Part II.E Commodities and Logistics

- Accuracy of logistics data for inventory management
- Percent difference between consumption forecasts and actual consumption
- Existence of a multi-year procurement plan for each product offered
- Commitment by all stakeholders to carry out established procurement plans for each product
- Percent of facilities that maintain acceptable storage conditions
- Percent difference between the quantity of products ordered and the quantity actually received
- Percent of facilities that experience a stockout at any point during a given time period
- Percent of facilities whose stock levels ensure near-term product availability
- Logistics System Assessment Tool – Qualitative Indicators

Part II.E

Commodities and Logistics

The system for obtaining adequate quantities of contraceptives and other reproductive health supplies and for delivering them to service delivery points (SDPs) constitutes a critical element of family planning and reproductive health operations. Without the products that clients need and without the logistics systems to provide them, no program can expect to meaningfully improve the reproductive health of the people it serves. In short:

No product? No program

As shown in Figure II.E.1, commodities are among the key inputs to any reproductive health program, and logistics systems are among the key processes that enable program success. The figure shows the main mechanisms and sub-components of logistics processes, including logistics management, policies, human and organizational capacity, and financial resource mobilization. It also shows how logistics processes and functional outputs relate to the overall reproductive health conceptual framework shown in Figure II.E.1. These processes and outputs result in product availability to clients – the main direct result of effective logistics systems. Logistics may involve family planning products exclusively (in categorical programs), or an expanded range of reproductive or other health products, as is the case with increasing frequency in many countries. When a program mobilizes human, technical, and financial resources – with a minimum of external assistance – so that the program consistently ensures product availability, access to services, and quality of care consistently in a way that meets clients' needs, the program achieves contraceptive/commodity security. To the extent that logistics systems improve product availability and contribute to commodity security, they also contribute to increased use of reproductive health services and ultimately to improved health outcomes.

Ensuring product availability requires attention to six rights: the *right goods*, in the *right quantities*, in the *right condition*, delivered to the *right place*, at the *right time*, for the *right cost*. As shown in Figure II.E.2, the logistics system is often depicted as a cycle with components of product selection (the right goods), forecasting and procurement (the right quantities, cost), inventory management and distribution (right place, time, and cost), and provision to customers (right place, time, and cost). Information for decision-making is central to the cycle, and quality assurance and monitoring take place throughout. Meeting the needs of end users is the ultimate goal of reproductive health logistics systems, and attention to all six rights is essential to that effort.

Monitoring and evaluating logistics system performance can help managers, donors, and other stakeholders better understand this essential program component and identify ways to improve it. When using the indicators in this section, evaluators should consider the challenges present in several features of logistics systems. Some issues apply to logistics systems in general, and some are unique to integrated reproductive health systems in today's changing health care environment.

Considerations relevant to the evaluation of *any* logistics system include the following.

Methodological Challenges of Evaluating Commodities and Logistics

- **As with many other program components, the causal relation between logistics system improvements and health outcomes is complex and largely indirect.**

Many factors besides commodities and logistics contribute to long-term health outcomes. Although proving the magnitude of the contribution made by effective logistics systems is rarely feasible, it is highly plausible that better systems and increased product availability enable increased use and improved health. But it is beyond the scope of most evaluations to confirm this scientifically.

Figure II.E.1. Conceptual Framework for Logistics, Commodity Security, and Reproductive Health Outcomes

