USAID | DELIVER PROJECT

LOGISTICS INDICATORS ASSESSMENT TOOL (LIAT)

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ACRONYMS

DK	Don't know
LIAT	Logistics Indicators Assessment Tool
LMIS	logistics management information system
LPG	liquified petroleum gas
MOH	Ministry of Health
NGO	nongovernmental organization
SDP	service delivery point
STI	sexually transmitted illness
TB	tuberculosis

LOGISTICS INDICATORS ASSESSMENT TOOL (LIAT) USER'S GUIDE

PURPOSE

The Logistics Indicators Assessment Tool (LIAT), a quantitative data collection instrument developed by USAID | DELIVER PROJECT, is used to conduct a facility-based survey to assess health commodity logistics system performance and commodity availability at health facilities. The LIAT can be used to monitor the performance of certain processes involved in the logistics management of health commodities over time, to evaluate certain outcomes of logistics interventions, to provide ongoing supervision and performance monitoring, and to monitor commodity availability.

The data collected using the LIAT can be used to calculate the following core logistics indicators:

- accuracy of logistics data for inventory management
- percentage of facilities that receive the quantity of products ordered
- percentage of facilities that maintain acceptable storage conditions
- percentage of facilities whose stock levels ensure near-term product availability (stock status)
- percentage of facilities that experienced a stockout at any point during a given period or at the time of the visit.

In addition to these indicators, the data collected can also be used to calculate additional related indicators, such as duration of stockouts, reasons for stockouts, and more. For a description of the indicators, refer to the *List of Indicators* in this manual, following the tool.

Supplemental questions provide additional information about the characteristics of the supply chain being assessed, such as the use of LMIS information, ordering procedures, transport systems, supervision frequency, cold chain management, and others.

METHODOLOGY

The LIAT is used to conduct a facility-based survey to collect quantitative data that will be used to calculate indicators for monitoring and evaluating logistics system performance. It is important to have stakeholder's buy-in for this type of study from the beginning to the end. The following steps outline the recommended methodology for completing this assessment.

1. Preparatory Work
    a. Identify the objectives of the assessment and develop a scope of work based on the program and/or categories of health commodities to be studied.
    b. Secure financing for all the study teams' costs, including travel and accommodations.
    c. Review and adapt the LIAT to meet the objectives identified for the assessment, as well as to meet ongoing monitoring needs.
    d. Determine the appropriate sample size and develop the sampling frame of the facilities to be visited. The main purpose of the sampling design is to avoid a convenience sample. Randomly select the facilities as much as possible.

        To calculate the sample size and select sites—

        - Compile a list of the total number of facilities in the country.
        - Document the total number of each type of facility (warehouse, hospital, service delivery point [SDP]), and the location and distribution of facilities.
        - Ensure that all parties involved agree to the criteria for the selection of sites.
        - For a statistically significant sample, use a standard sampling formula, which often yields a large sample size. In case of resource constraints, visit a default number of a minimum of 100 facilities or 15% of facilities, whichever is smaller.
        - Determine the sampling frame by stratifying for each type of facility in the country; evaluators should randomly select sites proportionally within each stratum, without breaking the supply chain between levels. In other words, select higher level warehouses first, then randomly select districts within selected regions, randomly select SDPs within selected districts, etc.

    e. Recruit study team members. The following qualifications for study members should be considered—

        - experience in field surveys
        - willingness to commit to a 3–4 week full-time assignment
        - physical ability to travel in both urban and potentially difficult rural settings
        - familiarity with the areas to be visited and local health care system
        - detail oriented
        - good communication skills
        - fluency in local languages a plus
        - ability to work as a member of a team
        - advanced degree, preferably in public health
        - quantitative research skills
        - knowledge of logistics systems (desirable).

f. Obtain written authorization for study team members to visit facilities (where needed).

g. Prepare itineraries and logistical arrangements for study team travel and accommodations.

h. Prepare study team training curriculum. Ideally, the curriculum should include at least two days of classroom activities (review and discussion of the assessment tool), one day to field test the tool, and one day of classroom discussion to finalize the tool and prepare for the field work. Examples of curricula from past training can by obtained from USAID | DELIVER PROJECT. This training should stress the importance of proper completion of surveys. Experience has shown that incomplete surveys cannot be used and are, therefore, a waste of time, energy, and money.

i. Schedule a meeting to be held at the end of the assessment to present preliminary findings to stakeholders in the country.

