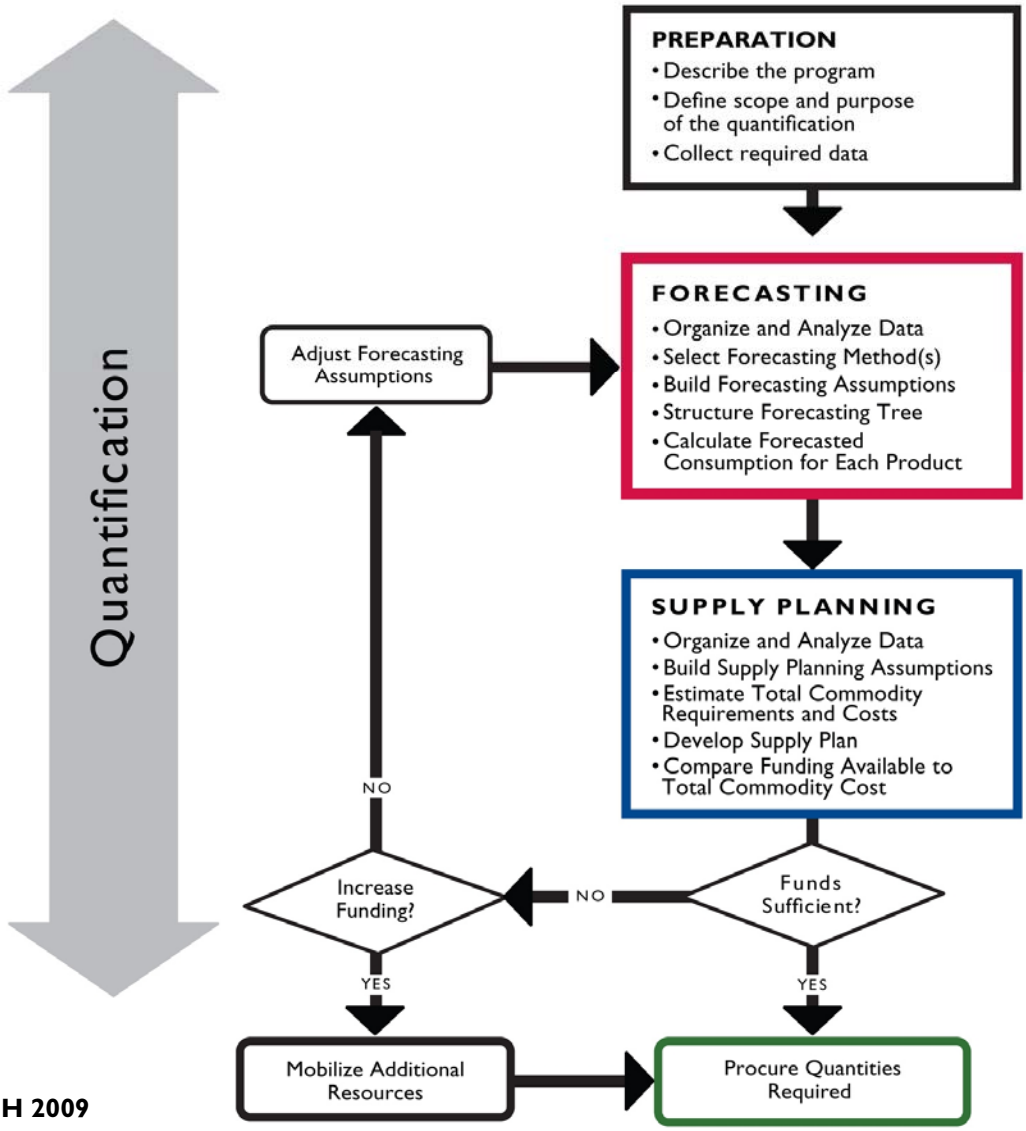
USAID | DELIVER PROJECT

QUANTIFICATION OF HEALTH COMMODITIES

A GUIDE TO FORECASTING AND SUPPLY PLANNING FOR PROCUREMENT



MARCH 2009

This publication was produced for review by the U.S. Agency for International Development. It was prepared by the USAID | DELIVER PROJECT, Task Order 1.

QUANTIFICATION OF HEALTH COMMODITIES

A GUIDE TO FORECASTING AND SUPPLY PLANNING FOR PROCUREMENT

USAID | DELIVER PROJECT, Task Order 1
The USAID | DELIVER PROJECT, Task Order 1, is funded by the U.S. Agency for International Development under contract no. GPO-I-01-06-00007-00, beginning September 29, 2006. HIV-related activities of Task Order 1 are supported by the President's Emergency Plan for AIDS Relief. Task Order 1 is implemented by John Snow, Inc., in collaboration with PATH, Crown Agents Consultancy, Inc., Abt Associates, Fuel Logistics Group (Pty) Ltd., UPS Supply Chain Solutions, Family Health International, The Manoff Group, and 3i Infotech. The project improves essential health commodity supply chains by strengthening logistics management information systems, streamlining distribution systems, identifying financial resources for procurement and supply chain operations, and enhancing forecasting and procurement planning. The project also encourages policymakers and donors to support logistics as a critical factor in the overall success of their health care mandates.

Recommended Citation
USAID | DELIVER PROJECT, Task Order 1. 2008. *Quantification of Health Commodities: A Guide to Forecasting and Supply Planning for Procurement.* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

Abstract
This guide for quantification of health commodities has been developed by the USAID | DELIVER PROJECT, Task Order 1, to assist technical advisors, program managers, warehouse managers, procurement officers, and service providers in (1) estimating the total commodity needs and costs for successful implementation of national health program strategies and goals, (2) identifying the funding needs and gaps for procurement of the required commodities, and (3) planning procurements and shipment delivery schedules to be able to ensure a sustained and effective supply of health commodities.

The step-by-step approach to quantification presented in this guide is complemented by a set of product-specific companion pieces that provide detailed instructions for forecasting consumption of ARV drugs, HIV test kits, antimalarial drugs, and lab supplies.

Cover photo: Steps in Quantification, USAID | DELIVER PROJECT, March 2009

USAID | DELIVER PROJECT
John Snow, Inc.
1616 Fort Myer Drive, 11th Floor
Arlington, VA 22209 USA
Phone: 703-528-7474
Fax: 703-528-7480
Email: askdeliver@jsi.com
Internet: deliver.jsi.com

CONTENTS

ACRONYMS

3TC	lamivudine
AIDS	acquired immunodeficiency syndrome
ANC	antenatal care
ART	antiretroviral therapy
ARV(s)	antiretroviral (drug(s))
AZT	zidovudine
CHAI	Clinton HIV/AIDS Initiative
CIDRZ	Center for Infectious Disease Research in Zambia (University of Alabama)
d4T	stavudine
ddI	didanosine
DHMT	District Health Management Team
EFV	efavirenz
FPLM	Family Planning Logistics Management (project)
HIV	human immunodeficiency virus
HMIS	health management information system
LMIS	logistics management information system
LPV/r	lopinavir/ritonavir
max-min	maximum and minimum (type of inventory control system)
M&E	monitoring and evaluation
MOH	Ministry of Health
NGO	nongovernmental organization
NMCC	national malaria control council
NVP	nevirapine
OI(s)	opportunistic infection(s)
PITC	provider-initiated testing and counseling
PMTCT	prevention of mother-to-child transmission (of HIV)
RH	rifampicin/isoniazid
RHZE	rifampicin/isoniazin/pyrazinamide/ethambutol
SOW	scope of work

STG(s)	standard treatment guideline(s)
TB	tuberculosis
TDF	tenofovir
USAID	U.S. Agency for International Development
UTH	university teaching hospital
VCT	voluntary counseling and testing (HIV/AIDS)

ACKNOWLEDGMENTS

This publication is dedicated to the many individuals from communities, nongovernmental organizations (NGOs), faith-based organizations, Ministries of Health, and other organizations who have consistently fought for access to essential medicines and health services. The publication is also dedicated to friends and counterparts who have worked with the USAID | DELIVER PROJECT and its predecessor projects, the John Snow, Inc./DELIVER Project and the Family Planning Logistics Management I, II, and III projects, and to the thousands of committed professionals in Ministries of Health and NGOs who work daily to supply their customers and programs with essential public health commodities.

U.S. Agency for International Development (USAID) contracts funded the technical assistance, in-country projects, and research that produced the experience and lessons in the CD "Resources for Managing the HIV & AIDS and Laboratory Supply Chains." We are deeply grateful to the team of professionals in the Commodity Security and Logistics Division in the Office of Population and Reproductive Health of the USAID Global Health Bureau's Center for Population, Health, and Nutrition for their encouragement and advice and for their commitment to improving human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) laboratory and public health programs through logistics.

Sincere thanks go to the extended core team of dedicated technical staff from the field and from the project office in Arlington, Virginia, who developed and wrote parts of this guide. The lessons drawn from the experience of the USAID | DELIVER PROJECT and its predecessor projects in conducting quantification exercises in multiple countries across commodity categories would not have been possible without these valuable contributions.

PURPOSE OF THIS GUIDE

WHO CAN USE THIS GUIDE?

This practical guide for quantification of health commodities has been developed as a reference for technical advisors, program managers, procurement officers, warehouse managers, service providers, government officials, implementing partners, donor agencies, and others on how to conduct a national-level quantification exercise. Individual members of the quantification team who may be responsible for program planning, budgeting, and mobilizing resources for procurement of commodities will also benefit from using this guide to understand how to use the outputs of the quantification to support these activities.

WHAT IS THE PURPOSE OF THIS GUIDE?

This guide is designed to assist users in applying a systematic, step-by-step approach to quantifying health commodity requirements and costs. The guide should be used when conducting a national-level quantification exercise and includes specific guidance on how to use the results of the quantification to

- Identify the funding needs and gaps for procurement of the required commodities
- Coordinate procurements and shipment delivery schedules to ensure a sustained and effective supply of commodities
- Implement a process for reviewing and updating the results of the quantification to maintain and improve the validity, accuracy, and usefulness of current and future quantifications

While several software programs exist that can be used to complete the forecasting and the supply planning steps in a quantification exercise, currently no one tool does it all. It is not the purpose of this guide to train users in the use of any specific software tool, but rather to guide users through the process of conducting a quantification. It is important to note, however, that the process explained in this guide for supply planning is linked to the use of the PipeLine software. Experience over 20 years working with a wide range of commodities has demonstrated the use of PipeLine software as a best practice in preparing supply plans. Several of the currently available software programs are referenced in *Appendix B. Software Programs for Quantification of Health Commodities*.

The step-by-step approach to quantification of health commodities presented in this guide will enable users to

- List the specific data required at each step of the quantification
- Collect and analyze the available data
- Select the appropriate forecasting method(s), based on available data

- Identify and obtain consensus on the forecasting assumptions needed to account for missing data and to estimate the effect of key programmatic and environmental factors expected to influence the demand for commodities
- Structure the "forecasting tree" for morbidity-based forecasts to be able to organize forecasting data and assumptions
- Utilize the forecasting data and assumptions to calculate the quantity of each product expected to be dispensed or consumed during each year of the quantification
- Identify the key supply chain parameters required to estimate the total commodity requirements and costs for the country or the program
- Identify and obtain consensus on the supply planning assumptions needed to account for missing data and to estimate the effect of the key supply chain factors expected to influence the supply of health commodities
- Calculate the total commodity requirements and costs for each year of the quantification
- Plan shipment quantities and delivery schedules to ensure continuous supply for each year of the quantification
- Compare the amounts and timing of funding commitments for procurement with the total commodity costs and required shipment delivery dates as the final step in the quantification
- Explain the benefits of using the PipeLine software for obtaining the final outputs of the quantification

HOW TO USE THIS GUIDE

This general guide is designed to be used together with companion pieces that have been developed for different categories of commodities. This guide describes the overall quantification process from start to finish, provides instructions for each step in the quantification process, and cites challenges and examples from actual quantification exercises.

The product-specific companion pieces provide detailed guidance on forecasting consumption for antiretroviral (ARV) drugs, HIV test kits, laboratory supplies, malaria drugs, and contraceptives. A separate quantification exercise must be conducted for each category of commodities. Companion pieces include information on the products themselves; how they are prescribed, dispensed, and used; the types of data required; and the common assumptions that should be incorporated into the forecasting step for these commodities. These companion pieces are necessary to complete a quantification for each of these commodity categories.

