, comparison price, currency, defined daily dose (DDD), and DDD unit.

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[1] Management Sciences for Health (MSH), in collaboration with the World Health Organization. 2004. *International Drug Price Indicator Guide* (updated annually). Boston, MA: MSH.

Figure 4-7. Generic Medicines List Validation Table

Generic Medicines List Add/Edit

From the Generic Medicines List window (Figure 4-7), users can modify the selected record, add a new record, or delete an existing record (the one selected) from the Generic Medicines List.

Clicking the Edit or Add record buttons opens the Generic Medicines List Add/Edit window (Figure 4-8).

Figure 4-8. Generic Medicines List Add/Edit window

The Product field is shaded here, which means that the product definition cannot be modified directly in this field. The Product field is displayed as blank if the user is creating a new record. This window/form contains several rows that allow the user to select the generic name for the product, the medicine strength, and the form for each medicine in a combination product. These fields are combined by Quantimed to create the Product. Most fields on this screen have drop-down product lists to choose from. Any field with a drop-down list is linked to its respective validation table; this link allows for consistency of data entry throughout Quantimed. The data fields available in this screen are summarized in Table 4-1.

Table 4-1. Summary of Data Fields

File	Description	Example
Product	This uniquely identifies a particular product by combining the name, strength, and dosage form.	Chloroquine phosphate 100 MG/tab
User Created	This feature indicates if the new product is being defined by the user. A check mark means yes, blank means no.	Yes
Generic Name	The approved or nonproprietary name of a medicine. Not a trade name.	Chloroquine phosphate
Medicine Strength	These fields are linked to Strength Units and Units Validation Tables.	100 MG
Abbreviated Name	This field is optional and allows the user to enter the abbreviated name for the generic medication, if desired	CQ
Pharmaceutical Form	This field is used to indicate the dosage form of a medicine. For example, acetaminophen comes in tablet form, which is indicated by TABLET. This field is linked to the Pharmaceutical Forms Validation Table.	TABLET
Route	This field identifies the route through which the medicine enters the body (e.g., TOP [topical], IV [intravenous], PO [oral]). This field is linked to the Medicines Delivery Route Validation Table.	PO
VEN	This field is used to classify items into vital, essential, or nonessential categories based on health impact for reporting purposes. When accessed, an option window is displayed listing the three category choices.	V
ATC Code	The ATC classification code is displayed or may be entered here for new items, if desired.	P01BA01
Defined Daily Dose (DDD)	The DDD is displayed or may be entered here for new items, if desired.	0.5 GM
WHO Therapeutic Class	Therapeutic groupings of related medicines, usually ones used to treat similar conditions or containing related chemical constituents. This field is linked to the WHO Therapeutic Classification Table.	0.6.4.3 Antimalarial medicines
WHO EML Status	This field indicates the status of the drug on the WHO Essential Medicines List. This field is linked to the WHO EML Validation Table.	E
Comparison Price	Used to indicate a competitive rate in the marketplace. To enter a comparison price, enter the price and then select the currency and unit from the corresponding validation tables. *International Drug Price Indicator Guide* median prices have been entered for those medicines where available.	USD 0.0051
Source	Indicates the source of the comparison price.	MSH
Year	Year of the comparison price.	2001
Date Added	Indicates the date the medication was added to the database. Quantimed automatically adds this information when a medicine is added to the Generic Medicines List.	07-Jan-2003
Date Changed	Used to track changes to the information listed on the Generic Medicines List for each specific product.	23-Jan-2003

Generic Supply Item List

The Generic Supply Item List Validation Table (Figure 4-9) lists supply items. A list of standard, internationally recognized names of supply items does not exist. A list of commonly used supply items is included in Quantimed and should be amended and added to, as appropriate. This table includes the supply item, supplementary information, administration unit, comparison price, currency, price unit, and notes. (Use the scroll bar to see all available fields.)

Figure 4-9. Generic Supply Item List Validation Table

Generic Supply Item List Add/Edit

From the Generic Supply Item List window (Figure 4-9), the user can modify the selected record, add a new record, or delete an existing record (the one selected) from the Generic Supply Item list.

Clicking the Edit or Add record buttons opens the Generic Supply Item List Add/Edit window (Figure 4-10). Table 4-2 lists the information that may be added or modified in the Generic Supply Item List screen.

Figure 4-10. Generic Supply Item Add/Edit window

Table 4-2. Information on the Generic Supply Item List Screen

Field	Description	Example
Supply Item	The name of the supply item.	Formaldehyde
Supplementary Information	This field is optional and is designed to provide additional information about the supply item.	1,000 cc bottle
Administration Units	This field is linked to the Units Validation Table and is used to describe the unit of measure for the supply item when stating how much is needed per use. It is important to complete this field correctly because the information in this field will be used when entering regimen information. For example, bandages may be available in 2-meter rolls (of 4 cm width), but the usual amount used for each application may be only 20 cm, so that the administration unit is centimeters, not meters.	cc
Comparison Price	Used to indicate a comparison rate in the marketplace.	10.00 USD/l
Source	Indicates the source of the comparison price.	Central Medical Store
Year	Year of the comparison price.	2002
Notes	Enter any additional relevant notations.	
Date Added	The date the supply item was added to the database. Quantimed automatically adds this information when the supply item is added to the Generic Supply Item List.	07-Jan-2003
Date Changed	Used to track changes to the information listed on the Generic Supply Item List for each specific product.	23-Jan-200

Additional References

International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10)

The International Classification of Diseases is an official system of assigning codes to diagnoses associated with hospital care, as shown in Figure 4-11. Table 4-3 lists the fields used for the ICD Reference Table.
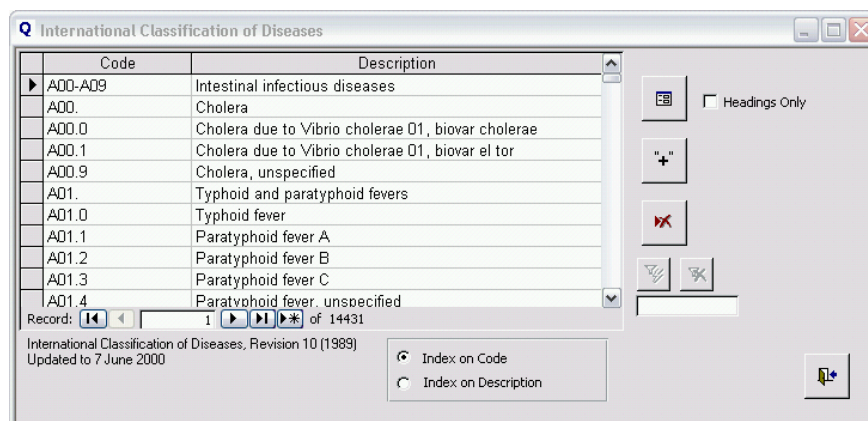
Figure 4-11. International Classification of Diseases Reference Table

Table 4-3. Fields Used for the ICD Reference Table

Field	Description
Code	Codes used to uniquely identify a particular diagnosis.
Description	A description of a particular diagnosis represented by the code.
Headings Only	When the Headings Only box is checked, the screen will display only disease headings.
Filters	Used to filter information based on specific criteria. A criterion is established by either selecting a record from the ICD screen or typing a phrase into the text box below the filter icons. For instructions on using the filtering process, see the section on Using Filters in Chapter 3.
Index on Code	Sorts the ICD listing in alphabetical order based on the information contained in the code field.
Index on Description	Sorts the ICD listing in alphabetical order based on the information contained in the description field

WHO Therapeutic Class

The WHO Therapeutic Classification (Figure 4-12) is based on the WHO Model List of Essential Medicines (EML) and defines the various therapeutic classes in which a medicine may be classified based on its clinical use. Users should utilize the therapeutic classification most common in their region. Table 4-4 lists the fields used in the WHO Therapeutic Class database.
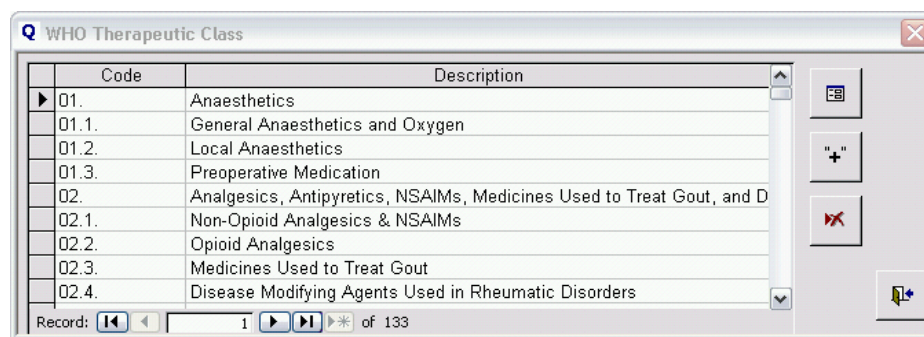
Figure 4-12. WHO Therapeutic Classification database

Table 4-4. Fields Used in the WHO Therapeutic Classification Database

Field	Description
Code	Codes used to uniquely identify a particular therapeutic class.
Description	A description of the types of items that should be contained in each class

Users can utilize the icons at the right of the screen to edit, add, and delete information or to exit this screen.

WHO EML Status

The WHO EML Status Table (Figure 4-13) allows for medicines to be categorized according to their relationship to the WHO EML list. The five categories can be viewed in this reference table. Table 4-5 lists the fields used in the WHO EML Status Table.
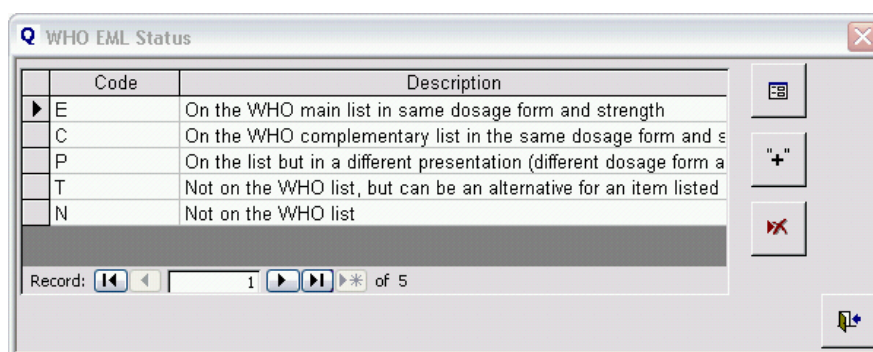
Figure 4-13. WHO EML Status Table

Table 4-5. Fields Used in WHO EML Status Table

Field	Description
Code	Codes used to uniquely identify the status of a medicine in relationship to the WHO Model List of Essential Medicines.
Description	A description of the WHO EML status category

DEFINE QUANTIFICATION PARAMETERS

Before beginning a quantification of pharmaceutical requirements using Quantimed, the user must first determine the type and scope of the exercise. Key questions include:

- Which quantification method(s) will be used?
- What geographic area will the study cover?
- Which facilities will be included?
- What health conditions or diseases will be included?
- Which medicines and/or supply items will the study quantify?
- What population will the study cover?
- Will the data be collected at the facility level or in aggregate form at the central or regional level?
- Will the study include estimates for scaling up programs?

Data Set Definition

In order to conduct any type of analysis, data must first be collected and entered into the program as a defined data set. A data set includes all the collected information that will be used for analysis and generating reports. Quantimed allows users to establish and maintain a number of individual data sets, within a single database file, that can be used to quantify medicine and supply item requirements for various conditions or health systems.

For example, users can create a single data set to contain information for a specific population in studying the medicine and supply needs for tuberculosis. Users may also have a separate data set to be used for HIV/AIDS treatment procurement purposes. Alternatively, users can include both these health issues within a single data set. Establishing different data sets for each health issue or location means that the analysis and reporting will be undertaken separately within Quantimed for each health condition or location. Including multiple conditions or locations within a single data set allows for composite analysis and reporting of the medicine and supply item requirements. Therefore, the first step in using Quantimed is to define a data set before entering any subsequent quantification information.

To create and define a data set, select Define Quantification Parameters >Data Set Definition from the main menu. The Data Set Definition screen (Figure 4-14) shows a list of all data sets in the program, including the name, description, population, and notes. This screen is also used to select the active data set.
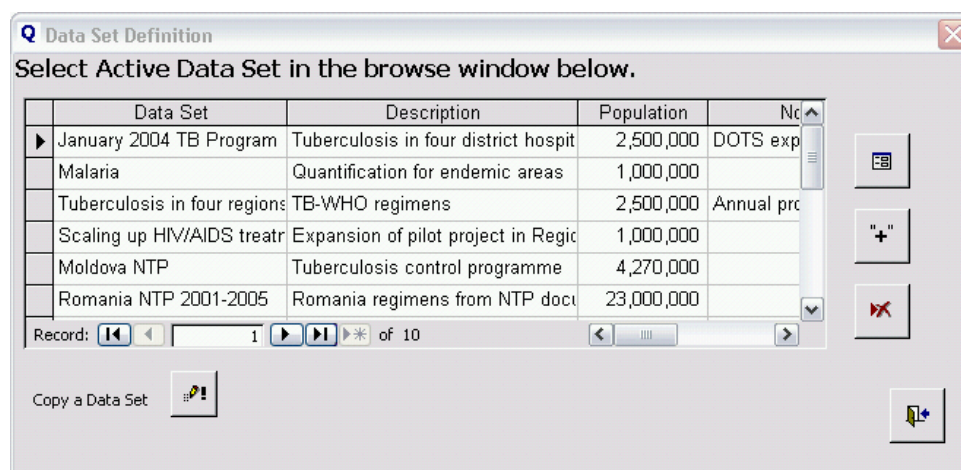
Figure 4-14. Data Set Definition screen

Data Set Definition Add/Edit

The Data Set Definition Add/Edit screen, shown in Figure 4-15, is used to enter the parameters of the data set, including the name, population, dates, notes, and which quantification method(s) will be used in the study.

Note: When the Scaling-Up Option is selected other methods (Morbidity Non-Scaling-Up, Consumption, and Proxy Consumption) can not be viewed.
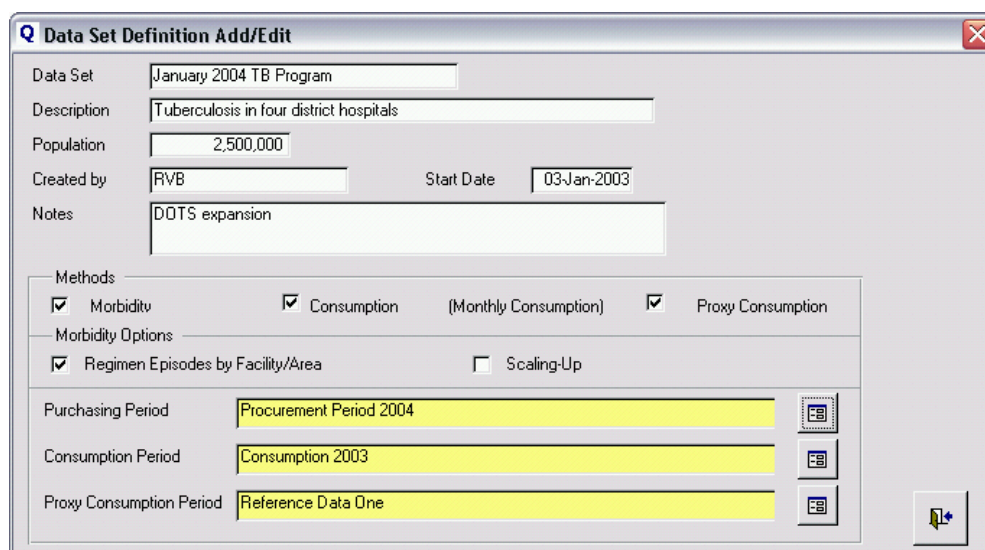
Figure 4-15. Data Set Definition Add/Edit screen

The user will define the Procurement Period (the dates and length of time for which the quantification is being prepared), Consumption Period (the dates and length of time for which consumption data are to be entered), and Proxy Consumption Period (the dates and length of time for which proxy consumption data are to be entered), as appropriate to the exercise and methods selected.

Note: The Consumption Period options do not apply unless Consumption or Proxy Consumption methods are selected.

Table 4-6 presents the fields used to define data sets.

Table 4-6. Fields Used to Define Data Sets

Field	Description
Data Set	Enter a name for the data set.
Description	A description of the scope of the data set.
Population	Identifies the population covered by the data used in this data set. This figure may be used in the program's calculations, depending on the quantification method, so it is important to be as accurate as possible. "Population" can mean the total number of persons in a geographic area or represent a subgroup defined by specific characteristics, such as women of reproductive age, children under five years old, or long-haul truck drivers, who may be vulnerable to specific health problems for which commodities needs are to be estimated.
Created By	An optional field that may contain information about the individual or organization who will be creating or modifying data sets.
Start Date	The date will be automatically generated when a new data set is added.
Notes	Enter any additional relevant notations about the data set.
Methods	This box is used to indicate which quantification method(s) will be used for the information in this data set. Select the quantification method(s) to be used with this data set. It is important to select the correct method, as certain screens will not be available if the corresponding method is not selected. For example, if the Proxy Consumption method is not selected, the Select Quantification menu option will not provide access to the Proxy Consumption Method menu when using this data set.
Morbidity Options	If the Morbidity Method is chosen, use this feature to further define criteria for calculating morbidity. You may choose to define Regimen Episodes by Facility/Area and/or the Scaling-Up Option. (For more details, see Chapter 5 - Using the Morbidity-Based Quantification Method.

Purchasing Period Set-Up

With each data set it is necessary to define a specific purchasing period, the period of time to be covered by the quantification. By selecting the Open Procurement Set-Up (or Properties) button next to Purchasing Period, the user may either create or modify a purchasing period for the specific data set (Figure 4-16). This information is used to describe the parameters of the quantification analysis in reports. Table 4-7 presents the fields used in the Purchasing Period Set-Up Add/Edit screen.
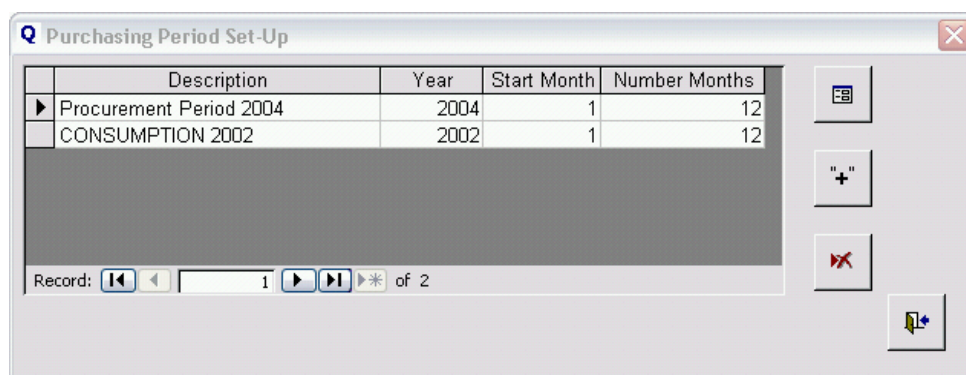
Figure 4-16. Purchasing Period Set-Up window

Table 4-7. Purchasing Period Set-Up Add/Edit Fields

Field	Description
Description	Description of the purchasing period. This information is displayed in the Data Set Definition Add/Edit screen and reports.
Year	The year associated with the purchasing period.
Start Month	The month that the purchasing period starts.
Number of Months	The duration of the purchasing period

Consumption Period Set-Up

To define a specific consumption period within this data set, select the Open Consumption Set-Up (or Properties) button to the right of the Consumption Period field. Consumption period is the period of time for which the user will enter data on past consumption. From the Consumption Period Set-Up window (Figure 4-17), it is possible to create or modify a consumption period for this specific data set. This information is used to facilitate consumption data entry. Table 4-8 presents the fields used in the Consumption Period Set-Up Add/Edit screen.
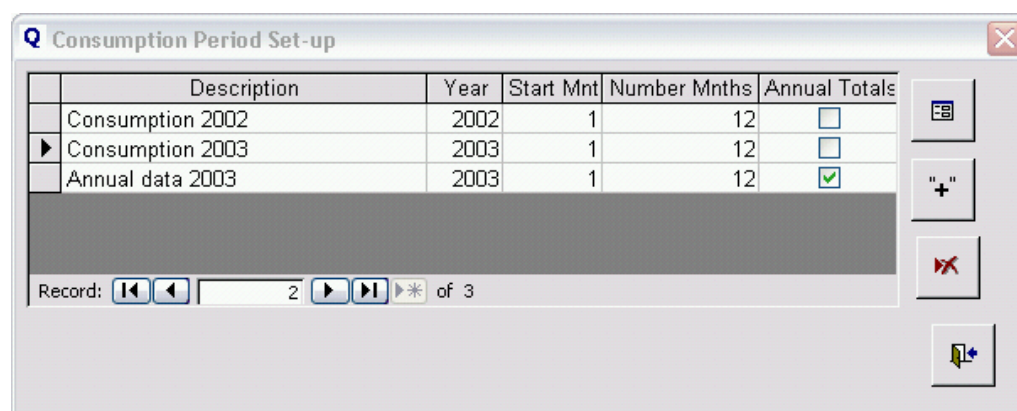
Figure 4-17. Consumption Period Set-Up window

Table 4-8. Consumption Period Set-Up Add/Edit Fields

Field	Description
Description	Description of the consumption period. This information is displayed in the Data Set Definition Add/Edit screen.
Year	The year associated with the consumption period.
Start Month	The month that the consumption period started.
Number of Months	The duration of the consumption period.
Data Entry Method	Select between individual months or annual totals for entering the consumption data collected

Proxy Consumption Period Set-Up

The Proxy Consumption Period button to the right of the Proxy Consumption field allows the user to define the proxy consumption period for this specific data set. Proxy Consumption period is the period of time that the consumption data to be entered refers to. The Proxy Data Set Definition Set-Up window (Figure 4-18) allows the user to create or modify proxy consumption information for this specific data set. This information is used to facilitate proxy consumption data entry. Table 4-9 presents the fields used in the Proxy Consumption Period Set-Up Add/Edit screen.
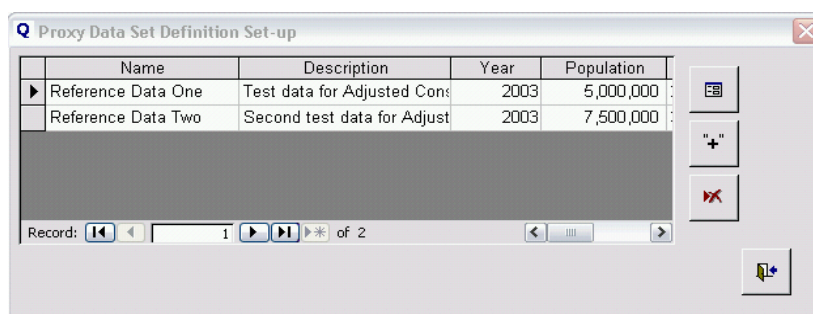
Figure 4-18. Proxy Data Set Definition Set-Up window

Table 4-9. Proxy Data Set Definition Add/Edit Fields

Field	Description
Name	A name for the proxy consumption period. This information is displayed in the Data Set Definition Add/Edit screen.
Description	Description of the proxy consumption period.
Year	Year associated with the proxy consumption period.
Start Month	Month that the proxy consumption period started.
Number of Months	Duration of the proxy consumption period.
Population	Identifies population covered by the health system/area for which the consumption data are available.
Created By	Optional field that may contain information about the individual or organization who will be creating or modifying data sets.
Notes	Enter any additional relevant notations.

Copy a Data Set

In the bottom left corner of the Data Set Definition window is a button labeled Copy a Data Set. This button allows the user to copy specific data from the active data set into a new data set, thus reducing the volume of data entry for the second application. Clicking on Copy a Data Set opens a window that allows the user to select the data set into which the data will be copied. It is necessary to define the data set receiving the information (in Data Set Definition) before initiating this procedure. Clicking the Execute Copy Routine button will perform the copying. In the lower portion of the window, Quantimed displays the specific data that will be duplicated from the active data set. Figure 4-19 is a sample of the screen displayed when the Copy a Data Set button is selected.
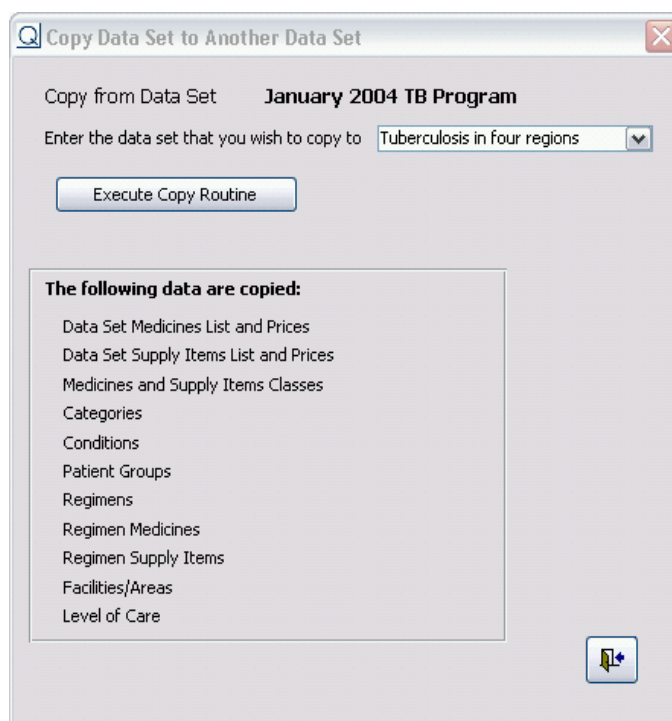
Figure 4-19. Copy a Data Set screen

Cost Parameters

Currency Codes

The Currency Codes menu option (Figure 4-20) provides a table listing the monetary units for each country. The currency codes and exchange rates are independent of the data sets. Table 4-10 describes the fields in the currency codes screen.
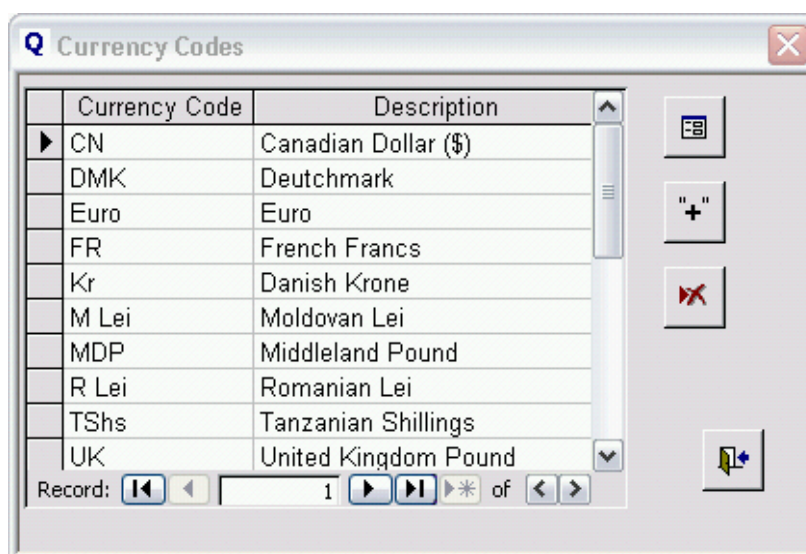
Figure 4-20. Currency Codes screen

Table 4-10. Fields on the Currency Codes Screen

Field	Description
Currency Code	Abbreviation for the monetary unit of the country.
Description	Displays the name of the country or full name of the currency used by each country.

Exchange Rates

The Exchange Rates menu option (Figure 4-21) allows the user to define exchange rates for the currencies entered in Quantimed. The user may select a particular currency and then stipulate the exchange rate to another currency. Table 4-11 lists the fields used in the Exchange Rates screen.
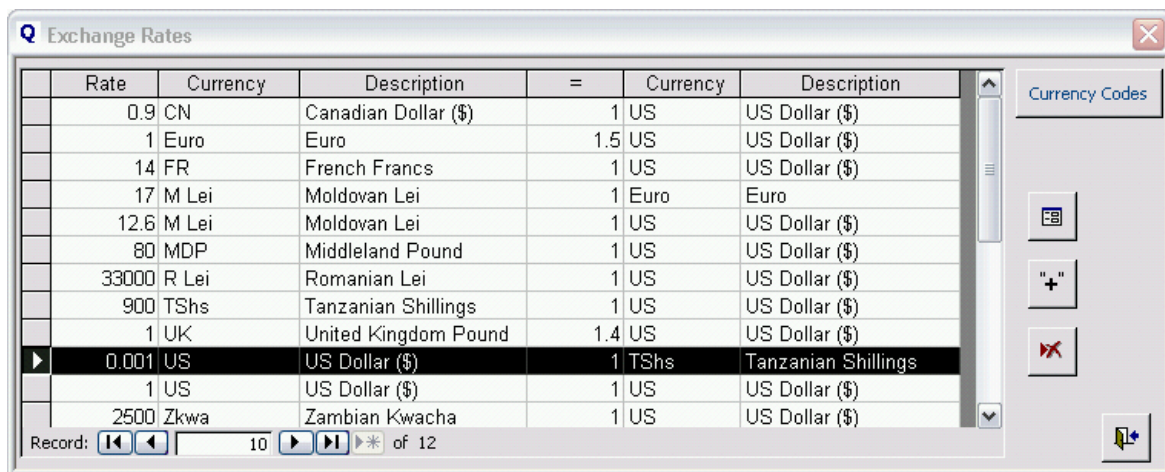
Figure 4-21. Exchange Rates screen

Table 4-11. Fields on the Exchange Rates Screen

Field	Description
Rate	Present value of the currency being exchanged. A quantity of the first currency in the exchange (default is 1).
Currency	Code for the first currency in the exchange.
Description	Displays the country or full name of the currency used by each country.
=	Displays the quantity of the second currency equivalent to the quantity of the first currency.
Currency	Code for the second currency in the exchange.
Description	Displays the country or full name of the currency to which the initial currency is to be converted.

The Add/Edit (Properties) window (Figure 4-22) for a specific exchange rate on the screen allows the user to modify the information as shown below. Table 4-12 lists the fields on the Exchange Rates Add/Edit screen.

Figure 4-22. Exchange Rates Add/Edit screen

Table 4-12. Fields on the Exchange Rates Add/Edit Screen

Field	Description
Rate	Present value of the currency to be exchanged.
Currency	Displays currency code for the rate just defined.
Description	Displays the description entered into Currency Codes screen.
=	Displays the exchange rate for the first currency as it relates to the second currency.
Currency	Code for the second currency in the exchange.
Description	Displays the country or full name of the second currency in the exchange.
Valid From	Date of the addition or change in exchange rate. The system will automatically update the changed rate in the Date Changed and Date Started fields.

Price Types

The Price Types screen (Figure 4-23) provides the opportunity to define different sets of price information that can be used for cost analysis. Possible price types include local currency/tender, international currency/tender, and the *International Drug Price Indicator Guide*. Except for those from the *International Drug Price Indicator Guide,* Price Types are user defined.

Figure 4-23. Price Types screen

Price types are associated with data sets. Users may want to define different price types to assist with their analyses. For example, it is possible to project the cost of estimates by using the median prices from the *International Drug Price Indicator Guide* or the prices paid in the last procurement, or by using both and comparing the results. Or, if using the morbidity method and calculating the episodic cost for various conditions, the user can see the potential cost to the patient if the local pharmacy prices for medications have been obtained and entered. Table 4-13 lists the fields on the Price Types screen.