2. Prior to the Assessment

   a. Confirm arrangements (transportation, accommodations, translation, etc.).

   b. Obtain any legal travel documents needed for study team members.

   c. Obtain and review any logistics forms being used in the country related to products in the study.

   d. Agree upon the indicators and products to be studied with all the parties involved.

   e. Conduct training of team members on how the assessment will be carried out and how to use the tool, closely following the guiding text provided within the LIAT.

   f. Field test the tool at one or more accessible health facilities with all team members.

   g. Review the results of the field test and discuss final revisions with the study team members.

   h. Adapt questions

   i. Finalize the assessment tool. At this point, it is recommended that you list the products to be assessed in the tables of the tool.

3. During the Assessment

   a. Observe as many study teams as possible conducting data collection at each level of the system being assessed.

   b. Review completed questionnaires to clarify any data inconsistencies. This is a very important step to ensure the study team is collecting complete and accurate data. A schedule for teams to send completed questionnaires back to the assessment coordinator should be developed.

   c. Schedule a call with survey teams to discuss completed surveys. Provide feedback to data collectors and clarify any issues.

   d. Enter the data collected into the chosen database or spreadsheet.

4. Following the Assessment

a. Conduct data analysis.

b. Present the preliminary results, conclusions, and recommendations from the assessment to all stakeholders.

c. Write the report of results, conclusions, and recommendations.

d. Disseminate the final report to key stakeholders.

Following the tool in this booklet is a *List of Indicators*. It includes core logistics indicators that can be calculated with the information collected when the LIAT is used for a facility survey. For a more complete description of the logistics indicators please refer to the *Monitoring and Evaluation Indicators for Assessing Logistics Systems Performance* publication available through the USAID | DELIVER PROJECT. Additionally, Guidelines for conducting analysis for the core logistics indicators is available for SPSS software users. This document walks the user through the various steps in doing data analysis in SPSS for the most common logistics indicators.

LOGISTICS INDICATORS ASSESSMENT TOOL (LIAT)

INTERVIEWER'S GUIDE

Facility Identification	Record the name of the facility and location. Using the codes provided for each question, place all other responses in the boxes on the right.
Information about Interview	Record the date the interview took place and list the names of the interviewers.
Introduction	Use the text here to guide your introduction of the survey to facility staff.
Questions 01 to 05	Receive permission to conduct the interview and record information regarding the interviewee.
Questions 101 to 117	Record responses by clearly circling either the number or letter that corresponds to the interviewee's response. Questions with letters may have multiple responses; questions with numbers have only a single response.
Questions 118 to 122	These questions are to be asked at facilities that are part of a cold chain system.
Questions 123 to 126	The following questions in this section should be asked of the storeroom manager.
Table 1: Stock Status	Record the maximum months of stock, minimum months of stock, and order interval above the table. If the interviewee does not know these, mark DK as the response. To fill in the cells, follow the instructions above the table.
Table 2: Storage Conditions	Record observations on the main storage area (even if it is a cabinet) by responding to storage conditions 1 to 14 for every facility visited. For large storage areas that require stacking of multiple boxes, continue to complete storage conditions 15 to 17.
Table 3: Data Quality	Complete the table for all or for a selection of products.
Table 4: Forecast Accuracy	Complete the table for all or for a selection of products.
Table 5: Order Fill Rate	Complete the table for all or for a selection of products.
End Interview	Ask the interviewee/s if they want to ask you any questions. Thank them for their time and cooperation.