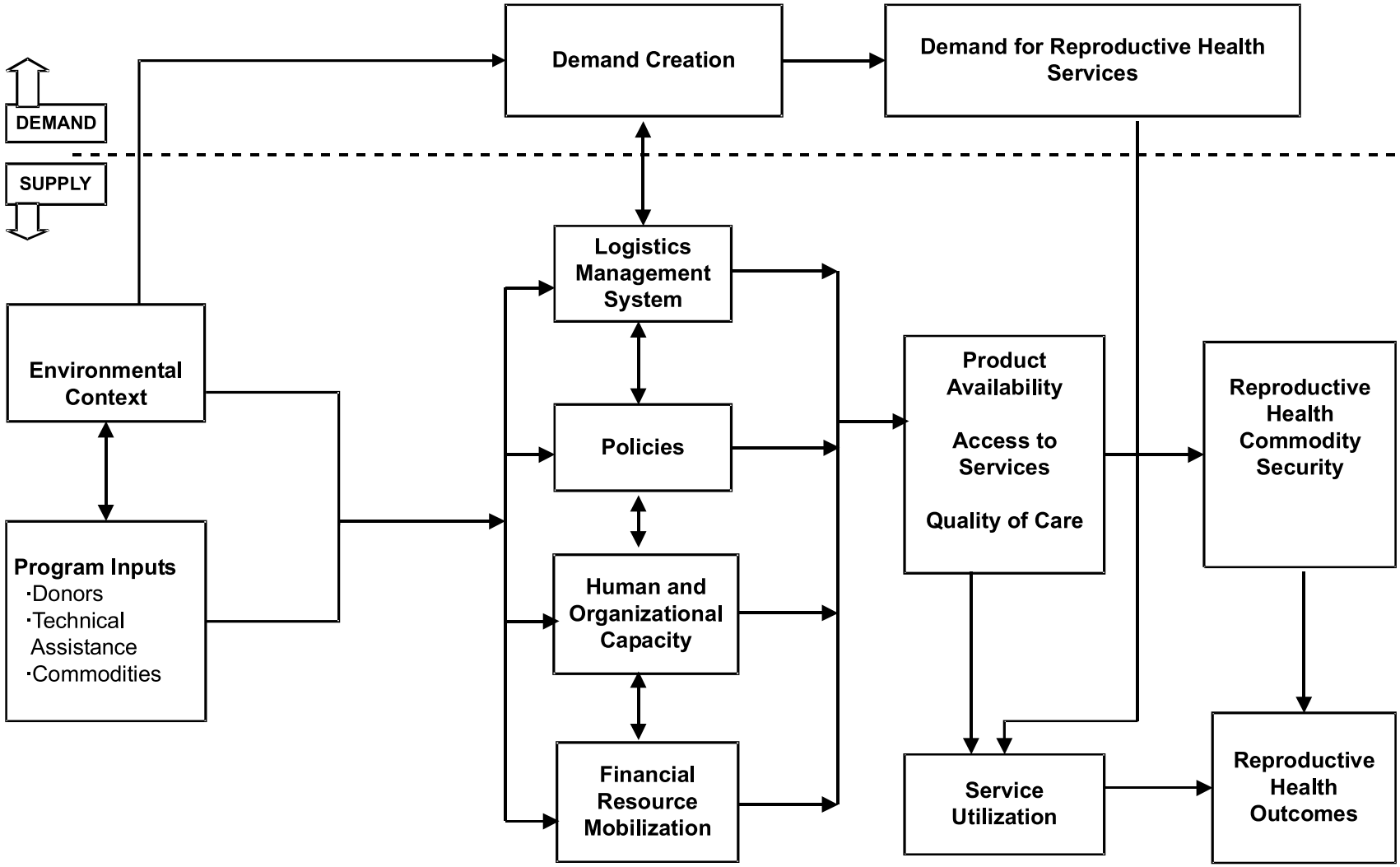
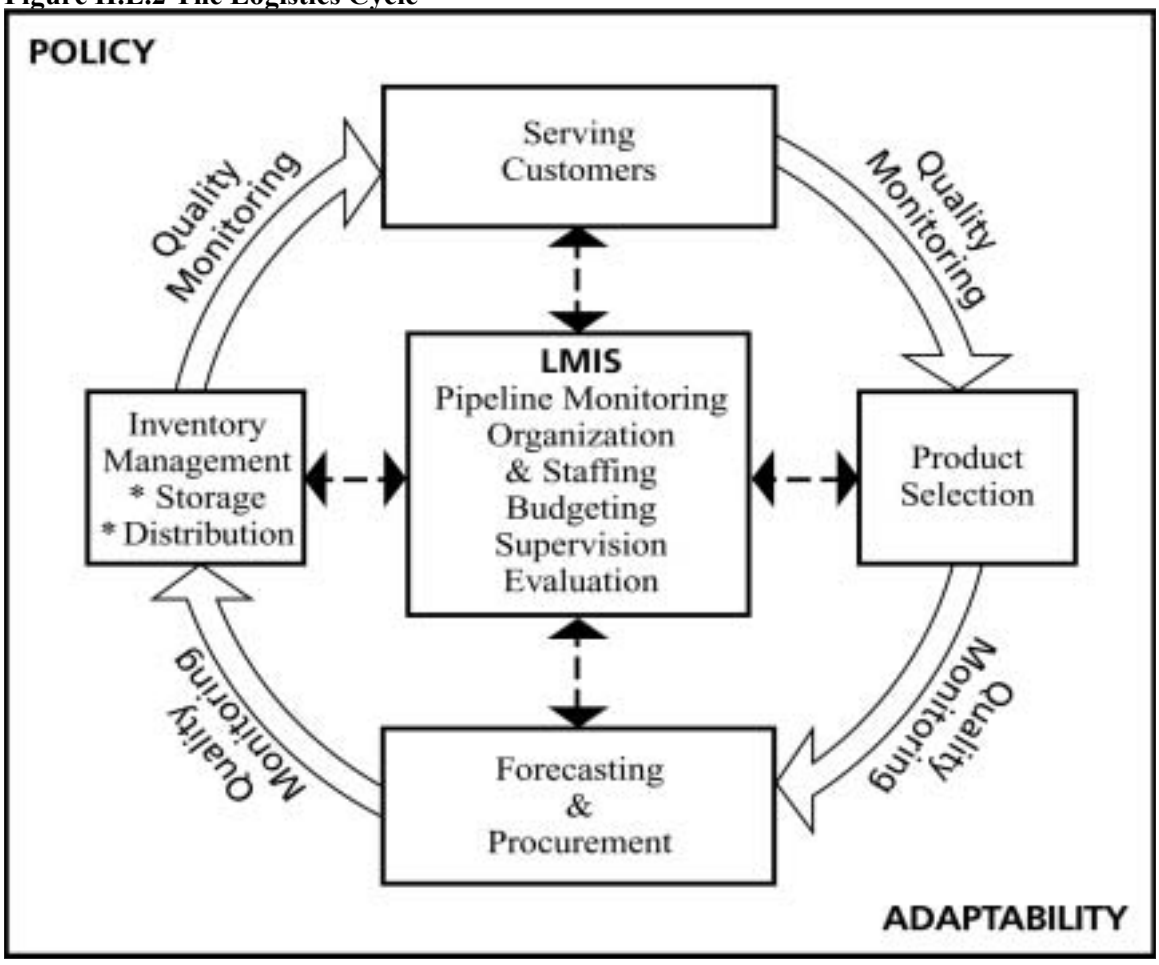


Figure II.E.2 The Logistics Cycle



Source: FPLM/ John Snow Inc., 2000.

- **Logistics indicators (especially stockout frequency and adequate stock levels) are interrelated and should be used together; interpreted separately, they can result in misleading conclusions.**

If evaluators apply the stockout indicator alone, for example, it may not reveal whether products are actually available *to clients*. If reducing stockouts is a strong programmatic priority, service providers may hoard or may ration products to avoid running out. This practice may indeed minimize stockouts, but the result to the client is still the same – no product. When evaluators apply the stockout indicator with adequate stock levels, however, they minimize counterproductive results. The stock status indicator will reveal whether a product is overstocked or under-stocked at any given time and site, an indirect indication of whether rationing is occurring and a direct measure of whether products are actually available when clients need them.