Table 4-13. Fields on the Price Types Screen

Field	Description
Data Set	Displays the active data set.
Price Type	Displays the price types associated with the active data set.
Currency	Currency in which the prices of that type are given.
Multi Currency	This check box is used to specify if multiple currencies are accepted for the specified price type. A check mark indicates Yes; a blank indicates No.

Facility/Area Set-Up

Quantimed enables data entry and analysis of medicines and supply item estimates for multiple health facilities or geographic areas within a single data set. Consumption data from each facility or area comprising the scope of the data set may be entered separately into Quantimed, variations in the incidence/prevalence of health conditions between facilities or areas can be accounted for in morbidity quantification, and the results of the different quantifications can be output by facility/area, or as the aggregate for the data set. To take advantage of this functionality, the user must first define the facilities or areas included in the data set.

Level of Care

The Level of Care screen (Figure 4-24) accesses a database designed to describe the various service levels that may be assigned to the facilities in an organization's health service or geographic/administrative area. Use this table to define the various service levels available—for example, district hospital, primary health care facility, and so on. Defining these levels allows the user to use them later in analyzing the data that has been entered. The fields included on this screen are listed in Table 4-14.
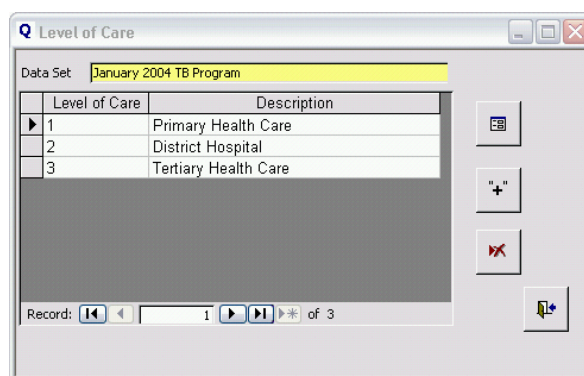
Figure 4-24. Level of Care screen

Table 4-14. Fields Used in the Level of Care Screen

Field	Description
Data Set	Displays the active data set.
Level of Care	Displays the code for each level of care available to the data set.
Description	Provides a description of what each care level represents.

The Level of Care database is tied to specific data sets (Figure 4-25), so it is possible to have varying levels of care that differ from one data set to the next.

Figure 4-25. Level of Care Add/Edit screen

Facility/Area Types (First and Second)

Those users wishing to add levels of classification for facilities other than level of care may use these screens (Figure 4-26) to build the list. For example, it is possible to use the Facility/Area Types (First) category level to describe the facilities by province or state. Then use the Facility/Area Types (Second) category level to describe the facility type by affiliation (e.g., Lutheran, Catholic, nondenominational) or by location or type (e.g., city, rural, hospital, or clinic) or any other user-defined categorization.

Figure 4-26. Set Up Facility/Area Types screen

Facility/Area Definition

Use the Facility/Area Definition screen (Figure 4-27) to define facilities or areas using the Level of Care and Facility/Area Types options. This screen displays the information entered in Level of Care and Facility/Area Add/Edit screens in addition to the facility/area population, the total population for all facilities/areas, and the percentage of data set population each facility population represents.

Figure 4-27. Facility/Area Definition screen

Selecting the Add/Edit Selected Records button on the Facility/Area Definition screen brings up the Facility/Area Definition Add/Edit screen (Figure 4-28). In this screen, the user may may create a Facility/Area and classify it based on the Facility/Area Types (first and/or second) that were previously defined. In addition, both the level of care provided at the facility (choose from drop-down list) and the population serviced by the facility may be specified. All of these options can be used later in data analysis. There is a large text box also on this screen that allows the entry of detailed information regarding the facility. The Date Added box is automatically updated by the system when the facility is created, and the Date Last Changed box will indicate when any information on this screen has been changed.

Figure 4-28. Facility/Area Definition Add/Edit screen

Facility/Area Regimen Episodes

If Regimen Episodes by Facility/Area has been selected as a Morbidity Option in the Data Set Definition Add/Edit screen, the Facility/Area Definition screen looks as in Figure 4-29. The Facility/Area Regimen Episodes portion of the Facility/Area Definition summary screen contains the data set's list of conditions and regimens after those have been entered using the morbidity method (Chapter 5). It is necessary to return to this screen to enter facility/area-specific estimates after entering condition and regimen data. Entering facility/area-specific estimates for the percentage of the population treated by each regimen accounts for variations in the incidence/prevalence of health conditions among facilities/areas. For example, if some facilities are in malaria-endemic areas and some are not, it may not be desirable to use a single global incidence/prevalence figure for the entire data set.

Figure 4-29. Facility/Area Definition screen when "Regimen Episodes by Facility/Area" morbidity option is selected on Data Set Definition Add/Edit screen

Clicking the **%** button on the right side of the Facility/Area Regimen Episodes portion of the screen brings up the Estimate Percentage of Patients Treated by Regimen by Facility/Area screen (see Figure 4-30). First, enter either the percentage of the population affected by the condition or the number of patients affected. At the bottom of the screen will be fields displaying the percentage of the population on this regimen and the number of episodes treated with the regimen. These numbers are used in calculating the morbidity estimates on the Morbidity and Consumption Estimate screen.

Note: If the Scaling-Up Option is selected along with the Regimen Episodes by Facility/Area Option, the user will not be able to enter a percentage for the Condition/Care Provided and can only enter a percentage for the regimen. A percentage cannot be entered for a Condition/Care Provided because a scaling-up set is created for a Condition/Care Provided and hence 100% of the patients in the scaling-up set have the Condition/Care Provided. Scaling-up sets are further discussed in Chapter 5.

Figure 4-30. Estimate Percentage of Patients
Treated by Regimen by Facility/Area screen

Commodities

User Medicines Classification Scheme

The User Medicines Classification Scheme Table is optional and is linked to a specific data set. Any individual whose health system has its own specific medicines classification scheme can use this table. Otherwise, the international classification schemes may be used, or none at all.

This table is tied to a specific data set, so it is possible to have user medicines classification schemes that differ from one data set to the next. The User Medicines Classification Scheme screen is similar to the User Supply Item Classification Scheme screen in Figure 4-31.

User Supply Item Classification Scheme

The User Supply Item Classification Scheme Table is optional and allows individual users to create or use their own classification scheme for their supply items.

This table is tied to a specific data set, so it is possible to have varying user supply item classification schemes that differ from one data set to the next. The icons at the right of the screen can be used to edit, add, and delete information or to exit this screen. The User Supply Item Classification Scheme screen is displayed in Figure 4-31.
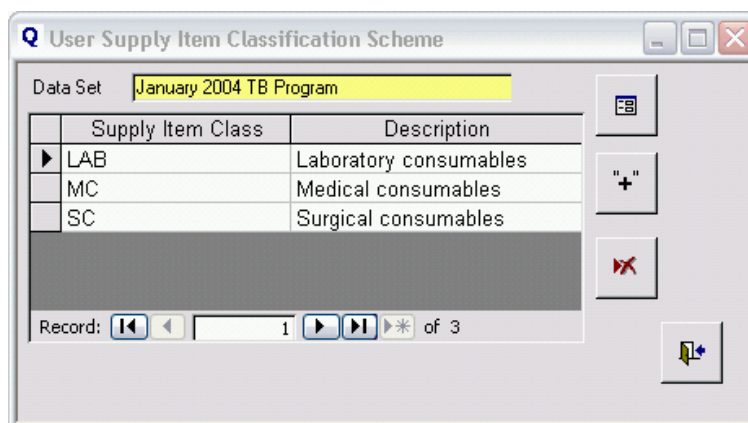
Figure 4-31. User Supply Item Classification Scheme screen

Data Set Medicines List

This screen is used to define or add to the list of medicines that are to be quantified in the selected data set. Users may select items from Quantimed's extensive generic medicines list or create their own list of medicines here.

The Data Set Medicines List screen is divided into two sections (Figure 4-32). The top portion shows the following information for each medicine: institutional code, user EML, user-defined class, product name, added name, unit, route of administration, WHO therapeutic class, VEN classification, defined daily dosage (DDD), WHO EML status, note, pharmaceutical form, and ATC code (scroll left or right as necessary to see the additional columns in this screen).
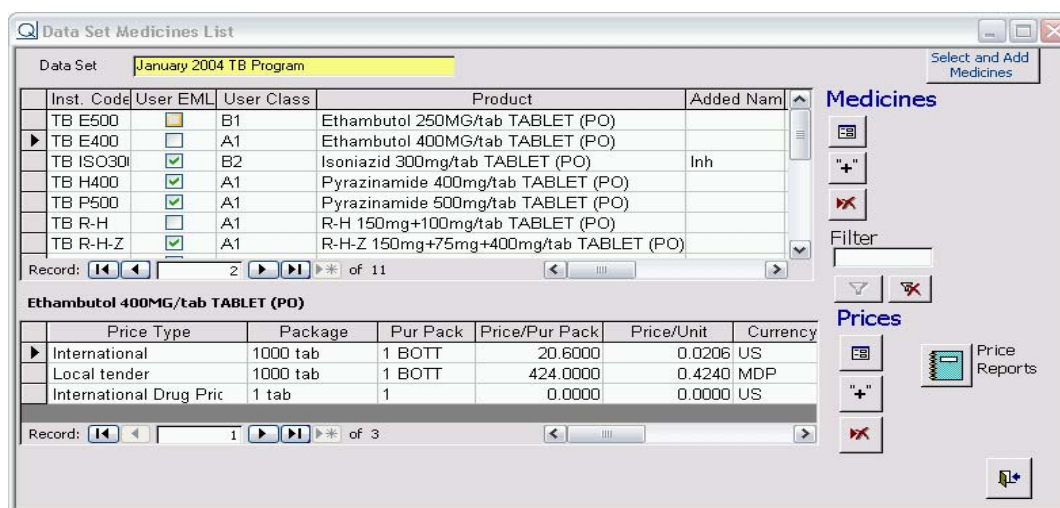
Figure 4-32. Data Set Medicines List (two sections)

The Select and Add Medicines button in the upper right corner of this screen provides a link to the Generic Medicines List (Figure 4-33) and enables users to select, filter, and add items from the list to the Data Set Medicines List for the specific data set. Click the corresponding box in the Select column for each item to be added, and then click the Add Selected Items to Active Data Set button.

Figure 4-33. Generic Medicines List when accessed from the Data Set Medicines List screen

Clicking the Edit or Add record buttons/icons under Medicines in the Data Set Medicines List opens the Data Set Medicines List Add/Edit screen (Figure 4-34). The fields used in this screen are described in Table 4-15.

Figure 4-34. Data Set Medicine List Add/Edit screen

Table 4-15. Summary of Data Fields in Data Set Medicine List Add/Edit Screen

File	Description	Example
Product	This uniquely identifies a particular product by combining the name, strength, and dosage form. This area is shaded, so the product description cannot be modified. The product description is generated from data input into this screen.	Ethambutol 250 MG tablet
Generic Name	The approved or nonproprietary name of a medicine. Not a trade name.	Ethambutol
Medicine Strength	These fields are linked to Strength Units and Units Validation Tables.	250 MG
Abbrev Name	This field is optional and allows you to enter the abbreviated name for the generic medicine, such as brand names, if desired.	–
Added Name	This field is optional and allows you to enter an additional name for the generic medicine, if desired.	–
Pharmaceutical Form	This field is used to indicate the dosage form of a medicine. For example, acetaminophen comes in tablet form, which is indicated by TABLET. This field is linked to the Pharmaceutical Forms Validation Table.	TABLET
Route	This field identifies the route through which the medicine enters the body (e.g., TOP [topical], IV [intravenous], PO [oral]). This field is linked to the Medicines Delivery Route Validation Table.	PO
VEN	This field is used to classify items into vital, essential, and nonesssential categories based on health impact for reporting purposes. When accessed, an option window is displayed listing the three category choices.	Vital
ATC Code	The ATC classification code is displayed or may be entered here for new items, if desired.	–
Defined Daily Dose (DDD)	The DDD is displayed or may be entered here for new items, if desired.	–
WHO Therapeutic Class	Theoretical groupings of related medications, usually ones used to treat similar conditions or containing related chemical constituents. This field is linked to the WHO Therapeutic Classifications Table.	06.2.3
WHO EML Status	This field indicates the status of the medicine on the WHO EML. This field is linked to the WHO EML Validation Table.	E
Institutional Code	This field is optional and allows the user to enter the institutional code.	TB E500
User Class	This field is optional and allows the user to enter a facility or administrative defined-user class.	B1
User EML	This field is optional and allows the user to enter a facility or administrative EML status.	–
Notes	Enter any additional relevant notations.	–

On the lower portion of the Data Set Medicines List screen (Figure 4-32), users can define the pricing and packaging information for the selected drug (Figure 4-35). Price information for multiple price types can be listed for each medicine.

Figure 4-35. Medicine Price Add/Edit screen (detail)

In the Data Set Medicines List window select the Edit or Add button under Prices to enter price data. Select the price type from the validation table, define the packaging information, purchase pack, price per purchase pack, and source of the price. Price per administrative unit and currency of the price type are automatically generated by the system. The data displayed are based on the selected data set, which is displayed in the yellow highlighted area at the top of the screen. Table 4-16 describes the detailed information displayed on the pricing screen.

Table 4-16. Fields on the Medicine Price Add/Edit screen

Field	Description
Product	Displays pharmaceutical item for which a price is being determined.
Price Type	Displays the Price Type if modifying an existing record or allows selection from the drop-down list when creating a new record.
Packaging	Provides a description of the item's packaging, e.g., 60 tab/bottle.
Purchase Pack	Defines the number of packaging units in the purchase pack.
Price/Purchase Pack	Cost of a purchase pack.
Price/Administration Unit	The price of each administration unit. Based on the information entered, Quantimed automatically calculates this data.
Source	Allows entry of information on the source of the price data.
Date	Date of the last data set update

Clicking the Price Reports icon in the lower right of the Data Set Medicines List screen (Figure 4-32) allows the user to send a report to the screen or printer that provides (a) a list of items in the data set that do not contain price values for the selected price type (Missing Price Report) and (b) a list of prices for all items in the data set (Price Audit Report). The Missing Price Report should be generated separately for each Price Type to confirm the inclusion of prices for all items (if price data are to be included in the study), so that analysis results are not distorted because of missing prices.

Data Set Supply Item List

The Data Set Supply Item List screen (Figure 4-36) shows which supply items are included in a specific data set. The information in the highlighted yellow field at the top of the screen indicates which data set is currently active.

The Generic Supply Item Select and Add button in the upper right corner of this screen provides a link to the Generic Supply Item List and enables users to select, filter, and add items from the Generic Supply Item List to the Data Set Supply Item list for the specific data set. Click the box in the Select column for each item it is desired to add, and then click the Add Selected Items to Active Data Set button.

Figure 4-36. Data Set Supply Item List screen

Clicking on the Edit or Add record buttons under Supply Item in the Data Set Supply Item List (Figure 4-36) will open the Data Set Supply Item List Add/Edit screen (Figure 4-37). The fields used in this screen are described in Table 4-17.

Figure 4-37. Data Set Supply Item List Add/Edit screen

Table 4-17. Data Fields on the Data Set Supply Item List Add/Edit Screen

Field	Description	Example
Supply Item	Name of the supply item.	Formaldehyde
Supplementary Information	This field is optional and may be used to record additional information about the supply item.	1,000 cc bottle
Administration Units	This field is linked to the Units Validation Table and is used to describe the unit of measure for the supply item when stating how much is needed per use. It is important to complete this field correctly because the information in this field will be used when entering regimen information. For example, bandages may be available in 2-meter rolls (of 4 cm width), but the usual amount used for each application may be only 20 cm, so that the administration unit is centimeters not meters.	cc
Institutional Code	This field is optional and allows for the entry of the institutional code.	
VEN	Used to classify items into vital, essential, or nonessential categories based on health impact for reporting purposes.	Vital
User Supply Class	This field is optional and allows the user to enter a facility or administrative defined-user class.	
User EML	This field is optional and allows the user to enter facility or administrative EML status.	
Notes	Enter any additional relevant notations.	
Date Added	Indicates the date the supply item was added to the data set.	10-Jan-03
Date Changed	Used to track changes to the information listed on the Data Set Supply Item List.	23-Jan-03

The lower portion of the Data Set Supply Item List screen (Figure 4-36) provides a pricing summary for the selected supply item, by price type. Selecting the Properties button will display the Supply Item Price Add/Edit screen (Figure 4-38), which is used to modify the item price by adjusting the packaging, purchase pack, and price/purchase pack.

Figure 4-38. Supply Item Price Add/Edit screen

In the Supply Item List window (Figure 4-36), select the Edit or Add buttons under Prices to enter price data. Select the Price Type from the validation table, define the packaging information, purchase pack, price per purchase pack, and source of the price. Price per administration unit and currency of the price type are automatically generated by the system. The data displayed are based on the selected data set, which is displayed in the yellow highlighted area at the top of the screen. Table 4-18 describes the detailed information displayed on the Supply Item Price Add/Edit screen.

Table 4-18. Fields on the Supply Item Price Add/Edit Screen

Field	Description
Product	Displays the supply items for which a price is being determined.
Supplementary Information	Optional field that displays additional information about the supply items.
Price Type	Displays the price type if modifying an existing record or allows for the drop-down list when creating a new record.
Packaging	Provides a description of an item's packaging, e.g., 1,000 pieces/bottle.
Purchase Pack	Defines the number of packaging units in the purchase pack.
Price/Purchase Pack	The cost of a purchase pack.
Price/Administration Unit	The price per administration unit. Based on the information entered, Quantimed automatically calculates these data.
Source	Allows entry of information on the source of the price data.
Date	Date of the last data set update

Once the information described in this chapter has been entered into the program, the user may begin entering consumption or morbidity data.

CHAPTER 5
Using the Morbidity-Based Quantification Method

Objectives

- To provide an overview of morbidity-based estimates

- To discuss data entry for the morbidity-based quantification method

- To detail entry of medicine and supply item regimens

- To explain how to use the scaling-up function for morbidity-based estimates

OVERVIEW

In an adequately financed supply program with reliable inventory control, distribution systems, stable disease patterns, and good prescribing practices, medicines and supply items can be ordered on the basis of projections from recorded past consumption. However, under some circumstances, the morbidity method may be a more appropriate means of establishing pharmaceutical requirements. For example, this may be the case when—

- Available funds are likely to be inadequate for projected needs
- Consumption information is incomplete or unreliable
- Prescribing patterns seem inefficient or irrational
- A new medicines supply program is being established
- An existing program is expanding rapidly
- A new therapy with new medicines is implemented
- Disease epidemics occur
- A new disease-specific program, such as antiretroviral treatment (ART), is being established

The morbidity method requires six basic steps. The first three steps are to be taken *prior* to using Quantimed. For more information on the process, please consult the WHO manual *Estimating Drug Requirements* (WHO/DAP 1988) available from WHO (http://www.wholibdoc.who.int/hq/1988/WHO_DAP_88.2.pdf), and Chapter 14 of *Managing Drug Supply*, second edition, available from Kumarian Press (http://www.kpbooks.com/details.asp?title=Managing+Drug+Supply).

1. Determine the *population* to be served. This can be a subgroup of the population of a country, (e.g., children under five, women of reproductive age) or an estimate of the caseload for the condition(s) of interest.

2. Determine the incidence of each health care category/condition being treated for which pharmaceuticals are being quantified.

3. Determine or establish regimens (treatment guidelines), as well as how frequently each regimen is used.

4. Enter the data that have been gathered into Quantimed.

5. Use the analysis options in Quantimed to calculate the quantities of medicines and supply items required. The estimation is based on the factors identified in steps 1–3.

6. To calculate procurement quantities that are not necessarily equal to the quantities estimated, the user must also collect and enter data on the quantity of stock on hand and on order, along with procurement factors such as lead time, safety stock, and procurement period. A factor to account for program losses may also be incorporated. If necessary, in order to accommodate budget restrictions, Quantimed can be used to re-estimate requirements by reassessing which conditions to treat or which population to treat, or by setting a limit to the proportion of patients affected who can obtain pharmaceuticals.

Cautions: In theory, the morbidity method seems to provide a "truer" estimate of medicine and supply item requirements. In practice, several cautionary factors should be considered when using this method—

- Accurate estimates of population coverage and health condition frequencies are often difficult to obtain. Weak assumptions can lead to poor estimates, which may significantly misdirect funds to inappropriate pharmaceutical or supply item purchases.

- The process of establishing standard treatment guidelines (STGs), if they do not already exist, can be time-consuming, leading to potential delays in initiating the procurement process.

- It is difficult to create an accurate morbidity-based estimate for the needs of an entire health care system because complete data for all diseases are often impossible to obtain. The morbidity-based estimate is more suitable for the needs of a specific program or facility, where comprehensive morbidity data on the major health issues are available.

- If the STGs/regimens used to estimate needs are not fully communicated and adhered to by health care providers, actual pharmaceutical and supply item consumption is likely to deviate significantly from projected needs.

In other words, with a morbidity-based estimate, it is possible to create stock-outs and overstocks that might not have occurred with reliable consumption-based orders, although a well-managed inventory control system will significantly reduce the potential for these errors. However, if the treatment regimens represent a significant therapeutic improvement over existing prescribing practices, stock mismatches may represent an acceptable short-term cost of long-term improvements in drug use.

DATA COLLECTION FOR THE MORBIDITY METHOD

For the morbidity method, four key types of information must be collected or developed. More detail on each type is given later in the chapter.

1. **Service population.** The planner must determine the intended population to be served by the quantification exercise. This population may be expressed in terms of number of people, number of outpatient attendances, or number of treatments prescribed. The number will be entered when the data set is defined. It is important to note that, whatever measure of the service population is used, the other information collected must relate directly to it and be expressed in similar terms.

   If data for the frequency of health problems are not available for all conditions, it may be possible to extrapolate by using reliable statistics on caseloads or treatments from representative facilities at different levels of the system (e.g., central hospital, district hospital, hospital outpatients, rural health center).

2. **List of medicines and supply items to be quantified.** It is necessary to define the list of products for which quantification of requirements will be undertaken. For medicines, the national (or WHO) Essential Medicines List or the hospital formulary should be consulted when developing the Data Set Medicines List. For supply items, a well-established or recommended list may be less common, and health providers may need to be consulted on what items are necessary to provide the treatments incorporated in the local program.

3. **Health condition and category list.** The health conditions to be studied and the categories into which they will be assigned must be selected, and the frequency of each must be determined. The health conditions and categories must be identified clearly enough to distinguish conditions requiring different types of medical treatment. For example, "ear pain" is not a precise enough category if external ear infections (otitis externa) are to be treated with ear drops and middle ear infections (otitis media) are to be treated with oral antibiotics. Getting reliable health condition information is often the most difficult part of the morbidity method (see pages 5-8 through 5-10 for further explanation). There are at least four potential sources of data—

   - Existing government data
   - Survey data
   - Comparable data from similar service populations
   - Expert panels

4. **Standard treatment guidelines.** STGs are essential for calculating medicine and supply item requirements with this method. For estimation purposes, STGs must be specific with regard to dosage, frequency of administration, and duration of treatment. For clinical purposes, the STGs may include a range of treatment regimens. Quantimed allows multiple-regimen entries for each health condition. Programs often have two regimens for a health condition, for example, due to the differences in treatment for adult and pediatric patients.

If STGs exist but are not widely accepted, users may decide to include average actual treatments. These average regimens are based on observed or reported practices and are more likely to predict what will actually happen, as opposed to what should happen. Users may want to include both treatment regimens in their quantification and estimate the percentage of patients likely to be treated with each. Users should be sure to consider whether the percentage using each regimen is likely to change, for example, as a result of an education campaign. Quantimed can be used to compare the cost of existing prescribing practices with nationally or internationally recognized regimens.

Those planning to calculate procurement quantities from a morbidity-based requirements estimate should also collect and enter data on the quantity of stock on hand and on order, as well as information on procurement factors such as lead time, safety stock, and procurement period. These factors contribute toward the systematic calculation of procurement quantities.

DATA ENTRY FOR THE MORBIDITY METHOD

Quantimed was designed to be flexible for the user. The concepts of health care categories, conditions/care provided, patient groups, and regimens are important to understand because they can be used in different ways, depending on the user's data and reporting needs. The primary purpose of these four divisions is to help organize data and to report on the analysis in a logical and meaningful manner.

When establishing the health care categories and conditions for a data set, users should consider how they will want to report the information. Quantimed is designed to generate reports based on the health care categories, conditions, and care provided, as well as the regimens defined here. There is more than one correct way to enter the information, although consistency is important. Remember that regimens can be further defined by identifying a patient group for each one. This also allows organizing data in the reports by patient groups—for example, children under five years.

The four key parameters that must be defined or developed for the morbidity method are—

1. Health care category
2. Condition/care provided
3. Patient groups
4. Regimen

These parameters will be used throughout both the data collection/data entry and analysis components of the program for the morbidity quantification method. A description of each parameter is given after the following examples, which show how categories, conditions/care provided, and regimens can be used to organize data (Tables 5-1, 5-2, and 5-3). A hierarchy is established such that a single regimen or multiple regimens can be defined to treat a condition/care provided, and related conditions/care provided are grouped under a more broadly defined health care category.

Table 5-1. Sample Organization of Data for Respiratory Infections

Health Care Category	Condition/Care Provided	Regimen
Tuberculosis	TB of the lung	First line
		Second line
	TB of the nervous system	Primary
Pneumonia	Viral pneumonia	First line
		Second line
	Bacterial pneumonia	First line
		Second line

Table 5-2. Sample Organization of Data for Primary Health Care

Health Care Category	Condition/Care Provided	Regimen
Immunizations	Child	6 months
		1 year
	Adult	Booster
Infectious diseases	Respiratory	Tuberculosis 1
		Tuberculosis 2
		Pneumonia
	Intestinal	Cholera (child patient group)
		Typhoid (child patient group)
		Typhoid (adult patient group)
Sexually transmitted infections	Syphilis	Symptomatic
		Latent
	Chlamydia	Women
		Men

Table 5-3. Sample Organization of Data for Reproductive Health Care

Health Care Category	Condition/Care Provided	Regimen
Prenatal care	Prenatal care	Prenatal care
Prevention of mother-to-child Transmission (PMTCT)	PMTCT	Mother
		Child
Obstetric complications/hemorrhage	Atonic uterus	Oxytocin
		Ergometrine
		Prostaglandin
	Retained placenta	Ergometrine
		Prostaglandin

Defining Health Care Category, Condition/Care Provided, Regimen, and Patient Groups takes place in the respective data entry screens under Select Quantification Method >Morbidity Method >Morbidity Parameters.

Health Care Category

For this parameter, the user must develop a list of all health care problems, illnesses, or diagnoses that require health care services and that will be included in the quantification. These health care categories must be identified clearly enough to distinguish categories requiring different types of treatments. Health care categories are the highest level of the hierarchy used to organize morbidity data.

The Health Care Category table requires two entries, *category* and *description*, to complete the record. The screen shown in Figure 5-1 contains examples of typical health care categories.
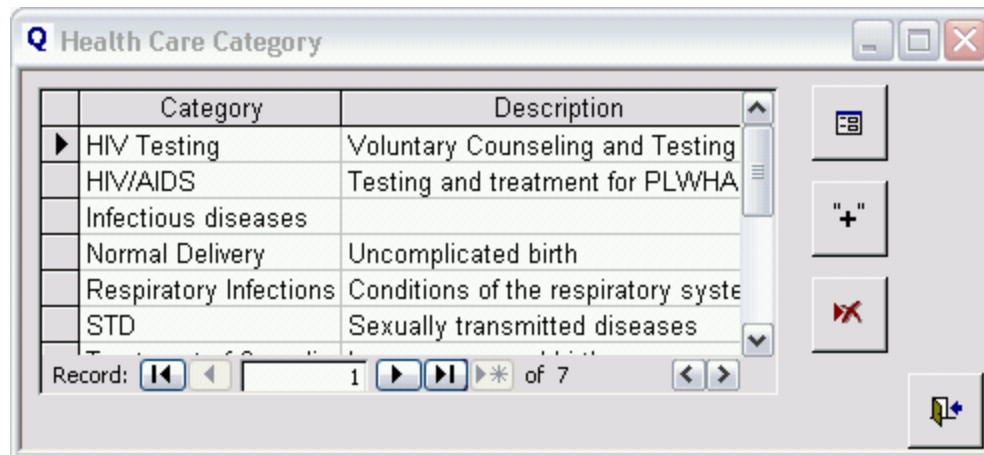
Figure 5-1. Examples of Health Care Categories

Condition/Care Provided

Use this parameter to develop a detailed list of conditions/care provided or symptoms that fall under each health care category. The Condition/Care Provided table is linked to the Health Care Category table and allows users to associate specific conditions with each health care category. This screen (Figure 5-2) displays a table containing health conditions from the International Classification of Diseases system, from which users can select as appropriate. Alternatively, users may define their own conditions using the Add button. This is the second level of the hierarchy used for organizing morbidity data. Defined conditions/care provided are available to be included in any data set subsequently created by the user.

Caution: Defined conditions/care provided are available to be included in any data set created by the user and should not be deleted if they are to be used in any other data set. It is important not to delete them even if they are not being used in the active data set.
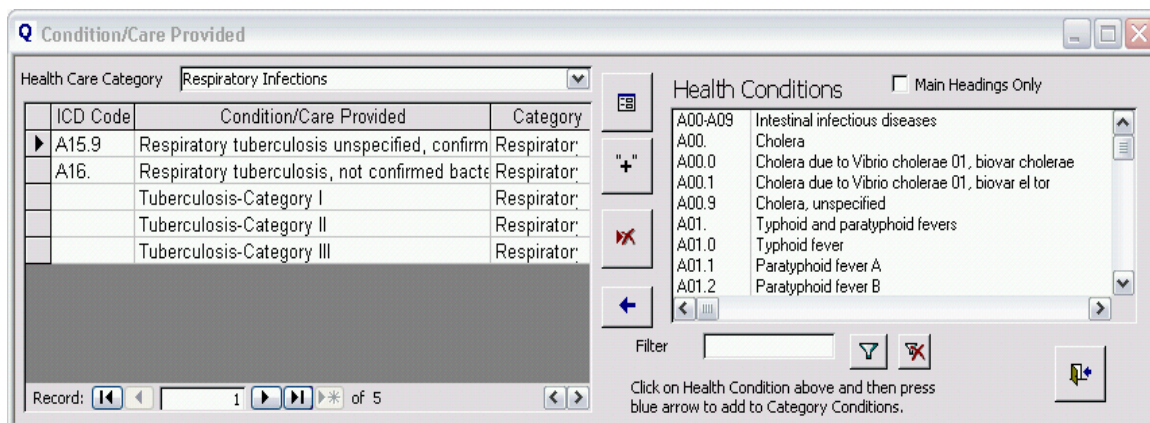
Figure 5-2. Examples of Condition/Care Provided table

To add an ICD health condition to the Condition/Care Provided table, simply highlight the condition(s) on the right side of the screen and click the left-pointing arrow in the middle of the screen. This will copy the selected items onto the current table.

Selecting the Main Headings Only check box will cause only the ICD headings to be displayed. Use the Filter box to enter specific text. Quantimed will filter the ICD list and show only those conditions that contain the character string entered.

Patient Groups

Patient groups, such as children under five or women of reproductive age, can be defined and then linked to treatment regimens. These labels are descriptive and are intended to facilitate reporting on specific groups. The patient group can also help to distinguish treatment regimens, because different patient groups may require different treatments or dosages for the same illness or condition. The Patient Group table screen displays the information shown in Table 5-4.