INTRODUCTION TO QUANTIFICATION

ROLE OF QUANTIFICATION IN THE SUPPLY CHAIN

The approach to quantification developed by the USAID | DELIVER PROJECT and its predecessor projects is based on more than 20 years of experience conducting quantifications for a wide range of public health commodities. Quantification is a critical supply chain activity that links information on services and commodities from the facility level with program policies and plans at the national level, and is then used to inform higher level decision making on the financing and procurement of commodities. The results of a quantification can be used to help maximize the use of available resources for procurement, advocate for mobilization of additional resources when needed, and inform manufacturer production cycles and supplier shipment schedules.

Quantification is not a one-time exercise, but an iterative process with reviews and updates required year-round.

Quantification is not a one-time, annual exercise that ends when the final quantities and costs of the commodities have been determined. Quantification is a critical supply chain management activity that, once the outputs have been produced as a result of the exercise, should drive an iterative process of reviewing and updating the quantification data and assumptions, and recalculating the total commodity requirements and costs to reflect actual service delivery and consumption of commodities, as well as changes in program policies and plans over time. The results of a quantification should be reviewed and updated at least every six months, and more frequently for rapidly growing or changing programs.

Please see the *References* section of this guide for other USAID | DELIVER PROJECT documents and software products related to quantification of health commodities in resource-constrained settings.

WHO SHOULD CONDUCT A QUANTIFICATION?

For a quantification exercise to be useful and effective, the right people need to be involved in each step of the quantification process, from data collection and analysis to presenting the final results to the Ministry of Health (MOH) and other relevant authorities. The people involved in a quantification are often logistics managers, policymakers, program managers, technical experts, procurement officers, warehouse managers, and service providers. The policies determining the selection and use of the products being quantified are also specific to each program, type of service, and type of commodity being used. Therefore, it is important to consult with clinical, pharmacy, and laboratory staff that are closely involved in provision of these services and management of these commodities throughout the quantification process.

One or more of the quantification team members should have significant software database management skills. These skills are required to structure the quantification databases and then enter the forecasting and supply planning data and assumptions into the database, calculate the final drug quantities and costs, and plan the required shipment quantities and schedules to meet the total program or country requirements.

Institutionalizing local skills and capacity in quantification requires resources and commitment by all key players.

Depending on the capacity of in-country program managers and staff, external technical assistance is often required for national programs wishing to apply a proven approach to quantification. The success of capacity building efforts and institutionalization of local capacity in quantification of health commodities will depend on the level of investment in the process and the commitment of local staff to make quantification part of their job responsibilities. Detailed information on the level of effort, specific activities, and the staff skills and experience required to conduct, review, and update national quantifications is provided in the *Reviewing and Updating the Quantification* section.

A sample schedule for conducting a quantification using external technical assistance that also builds in resources and time for taking a capacity-building approach is provided in *Appendix A*.

STANDARDIZATION AS A PREREQUISITE TO QUANTIFICATION

A prerequisite for conducting quantification for any health commodity is the existence of clear, well-defined standard treatment guidelines (STGs), testing protocols, and laboratory testing menus for defining how specific products should be administered for treatment or used for testing. In the absence of reliable consumption data, quantifications are often conducted using a method which that depends on the existence of STGs, testing protocols, and laboratory testing menus, which should be clearly documented and disseminated. A critical assumption when using the morbidity method is that service providers are adhering to established standard guidelines. Therefore, standardization should precede quantification, as these guidelines form the basis of the assumptions in the forecasting step of the process.

In the case of new, rapidly expanding programs, the importance of STGs and testing protocols is magnified, as sufficient quantities of commodities must be procured to allow for expansion. In addition, many health services require multiple products to be available at the same service delivery point at the same time.

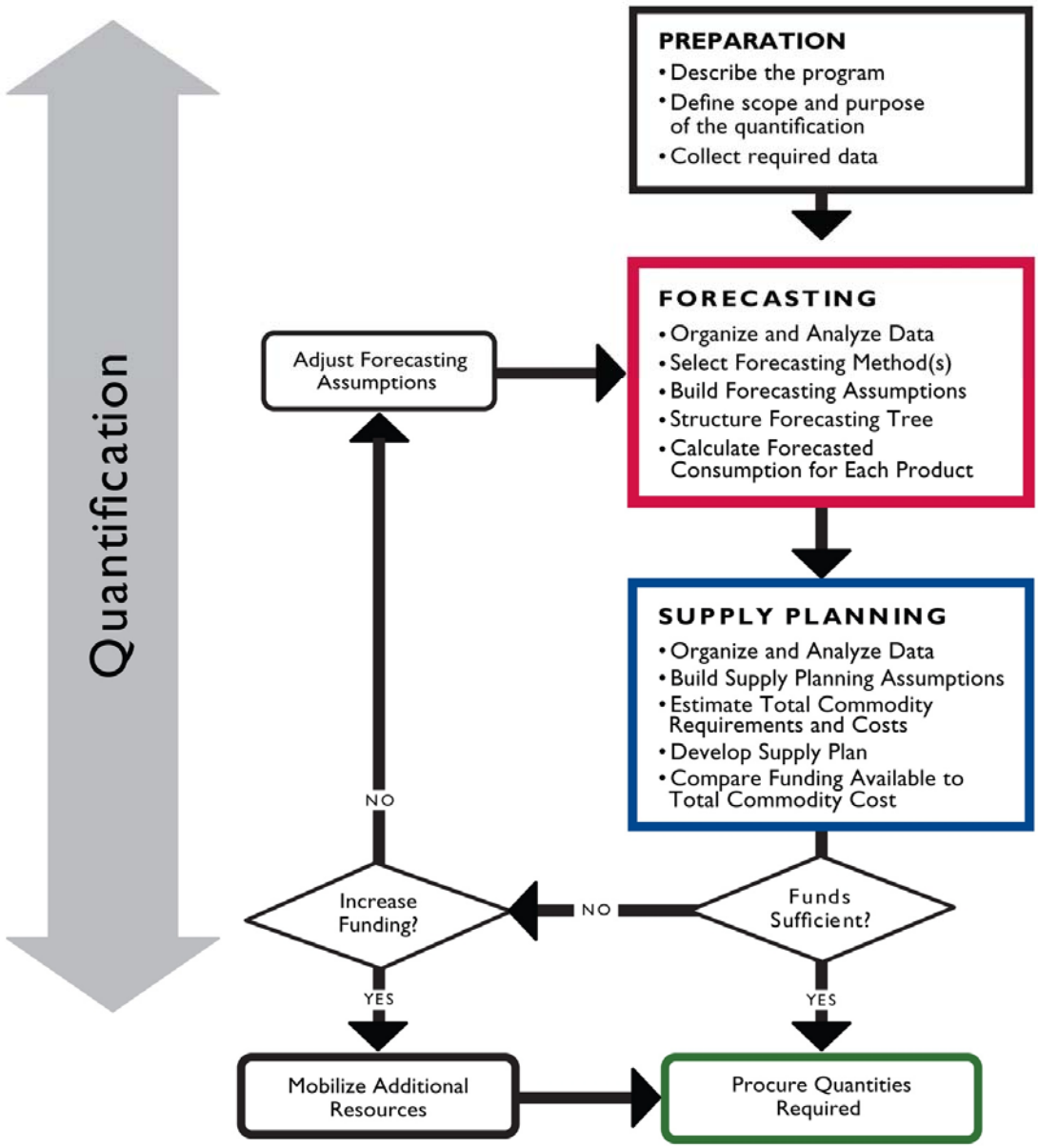
Sometimes, when conducting a national-level quantification, which could encompass programs run by the MOH along with other donors, more than one set of STGs can exist. For example, an NGO-run treatment program may utilize its own guidelines and not adhere to national STGs. In this case, the programs must be quantified separately.

Adherence to STGs can help ensure that products are used as intended and can also enhance the accuracy in the forecasting step of the quantification. Noncompliance with STGs may compromise the validity of the forecasting results and can lead to procurements that result in overstocking and wastage of some products, and stockouts of others.

STEPS IN QUANTIFICATION

This section offers a standardized, step-by-step approach to quantification. It follows the steps outlined in figure 1. The three basic steps are preparation, forecasting, and supply planning.

Figure 1. Steps in Quantification



Quantification is not a one-time, annual event. One of the outputs of a quantification exercise should be an implementation plan for routine monitoring, review, and updating of the quantification at least every six months for more stable, well-established programs, and more often if key data and assumptions change or the volume of services and commodity use differs greatly from the forecasted demand for services and consumption. The *Reviewing and Updating the Quantification* section provides more detail on monitoring and updating quantifications.

PREPARE FOR THE QUANTIFICATION/PREPARATION

Prior to collecting data, two initial steps should be taken: (1) describe the program and (2) define the scope, purpose, and timeframe of the quantification.

DESCRIBE THE PROGRAM

PREPARATION

- Describe the program
- Define scope and purpose of quantification
- Collect required data

Summarize the background, current status, and performance of the program for which the commodities are being quantified. This summary should include a review of program goals, strategies, and priorities, and any expansion plans or change in policies that may significantly influence uptake of services and demand for commodities. It should also include a brief description of the service delivery model, the supply chain, the level of political commitment, and financial support for services and for commodities. It should note any challenges the program has encountered in ensuring the supply of commodities for the program and availability of products at service delivery points. The commodities that will be quantified should also be identified and agreed upon.

DEFINE THE SCOPE, PURPOSE, AND TIMEFRAME OF THE QUANTIFICATION

Scope of the Quantification

It is necessary to define which programs and which commodities will be included in the quantification exercise. Quantification of one category of commodities, such as ARV drugs, may include commodity requirements for the public sector antiretroviral therapy (ART) program or could include the NGO and faith-based sectors as well. A quantification could also be conducted for a particular funding agency, implementing partner, geographical region, or specific population group. Best practices in supply chain management have shown that a national-level quantification of commodity requirements to cover all demand for a particular category of commodities is the most useful. A national-level quantification allows key stakeholders to know the full extent of the commodity needs and coordinate mobilization of resources for procurement.

The specific list of commodities to be quantified should be agreed upon in defining the scope of the quantification. This list could include a combination of branded and generic products; products

procured by governments and local institutions and donated by different funding agencies; or products procured from multiple suppliers.

Purpose of the Quantification

It is important to identify the purpose of the quantification and how it will address the program's needs. Examples of the purpose of a quantification include the following:

- To provide data on specific commodity requirements and costs for the government's annual budget allocations
- To inform donors about funding requirements and advocate for resource mobilization for commodity procurement
- To estimate commodity needs and assess stock status of the in-country supply pipeline to identify and correct supply imbalances
- To support an estimate of commodity procurement, storage, and distribution costs

Time Period of the Quantification

For maximum effectiveness and usefulness for procurement purposes, it is recommended to conduct a quantification of commodity requirements and costs for a rolling two-year period. This should include not only the actual quantities of each product to be procured and when, but also a shipment delivery schedule based on funding available and established program stock levels that account for procurement and supplier lead times and buffer stock. Quantifying commodity requirements and costs for a two-year period facilitates timely procurement and identification of funding gaps to mobilize needed resources before stockouts occur, or to adjust shipment schedules to avoid overstocking.

COLLECT REQUIRED DATA

The importance of available and quality services data on the number and type of health services being provided and logistics data on the consumption and stock levels of commodities for informing the quantification cannot be underestimated. A well-functioning health management information system (HMIS) and logistics management information system (LMIS) are central to improving the accuracy and usefulness of health commodity quantifications. In addition, morbidity data, demographic data, and information on national program policies, strategies, and expansion plans should be used to inform the assumptions in the forecasting step of the quantification.

Different types of data and information will be required at each step in the quantification. The data and information may be collected through interviews and consultative meetings with key stakeholders, including program managers, policymakers, donors and implementing partner organizations, procurement officers, warehousing managers, and clinical and other technical experts, as well as from direct service providers.