- **Evaluators should interpret logistics indicators in relation to other reproductive health indicators.**

Ensuring that supplies arrive at their intended destinations is not the only objective of a logistics system. Product needs change depending on programmatic interventions, and logistics managers need to constantly communicate with program managers to ensure that supplies go where they can be dispensed appropriately. For example, logistics must be coordinated with training. Clearly, contraceptives such as IUDs, injectables, and Norplant should go only to sites where trained providers dispense them, and where at least potential demand for the product exists. As family planning programs are integrated with a broader range of reproductive health services, these issues become important for an ever-increasing number of products, including STI and HIV test kits, STI drugs and anti-retrovirals, vaccines, and others. Unless logistics and programmatic activities are well coordinated, programs run the risk of expired prod-

ucts, stockouts, inadequate service provision, improper use of products, and ultimately, worsened health outcomes.

- **The measurement of some indicators requires specialized logistics knowledge and on-site evaluation.**

Complete logistics assessments usually require site visits by a logistics system expert. In a typical assessment, M&E specialists may be responsible for the design of tools, sampling strategy, data entry, and analysis, while the actual application of the tools is carried out by logistics experts who may or may not have M&E experience. For example, though in theory storage conditions can be self-monitored, with storage indicators captured through supervision and MIS systems, in practice, site visits by a logistics expert may be the only way to get accurate information. Moreover, a complete logistics assessment (using all the suggested indicators) requires visits to different kinds of sites at different levels, including host-country organization offices, central and district warehouses, and service delivery points, with different information collected at each. This requirement makes monitoring and evaluation of logistics systems potentially more resource intensive than the monitoring and evaluation of other program components.

If these considerations did not make the evaluation of logistics programs difficult enough, recent changes in service delivery strategies further complicate the process. Until recently (and even in many cases today), family planning logistics systems have served categorical (or vertical) programs. In such cases, those logistics systems had to ensure that a small number of contraceptive products reached their intended supply points. Monitoring and evaluation could focus on the effectiveness of those systems at achieving this relatively straightforward goal.

Two major changes in recent years, however, have led donors, cooperating agencies, host-country governments, and logistics managers to rethink the way they manage family planning logistics systems. First, the 1994 United Nations International Conference on Population and Development (ICPD) mandated a broader, integrated approach to family planning within a reproductive health context, and a focus on client rights as opposed to national demographic objectives. Second, health sector reform efforts have accelerated in developing countries around the world. This acceleration, like ICPD, has led to integration, but more to enhance efficiency and economy than to further individual rights. Health sector reform has also led to decentralization and privatization; both of which have created challenges and opportunities for logistics systems as well as for other components of national reproductive health programs. All these changes have occurred in a period of shifting donor commitment that requires greater coordination among all stakeholders, greater ability of logistics systems to adapt to differing donor procedures, and greater emphasis on demonstrating measurable results from donor inputs.

These changes have created new methodological challenges for evaluators of logistics systems in integrated reproductive health programs.

- **With the broadening of the family planning mandate to embrace a reproductive health perspective, logistics systems must manage an increased number of products.**

The number of products alone is not necessarily the problem — automated logistics systems can easily manage thousands of products. But larger systems depend on computers, and most developing country programs do not yet have the resources or capacity for automation. To put the challenge in perspective, categorical family planning logistics systems typically manage fewer than 20 - often fewer than 10 - distinct products, some with multiple brands. When family planning is integrated with programs such as HIV/AIDS, maternal and child health, integrated management of childhood illness, and malaria, the number of products expands proportionately - and the complexity of the system expands exponentially. As just one example, HIV/AIDS programs use products such as test kits, Nevirapine (for reduction of mother-to-child transmission of HIV), antiretroviral drugs, STI drugs, drugs for the treatment of opportunistic infections, home-based care kits, and all the materials needed to provide those products. The increased number and variety of products requires M&E systems to capture, analyze, and manage far more data than they ever have before. Integration may also result in a merging of logistics and health management information systems, a process that can result in the loss of essential logistics data. In practice, the best way to prevent such loss is to maintain and to manage logistics MIS separately from health MIS. If separation is impossible and the two systems merge, evaluators and logisticians should set up reporting systems to ensure that logistics information is easily and continually accessible to those who need it.

- **Beyond sheer numbers, additional products also pose special challenges in logistics forecasting, procurement, storage, and distribution.**

Because the demand for most other products is not as well known as the demand for contraceptives, forecasting needs accurately is difficult. Many products have short shelf lives and thus require more precise procurement planning and inventory management. Because logistics systems integration and decentralization complicate storage and transport, systems that were adequate in a categorical family planning program may fail as the program integrates. Thus, evaluators must measure and interpret logistics indicators in ways that result in appropriate conclusions.

For example, HIV/AIDS condoms, while functionally equivalent to family planning condoms, have a number of unique characteristics that require new ways to manage distribution and new evaluation strategies. In addition to the increased quantity needed (which affects storage and transport decisions), HIV/AIDS condoms are typically dispensed through different outlets from traditional family planning sites. Sites for HIV condoms potentially include everything from bars and brothels to markets, schools, work places, truck stops, barber shops/ beauty salons, and many more. From a monitoring and evaluation perspective, such sites may be far less prepared than family planning sites are to record and report data necessary to measure indicators.

- **Many additional products now being managed are in chronic short supply, with distribution systems based on budgetary constraints or rationing policies rather than on need.**

Family planning products have typically enjoyed strong support from donors, so that supplies are adequate to meet expected demand. Family planning logistics systems, therefore, operate on the assumption that contraceptives are "full supply" products, meaning that in a well-functioning system they should always be available. This assumption allows managers to set maximum and minimum desired inventory levels, and to try to maintain the amount of each product within that range. When a full-supply product such as a contraceptive method is within its planned "max-min" levels, it is said to be "stocked according to plan," and its stock levels are said to be satisfactory.