Table 5-4. Information Required for the Patient Group Table

Field	Description
Patient Group	Brief name or code for the patient group.
Patient Group Description	Describes the patient group within the active data set.
Percent	Indicates what percentage of the total population this group represents. This is informational only and is not used in calculations.
Sort Order	Allows the user to change the order in which data are listed.
Date Created	Indicates the date record was created.
Date Changed	Indicates the date a change was made.

Regimen

The regimen is the specific combination, dose, and quantity of pharmaceuticals and medical supplies used for the prevention or treatment of a disease or condition, or the provision of a service. Regimen data are essential for calculating pharmaceutical requirements when using the morbidity method.

Use the Regimen menu option to link regimens to conditions defined in the Condition/Care Provided screen. For example, a user who defined respiratory infections as a health care category and listed tuberculosis as a condition must define a name or names for the regimen(s) used to treat the condition. This screen has two sections into which data must be entered. The top portion is used to enter additional details about each condition defined earlier. The bottom portion is used to enter the names and other details of each regimen associated with a condition. Only the regimen definitions are entered here; the actual medicines and supplies for these regimens are entered in the screen found under Select Quantification Method >Morbidity Method (see p.5-14).

It is important to understand the percentage figure in the Conditions/Care Provided portion of the Attach Regimens to Condition/Care Provided screen, shown in Figure 5-3. Click the Edit button to the right to open a selected Condition/Care Provided record.

Figure 5-3. Attach Regimens to Condition/Care Provided screen

The percentage figure here is used to show or calculate the annual episodes of this condition that occur in the data set population. The user can enter either a number of episodes (in the box called Annual Episodes of This Condition) and Quantimed will calculate the percentage, or the user can enter the percentage in the right-hand box, and the program will calculate the number of episodes. These figures are based on the data set population entered in the data set definition and displayed here.

The Attach Regimens to Conditions/Care Provided Add/Edit screen requires the information listed in Table 5-5; the screen is shown in Figure 5-4.

Note: If the Scaling-Up Option is selected along with the Regimen Episode by Facility/Area Option, the user will not be able to enter a percentage for the scaling-up sets. A percentage can not be entered for a Condition/Care Provided because a scaling-up set is created for a Condition/Care Provided and hence 100% of the patients in the scaling-up set have the Condition/Care Provided.

Figure 5-4. Attach Regimens to Condition/Care Provided Add/Edit screen

Table 5-5. Information Required for the Attach Regimens to Conditions/Care Provided Add/Edit Screen

Field	Description
Data Set	Displays the name of the data set being used.
Active	Checking this box determines whether this condition/care provided will be included in the medicines and supply requirement calculations.
Category	Select from the list of categories available within the active data set.
Condition/Care Provided	Select an option from the Condition/Care Provided drop-down list.
Data Set Population	The population data of the active data set are displayed here.
Total Scaling-Up Patient Months	Displays the sum of patients treated per month. This field will be displayed when the Scaling-Up option has been selected in the Data Set Definition Add/Edit screen.
Chronic Condition	Select this option if this is a chronic condition, i.e., if treatments should be calculated for 12 months. Checking this box is key for ensuring that Quantimed calculates correctly the quantity of pharmaceuticals required for a regimen, in both the morbidity and scaling-up morbidity methods.
Annual Episodes of This Condition	The number of times this condition occurs on an annual basis. Enter this figure or the percentage of data set population or scaling-up set.
Percentage of Data Set Population	Ratio of the annual episodes to the data set population. Enter this percentage or the annual episodes of this condition.
Notes	Enter any additional relevant notations.
Created By/Date Created	Displays the initials of the author and the date when the entry was created.

The bottom half of the Attach Regimens to Conditions/Care Provided screen (Figure 5-3) requires information on regimens. There are buttons to copy regimens from a condition to the clipboard or paste from the clipboard into a second condition. These buttons are handy to use when entering in several conditions that use the same regimens, but in different percentages. Click Add/Edit button to the right to open a selected regimen in the Regimen for Condition screen (Figure 5-5). The Regimen for Condition screen requires the information described in Table 5-6.

Figure 5-5. Regimen for Condition screen

Table 5-6. Information to Be Entered on the Regimen for Condition Screen

Field	Description
Regimen Description	Enter the name of the regimen.
Active Regimen	Used to indicate whether regimen is currently in use. If box is not checked, regimen will not be included in analysis and reports.
Level of Care (Optional)	Select from the Level of Care Table. Indicates the level of health facility in the health system at which this regimen may be implemented.
Patient Group (Optional)	If this regimen is for a specific group of patients, indicate group here (pick from list).
Annual Episodes of This Condition	Displays the number of patients who have this condition. Derived from the Attach Regimen to Condition/Care Provided Add/Edit screen.
Percentage of Patients Treated with This Regimen	Enter this value as the percentage of the number of patients with this condition that will be treated with this regimen. Please note that there is an additional % button, which leads to a screen that allows the user to calculate the percentage treated with this regimen by stepping through a decision tree that includes gender and weight as criteria to help determine the percentage. If the user has selected the Regimen Episode by Facility/Area option, with or without the Scaling-Up Option, this field will not be available. Regimen percentages will need to be entered under the Facility/Area Definition screen (Figure 4-29).
Number of Patients Treated with This Regimen	A number representing the patients treated is displayed in this field based on the annual episodes of the condition and the percentage of patients treated with this regimen.
Notes	Enter any additional relevant notations.

At the middle of the Regimen for Condition screen (Figure 5-5) are two fields, the first showing the total percentage of patients treated with the regimen and the second showing the number of patients treated. The regimen summary information in these fields is specific to the condition/care selected in the Condition/Care Provided table.

The previous steps have established the framework of the data set morbidity quantification—that is, its coverage in terms of population and its scope in terms of health issues. Now we begin to enter specific data in order to generate the estimate of medicines and supply items required.

Regimen Medicines & Supply Item Entry

The Regimen Medicines & Supply Items Entry screen (Figure 5-6) allows the user to enter details of each medicine and supply item required for each regimen. When entering regimen information, the user must be specific with regard to dosage, frequency of administration, and duration of treatment. The Regimen Medicines & Supply Item Entry screen is found under Select Quantification Method >Morbidity Method. It may be necessary to determine which and how certain pharmaceutical products are being used by the providers before entering them in for the regimens. For example, an ampoule may have enough medicine to be used for more than one patient, but it may be the practice of providers that the ampoule is thrown away after 12 hours, or FDC may be used whenever possible even when single formulations are available.

Figure 5-6. Regimen Medicines & Supply Items Entry screen

The Regimen Medicines & Supply Items Entry screen (Figure 5-6) has buttons to access the Price Summary, the Data Set Medicines List, and the Data Set Supply Item List. Once data entry is complete, users may click the Price Summary button on the right to see the summary of medicines and supply item costs for the selected regimen (Figure 5-7). The other two buttons provide access to the Data Set Medicines and Supply Items Lists. There are also buttons to copy medicines and supply items from a regimen to the clipboard or paste from the clipboard into a second regimen. These buttons are handy to use when entering several regimens that use the same medicines or items, but in different dosages, for example, to account for patient weight. The Regimen Audit button will create a report detailing the medicine and supply information added under each regimen.

Note: If the regimen was defined as being for a chronic condition in the Attach Regimen to Condition/ Care Provided screen (Figure 5-3), the "Chronic" box will display a check mark on the Regimen Medicines & Supply Items Entry screen.

Figure 5-7. Price Summary screen

To enter Regimen Medicines & Supply Items , follow these steps:

Step 1: Ensure that the correct data set is displayed in the Regimen Medicines & Supply Items screen (Figure 5-6), and then select the category and the conditions/care provided from the corresponding list box in the upper right of the screen to display the regimen descriptions entered earlier in the Regimen Condition screen (Figure 5-5). To complete this data entry, follow Steps 2–4.

Step 2: Select a regimen from the list in the upper browse window.

Step 3: Click the + symbol to add a product (either medicines or supply items) to the list of items to be included in the selected regimen. Figure 5-8 shows the Regimen Medicine Add/Edit screen, where the medicine and its dosing information for the regimen are entered.

Figure 5-8. Regimen Medicine Add/Edit screen

When adding/editing this information, the user must supply detailed information regarding the medication, route of administration, dose per administration (e.g., number of milligrams), number of administrations per day, number of treatment days, and the percentage of cases treated with this drug. The default % of Cases Treated (with this item) is 100%. The user may enter a figure less than 100% if the STG recommends an alternative medicine be prescribed—for example, for those who are unable to take the medicine of first choice (e.g., penicillin). After entering this information, select the specific product from the choices entered into the Data Set Medicines List. Once the specific pharmaceutical product has been selected, the system automatically displays the medication strength and calculates the quantity needed per administration and per treatment based on information previously entered into the system.

If the regimen was defined as a Chronic Condition in the Attach Regimen to Condition/Care Provided field, a check box is present in the Regimen Medicine Add/Edit screen, accompanied by the text "Chronic Condition (check to select 1 year treatment duration)." Check this box to automatically enter 365 in the Treatment Duration (Days) field.

Important: Remember that the dose of oral liquid medicines should normally be entered in terms of the weight of the active ingredient and not the volume of suspension or solution that contains the required dose of the medicine (e.g., milligrams, not milliliters).

Step 4: If necessary, add any supply items that are needed to complete the treatment regimen—for example, syringes for injectable medicines. As with the Regimen Medicine Add/Edit screen, the Regimen Supply Item Add/Edit screen (Figure 5-9) allows the user to select the item to add to the regimen. On this screen, specify the supply item (from a list box); any associated drugs; the quantity needed for each administration of the item (e.g., number of centimeters of tape or milliliters of a liquid); number of administrations per day; number of treatment days; and the percentage of cases treated with this item. As for medicines, the user can check the box for Chronic Condition to automatically enter 365 as the treatment duration. These figures should match those entered for the associated medicines. There is also a space to enter notes. The remainder of the screen will display calculated usage information based on the numbers entered.

Figure 5-9. Regimen Supply Item Add/Edit screen

Important: For both the Regimen Medicine Add/Edit and Regimen Supply Item Add/Edit screens, users should carefully review the entire screen for the first few entries made, to ensure that the information on the screen makes sense. It can be tricky to get the units right, especially if there were any problems defining the medicines/items in the first place. Reviewing the yellow-shaded boxes of summary information should help users tell whether they are entering the information correctly. If the strength and/or quantities do not make sense, reexamine the data entered and the original definition of the medicine or item. Note that when the % of Cases Treated is changed to less than 100%, the Quantity per Treatment Course (Episode) reflects this and displays the needs for the average patient on that regimen.

In the Regimen Medicines & Supply Items Entry screen, click the Edit button to review and/or amend previously entered data. Table 5-7 describes the fields displayed when adding or editing medicines.

Table 5-7. Fields on the Regimen Medicine Add/Edit Screen

Field	Description
Primary Generic Medicine	Select the medicine that will be used in this regimen from the drop-down list, which is based on the medicines in the Data Set Medicines List.
Route	Select the route of administration. The user will only see the routes that are relevant for the generic medicine selected, based on the products in the Data Set Medicines List. If the medication or route needed cannot be found, add the missing item to the Data Set Medicines List.
Dose per Administration	Enter the dosage amount and select the unit. For example, if the dose is 1,500 mg, enter 1,500 in the first box and select mg for the unit.
Additional Dose Information	Use this field to enter any additional dosage information.
Number of Administrations per Day	Enter the number of administrations per day; if the patient is required to take two doses per day, then 2 would be entered into this field.
% of Cases Treated	Specify the percentage of cases on this regimen treated with this medicine.
Chronic Condition	If this box is selected, the system will automatically enter the number 365 in the Treatment Duration (Days) field.
Treatment Duration (Days)	Enter the number of days for the treatment, if Chronic Condition box is not selected.
Select Medicine Product	This field is used to select a specific pharmaceutical product that contains the primary generic medicine selected.
Notes	Enter any additional relevant notations.

Table 5-8 describes the fields displayed when adding or editing supply items.

Table 5-8. Fields on the Regimen Supply Item Add/Edit Screen

Field	Description
Supply Item	Select from the list of items that have been added to the data set.
Supplementary Information	Displays information entered previously in Supplementary Information field in the Data Set Supply Item List screen.
Associated Medicines	Specify what medications the supply item might be associated with. For example, if the selected medicine was an injection and this is a needle, you can specify what medicine it is associated with.
Quantity per Administration	Enter the number that would be needed for each administration. The unit displayed in the yellow field is based on the administration unit defined for this item in the data set.
Number of Administrations per Day	Enter the number of administrations per day.
% of Cases Treated	Specify the percentage of cases that require this product, which should match the percentage of cases treated with the associated medicine.
Treatment Duration (Days)	Enter the number of days of the treatment duration.
Notes	Used to enter notes about this supply item.

Once this information is entered, the system will display the Quantity per Administration and calculate Administrations per Treatment Course and Quantity per Treatment Course (Episode), the fields for which are displayed on the remainder of the screen.

MORBIDITY-BASED SCALING-UP ESTIMATE

The morbidity-based scaling-up estimate is designed to help plan pharmaceutical requirements for program expansion. This is particularly useful for situations like the initiation or expansion of antiretroviral treatment services. Refer to Chapter 12 on using Quantimed for HIV/AIDS-related quantification. In order to use the morbidity-based scaling-up function, the corresponding box must have first been checked in Data Set Definition.

From the Select Quantification Method menu option, choose Morbidity-Based Scaling-Up Estimate Set-Up to access the screen shown in Figure 5-10.

Figure 5-10. Scaling-Up Estimator screen

The first step is to create a single or multiple scenarios of the caseload relating to a certain planned level and/or planned growth of services to address a particular condition/care provided. The Scaling-Up Estimator feature generates the total number of cases to be treated over a defined period, and for chronic conditions requiring continuous treatment it estimates the total number of patient months of treatment for both new and existing patients. For example, starting with 0 patients and adding 10 patients for 3 months, with no attrition, will yield 30 total number of cases, and 60 patient months (10 patients for the first month, 20 patients for the second month, and 30 patients for the third month). Applying these estimates to the Regimens defined under the morbidity method results in the quantification of medicine and supply item requirements.

The upper browse window will display the characteristics of each scaling-up set once these are defined in the Scaling-Up Details screen (Figure 5-11). The lower window displays the numerical details of the selected scaling-up set by the incremental period specified in the model. Reach the Scaling-Up Details screen by clicking on the Edit Scaling-Up Parameters Add/Edit button/icon below the Condition/Care Provided box.

Figure 5-11. Scaling-Up Details screen

Each of the scaling-up parameters is defined (with an example) in Table 5-9.

Table 5-9. Parameters on the Scaling-Up Details Screen

Field	Aspect	Example
Description	The scaling-up set being used by the estimator.	Scaling-Up Set #1
Active	Specifies whether the set is active and will be considered in estimates.	A check mark indicates Yes; a blank indicates No.
Linked to a Facility?	Specifies whether the scaling-up set is linked to a specific facility.	A check mark indicates Yes; a blank indicates No.
Which Facility?	Displays a list of the facilities that the set could be linked to, if Linked to Facility is checked.	East Lake, West Bay City, etc.
Start/Months/End	A user-defined period: The number of months over which the scaling-up program will take place and for which the quantification is being conducted.	6 months (e.g., program may have budget/grant support from a donor for this period)
Starting Patients	A base number of patients/cases (the number to be treated during the first user-defined period).	10 patients/cases in first period of time (initiation of program/services at site or system)
Update Period	A user-defined incremental period of time (default is monthly) for planned increases in the number of patients/cases.	Monthly, bimonthly, quarterly, or half-yearly
Number or Percentage of Cases Added/Attrition	A user-defined percentage **or** absolute number of new patients/cases and the expected monthly attrition figures per user-defined period of time.	Constant increase examples: 10% increase per month **or** 10 new cases per month
Percentage Updates	Select updates based on the initial number of patients or the previous month's total when a percent is used in Added and Attrition fields.	

To use the scaling-up feature, the user must enter the initial number of cases; select the incremental period; specify the number of cases anticipated to be added within the incremental period (either as an absolute number or percentage—both cannot be used at the same time); and optionally enter the projected attrition rate (either as an absolute number or percentage—again, both cannot be used at the same time). If a percentage is used instead of a number for either or both the addition or attrition, the user must also choose whether the percentage adjustment should be applied to the initial number of cases or to the previous month's totals. Addition and attrition begin with the first month.

For users who want to "fine-tune" or modify the trend in the number of cases or patient months established by the data entered into the Scaling-Up Details screen—for example, to account for a planned doubling of capacity—data may be entered directly into the model. Type the desired modification directly into the column headed "User Adjustment" in the lower browse window of the Scaling-Up Estimator screen (Figure 5-10). Figures may be either positive or negative.

Important: Before exiting the Scaling-Up Estimator Screen, confirm that the figure in the two yellow fields to the right of the screen is the same as those in the upper browse window. If this is not so, click on the "Update" button to update the figures.

If a data set consists of a number of facilities/areas, when the Scaling-Up Estimator screen is exited the system opens the Facility/Area Regimen Summary screen and lists the facilities/areas and associated scaling-up sets, thus allowing the user to verify that each facility/area is linked to one scaling-up set before proceeding. Users who choose to link the scaling-up set to facilities are able to ensure that they do not have multiple scaling-up sets linked to one specific facility/area. The scaling-up sets must be checked as Active in order to be displayed on the verification list.

The scaling-up estimates are based on the conditions and regimens entered in that data set's morbidity method section. This information must be entered before the scaling-up features can be used.

Morbidity-Based Scaling-Up Estimates for Chronic and Acute Conditions

The Regimen Medicine Add/Edit screen (Figure 5-12) and the Regimen Supply Item Add/Edit screen operate slightly differently when the Scaling-Up option is checked in the Data Set Definition screen. The default Treatment Duration (Days) for chronic conditions is 365, since treatment is assumed to be continuous. If the treatment is intermittent, this number can be changed (e.g., 52 for a weekly treatment). However, it is possible that the regimen may be defined to include the short-term use of a medicine or the initial use of diagnostic tests.

Figure 5-12. Regimen Medicine Add/Edit screen

For these chronic conditions the Regimen Medicine and Regimen Supply Item Add/Edit screens include a check box with the text "Check for acute use of product." Check this box and enter the appropriate number of days of use of medicines for short-term treatment or the number of times in a year a test will be done.

- When the "Check for acute use of product" box is selected, Quantimed calculates the requirements as follows—

  Quantity per treatment course or Episode **x** number of **patients** in the scaling-up set. In this case, the total number of patients equals the starting figure plus the sum of incremental modeling and user adjustments figures.

- When "Check for acute use of product" is NOT selected, Quantimed calculates the requirements as follows—

  Quantity per treatment course or Episode /12 **x** total number of **patient months** in the scaling-up set.

DATA ANALYSIS FOR THE MORBIDITY METHOD

Once all required morbidity data have been entered, the quantities of medicines or supply items required are calculated by multiplying the number of patients being served by the quantities of individual medicines/items needed to treat each health problem. It is important to note that Quantimed rounds each partial case to a whole number. For example, with a group of 250 people, 1.5% of whom are receiving a particular regimen, Quantimed considers that as 4 cases, rather than 3.75 cases, and will calculate the medicine and supply item requirements accordingly. This is to prevent underestimation of requirements.

The results of these calculations are available through the Analysis & Reports Menu. Refer to Chapter 8 for details on using this Quantimed feature (pages 8-4 to 8-11 and 8-15 to 8-18).

CHAPTER 6
Using the Consumption-Based Quantification Method

Objectives

- To provide an overview of consumption-based estimates

- To discuss data entry for the consumption-based quantification method

OVERVIEW

The rate at which pharmaceuticals are consumed or used is pivotal in determining their requirements. This information is factored into decisions on buying, reordering, and distribution of medicines and supply items. Access to reliable historical data can help facilities better manage their budgets by helping them assess the need for and rational use of available resources. The consumption method uses information from past medicine and supply item usage to forecast future needs. The results can be adjusted based on experience, and by including procurement parameters, accurately determine order quantities. Quantimed allows for information from different facilities or areas to be entered, compared, and combined for estimation purposes. The consumption method can not be used in the same Data Set as when the Scaling-Up Morbidity Option is selected.

In an adequately financed and well-managed pharmaceutical supply program, requirements are usually based on recorded past consumption. There are, however, disadvantages as well as advantages to using the consumption-based approach.

Advantages of the Consumption Method

- When accurate consumption data are available, the consumption method is the easiest way to determine future pharmaceutical needs.

- The consumption method does not require epidemiological data, which can be difficult to obtain, or STGs, which can be time-consuming to develop and approve.

- Consumption data are far easier to record and compile and are less open to interpretation (e.g., in diagnosis, identification of condition for morbidity).

- If consumption data are complete, consumption-based estimates should result in fewer instances of shortages or overstocks than morbidity-based estimates, on the condition that—

  o Shortages that have occurred have been recorded and are factored into the estimation.
  o Prescribing practices remain relatively unchanged.
  o The program is not experiencing rapid change, either in growth or contraction.

Disadvantages of the Consumption Method

- If there have been unrecorded shortages of items, needs will be underestimated.

- If past and current prescribing and dispensing practices are irrational or wasteful, these practices will be perpetuated—if not encouraged—by consumption-based ordering.
- Estimates of consumption made on the basis of amount of supplies issued from the central medical store may not reflect current pharmaceutical or supply item use patterns at the provider level. Stock management practices at both central and provider levels may be unpredictable, and it may take months before changes in prescribing patterns at the provider level are reflected in stock issues at the central level.

DATA COLLECTION FOR THE CONSUMPTION METHOD

Data collection for the consumption method begins with determining the list of pharmaceutical products eligible for order. It is preferable that the list be an officially accepted essential medicines list, rather than a list taken simply from past orders or from individual physician or health worker requests.

The next step is to collect relevant consumption data. In an established supply system, consumption data can usually be obtained from the stock card records or a computerized inventory system. Consumption data can also be obtained from proxies such as customs records or import data, other government programs that provide medicines (e.g., Social Security or the armed forces in some countries), or from sampling consumption at selected health facilities.

An obvious but frequently overlooked factor is the crucial need for consistency in the data. When medicines are ambiguously described, the data also become ambiguous. Consumption should be recorded according to official generic medicine name. Strengths, package sizes, and the unit of measure must be explicitly stated to avoid confusion among those responsible for the input of the data. If data are being collected from several levels of the system, it is important to avoid double counting.

Consumption records should also include information about stock-outs so that the consumption figures can be adjusted to reflect the consumption that would have occurred if there had been no stock-outs. If the procurement is to cover a 12-month period, 12 months of consumption data should be reviewed (assuming the data are useful). If a shorter period is used, it should be the same period that the procurement will cover, in case of seasonal variations. For example, using only 3 months of consumption data to estimate annual needs is likely to be problematic, unless the 3 months reflect steady consumption for the entire year.

DATA ENTRY FOR THE CONSUMPTION METHOD

Medicines Consumption

The Medicines Consumption screen (Figure 6-1) provides a summary of the consumption data entered (by facility/area, if these have been defined by the data set; see p. 4-22) for the current data set.

Figure 6-1. Medicines Consumption screen

To begin entering medicine consumption figures, first select a *facility/area* from the drop-down list on the Medicines Consumption screen. If the data set does not have multiple *facility/areas,* create a single surrogate *facility/area* to represent the complete data set and select this here. The date range displayed is based on the information previously entered in the Data Set Definition Consumption Data Period Set-Up screen. Using the Default Pack Size drop-down list at the right side of the screen, the user may select a default pack size to use, which is helpful for items that are predominantly in one pack size.

To review detailed information about a specific pharmaceutical item, select the desired item from the Medicines Consumption screen and click the Data Set Medicines button in the lower right corner of the screen. Quantimed opens the Data Set Medicines List with the selected item as the active record.

Once the user has selected a *facility/area*, the table shows the list of the data set medicines and displays columns for the following information for that *facility/area*—

- Institutional Code
- Product
- Unit
- Days Out (of Stock)
- Quantity-Consumption

To enter consumption information for each medicine, click the Enter Consumption Data button on the right side of the screen. This will open the Medicines Consumption Add/Edit screen (Figure 6-2).

Medicines Consumption Add/Edit

The Medicines Consumption Add/Edit screen (Figure 6-2) is used to enter consumption data for the selected medicine. The yellow-shaded boxes are for information only and cannot be edited. If monthly data entry (Consumption Period Set-Up; see p. 4-17) is selected, the left-hand section of the screen is used to select the month for data entry and provides a summary of the consumption data to enter. To enter consumption data, select the appropriate month in the Consumption by Month section and complete the fields in the Package Consumption for *Month/Year* section of the screen. The user can confirm the month selected by checking that the Package Consumption for *Month/Year* text has changed to the correct month and year. If entering annual data, the headings of the sections change to "Consumption by Year" and "Package Consumption for *Year*." Enter data for January only. Table 6-1 shows the information required for the Medicines Consumption Add/Edit screen.

Figure 6-2. Medicines Consumption Add/Edit screen

Table 6-1. Information to be Entered in the Medicines Consumption Add/Edit Screen

Field	Description
Days Out of Stock during Month (Year)	If there were any disruptions in availability for this medicine during the selected month/year, enter the total number of days the facility/area was out of stock.
# Packs	Enter the number of packs used that month (or year).
Units/Pack	This figure indicates how the medication was packaged for that specific consumption period. Note that a program or facility may have multiple pack sizes (and numbers of packs consumed) for a medicine. Enter the quantity consumed of each different pack size in separate rows of the table.
Donated	If the medicine/item was donated, check the Donated box. Although not specifically designed for such analysis, Quantimed will generate a report on consumption filtered by whether the product was donated or not.

As data is entered into the Package Consumption section of the form, the program will calculate—

First

- The aggregate of the products of *Number of Packs × Units per Pack* for each row of data entered, and it will display the monthly or annual total in the Consumption by Month/Year section

Second

- Total consumption (sum of monthly consumption figures)
- Total number of days out of stock (sum of days out of stock by month)
- Average monthly consumption (see the formula below)

$$\text{Average Monthly Consumption} = \frac{\text{Total Consumption}}{(365 - \text{Total Days Out of Stock})} \times 365/12$$

- Adjusted annual consumption (average monthly consumption × 12)

This information is then displayed on the lower right portion of the screen.

When finished entering consumption data for all drugs in one facility/area, select the next facility/area in the drop-down list on the Medicines Consumption screen and enter the figures for it.

Supply Items Consumption

The Supply Items Consumption screen (Figure 6-3) is used to enter consumption data (by facility/area, if defined) for the current data set and is used in an identical way to the Medicines Consumption screen. To begin entering supply item consumption figures, first select a facility/area from the drop-down list on the Supply Items Consumption screen. The date range displayed is based on the information entered in the Consumption Period Set-Up window (see p. 4-17). Using the Default Pack Size drop-down list at the right side of the screen, the user may select a default pack size to use, which is helpful for items that are available predominantly in one pack size.

Figure 6-3. Supply Items Consumption screen

To review the detailed information about a specific supply item, select the desired item from the Supply Items Consumption screen and click the Data Set Supply Items button on the lower right of the screen. Quantimed opens the Data Set Supply Items List with the selected supply item as the active record (see p. 4-30).

Once a facility/area is selected, the table shows the list of the data set supply items and displays columns for the following information for that facility/area—

- Supply Item
- Supplementary Information
- Quantity-Consumption
- Units
- Days Out of Stock

To enter consumption information for each supply item, click the Enter Consumption Data button on the right side of the screen. This will display the Supply Items Consumption Add/Edit screen (Figure 6-4) for the supply item that has been highlighted.

Supply Items Consumption Add/Edit

The Supply Items Consumption Add/Edit screen (Figure 6-4) is used to enter consumption data for the selected supply item. The yellow-shaded boxes are for information only and cannot be edited. If monthly data entry (Consumption Period Set-Up; see p. 4-17) is selected, the left-hand section of the screen is used to select the month for data entry and provides a summary of the consumption data to enter. To enter consumption data, select the appropriate month in the Consumption by Month section and complete the fields in the Package Consumption Details section of the screen. The user can confirm the month selected by checking that the Package Consumption Details text has changed to the correct month and year. If entering annual data, the headings of the sections change to "Consumption by Year" and "Package Consumption for *Year*." Enter data for January only. Table 6-2 shows the information required for the Supply Items Consumption Add/Edit screen.

Figure 6-4. Supply Items Consumption Add/Edit screen

Table 6-2. Information to Be Entered on the Supply Items Consumption Add/Edit Screen

Field	Description
Month/Days Out of Stock	If there were any disruptions in availability for this supply item during the selected month/year, enter the total number of days the facility/area was out of stock.
# Packs/Bottles	Enter the number of packs or bottles used that month (or year).
Pack/Bottle Size	This figure indicates how the supply item was packaged for that specific consumption period. Note that you may have multiple pack sizes (and numbers of packs consumed) for a supply item. Enter the quantity consumed of each different pack size in separate rows of the table.
Donated	If the supply item was donated, check the Donated box. Although not specifically designed for such analysis, Quantimed will generate a report on consumption filtered by whether the item was donated or not.

As data is entered, the system will calculate—

First

- The aggregate of the products of *Number of Packs/Bottles × Pack/Bottles Size* for each row of data entered, and display the monthly or annual total in the Consumption by Month/Year section

Second

- Total consumption (sum of consumption figures)
- Total days out of stock (sum of days out of stock)
- Average monthly consumption (see the formula below)

$$\text{Average Monthly Consumption} = \frac{\text{Total Consumption}}{(365 - \text{Days Out of Stock})} \times 365/12$$

- Adjusted annual consumption (average monthly consumption × 12)

This information is then displayed on the lower right portion of the screen.

When finished entering consumption data for all supply items in one facility/area, select the next facility/area in the drop-down list on the Supply Items Consumption Add/Edit screen and enter the figures for that facility/area.

DATA ANALYSIS FOR THE CONSUMPTON METHOD

After consumption data have been collected and entered, Quantimed's Analysis & Reports menu can be used to analyze the data (see Chapter 8, pages 8-4 to 8-11, for details). The analysis should be reviewed by an essential medicines committee, a formulary committee, a pharmacy and therapeutics committee, or some other qualified group. This utilization review is the most important part of the consumption-based estimation process. It is particularly important when the projected need for medicines exceeds the available funds, when considerable past shortages or overstocks have occurred, or when planners believe prescribing habits have been wasteful or inappropriate.

CHAPTER 7
Using the Proxy Consumption Quantification Method

Objectives

- To provide an overview of proxy consumption-based estimates

- To discuss data entry for the proxy consumption-based quantification method

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OVERVIEW

Sometimes the available data on consumption of pharmaceuticals or medical supplies within a health program is unreliable, incomplete, or weak, in which case using such data would be unlikely to produce a meaningful estimate. Under these circumstances, an alternate source of consumption data may be used to generate an estimate of pharmaceutical requirements. It is important that the alternate data come from a country, administrative area/facility, or organization that faces health issues fairly similar to those of the respective program, with similar incidence/prevalence of disease, follows comparable STGs, and has reliable and complete data. These data can then be substituted for the unreliable, incomplete, or weak data using the proxy consumption method. The proxy consumption method can not be used in the same Data Set as when the Scaling-Up Morbidity Option is selected.

It is not necessary for the size of the population served by the alternate system to be exactly the same as the target population because Quantimed will adjust the requirements by the ratio between the populations. For example, if the alternate system has 1,000,000 people and the target system has 900,000 people, enter the population and consumption numbers without alteration, and Quantimed will adjust the quantities required for each medication or item to be 90 percent of the alternate system's totals.

DATA ENTRY FOR THE PROXY CONSUMPTION METHOD

Proxy Consumption Sources

The information from the alternate system is entered into Quantimed using the proxy consumption method. The proxy source may be defined by selecting the **Define Quantification Parameters menu > Data Set Definition Add/Edit >Proxy Consumption Period >Proxy Data Set Definition Add/Edit** window. The Proxy Data Set Definition Add/Edit screen (Figure 7-1) requires the information shown in Table 7-1.