Facility Services and Infrastructure

FACILITY IDENTIFICATION

Name of the facility_____	
Facility location	
City/town: _____	
Region _____	Region ..... ☐
District _____	District..... ☐☐
Code of the facility.....	Facility Code ..... ☐☐
Facility Type: (1=Warehouse; 2=SDP)	Warehouse/SDP..... ☐
If SDP, mark type of facility: (1=District hospital; 2=Rural hospital; 3=Health centre; 4=Dispensary; 7=Other _____)	SDP Facility Type ☐
If Warehouse: mark level: (1=Central; 2=Regional/provincial; 3=District	Warehouse Facility Type ..... ☐
Operating Authority 1=MOH; 2=NGO	Operating Authority ..... ☐
Facility characteristics: Tarmac to the facility? (0=no; 1=yes)	Tarmac..... ☐
Operational electricity on day of visit? (0=no; 1=yes)	Electricity..... ☐
Operational water in the building on the day of visit? (0=no; 1=yes)	Water ..... ☐
Operational telephone (land line or mobile) or radio on day of visit? (0=no; 1=yes)	External Communication..... ☐

Date: _____

DAY/ MONTH/ YEAR

Interviewer/s: _____

_____

Introduce all team members and ask facility representatives to introduce themselves.

Explain the objectives of this survey:

Good day. My name is _____. My colleague and I are representing _____ (e.g., the MOH in the country under study). We are conducting a survey regarding the health commodity logistics system. We are looking at the availability of selected commodities and information about how you order and receive those products. We are visiting selected health facilities throughout the country; this facility was selected to be in the survey. The objectives of the survey are to collect current information on logistics system performance and stock status of key health products. This is not a supervisory visit and the performance of individual staff members is not being evaluated.

The results of this national survey will provide information to make decisions and to promote improvements. The survey has been/will be conducted again in the future to measure changes in the logistics system.

[Add any additional objectives here.]

We would like to ask the supply manager a series of questions about the products and supplies available at this facility. In addition, we would like to actually count selected products you have in stock today and observe the general storage conditions.

Do you have any questions?

Ask the in-charge to introduce the team to the person managing commodities. Extend the invitation to the in-charge to stay with the team but explain that we are aware that they have other responsibilities. Offer to check back with him/her before leaving the facility.

No.	Question	Code Classification	Go To
01.	Can we continue?	Yes..... 1 No 0	➔STOP
02.	Name and title and mobile phone number of person interviewed for this survey	Name: _____ Title: _____ Mobile number: _____	

03.	Number of years and months you have worked at this facility?	Years: _____ Months: _____	
04.	Who is the principal person responsible for managing medical supplies at this facility?	Nurse ..... 1 Clinical Officer ..... 2 Pharmacy Technician ..... 3 Pharmacy Assistant ..... 4 Pharmacist ..... 5 Medical Assistant ..... 6 Other (Specify) _____ 9	
05.	Is supplies/stock management the primary role of this person at this facility?	Yes..... 1 No 0	

First, ask the following questions of the in-charge or acting facility manager. After asking questions 101–122, visit the warehouse, storeroom, or storage area where the health products listed are managed. If you are referred to another staff member for the stocktaking exercise, introduce the survey goals and objectives as you did during the introduction. Hand the respondent the list of products that are included in the survey, and explain that we will refer to the list for some of the following questions.

No.	Questions	Code Classification	Go To/ Comments
101.	Do you use the following stock keeping logistics forms to manage health products in this facility?		
	A. stock cards/bin card/ inventory control card	Yes 1 No 0	
	B. stock ledger	Yes 1 No 0	
	C. other	Yes 1 No 0	
102.	What LMIS forms do you use for reporting/ordering?		
	A. insert name of country-specific forms	Yes 1 No 0	
	B. insert name of country-specific forms	Yes 1 No 0	
	C. other	Yes (specify)_____ 1 No 0	
103.	Do LMIS report forms include the following?		
	A. stock on hand	Yes 1 No 0	
	B. quantities used	Yes 1 No 0	
	C. losses and adjustments	Yes 1 No 0	
104.	Does a completed LMIS report include the following? (must be verified with completed report)		
	A. stock on hand	Yes 1 No 0 Completed report not available 9	
	B. quantities used	Yes 1 No 0 Completed report not available 9	