Specific data on the number and type of health services provided and the consumption and stock levels of individual commodities may be collected through existing HMIS and LMIS reports and through direct data collection at health facilities. In addition, current policy and technical documents and reports, and any epidemiological surveillance data, demographic health surveys, census data, or special survey studies should be reviewed to collect morbidity and demographic data that may be used in the quantification.

Data for Forecasting

- **Consumption data: quantity of each product dispensed or consumed over the past 12-month period**

  Consumption data are historical data on the actual quantities of a product that have been dispensed to patients or consumed at a service delivery point within a specified period. These data may be reported monthly, bimonthly, or quarterly. Daily consumption data can be found in pharmacy dispensing registers or other point-of-service registers. Where a well-functioning LMIS captures and aggregates these data from service delivery points, aggregated consumption data can be found in monthly facility-level and annual program-level reports. When consumption data are used, the forecast is based on the quantities of products consumed in the past. Consumption data are most useful in mature, stable programs that have a full supply of products and reliable data.

- **Services data: number of visits, number of services provided, lab tests conducted, treatment episodes, or number of patients on treatment over the past 12-month period**

  Service data are historical program-level or facility-level data on the number of patient visits to facilities, the number of services provided, the number of fever episodes, or the number of people who received a specific service or treatment within a given period. Service statistics data can be found in program monitoring reports, HMIS data, facility-level data on service utilization and attendance rates, or patient records.

- **Morbidity data: incidence and prevalence of specific diseases/health conditions (may be available by population group or through surveillance or research study group, and extrapolated to estimate national-level incidence and prevalence of specific diseases/health conditions)**

  Morbidity data are estimates of the number of episodes of a specific disease or health condition that will occur in a common denominator of the population (e.g., number of episodes per 1,000 or per 100,000 population).

- **Demographic and population data : population numbers and growth, demographic trends**

  Demographic data are data on the proportion of a specific population estimated to be affected by a specific disease or health condition that requires a specific treatment. In some cases, these population-based figures are further refined to estimate a more segmented population that may actually have access to a health facility where the services are provided. Demographic and morbidity-based estimates are often used to estimate the total unmet need for a service or treatment in a program or country, and therefore would represent the uppermost bounds of the potential drug requirements for a program.

- **Information on current program performance, plans, strategies, and priorities, including specific program targets for each year of the quantification.**

  The quantification team may be able to utilize target data. In some situations, program targets are also "political targets" that do not relate to the actual number of patients being served or who can be served by a program. Broad "political program targets" of this type are best used for advocacy and resource mobilization, and should not be used for quantification of products for procurement. Sources of program target data include program planning documents, national policy and strategy documents, and materials published for dissemination and advocacy.

See figure 2 for more information on each type of data for forecasting.

Data for Supply Planning

Data for the supply planning step are different from the data for the forecasting step. Data for both the forecasting and the supply planning steps may be collected at the same time, such as during meetings or consultative workshops with stakeholders. For example, if a quantification is being conducted for a national ART program and there are multiple donors, each with its own record-keeping system, it may be easiest to gather data on both past program performance and any shipments on order at the same time.

The monthly forecasted consumption of each product for each year of the quantification is the major output of the forecasting step and also **is the key input data to the supply planning step**. Other data that are required for the supply planning step include

- National- or program-level stock on hand (preferably from physical inventory) of each product to be quantified (should include losses and adjustments)
- Expiration dates of products in stock, to assess whether they will be used before expiration
- Quantity on order: any shipment quantities of product(s) already on order, not yet received
- Procurement lead time(s)
- Supplier lead time(s)
- Established shipment intervals and current shipment delivery schedule
- Established national- or program-level maximum and minimum stock levels
- Product information
  - Verify patent status, registration status, prequalification status if applicable
  - Verify whether all products are on the National Essential Medicines List
  - Identify specific product characteristics (formulations, dosages, number of units per pack size, unit cost, and others)
- Supplier information
  - Supplier prices
  - Supplier packaging information
  - Supplier lead times
  - Shipping and handling costs
- Funding information
  - Identify all funding sources for procurement of commodities
  - Verify amount and timing of funding commitments by funder
  - Confirm funding disbursement schedules to determine when funding will be available for procurement from each source

- Procurement information
  - Identify all procurement mechanisms (e.g., competitive international bidding/tendering, donor procurement, or local procurement) for all products to be quantified
  - Verify procurement lead time for each procurement mechanism
- Distribution information
  - Customs clearance fees
  - In-country storage and distribution costs (if applicable)
  - In-country sampling/quality testing costs

Information on Programmatic, Environmental, Societal, and Behavioral Factors Expected to Influence Demand for Services and Commodities

The following are examples of programmatic and environmental factors that may affect demand for services and commodities and may need to be taken into account in the forecasting assumptions:

- Changes in policies and STGs mandating product selection and how products are to be prescribed, dispensed, and used
- Emergence of new products and formulations on the market
- Changes in amounts and timing of financing available for commodity procurement
- Changes in program priorities, strategies, and goals, particularly targets for coverage (e.g., provider-initiated testing and counseling [PITC], emphasis on early infant diagnosis [EID], pediatric ART, ART lab diagnostics and monitoring, increased focus on home-based care and nutritional support) that result in demand for new commodities or may create variation in consumption of existing commodities
- Seasonality in incidence of specific diseases/health conditions
- Geographical variation in incidence of specific diseases/health conditions
- Changes in political, legal, or regulatory environment (e.g., community-based distributors have been recently authorized to distribute injectable contraceptives, second-line ARV drugs are rolled out down to the district level, or products are now available free of charge)
- Societal and behavioral factors (e.g., reduction in stigma affects demand for ARVs, wider use of bednets reduces incidence of malaria)

FORECAST CONSUMPTION/FORECASTING

ORGANIZE AND ANALYZE THE DATA

Multiple types and sources of data may have been collected, ranging from LMIS reports to number of patients treated or clients served, to incidence and prevalence rates of disease. Once the forecasting data have been collected, they should be organized by type of data, either consumption, services, morbidity, or demographic (see figure 2). Program targets for the two-year quantification period should also be included if available.

One of the most critical steps for the quantification team is to assess the quality of the data to determine if they can be used for the quantification. Some considerations for data quality include the following:

FORECASTING

- Organize and Analyze Data
- Select Forecasting Method(s)
- Build Forecasting Assumptions
- Structure Forecasting Tree
- Calculate Forecasted Consumption for Each Product

- What is the facility reporting rate? How many of the facilities that should be reporting consumption and/or services data have reported? Reported data must be adjusted to accommodate for nonreporting facilities. The lower the reporting rate, the lower the quality of the data. With very low reporting rates, it is not likely that data can be extrapolated to represent a national picture.
- For consumption data, did facilities experience stockouts at any time? If the program has experienced stockouts of products, past consumption data will underestimate what the consumption would have been if products had been continuously available at all facilities, and adjustments will be required to cover the stockout periods.
- How recent are the data? This is critical for all types of data, whether consumption, services, morbidity, or demographic data. The older the data, the lower the quality.
- Are historical data predictive of future need? Is current program performance an accurate reflection of the demand for services that will be provided or quantities of drugs that will be dispensed in the future?
- For new or expanding programs, the rate of increase in services to be provided or products to be dispensed should take into consideration past performance and historical growth rates.

It is helpful to organize the data that you have collected and analyzed into a table. Table 1 shows data that could be collected for conducting a quantification of HIV tests.

Table 1. Example Data for a Sample Quantification of HIV Tests

Type of Data	Data	Quality of Data	Other Notes
Consumption data	Central-level issues data Central-level stock on hand	Complete monthly issues data for the past 12 months	No stock on hand at facilities available Site-level consumption data not available
Services statistics	Number of clients tested, according to MOH monitoring and evaluation (M&E) reports. This includes numbers of people tested for voluntary counseling and testing and prevention of mother-to-child transmission (PMTCT). Number of antenatal care (ANC) visits	75% reporting rate for the past 3 months	No data available on numbers of tests used for blood safety No data available on numbers of tests used for training
Morbidity data	HIV prevalence rate	1 year old	Adult prevalence rate only. No prevalence rate available for under 15 years old.
Demographic	Total population	3 years old	No population growth rate available

The quantification team will need to formulate assumptions on current program performance where data are missing or of questionable quality, such as unreliable, outdated, or incomplete data. Once all historical data have been evaluated and adjusted, the quantification team will need to formulate and gain consensus on all assumptions about future program growth and any increase or decrease in demand for services and commodities to forecast quantities of each product that will be needed during each year of the quantification.

SELECT THE FORECASTING METHOD(S)

Essentially, two types of forecasting methods exist: the consumption method and the morbidity method. The difference between the two methods is the basis from which the forecast starts. The consumption method uses consumption data to estimate the future quantities of each product that will be dispensed or consumed during each year of the quantification. This method involves analyzing historical consumption trends and making assumptions about factors expected to influence the demand for individual products during the period of the quantification. With the consumption method, the quantification is based on quantities of products historically consumed. With the morbidity method, the data utilized could be services data, morbidity data, or demographic

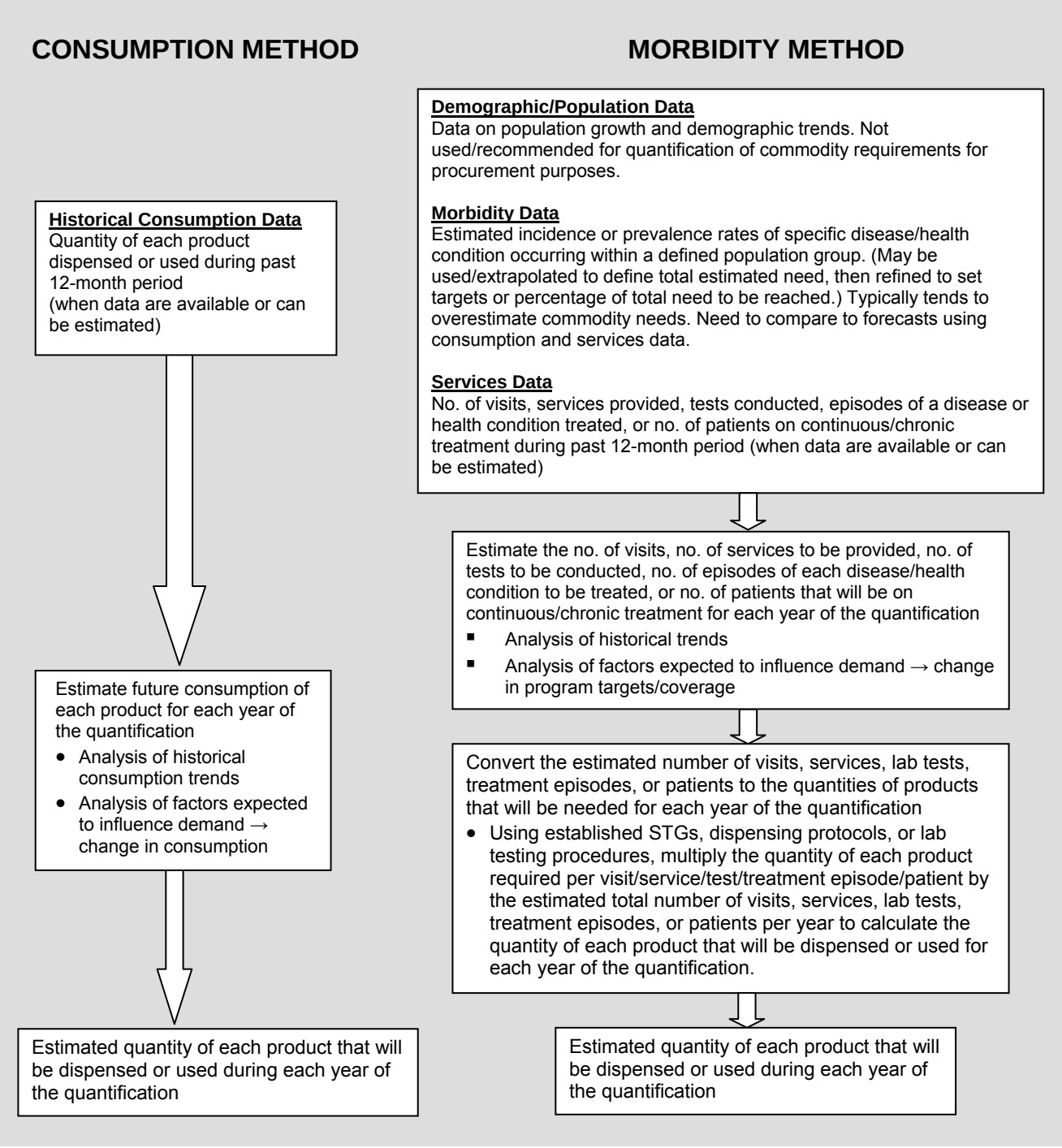
data. For the morbidity method, services, morbidity, and demographic data as well as program targets (e.g., number of patients or clients served, number of treatment episodes/number of percent of population, or program targets for expanded service coverage) are used as the starting point, and these must be converted into quantities of products. More information on converting the total number of episodes/clients/population into numbers of products can be found in the *Calculate Forecasted Consumption for Each Product* section.