Figure 7-1. Proxy Data Set Definition Add/Edit screen

Table 7-1. Information Required by the Proxy Data Set Definition Add/Edit Screen

Field	Description
Active Data Set	This information is displayed for reference only and shows the active data set.
Proxy Data Set Name	Enter the name or source of the proxy data. For example, if the data were obtained for a neighboring region in Tanzania, the user may want to enter *Proxy Data from Arusha*.
Description	This field can be used to provide additional information about the proxy data source.
Consumption Year/ Start Month/ Number of Months	Enter the consumption year, the start month, and the number of months for which the data are available and to be entered.
Population of Proxy Data Set	Enter the population that the proxy data relate to.
Created By	An optional field that may contain information about the individual or organization that will be creating or modifying the data set.
Notes	Enter any additional relevant notations about the data set.

Proxy Consumption Medicines

The Proxy Consumption Medicines screen (Figure 7-2) allows entry of an aggregate figure of quantity consumed in the specified period for all medicines in the specified data set. The Proxy Consumption Medicines screen can be accessed under Select Quantification Method >Proxy Consumption Method. To enter detailed consumption information, select a medicine and click the Enter Proxy Consumption Data button. The Data Set Medicines List can be accessed by clicking on the Data Set Medicines button.

Q Proxy Consumption Medicines

Data Set [January 2004 TB Program]   Proxy Period [Reference Data One]
                                      From [1/1/2003] to [12/31/2003]

	Product	Added Nam	Days Out	Qty. Proxy Adjusted	Units
▶	Ethambutol 250MG/tab TABLET (PO)			28,000,000	tab
	Ethambutol 400MG/tab TABLET (PO)				tab
	Isoniazid 300mg/tab TABLET (PO)	Inh		9,000,000	tab
	Pyrazinamide 400mg/tab TABLET (PO)				tab
	Pyrazinamide 500mg/tab TABLET (PO)			10,000,000	tab
	R-H 150mg+100mg/tab TABLET (PO)				tab
	R-H-Z 150mg+75mg+400mg/tab TABLET (PO)				tab
	R-H-Z-E 150MG+75MG+400MG+275MG/tab TA	150+75+40C			tab
	Rifampicin 150mg/tab TABLET (PO)			34,000,000	tab
	Rifampicin 300mg/tab TABLET (PO)				tab
	Streptomycin Sulfate 1gm/vial VIAL (INJ)			4,000,000	vial

Record: |◄ ◄ [1] ► ►| ►* of 11

Enter Proxy Consumption Data

Data Set Medicines

Figure 7-2. Proxy Consumption Medicines screen

Ideally, consumption data from the proxy source will be available for a period of 12 months. If data are available for less than a year, the period is defined in the Proxy Data Set Definition, described previously. Quantimed annualizes data from periods of less than 12 months.

The Proxy Consumption Medicines Add/Edit screen (Figure 7-3) is selected by clicking the Enter Proxy Consumption Data button. The top portion of the screen displays information about the data set, proxy data set, product (medicine), added name, institutional code, and year. The Proxy Data Set Consumption Detail window is used to enter the proxy consumption data. Items that must be entered are listed in Table 7-2.

Figure 7-3. Proxy Consumption Medicines Add/Edit screen

The Totals section will display the total units consumed for the medicine during the defined period, the number of days out of stock, the monthly average consumption, adjusted number of days out of stock, and annualized consumption.

Table 7-2. Information to Be Entered into the Proxy Consumption Medicines Add/Edit Screen

Field	Description
Number of Packs	The total number of purchase packs consumed for the defined period.
Pack Size	This is the number of units in each pack. For example, if the medicine comes in tablet form and is purchased in bottles containing 1,000 tablets, enter 1,000. Quantities of different pack sizes may be entered.
Days Out of Stock	If there were any days when the health system was out of stock of the specified medication during the defined period, enter the number of days here.

Proxy Consumption Supply Items

The Proxy Consumption Supply Items screen (Figure 7-4) allows entry of an aggregate figure of the quantity consumed in the specified period for all supply items in the specified data set. The Proxy Consumption Items screen can be accessed under Select Quantification Method >Proxy Consumption Method. To enter detailed consumption information, select an item and click the Enter Proxy Consumption Data button. The data set supply list can be accessed by clicking on the Data Set Supply Items button.

Figure 7-4. Proxy Consumption Supply Items screen

Ideally, consumption data from the proxy source will be available for a period of 12 months. If data are available for less than a year, the period is defined in the Proxy Data Set Definition, described previously. Quantimed annualizes data from periods of less than 12 months.

The Proxy Consumption Supply Items Add/Edit screen (Figure 7-5) is selected by clicking the **Enter Proxy Consumption Data** button. The top portion of the screen displays information about the data set, proxy data set, product description, supplementary information, institutional code, and year.

The Proxy Consumption Detail option is used for entering the proxy consumption data. The items that must be entered are listed in Table 7-3.

Figure 7-5. Proxy Consumption Supply Items Add/Edit screen

The Totals section will display the total units consumed for the supply item during the defined period, the number of days out of stock, the monthly average consumption, adjusted number of days out of stock, and annualized consumption.

Table 7-3. Information to Be Entered on the Proxy Consumption Supply Items Add/Edit Screen

Field	Description
Number of Packs	The total number of packs consumed during the year.
Pack Size	This is the number of units in each pack. Quantities of different pack sizes may be entered.
Days Out of Stock	If there were any days when the health system was out of stock of the specified supply item during the defined period, enter the number of days here.

DATA ANALYSIS FOR THE PROXY CONSUMPTION METHOD

When data entry is complete, go to the Analysis & Reports Menu and click on the Extrapolate from Proxy Data Set submenu (see Chapter 8, pages 8-12 to 8-14, for details) in order to generate the estimate of requirements for the active data set.

CHAPTER 8
Data Analysis

Objectives

- To illustrate how to display results and analyze data

- To describe how to generate queries from the data and output reports

- To describe how to calculate procurement quantities from the best estimate of requirements

OVERVIEW

The primary purpose of Quantimed is to provide users and their management teams with the data analysis needed to make informed decisions about order planning and procurement. This chapter discusses how to use the Analysis & Reports module to generate information and reports using data entered into Quantimed.

The analysis and reports to which a user has access will depend on the quantification options selected at initial set-up and other data set parameters set by the user (see Chapter 4). For example, a user who has not selected proxy data set as one of the quantification methods in data set definition will not have access to the Extrapolate from Proxy Data Set submenu.

As with any analytical process, the results are only as accurate as the source data. If there is reason to have low confidence in the data that have been entered, keep this in mind when analyzing the results.

The Analysis & Reports menu option contains a number of analytical functions and reports grouped under each quantification method. This section of Quantimed also provides a comparison of the results of the methods used in the quantification.

Quantimed has four primary areas of analysis: Morbidity & Consumption Estimates; Extrapolate from Proxy Data Set; Scaling-Up Morbidity Estimate; and Calculate Procurement Quantity. In each of these areas, medicines and supply items are handled separately and several options are available for analyzing and reporting analytical data. This chapter discusses the areas of analysis and the options in each.

MORBIDITY & CONSUMPTION ESTIMATES

Selecting either medicines or supply items under the Morbidity & Consumption Estimate option will display a cross-sectional table that provides estimates of the total requirements for each medicine or supply item for which data were entered. This is a key screen in Quantimed, with three primary purposes:

- To show the various estimates from the different quantification methods used

- To provide an interface for querying the database and generating reports

- To facilitate reconciliation of alternative estimates and allow user adjustments to be incorporated through the Calculate Best Estimate of Requirements feature

The set of columns displayed in this window will depend upon which quantification methods are included in the data set. Only relevant data are included; for example, if the user has not included the morbidity method, no column will appear for morbidity estimates. Figure 8-1 shows all possible options; it should be noted that, unless the user is preparing a quantification using all three methods, the screen will not look exactly like the one pictured here.

Figure 8-1. Morbidity & Consumption Estimate: Medicines screen

The yellow-shaded boxes on this screen display information on the active data set, data set population, facility/area population, percentage of data set (if incorporated into the data set), the selected consumption period, the proxy data period, and the purchasing period (as appropriate to the data set). Select the price type to use for the basis of cost information via the drop-down list. Using the options in the lower right corner, the display of the results can be changed by sorting the items by formulation, institutional code, or user class and formulation.

The cross-sectional table on the screen displays the information listed in Table 8-1 below, depending on which quantification options have been selected in the program and on whether the Regimen Episodes by Facility box has been checked in the Data Set Definition screen. Table 8-1 presents all possible options.

Table 8-1. Information Included on the Morbidity & Consumption Estimate Screen

Field	Description
Product	The medicine or supply item in the data set.
Units	The smallest unit of distribution (e.g., tablet, ml, vial) for the medicine or supply item.
Qty--Morbidity or Qty--Morbidity Factor	Qty--Morbidity is the total quantity estimated based on the data entered using the morbidity method, without Regimen Episodes by Facility. The Qty--Morbidity Factor (for the facility/area) is the total quantity estimated based on the data entered using the morbidity method, scaled to match the actual facility/area population entered. This figure appears if "Regimen Episodes by Facility" has been selected in the Data Set Definition screen.
Qty--Consumption	The total quantity estimated based on the data entered using the consumption method, adjusted for stock-outs.
Qty--Proxy	The total quantity estimated based on the data entered, using the proxy consumption method scaled to match the actual facility/area population entered. If any changes have been made with the adjustment factor on the Extrapolate from Proxy Data Set screen, the "Required" quantity from that screen is the number displayed here.
Requirement	The annual requirement, calculated according to the best method selected by the user and the adjustment percentage defined by the user in the Calculate Best Estimate of Requirements screen. This column is blank until the user determines the best estimate by using the Calculate Best Estimates of Requirements feature. If any changes are made to the methods used, the user will have to return to Calculate Best Estimates of Requirements to update the figure.
Est Cost	Displays the estimated cost for the quantity required for the product, based on the Price Type selected and the unit prices previously entered. Estimated costs are presented in the currency selected in the Reports Currency field (not the currency of the Price Type).
Institutional Code	This field is optional and allows the user to enter an institutional code.

Table continues

Table 8-1. Information Included on the Morbidity & Consumption Estimate Screen *(continued)*

Field	Description
Active	A check mark in this field indicates that the item will be included on reports if "Active Selection Only" is chosen in the query. Check those items for reports on Active products only in this column.
VEN	Items are defined as vital, essential, or nonessential based on health impact.
EML	Indicates whether the medicine is included on the user's essential medicines list.
User Class	Displays the class entered for the item in the Data Set Medicines List. This is based on the user medicines classification scheme entered by the user in the **Define Quantification Parameters >Commodities** submenu.
Unit Price	The price per one unit of the product.
Price Currency	The currency for the price quoted according to the selected Price Type.
Currency Exchange	The rate/value at which the currency defined for the selected Price Type is exchanged in relation to the currency selected in the Reports Currency field.
Converted Price	The price in the converted currency.
Currency	Displays the currency for the Converted Price as selected in the Reports Currency field.

Calculate Best Estimate of Requirements

Selecting the Calculate Best Estimate of Requirements button on the right side of the Morbidity & Consumption Estimate window (Figure 8-1) will display a screen (Figure 8-2) that summarizes the estimates for a specific medicine/supply item resulting from the quantification method(s) used. Review the available estimates and click in the circle next to the quantification method desired (consumption, morbidity, or proxy consumption) to calculate the *best estimate* for the item. Once a method is selected, the figure will be displayed in the Best Estimate field. Note: An alternative figure may be entered into the Best Estimate field, based on a comparison of the results of the quantification methods and the judgment or experience of the user.

Figure 8-2. Calculate Best Estimate of Requirements screen,
accessed from the Morbidity & Consumption Estimate window

Quantimed provides an Adjustment Percent box that can be used to modify the best estimate figures as considered appropriate. For example, if there has been an overall increase in pharmaceutical usage of 5%, based on monthly usage for the past two years, it may be appropriate to adjust the estimate of future needs accordingly to account for that increase. The adjustment can be positive or negative. If an adjustment is made, use the Adjustment Notes box to indicate the reasons for the adjustment. Reducing or increasing the best estimate to account for a phased switch from one drug formulation to another within the treatment protocols for a condition may also be managed through this adjustment feature. The Annual Requirement (and corresponding Monthly Requirement) is based on the best estimated requirement for the product to treat the caseload projected, plus or minus the adjustment.

On exiting this screen, the figure in the Annual Requirement field will be shown in the Morbidity & Consumption Estimate window and used as the base requirement in the Procurement: Medicines Requirements for Data Set screen (see p. 8-21).

Querying the Database

One advantage of using a database tool like Quantimed is the ability to generate a variety of analyses and reports. The information displayed on the cross-sectional Morbidity & Consumption Estimate table (Figure 8-1) or printed in the reports can be filtered by clicking the Query button (shown here) on the Morbidity & Consumption Estimate Screen and selecting specific criteria with which to sort the data.

The purpose of a query is to ask the system a "question" to extract specific information relating to a specific characteristic or subset of the database. The "question" is answered by specifying certain criteria that must be met before the result is generated and displayed.

The Create Query screen (Figure 8-3) allows filtering of the data for a report or table according to the criteria described in Table 8-2. Several filters may be applied at the same time, but keep in mind that it is possible to restrict the analysis or report to such an extent that the results have little value. The Query box summarizes the criteria selected for the query.

Figure 8-3. Example of the Create Query screen

Table 8-2. Criteria Required for the Create Query Screen

Field	Description
ABC - A Level % **ABC - B Level %**	Use these fields to define the thresholds for Category A and B items in the ABC analysis of category items that account for most pharmaceutical/item expenditures. These thresholds can be user-defined to match the standards of the user's system. Refer to page 8-10 for further guidance.
One Facility/Area Only	Checking this box will cause the Choose One Facility/Area list box to activate. The user may then select a specific facility, which will limit the report or screen display to data related to that location only.
One Facility/Area Type (First) or One Facility/Area Type (Second)	Selecting either of these check boxes will activate the corresponding list box, which can be used to further filter data. The options available are according to the Facility/Area types defined under **Define Quantification Parameters >Facility/Area Set-Up**.
One Class of Medicines	This check box activates the User Class list box, which can be used to show data in the selected user-defined class only.
Active Selection Only	Selecting this option will ensure that only those items with a check mark in the Active column are included in the table or report.
On EML Only	Marking this check box will filter the items so that only those on the user's essential medicines list are included.
Select VEN	This option allows the user to include only items from the specified vital/essential/nonessential category.

As selections are made, they will be added to the Query box at the bottom of the screen. The information displayed here is referred to as the *query syntax*. A currency in which cost information will be output (displayed on screen or printed in reports) must be selected using the Currency drop-down list located below the Query description box.

The Create Query window and fields displayed for medicines are exactly the same for supply items.

Morbidity & Consumption Estimate – Reports

Available reports can be generated and output to screen, printer, or Microsoft Excel using the function located at the bottom left corner of the screen. Examples of Medicines Reports for the Morbidity & Consumption Estimates are available in Annex 2.

Medicines Reports

These reports pull information from the data set currently in use. The population, facility/area, time periods, pricing, and percentage of the data set represented in this analysis are shown at the top of the Morbidity & Consumption Estimate screen. Within this area of the screen, only the Price Type field can be modified.

Details about the reports that can be generated by Quantimed are presented below. As noted earlier, these data may be sorted alphabetically by formulation, institutional code, or user class and formulation. In the lower left corner of the Morbidity & Consumption Estimate screen (Figure 8-1), the Reports section contains a drop-down list of predefined reports. These reports can be displayed on the screen, sent to a printer, or exported to Excel. Always close a displayed report by using the Close button on the taskbar. To view report options, click on the drop down list under the Reports section.

- **Estimate of Medicines Requirements (Morbidity-Based Method)**

   This report generates a list of the medicines and quantities required based on the morbidity method of quantification. The results are displayed in terms of units, not packages. The expected cost of these items is based on the prices entered for the price type chosen and is displayed in the report currency selected.

- **Estimate of Medicines Requirements (Consumption-Based Method)**

   This report generates a list of the medicines and quantities required based on the consumption method of quantification (including the actual and adjusted consumption figures for comparison purposes). The results are displayed in terms of units, not packages. The expected cost of these items is based on the prices entered for the price type chosen and is displayed in the report currency selected.

- **Comparison of Morbidity and Consumption Medicines Estimates**

  This report compares the results produced by the morbidity method with results produced by the consumption method. The results are displayed in terms of units, not packages. The expected cost of these items is based on the prices entered for the price type chosen and is displayed in the report currency selected.

- **Comparison of Morbidity, Consumption, and Proxy Data Set Medicines Estimates**

  This report compares the results of the morbidity, consumption, and proxy consumption methods. The results are displayed in terms of units, not packages. The expected cost of these items is based on the prices entered for the price type chosen and is displayed in the report currency selected.

- **ABC Analysis (Morbidity-Based Medicines Estimate)**

  This report is an ABC analysis of the required medicines using results from the morbidity method. In general, a relatively small number of products often account for a large percentage of cost (defined as Category A medicines) and, conversely, a large number of items account for a relatively small proportion of cost (Category C). The analysis of this phenomenon is known as pareto analysis, or more commonly, ABC analysis. In general, the following boundaries are used: *A* items have the highest annual cost, with 10-20 % of the items usually accounting for 75-80% of the funds. *B* items represent another 10-20% of items and use 15-20% of the funds. *C* items account for 60-80% of the items but only 5-10% of the value. These boundaries are somewhat flexible, and Quantimed allows the user to set the boundaries in the Create Query screen. The expected cost of these items is based on the prices entered for the price type chosen and is displayed in the report currency selected.

  The report displays the code, name, quantity, unit price, and extended price (quantity multiplied by unit price) for each item. The items are ranked by value; that is, those representing the greatest expenditure appear first in the list. Four key figures are shown—

  - Value %: The percentage of the total cost that the expenditure on this item represents.

  - Value Cum. %: The cumulative percentage that the expenditure on this item (and on the ones before it) represents of the total cost.

  - Items Cnt.: The rank of the item in the ordered list.

  - Items Cum. %: The cumulative percentage of how many items account for the cumulative value; e.g., 20% of the items account for 80% of the cumulative value.

  The final *ABC* column shows into which category the item falls, based on the user-defined thresholds for the ABC categories.

- **ABC Analysis (Consumption-Based Medicines Estimate)**

  This report is an ABC analysis of medicines consumption. For more details on this report format, please see ABC Analysis (Morbidity-Based Medicines Estimate) Report, described above.

Supply Item Reports

Below is a list of Supply Item Reports, which are similar to those described under the Medicines Reports section, described above.

- **Estimate of Supply Item Requirements (Morbidity-Based Method)**
- **Estimate of Supply Item Requirements (Consumption-Based Method)**
- **Comparison of Morbidity and Consumption Supply Item Estimates**
- **Comparison of Morbidity, Consumption, and Proxy Data Set Supply Item Estimates**
- **ABC Analysis (Morbidity-Based Supply Item Estimate)**
- **ABC Analysis (Consumption-Based Supply Item Estimate)**

EXTRAPOLATE FROM PROXY DATA SET

Extrapolate from Proxy Data Set: Medicines

The Extrapolate from Proxy Data Set: Medicines screen (Figure 8-4) is used to hypothesize, based on proxy data, to produce an estimate of medicines requirements for the user's system. These requirements are used in the Morbidity & Consumption Estimates screen (Figure 8-1).

The yellow-shaded boxes at the top of the screen display key information from the active data set. First displayed are the name of the data set and the data set population. The parameters of the active proxy data set (proxy data set population, consumption data year, consumption data start month, consumption data number of months, start date, end date, and factor) are also shown. The factor is the ratio used to adjust the proxy data set consumption figures to correlate with the population of the active data set.

To display cost information, the price type and currency to use must be selected via the drop-down lists. The Sort Order options offer alternative listings of the items to be ordered by product name, institutional code, or cost. If considered appropriate, an adjustment to the proxy estimate can be made by entering a percentage into the Adjustment Factor field. The total cost of the requirements for the data set based on the proxy information for all the products is also displayed, in the currency selected. The fields that appear in this screen are described in Table 8-3.

Figure 8-4. Extrapolate from Proxy Data Set: Medicines screen

Table 8-3. Fields in the Extrapolate from Proxy Data Set: Medicines Screen

Field	Description
Institutional Code	This field is optional and displays the user-defined institutional code.
Product	The medicine in the data set.
Units	The smallest unit of distribution (e.g., tablet, ml, vial) for the medicine.
Qty - Proxy	The quantity consumed by the proxy as entered into the program using the proxy consumption method input screen.
Required	The estimated required quantity based on adjusting the proxy data by the defined population factor and any additional adjustment factor entered. If any changes are made to the methods used, the user will have to return to Calculate Best Estimates of Requirements to update the figure.
Unit Price	The price per unit (e.g., tablet, ml, vial) of the item, in the report currency selected.
Cost	The required quantity multiplied by the unit price, in the report currency selected.
Currency	The currency for the price quoted, based on the display currency selected at the top of the screen

Extrapolate from Proxy Data Set: Supply Items

The Extrapolate from Proxy Data Set: Supply Items screen is used to extrapolate from the proxy data to produce an estimate of supply item requirements for the user's system. It functions similarly to the Extrapolate from Proxy Data Set: Medicines screen, described above.

Proxy Consumption Estimate – Reports

Available reports can be generated and output to screen, printer, or Microsoft Excel, using the functions located at the top right-hand corner of the screen. Examples of Medicines Reports for Proxy Consumption Estimate are available in Annex 2. To view report options, click on the drop down list under the Reports section.

Medicines Reports

- **Extrapolate Medicines from Proxy Data Set**

  This report analyzes the data extrapolated from the proxy data set for medicines. It lists the proxy quantity, the estimated quantity, the unit cost, and the extended cost for each medicine. The expected cost of these items is based on the prices entered for the price type chosen and is displayed in the report currency selected.

- **ABC Analysis (Proxy Consumption-Based Method Medicines Estimate)**

  This report presents an ABC analysis of the estimated medicines quantities from the proxy consumption data. For more details on this report format, see ABC Analysis (Morbidity-Based Medicines Estimate) Report, described above.

  Note: the ABC "A" and "B" level parameters described under the Morbidity-Based Medicine Estimate ABC Analysis (page 8-10), as entered or modified in the Create Query for Medicines screen (Figure 8-3) also apply to the Proxy Consumption-Based Method Medicines Estimate ABC Analysis report.

Supply Item Reports

Below is a list of Supply Item Reports, which are similar to Medicines Reports, described above.

- **Extrapolate Supply Items from Proxy Data Set**
- **ABC Analysis (Proxy Consumption-Based Method Supply Item Estimate)**

SCALING-UP MORBIDITY-BASED ESTIMATE

Pages 8-15 to 8-18 refer to the quantification of medicines and supply item requirements using the morbidity method, applied to circumstances in which program activities are expanding or scaling up. The menu options described in this section are only available to the user if the Scaling-Up box has been checked in the Data Set Definition screen.

Scaling-Up Morbidity-Based Estimate: Medicines

In the Quantimed Application Window (see Figure 3-1), selecting the Medicines option under the Analysis & Reports >Scaling-Up Morbidity-Based Estimates menu will open a cross-sectional table (Figure 8-5) that displays the results from the scaling-up method for each medicine for which data were entered. This screen has three primary purposes:

- To show the results of the quantification based on the regimens used to treat the conditions of interest and the scaling-up scenario(s) entered

- To provide an interface for querying the database and generating reports

- To facilitate the calculation of the final estimates through the Calculate Best Estimate of Requirements feature

The columns included in this table are similar to those found under the Morbidity & Consumption Estimates option, though only the estimates based on the scaling-up scenario(s) are displayed. It is not usual to compare the scaling-up requirements estimates to those produced by using the consumption, morbidity, or proxy consumption methods, because of the different methodologies used in calculating caseloads.

On initially opening the screen, there will be no data displayed. Selecting a price type, procurement period, number of months, and currency will enable Quantimed to calculate and display the data illustrated in Figure 8-5 and described below in Table 8-4.

Figure 8-5. Scaling-Up Morbidity-Based Estimate: Medicines screen

Use the procurement period (PP) starting date and the number of months in the Months field to generate estimates of requirements for periods within the time frame defined in the scaling-up set. For example, if a scaling-up set has been defined as starting in January 2005 and continuing 12 months, procurement estimates can be made for the first six months of this year by entering 1/1/2005 into the PP Date field and 6 into the Months field. Or, as a second example, for the last quarter, by selecting 10/1/2005 and 3.

The purchasing period defined in the data set definition is not referenced here. To be consistent, the period defined by the PP date and the number of months should coincide or fall within the purchasing period defined in the data set definition. The total requirement cost of the drugs is displayed near the bottom of the screen.

Table 8-4. Fields on the Morbidity-Based Scaling-Up Estimate: Medicines Screen

Field	Description
Inst. Code	The institution's or organization's code for the item. This is user-defined.
Product	The specified medicine from the data set.
Units	The smallest distribution unit (e.g., tablet, ml, vial) for the medicine.
Qty Scaling-Up	The total quantity estimated based on the data entered, using the morbidity-based scaling-up method.
Requirement	The required quantity, calculated according to the scaling-up method, number of months, and the adjustment percentage you have defined on the Calculate Best Estimate of Requirements screen. If any changes are made to the methods used, the user will have to return to Calculate Best Estimates of Requirements to update the figure.
Unit Price	The unit price of the product.
Cost	The required quantity multiplied by the unit price.
Currency	The currency for the price quoted

The same Query options as in the Morbidity & Consumption Estimate screen and the Extrapolate from Proxy Data Set screen are not available in the Scaling-Up Morbidity Based Estimate screen. Other options can be used to query the Scaling-Up Morbidity-Based requirements. To change which health categories and conditions/care provided are estimated in the Morbidity-Based Scaling-Up screen, click on Select Active Condition/Care Provided in the upper right of the Morbidity-Based Scaling-Up screen (Figure 8-5). For example, if the data set contains a single category named HIV/AIDS, with condition/care provided of ART, VCT, and PMTCT, estimates can be derived for a single condition/care provided or for any combination of these. Select the condition/care provided to include by using the Active check box in the upper window of the Select Active Category and Condition/Care Provided screen (Figure 8-6). Specific scaling-up sets can also be made active in this screen. Note that changing the active condition/care provided will reset the best estimates and requirements fields to 0, because the scope of the quantification has been revised.

Figure 8-6. Select Active Category and Condition/Care provided screen

Scaling-Up Calculate Best Estimate: Medicines

Clicking on the Calculate Best Estimate of Requirements button on the Scaling-Up Morbidity-Based Estimate screen (Figure 8-5) will display a screen in which the user can accept the scaling-up estimate as the "best estimate" or modify this through the Adjustment Percent box (Figure 8-7). For example, if there has been an overall increase in usage of 5%, based on monthly usage for the past two years, the user may want to adjust the estimate to account for the annual increase. The adjustment can be positive or negative. If an adjustment is made, use the Note text box to indicate the reasons for the adjustment. The Requirement field is based on the best estimate plus or minus the adjustment.

If the user has selected Select Active Condition/Care Provided and Requirements has been set to 0, clicking the Update Best Estimate to Scaling-Up Estimate button will automatically input the new Scaling-Up Estimate to the Best Estimate field.

Figure 8-7. Calculating Best Estimate of Requirements: Medicines screen

Scaling-Up Morbidity-Based Estimate: Supply Items

This option functions in the same way as Scaling-Up Morbidity Estimates: Medicines, described above.

Scaling-Up Morbidity-Based Estimate – Reports

Medicines Reports

The available report can be generated and output to screen, printer, or Microsoft Excel using the functions located at the bottom left corner of the screen. Examples of the Medicines Reports are available in Annex 2. To view report options, click on the drop down list under the Reports section.

- **Estimate of Scaled-Up Medicines Requirements**

  This report analyzes the data extrapolated from the active medicines data set. It lists the category, condition, scaling-up sets, and number of patient months that appear in the results for the active scaling-up set. The expected cost of these medicines is based on the regimen and price type selected and is displayed in the report currency chosen.

Supply Item Reports

This option funtions in the same way as Scaling-Up Morbidity Estimates: Medicines, described above.

- **Estimate of Scaled-Up Supply Item Requirements**

CALCULATE PROCUREMENT QUANTITY

The final step in the estimation process is order planning. Up to this point Quantimed has been facilitating the estimation of the quantities of pharmaceuticals needed to address an estimated (or target) number of cases or patients, or the projected level of diseases affecting or services required by a population. In this next step, the planner uses the best estimates of requirements derived from the data analyses of past consumption, morbidity patterns, and/or information on shortages and usage patterns to make a final determination of the quantity of pharmaceuticals to *order*. Procurement parameters such as procurement period, lead time, and safety stock are considered, as well as the quantities of stock on hand and on order (but not yet received). Quantimed organizes this information and performs the calculations, but the final order may still depend on the experienced judgment of the responsible officials.

Ordering Information Defaults

The Ordering Information Defaults screen (Figure 8-8) allows the user to specify the default settings for the procurement process for the data set, which are then applied to all medicines, and separately, to all supply items. The user has the option of using these defaults or not by clicking the box in the Procurement: Requirements screen, described later. These defaults include the adjustment for losses, procurement period, lead time, and safety stock. The procurement period is not displayed when working with a scaling-up data set, because the procurement period is defined in the Scaling-Up Morbidity-Based Estimate screen (Figure 8-5). Most supply items encounter some losses of product due to damage in transit or storage, expiry, overlooked short-shipments, and theft. A well-functioning inventory control system with good management information will be able to determine the level of past losses. This figure (as a percentage) can be used to forecast the losses over the procurement period and allow the user to adjust the order quantity to compensate. Lead time is defined as the number of months it takes for an ordered consignment to arrive once the order has been placed. Safety stock is defined as the number of months' worth of stock the user wants to always have on hand to avoid stock-outs. These factors are all used in calculating the quantity of an item to include in the tender or the order placed with a supplier.

Figure 8-8. Ordering Information Defaults screen

Calculation Formulas

In the formulas below, lead time, procurement period, and safety stock are stated as a number of months; and average monthly requirement, final month's requirement, current stock, and quantity on order are numbers of units of the item.

Unless when scaling-up method is being used, the formula Quantimed uses to calculate the quantity to order is:

[(Lead Time + Procurement Period) × Average Monthly Requirement] +
[Safety Stock × Average Monthly Requirement] – (Current Stock + Quantity on Order)

For the scaling-up estimates, which are premised in general on an increasing need for each item, the calculation is slightly different because using the mathematical average monthly requirement would likely result in an underestimate of order quantity. Therefore, we use the requirements necessary for the final month of the defined scaling-up period instead of average monthly requirement. In this case, the formula Quantimed uses to calculate the quantity to order is:

[(Lead Time + Safety Stock) × Final Month's Requirement] + Sum of Monthly Requirements –
(Current Stock + Quantity on Order)

The Final Month's Requirement is *either* the quantity needed for the month after the final month of the scaling-up period *or* the quantity required for the final month of the scaling-up period if the next month's figure is not available. The sum of monthly requirements over the scaling-up period is the quantity necessary for the scaling-up period defined.

Procurement: Medicines

The Procurement: Medicines screen (Figure 8-9) displays all information on the requirements, stock information, cost, and procurement parameters for each item in the data set. This screen also provides an interface for finalizing the procurement quantity for each medicine.