	C. losses and adjustments	Yes 1 No 0 Completed report not available 9	
105.	How often are these LMIS reports sent to the higher level? *(Circle all that apply.)*	Monthly ..... A Quarterly B Semi-annually C Annually ..... D Other_____W	
106.	When was the last time you sent an order/report for products at this facility?	Never ..... 1 Within the last month 2 2 months ago ..... 3 3 months ago ..... 3 More than 3 months ago 4	
107.	How many facilities are supposed to send LMIS reports to this facility?	_____	
108.	How many facilities submitted complete LMIS reports for the month of _____ (two months prior to survey month)?	_____ Ask to see reports and check here if verified. _____	
109.	How did you learn to complete the forms/records used at this facility? *(Circle all that apply.)*	During a logistics workshop ..... A On-the-job training ..... B Never been trainied ..... C Other (specify) _____W	
110.	How many emergency orders for _____ (product of interest, e.g., contraceptives, STI drugs, etc.) have you placed in the last 3 months?	None..... 0 1 ..... 1 2 ..... 2 3 ..... 3 More than 3 4 NA 9	
111.	Who determines this facility's resupply quantities? *(Circle all that apply.)*	The facility itself ..... A Higher-level facility ..... B Other _____W	
112.	How are the facility's resupply quantities determined?	Formula (any calculation) _____ 1 Don't know ..... 2 Other means..... 9	
113.	Who is responsible for transporting products to your facility? *(Circle all that apply.)*	Local supplier delivers ..... A Higher level delivers ..... B This facility collects ..... D Other (specify) W	
114.	What type of transportation is most often used?	Facility vehicle ..... 1 Public transportation ..... 2 Private vehicle ..... 3 Boat..... 4 Motorcycle ..... 5 Bicycle ..... 6 On foot ..... 7 Other (specify) _____ 9	

115.	On average, approximately how long does it take between ordering and receiving products?	Less than 2 weeks..... 1 2 weeks to 1 month ..... 2 Between 1 and 2 months ..... 3 More than 2 months 4	
116.	When did you receive your most recent supervision visit? *Check visitors book, if necessary.*	Never received ..... 1 Within the last month ..... 2 1 - 3 months ago..... 3 3 - 6 months ago ..... 4 More than 6 months ago ..... 5 *Other (specify) _____ 9*	
117.	Did your last supervision visit include drug management (e.g., stock cards checked, reports checked, expired stock removed, storage conditions checked)?	Yes 1 No 0 Don't know 9	

No.	Questions	Code Classification	Go To/ Comments
	If the study team is studying a cold chain logistics system, answer questions 118–122. If not, go to question 123, next page.		
118.	Do you have a functioning refrigerator(s) to store vaccines and/or HIV test kits?	Yes (specify number ____) 1 No 0 Not applicable 9	If "No" or "Not applicable" skip to Question 123.
119.	To record the actual temperature, look at the internal thermometer inside the refrigerator—ideal temperature is between 0 and +8 degrees centigrade. (Note if thermometer is broken or missing.)	Temperature (in centigrade) _____	
120.	Are refrigerators located away from any surrounding objects (approximately ½ meter)?	Yes 1 No 0	
121.	Is the temperature chart up-to-date? (to be up-to-date, there must be an entry for the day before the visit).	Yes 1 No 0	
122.	Is there a supply of paraffin or LPG for cold chain and sterilization purposes?	Yes 1 No.....0	

Thank you for your time and information. You have been very helpful. Our remaining questions will require looking at products in the storeroom and speaking with the person who oversees the store.

When in the Store Room (if with a different person) repeat the introduction to the survey and data collection team members.