These measurements do not apply, however, to many essential drugs and other products purchased by national health ministries or provided by donors with insufficient budgets. Such products are purchased too infrequently, or in insufficient quantities, to prevent stockouts between procurements. Max-min inventory control systems by definition can not apply to non-full supply products, and both logisticians and evaluators must treat the desired minimum stock levels less rigidly.

Evaluators must address many factors to fully evaluate logistics system performance, and many of these factors require qualitative assessment, and expert working groups in the past have suggested a two-pronged approach using both quantitative and qualitative assessments. In response, the USAID-funded DELIVER project has developed separate tools to carry out each type of assessment: the Logistics Indicator Assessment Tool (LIAT) and the Logistics System Assessment Tool (LSAT).[1] The LIAT gathers a relatively small number of quantitative indicators to measure key output results that demonstrate whether or not the logistics system is performing well. The LSAT, on the other hand, contains quantifiable sections allowing for monitoring of changes over time, but it serves mainly as a qualitative diagnostic instrument that describes the overall system and helps identify underlying reasons for each system's strengths and weaknesses.

This section first presents the eight quantitative indicators, followed by a description of the Logistics System Assessment Tool. Ideally, evaluators should collect all the indicators as a package, providing a comprehensive picture of the characteristics of a logistics system and its performance, but in practice, not all programs can carry out such a complete assessment. In such cases, measuring any of the indicators individually is still worthwhile, with previously mentioned caveats in mind. The choice of indicators to measure will depend on program objectives, available resources, or other factors. When choosing, evaluators should recognize that product availability (stockout frequency = zero) is the most vital logistics result from the client's perspective, so in that sense, it may be the "most important" indicator. Since stockout data are usually collected through facility surveys, however, evaluators may simultaneously collect data on stock data quality, storage conditions, local forecast accuracy, order fill rates, and stock sta-

[1] Both the LIAT and LSAT questionnaires are provided in Appendix D and E, respectively. These tools are also available on-line at www.deliver.jsi.com

tus. The LIAT can be used to collect such data at the facility level, the application of which can be used to measure five of the core indicators described in this section. Data on national level forecast accuracy, procurement planning, and stakeholder commitment, on the other hand, are obtained centrally and may therefore be less costly to collect. Finally, if one wants to understand the strengths and weaknesses of a logistics system, especially from a qualitative perspective, the LSAT provides the most useful information. In sum, the indicators will be most useful when measured as a package, but if available resources do not allow for this strategy, measuring any of them individually should provide useful information.

Despite the challenges described above, the logistics indicators proposed in this chapter are similar to those used in the past by categorical family planning programs. Logistics systems —whether categorical or partially or fully integrated, large or small, health or non-health — all share fundamental characteristics. All depend on quality data to forecast needs and to order products in the right quantities. Products must be stored and transported effectively, with a minimum of wastage. Inventories should be managed in a way that minimizes the likelihood of wastage or stockouts and that maximizes product availability. Because the indicators suggested here measure all of these elements of a logistics system, they allow managers to better understand its strengths and weaknesses, and to implement interventions that ensure products are available to customers. Thus, the indicators ultimately contribute to contraceptive/reproductive health commodity security and improvements in reproductive health of the communities the program serves.

Indicator

Accuracy of Logistics Data for Inventory Management

Definition
For each method/brand/product of interest, evaluators measure accuracy of logistics data by comparing (1) the physical stock to the recorded count of that stock, and (2) the recorded stock count to the count in reports produced for logistics management information system (LMIS). The discrepancy is expressed as a percentage, as follows:

(1) Accuracy in keeping stock records (see Appendix D, Table 33A, Column 7)

$$\frac{\text{Stock record count} - \text{physical stock count}}{\text{Physical stock count}} \times 100$$

(2) Accuracy in transferring information to the LMIS form (see Appendix D, Table 33b, Column 4)

$$\frac{\text{LMIS report count} - \text{stock record count}}{\text{Stock record count}} \times 100$$

Physical stock, stock record, and LMIS report counts refer to the amount of each product that is shown as undamaged, unexpired, and available for use in a service delivery facility or warehouse. Physical stock count is determined by actually counting the stock in the store. Stock record count is recorded on forms that specific facilities use to track stock balances, transactions, and adjustments over time. LMIS report count is recorded in periodic reports that summarize stock balances, transactions, and adjustments over a period of time, and that are transmitted from one level of the system to another.

Evaluators can report each measure of discrepancy (or agreement) by facility or in the aggregate, and should report for each product of interest. It may also be useful to use these measures to calculate the percent of facilities that keep accurate stock records and produce accurate reports (defined as reports showing that discrepancies for all products fall within a margin of error agreed to by the program).

Data Requirements
Physical counts of total number of products in the facility; recorded inventory, which can be retrieved from the stock ledger or from stock cards; and LMIS reports.

Data Source(s)
Facility survey/logistics site visits to all facilities or to a representative sample

Purpose and Issues
This indicator measures the accuracy of data on product stock levels at various points in the logistics system. Since the supply chain relies completely on stock data to forecast, procure, and deliver the right quantities of product to storage and service delivery sites, this indicator is essential. It highlights the importance of data quality down to the lowest level of the system. The first part of the indicator provides information on whether facilities are accurately tracking their inventories, while the second part tells whether this information is accurately transferred to LMIS reporting forms. The first part uses information on stock levels on the day of the site visit, while the second part compares the most recent available LMIS report to the inventory record balance closest to that date. Since the latter measure requires reviewing historical stock records, evaluators may have difficulty collecting these data. This indicator may also check for leakage in the system, track timeliness in updating stock records, and determine the extent to which programs complete and submit LMIS reports.