Figure 8-9. Procurement: Medicines Requirements for Data Set screen

The yellow-shaded boxes at the top of the screen display information about the selected data set's population, the purchasing period, and the sum of total costs. The default display is for All Facilities/ Areas. Click on Select 1 Facility/Area to access a drop-down list of facilities/areas to display information for a single facility/area. If using the scaling-up method, the section allowing selection between All Facilities/Areas and Select 1 Facility/Area fields will not appear.

Details on the data displayed in this screen are provided in Table 8-5.

Table 8-5. Fields in the Calculate Medicines Procurement Requirements Screen

Field	Description
Institutional Code	This field is optional and displays the user-defined institutional code.
Product	A list of the items for which the user may calculate procurement quantities.
Requirement	Amount required of the selected item as determined in Calculate Best Estimate of Requirements.
Qty. to Order	Quantity that needs to be ordered to meet the needs of the program and maintain the appropriate stock levels.
Pack Size	The purchase pack size as defined in the pricing section of the medicine definition.
Purchase Packs	Shows the number of purchase packs needed to meet the required number of units, based on the purchase pack size defined in the data set medicines list option.
Price	The price of each purchase pack, as defined in the data set medicines list.
Pack Total	Total package requirements based on requirements and pack size.
Extended Price	The cost for the number of purchase packs required, based on the price type selected and information in the data set medicines list.
Currency	This is the currency selected for reports/display and may not be the price currency for the Price Type selected.
Adjustment for Losses	The user-defined percentage to compensate for estimated losses or expected increases or decreases in demand.
Procurement Period	The interval at which the user places orders for the item, in terms of months.
Lead Time	The number of months it takes for an ordered consignment to arrive once the order has been initiated.
Safety Stock	The number of months' worth of stock the user always wants to have on hand to avoid stock-outs.
In Stock	Quantity currently in stock.
On Order	Quantity of the selected item on order.

The following functions can be accessed by clicking in the appropriate place on the right side of the screen: the Calculate Order Quantity button; the Use Data Set Ordering Defaults check box; and the Data Set Ordering Defaults button. Each is described below.

Calculate Order Quantity: Medicines

When an item is selected in the form window and the Calculate Order Quantity button is selected, the Procurement Edit: Medicines for Entire Data Set screen (Figure 8-10) is displayed. "Scaled-Up" is added to the end of the screen name if using the scaling-up method. This screen enables users to enter values for the variables required in the calculation of the quantity of the item to be ordered (as described under Ordering Information Defaults on p. 8-19).

Figure 8-10. Procurement Edit: Medicines for Entire Data Set screen

The fields in this screen are listed in Table 8-6. The yellow-shaded fields display the product name, annual requirement (or scaled-up requirement, if using the scaling-up option), program/use adjustment, and adjustment note as determined and defined in the Calculate Best Estimate of Requirements screen. Enter values for the procurement period, lead time, safety stock, and quantities on order and in stock. Quantimed will then calculate based on figures entered and will place the quantity to order in the yellow Quantity to Order field at the bottom of the screen.

Table 8-6. Fields in the Procurement Edit: Medicines for the Entire Data Set (Scaled-Up) Screen

Field	Description
Adjustment for Losses	The user-defined percentage to compensate for estimated losses or expected increases or decreases in demand.
Notes	Enter any additional relevant notations.
Procurement Period	The interval at which the users places orders for the item, in terms of months.
Lead Time	The number of months it takes for an ordered consignment to arrive once the order has been initiated.
In Stock	Quantity currently in stock.
On Order	Quantity of the selected item on order.
Safety Stock	The number of months' worth of stock the user wants to have on hand to avoid stock-outs.
Quantity to Order	Quantity that needs to be ordered to maintain the appropriate stock levels.

Use Data Set Ordering Defaults

Checking the box to the right of the table will activate the data set ordering defaults entered in the Calculate Procurement Quantity >Ordering Information Defaults screen. Those parameters are conveniently viewed or edited by clicking the Data Set Ordering Defaults button.

Data Set Ordering Defaults

Clicking the Data Set Ordering Defaults button displays the procurement parameters for ordering items within this data set. These factors are adjustment for losses, procurement period, lead time, and safety stock.

Calculate Procurement Requirements – Reports

Medicines Reports

Available reports can be generated and output to screen, printer, or Microsoft Excel, using the functions located at the bottom left corner of the screen. Examples of the Medicines Reports are available in Annex 2. To view report options, click on the drop down list under the Reports section.

- **Estimate of Medicines Procurement Quantities**

  This report is available to users not using the Scaling-Up method. It displays information for each product name, annual quantity required, unit, quantity in stock, quantity on order, procurement period, safety stock, lead time, quantity to order, packaging, purchase packs, pack price, extended price, and total cost. The cost figures are based on prices entered and the pricing method chosen.

  Note: The *Number Packs* figure is calculated by dividing the *Quantity to Order* by the number of base units in a *Purchase Pack*. The quantity in a *Purchase Pack* is the product of the number of units in the defined *Packaging* (e.g., 1,000 tablets per bottle) and the number of containers (bottles in this example) in a *Purchase Pack* (e.g., 10 bottles per pack), totaling 10,000 tablets.

- **Estimate of Scaled-Up Medicines Procurement Quantities**

  This report is available if using the scaling-up method. Two sets of information are given. The first displays the active scaling-up sets, and the second displays information for each product name, annual quantity required, unit, quantity in stock, quantity on order, procurement period, safety stock, lead time, quantity to order, pack size, pack price, extended price, and total cost. The cost figures are based on prices entered and the pricing method chosen.

Procurement: Supply Items

This option functions in the same way as Procurement: Medicines, described above.

Supply Item Reports

Below is a list of Supply Item Reports, which are similar to Medicines Reports, described above.

- **Estimate of Supply Items Procurement Quantities**
- **Estimate of Scaled-Up Supply Items Procurement Quantities**

CHAPTER 9
Reports

Objectives

- To describe the standard data collection forms and reports available in Quantimed

The Reports menu contains several standard reports that offer an excellent way to consolidate large amounts of data and to present the information in an easy-to-read manner. This menu also allows the user to print several blank forms, as well as access directly the data entered into the system. Sample data collection forms can be found in Annex 1 and a sample of each report can be found in Annex 2.

The effectiveness of the reports is dependent on the accuracy of the data entered into the program. It is therefore critical that the information entered be correct and up-to-date. If there are known problems with the data, keep that in mind when interpreting reports.

Reports may be sent directly to the printer or displayed on-screen using the blue Preview Report icon. Some reports can also be exported to Excel. It is recommended to maximize the Report window in order to see all the information. If the report consists of multiple pages, maximizing the Report window also makes the navigation buttons visible across the bottom of the window. These navigation buttons will enable users to view all pages of the report on the screen, sequentially.

When a report is displayed using the Preview Report option, users see exactly how their reports will look when printed out. When this feature is selected, the Print Preview toolbar (Figure 9-1) appears near the top of the window above the report.

Figure 9-1. Print Preview toolbar

The icons on this toolbar can be used to perform various functions, including printing; zooming in; using the magnifier or the zoom box (in which users can choose a magnification percentage); viewing multiple pages; linking to a Microsoft Office application such as Word or Excel; and closing the Preview Report window.

STANDARD QUANTIMED REPORTS

The following is a brief description of the standard data collection forms and reports that can be generated by Quantimed.

Data Collection Forms

The Data Collection Forms option allows the user to view the blank forms, to print and export to Excel a blank copy of the specified data collection form, which can then be filled in by data collectors and/or facility staff members. These forms are intended to facilitate data collection for Quantimed by capturing data in a format compatible with the program. The Data Collection Forms submenu includes the following forms:

- Data Collection – Regimen Medicines
- Data Collection – Regimen Supply Items
- Data Collection – Treatment Regimen Medicines
- Data Collection – Treatment Regimen Supply Items
- Data Collection – Scaling-Up Facilities/Areas
- Data Collection – Medicines Consumption
- Data Collection – Supply Items Consumption

These blank forms can be used to collect data that may be stored manually. Information written on the form is then entered into Quantimed for analysis.

The first five reports are Excel files, and all can be accessed through the Quantimed menu system or directly from the program directory. This is to facilitate user customization of the data collection forms for particular systems. Before using the forms to collect data, users should review them and make any adaptations required for local needs (e.g., changing terminology or deleting columns for data that will not be collected). When users select a blank form, two primary icons will appear on each screen: Preview Report and Print.

The Preview Report icon, if selected, launches Microsoft Excel and allows the user to view the chosen form.

The Print icon, if selected, will send the blank report form directly to the printer. Information can then be manually added to the form.

For Data Collection—Medicines Consumption and Data Collection—Supply Item Consumption, users must enter a start date (the month is selected from a drop-down list) for the period for which consumption data is being collected. The year is keyed in directly.

Quantimed's Reports feature also enables users to pull information from various tables and present it in a report format. These are the Data List and Consumption Data Audit reports.

Data List Reports

Data Set Medicines

This report provides a list of medicines from the selected data set. Through the use of the Price Type drop-down list, users have the option of generating a Data Set Medicines List Report based on a specific price type, simply by choosing the desired price type available for the data set from the list. The report is a summary list of the medicines in the data set and includes the institutional code, product, additional information on the product, therapeutic class, VEN, user EML, package, unit, unit price, and source of the price. The currency in which cost information will be displayed in the report can be selected here.

Data Set Supply Items

This report provides a list of supply items from the selected data set. Through the use of the Price Type drop-down list, users have the option of generating a Data Set Supply Items List Report based on a specific price type simply by choosing the desired price type available for the data set from the list. The report is a summary list of the supply items in the data set and includes the institutional code, product, additional product information, supply class, units, packaging, unit, unit price, and source of the price.

List of Regimens by Condition and Category

This report provides a list of regimens that have been entered in the morbidity module. When this report is selected, the data set currently in use is displayed and the phrase *All Categories* appears in the Category field. Users have the option of selecting the health care category for which they wish to generate regimen reports by choosing the desired category from the drop-down list. This report contains information on the regimens established for the Condition/Care Provided under the specified categories, including the level of care, patient group, percentage and number treated, and regimen notes. It does not include the medicines and supply items for the regimens; those are included in the Regimen Episodic Costs Report.

Percentage of Cases Treated by Regimen

This report lists the categories, conditions, and regimens entered for the data set. It contains the percentages entered for the conditions and for the protocols, along with patient group information and notes. This report is meant to provide a convenient way to check the morbidity assumptions and confirm that the percentages entered are correct.

Note: this report is not applicable if the Regimen Episodes by Facility/Area option has been selected in Data Set Definition.

Regimen Episodic Costs

This report provides detailed information about the medicines, supply items, and costs associated with each regimen. The report is particularly useful because it summarizes the cost of medicines and supply items for the treatment of a single case (episode) and the total cost for the estimated caseload. Although this information is available on the system, it is often helpful to print the report for comparison with other material. When this report option is selected, the data set currently in use is displayed and the phrase *All Categories* appears in the Category field; in addition, one of the price types defined for the data set appears in the Select Price Type field. Users have the option of generating a report either for all categories or for a single category for each of the alternative price types available within the data set from the list. The report details the medicines, supply items, and costs for each regimen, and includes the level of care, patient group, percentage and number treated, and notes for each regimen. The currency in which cost information will be displayed in the report can be selected here.

Note: If the Regimen Episodes by Facility/Area option has been selected in Data Set Definition, then the figure displayed in this report for the Number Treated for each regimen is the sum of the number treated for each Facility/Area, based on the Facility/Area specific percentages of patients on each regimen. If the Regimen Episodes by Facility/Area option has not been selected in Data Set Definition, then this report displays both the percentage and the number treated, for each regimen, based on the data set wide parameters entered in Attach Regimens to Condition/Care Provided.

Consumption Data Audit Reports

Consumption Data Entry Printout

The Medicines: Consumption Data Entry Printout Report option allows the user to print medicines or supply item consumption information categorized by facility or area. It is useful as a summary or as a means of double-checking consumption data entry. Before printing, select the facility/area and medicines or supply items for which data were entered. The report shows the products and monthly (or annual) figures for days out of stock, number of packs, the pack size for each, and whether the product was donated.

Consumption Donated

The Consumption Donated Report option allows the user to print out a list of donated medicines or supply items by facility or area. Before printing, check the box to indicate if all facilities/areas are to be reported on or select the individual Facility/Area, and select the Price Type, the Currency, and Medicines or Supply Items using the drop-down lists. The report shows the products' annual consumption, donated quantity, and percentage donated of the total consumption. Additional information includes the price of the donated products and the percentage and value of total donated products.

CHAPTER 10
Interpretation of Results

Objectives

- To provide guidelines for interpretation of results

- To provide hints and tips to consider when analyzing results

.

OVERVIEW

Conducting a successful quantification is a challenge. If the available data are not accurate, complete, or reliable, the usefulness of the quantification results will be reduced. The extent of this reduction in value will depend on the seriousness of the data problems. This does not mean that a quantification cannot be performed with less-than-perfect data. It does mean that a closer review of the results and an understanding of the deficiencies, the application limitations, and the risks—financial and otherwise—of using such results are crucial.

Quantimed is a tool designed to assist in quantifications by streamlining the data entry and calculation processes. It cannot conduct a quantification, create good data, or exercise judgment to interpret the results of a study or reconcile them to the available budget. Anyone who has conducted a quantification understands the data problems often encountered and knows that quantification is as much an art as a science due to the number of variables involved. Quantimed is intended to facilitate the mechanics of the quantification analysis, reduce the opportunities for mathematical error, and allow the user more time for interpretation of results.

This chapter includes some guidelines on how to interpret certain results that may occur in a quantification. It contains tips on potential trouble spots and hints to help the user avoid under- or overestimating requirements. However, it is not intended as a comprehensive tutorial on quantification. Users who need more information on conducting a quantification may refer to the MSH/WHO textbook *Managing Drug Supply,* second edition (available from Kumarian Press at http://www.kpbooks.com), and the WHO manual *Estimating Drug Requirements: A Practical Manual* (WHO/DAP/88.2) (available at http://www.wholibdoc.who.int/hq/1988/WHO_DAP_88.2.pdf).

GUIDELINES FOR INTERPRETING RESULTS

Basic Verification

Before starting a review of the results, it is always a good idea to undertake some basic checks that serve not only to highlight potential data entry or transcription errors, but also to confirm the quality of the data. As a starting point, ask whether the results make sense and appear reasonable.

Even for those who will not be undertaking a full consumption-versus-morbidity comparison, looking at the big picture at this stage can be beneficial. Are there any huge discrepancies with previous years' estimates? Are the cost levels within the bounds of reality? Are there substantial inconsistencies between consumption and morbidity results that are unclear? If there are any large differences, investigation of the data is required. Verify that no errors were introduced during data entry or transcription, and investigate the data situation before proceeding.

Reviewing Results

The analysis results should be reviewed by an essential medicines committee, a formulary committee, a pharmacy and therapeutics committee, supply managers, or some other qualified group. This utilization review is the most important part of the consumption-based estimation process. It is particularly important when the estimated need for pharmaceuticals exceeds the available funds, when considerable past shortages or overstocks have occurred, or when planners believe prescribing habits have been wasteful or inappropriate.

The review process is also a key part of a morbidity-based quantification, because it is necessary to understand whether the theoretical results of that process accurately reflect both the prescribing practices in the system and real-life disease patterns. The reviewing group can provide advice on reconciling differing results from quantification methods. Even if only one quantification method was used, users should still consider what is known about the entire health system when making decisions on requirements. Using more than one quantification method is highly recommended, even if the second method serves only to produce a rough estimate for comparison.

Comparing Morbidity and Consumption Results

It is only possible to directly compare morbidity and consumption results if the studies have been conducted on the same basis—that is, the commodities being quantified are largely (or entirely) used for the selected morbidities. This will likely never happen for a "big picture" quantification, but it could be done when looking at, for example, only HIV/AIDS or TB under circumstances in which the medicines required have few or no uses beyond these health conditions. It could also be done on a facility basis.

Users who have conducted morbidity- and consumption-based estimates (using either their own data or proxy data) will probably get different results from each. Ideally, the estimates would produce very similar results, but in practice this rarely happens. It is the user's task, then, to consider both the quality of the source data used and the results obtained to make an informed judgment on the actual quantities required. These quantities will likely need to be adjusted to fit the budget as well.

However, even for those who have not conducted full morbidity- and consumption-based quantifications on the same basis, it is still very useful to consider and compare morbidity and consumption results. This is true even if the data are inaccurate and even if the comparison can be done only roughly and with difficulty. The comparison has the potential to catch large discrepancies and can force a reevaluation of preconceived notions about the accuracy of the data. Investigation of the reasons for discrepancies often turns up essential information needed for the quantification.

For example, in one quantification conducted, the issues data (issues being quantities distributed from a storage point) were considered to be good, and indeed they were an accurate record of the stocks given out. However, enough intrauterine devices (IUDs) had been issued for every man, woman, and child in the province. Comparison with the population and morbidity data was essential in highlighting the problem of leakage and/or resale of the IUDs outside the country. This produced a more accurate quantification for the next year's supply.

The scenarios that follow explain and suggest actions to take, based on the results of each method and depending on confidence in the data used. For the consumption method, the user should be confident that the logistics management information system (LMIS) accurately and reliably maintains data on *consumption* (that is, not on stock movement, which may include losses, expired stock, etc.). A crucial factor to consider in any analysis of results is possible irrational use of pharmaceuticals in the system.

Consumption-Based Estimate Greater Than Morbidity-Based Estimate

If the consumption-based estimate is more than 50 percent greater than the morbidity-based estimate, a more detailed investigation of the data should be undertaken before proceeding with the quantification. Were the data entry and transcription done correctly? Was the correct population and morbidity information obtained? Is there a possibility of large-scale leakage and/or diversion of supplies? Are there any special factors at work? Once the data are verified, for handling smaller discrepancies users may proceed as follows.

If **not confident in the quality of either** the consumption or morbidity data:

- Consider an overall system assessment, and strengthening of the health management information system (HMIS) and LMIS.

- Seek comparative facilities, regions, or countries with reliable information systems and use their data as proxy data.

- Try to judge the percentage of confidence it is reasonable to have in the accuracy, completeness, or reliability of the data and adjust the results accordingly.

If **more confident in the consumption data** than the morbidity data:

- Examine the morbidity data for underestimation of disease incidence.

- Make sure that the population data is current. Ask whether there has been any large movement of population into the area, such as refugees, seasonal workers, or employees of new industries.

- Determine whether standard treatment guidelines (STGs) are followed.

- Investigate whether pharmaceuticals are used in other programs or for other purposes.

If **more confident in the morbidity data** than the consumption data:

- Consider whether there is high pilferage, expiration, or leakage of stock.

- Investigate whether pharmaceuticals are used in other programs or for other purposes.

- Ask whether stock-outs of other related pharmaceuticals caused higher consumption of this item.

If **confident in the quality of both** the consumption and morbidity data:

- Use the consumption-based estimate to avoid the problem of ordering too few pharmaceuticals and supplies.

Morbidity-Based Estimate Greater Than Consumption-Based Estimate

If **not confident in the quality of either** the consumption or morbidity data:

- Consider an overall system assessment, and strengthening of the HMIS and LMIS.

- Seek comparative facilities, regions, or countries with reliable information systems and use their data as proxy data.

- Try to judge the percentage of confidence it is reasonable to have in the accuracy, completeness, or reliability of the data and adjust the results accordingly.

If **more confident in the consumption data** than the morbidity data:

- Examine the morbidity data for overestimation of disease incidence.

- Ask whether there has been a change in the population as a result of exodus due to war, unrest, drought, famine, migration of seasonal workers, departures of refugees, etc.

- Determine whether STGs are followed.

- Investigate whether pharmaceuticals are used in other programs or for other purposes.

- Consider whether there is low program coverage and/or inadequate support services or diagnostics for health conditions.

If **more confident in the morbidity data** than the consumption data:

- Consider whether there is a poor management information system (MIS).

- Ask whether the budget has been sufficient to meet the full needs of the population or if a proportion has gone untreated.

- Consider whether there is low program coverage and/or inadequate support services or diagnostics for health conditions, and whether access to these services has been limited by unrest, strikes, or transport problems.

- Determine whether pharmaceuticals are being supplied from multiple sources not included in the quantification.

If **confident in the quality of both** the consumption and morbidity data:

- Use the morbidity-based estimate to avoid the problem of ordering too few pharmaceuticals and supplies.

Additional Analysis

Using the ABC Analysis reports in Quantimed can provide valuable additional information on the quantification results; this may help point to ways to reconcile the estimates and/or budget. If the user's system does not already utilize it, the VEN system, which categorizes pharmaceuticals by their relative public health value, can be particularly useful in setting priorities, determining safety stock levels, and so on.

HINTS AND TIPS

This section of the Quantimed User's Guide raises issues to consider when interpreting quantification results.

Stock-Outs and Product Substitution

One thing to be wary of in conducting a consumption-based quantification is double counting of requirements. This can happen, for example, under the following circumstances: If a store normally stocks 200 mg ibuprofen tablets and 400 mg ibuprofen tablets but is out of stock of the 200 mg tablets for a few weeks or months of the year, the staff may have simply issued more 400 mg tablets to compensate. So when the stock-out time is factored into the consumption requirement for the 200 mg tablets (as it should be), it will increase proportionally the annual consumption figure for that item. That is not a matter for concern.

However, the higher-than-usual consumption of the 400 mg tablets will also be factored into the consumption requirement for that item, when the true consumption would have been lower had it not been used to substitute for the out-of-stock 200 mg tablets. Purchasing the total quantities calculated as required for both items will almost certainly result in more ibuprofen tablets being ordered than are actually needed. To help prevent this problem, be sure to discuss substitution patterns with store managers, especially if stock-outs are a frequent problem.

Filling the Supply Pipeline

When calculating the stock estimates, remember to include appropriate procurement parameters, such as lead time, that keep the supply pipeline filled. This is especially important for morbidity-based estimates for a new system or if a revolving drug fund is planned. As *Managing Drug Supply* states, "the number of levels, the frequency of requisition and delivery, and the amount of safety stock at each level: these factors all influence the amount of medicines needed to fill the pipeline" (p.190). Underestimating the stock required for this is a common problem

Losses

Be sure to adjust the quantification estimates for losses (theft and wastage). Because the losses for some items will be greater than for others, it is important to try to get accurate and specific figures for this. Failing to adjust for losses will lead to stock-outs (unless the losses can be eliminated), but including a higher adjustment than necessary is a waste of resources. Refer to *Managing Drug Supply* for more information.

Budget Reconciliation

No matter which quantification method is used, there may be a discrepancy between the quantities estimated and the budget to pay for them. As noted in *Managing Drug Supply,* "The quantification process itself may help justify an increase in the budget, but often the quantification estimates have to be adjusted and reconciled to fit available funds" (p.185). The morbidity method can be especially persuasive in supporting budget requests. Quantimed can be used to run "what-if" scenarios and adjust the caseload

Future Considerations

With any quantification results, be sure to consider possible changes in future needs before making a final decision on procurement quantities. Examples of things to consider include:

- The construction of new health facilities, which might increase the number of cases treated.

- A large number of returning refugees, which will place greater demands on the system than predicted by any of the methods because of an increase in the population base.

- Expected weather patterns that may increase or decrease the need for certain medicines if epidemics are predicted to begin or to end; or a natural catastrophe that may have increased the demand in the past year but is not likely to be repeated.

- Plans for major public health campaigns that may require verification that there are adequate supplies on hand to support those efforts.

- The requirement for "old" medicine stock reduction if it is known that a particular formulary medicine is going to be replaced with a new medicine.

These are the kinds of events that must be factored into a quantification estimate, because they will not necessarily be included in the historical information used for the calculations.

Additional Uses of Data

The results of the quantification may be useful for other things besides determining procurement quanti-ties. Consider whether the data can be used to support efforts to encourage rational use of medicines. For example, groups promoting the use of STGs could compare the relative costs of following the STGs with actual prescribing patterns to help educate prescribers to the (most likely) wasteful and inefficient use of resources caused by incorrect prescribing or overprescribing. If both the consumption and morbidity methods have been used, it could be instructive to investigate the sources of the differences in the estimates.

Another constructive use of the data is to save the results to compare with actual consumption over the procurement period. If there are serious discrepancies between the projected and consumed quantities, it is important to determine why before conducting the next quantification and procurement.

CHAPTER 11
Tools

Objectives

- To discuss Quantimed system tools and maintenance

- To explain user report options

- To explore file importing and exporting

.

OVERVIEW OF TOOLS MENU OPTIONS

The Tools menu contains several maintenance, configuration, and import/export functions for Quantimed. Each menu option is described below. Microsoft naming conventions are used, so that the "front end" refers to the Quantimed program (default file name is **Qmed.mdb**) and the "back end" refers to the user's data (default file name is **Qmed_be.mdb**).

Linked Table Manager

To connect the front-end Microsoft Access program to the back-end data file, it is necessary to use the Linked Table Manager in the Quantimed Tools Menu. In the Linked Table Manager, select Yes to relink the tables and use the file dialogue box to find the location of the required back end (usually named **Qmed_be.mdb**). Quantimed will show a message box when the linking is complete.

If the user has Microsoft Access installed, there is also a Linked Table Manager option in the Access menu, which is more complicated to use. If using this option, be sure to select all tables to link and then choose the appropriate back end from the file dialogue box.

Set Default Printer

Select Set Default Printer and click the Set Printer button to choose the printer for printing all Quantimed reports. This button directly interfaces with the Windows operating system and will provide a list of printers that have been configured on the Windows system. Simply select the printer that will be the default for use with Quantimed and click OK. Quantimed will use the Windows default printer if another printer is not selected.

Report Footers

Use this screen to specify the report footers that will appear on all Quantimed reports. This feature allows the user to enter up to three lines of text that will appear in the footer area of each report, with the exception of the Blank Forms. For example, the default report footers are Report Footer 1 – Quantimed, Report Footer 2 – Pharmaceutical Quantification and Cost Estimation Tool, and Report Footer 3 – Management Sciences for Health, Washington, D.C., USA. This information appears on the bottom of all reports selected under the Reports menu when printing.

Users may wish to modify the report footers to reflect their projects. For example, the footers could be changed as follows: Report Footer 1 – Quantimed Medicines & Supply Quantification, Report Footer 2 – Tanzania Mission Hospital Study, and Report Footer 3 – ABC Consultants, Dar es Salaam, Tanzania. Users should check that long footers fit satisfactorily on the printed page.

Compact & Repair the Database

This feature allows the user to compact and repair the Quantimed database so that it will run more efficiently. This option essentially removes unnecessary or duplicative information from the database and keeps the file from getting artificially large, a well-documented problem with Access databases. No data will be lost by running this option. It is recommended to run it once a day if entering significant amounts of data into Quantimed.

Export/Import Submenu

Import Generic Medicines List

This screen allows the user to import updated lists of generic medicines made available by MSH. Only medicine lists from MSH will be in the correct format for importing into the program. The list will be updated annually, based on the items and prices in the *International Drug Price Indicator Guide.*

The Import MSH Generic Medicines List dialogue box displays the file name of the current list. Click the Import MSH Generic Medicines List button, which will allow the user to browse through the system to find the correct location of the file. Importing the new file will update the Generic Medicines List in Quantimed but will not affect the data set lists. It will also not affect any medicines or supply items that have been entered in the Generic Medicines List or Generic Supply Items List. To delete existing medicines list records first, check the box for that option. Enter the source and year of new data for reference purposes.

Export Medicines and Supply Items to Excel File

This feature is used to export a medicines or supply items list to a Microsoft Excel file in order to, for example, import it into another copy of Quantimed. To use this feature, select the data set and price type option to export, then choose which list (medicines or supply items) to export (Figure 11-1). After selecting a name and destination for the new file, and clicking **Open**, the file is created. Do not make any changes to the columns or column headings in the Excel file that is created if it will be imported to another Quantimed "back end."
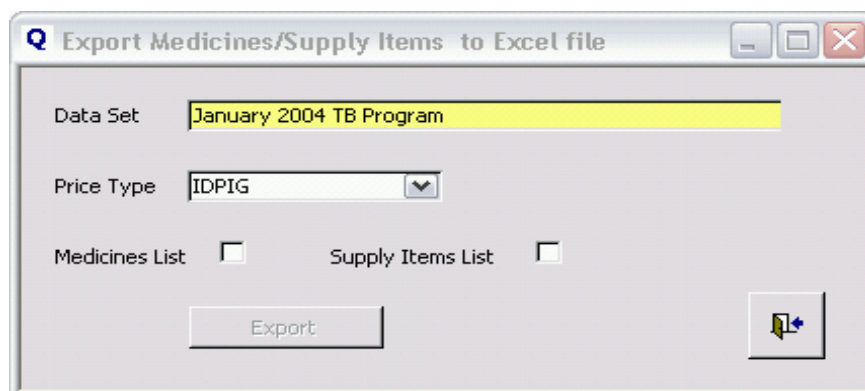
Figure 11-1. Export Medicines/Supply Items to Excel File screen

Import Medicines and Supply Items Lists from Excel File

This feature is used to import a medicines or supply items list from a Microsoft Excel file created in another copy of Quantimed, and is the companion to the Export Medicines and Supply Items Lists process described above. To use this feature, select the data set that the medicines and/or supply items list is to be imported into, as well as the appropriate price type from the drop-down lists, and then choose which list (medicines or supply items) to import (Figure 11-2). After selecting the source Excel file and clicking **Open**, the import process will begin.
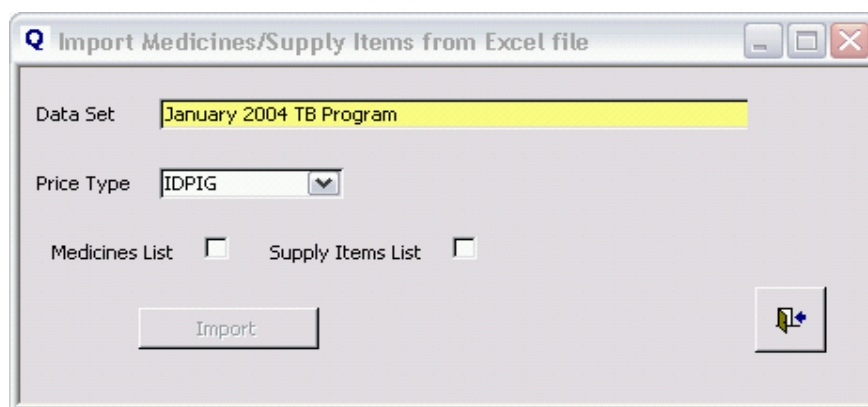
Figure 11-2. Import Medicines/Supply Items List from Excel File screen

Export Consumption Data to Excel File (Transfers)

This feature is used to export consumption data to a Microsoft Excel file, which can then be imported into another copy of Quantimed. It can also be modified and analyzed using Microsoft Excel. This feature would be useful, for example, for a district with several hospitals when consolidating figures from the various hospitals in one system. The information for each hospital could be exported and then imported into a single data set or database file at a central location. The accumulated hospital information could then be exported to a higher level of the system, if necessary. A similar process could be used to consolidate regional data, for example, from facilities, to regions, to the central level.