- The consumption method estimates the number of products expected to be consumed.
- The morbidity method estimates the number of people or episodes of a disease that are expected to be treated, and then translates these into the number of products expected to be consumed.

After organizing and analyzing the data and evaluating the quality and usefulness of the data, the quantification team should select the appropriate forecasting method(s). If data of one type are of very poor quality, the team may choose to not base a forecast on those data. For example, if no consumption data exist, the quantification team may elect to use morbidity data instead. Ideally, multiple types of data should be used to calculate one or more forecasts. Then these results should be compared to arrive at final forecast consumption figures. For example, a quantification team could use both morbidity and services data and utilize the morbidity method to calculate two different forecasts, compare the resulting numbers, and then select a final forecast. In the same way, a quantification team could use consumption data and the consumption method to calculate a forecast and also use demographic data and the morbidity method to calculate a forecast. The team could compare these two forecasts and then select the final forecast numbers (see figure 2).

No matter which forecasting method is selected, the final outcome will be the quantity of each product expected to be dispensed or consumed during the quantification period.

Figure 2. Types of Data and Methods for Forecasting Consumption of Health Commodities



BUILD THE FORECASTING ASSUMPTIONS

Two kinds of assumptions need to be made during the forecasting step:

1. Assumptions on adjustments made to historical program data, when data are missing, unreliable, outdated, or incomplete
2. Assumptions on future program performance, based on factors influencing demand for services and commodities

Sample assumptions for a national quantification of HIV test kits for PITC and PMTCT for the period 2009–2011.

- Number of women receiving an HIV test as part of PMTCT services will grow by 10%, corresponding to an average of ANC attendance growth rates observed during 2007 and 2008.
- Prevalence rate for PMTCT is 18%, based on 2008 MOH M&E reports.
- New policy of provider-initiated testing and counseling (PITC) is expected to be rolled out nationally and to significantly increase number of individuals tested. Pilot PITC programs showed a growth rate of 60%, which was utilized during the first year of the quantification.
- Prevalence rate for PITC is 15.6%.
- 2,000 individuals are expected to be trained in rapid HIV test use, according to MOH training plans.

Most often, complete data are not available for a particular quantification. The most critical point in making assumptions is to document clearly and specifically which assumptions were made, and on what basis. If there are few or no data, the forecast will rely heavily on assumptions. Assumptions may include issues such as a change in STGs, products, program strategies, priorities, expansion plans, or service capacity (infrastructure, human resources availability, and capacity), client awareness of and access to services, timing and amount of funding commitments for procurement, seasonality, or geographical differences in disease incidence and prevalence.

It is critical for the quantification team to reach consensus on the forecasting assumptions. A quantification workshop is often an effective forum to achieve consensus, and should include dedicated time for clarifying, agreeing upon, and documenting assumptions. This should be a consultative process with a wide range of program implementers (program planners, procurement specialists, clinical experts, pharmacists, warehouse managers). It is important to document the sources of information and input from key informants used in making the forecasting assumptions. The quantification should be revised if any of the forecasting assumptions change.

STRUCTURE THE "FORECASTING TREE"

Once the data have been collected, analyzed, evaluated, and adjusted, and the forecasting assumptions have been determined, a "forecasting tree" needs to be constructed to organize and utilize the data and assumptions to help estimate future consumption. A forecasting tree does not

need to be constructed for a consumption-based forecast, because the starting point is already quantities of products. However, forecasting trees are necessary for forecasts calculated using the morbidity method (which may be based on services, morbidity, demographic data, or program targets) because the starting point is number of patients or clients, services, population, or episodes of disease.

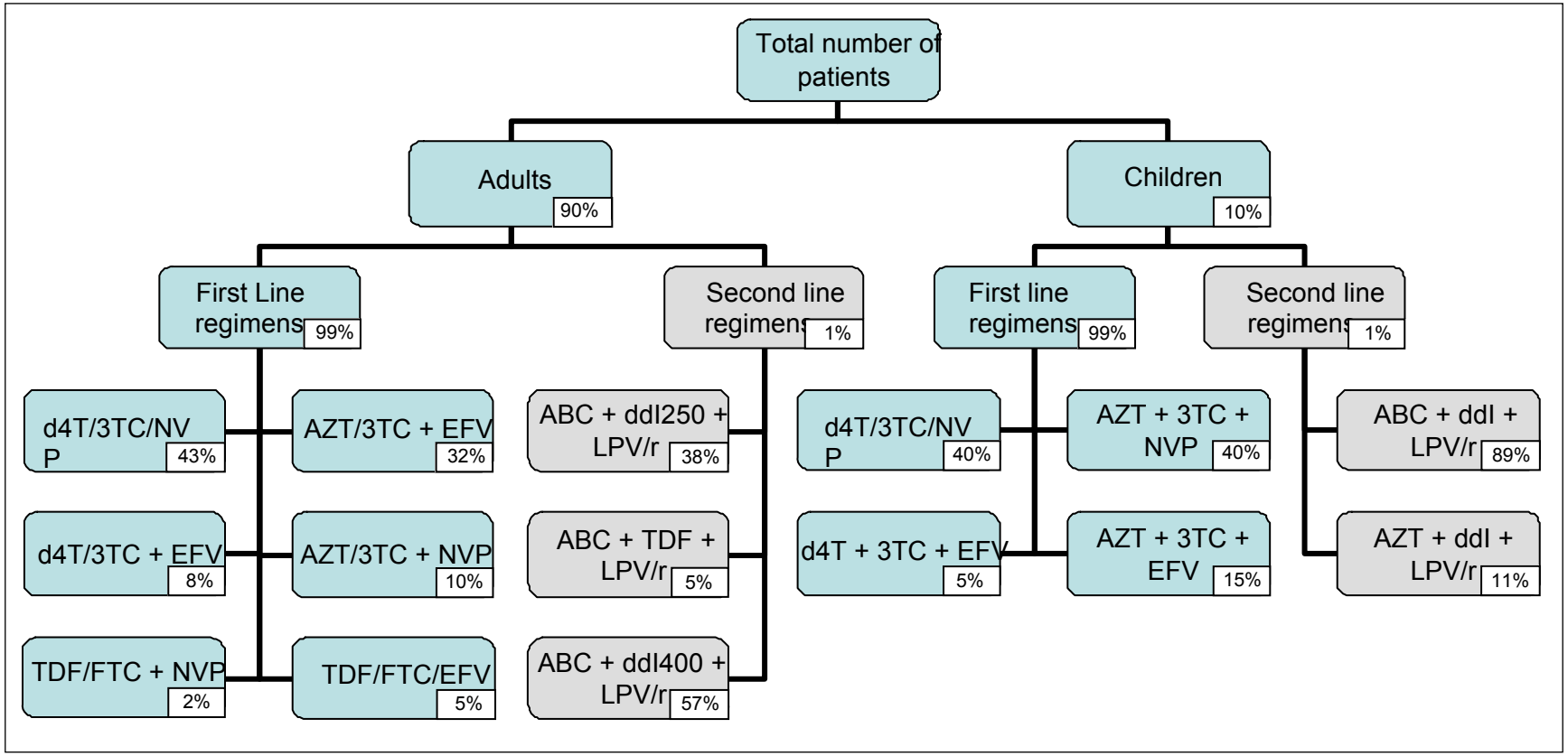
The forecasting tree is a diagram of patient groups (or health conditions) and the products required to treat one patient or one episode (see figure 3). It can be completed with a pencil and paper (no software is needed). Data required to conduct a forecasting tree are:

- STGs, treatment regimens, testing protocols, or lab testing procedures, including the list of products and specific product characteristics (e.g., formulations and dosages, and pack sizes)
- specific patient groups or health conditions

Steps for constructing a forecasting tree are as follows:

1. Identify the specific disease or health condition (e.g., ART, malaria treatment, or tuberculosis [TB] treatment).
2. Separate the logical patient groups or health conditions to be treated:
    a. For antimalarial drugs, the patient groups could be adults vs. children, further separated into complicated vs. uncomplicated malaria.
    b. For ARV drugs, the patient groups could be adults vs. children, further separated into existing vs. new patients.
    c. For TB drugs, the patient groups could be adults vs. children, further separated into Category I vs. Category II patients.
3. For each of the patient groups, list all the possible treatment regimens for each group.
4. Assign the specific drugs required for each of the possible treatment regimens within each patient group.

Figure 3. Sample Forecasting Tree for an ARV Drug Quantification



CALCULATE FORECASTED CONSUMPTION FOR EACH PRODUCT

Forecasts conducted using the morbidity method (using services, morbidity, demographic, or program target data) must be based on assumptions about the application of and adherence to current STGs, dispensing protocols, testing algorithms, or lab testing procedures. These assumptions should include information on product characteristics and how products should be prescribed and dispensed. The following example demonstrates how this can be presented and calculated:

the number of basic units of product (tablet, capsule, ampoule, bottle, test strip, ml of liquid, etc.) that should be dispensed or consumed per visit, per service, per treatment episode, or per patient, and the quantities of each product required per day or per year if forecasting for a chronic health condition

MULTIPLIED BY

the total estimated number of visits, services, lab tests, treatment episodes, or patients expected to be treated/ receive services for each year

This will yield the quantity of each product expected to be dispensed or consumed (i.e., the forecasted consumption). The forecasted quantity of each product to be dispensed or consumed should be estimated on a monthly basis for each year of the quantification for programs that are new, scaling up services, or planning to implement significant changes in polices or strategies that will affect the demand for products, as well as for new products that will be introduced or products that will be substituted or replaced with others during the year for which there are no historical data.

Example of calculating TB drugs for adult Category I patients:

- Each TB case requires 60 tablets of RHZE (rifampicin/isoniazid/ pyrazidamine/ ethambutol) and 180 tablets of RH (rifampicin/isoniazid).
- There are an anticipated 20,000 adult Category I TB cases each year.
- This yields a yearly total of 1,200,000 tablets of RHZE and 3,600,000 tablets of RH.
- As TB is not seasonal, the annual number of tablets can be divided by 12 to get a monthly estimation of consumption.
- This means 1,000,000 tablets of RHZE and 3,000,000 tablets of HR will be needed each month.

At this point in the quantification process, software can be utilized to calculate the total estimated quantity of each product to be dispensed or consumed for each year of the quantification.

For forecasts using the consumption method, the PipeLine software should be utilized. For forecasting HIV test kit needs (regardless of the forecasting method used), the ProQ software may be utilized. Forecasting consumption using the morbidity method can be done using Excel spreadsheets or a number of other software programs. A software tool commonly used for forecasting drug requirements with the morbidity method is Quantimed. See *Appendix B* for a summary of available software programs.

At this stage in the quantification, the monthly forecasted consumption for each product should have been calculated, and the team will then move on to supply planning. Output from the forecasting step is a major input to the supply planning step. See *Appendix C*, "Flow of Data in Quantification" for a diagram of the flow of data throughout the quantification process.

SUPPLY PLANNING

Typically, national quantification exercises include a commodity **forecast for a two-year period** in order to identify funding sources and mobilize additional resources to meet funding gaps if needed. Although the forecast should be done for two years, an actual procurement plan should be done for one year, where orders have been placed with suppliers and shipment dates negotiated. Developing the supply plan entails coordinating the timing of funding disbursements from multiple funding sources with procurement lead times and supplier delivery schedules to ensure a continuous supply of products and to maintain stock levels between the established maximum and minimum levels.