Ideally, a program should have no discrepancies between the physical inventories and the two sources of stock level data, but in practice, evaluators should expect some errors. Acceptable levels of error will depend on conditions in each country. In general, discrepancies of over ten percent should cause concern and likely warrant efforts to improve data quality.

Related indicators:

- Percent of facilities that keep accurate logistics data for inventory management
- Percent of facilities that completed and submitted an LMIS report for the most recent reporting period

Indicator

Percent Difference between Consumption Forecasts and Actual Consumption

Definition
For all products that the program has committed to supplying, the percentage difference between forecasts previously made for a year (or other appropriate time period) and the actual consumption or issues data for that period. Evaluators should calculate the indicator for each product for which a forecast is made. If evaluators desire a mean forecast accuracy figure for all products, they should base it on the absolute values of the discrepancies calculated for each product.

This indicator is most commonly measured annually at the central level, but it can also be applied more frequently at lower levels of the system as a measure of facilities' capacity to determine their own order quantities. In either case, the basic formula is the same

This indicator is calculated as:

$$\frac{\text{Forecast consumption} - \text{Actual consumption}}{\text{Actual consumption}} \times 100$$

(See Appendix D, Table 34)

Data Requirements
List of products that the program has committed to supplying; forecasts or order requests by product for the period of interest; and actual consumption or issues data by product for the period of interest

Data Source(s)
Logistics data from LMIS reports, plus (at the national level) key informant interviews; records reviews; demographic surveys; and/or service statistics

National level forecasts and the list of products should come from government or other sources — e.g., Contraceptive Procurement Tables (CPTs) for USAID-supplied contraceptives, recommended orders to donors for essential drugs, or a government forecast of Vitamin A tablets. At lower levels of the system, the "forecasts" would be represented by order requests to the next higher level. Evaluators may obtain consumption data from LMIS reports at any level and at the national level may estimate consumption from demographic surveys or service statistics. They can obtain CPTs or national level forecasts by product through the local USAID Mission, from the USAID-funded DELIVER Project, or from host-country program managers for contraceptive products that USAID supplies. At lower levels of the system, LMIS forms can be used to obtain data on order quantities requested and consumption/issues for each facility in the most recent order period.

Purpose and Issues
At all levels of the system, accurate forecasting helps countries and organizations order the right amount of each commodity, thereby reducing the likelihood of wastage or shortages and increasing the likelihood of meeting client needs with available products. A forecast made using past consumption data and sound forecasting methodologies should approximate actual consumption within a margin of error appropriate for each product. Host-country stakeholders should agree on the allowable margin of error, and evaluators should interpret results in light of real world conditions that may have been impossible to foresee. Forecasts are subject to uncertainty for many reasons, so some errors must always be accepted, particularly at the national level when the forecast period is long. Documenting the reasons for particularly wide discrepancies (including assumptions used in preparing the forecast) helps put the results in perspective and may provide insights for improving future forecasts.

This indicator also indirectly measures data quality, since an accurate forecast can only result if the data used are of good quality.

Related indicators:

- Mean level of forecast accuracy/discrepancy for a range of facilities and/or products; and
- Percent of facilities with forecasts within 5 percent of actual consumption, by product.

Indicator

Existence of a Multi-Year Procurement Plan for Each Product Offered

Definition
For each product procured by a program, a multi-year procurement plan prospectively ensures that the product will be in stock throughout the period, and, for full-supply products, does not result in stock quantities exceeding established maximum levels. This is a yes/no indicator for each product. Ideally, procurement plans should cover three or more years, particularly for donor-supplied products, which may have very long lead times. However, given the practical realities of synchronizing procurement plans with donor budget cycles, evaluators should score a plan that meets the above criteria for at least two years as satisfactory. The indicator is scored affirmatively if columns 7 and 8 in Table II.E.1 show positive stock levels throughout the period of the plan and if stock levels for full-supply products do not exceed the established maximum level.

Data Requirements
List of products that the program has committed to supplying; procurement plan for program-wide product requirements; program-wide stock levels for each product; established maximum levels for each full-supply product; and existence of a forecast.

Data Source(s)
Key informant interviews and records review

The procurement plan should be available at the level where procurement decisions are made. Evaluators can use Table II.E.1 to determine the indicator.

Purposes and Issues
This indicator measures whether the program has adequately planned the procurement and shipping schedule for the products that it has committed to supplying and for which it has forecasted needs. Given budgetary realities, program managers may not have plans for many non-full-supply products (or the plan may be inadequate to avoid stockouts or expiration), but the indicator should measure all products nevertheless. The indicator is useful for showing policy makers and donors where shortfalls or oversupply may occur, and for advocating changes to avoid such supply imbalances. It can also be used to check whether procurement schedules make sense given factors such as shelf life of products and storage capacity relative to patterns of use.

The indicator shows only whether the plan is consistent with historical use and anticipated future consumption patterns at a particular point in time. It does not measure whether the plan is actually carried out. To determine whether products are in fact procured/delivered as planned, one must monitor over time to see whether shipments of goods actually arrived at the expected times and in the right quantity. Program staff can manually monitor small numbers of products, but may require an automated tracking system (e.g., PipeLine, available from www.deliver.jsi.com) in programs managing many products.

The indicator may measure a national program, or individual programs or levels where procurement plans are prepared.

Related indicators:

- Existence of a procurement plan for each product (whether or not it maintains adequate stock);
- Percent of shipments that arrive on time; and
- Percent of shipments that arrive in the right quantity.