No.	Question	Code Classification	Go To
123.	Name and title and mobile phone number of person interviewed for this survey	Name: _____ Title: _____ Mobile number: _____	
124.	Number of years and months you have worked at this facility.	Years: _____ Months: _____	
125.	Who is the principal person responsible for managing medical supplies at this facility?	Nurse ..... 1 Clinical Officer ..... 2 Pharmacy Technician ..... 3 Pharmacy Assistant ..... 4 Pharmacist ..... 5 Medical Assistant ..... 6 Other (Specify) _____ 9	
126.	Is supplies/stock management the primary role of this person at this facility?	Yes..... 1 No 0	

Table 1. Stock Status (Specify a full six month period prior to the survey; and the day of visit)

Column:
1. Name of all authorized products that will be counted
2. Unit of count for the product

Note*:* Columns 1 and 2 should be filled out before questionnaires are printed for the survey.

3. Whether or not the product is managed at this facility, answer Y for yes or N if no. Note that for some products, at certain levels all facilities should manage the product. In such cases, this column should be marked Y.
4. Record the quantity of product in an open container. Estimate the quantity of the product to 1/4, 1/2. or 3/4 full using the smaller unit of count established in column 2.
5. Record if the facility is experiencing a stockout of the product on the day of the visit, *according to the physical inventory*, answer Y for yes or N for no.
6. Record the quantity of expired products. Count all expired products on the day of the visit. If there are products that are near expiry (within one week), note in the comments section.
7. Check if the stock card is available, answer Y for yes or N for no.
8. Check if the stock card had been updated within the last 30 days, answer Y for yes or N for no. Note: If the stock card was last updated with the balance of 0 and the facility has not received any resupply, consider the stock card up-to-date.
9. Record the balance on the stock card.
10. Record if the facility has had any stockout of the product during the most recent 6 full months before the survey, answer Y for yes or N for no.
11. Record how many times the product stocked out during the most recent full 6 months before the survey according to stock cards, if available, or to a key informant if not. Note source information.
12. Record the total number of days the product was stocked out during the most recent full 6 months before the survey.
13. Record the quantity of product dispensed to users or issued from the storeroom during the most recent 6 months before the survey.
14. Record the number of days the issued data represents (may be less than 180 if you are looking at 6 months of data); record the days for which there is any data recorded, including 0.

Maximum months of stock_____ Minimum months of stock _____ Order interval_____

Note: For any product that experienced a stockout in the last six months (including the day of the visit), please note reasons (by product).

Note: For any product that experienced a stockout in the last 6 months (including the day of visit), please note reasons (by product).

Are stock cards and reports completed using the smallest unit of count? Y/N

Product	Units of count	Managed at this facility?	Physical inventory — Store room	Stockout today? (Y/N)	Quantity of expired products	Stock card available? (Y/N)	Stock card updated? (Y/N)	Balance on stock card	Stockout most recent 6 months (Y/N)	Number of stockouts	Total number of days stocked out	Total issued (most recent 6 months)	Number of days of data available
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Comments:

Table 2. Storage Conditions

Items 1–14 should be assessed for all facilities for products that are ready to be issued or distributed to clients. Place a check mark in the appropriate column based on visual inspection of the storage facility; note any relevant observations in the comments column. *To qualify as "yes," all products and cartons must meet the criteria for each item.*

No	Description	No	Yes	Comments
01.	Products that are ready for distribution are arranged so that identification labels and expiry dates and/or manufacturing dates are visible.			
02.	Products are stored and organized in a manner accessible for first-to-expire, first-out (FEFO) counting and general management.			
03.	Cartons and products are in good condition, not crushed due to mishandling. If cartons are open, determine if products are wet or cracked due to heat/radiation (fluorescent lights in the case of condoms, cartons right-side up for Depo-Provera®).			
04.	The facility makes it a practice to separate damaged and/or expired products from usable products and removes them from inventory.			
05.	Products are protected from direct sunlight.			
06.	Cartons and products are protected from water and humidity.			
07.	Storage area is visually free from harmful insects and rodents. (Check the storage area for traces of bats and/or rodents [droppings or insects].)			
08.	Storage area is secured with a lock and key, but is accessible during normal working hours; access is limited to authorized personnel.			
09.	Products are stored at the appropriate temperature according to product temperature specifications.			
10.	Roof is maintained in good condition to avoid sunlight and water penetration.			
11.	Storeroom is maintained in good condition (clean, all trash removed, sturdy shelves, organized boxes).			
12.	The current space and organization is sufficient for existing products and reasonable expansion (i.e., receipt of expected product deliveries for foreseeable future).			
13.	Fire safety equipment is available and accessible (any item identified as being used to promote fire safety should be considered).			