Organize and Analyze the Data

At this stage in the quantification, monthly forecasted consumption of each product for each year of the quantification has been calculated. In order to determine the total quantities to procure, other data must be utilized. During the preparation stage, data should be collected for the supply planning step. These data, which should now be organized and analyzed, include

- National/program-level stock on hand (physical inventory) of each product to be quantified
- Expiration dates of products in stock, to ensure they will be used before expiration
- Quantity on order: any shipment quantities of product(s) already on order, not yet received
- Established program-level maximum and minimum stock levels
- Procurement lead time(s)
- Supplier information
  - Supplier prices
  - Supplier packaging information
  - Supplier lead times
  - Shipping and handling costs
- Funding information
  - Identify all funding sources for procurement of commodities.
  - Verify amount and timing of funding commitments by funder.
  - Confirm funding disbursement schedules to determine when funding will be available for procurement from each source.

- Procurement information
  - Identify all procurement mechanisms (e.g., government or international bidding/tendering, donor procurement, or local procurement) for all products to be quantified.
  - Verify procurement lead time for each procurement mechanism.
- Distribution information
  - In-country storage and distribution costs (if applicable)
  - In-country sampling/quality testing costs
  - Customs clearance fees

As with the forecasting step, where data are unavailable, incomplete, unreliable, or outdated, assumptions must be made.

Build the Supply Planning Assumptions

As previously mentioned, the most critical point in the assumptions building process is to document clearly and specifically the sources of information and the key informant inputs on the assumptions. And as in the forecasting step, consensus must be reached among the quantification team on the supply planning assumptions. For the supply planning step, assumptions may need to be reached on the timing of available funds, lead times for each supplier, exact amounts of funding available, and estimates on arrival dates of supplies.

The quantification team will also need to make assumptions about national and facility stock levels, if the data are not available.

If a maximum-minimum inventory control system has not been formally established, the quantification team will need to make assumptions about the minimum and maximum stock levels at each level of the logistics system (facility and central levels, for example).

Example of assumptions from HIV test kit quantification for 2010–2011:

- Central-level minimum stock level is four months, and maximum is nine months.
- Global Fund Round 8 funding will be available for procurement until beginning February 2010.
- MOH will have $700,000 available for HIV test kit procurement in March 2010.

Estimate the Total Commodity Requirements and Costs

Estimating the total commodity requirements consists of determining the quantity of each product needed to

1. meet the forecasted consumption and
2. ensure that the in-country supply pipeline has adequate stock levels to maintain continuous supply to service delivery points.

The estimate of the total commodity requirements for the forecast period is determined by calculating the additional quantities of product needed to cover procurement and supplier lead times and buffer stocks, and then subtracting the quantity of each product already in stock in the country

(stock on hand), any quantities that have been ordered but not yet received (quantity on order), and any products that will expire before they are used. In some cases, the total commodity requirements may need to be reduced and shipment delivery schedules adjusted to accommodate constraints in the storage and distribution capacity of the logistics system.

At this point in the quantification, regardless of the forecast method used, PipeLine software should be used. PipeLine was specifically developed to address the unique considerations of supply planning and pipeline monitoring for public health programs in resource-poor and limited settings and its use is recommended as a best practice. If creating a database for the first time, the quantification team should enter program, product information (including pack sizes and prices), and supplier data. Please see the PipeLine User's Manual for specific guidance on how to use the software.

If a PipeLine database already exists, the quantification team should update all data inputs, including the timing and quantities of any shipments received and entered into inventory, the actual consumption of each product, and any losses and adjustments to inventory that have occurred since the last update.

Whether a new PipeLine database is being created or an existing PipeLine database is being updated, the following data should be entered:

- National stock on hand of each product at the time of the quantification, whether from a physical count or review of stock card entries
- All shipments currently on order, by supplier, with the expected arrival date
- All planned shipments by supplier, with the expected arrival date
- Monthly forecast consumption for each product (If Quantimed has been used in the forecasting step, the forecast consumption can be directly imported into PipeLine. See *Appendix D* for more information on how to export data from Quantimed and import it into PipeLine.)

At this step in the quantification, an assessment of the in-country stock status is needed to calculate the quantities of each product to be ordered that can reasonably be expected to be stored, distributed, and used before expiration. Assessment of the in-country stock status (months of stock) for each product should provide an estimate of how long the existing stocks of each product are going to last.

Develop the Supply Plan

A shipment should be scheduled to arrive when the national months of stock reaches the established minimum stock level. The quantity of product to order should bring the national months of stock back up to the established maximum stock level The quantity to order will need to be rounded up to the nearest whole unit of supplier packaging.

The next step is to estimate the cost of the total commodity requirements.

Updated sources of information on drug prices and supplier rates are needed to estimate the cost of the quantities of drugs to be ordered. In addition, information on the cost of insurance and freight, customs clearance and duties, and in-country storage and distribution costs may need to be added to the cost of the quantities of drugs to be procured if not included in supplier rates or budgeted for through other mechanisms or waiver agreements.

If price data have already been entered into PipeLine, the costs associated with a shipment will automatically be calculated.

Flexible procurement contracts with suppliers are recommended so that shipment quantities can be adjusted to respond to uptake in services, fluctuations in patient demand, existing stock levels, and rates of consumption of drugs. Agreements with suppliers may also need to include flexibility in delaying shipments into the year following the year of the forecast if uptake of services does not meet expected demand.

Compare Funding Available to Total Commodity Costs

The final decision on the quantities to procure will be determined by the amount of funding available for procurement of products. Where sufficient funding is available, the final quantity to procure of each drug will be the same as the quantity to order as a result of the quantification.

If funding is insufficient, the quantification team will need to determine whether additional resources can be mobilized. An effective venue for this can be through the presentation of the quantification results, illustrating what the funding gap is in order to ensure timely procurement and delivery of the required quantities of commodities.

If resources are insufficient and a funding gap exists, it is critical that the reduction in quantities required come from revisiting and adjusting the forecasted quantities rather than eliminating quantities required to fill the in-country supply pipeline. Shortchanging quantities to fill the pipeline will result in stockouts and undermine program goals.

In situations of non-full supply, where it is not possible to mobilize additional resources to procure the full quantities of products required, the forecasted quantities of products expected to be dispensed will need to be reduced. This is done by returning to the forecasting step in the quantification and engaging in further consultation and consensus building to adjust the forecasting assumptions. For example, for ARV drugs, the total number of patients expected to start treatment each month will need to be reduced. For antimalarial drugs, the number of malaria episodes to be treated will need to be reduced. Adjusting the forecasting assumptions will reduce the total quantities of products expected to be consumed.

After adjusting the forecasting assumptions, the quantification team will need to repeat the steps in the quantification process, through the calculation of the forecasted monthly consumption of each product to the final calculation of the actual quantities of each product to procure, to reconcile the results of the quantification with the funding constraints.

USING THE RESULTS OF THE QUANTIFICATION

The quantification team should formally present the results of the quantification to stakeholders. This enables the team to receive feedback about the assumptions that were made during the forecasting step, as well as the data sources used. Presenting the results of the quantification is an opportunity for the team to present on national stock status levels for commodities to all stakeholders, and outline the actions required to maintain adequate stock levels.

Through the presentation of the quantification results to policymakers, program managers, procurement managers, funders, and commodity managers, the following decisions and actions can be facilitated:

- Program planning and budgeting decisions
- Mobilization and allocation of funding for commodity procurement
- Coordination of multiple sources of funding for procurement
- Informing procurement actions on which products to procure, how much to procure, and when to procure
- Adjusting timing of procurements and shipment delivery schedules to ensure continuous supply while avoiding stockouts and overstocking

When conducting a presentation, the quantification team should prepare slides explaining each step of the quantification, including

- Scope, purpose, and timeframe of the quantification
- Review of all data sources used, and challenges in data collection
- Summary of the major forecasting assumptions and description of what data sources were utilized to make those assumptions
- Summary of supply planning assumptions (especially if assumptions about amounts and timing of funding commitments will affect procurement and delivery)
- Total quantities of each product required for each year of the quantification
- National stock status (months of stock on hand) for each product (PipeLine Stock Status Graphs are very useful to convey this information). Highlight products on verge of expiry, stocked out, or overstocked based on stock status analysis ([months of stock on hand]).
- Summary of shipments by supplier
- Total funding gaps for the next 24-month period

- Specific actions required to address any critical stock imbalances and maintain stocks at established levels

REVIEWING AND UPDATING THE QUANTIFICATION

Quantification does not end when the final quantities and costs have been determined; it is an ongoing process of monitoring, reviewing, and updating the forecasting data and assumptions, which in turn may require a recalculation of the total commodity requirements and costs. For the quantification exercise to be useful and effective, the forecasting assumptions and the supply plan should be reviewed and updated at least every six months, and more frequently for rapidly growing or changing programs. Ongoing monitoring and updating of the quantification is critical to keeping program managers, donors, and other stakeholders informed on the availability of drugs and is a vital precondition for timely decision making on product selection, financing, and delivery of commodities.

Reviewing and updating the quantification involves the following activities:

- Reviewing and updating the forecasting data and assumptions
- Calculating or recalculating the forecasted consumption (using Quantimed, Excel spreadsheets, or other software)
- Updating the stock on hand for each product
- Assessing national stock status for each product (based on product consumption and stock levels)
- Reviewing and updating shipment delivery schedules to ensure continuous supply and maintain desired stock levels
- Updating the amounts and timing of funding commitments
- Recalculating the commodity requirements and costs over time
- Estimating and updating funding needs and gaps for procurement

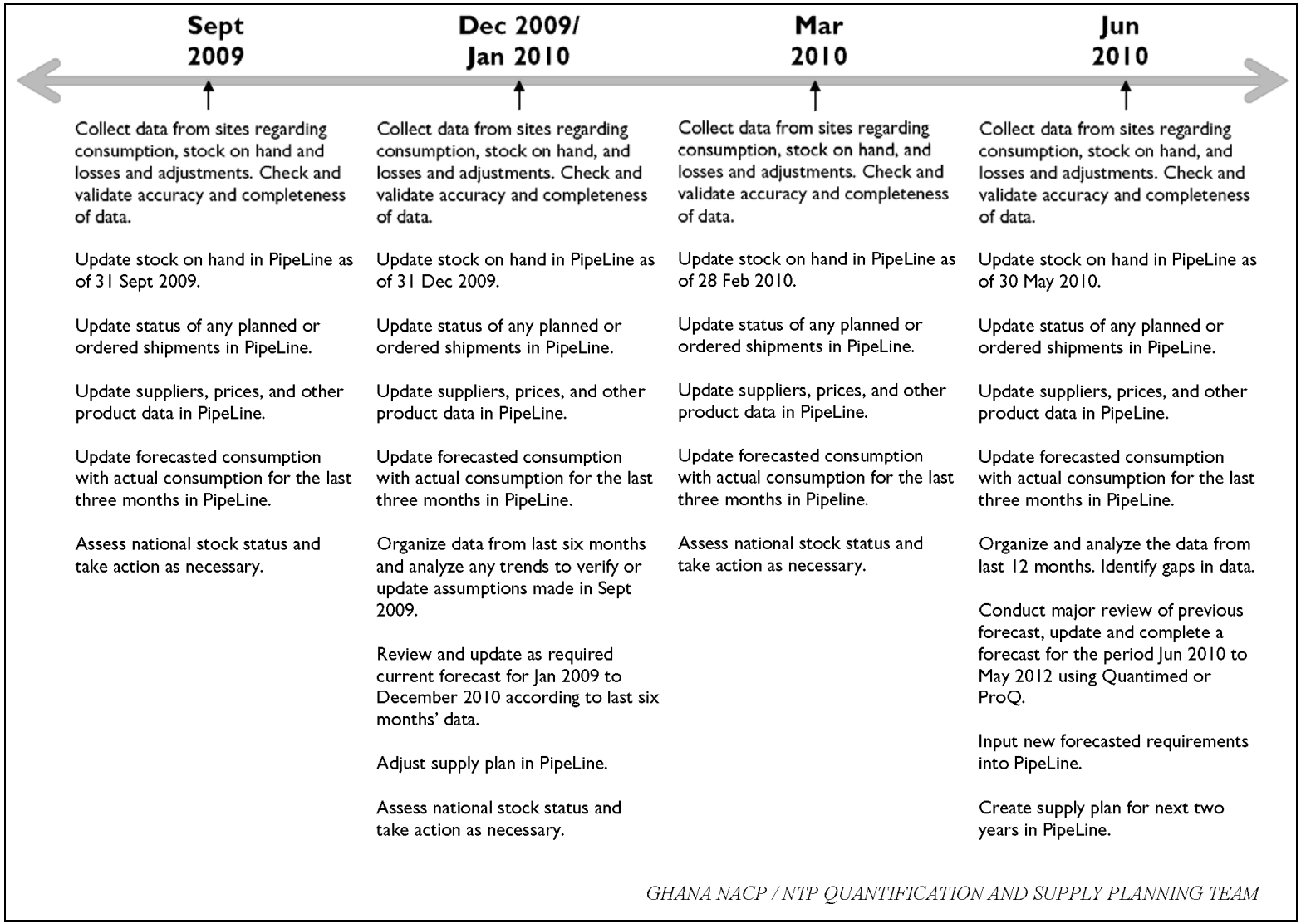
Knowledge and Skills Required

Ideally, the same core team of people who conducted the initial quantification should conduct routine updates. The knowledge and skills required to complete a quantification for health commodities include the following:

- For each commodity category, expertise in the specific program area and knowledge about the commodities and how they are used
- Computer literacy and proficiency in the use of Microsoft Excel spreadsheets or software programs to create and manage databases
- Commitment to conduct ongoing monitoring, data collection, and updating of the forecasting data and assumptions and supply planning data to update the PipeLine database
- Preparation and presentation of quantification data and methodology and final quantification results to key stakeholders and implementers

Figure 4 shows the activities that need to be done routinely to update a national quantification.

Figure 4. Timeline for Updating and Reviewing Forecast and Supply



REFERENCES

John Snow, Inc./FPLM. 2000. *Contraceptive Forecasting Handbook.* Arlington, Va.: John Snow, Inc./FPLM, for the U.S. Agency for International Development (USAID).

John Snow, Inc./DELIVER. 2004. *ProQ User's Manual.* Arlington, Va.: John Snow, Inc./DELIVER, for the U.S. Agency for International Development (USAID).

John Snow, Inc./DELIVER. 2004. *ProQ Software.* Arlington, Va.: John Snow, Inc./DELIVER, for the U.S. Agency for International Development (USAID).

USAID | DELIVER PROJECT, Task Order 1. 2007. *PipeLine Software Version 4.0.* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

USAID | DELIVER PROJECT, Task Order 1. 2007. *PipeLine Version 4.0 User's Manual.* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

USAID | DELIVER PROJECT, Task Order 1. 2008. *Guide for Quantification of Antimalarial Drugs. A Practical Guide to Forecasting and Supply Planning of Antimalarials. DRAFT.* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

USAID | DELIVER PROJECT, Task Order 1. 2008. *Guide for Quantifying Laboratory Supplies.* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

USAID | DELIVER PROJECT, Task Order 1. 2008. *Guide for Quantifying ARV Drugs.* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

USAID | DELIVER PROJECT, Task Order 1. 2008. *Quantification of HIV Test Kits: A Practical Guide for Estimating National HIV Test Kit Requirements and Costs.* Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

APPENDICES

APPENDIX A

SAMPLE SCHEDULE FOR QUANTIFICATION ACTIVITY

May 19–June 6, 2008						
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
19 **Morning** Schedule and SOW review Lusaka DHMT **Afternoon** Meetings with key-stakeholders - MOH Facility survey - Chilenja - Center	20 **Morning & Afternoon** Kabwe DHMT Courtesy call Facility surveys Kabwe General & Mine Hospitals Kalingalinga Health Center - Lusaka CIDRZ - Lusaka	21 **Morning** Visit to central medical stores **Afternoon** Meeting with key stakeholders in National Malaria Control Center	22 **Morning & Afternoon** Assumption-building workshop preparations Survey compiling and data collection	23 **Morning** Assumption-building workshop preparations **Afternoon** Facility Survey - UTH, Cancer Center Meeting with MOH and data collection	24 **Morning & Afternoon** Preparation work for upcoming antimalarial and drugs for OIs assumption-building workshop	25 **Morning & Afternoon** Preparation work for upcoming antimalarial and drugs for OIs assumption-building workshop
26 **Morning** Preparation for antimalarial and drugs for OIs assumption-building workshop **Afternoon** Workshop site visit	27 **Morning & Afternoon** Assumption-building workshop for antimalarials *Crestview Hotel*	28 **Morning & Afternoon** Assumption-building workshop for drugs for OIs *Crestview Hotel*	29 **Morning & Afternoon** Assumption-building workshop for drugs for OIs Statistics collection from University Teaching Hospital	30 **Morning** Assumption target review at National Malaria Control Center with key stakeholders **Afternoon** Initial data entry into Quantimed software	31 **Morning & Afternoon** Data entry into Quantimed and PipeLine software packages	1 **Morning** Data entry into Quantimed and PipeLine software packages **Afternoon** Quantification results analysis for antimalarials

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
2 **Morning & Afternoon** Review of results of antimalarial data with NMCC Preparation for antimalarial stakeholder meeting	3 **Morning** PipeLine data entry for OI drugs Visit to central medical stores **Afternoon** Preparation for antimalarial & OI drugs stakeholder meetings	4 **Morning & Afternoon** Stakeholders' debriefing for antimalarials *Crestview Hotel* Preparation for OI drugs stakeholder meetings	5 **Morning & Afternoon** Stakeholders' debriefing for OI drugs *Crestview Hotel* Trip report preparation	6 **Morning & Afternoon** Trip report preparation		

APPENDIX B

SOFTWARE PROGRAMS FOR QUANTIFICATION OF HEALTH COMMODITIES

Different software tools exist to facilitate the completion of the forecasting step: collection, organization, and analysis of the forecasting data and assumptions and using data to calculate the quantity of each product needed. These tools include ProQ, Quantimed, Clinton HIV/AIDS Initiative (CHAI)-developed tools, and Excel spreadsheets. The PipeLine software is used for calculating consumption-based forecasts. Regardless of the forecast method used, PipeLine is also used for the supply planning step: aggregating the total commodity requirements and costs, determining funding needs and gaps, and planning timing of procurements and shipment delivery schedules.

I. FORECASTING TOOLS

The following software tools may be used to assist in completing the forecasting step of the quantification.

ProQ

ProQ quantifies HIV test requirements based on realistic forecast demand, assessment of existing supply chain capacity, and availability of resources for procurement. ProQ offers four methodologies (consumption, services, demographic, and target) for quantifying HIV tests for national programs, and allows for comparison of results from these different methodologies. ProQ can be used in both data-poor and data-rich situations.

The ProQ software and user's manual can be accessed through the USAID | DELIVER PROJECT by sending an email to askdeliver@jsi.com.

Quantimed

Quantimed is a tool developed by Management Sciences for Health. Quantimed calculates the forecast quantities and costs of medicines and medical supplies needed to provide services for health programs. Quantimed offers three methods for forecasting medicines and medical supplies: consumption, proxy consumption, and morbidity. Quantimed can be used to forecast needs for a single health facility, a national program, or a group of geographic or administrative areas and for a variety of medicines or medical supplies, including antiretrovirals and drugs to treat opportunistic and sexually transmitted infections, malaria (bednets and drugs), and tuberculosis drugs. Quantimed can be obtained by emailing quantimed@msh.org.

CHAI Forecasting Tools (adult and pediatric ARVs and lab supplies)

The Clinton Foundation's HIV/AIDS Initiative has developed Excel spreadsheets for forecasting adult and pediatric ARVs and for laboratory commodities. These spreadsheets utilize services data and demographic data for ARVs, and demographic data for laboratory supplies. Access to these tools can be obtained by emailing procurement@clintonfoundation.org.

Excel Spreadsheets for Forecasting ARVs, HIV Test Kits, and Laboratory Supplies

Forecasts can be conducted using Excel spreadsheets. Spreadsheets will vary from user to user, but can be formatted to follow the steps in quantification outlined in this guide.

II. SUPPLY PLANNING AND PIPELINE MONITORING TOOLS

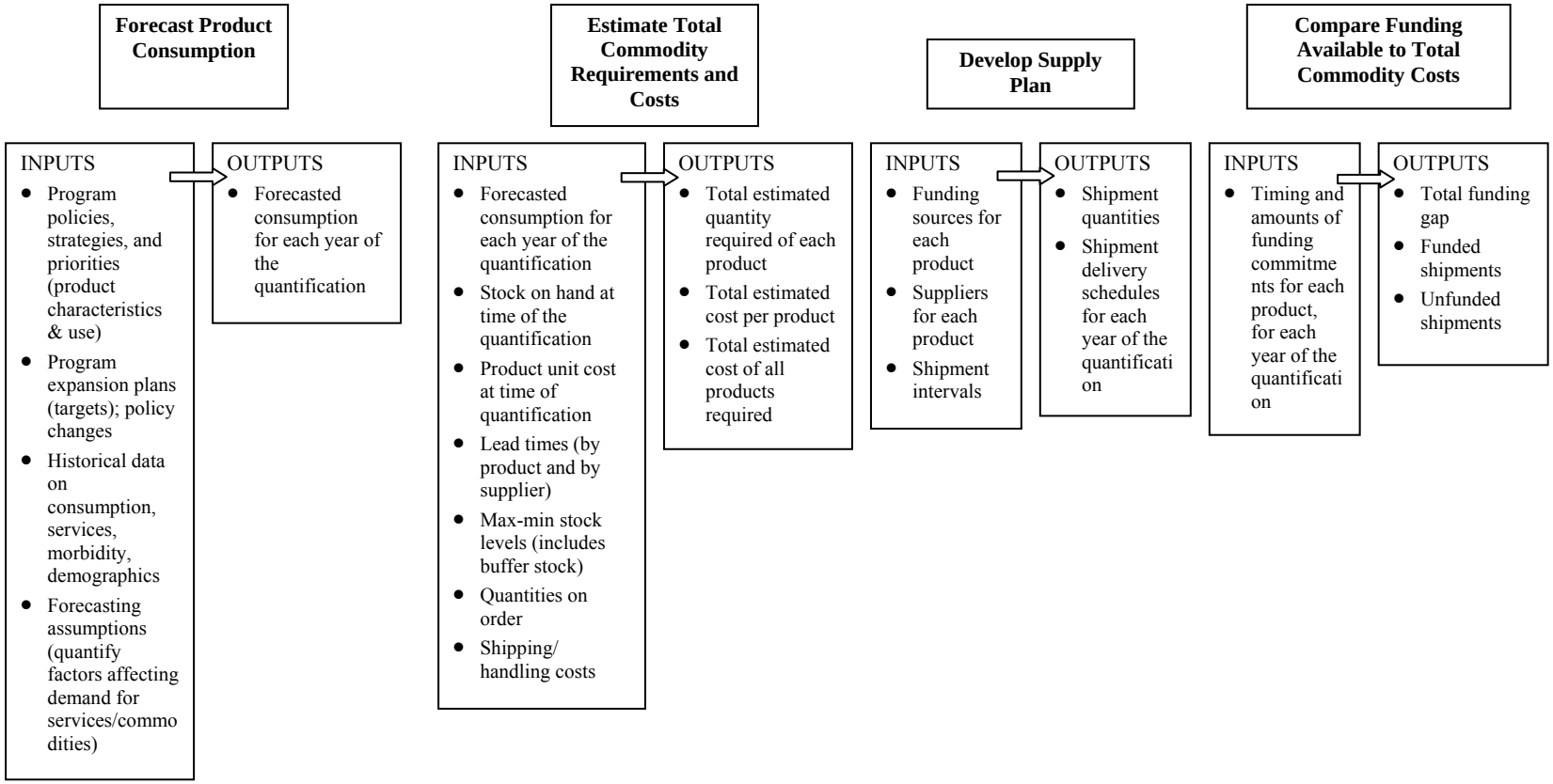
PipeLine software

The PipeLine software for pipeline monitoring and procurement planning helps program managers enter and track critical forecasting data, ensure timely procurement and delivery of products, and maintain stock levels between established maximum and minimum levels at the program or national level to prevent stockouts and overstocking. PipeLine is a central-level tool that helps users plan optimal procurement and delivery schedules for health commodities and monitor the status of shipments. Policymakers, product suppliers, and donors can generate reports, monitor the status of shipments, and use the software as a key tool in program planning. PipeLine can be used for any type of health commodity.