Table II.E.1 Instrument for Measuring Adequacy of Procurement Planning

Established Maximum Stock Level (if applicable) = _____ Months

Month (1)	Beginning Balance (2)	Quantity Received (3)	Supplier (4)	Estimated Consumption (5)	Stock Adjustments (6)	Ending Balance (7)	Stock in Months (8)
01-Jan							
01-Feb							
01-Mar							
01-Apr							
01-May							
01-Jun							
01-Jul							
01-Aug							
01-Sep							
01-Oct							
01-Nov							
01-Dec							
02-Jan							
02-Feb							
02-Mar							
02-Apr							
02-May							
02-Jun							
02-Jul							
02-Aug							
02-Sep							
02-Oct							
02-Nov							
02-Dec							

Guidelines for Completion

- In Column 6, "Stock Adjustments," includes the projected amount of lost, expired, and damaged product for each month.

- Column 7, "Ending Balance," is calculated by adding columns 2 and 3, subtracting column 5, and adding or subtracting column 6, depending on the direction of the adjustment.

- Column 8, "Stock in Months," is calculated by dividing the ending stock balance (column 7) by the projected average monthly consumption (normally calculated as the average of the previous three, six, or twelve months of consumption from column 5). This calculation is best accomplished with PipeLine software (available on the Internet at deliver.jsi.com) or a computerized spreadsheet.[2]

[2] Table II.E. 1 is adapted from John Snow, Inc.'s (JSI) PipeLine software, which is available on the Internet at www.deliver.jsi.com.

Indicator

Commitment by All Stakeholders to Carry Out Established Procurement Plans for Each Product

Definition
For each product procured by a program, all stakeholders – donors, lenders, and program managers – have committed to carrying out the established procurement plan. Commitment from donors should ideally be in writing. Further, all commitments should include a planned shipment schedule consistent with the plan, and a confirmation of the budget allocation for the product. All of these conditions should be met before evaluators score the indicator as "yes."

This is a yes/no indicator for each product (though it could potentially be scaled, if so desired). Evaluators may wish to qualitatively assess the strength of commitment to determine whether shipments are likely to occur as promised and as scheduled. Evaluators can assess this commitment through key informant interviews.

If no procurement plan exists for a given product, this indicator does not apply.

Data Requirements
List of products the program has committed to supplying; procurement plans for program-wide product requirements, by product; and acceptable evidence (or lack thereof) of commitment to procurement, including shipment schedules and documented planned budgetary allocations.

Data Source(s)
Key informant interviews and records review of procurement planning documents at the level(s) where forecasting and quantification exercises take place

The product list, planned shipment schedules, and information about budget line item for products should also be available at the central level for each program.

Purpose and Issues
This indicator measures whether key stakeholders are committed to the procurement plan. While logistics planners may not be able to control timing of actual product deliveries, they should at least secure commitments from appropriate stakeholders and should follow up with donors to increase the likelihood that shipments will arrive as planned. Gaining such commitment is an essential component of reproductive health product security.

Gender Implications of this Indicator

Reproductive health security and contraceptive supply can be jeopardized at many points along the logistical supply system. Lack of commitment to maintain supplies of commodities that not only prevent unwanted pregnancies but also may save lives or be essential to maintain health are gender and human rights issues for which those responsible for keeping these commitments are accountable. Numerous "situation analyses" of service delivery sites conducted by the Population Council's operations research program found alarmingly high levels of stockouts of condoms in countries with high HIV prevalence. Other studies have shown that many service providers do not present condoms as a contraceptive option to clients because these providers prefer to promote long-term or more highly efficacious methods. For women who need protection against disease as well as against pregnancy, an uninterrupted supply of condoms is essential. Increasingly, as supply systems must include drugs such as antiretrovirals to prevent mother-to-child transmission and to treat AIDS, lives depend on the commitments made by each party responsible for maintaining supply — from donors and program mangers to supply and stocking personnel.

Indicator

Percent of Facilities That Maintain Acceptable Storage Conditions

Definition
Evaluators should report this indicator for each condition (see Appendix D, Table 35).

This indicator is calculated as:

$$\frac{\text{\# of storage facilities meeting each acceptable storage condition}}{\text{Total \# of facilities reviewed}} \times 100$$

Data Requirements
Checklist of acceptable storage conditions; and data collected for each condition for all facilities or for a representative sample of facilities by an observer knowledgeable about storage requirements

Data Source(s)
Facility survey/logistics site visits

Purpose and Issues
This indicator measures the conditions of storage facilities compared to a list of conditions required to protect the integrity of products. Evaluators can apply the indicator at each level of the logistics system to identify facilities that need improvement.

Evaluators should use the first part of the checklist (see Appendix D, table 35, items 1-13) to assess all storage facilities (including small storage spaces at the SDP level), while they should apply the second part (items 14-18) to larger facilities as appropriate.

Related indicator:

- Percent of facilities meeting all (or a desired percent) of the storage conditions

Indicator

Percent Difference between the Quantity of Products Ordered and the Quantity Actually Received

Definition

For each product that the program is committed to supplying, the percentage difference between the quantity ordered the last time an order was placed and the amount actually received. The indicator should be calculated separately for each product for which orders are placed between levels of the logistics system, or for which national procurement orders are placed. It can be calculated at the individual facility level, for different levels of the system, or for the country as a whole. In most cases, results will be aggregated across many facilities and orders, and in such cases, the indicator should be calculated using the sum of the absolute values of the order discrepancies for each product, divided by the sum of all order quantities.

$$\frac{\text{Sum}|\text{ quantity received} - \text{quantity ordered}|}{\text{Sum quantity ordered}} \times 100$$

Data Requirements

List of products that the program has committed to supplying or a predetermined subset of this list; amount of products requested the last time an order was placed for all facilities or a representative sample of facilities, or the amount of products ordered for the most recent national procurement; and the amount of products actually received in response to the last order or procurement

Data Source(s)

Facility survey/logistics site visits, or procurement records for national procurement orders

Purposes and Issues

This indicator measures the efficiency of a supply chain in ensuring that products reach their destinations in the quantities requested and on schedule. It can be calculated for the supply chain as a whole or for any level or facility that receives supplies based on an order to a higher level. The information can reveal which products are frequently under- or over-supplied, which types of deliveries are most apt to be on time or delayed, and which suppliers or distributors are most/least reliable. Managers and evaluators can use this information to take corrective actions and improve supply chain efficiency.