To use this feature, ensure that the facility name and consumption period for the data set are displayed. Then choose which list (medicines or supply items) to export (Figure 11-3). After creating a file name and destination for the new file and clicking **Open**, an Excel file is created that contains the exported data.
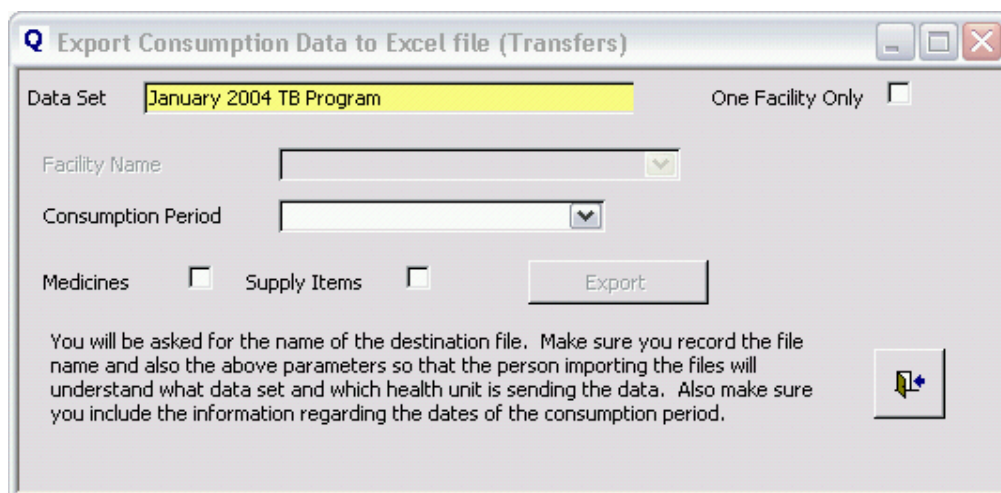
Figure 11-3. Export Consumption Data to Excel File (Transfers) screen

Import Consumption Data from Excel File (Transfers)

This feature is used to import consumption data from a Microsoft Excel file in the Quantimed format. It is the companion to the Export Consumption Data to Excel File (Transfers) process described above. To use it, select the facility name to which the data will be imported and consumption period for the data set displayed. Then choose which list (medicines or supply items) to import (Figure 11-4). After selecting the Excel file and clicking **Open**, the data will be imported.
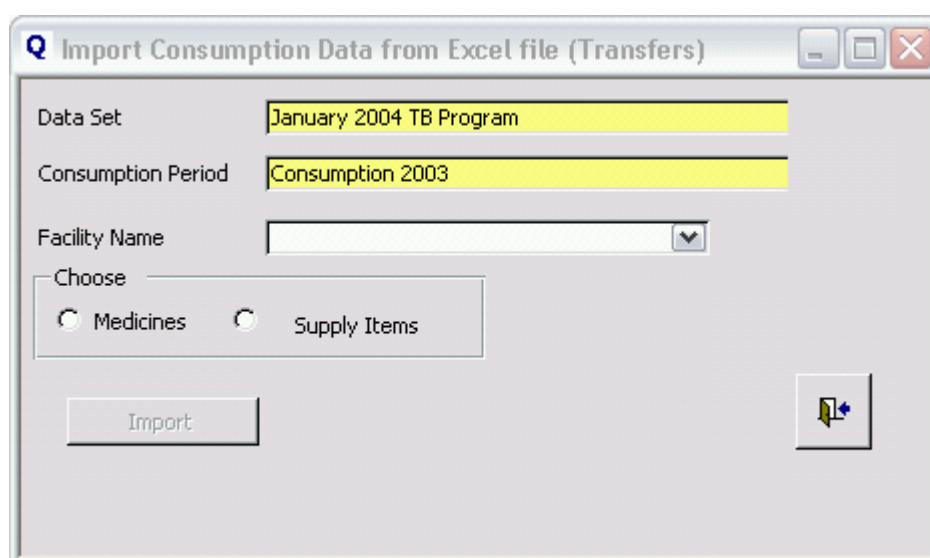
Figure 11-4. Import Consumption Data from Excel File (Transfers) screen

Create Excel File for Entering Consumption Data
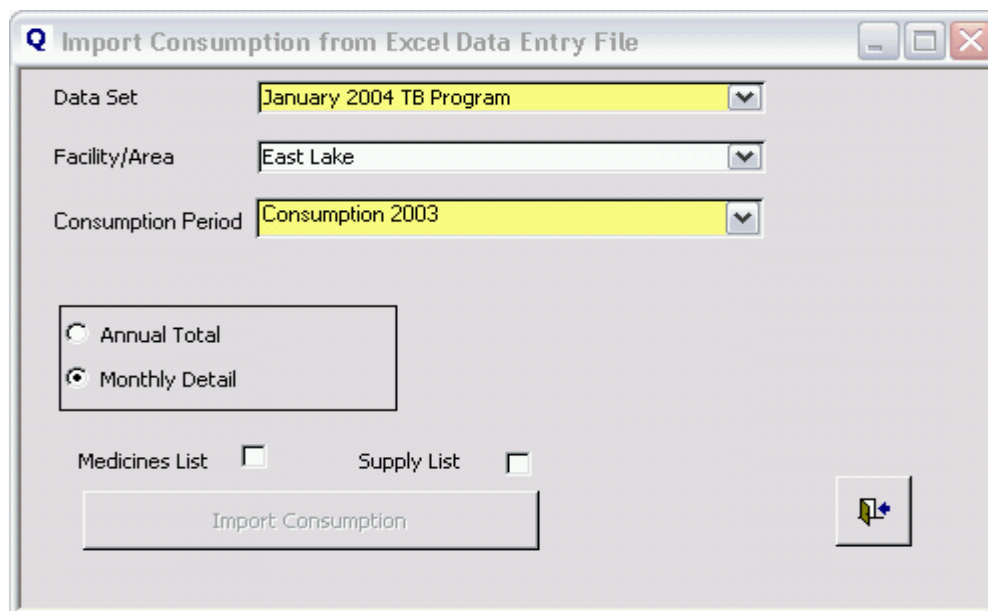
This feature is used to create an Excel spreadsheet formatted appropriately for Quantimed, which can be used to enter data and then be imported into a Quantimed database file (see below—Import Consumption from Excel Data Entry File). When this option is selected (Figure 11-5), choose the list (medicines or supply items) that a data entry Excel spreadsheet will be created for, and then click the **Export** button. After creating a file name and destination for the new file and clicking **Open**, the data entry Excel file is created. When entering data into the spreadsheet, it is very important to leave the column headings in row 3 unchanged.

Figure 11-5. Create Excel Data Entry File for Entering Consumption Data screen

Import Consumption from Excel Data Entry File

This feature is used to import consumption data from a Microsoft Excel file created as in the previous option and containing data. It is the companion to the Create Excel Data Entry File described above. Prior to initiating this function, make sure the receiving data set is active and the correct consumption period is selected. These characteristics will be displayed in the Import Data Set Medicines/Supply Items Data to Import File screen. Ignore any font change on this screen. To use it, select the facility to which the data will be imported (Figure 11-6). Then choose whether the spreadsheet contains annual totals or monthly details and which list (medicines or supply items) to import. Click the **Import Consumption** button. After selecting the Excel file and clicking **Open**, the data will be imported. Importing consumption data from an Excel file may be an easier and faster alternative to entering them directly into Quantimed.
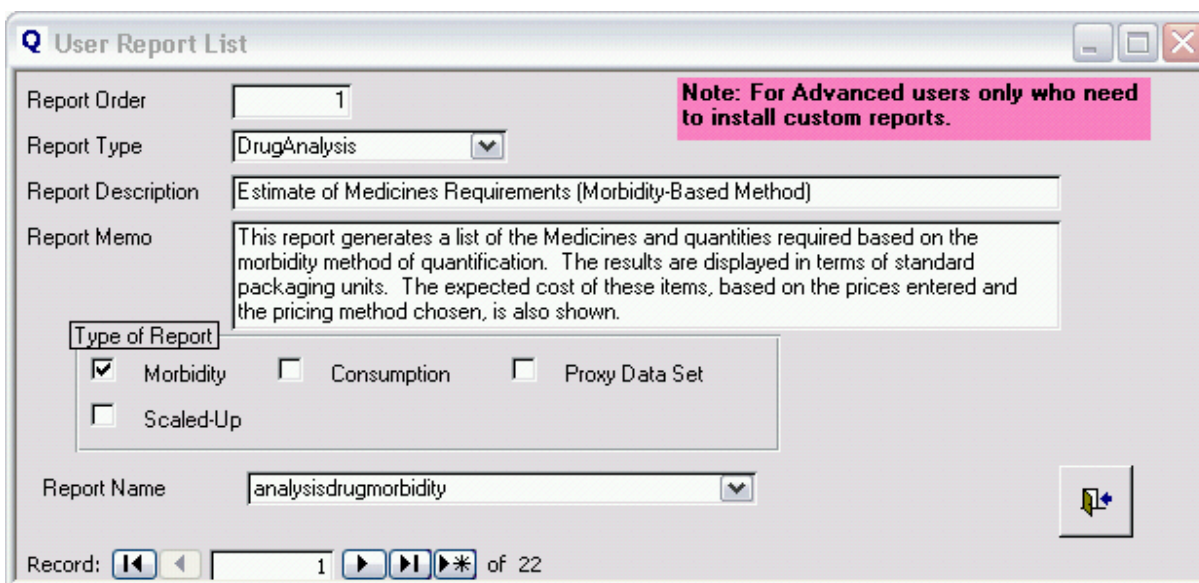
Figure 11-6. Import Consumption from Excel Data Entry File screen

User Report Set-Up

This menu option is for advanced users only. Its primary purpose is to allow users to add Access reports they have written to the program. This option controls the reports that appear in the drop-down lists of reports in the various analysis screens. Users wishing to modify an existing report could use this screen (Figure 11-7) to look up the Access name for the report. Fields on this screen are shown in Table 11-1.

Figure 11-7. User Report List screen

Table 11-1. Fields on the User Report List Screen

File	Description
Report Order	Specifies the order in which the reports should be displayed in the drop-down lists.
Report Type	Use the drop-down list to select the window in which this report will be available.
Report Description	Provides the title of the report.
Report Memo	Provides a description of the report.
Type of Report	These check boxes are used to control the circumstances under which the reports are available in the various sections of the Quantimed program. For example, if Consumption is checked as a Type of Report, the report will appear when Consumption has been selected under Data Set Definition. The user may check as many of the options as are appropriate.
Report Name	Use the drop-down list to select the Quantimed internal name of the report.

A record navigator appears on the bottom left of the screen. Use the navigation buttons to select a specific record or scroll through the records currently available. The **Add New Record** button (icon on lower right of screen) gives the option of adding a new report to the database.

If a scroll bar appears in the lower right side of the form, resize or maximize the window in order to reveal the **Exit** button.

CHAPTER 12
Quantimed for HIV/AIDS Programs

Objectives

- To describe how to prepare and use Quantimed for HIV/AIDS pharmaceutical quantification

- To provide hints and tips to consider when using Quantimed for HIV/AIDS programs

.

OVERVIEW

With greater availability and affordability of antiretrovirals (ARVs) and rapid HIV test kits, HIV/AIDS programs are developing new initiatives and expanding activities to provide comprehensive prevention, care, and treatment services to increasing numbers of people. The cost of ARVs remains high, however, and poor quantification can lead to stock-outs if needs are underestimated or to financial losses due to product expiry if needs are overestimated. Quantimed has been specifically designed to quantify HIV/AIDS pharmaceutical needs, including those for programs that have limited historical data on the consumption of commodities and/or programs that are scaling up.

This chapter will build on the information provided in Chapters 4 and 5 and will review the information-gathering process for HIV/AIDS pharmaceutical quantification. Hints for making this process easier can be found at the end of this chapter.

REVIEWING PROGRAM READINESS

Prior to quantifying ARVs, rapid HIV test kits, and/or other pharmaceutical and supply needs for voluntary counseling and testing (VCT), prevention of mother-to-child transmission (PMTCT), prevention and treatment of opportunistic infection (OI), palliative care, or antiretroviral treatment (ART) programs, the readiness of the program itself to deliver services should be assessed. If staff, infrastructure, financial, clinical, and management requirements are not in place, it may be premature and therefore difficult to quantify pharmaceutical or HIV test kit needs with any degree of accuracy.

To determine the extent to which the program will achieve the level and type of services anticipated, review the status of the following:

- Availability of finances to continue program support of patient care, treatment, and monitoring on a long-term basis (for ARVs, "long-term" currently means for the life of the patient).

- Availability of adequate numbers of health care workers by cadre (e.g., nurses, midwives, doctors, lab technicians, pharmacists, assistants, and technologists) and lay staff to meet the demands of the program.

- Training of health care workers and lay staff to effectively carry out new responsibilities to support the program.

- For ART, existence of an eligibility committee and/or guidelines on patient selection.

- Availability of reliable and timely laboratory services to meet the demands and requirements of the program.

- Adequate security and storage infrastructure.

- Functional procurement and distribution systems.

- Effective record-keeping practices and pharmaceutical management information system to facilitate future quantification activities.

One or more of the above areas may need strengthening before it is feasible to start an ART program. It is recommended that these issues be addressed adequately to achieve a basic operational level before making a commitment to provide treatment for HIV/AIDS.

CHOOSING THE QUANTIFICATION METHOD

In Chapter 5, the circumstances when the morbidity method is a more appropriate means of determining requirements than the consumption or proxy consumption method were described. These conditions include:

- When consumption information is incomplete or unreliable
- When a new pharmaceutical supply program is being established
- When an existing program is expanding rapidly
- When a new therapy with new medicines becomes available

Because HIV/AIDS programs are likely to meet most, if not all, of these conditions, this chapter will focus on the morbidity method and the morbidity-based scaling-up function.

If the program is using rapid HIV test kits and/or ARV medicines, if program growth is minimal, and if accurate consumption data is available, the consumption method may also be used to calculate requirements. If the ART program is growing rapidly but accurate data is available, a two-part calculation can be used: The consumption method is used for existing patients already on treatment, and the morbidity method is used to calculate needs for the new patients beginning treatment. In this situation, different assumptions and therefore different patient groups will be used in each part of the calculation. It is very important to keep these two patient groups—and calculations—separate. The results from these two different methods can then be exported to an Excel spreadsheet and added together. Please refer to Chapter 6 for more information on the consumption method.

The examples used in this chapter are for the quantification of ARVs and rapid HIV test kits. Quantimed can also be used to quantify other pharmaceutical and supply items such as those needed for the prevention and treatment of OIs and for palliative care. The methods described in Chapter 5 (morbidity method) and Chapter 6 (consumption method) as well as those described in this chapter can also be used for the quantification of these pharmaceuticals and supply items.

USING THE MORBIDITY METHOD FOR HIV/AIDS
THERAPEUTICS AND COMMODITY QUANTIFICATION

As detailed in Chapter 5, certain steps must be taken prior to using the morbidity method in Quantimed. These steps include determining the characteristics and size of the population to be served and determining and defining health care categories, conditions/care provided, and related treatment regimens.

Determine and Define Health Care Categories, Condition/Care Provided, and Regimens

As was discussed in Chapter 5, Quantimed requires information on three different parameters:

1. Health Care Category: For this parameter, the user must develop a list of all health care problems, illnesses, or diagnoses that require health care services and will be included in the quantification. These Health Care Categories must be identified clearly enough to distinguish categories requiring different types of pharmaceutical treatment. Categories are the highest level of the hierarchy used to organize morbidity data.

2. Condition/Care Provided: Use this parameter to develop a detailed list of symptoms or conditions that fall under each health care category. This is the second level of the hierarchy used for organizing morbidity data.

3. Regimen: The regimen is the specific combination, dose, and quantity of medicines and medical supply items used for the prevention or treatment of a disease or condition, or for the provision of a service. Regimen data are essential for calculating pharmaceutical requirements when using the morbidity method.

The first step is to determine the prevention, treatment, and care services that the facility/area provides. The services being provided determine Health Care Categories and Condition/Care Provided and relate to the characteristics of the population being served. For example, a facility may be providing only PMTCT services to a defined group of pregnant women; or a province may be providing all people living with HIV/AIDS (PLHA) who seek care with all care and treatment services, such as adult and pediatric ART, PMTCT, and postexposure prophylaxis (PEP). The data collection form titled Treatment Regimens (Medicines and Supply Items) under the Reports menu option can be used to gather and organize this information.

Next, determine the Regimens to be used for each Condition/Care Provided. Regimens can be determined either through gathering data on current consumption or through a review of prescribing patterns if the services are already being provided, or by reviewing established standard treatment guidelines (STGs). Using existing consumption or prescribing patterns can perpetuate irrational medicines use patterns; however, using STGs can be difficult if they offer many options. With both methods, it is important to regularly consult national or even international STGs, especially for ART. ART guidelines are frequently updated, and it is important to stay informed regarding recent changes in recommenda-

tions and possible future changes that could affect the selection and use of a specific ARV medicines or regimens. If updated recommendations have had or will have an impact on regimens currently used in an ART program, it is of vital importance that key stakeholders reach consensus on which guidelines and/or regimens will be used, so that the accurate quantification of pharmaceutical needs is ensured.

It will also be necessary to regularly evaluate the STGs to determine the appropriateness of their recommendations. Recent studies have shown that some treatments previously thought to be effective for PMTCT and ART are inferior to and less desirable than others. Also, it is important to consider the situation in which the recommendations will be used. The treatment chosen may be clinically sound, but may not be appropriate for the local population or context. For example, the stavudine pediatric formulation (1 mg/ml solution) is stable in refrigeration for 30 days; however, without refrigeration, the solution is stable only for 24 hours. Selecting this medicine to treat pediatric patients in a population that is unlikely to have access to refrigerators would not be appropriate. Certain medicines may be inappropriate in any situation; for example, the pill burden of some treatments may inhibit adherence to treatment (e.g., the amprenavir adult dose of 16 capsules per day).

Once the user has determined the Health Care Categories, Conditions/Care Provided, and Regimens, the next step is to define them by giving them distinct names to enter into Quantimed. The hypothetical province above providing services to PLHA may define its Health Care Category as HIV/AIDS and the Conditions/Care Provided based on the services that it is providing, such as PEP, PMTCT, and ART. Tables 12-1 and 12-2 give two examples of how Health Care Categories, Conditions/Care Provided, and Regimens can be named and organized for ARVs.

The name of each Regimen is also determined by the user. If many Regimens can be used for each Condition/Care Provided, or if each Regimen is composed of many commodities, it is important to use distinct names for each Regimen to avoid confusion. Using the convention of naming the Regimen according to the medicines it contains (e.g., the Regimen of stavudine/lamivudine/efavirenz can be defined as d4T/3TC/EFV) can help users avoid errors when selecting the medicines or supplies required for each Regimen.

Table 12-1. Sample Definitions/Names for Health Care Categories, Condition/Care Provided, and Regimen

Health Care Category	Condition/Care Provided	Regimen
ART	Adults	< 60 kg d4T/3TC/EFV
		> 60 kg d4T/3TC/EFV
		< 60 kg d4T/3TC/NVP
		> 60 kg d4T/3TC/NVP
		ZDV/ddI/LPV/r
	Pediatrics	< 25 kg ZDV/3TC/NVP
		> 25 kg ZDV/3TC/NVP
PMTCT	Mother	ZDV/3TC
		NVP
	Child	NVP

(ddI: didanosine; d4T: stavudine; EFV: efavirenz; LPV: lopinavir; NVP: nevirapine; r: ritonavir; 3TC: lamivudine; ZDV: zidovudine)

Table 12-2. Additional Sample Definitions

Health Care Category	Condition/Care Provided	Regimen
HIV/AIDS	ART	d4T/3TC/EFV for adults
		ZDV/3TC/EFV for adults
		ZDV/ddI/LPV/r for adults
		Average pediatric consumption per month
		ZDV/ddI/LPV/r
	PEP	ZDV/3TC
	PMTCT	Mother
		Child

If the program data on medicines use consists of the numbers of patients taking each pharmaceutical product rather than the number of patients on a regimen (i.e., a specific combination of therapeutics), the user may define a Regimen in Quantimed as a single pharmaceutical product. In this situation, the Regimen named ZDV/3TC/NVP becomes three separate regimens for each product: ZDV, 3TC, and NVP. Table 12-3 is an example of this option.

Table 12-3. Sample Individual Product Regimens

Health Care Category	Condition/Care Provided	Regimen
HIV/AIDS	ART	ZDV 300 mg
		3TC 150 mg
		NVP 200 mg

DETERMINE FREQUENCY OF CONDITION/CARE PROVIDED, REGIMENS, AND PHARMACEUTICALS AND SUPPLIES

When using the morbidity method or the morbidity-based scaling-up method, frequency percentages are required for two of the above parameters, Condition/Care Provided and Regimen, in addition to a third frequency percentage for the medicines and supply items added to each Regimen. Percentages entered under the Patient Group parameter defined in Chapter 5 are not used in calculations of requirements but may be entered for the user's own information.

Frequency of Condition/Care Provided

The frequency percentage of the defined Condition/Care Provided represents the population of the Health Care Category that will receive services for that particular Conditions/Care Provided. In Table 12-2, the Health Care Category is defined as HIV/AIDS with three defined Conditions/Care Provided. If the PMTCT program goal is to treat 10,000 patients and this is the number that is used in the Data Set Definition screen in the population field or is the figure derived from the Scaling-Up Estimator screen, 100% would be entered as the percentage. However, if the population figure used is the population living in a province (e.g., 1,000,000), the percentage will represent the number of pregnant women with HIV/AIDS in the province (e.g., 100,000 or 10% prevalence) who receive PMTCT services (e.g., 10,000 or 10% of pregnant women with HIV/AIDS). In this situation, the frequency percentage entered for the Condition/Care Provided would be 1%.

This figure is entered in the Select Quantification Method >Morbidity Method >Morbidity Parameters >Regimen screen and can be either a percentage or a number of cases.

Frequency of Regimen

The frequency percentage of the defined Regimen represents the proportion of the population under Conditions/Care Provided that will receive that particular Regimen. There may be a number of different Regimens available to treat each Condition/Care Provided. The percentages used for each Regimen must reflect the proportion of all patients who are receiving that Regimen for the defined Condition/Care Provided. For example, for an ART condition/care that has been defined to include both first- and second-line regimens, a greater proportion of patients should be on first-line treatment than second-line treatment, and the percentages should reflect these differences.

An easy way to cross-check whether the percentages used in all of the ART regimens are realistic is to check the yellow box at the bottom of the Attach Regimens to Conditions/Care Provided screen. Because each patient will receive only one ART regimen, the percentage in this yellow box should add up to 100%, or very close to it.

Note: This cross-check cannot be used to check the accuracy of percentages used for all regimens. For example, with treatments for opportunistic infections, the total percentage may exceed 100% because some patients may be placed on more than one regimen (e.g., for esophageal candida, cytomegalovirus, and Pneumocystis jiroveci pneumonia).

These figures are entered in the Select Quantification Method >Morbidity Method >Morbidity Parameters >Regimen screen.

Quantifying for Existing Programs or Uses

If the program is already using the medicinesor commodities to be quantified for the defined Condition/Care Provided, and the prescribing data are reliable, an assumption can be made that the same prescribing patterns will continue and that the same proportions/percentages of each regimen will be used. Adjustments can then be made to these percentages based on any expected changes in prescribing patterns.

Quantifying for New Programs or Uses

If the program is new or the prescribing data are unavailable or unreliable, the Regimen Percentage Assistance function in the Regimen for Condition screen can be used to help determine percentage estimates. The Percentage Regimen Assistance screen will take the user through a decision tree that will help calculate the percentages to be treated with each Regimen, including adjustments for gender and weight. For regimens that vary by weight, it is helpful to include the weight category in the Regimen name to avoid confusion (as in the Table 12-1 example) when using the Regimen Percentage Assistance function. Some ART guidelines may have special recommendations for female patients who are of reproductive age or are pregnant, patients with hepatic dysfunction, or patients receiving TB treatment. Recent health statistics and demographic data can be helpful in determining the percentages for each of these different scenarios.

Figure 12-1 shows an example of how the Regimen Percentage Assistance screen can be used to determine the percentage for the regimen < 60 kg d4T/3TC/NVP. In this example, 52% of the population treated is male and the Regimen of < 60 kg d4T/3TC/NVP will be used to treat both males and females. Only 20% of males will take this combination (in this example, the other 80% take d4T/3TC/EFV), whereas 70% of females will be placed on this combination. Also, in the example below, 70% of both males and females weigh less than 60 kg. The final percentages for males and females are presented in the yellow fields at the bottom of the screen and are added together in the Total field.

Figure 12-1. Regimen Percentage Assistance function, showing
Estimate Percentage of Patients Treated by Regimens option

Whether the user has data on current prescribing patterns or is using the Regimen Percentage Assistance screen, it is advisable to discuss the suggested percentages of the Regimens with a group of stakeholders to determine if the percentages are reasonable *before* proceeding with the quantification.

Frequency of Medicines/Supply Items Added to Regimens

The frequency percentage for the medicines/supply items represents the percentages for each pharmaceutical included under each defined regimen. The percentages used will depend on how the user has defined the regimen, which can be either very specific or general. In a more specific regimen, the medicines and supply items frequency percentages are more likely to be each 100%, but in the general regimen definition, there may be medicines or supply items percentages that will be less than 100%.

The regimens that have been defined using weight categories in Table 12-1 are examples of specific regimens where 100% of the patients will receive each of the three different ARVs (e.g., for the Regimen < 60 kg d4T/3TC/NVP, 100% of the patients who weigh less than 60 kg will receive d4T 30 mg, 3TC 150 mg, and NVP 200 mg, and for the Regimen ≥ 60 kg d4T/3TC/NVP, 100% of the patients who weigh 60 kg or more will receive d4T 40 mg, 3TC 150 mg, and NVP 200 mg). Because the weight categories are used as part of the definition of each regimen, there are two regimens (< 60 kg d4T/3TC/NVP and ≥ 60 kg d4T/3TC/NVP), with three medicines entered for each.

The regimens that have been defined without the weight categories in Table 12-2 are examples of general regimens, and different percentages for each medicine and dosage form may need to be used (e.g., for the Regimen d4T/3TC/NVP, 100% of the patients will be on 3TC 150 mg and NVP 200 mg, but because 70% of the population weigh less than 60 kg, only 70% will take d4T 30 mg; the other 30%, who weigh 60 kg or more, will take d4T 40 mg). Because the weight categories are not used as part of the definition of this Regimen, there is one Regimen (d4T/3TC/NVP), with the pharmaceutical products, d4T 40 mg, d4T 30 mg, 3TC 150 mg, and NVP 200 mg, all entered once.

Caution: Be aware that most patients who start ART are expected to gain weight, and therefore the percentages used for the < 60 and ≥ 60 kg categories will change as more patients remain in the program and gain weight.

Note: Some pediatric ARV dosages are based on body surface area (BSA). A BSA nomogram, as well as a formula, are included in Annex 3.

DETERMINE CHARACTERISTICS AND SIZE OF THE POPULATION TO BE SERVED

To quantify the pharmaceuticals needed for each Health Care Category and Condition/Care Provided, the user must determine either the number of cases (e.g., the defined group of HIV-positive pregnant women for PMTCT care) or the size of the population to be served (e.g., the population of the province receiving HIV/AIDS services). The data collection form titled Scaling-Up Facilities/Areas under the Reports menu option may be used to gather and organize this information.

Many ART programs have a goal for the number of patients to be treated within a certain time period. The availability of resources required for introducing or scaling up an ART program is key to setting such a goal (see Reviewing Program Readiness section above). Experience has shown that ART programs can fail to meet their targets if these critical resource needs are neglected.

Morbidity Method

Check the Morbidity box under Methods in the Data Set Definition Add/Edit screen and enter the population size into the Population field in the Data Set Definition screen.

Morbidity-Based Scaling-Up Method

If the program is scaling up, check the Morbidity box under Methods in the Data Set Definition Add/Edit screen and check the Scaling-Up box under Morbidity Options. This enables you to use the Scaling-Up Estimator (select Quantification Method >Morbidity Method >Morbidity-Based Scaling-Up Estimate Set-Up) screen to create different scaling-up scenarios, or sets, using different growth rates and attrition rates, with percentages or numbers, until the number in the Aggregate column for the final month of the calculation equals or nears the program goal. Users can also make adjustments (positive or negative) in the rate of scale-up for each month (or time period selected) using the User Adjustment column. Once the estimated or desired scaling-up scenario (set) has been determined, this scenario can then be checked as Active to include it in the quantification calculation. It is advisable to discuss the chosen growth rates and program goals with a wider group of stakeholders to determine whether the goals are realistic.

For greater accuracy, attrition rates can be included in scaling-up sets if patients die, are transferred, or are lost to follow-up. If program goals allow each lost patient to be replaced with a new patient, it is not necessary to include the attrition rate. Program planners should be aware, however, that omitting attrition rates does lead to a certain level of overestimation of needs. This overestimate can act as additional buffer stock, but the user must determine whether that extra buffer represents too much of an overestimate, either financially or in terms of storage space. Please refer to Chapter 5 for more information on the Morbidity-Based Scaling-Up Estimator.

USING THE MORBIDITY METHOD FOR RAPID HIV TEST KITS

Quantifying rapid HIV test kits is not as complex as quantifying ARVs, and the methods described above generally apply. Some of the differences in quantifying needs for rapid HIV test kits are described below.

When quantifying needs for test kits, remember that kits may be used at many places, such as VCT sites, health facilities for confirmatory testing, and antenatal care (ANC) sites for PMTCT. Additional kits will be needed for training staff, conducting quality assurance testing, and retesting in the case of discordant test results. Before beginning the quantification, ensure that all the different programs and/or sites that will require supplies have been identified and included in the data collection.

HIV testing policies can have a great impact on the number of tests required, and it is necessary to review relevant policies, such as testing procedures for PMTCT and established HIV testing algorithms. For example, a greater number of test kits will be needed if the ANC clinic has an opt-out policy (all pregnant women are tested except those who decline) versus an opt-in policy (no pregnant women are tested except those who choose to be). A parallel testing algorithm (where all persons are tested using two different test kits simultaneously and, if the tests are discordant, a third type of test is used) will require a greater number of rapid HIV test kits than will a serial testing algorithm (where all persons are tested with one rapid test kit and only those who are positive have a second, confirmatory test; a third test is used for discordant results).

Table 12-4. Sample Definitions for Health Care Categories, Conditions, and Regimens for Rapid Test Kits

Health Care Category	Condition/Care Provided	Regimen
HIV/AIDS	All uses of rapid HIV tests	Parallel (Uni-Gold)
		Parallel (Determine)
		Tiebreaker for discordant results
		Quality assurance

Table 12-5. Additional Sample Definitions

Health Care Category	Condition/Care Provided	Regimen
HIV/AIDS	Quality assurance	Quality assurance
	PMTCT testing	Serial testing
	VCT	Parallel testing

If the population defined in the Scaling-Up Set or the population figure in the Data Set Definition represents the total population to be tested, the frequency of the defined Condition/Care Provided would be 100% (see example in Table 12-4). If there are several conditions that use rapid HIV test kits, the respective percentages for each defined Condition/Care Provided should be entered (see example in Table 12-5).

Frequency percentages used in the Regimens for the patients who receive each HIV test kit are determined by the testing algorithm and by the prevalence rates of HIV in the population coming forward for testing. In serial testing, the frequency percentage of 100% represents the patients receiving the first HIV test, and the frequency percentage for the second, confirmatory HIV test is equal to the HIV prevalence rate of the population. For parallel testing, the frequency percentage of 100% represents the patients receiving both HIV tests. The frequency percentages used for the tiebreaker test kits for discordant results and quality assurance testing, for both algorithms, can be based on information gathered by the national AIDS program, by the national testing laboratory, by other programs using the same testing algorithm, or from the program's own historical data.

For more information on quantifying rapid HIV test kits, please consult the RPM Plus/Family Health International manual *Commodity Management in VCT Programs: A Planning Guide,* available for download at www.msh.org/rpmplus.