The PipeLine software and user's manual can be accessed through the USAID | DELIVER PROJECT's website at www.deliver.jsi.com.

APPENDIX C

FLOW OF DATA IN QUANTIFICATION

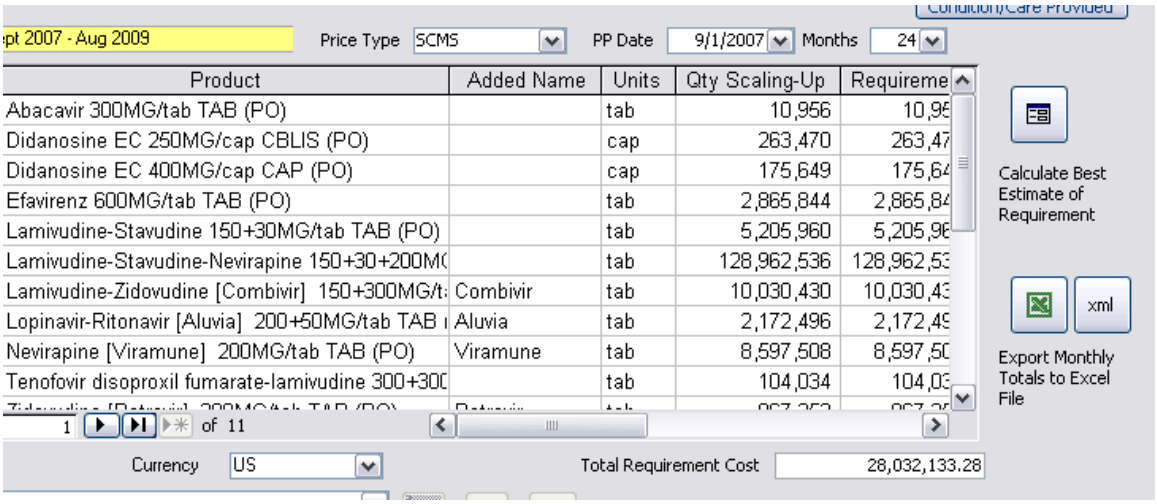


APPENDIX D

INSTRUCTIONS FOR EXPORTING MONTHLY FORECAST DATA FROM QUANTIMED INTO AN XML FILE (FOR SUBSEQUENT IMPORT INTO PIPELINE)

Check to see if version has two buttons on right-hand side above script "Export Monthly Totals to Excel File," as in figure D1.

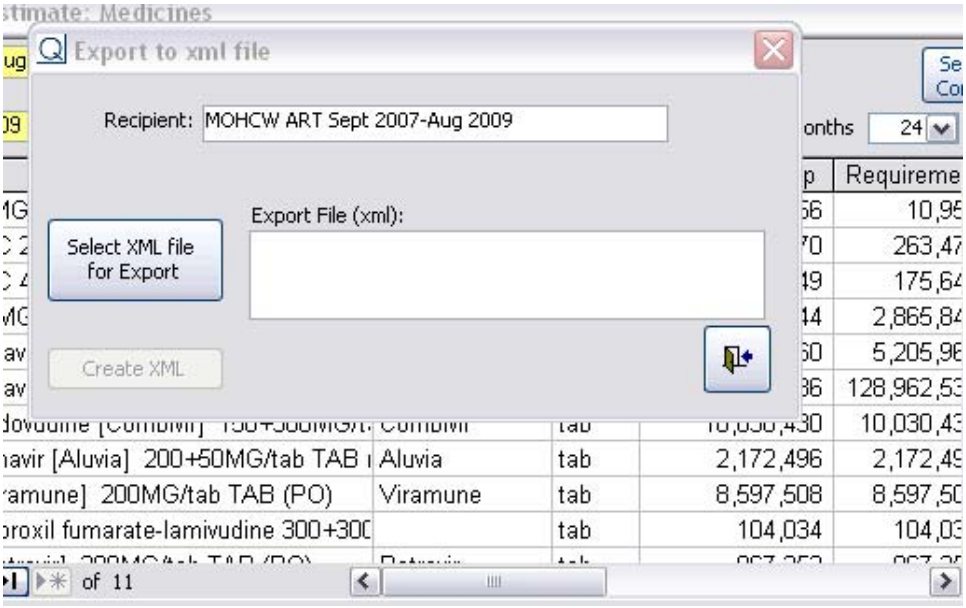
Figure D1



Make sure that the quantities displayed in the "Analysis and Reports>Scaling-up Morbidity-Based Estimate: Medicines" screen meet your required parameters for the Price Type, PP Date, and Months, and include all the Condition/Care Provided you want included in the calculation.

Click on the button marked "xml," and the screen "Export to xml file" appears (figure D2).

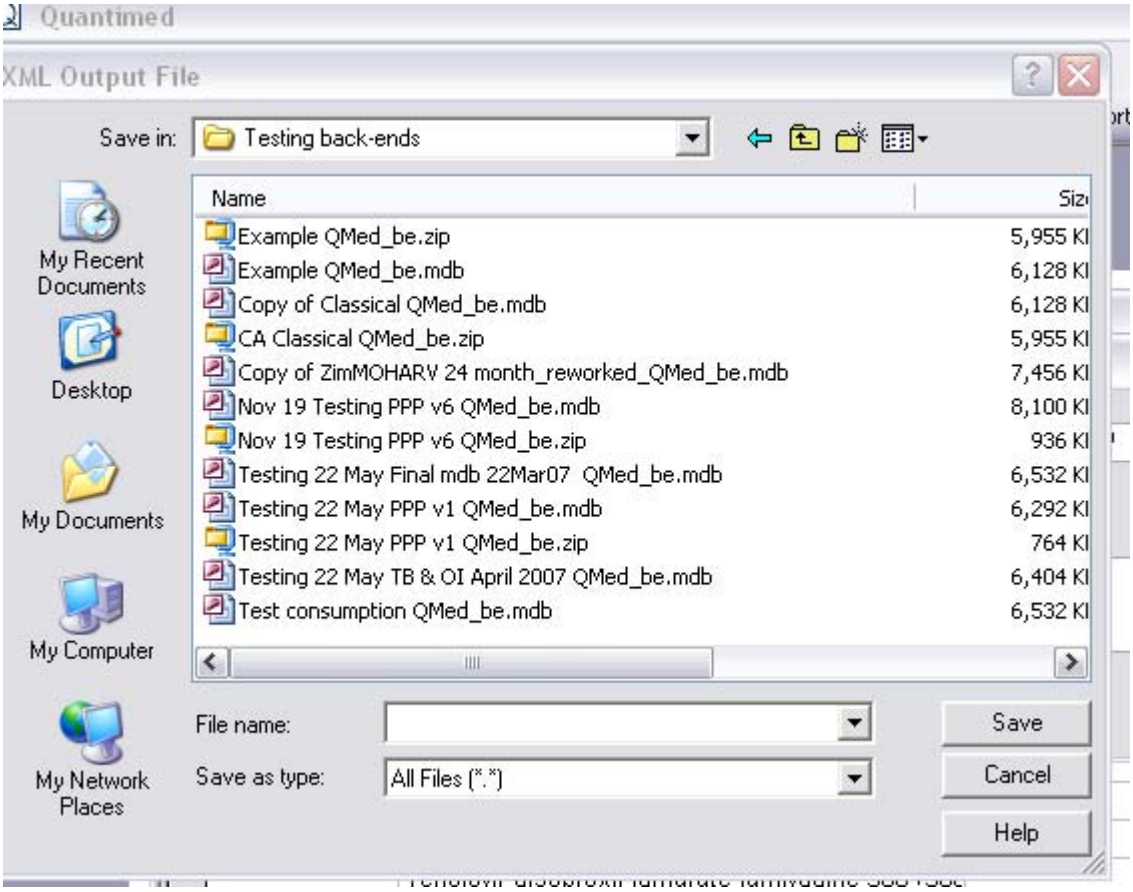
Figure D2



Note: The field "Recipient" should display with the name of the active dataset.

Click the button "Select XML file for Export"; the box in figure D3 appears.

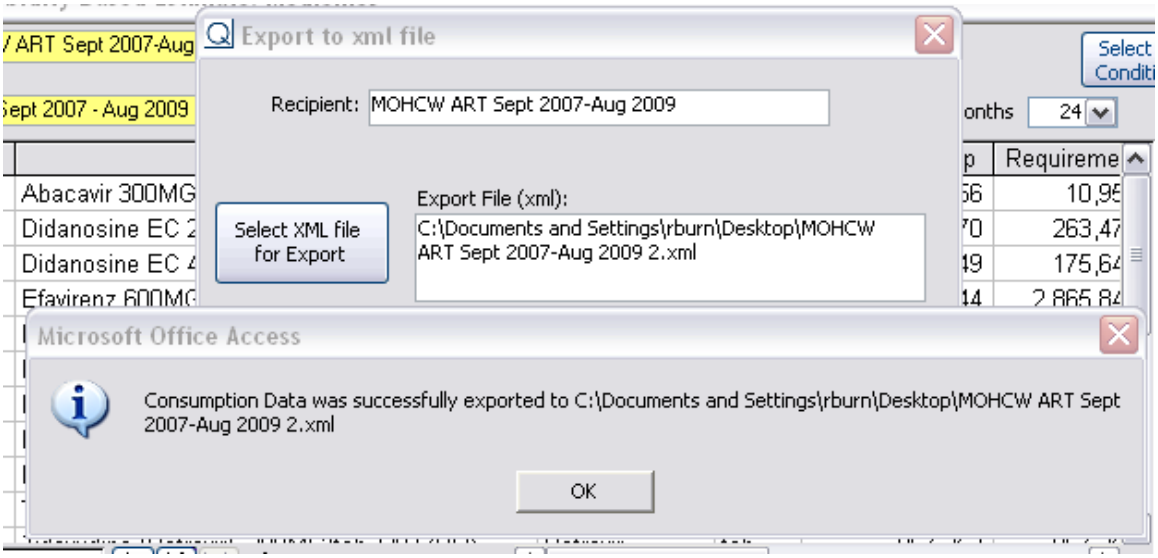
Figure D3



Select the folder to save the xml file in (could be the relevant folder under PipeLine) in the "Save in:" field; type a filename in the "File name" field; click "Save." The default filename is the name of the dataset. Remember where this is saved so that when importing into PipeLine it can be found easily.

The full path and name for the xml file will appear in the previous screen (figure D2) and the button "Create XML" is now active. Click on this button. A confirmation screen (figure D4) will appear.

Figure D4



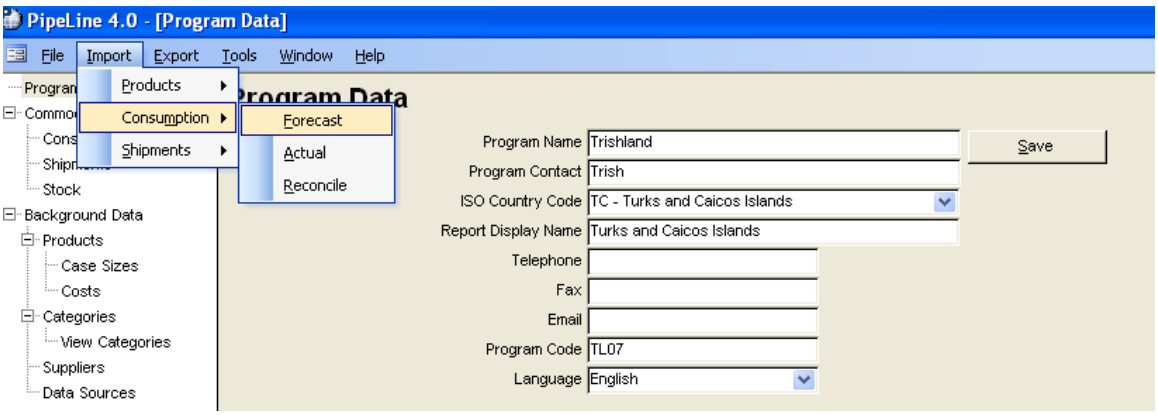
Click "OK"; you are returned to the "Analysis and Reports>Scaling-up Morbidity-Based Estimate: Medicines" screen and the xml file should be saved in the chosen location.