Caution should be exercised when interpreting the indicator for non-"full supply" products. Many of those products are rationed due to limited resources, so it is to be expected that they would experience greater order discrepancies than full supply products. Such discrepancies, however, may be more due to lack of funds to procure supplies than to inefficiencies of the supply chain.

Related indicators:

- Percentage of all orders that are completely filled and on schedule;
- Average duration of time between the date an order was placed and when it was received;
- Percentage of facilities that received their last order completely filled; and
- Percentage of facilities that received their last order according to schedule.

Indicator

Percent of Facilities That Experience a Stockout at Any Point During a Given Time Period

Definition

This indicator measures the percent of facilities (service delivery points, warehouses) that experienced a stockout – of a method/brand/ product expected to be provided or issued by that site – at any time during a specified period (e.g., the past 6 or 12 months). Evaluators should collect the indicator at all (or a sample of) facilities that distribute or issue products, should calculate the indicator separately for each product, and should aggregate it to calculate the percentage of facilities that experienced a stockout of each product at any time during the period. Evaluators may use Table 32, column 1, in Appendix D, to tabulate data required to measure the indicator.

This indicator is calculated as:

$$\frac{\text{\# of facilities assessed that experienced a stockout of a (}\textit{method/brand/product)}}{\text{Total \# of facilities assessed that distribute or issue (}\textit{method/brand/product)}} \times 100$$

Data Requirements

Information on stock levels of all products of interest for the past 6 (or 12) months at all levels of the system

Data Source(s)

A facility survey/logistics site visit – at all facilities or a representative sample – is usually necessary. In some countries/programs, evaluators may use logistics management information systems or supervisory records, depending on the quality of the information.

Purpose and Issues

This indicator measures product availability (or lack thereof) over a period of time, and serves as a proxy indicator of the ability of a program to meet clients' needs with a full range of products and services. Evaluators should use this indicator in conjunction with the stock status indicator and interpret it with caution, because facilities can avoid stockouts by rationing supplies. Other related indicators (see below) may shed additional light on overall product availability. For example, duration of stockouts may help differentiate between products stocked out for a short period of time (e.g., 1-2 days) versus those stocked out for extended periods. Evaluators may assess reasons for stockouts to help program managers address the underlying causes of this logistics system failure.

If national policy dictates that different brands of the same product cannot be used interchangeably, then evaluators should monitor brands separately. If the policy allows substitution of equivalent brands, and if providers make such substitutions in practice, then evaluators can monitor different brands as a single product.

Using data for a 12-month period allows evaluators to consider seasonal variations in product use, but they may have difficulty obtaining the historical data. Calculating this indicator using data for 6 months is less cumbersome because it requires reviewing fewer reports. If evaluators rely on fewer than 12 months of data, they should investigate seasonality issues.

Related indicators:

- Mean duration of stockouts;
- Percentage of facilities stocked out of any product on day of visit;
- Percent of facilities fully stocked (all products) on the day of visit;
- Mean number of methods stocked out/in stock on day of visit;
- Percentage of products stocked out/not stocked out at any time during past 6 (or 12) months; and
- Mean number of times each method was stocked out in the past 6 (or 12) months.

Indicator

Percent of Facilities Whose Stock Levels Ensure Near-Term Product Availability

Definition
This indicator measures the percent of facilities with stock levels greater than zero and below the established maximum level for each full-supply method/brand/product of interest at a point in time (e.g., the day of visit). Where stock levels are greater than zero but below the established minimum level, evaluators must find an outstanding order for replacement stock, made at or before the time stock levels reached minimum.

This indicator is calculated as:

$$\frac{\text{\# of facilities that have stock levels above zero but below the established maximum level for the product}}{\text{Total \# of facilities reviewed}} \times 100$$

(See Appendix D, Table 31, column 12)

Evaluators can report the indicator at the facility level or aggregate it for a sample of facilities or for the entire program. At any level, evaluators should calculate and report the indicator separately for each product of interest so that each product receives a unique measure. If so desired, evaluators can further aggregate to construct additional indicators, such as the percent of facilities with *all* full-supply products adequately stocked. (See related indicators below.) Averaging all products for an "average" stock level adequacy is not recommended, because oversupply in one product can cancel out undersupply in another, and thus falsely imply that average stock levels were adequate.

Data Requirements
Stock levels of all products of interest at a point in time (e.g., the day of the visit); maximum and minimum stock levels established by the program; historical consumption or issues data for each product at each facility; and records of recent orders (for products below minimum levels)

Data Source(s)
A facility survey/logistics site visit – to all facilities or to a representative sample – is frequently necessary to assess stock levels. Evaluators may collect stock data by taking a physical inventory or by reviewing the stock ledger or stock cards. In some countries/ programs, the LMIS or supervisory/ staff records may provide usable stock-level data. The LMIS should also provide maximum and minimum stock levels along with consumption data by product. Service statistics or similar records may provide the needed data on consumption or issues if the LMIS does not.

Purpose and Issues
This indicator provides an overall measure of whether stock levels of products are adequate at a point in time. It helps reveal overstock situations that could lead to product expiration and wastage, and low stock levels that could result in stockouts or rationing. In applying this indicator, evaluators must carefully evaluate facilities where stock quantities are below established minimum levels. To do so, the evaluator should determine whether a new order was placed when stock levels reached minimum. If such an order is outstanding, then the evaluator may consider stock status adequate, because the order will likely arrive before the facility stocks out. If not, the stock status is inadequate.