HELPFUL HINTS

Adding or Editing Pharmaceuticals

- When adding a pharmaceutical that has a fraction as a strength (e.g., Kaletra, which contains LPV/r), it is advisable to use two decimal places (133.33/33.33 mg should be entered instead of 133/33 mg). Rounding to whole numbers may result in confusion for the user because the calculation may result in fractions of products (e.g., dose per administration of 400 mg of LPV/r will be calculated as 3 tablets when two decimal places are used and will be calculated as 3.008 tablets when no decimal places are used.

- When adding liquids to the Generic Medicines List or the Data Set Medicines List, enter the concentration as the strength per one milliliter (e.g., zidovudine syrup 50 mg/5 ml should be entered as 10 mg/ml). This entry will assist you when you come to the Packaging of the Medicines Price Add/Edit screen—allowing you to enter the pack size in milliliters instead of doses. For example, instead of having to enter 48 of 5 ml in a bottle (48 x 5 = 240 ml) when using 50 mg/5 ml for a concentration, you will instead enter 240 of 1 ml in a bottle of 240 ml using 10 mg/ml concentration.

Regimens

- Initiation dosing recommendations for some products (e.g., nevirapine, which is given once daily for the first 2 weeks of treatment) generally make a negligible difference in final requirements for an ART program and can be ignored unless products used for the initiation phase are different from those used for the continuation phase (e.g., a single dose of NVP plus a fixed-dose combination of d4T/3TC for the initiation phase and a fixed-dose combination of d4T/3TC/NVP for the continuation phase). If the products are different, all products to be used (single dose, double fixed-dose and/or triple fixed-dose) will need to be entered. The acute check box can be selected for the products used in the initiation phase in the Regimen Medicine Add/Edit screen and a figure should be entered into the Treatment Duration (Days) field (e.g., 14 days). In the scaling-up morbidity method, when the acute check box is selected, Quantimed calculates requirements for the initiation phase by multiplying the medicines/supply items by the number of new cases and not by the total patient months.

- In most settings where ART services are provided, new patients begin on a limited set of regimens and as they remain on treatment may be switched to alternative first-line or second-line treatments due to toxicities or treatment failure. This may mean that the existing patient population will be on a different set of regimens at different frequencies than the new patients entering the ART program. If the differences are significant, separate conditions can be created for these two categories of patients (e.g., a condition for existing patients and a condition for the new patients). The scaling-up morbidity function can still be used in this situation. When entering the Scaling-Up Details for the existing patient condition, the existing number of patients would be entered into the Starting Patients field in the Scaling-Up Details screen, and the "Added" fields would remain empty since new patients are not part of this condition. For the "new patient condition," no figure is entered for

Starting Patients and the number or percentage of patients added should be entered in the "Added" fields. Refer to Chapter 5 for more information on the Scaling-Up Estimator.

- Converting a patient on first-line treatment to alternative first-line treatment or second-line treatment can be accommodated by creating a separate condition and a related scaling-up set for patients expected to be converted and changing the start month to a later date in the program. For example, 100 patients start in January 2005 on first-line treatment, and it is estimated that 10% of them will need second-line treatment in 6 months, beginning July 2005. A second scaling-up set can be created in July 2005 starting with 10 patients, increasing at the same rate as the original data set. User adjustment can be used to decrease 10 patients from the first-line treatment scaling-up set in July and the following months.

- Users who are unsure of the frequency percentages used in the Condition/Care Provided, Regimens, and/or Medicines and Supplies added to Regimens and would like to know what the range would be if minimum and maximum frequencies, a duplicate data set can be created for each scenario by copying the data set. In the first data set, enter the minimum frequencies; then copy the data set, and in the duplicate data set, replace the minimum values with the maximum frequencies. Requirements from the two different data sets can then be exported to Excel for comparison. Directions for how to copy a data set are given in Chapter 4.

- When determining regimens for new pediatric ART patients, assumptions will have to be made on the average weight, body surface area, and age of the pediatric patient population. This adjustment can be made either by estimating the characteristics for the whole patient group or by splitting the patients into two or more subgroups by weight, age, surface area, dose, or formulation (tablets or liquid). This is easier if some consumption data is available based on the above characteristics for a cohort of pediatric patients already on treatment—either in the program or nationally. An extra adjustment should be made to pediatric formulations to account for children's accelerated growth rates, for errors in measuring liquids, and the dispensing of whole bottles.

- When adding a liquid product to a regimen, enter the dose in strength (e.g., milligrams) rather than volume (e.g., milliliters) in the Dose per Administration field of the Regimen Medicines Add/Edit screen. Quantimed will not be able to calculate requirements based on volume.

Procurement

- If different suppliers are used for procurement of the same product, do not quantify by how much the user is procuring from each supplier. Calculate the total amount of product required and then decide how much to procure from each supplier.

- When a program is scaling up, there are no true average monthly consumption rates. Therefore, the safety stocks and lead time are calculated based on the required quantity for the final month of the procurement period or on the following month's estimate, if available, as explained in Chapter 8. As

the program continues to scale up, these safety stock and lead time estimates will not meet the demands of the number of months entered into the Safety Stock and Lead Time fields. For a better estimate of quantities needed to cover the safety stock and lead time periods, include this in the Scaling-Up Set, the Data Set Procurement Period, and the Procurement Period Date in the Scaling-Up Morbidity-Based Estimate Screen. For example, if the procurement period is from January to June, the lead time is two months, and the program would like to keep three months of safety stock, the Scaling-Up Set, the Data Set Procurement Period, and the Procurement Period Date in the Scaling-Up Morbidity Screen should be from January to November ($6 + 2 + 3 = 11$ months starting in January).

Other Uses for Quantimed

- Quantimed can be used to estimate the number of times that laboratory tests are needed or how much human resources time is required to provide a service. These figures can be quantified as for any other commodity, by entering them as a supply item and associating them with a Regimen. For example, liver function tests (LFTs) conducted for every patient placed on NVP can be added as a "supply item" and included in the Regimen containing NVP. Or average staff time (in minutes) for each VCT visit can be added as a "supply item" and to the Regimen containing rapid HIV tests. The final Requirements would represent the total number of LFTs required by the laboratory resources/equipment or the total amount of time required for staff to provide the VCT services, respectively. These figures could be used to judge whether enough resources are available for the expected level of services.

CHAPTER 13
Quantimed for Malaria Programs

Objectives

- To describe how to prepare and use Quantimed for malaria pharmaceutical quantification

- To provide hints and tips to consider when using Quantimed for malaria programs

OVERVIEW

Rising resistance to monotherapies used to treat malaria, particularly resistance to chloroquine by the *Plasmodium falciparum* parasite, has resulted in a change in the World Health Organization (WHO) recommendations for the case management of uncomplicated malaria.[1] In 2004, WHO recommended that countries adopt artemisinin-based combination therapies (ACTs) for the first-line treatment of uncomplicated malaria. Since then, most high-incidence countries in Africa, Asia, and the Americas have changed their national policies to adopt ACTs as recommended by WHO, and are now implementing or planning for the implementation of these new policies. In addition, WHO now recommends the use of intermittent preventive treatment (IPT) with sulfadoxine-pyrimethamine (SP) for the prevention of malaria during pregnancy in malaria-endemic countries, and most of these countries have changed their policies to adopt these new recommendations.

The implementation of these new policies depends on the availability of the required medicine, in particular the ACTs. Limited worldwide production of ACTs has resulted in a limited international supply. This limited supply, the shorter shelf life of ACTs as compared with chloroquine and SP, and the higher cost of ACTs means that accurate quantification of requirements is essential to avoid stock-outs or wastage and financial losses. An approach for changing policies can be found in *Changing Malaria Treatment Policy to Artemisinin-Based Combinations: An Implementation Guide*.[2]

This chapter will build on the information provided in Chapters 4 and 5 and will review the information-gathering process for antimalarial pharmaceutical quantification. It is strongly recommended that these two chapters be read before proceeding with Chapter 13.

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[1] World Health Organization (WHO). 2005. *Position of WHO's Roll Back Malaria Department on Malaria Treatment Policy.* <http://www.who.int/malaria/docs/who_apt_position.htm> (accessed March 21, 2006)

[2] Rational Pharmaceutical Management Plus Program. 2006. *Changing Malaria Treatment Policy to Artemisinin-Based Combinations: An Implementation Guide.* Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health.

CHOOSING THE QUANTIFICATION METHOD

Chapter 5 described the circumstances in which the morbidity method is a more appropriate means of determining requirements than either the consumption or proxy consumption method. These circumstances include:

- When consumption information is incomplete or unreliable
- When a new pharmaceutical supply program is being established
- When an existing program is expanding rapidly
- When a new therapy with new medicines becomes available

Because malaria programs are likely to be introducing new treatment guidelines/national policies and medicines, this chapter will focus on the morbidity method of quantification.

If program growth is minimal, if treatment guidelines and national policies have not recently changed (as is true for the recommendations for case management of complicated malaria), or if they have changed *and* accurate consumption data is available, the consumption method may instead be used to calculate requirements. Please refer to Chapter 6 for more information on the consumption method.

The examples used in this chapter are for the quantification of antimalarial medicines and some supplies. Quantimed can also be used to quantify other pharmaceutical and supply items used in the management of malaria, as well as products needed for the prevention and treatment of other maternal and childhood illnesses. The processes described in Chapter 5 (morbidity method) and Chapter 6 (consumption method), as well as those described in this chapter, may also be used for the quantification of these pharmaceuticals and supply items.

USING THE MORBIDITY METHOD FOR MALARIA
THERAPEUTICS AND COMMODITY QUANTIFICATION

As detailed in Chapter 5, certain steps must be taken prior to using the morbidity method in Quantimed. These steps include determining and defining health care categories, conditions/care provided, and related treatment regimens; determining the characteristics and size of the population to be served; and determining the frequencies for each condition/care provided and related treatment regimens in the population to be served.

The determination of the population and organization and frequency of the morbidity parameters are dependent on how the available collected data are organized—for example, how the morbidity data are presented by age group and how these groups correspond with those in the standard treatment guidelines (STGs). This relationship is further discussed in the sections below.

Determine and Define Health Care Categories, Condition/Care Provided, and Regimens

As was discussed in Chapter 5, Quantimed requires information on three different parameters:

1. Health Care Category: For this parameter, the user must develop a list of all health care problems, illnesses, or diagnoses that require health care services and will be included in the quantification. These Health Care Categories must be identified clearly enough to distinguish categories requiring different types of pharmaceutical treatment. Categories are the highest level of the hierarchy used to organize morbidity data. An example of a Category is "malaria prevention and treatment."

2. Condition/Care Provided: Use this parameter to develop a detailed list of symptoms or conditions that fall under each health care category. This is the second level of the hierarchy used for organizing morbidity data. Examples might include "uncomplicated malaria in children," "uncomplicated malaria in adults," "severe or complicated malaria," "uncomplicated malaria in pregnancy," "prevention of malaria in pregnancy," or "chemoprophylaxis for the general population."

3. Regimen: The regimen is the specific combination, dose, and quantity of medicines and medical supply items used for malaria prevention or treatment. Regimen data are essential for calculating pharmaceutical requirements when using the morbidity method. Examples might include "artemether-lumefantrine," "artesunate-amodiaquine," "quinine," "sulfadoxine-pyrimethamine (SP)," or "insecticide-treated nets (ITNs)."

The first step is to determine the prevention and treatment services that the facility/area provides. The services being provided determine the Health Care Categories and the Condition/Care Provided and relate to the characteristics of the population being served. For example, a health center (Facility/Area) may be providing only IPT services (Condition/Care Provided) to a defined group of pregnant women for the prevention of malaria (Health Care Category); or a province (Facility/Area) may be providing all

antimalarial services (Health Care Category), such as malarial testing, IPT, ITNs, and treatment for severe (complicated) as well as uncomplicated malaria (Conditions/Care Provided). The data collection form titled Treatment Regimens (Medicines and Supply Items) under the Reports menu option can be used to gather and organize this information.

Next, determine the Regimens to be used for each Condition/Care Provided. Regimens can be determined either by reviewing established STGs or through gathering data on current consumption or reviewing prescribing patterns if the services are already being provided. Using existing consumption or prescribing patterns can perpetuate irrational medicines use patterns; however, using STGs can be inaccurate if they do not reflect the reality of prescribing patterns. With both methods, it is important to regularly consult national or even international STGs.

Once the user has determined the Health Care Categories, Conditions/Care Provided, and Regimens, the next step is to define them by giving them distinct names to enter into Quantimed.

The hypothetical province providing malaria services (as discussed above) may define its Health Care Category as Malaria, and may define Conditions/Care Provided based on the specific services it provides, such as IPT, Treatment, and Testing. The Condition/Care Provided for malaria treatment may be further broken down by age group, such as treatment for 2–11-month-olds, treatment for 1–5-year-olds, etc. This method would be especially useful if census data is available on either the percentage or the numbers of the population in these age categories. Tables 13-1 and 13-2 give two examples of how Health Care Categories, Conditions/Care Provided, and Regimens can be named and organized for malaria.

Table 13-1. Sample Definitions/Names for Health Care Categories, Condition/Care Provided, and Regimen

Health Care Category	Condition/Care Provided	Regimen
Malaria	Prevention	Chemoprophylaxis
		IPT
		ITN
	Treatment (2–11 months)	Uncomplicated—first-line treatment
		Uncomplicated—second-line treatment
		Severe/complicated
	Treatment (1–5 years)	Uncomplicated—first-line treatment
		Uncomplicated—second-line treatment
		Severe/complicated
	Treatment (6–14 years)	Uncomplicated—first-line treatment
		Uncomplicated—second-line treatment
		Complicated
	Treatment (>14 years)	Uncomplicated—first-line treatment
		Uncomplicated—second-line treatment
		Complicated
	Treatment of malaria in pregnancy	First-trimester treatment
		Second-trimester treatment
		Third-trimester treatment

Table 13-2. Additional Sample Definitions

Health Care Category	Condition/Care Provided	Regimen
Malaria	Chemoprophylaxis	Proguanil
	IPT	SP
	Treatment (5–15 kg), uncomplicated	Artesunate-amodiaquine
		Artemether-lumefantrine
	Treatment (5–15 kg), complicated	Quinine
	Treatment (15–25 kg), uncomplicated	Artesunate-amodiaquine
		Artemether-lumefantrine
	Treatment (15–25 kg), complicated	Quinine
	Treatment (25–35 kg), uncomplicated	Artesunate-amodiaquine
		Artemether-lumefantrine
	Treatment (25–35 kg), complicated	Quinine
	Treatment (>35 kg), uncomplicated	Artesunate-amodiaquine
		Artemether-lumefantrine
	Treatment (>35 kg), complicated	Quinine

The name of each Regimen is also determined by the user. If many Regimens can be used for each Condition/Care Provided, or if each Regimen is composed of many commodities, it is important to use distinct names for each Regimen to avoid confusion. Using the convention of naming the Regimen according to the medicines it contains (e.g., the Regimen of sulfadoxine-pyrimethamine can be defined as SP) can also help users avoid errors when selecting the medicines or supplies required for each Regimen.

Regimens may not need to be so clearly defined if they fall under Condition/Care Provided definitions that are by default quite specific, as in the Table 13-1 example. In this example, the Regimens for the "treatment" Conditions have been defined as "uncomplicated" and "complicated." The user could have made the definitions more specific by defining each using the dosages for each age group, such as "artesunate 25 mg/amodiaquine 76.5mg" for children 2–11 months instead of "uncomplicated," but because the user knows that there is only one recommendation for the treatment of uncomplicated malaria in children 2–11 months old, there is little need to be so specific.

Determine Characteristics and Size of the Population to Be Served

To quantify the pharmaceuticals needed for each Health Care Category and Condition/Care Provided, the user must determine either the number of cases (e.g., a defined group of malaria patients) or the size of the population and the incidence to be served (e.g., the population of the province receiving malaria services). The decision as to which to use may be made according to what data are available.

With malaria programs, there are usually two sources of information on the size of the population to be served: data collected for the purposes of health information statistics (HIS) and census data. HIS data are likely to refer to the reported number of cases of malaria treated per age group and/or number of women given IPT, whereas census data refer to the population per country and/or administrative areas.

Population data, multiplied with incidence and access rate, generates number of cases. For example, the population living in one province would need to be multiplied by the percentage likely to be in a certain age group (4% are between 2 and 11 months), then multiplied by the percentage likely to access public health care (50%), then multiplied by the incidence rate of malaria for that age range (11%) in order to yield an estimate of the number of cases (calculations may not necessarily be in this exact order). If the assumptions of incidence and access are accurate, the figure will be comparable to the HIS data. In this chapter, using number of cases for each Condition/Care Provided will hereafter be referred to as Scenario 1, and using population figures will be referred to as Scenario 2.

Either scenario can be used in Quantimed. When using the morbidity method, check the **Morbidity** box under Methods in the Data Set Definition Add/Edit screen and enter the population size into the "Population" field in the Data Set Definition screen (Figure 4-15).

If quantifying for one program, facility, or geographic area as a whole, the user will **not** be using the Regimen Episode by Facility/Area morbidity method option in the Data Set Definition screen. If the number of cases for each Condition/Care Provided is known (Scenario 1), this figure can be directly

Attach Regimens to Condition/Care Provided Add/Edit screen (Figure 5-4). If the number of cases is known as a percentage of the total population entered in the Data Set Definition Add/Edit screen, this field can be used instead.

If quantifying for multiple facilities/areas that have different access and incident rates, the Regimen Episode by Facility/Area morbidity method option should be selected in the Data Set Definition screen. The population for each facility or geographic area can be then entered in the Facility/Area Definition Add/Edit screen (Figure 4-28). Once total populations have been entered for each Facility/Area, the number of cases for each Condition/Care Provided will need to be determined.

If **using** the Regimen Episodes by Facility/Area morbidity method option, the user can either enter a number of episodes of this Condition/Care Provided (in the "Number of Patients Affected" field) in the Estimate Percentage of Patients Treated by Regimen by Facility/Area screen (Figure 4-30) and Quantimed will calculate the percentage, or the user can enter the percentage (in the "% of Facility/Area Affected by the Condition/Care Provided" field), and the program will calculate the number of episodes for each Condition/Care Provided.

If the number of cases for each Condition/Care Provided is unknown (Scenario 2) but the population figures, access to care, and incidence rates are known, the frequencies of Condition/Care Provided and Regimens can be used to determine the number of cases to be served. An explanation of this option is discussed in the next section. Because the Condition/Care Provided and Regimen frequencies need to be multiplied by a population figure, the total population and/or the Facility/Area populations (if the Regimen Episodes by Facility/Area morbidity method option is chosen) would still need to be entered.

Determine Frequency of Condition/Care Provided, Regimens, and Pharmaceuticals and Supplies

When using the morbidity method, frequency percentages are required for the following morbidity parameters: Condition/Care Provided—to determine the number of cases in the population affected by this Condition/Care Provided; and Regimen—to define the proportion of cases treated by alternative regimens. In addition, a third frequency may be applied to each medicine and supply item in each Regimen to account for medicines that are substituted or alternatives used because of a patient's characteristics. Percentages entered under the "patient group" parameter defined in Chapter 5 are not used in calculations of requirements but may be entered for the user's own information.

Frequency of Condition/Care Provided

For each defined Condition/Care Provided, the user must enter data that determines the number of cases of the Conditions/Care Provided for which the medicines and supply items are being quantified. This data can be an estimate of the number of cases or a frequency percentage indicating the proportion of the population affected by the Health Care Category that will receive services for that particular Condition/Care Provided.

For example, in Table 13-1, the Health Care Category is defined as "malaria," with five defined Conditions/Care Provided. If the estimated number of cases of malaria for 2–11-month-olds is 2,200

patients (or there is a goal of treating this number of patients), this is the number used for the Condition/ Care Provided.

However, if incidence of the Condition/Care Provided in the population is known (rather than absolute number of cases), this percentage rate is used and applied to the population of the data set or for the Facility(s)/Area(s) (e.g., the population living in a province is 1,000,000). If not all cases have access to health facilities (and hence the user does not want to quantify their medicine and supply needs), this percentage should be scaled by multiplying the proportions of the population with access. For example, the percentage used to represent the number of children less than 1 year old in the province (e.g., 40,000, or 4% of total population in province) who have access to public sector malaria services (e.g., 20,000, or 50% of infants with malaria). In this situation, the frequency percentage entered for the Condition/Care Provided would be 2% (4% multiplied by 50%).

If **not using** the Regimen Episode by Facility/Area morbidity method option, the variable is entered in the Attach Regimen to Condition/Care Provided Add/Edit screen either as a percentage of the total population entered under Data Set Definition or as a number of cases in that population.

If **using** the Regimen Episode by Facility/Area morbidity method option, this variable is entered in the "% of Facility/Area Affected by the Condition/Care Provided" or the "Number of Patients Affected" fields in the Estimate Percentage of Patients Treated by Regimen by Facility/Area screen.

Frequency of Regimen

There may be a number of different Regimens available to treat each Condition/Care Provided. The frequency percentage of the defined Regimen represents the proportion of the cases affected by the Conditions/Care Provided that will receive that particular Regimen. The percentages used for each Regimen must reflect the proportion of all patients who are receiving that Regimen for the defined Condition/Care Provided.

In the above example where the treatment goal for 2–11-month-olds is 2,200 patients, 100% would then be used as the frequency for the "uncomplicated" Regimen, because all of these patients would receive the same (and only) regimen as treatment. But if population figures were used, as in the second example, and 20,000 (or 2%) was entered for the frequency of Condition/Care Provided, the incidence rate for uncomplicated malaria in 2–11-month-olds would be used as the frequency for the Regimen. For example, if the incidence rate was 11% for this age group, 11% would be entered instead of 100% (11% of 20,000 would be 2,200 patients).

If the "complicated" Regimens were equivalent to 20% of the "uncomplicated" regimens, in the first example the frequency for the complicated Regimens would be 20%. But in the second example, the frequency would be 20% of the incidence of complicated malaria, or 2.2% (11% multiplied by 20%). This would be the case if the Condition/Care Provided and Regimens were organized as in Table 13-1. If they were organized as in Table 13-2, the "complicated" Regimen would be 100% because the complicated cases would have already been defined at the Condition/Care level.

If **not using** the Regimen Episode by Facility/Area morbidity option, these figures are entered in the Select Quantification Method >Morbidity Method >Morbidity Parameters >Regimen screen (Figure 5-5).

If **using** the Regimen Episode by Facility/Area morbidity option, this figure is entered in the "Percentage of Patients with Regimen" or "Episodes Treated with Regimen" fields in the Estimate Percentage of Patients Treated by Regimen by Facility/Area screen for each defined Facility/Area (Figure 4-30).

Frequency of Medicines/Supply Items Added to Regimens

The frequency percentage for the medicines/supply items represents the percentages for each pharmaceutical included under each defined regimen. The percentages used will depend on how the user has defined the regimen, which can be either very specific or general. In a more specifically defined regimen, the medicines and supply items frequency percentages are more likely to each be 100%, but in the general regimen definition, there may be medicines or supply item percentages below 100%. The user may also enter a figure below 100% if the STG recommends an alternative medicine be prescribed—for example, for those who are unable to take the medicine of first choice or have treatment failure.

HELPFUL HINTS

- If a program is implementing concurrent policies, there may be a need to quantify for medicines under the old policy as well as under the new policy. If accurate consumption data exist for procurements of antimalarials under the old policy, this method can be used as well as using the morbidity method for the antimalarials for the new policies. These two quantifications would have to be carried out with two different data sets and added together outside of Quantimed (exported to Excel and added together in a spread sheet). If the morbidity method is used for both policies, calculations could be done with one data set with Conditions/Care Provided that represents both the old and new policies.

- If a malaria program is "phasing in" by region on an annual basis, the facilities/areas that will not be procuring the medicines and supplies quantified for can be made inactive by going to the **Query** button at the bottom of the Morbidity and Consumption Estimate screens. (More information is provided in Chapter 8.) If the Facilities/Areas are being phased in over a period of a year, assumptions would need to be made as to what the average populations and frequencies should be for each Facility/Area.

ANNEX 1
Quantimed Data Collection Forms

Contents

- Examples of blank data collection forms available in Quantimed

Data Collection Form: Medicines and Prices Used in Quantimed

Medicine Name	Strength/ Concentration	Form	Route	Institutional Code	VEN	User EML	Packaging	Purchase Packs	Price/Purch- ase Pack	Source	Note

Data Set:
Source:
Data Collector:
Date:

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Data Collection Form: Facility/Area Scaling Up Scenario

Category	Condition	Description	Facility/Area	Start Month/Year	Number of Months	Update Period (Monthly, Bi-monthly, Quarterly or Half-yearly)	Starting Number of Patients	Number or Percent Added per Period	Number or Percent Attrition per Period

Date Set:
Source:
Data Collector:
Date:

Quantimed
Pharmaceutical Quantification and Cost Estimation Tool

Data Collection Form: Supply Items Consumption

Facility _____

Location _____

Year _____ 2004

Institutional Code	Product	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unit Price
	Days out of Stock													
	Days out of Stock													
	Days out of Stock													
	Days out of Stock													
	Days out of Stock													
	Days out of Stock													
	Days out of Stock													
	Days out of Stock													

Quantimed
Pharmaceutical Quantification and Cost Estimation Tool

Page _____ of _____

Data Set _____

Source _____

Data Collectors _____

Date _____

Tuesday, February 01, 2005

Data Collection Form: Treatment Regimens and Corresponding Medicines for Morbidity-Based Quantification

Health Care Category	Condition/Care Provided	% Treated with Condition/Care Provided	Patient Group	Regimen	% Treated with Regimen	Medicine	Route	Dose/ Administration	Number of Admin./Day	Treatment Duration Days	% of Cases Treated	Acute or Chronic	Notes

Data Set:
Source:
Data Collector:
Date:

Quantimed
Pharmaceutical Quantification and Cost Estimation Tool

Data Collection Form: Supplies and Prices Used in Quantimed

Supply Item	Insitutional Code	Administration Unit	VEN	User EML	Packaging	Purchase Pack	Price/Purchase Pack	Source	Note

Quantimed

Pharmaceutical Quantification and Cost Estimation Tool

Data Set:
Source:
Data Collector::
Date:

Data Collection Form: Medicines Consumption

Facility _____

Location _____

Year ___ 2004 ___

Institutional Code	Product		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unit Price
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													

Data Set _____

Source _____

Data Collectors _____

Date _____

Quantimed
Pharmaceutical Quantification and Cost Estimation Tool

Data Collection Form: Supply Items Consumption

Facility _____

Location _____

Year ___ 2004

Institutional Code	Product		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unit Price
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													
		Days out of Stock													

Data Set _____

Source _____

Data Collectors _____

Date _____

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Pharmaceutical Quantification and Cost Estimation Tool

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ANNEX 2

Quantimed Sample Reports

Contents

- Examples of reports available in Quantimed

Estimate of Medicines Requirements (Morbidity-Based Method)

Data Set: Tuberculosis in four regions   Query:

Price Type: International   Currency: US

Institutional Code	Product	Morbidity Requirements	Units	Unit Price	Extended Price
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	4,475,718	tab	0.0140	62,660.05
TB E250	Ethambutol 250MG/tab TABLET (PO)		tab	0.0150	
TB E400	Ethambutol 400MG/tab TABLET (PO)	6,181,199	tab	0.0206	127,332.69
TB H150	Isoniazid 100MG/tab TABLET (PO)	8,259,067	tab	0.0008	6,194.30
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	10,672,215	tab	0.0171	182,708.33
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	17,023,867	tab	0.0215	366,013.14
TB R150	Rifampicin 150MG/tab TABLET (PO)	10,672,215	tab	0.0312	332,973.12
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	615,778	vial	0.0804	49,508.53
				Total Cost	1,127,390.16

ABC Analysis (Consumption-Based Medicines Estimate)

Data Set:	Tuberculosis in four regions	Query:	All Facilities/Areas	ABC Level - A: 20.00% B: 30.00%
Date Start:	1/1/2002 Date End: 12/31/2002			
Price Type:	International	Currency: US		

Institutional Code	Product	Consumption	Unit	Unit Price	Extended Price	Value %	Value Cum. %	Items Cnt	Items Cum. %	ABC
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	16,084,003	tab	0.0215	345,806.07	33.0%	33.0%	1	12.5%	A
TB R150	Rifampicin 150MG/tab TABLET (PO)	9,737,000	tab	0.0312	303,794.41	29.0%	62.0%	2	25.0%	C
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	9,861,000	tab	0.0171	168,820.33	16.1%	78.1%	3	37.5%	C
TB E400	Ethambutol 400MG/tab TABLET (PO)	5,731,650	tab	0.0206	118,072.00	11.3%	89.4%	4	50.0%	C
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	4,109,574	tab	0.0140	57,534.03	5.5%	94.8%	5	62.5%	C
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	579,433	vial	0.0804	46,586.43	4.4%	99.3%	6	75.0%	C
TB H150	Isoniazid 100MG/tab TABLET (PO)	7,860,210	tab	0.0008	5,895.16	0.6%	99.9%	7	87.5%	C
TB E250	Ethambutol 250MG/tab TABLET (PO)	100,000	tab	0.0150	1,500.00	0.1%	100.0%	8	100.0%	C
	Total Items 8			Total Cost	1,048,008.43					

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Quantimed
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Extrapolate Medicines from Proxy Data Set

Data Set:	Tuberculosis in four regions
Reference Site:	Reference Set One
Adjustment Factor:	
Price Type:	International	Currrency: US

Population:	2,500,000
Population:	5,000,000	Ratio:	0.50
Date Start:	1/1/2002	Date End:	12/30/2002

Institutional Code	Product	Units	Proxy Quantity	Estimated Quantity	Adjusted Price	Extended Price
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	tab	8,098,000	4,049,000	0.014	56,686.00
TB E250	Ethambutol 250MG/tab TABLET (PO)	tab		0	0.015	0.00
TB E400	Ethambutol 400MG/tab TABLET (PO)	tab	12,002,681	6,001,341	0.021	123,627.62
TB H150	Isoniazid 100MG/tab TABLET (PO)	tab	15,405,000	7,702,500	0.001	5,776.88
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	tab	20,102,000	10,051,000	0.017	172,073.13
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	tab	32,000,000	16,000,000	0.022	344,000.00
TB H-R-Z	R-H-Z 150MG+75MG+400MG/tab TABLET (PO)	tab		0	0.036	0.00
TB R150	Rifampicin 150MG/tab TABLET (PO)	tab	17,800,000	8,900,000	0.031	277,680.01
TB R300	Rifampicin 300MG/tab TABLET (PO)	tab		0	0.040	0.00
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	vial	1,206,000	603,000	0.080	48,481.20

Total Cost 1,028,324.83

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Comparison of Morbidity, Consumption and Proxy Data Set Medicines Estimates

Data Set: Tuberculosis in four regions   Query:

Date Start: 1/1/2002   Date End: 12/31/2002

Price Type: International   Currrency: US

Institutional Code	Product	Unit	Morbidity		Consumption		Proxy Data Set	
			Quantity	Price	Quantity	Price	Quantity	Price
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	tab	4,475,718	62,660.05	4,109,574	57,534.03	4,049,000	56,686.00
TB E250	Ethambutol 250MG/tab TABLET (PO)	tab			100,000	1,500.00		
TB E400	Ethambutol 400MG/tab TABLET (PO)	tab	6,181,199	127,332.69	5,731,650	118,072.00	6,001,341	123,627.62
TB H150	Isoniazid 100MG/tab TABLET (PO)	tab	8,259,067	6,194.30	7,860,210	5,895.16	7,702,500	5,776.88
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	tab	10,672,215	182,708.33	9,861,000	168,820.33	10,051,000	172,073.13
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	tab	17,023,867	366,013.14	16,084,003	345,806.07	16,000,000	344,000.00
TB R150	Rifampicin 150MG/tab TABLET (PO)	tab	10,672,215	332,973.12	9,737,000	303,794.41	8,900,000	277,680.01
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	vial	615,778	49,508.53	579,433	46,586.43	603,000	48,481.20
	Total Cost			1,127,390.16		1,048,008.43		1,028,324.83