Import Forecast Consumption Data from Quantimed into PipeLine 4.0

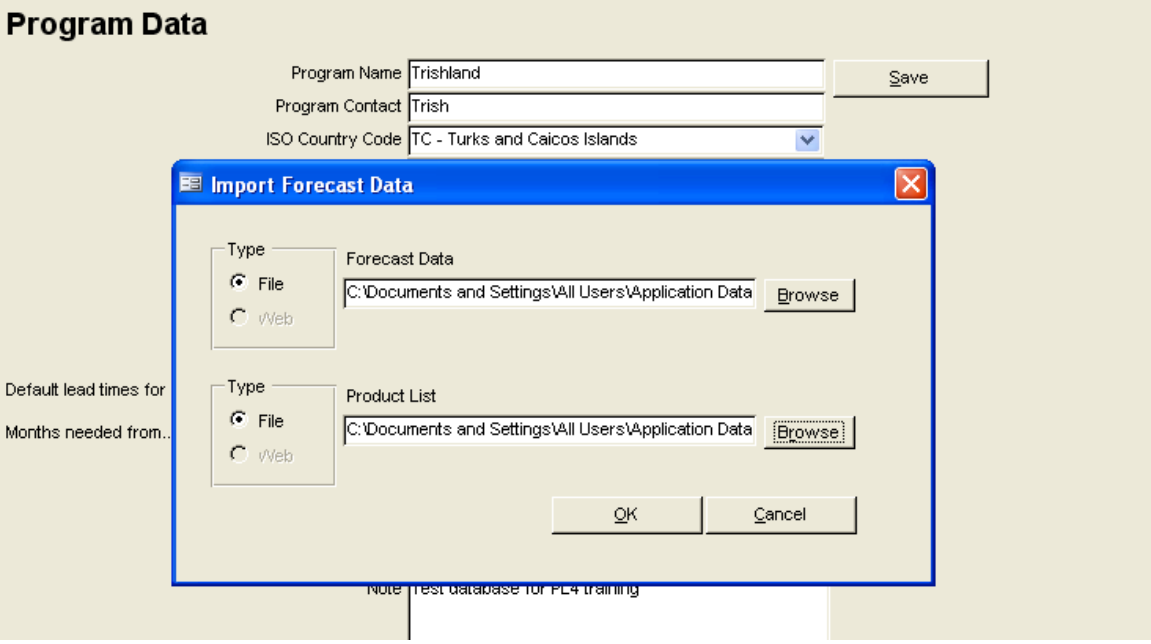
Generic instructions for importing forecast data can be found on pages A-2 through A-14 of the PipeLine 4.0 user's manual.

To import consumption data from Quantimed, you will need to have two types of files for export. One will be the consumption data (actual or forecast) generated from Quantimed; the other will be a list of products (obtainable from the Supply Chain Management System project). Both these files should be generated in XML format; that is, they will have an extension ".xml."

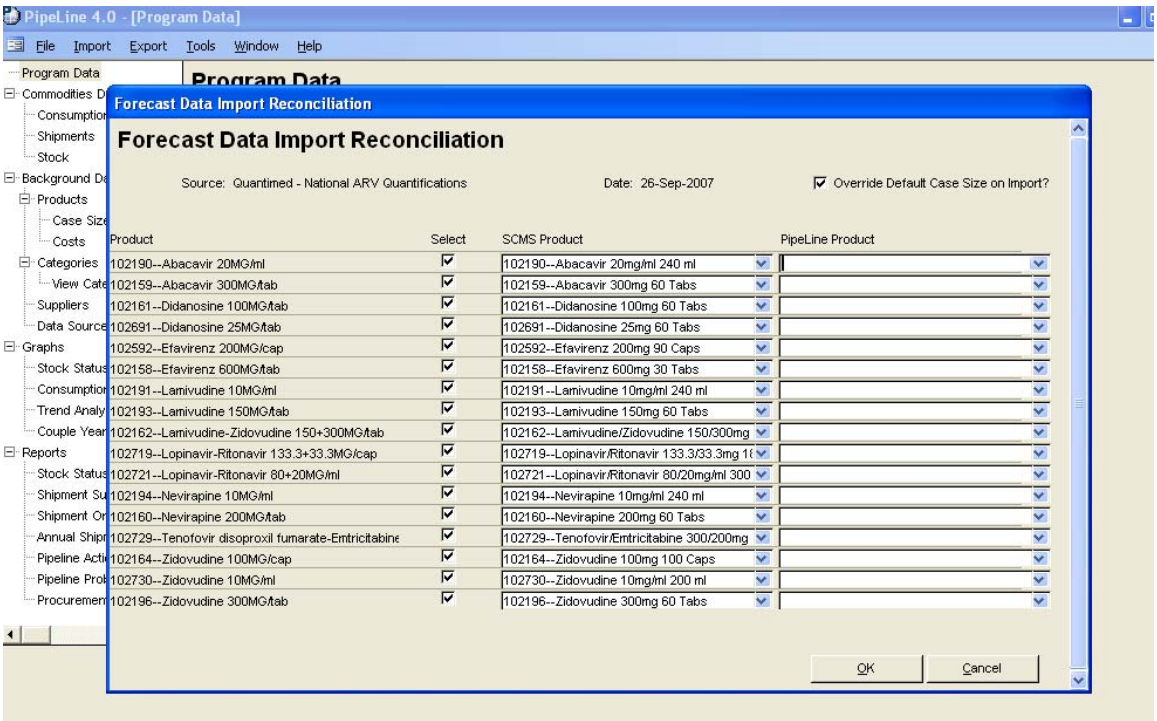
1. From the "Import" drop-down menu, select Consumption > Forecast.



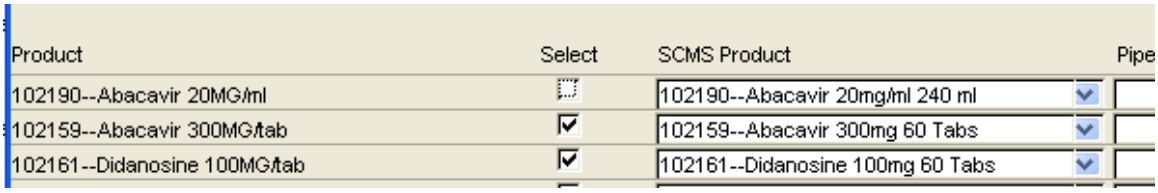
2. Select the locations of your consumption data and product list .xml files, generated from Quantimed, in the "Import Forecast Data" dialogue box.



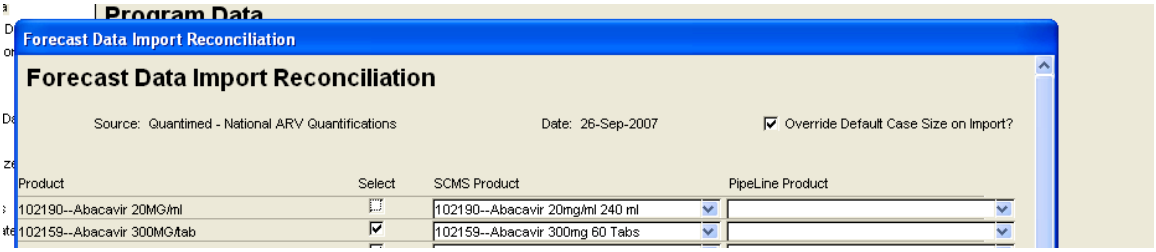
3. When you select "OK," the Forecast Import Reconciliation screen appears. If a product is already in PipeLine, it will appear in the "PipeLine Product" column on the right.



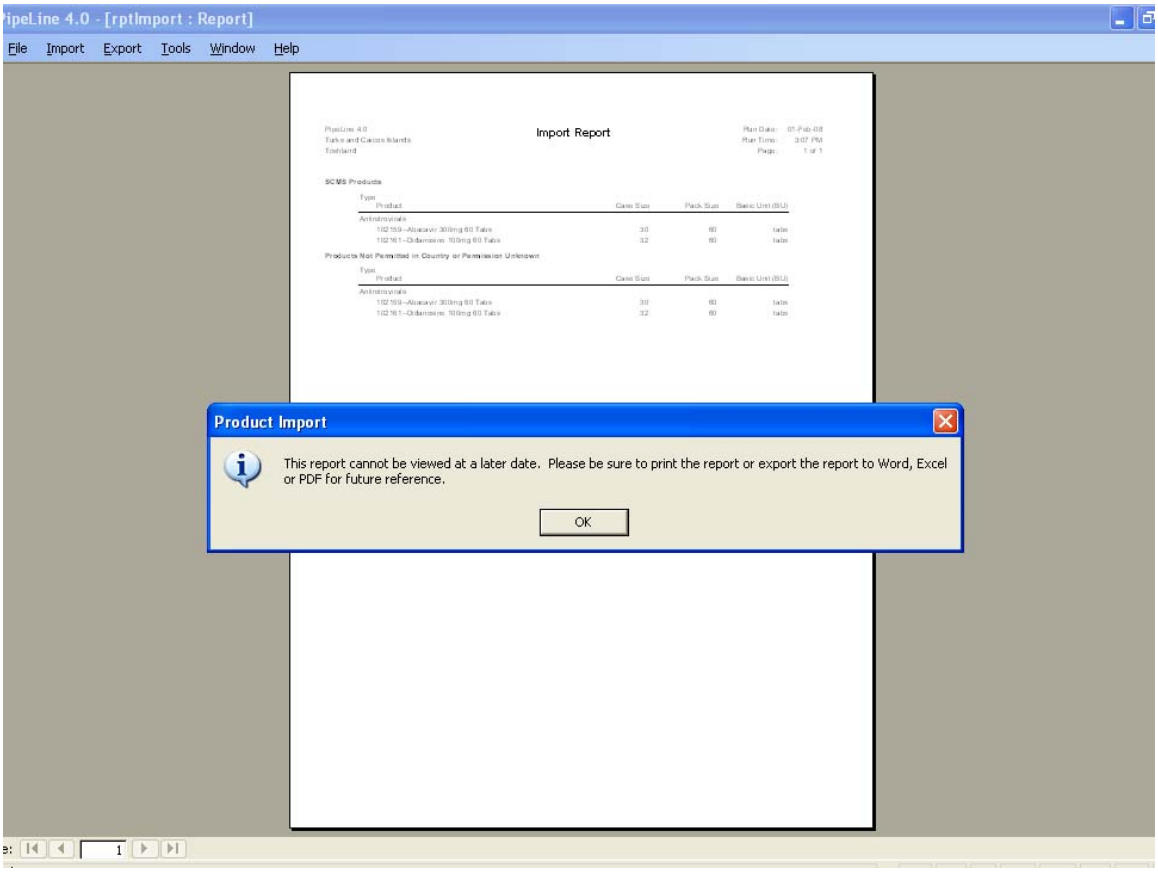
4. In the Forecast Data Import Reconciliation screen, deselect any products whose forecast data you do not wish to import, by clicking on the checkmark in the select column. The checkmark will be removed when you click on it.



5. Be sure the "Override Default Case Size on Import?" box is selected if you want to override the default case sizes already in your PipeLine database with the case sizes in the import file.



6. When you have successfully imported data, a report will be displayed confirming the data imported. This report is not saved anywhere; you should print it if you would like a copy for your records.



For more information, please visit deliver.jsi.com.

USAID | DELIVER PROJECT

John Snow, Inc.

1616 Fort Myer Drive, 11th Floor

Arlington, VA 22209 USA

Phone: 703-528-7474

Fax: 703-528-7480

Email: askdeliver@jsi.com

Internet: deliver.jsi.com