Evaluators should apply the indicator only to products the program has committed to keeping in full supply, because stock status at a point in time for non-full-supply products may reflect only the length of time since the last shipment arrived rather than measuring whether inventory management procedures are effective. Ideally, evaluators will measure stock status over a period of time (see related indicator, below), but this approach is usually possible only where the LMIS is automated.

Related indicators:

- Percent of time during a given period that each product of interest is adequately stocked (this indicator requires an automated LMIS system or extensive review of historical stock ledgers); and
- Percent of facilities with all full-supply products adequately stocked for near-term availability.

Indicator

Logistics System Assessment Tool (LSAT) – Qualitative Indicators

Definition
The Logistics System Assessment Tool (LSAT) allows a comprehensive system-level assessment of the performance of a logistics system for any health program managing any health commodity. Evaluators can use the tool with the other logistics indicators in this section to completely assess a program's ability to continually provide health commodities at service delivery points.

Data Requirements
System-level scores for each component and each subcomponent; and detailed information about logistics system processes

Data Source(s)
Evaluators should complete assessments by consensus among program managers or among others with knowledge in logistics management and system operations and performance.

Purpose and Issues
If the programs to be assessed are separate and vertical, the evaluator should complete this tool separately for each program. The instrument is organized according to the components of the logistics cycle shown in the introduction to this section: logistics management information system, product selection, forecasting, obtaining supplies/procurement, inventory control, warehousing and storage, transport and distribution, product use, finance, and organization/staffing. Each section contains a series of objective and quantifiable yes/no questions, as well as open-ended qualitative questions that explore strengths and weaknesses of the logistics system in detail.

The combination of yes/no and qualitative questions allows evaluators to use the tool for both monitoring and diagnostic purposes. Evaluators can average and score quantitatively the yes/no questions in each section to assess progress and improvements in a given logistics system over time, whereas the qualitative ones can help evaluators more clearly understand the system's strengths and weaknesses. Qualitative questions should also reveal the causes of areas of weakness and potential ways to improve them.

The main issue to consider when using the LSAT (from a monitoring perspective) is its potential subjectivity. If evaluators use a consensus exercise to answer each question, experts may disagree about what the response should be. In general, most yes/no questions are as objective as possible, so evaluators should easily find evidence to support one side or the other. In some situations, a condition may be met at some levels of the system or in some regions of the country, but not in all. In general, most questions require that the condition be met at all levels (central down to SDP) to receive a "yes" answer, so again, most scoring should be unambiguous. Finally, the question of reliability of scores over time may be an issue, given that different facilitators or participants may be involved (though evaluators are advised to maintain group consistency to the greatest extent possible). As with the other examples, this potential problem is minimal because the yes/no questions are as clear and objective as possible, but subjectivity can never be completely eliminated. Evaluators should always consider this limitation when they interpret the LSAT's results.

The following summary is a partial listing of the information collected in each section of the instrument (see Appendix E for the LSAT questionnaire).

Organizational Context: Yes/no questions ask about the existence of a logistics management unit and its responsibilities. Qualitative questions ask about relations among key stakeholders and how that affects logistics system performance.

Logistics Management Information System (LMIS): Yes/no questions assess the types of information collected through the LMIS, the purposes for which the information is used, and the extent to which the LMIS is automated. Qualitative questions seek to understand the flow of information at various levels of the system,

whether the information collected is used by program managers, how useful it is in practice, and whether reports are accurate and timely.

Product Selection: Yes/no questions ask about the existence of a national essential drug list, the existence of a National Drug Policy document, and the basic characteristics of each. Qualitative questions inquire about the contents of the documents and probe to determine to what extent they are disseminated and applied at various levels of the system.

Forecasting: Yes/no questions are used to determine what information is used in preparing forecasts, and how frequently they are programmed. Qualitative questions examine the quality of forecasts, the impact of forecasts on budgeting and planning, and the capacity of in-country staff to carry out forecasts without external assistance.

Obtaining Supplies/Procurement: Yes/no questions assess whether procurement plans take into account certain information items. Qualitative questions probe the methods for coordinating procurement planning in the country, and whether, in general, the program procures the right amounts of the right goods.

Inventory Control Procedures: Yes/no questions provide information on the use of state-of-the-art inventory control practices (e.g., first expiration – first out (FEFO); established maximum and minimum stock levels), and whether stockouts occurred at any level during the past 12 months. Qualitative questions look at how well the staff applies the procedures in practice. They also identify which products are most frequently stocked out and why, how the staff handles stockouts and oversupplies, and the effects of stockouts on the program.

Warehousing and Storage: Yes/no questions seek to determine the existence of guidelines for proper storage of all products, for assurance of product quality, and for disposal of hazardous waste and damaged/expired products. Qualitative questions collect more in-depth information on areas where staff could improve storage conditions, and how the staff assures product quality.

Transport and Distribution: Yes/no questions check for a budgetary line item for various components. Qualitative questions assess whether transport is sufficient and whether the distribution system is effective.

Product Use: Yes/no questions query the existence of standard treatment guidelines and procedures for monitoring prescribing practices. Qualitative questions probe to determine the extent to which standard treatment guidelines and universal safety precautions are actually implemented.

Finance: Yes/no questions assess whether the national budget covers logistics, whether a cost-recovery system is used, and what logistics expenses are covered by donors. Qualitative questions examine whether budget allocations for logistics are sufficient to ensure product availability, to examine the source of funds for the logistics budget, and to examine whether donor activities and resources are adequately coordinated.

Organizational Support for Logistics System: Yes/no questions assess the existence of job descriptions, and characteristics of communication channels, information use, decision-making, feedback, supervision, and training. Qualitative questions focus on how various organization and staffing procedures are carried out and how effective they are in practice.