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ABC Analysis (Morbidity-Based Medicines Estimate)

Data Set: Tuberculosis in four regions

Date Start: 1/1/2002   Date End: 12/31/2002   Query: ABC Level - A: 30.00%   B: 65.00%

Price Type: Local Tender   Currrency: US

All Facilities/Areas

Institutional Code	Product	Morbidity Quantity	Unit	Unit Price	Extended Price	Value %	Cum.%	Items Cnt	Cum.%	ABC
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	10,672,215	tab	0.0203	216,645.97	41.1%	41.1%	1	12.5%	A
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	17,023,867	tab	0.0056	95,759.25	18.2%	59.3%	2	25.0%	B
TB R150	Rifampicin 150MG/tab TABLET (PO)	10,672,215	tab	0.0069	73,371.48	13.9%	73.2%	3	37.5%	B
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	4,475,718	tab	0.0157	70,268.77	13.3%	86.5%	4	50.0%	C
TB E400	Ethambutol 400MG/tab TABLET (PO)	6,181,199	tab	0.0053	32,760.35	6.2%	92.7%	5	62.5%	C
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	638,332	vial	0.0340	21,703.28	4.1%	96.9%	6	75.0%	C
TB H150	Isoniazid 100MG/tab TABLET (PO)	8,259,067	tab	0.0020	16,518.13	3.1%	100.0%	7	87.5%	C
TB E250	Ethambutol 250MG/tab TABLET (PO)		tab	0.0029		0.0%	100.0%	8	100.0%	C

Total Cost   527,027.24

Total Items   8

ABC Analysis (Consumption-Based Medicines Estimate)

ABC Level - A: 30.00%   B: 50.00%

Data Set: Tuberculosis in four regions   Query: All Facilities/Areas

Date Start: 1/1/2002   Date End: 12/31/2002

Price Type: International   Currency: US

Institutional Code	Product	Consumption	Unit	Unit Price	Extended Price	Value %	Value Cum. %	Items Cnt	Items Cum. %	ABC
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	16,084,003	tab	0.0215	345,806.07	33.0%	33.0%	1	12.5%	A
TB R150	Rifampicin 150MG/tab TABLET (PO)	9,737,000	tab	0.0312	303,794.41	29.0%	62.0%	2	25.0%	B
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	9,861,000	tab	0.0171	168,820.33	16.1%	78.1%	3	37.5%	C
TB E400	Ethambutol 400MG/tab TABLET (PO)	5,731,650	tab	0.0206	118,072.00	11.3%	89.4%	4	50.0%	C
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	4,109,574	tab	0.0140	57,534.03	5.5%	94.8%	5	62.5%	C
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	579,433	vial	0.0804	46,586.43	4.4%	99.3%	6	75.0%	C
TB H150	Isoniazid 100MG/tab TABLET (PO)	7,860,210	tab	0.0008	5,895.16	0.6%	99.9%	7	87.5%	C
TB E250	Ethambutol 250MG/tab TABLET (PO)	100,000	tab	0.0150	1,500.00	0.1%	100.0%	8	100.0%	C

Total Items 8   Total Cost 1,048,008.43

Comparison of Morbidity and Consumption Medicines Estimates

Data Set: Tuberculosis in four regions   Query:

Date Start: 1/1/2002   Date End: 12/31/2002

Price Type: International   Currency: US

Institutional Code	Product	Unit	Morbidity		Consumption	
			Quantity	Price	Quantity	Price
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	tab	4,475,718	62,660.05	4,109,574	57,534.03
TB E250	Ethambutol 250MG/tab TABLET (PO)	tab			100,000	1,500.00
TB E400	Ethambutol 400MG/tab TABLET (PO)	tab	6,181,199	127,332.69	5,731,650	118,072.00
TB H150	Isoniazid 100MG/tab TABLET (PO)	tab	8,259,067	6,194.30	7,860,210	5,895.16
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	tab	10,672,215	182,708.33	9,861,000	168,820.33
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	tab	17,023,867	366,013.14	16,084,003	345,806.07
TB R150	Rifampicin 150MG/tab TABLET (PO)	tab	10,672,215	332,973.12	9,737,000	303,794.41
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	vial	615,778	49,508.53	579,433	46,586.43
	Total Cost			1,127,390.16		1,048,008.43

Estimate of Medicines Requirements (Consumption-Based Method)

Data Set	Tuberculosis in four regions		Query
Date Start	1/1/2002	Date End	12/31/2002
Price Type	International	Currrency:	US

Institutional Code	Product	Actual Consumption	Adjusted Consumption	Unit	Unit Price	Extended Price
TB H-E	E-H 400MG+150MG/tab TABLET (PO)	4,018,500	4,109,574	tab	0.0140	57,534.03
TB E250	Ethambutol 250MG/tab TABLET (PO)	100,000	100,000	tab	0.0150	1,500.00
TB E400	Ethambutol 400MG/tab TABLET (PO)	5,467,500	5,731,650	tab	0.0206	118,072.00
TB H150	Isoniazid 100MG/tab TABLET (PO)	7,723,000	7,860,210	tab	0.0008	5,895.16
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	9,861,000	9,861,000	tab	0.0171	168,820.33
TB H-R	R-H 150MG+75MG/tab TABLET (PO)	15,526,500	16,084,003	tab	0.0215	345,806.07
TB R150	Rifampicin 150MG/tab TABLET (PO)	9,737,000	9,737,000	tab	0.0312	303,794.41
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)	564,510	579,433	vial	0.0804	46,586.43
					Total Cost	1,048,008.43

Estimate of Medicines Requirements - Scaled-Up

Data Set: Haiti

Procurement Period Start:	10/1/2004	Number of Months	6	Purchasing Period	USG Fiscal year 2005
Price Type	Local Tender	Currency:	US		

Active Scaling-Up Sets

Category	Condition	Scaling-Up Set	Number Patient Month
HIV/AIDS	ART	Hinche	225
HIV/AIDS	ART	Berraca	225
HIV/AIDS	ART	Justinien	225
HIV/AIDS	ART	CBP	225
HIV/AIDS	ART	St. Nicolas	225
HIV/AIDS	ART	HAS	225
HIV/AIDS	ART	March	225
HIV/AIDS	ART	Cange	5,085
HIV/AIDS	ART	GHESKIO	14,225
HIV/AIDS	ART	Thomonde	225
HIV/AIDS	ART	Jacmel	255
HIV/AIDS	ART	Belladeri	225
HIV/AIDS	ART	Boucan Carre	1,115
HIV/AIDS	ART	Fame Pereo	1,115
HIV/AIDS	ART	Arcachon	195
HIV/AIDS	ART	Grace Children	195
HIV/AIDS	ART	St. Antoine	195
HIV/AIDS	ART	Cayes	195

Estimate of Medicines Requirements - Scaled-Up

Data Set: Haiti

Procurement Period Start: 10/1/2004 **Number of Months:** 6 **Purchasing Period:** USG Fiscal year 2005

Price Type: Local Tender **Currency:** US

Active Scaling-Up Sets

Category	Condition	Scaling-Up Set	Number Patient Month
HIV/AIDS	ART	Bethel	195
HIV/AIDS	ART	Lascahobas	225

Institutional Code	Product	Units	Scaling-Up Quantity	Requirement	Unit Price	Extended Pric
	3TC 10MG/ml SOLUTION (PO)	ml	373,715	373,715	0.03	10,479.59
	3TC 150MG/tab TABLET (PO)	tab	398,725	398,725	0.09	37,878.87
	ABC 300MG/tab TABLET (PO)	tab	17,887	17,887	1.22	21,732.71
	d4T 1MG/ml SOLUTION (PO)	ml	20,682	20,682	0.05	982.40
	d4T 30MG/cap CAP (PO)	cap	201,314	201,314	0.07	13,301.10
	d4T 40MG/cap CAP (PO)	cap	201,314	201,314	0.07	15,098.55
	ddl 200MG/cap CAP (PO)	cap	10,944	10,944	0.43	4,651.20
	ddl 50MG/cap CAP (PO)	cap	3,807	3,807	0.16	602.78
	EFV 200MG/tab TABLET (PO)	tab	27,856	27,856	0.46	12,894.23
	EFV 600MG/tab TABLET (PO)	tab	231,869	231,869	0.95	220,275.55
	IDV 400MG/cap CAP (PO)	cap	86,302	86,302	0.28	23,972.78
	LPV-r 133.33MG+33.33MG/cap CAP (PO)	cap	18,660	18,660	0.23	4,319.79
	LPV-r 80MG+20MG/ml SOLUTION (PO)	ml	1,300	1,300	0.14	180.57
	NFV 250MG/cap CAP (PO)	cap	20,733	20,733	0.30	6,282.10
	NVP 10MG/ml SOLUTION (PO)	ml	87,598	87,598	0.07	6,387.35
	NVP 200MG/tab TABLET (PO)	tab	702,595	702,595	0.60	421,557.00
	ZDV 10MG/ml SOLUTION (PO)	ml	889,551	889,551	0.03	26,315.88
	ZDV-3TC 300MG+150MG/cap CAP (PO)	cap	789,934	789,934	0.33	256,728.55
					Total Cost	**1,083,641.00**

Tuesday, February 01, 2005

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Management Sciences For Health, Washington, DC, USA

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Estimate of Medicines Procurement Quantities — Modified Ordering Defaults

Data Set: Tuberculosis in four regions

Facility/Area: All

Purchase Period: Annual Pharmaceutical Procurement 2004

Date Start: 1/1/2004   Date End: 12/31/2004

Price Type: International   Currency: US

Institutional Code	Product	Requirement	Unit	In Stock	On Order	Procure Period Months	Safety Stock Months	Lead Time Months	Quantity to Order	Pack Size	Number Packs	Pack Price	Extended Price
TB H-E	E-H 400MG+150MG/tab TABLET (PO	4,109,574	tab	10,000	0	12	12	3	9,698,869	500 tab	9,699	14.00	135,786.00
TB E400	Ethambutol 400MG/tab TABLET (PO)	6,181,198	tab	0	0	6	3	3	6,490,258	1000 ta	6,491	20.60	133,714.60
TB H150	Isoniazid 100MG/tab TABLET (PO)	7,702,500	tab	0	0	6	3	4	8,761,594	1000 ta	877	7.50	6,577.50
									Total Cost				276,078.10

Tuesday, February 22, 2005

Estimate of Medicines Procurement Quantities - Scaled-Up   Modified Ordering Defaults

Data Set: Haiti

Purchasing Period: USG Fiscal year 2005   Procurement Period 10/1/2004   for   6 Months

Price Type: Local Tender   Currency: US

Active Scaling-Up Sets

Category	Condition	Scaling-Up Set	Number Patient Months	Number of New Cases
HIV/AIDS	ART	Hinche	225	25
HIV/AIDS	ART	Berraca	225	25
HIV/AIDS	ART	Justinien	225	25
HIV/AIDS	ART	CBP	225	25
HIV/AIDS	ART	St. Nicolas	225	25
HIV/AIDS	ART	HAS	225	25
HIV/AIDS	ART	March	225	25
HIV/AIDS	ART	Cange	5,085	25
HIV/AIDS	ART	GHESKIO	14,225	115
HIV/AIDS	ART	Thomonde	225	25
HIV/AIDS	ART	Jacmel	255	30
HIV/AIDS	ART	Belladeri	225	25
HIV/AIDS	ART	Boucan Carre	1,115	45
HIV/AIDS	ART	Fame Pereo	1,115	45
HIV/AIDS	ART	Arcachon	195	45
HIV/AIDS	ART	Grace Children	195	25
HIV/AIDS	ART	St. Antoine	195	25

Estimate of Medicines Procurement Quantities - Scaled-Up — Modified Ordering Defaults

Data Set: Haiti

Purchasing Period: USG Fiscal year 2005

Price Type: Local Tender   Currency: US

Procurement Period 10/1/2004   for   6 Months

Active Scaling-Up Sets

Category	Condition	Scaling-Up Set	Number Patient Months	Number of New Cases
HIV/AIDS	ART	Cayes	195	25
HIV/AIDS	ART	Bethel	195	25
HIV/AIDS	ART	Lascahobas	225	25

Institutional Code	Product	Unit	Requirement	In Stock	On Order	Safety Stock Months	Lead Time Months	Quantity to Order	Pack Size	Number Packs	Pack Price	Extended Price
	3TC 10MG/ml SOLUTION (PO)	ml	373,715	20,000	0	0	3	562,344	240 ml	2,344	6.73	15,775.12
	3TC 150MG/tab TABLET (PO)	tab	398,725	10,000	500	3	3	833,407	60 tab	13,891	5.70	79,178.70
	ABC 300MG/tab TABLET (PO)	tab	17,887	0	0	0	0	17,887	60 tab	299	72.90	21,797.10
	d4T 1MG/ml SOLUTION (PO)	ml	20,682	0	0	0	0	20,682	200 ml	104	9.50	988.00
	d4T 30MG/cap CAP (PO)	cap	201,314	0	0	0	0	201,314	56 cap	3,595	3.70	13,301.50
	d4T 40MG/cap CAP (PO)	cap	201,314	0	0	0	0	201,314	56 cap	3,595	4.20	15,099.00
	ddI 200MG/cap CAP (PO)	cap	10,944	0	0	0	0	10,944	60 cap	183	25.50	4,666.50
	ddI 50MG/cap CAP (PO)	cap	3,807	0	0	0	0	3,807	60 cap	64	9.50	608.00
	EFV 200MG/tab TABLET (PO)	tab	27,856	0	0	0	0	27,856	90 tab	310	41.66	12,914.60
	EFV 600MG/tab TABLET (PO)	tab	231,869	0	0	0	0	231,869	30 tab	7,729	28.50	220,276.50
	IDV 400MG/cap CAP (PO)	cap	86,302	0	0	0	0	86,302	180 cap	480	50.00	24,000.00
	LPV-r 133.33MG+33.33MG/cap CAP (P	cap	18,660	0	0	0	0	18,660	180 cap	104	41.67	4,333.68
	LPV-r 80MG+20MG/ml SOLUTION (PO)	ml	1,300	0	0	3	6	3,478	300 ml	12	41.67	500.04
	NFV 250MG/cap CAP (PO)	cap	20,733	0	0	0	0	20,733	300 cap	70	90.90	6,363.00
	NVP 10MG/ml SOLUTION (PO)	ml	87,598	0	0	0	0	87,598	240 ml	365	17.50	6,387.50
	NVP 200MG/tab TABLET (PO)	tab	702,595	0	0	0	0	702,595	60 tab	11,710	36.00	421,560.00
	ZDV 10MG/ml SOLUTION (PO)	ml	889,551	0	0	0	0	889,551	240 ml	3,707	7.10	26,319.70
	ZDV-3TC 300MG+150MG/cap CAP (PO)	cap	789,934	0	0	0	0	789,934	60 cap	13,166	19.50	256,737.00

Total Cost: 1,130,805.94

Medicines

Data Set: **Tuberculosis in four regions**

Price Type: **International**

Currency: **US**

Institutional Code	Product	Additional Info	Therapeutic Class	VEN	User EML	Purchase Pack	Unit	Unit Price	Source
TB H-E	E-H 400MG+150MG/tab TABLET (PO)		06.2.4.	Essential	E	BOX	tab	0.0140	GDF 2002
TB E250	Ethambutol 250MG/tab TABLET (PO)	E	06.2.4.	Vital	E	BOTT	tab	0.0150	IDA
TB E400	Ethambutol 400MG/tab TABLET (PO)	E	06.2.4.	Vital	E	BOTT	tab	0.0206	IDA
TB H150	Isoniazid 100MG/tab TABLET (PO)		06.2.4.	Vital	C	BOTT	tab	0.0008	IDA
TB Z400	Pyrazinamide 400MG/tab TABLET (PO)	Z	06.2.4.	Vital	E	BOTT	tab	0.0171	IDA (IDPIG
TB H-R	R-H 150MG+75MG/tab TABLET (PO)		06.2.4.	Essential	E	BOTT	tab	0.0215	GDF
TB H-R-Z	R-H-Z 150MG+75MG+400MG/tab TABLET (PO)		06.2.4.	Vital	E	BOTT	tab	0.0360	GDF
TB R150	Rifampicin 150MG/tab TABLET (PO)	R	06.2.4.	Vital	E	BOTT	tab	0.0312	IDA
TB R300	Rifampicin 300MG/tab TABLET (PO)	R	06.2.4.	Vital	E	BOTT	tab	0.0400	IDA
TB SS1	Streptomycin Sulfate 1GM/vial VIAL (INJ)		06.2.4.	Vital	E	PACK	vial	0.0804	GDF

List of Regimens by Condition and Category

Data Set: Tuberculosis in four regions   Description: TB-WHO regimens

Data Set Population: 2,500,000

Category	Condition	% of Data Set Population	Number affected by condition

Respiratory Infections

Tuberculosis-Category I

1.50%   37,500

Regimen	Level of Care	Patient Group	Percent Treated	Number Treated	Regimen Notes
2 HRZE(S)/4 HR >70kg	2	Adult	10.00%	3,750	
2 HRZE(S)/4 HR 55-70kg	2	Adult	30.00%	11,250	
2 HRZE(S)/4 HR 40-54kg	2	Adult	42.55%	15,956	
2 HRZE(S)/4 HR 30-39kg	2	Adult	17.45%	6,544	

Total Percent Treated by Regimens   100.0%

Tuberculosis-Category II

0.01%   250

Regimen	Level of Care	Patient Group	Percent Treated	Number Treated	Regimen Notes
2 HRZES/1 HRZE/5 HRE >70k	2	Adult	10.00%	25	
2 HRZES/1 HRZE/5 HRE 55-70	2	Adult	30.00%	75	
2 HRZES/1 HRZE/5 HRE 40-54	2	Adult	42.55%	106	
2 HRZES/1 HRZE/5 HRE 30-39	2	Adult	17.45%	44	

Total Percent Treated by Regimens   100.0%

Tuberculosis-Category III

0.38%   9,500

Regimen	Level of Care	Patient Group	Percent Treated	Number Treated	Regimen Notes
2 HRZE/6 HE >70kgs	2	Adult	10.00%	950	
2 HRZE/6 HE 55-70kgs	2	Adult	30.00%	2,850	
2 HRZE/6 HE 40-54kgs	2	Adult	42.55%	4,042	

List of Regimens by Condition and Category

Data Set: Tuberculosis in four regions   Description: TB-WHO regimens

Data Set Population: 2,500,000

Category	Condition	% of Data Set Population		Number affected by condition
	2 HRZE/6 HE 30-39kgs	2	Adult	17.45%	1,658

Total Percent Treated by Regimens   100.0%

Percent of Cases Treated by Regimen

Category	Condition	Regimen	Percent	Note	Regimen %	Patient Group
Respiratory Infections						
	Tuberculosis-Category I		1.5%			
					10.0%	Adult
					30.0%	Adult
					42.6%	Adult
					17.5%	Adult
		Total Percent			100.0%	
	Tuberculosis-Category II		0.0%			
					10.0%	Adult
					30.0%	Adult
					42.6%	Adult
					17.5%	Adult
		Total Percent			100.0%	
	Tuberculosis-Category III		0.4%			
					10.0%	Adult
					30.0%	Adult
					42.6%	Adult
					17.5%	Adult
		Total Percent			100.0%	

Regimen Episodic Costs — Regimens by Facility

Data Set:	Tuberculosis in four regions	Description:	TB-WHO regimens
Data Set Population:	2,500,000	Price Type:	International
Category	Condition	Percent Condition Number	

Respiratory Infections — Tuberculosis-Category I

	1.50%	37,500

Regimen	Level of Care	Patient Group					Number Treated	Regimen Notes
					Facility Cases		4,225	

2 HRZE(S)/4 HR >70kg (2)

Level of Care: Adult

Medicines

Product	Units/Dose	Units	Doses/Day	Num Days	% Treated	Units/Episode	Episode Cost	
Ethambutol 400MG/tab TABLET (PO)	3.5	tab	1	62	75.0%	162.8	3.35	US
Isoniazid 100MG/tab TABLET (PO)	3.5	tab	1	62	100.0%	217.0	0.16	US
Pyrazinamide 400MG/tab TABLET (PO)	5.0	tab	1	62	100.0%	310.0	5.31	US
R-H 150MG+75MG/tab TABLET (PO)	5.0	tab	1	124	100.0%	620.0	13.33	US
Rifampicin 150MG/tab TABLET (PO)	5.0	tab	1	62	100.0%	310.0	9.67	US
Streptomycin Sulfate 1GM/vial VIAL (INJ)	1.4	vial	1	62	25.0%	21.7	1.74	US
							33.57	US

Supply Items

Product	Qty/Admin	Units	Admin / Day	Num Days	% Treated	Units/Episode	Episode Cost	
Syringe disposable with needle	1	each	1	62	25.00%	15.5	0.47	US
Gloves	2	pair	1	62	C0.00%	124	1.86	US
Ethanol 96%	10	lt	1	62	25.00%	155	0.78	US
Cotton wool, absorbent	25	gm*	1	62	25.00%	387.5	0.58	US
							3.68	US

Regimen Episodic Costs

Regimens by Facility

Data Set: Tuberculosis in four regions
Data Set Population: 2,500,000

Description: TB-WHO regimens
Price Type: International

Category	Condition		Percent	Condition Number
			1.50%	37,500

Respiratory Infections — Tuberculosis-Category I

Pricing	International		US	
	Medicines	Supply Items	Total	
1 Episode	33.57	3.68	37.25	
Data Set	141,830.21	15,553.28	157,383.49	

Tuesday, February 01, 2005

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Pharmaceutical Quantification and Cost Estimation Tool
Management Sciences For Health, Washington, DC, USA

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Medicines Consumption Data Entry Printout

Data Set   January 2004 TB Program
Facility   North Uplands
Consumption Set   Consumption 2003

Institutional Code	Product / Month	Days Out	Number Packs	Pack Size	Donated
TB E500	Ethambutol 250MG/tab TABLET (PO)				
	January 2003	19	(Days out of Stock for month)		
			240	1000	☐
	February 2003	0			
			200	1000	☐
			600	500	☐
	March 2003	0			
			540	1000	☐
	April 2003	0			
			520	1000	☐
	May 2003	0			
			514	1000	☐
	June 2003	0			
			539	1000	☐
	July 2003	0			
			545	1000	☐
	August 2003	0			
			1110	500	☐
	September 2003	0			
			543	1000	☐
	October 2003	0			
			500	1000	☐
			120	500	☐
	November 2003	0			
			560	1000	☐
	December 2003	0			
			500	1000	☐
TB ISO300	Isoniazid 300mg/tab TABLET (PO)				
	January 2003	0			
			170	1000	☑
	February 2003	0			
			150	1000	☑
	March 2003	0			
			161	1000	☑

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Medicines Consumption Data Entry Printout

Data Set	January 2004 TB Program
Facility	North Uplands
Consumption Set	Consumption 2003

Institutional Code	Product Month	Days Out	Number Packs	Pack Size	Donated
	April 2003	0	170	1000	✔
	May 2003	0	170	1000	✔
	June 2003	0	169	1000	✔
	July 2003	0	166	1000	✔
	August 2003	0	179	1000	✔
	September 2003	0	180	1000	✔
	October 2003	0	178	1000	✔
	November 2003	0	175	1000	✔
	December 2003	5 (Days out of Stock for month)	160	1000	✔
TB P500	Pyrazinamide 500mg/tab TABLET (PO)				
	January 2003	0	250	1000	✔
	February 2003	0	255	1000	✔
	March 2003	0	260	1000	✔
	April 2003	0	265	1000	✔
	May 2003	0	275	1000	✔
	June 2003	0	280	1000	✔
	July 2003	0	285	1000	✔
	August 2003	0			

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Value of donations based on Consumption data - Medicines

Data Set	January 2004 TB Program		Query	All facility/areas
Date Start	1/1/2003	Date End	12/31/2003	
Price Type	Local tender	Currrency:	US	

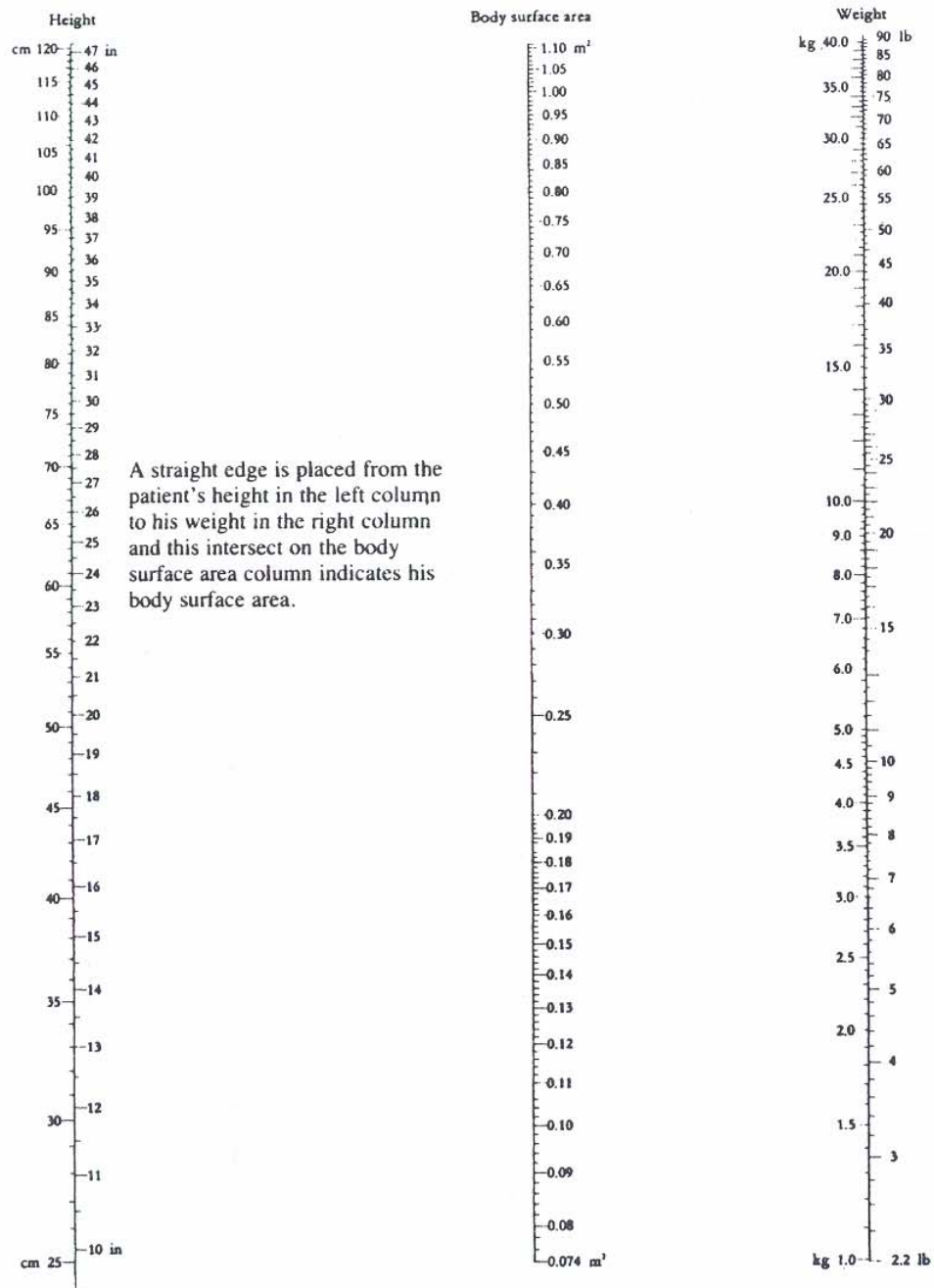| Institutional Code	Product	Total Actual Consumption	Donated	% Donated	Purchased	Unit	Unit Price	Extended Price Donated	Purchased
TB E500	Ethambutol 250MG/tab TABLET (PO)	13,352,506	0	0.0%	13,352,506	tab	0.0029	0.00	38,555.36
TB E400	Ethambutol 400MG/tab TABLET (PO)	3	0	0.0%	3	tab	0.0053	0.00	0.02
TB ISO300	Isoniazid 300mg/tab TABLET (PO)	4,134,500	2,028,000	49.1%	2,106,500	tab	0.0016	3,244.80	3,370.40
TB H400	Pyrazinamide 400mg/tab TABLET (PO)	23	0	0.0%	23	tab			
TB P500	Pyrazinamide 500mg/tab TABLET (PO)	6,826,000	3,370,000	49.4%	3,456,000	tab	0.0564	190,068.00	194,918.40
TB R-H	R-H 150mg+100mg/tab TABLET (PO)	2,034	0	0.0%	2,034	tab	0.0056	0.00	11.44
TB R-H-Z	R-H-Z 150mg+75mg+400mg/tab TABLET (PO)	32,023	0	0.0%	32,023	tab	0.0056	0.00	180.13
	R-H-Z-E 150MG+75MG+400MG+275MG/tab T	12	0	0.0%	12	tab			
TB RIF150	Rifampicin 150mg/tab TABLET (PO)	16,436,000	0	0.0%	16,436,000	tab	0.0069	0.00	112,997.50
TB RIF300	Rifampicin 300mg/tab TABLET (PO)	60,000	0	0.0%	60,000	tab	0.0125	0.00	750.00
TB SS1	Streptomycin Sulfate 1gm/vial VIAL (INJ)	2,404,000	0	0.0%	2,404,000	vial	0.0340	0.00	81,736.00
					Total Cost			193,312.80	432,519.25
					Total Percent			30.9%	69.1%

ANNEX 3
Calculating Body Surface Area

Contents

- Information on calculating body surface area of pediatric patients

Nomogram for determination of pediatric body surface from height and weight

Height

Body surface area

Weight

cm 120 — 47 in
46
115 — 45
44
110 — 43
42
105 — 41
40
100 — 39
38
95 — 37
36
90 — 35
34
85 — 33
32
80 — 31
30
75 — 29
28
70 — 27
26
65 — 25
24
60 — 23
22
55 — 21
20
50 — 19
18
45 — 17
16
40 — 15
14
35 — 13
12
30 — 11
cm 25 — 10 in

A straight edge is placed from the
patient's height in the left column
to his weight in the right column
and this intersect on the body
surface area column indicates his
body surface area.

1.10 m²
1.05
1.00
0.95
0.90
0.85
0.80
0.75
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.10
0.09
0.08
0.074 m²

kg 40.0 — 90 lb
85
80
35.0 — 75
70
30.0 — 65
60
25.0 — 55
50
20.0 — 45
40
15.0 — 35
30
10.0 — 25
9.0 — 20
8.0
7.0 — 15
6.0
5.0
4.5 — 10
4.0 — 9
3.5 — 8
3.0 — 7
— 6
2.5 — 5
2.0 — 4
1.5 — 3
kg 1.0 — 2.2 lb

From the formula of Du Bois and Du Bois. *Arch. intern. Med.*, 17, 863 (1916): $S = W^{0.425} \times H^{0.725} \times 71.84$, or $\log S = \log W \times 0.425 + \log H \times 0.725 + 1.8564$ (S = body surface in cm², W = weight in kg. H = height in cm)
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$$\text{BSA (m}^2\text{)} = \sqrt{\frac{\text{Ht (in)} \times \text{Wt (lb)}}{3131}}$$

$$\text{BSA (m}^2\text{)} = \sqrt{\frac{\text{Ht (cm)} \times \text{Wt (kg)}}{3600}}$$