14.	Products are stored separately from insecticides and chemicals.			

The additional standards below can be applied to any facility large enough to require stacking of multiple boxes.

No.	Description	No	Yes	Comments
15.	Products are stacked at least 10 cm off the floor.			
16.	Products are stacked at least 30 cm away from the walls and other stacks.			
17.	Products are stacked no more than 2.5 meters high.			

Additional guidelines for specific questions:

Item 2: In noting proper product arrangement, consider the shelf life of the different products.

Item 3: Check cartons to determine if they are smashed due to mishandling. Also, examine the conditions of the products inside opened or damaged cartons to see if they are wet, cracked open due to heat/radiation (e.g., for condoms, because of fluorescent lights), or crushed.

Item 4: Conduct the discarding of damaged or expired products according to the facility's procedures (this may differ from one facility to another). Specify if procedures exist and note what they are.

Item 7: It is important to check the storage area for traces of rodents (droppings) or insects harmful to the products.

Item 8: This refers to either a warehouse secured with a lock or to a cabinet in a clinic with a key.

Item 13:Fire safety equipment does not have to meet international standards. Consider any item identified as being used to promote fire safety (e.g., water bucket, sand). Do not consider empty and/or expired fire extinguishers as valid fire safety equipment.

Table 3. LMIS Data Quality: Usable Stock on Hand at Time of Most Recent LMIS Report

Column:

1. List the same products as in table 1 or use a sample of those products. Include only those products that are managed by the facility. (Note: Do this before finalizing the questionnaire and making photocopies.)
2. Get the most recent LMIS report showing the selected products, and record the stock on hand from the LMIS report in column 2.
3. Write the quantity of usable stock on hand from the stock records from the time of the selected LMIS report.
4. Calculate the percentage of discrepancy by subtracting quantities of stock on hand from the LMIS report (column 2) from quantities of stock on hand from stock records (from time of LMIS report [column 3], divide this by quantities of stock on hand from stock record [column 3], and multiply by 100). Note: This calculation can be made during the analysis phase of the survey and the column may be removed from the data collection tool.
5. Note the reasons for any discrepancy.

	Usable Stock on Hand (at time of most recent LMIS report)			
Method/Brand/Product	According to most recent LMIS report	From stock ledger or stock cards from time of LMIS report	% Discrepancy (col.3–col.2/col.2) *100	Reasons for discrepancy
1	2	3	4	5

Table 4. Percentage Difference between Quantity Ordered and Quantity Received

Column:

1. List the same products as in table 1 or use a sample of those products. (Note: Do this before finalizing the questionnaire and making photocopies.)
2. Enter the quantity ordered for the last order period for which products should have been received (i.e., don't include open orders whose expected receipt date has not arrived).
3. Enter the date the order was placed.
4. Enter the quantity received in the last order.
5. Enter the date the order was received.

Method/Brand/ Product	Quantity Ordered For Last Order Period	Date Order Placed	Quantity Received In Last Order/Procurement	Date Order Received
1	2	3	4	5

Table 5. Order Fill Rate to Be Calculated at Issuing Warehouses

Instructions

1. Fill in all authorized products of interest in column 1. (Note: Do this before finalizing the questionnaire and making photocopies.)
2. Obtain order forms received by this warehouse during the 3 months prior to the beginning month of the current survey (e.g., if the current survey runs from September to October, obtain order forms for the months of June, July, and August). Obtain forms corresponding to each lower-level facility to be visited during the survey and complete a separate table for each lower-level facility.
3. Obtain issues records that correspond to each order, if not shown on the order forms.
4. In the appropriate space at the top of each table, write in the name of the lower-level facility that made an order to this issuing facility during the 3 months in question.
5. Under each ordering facility, enter the quantity that was ordered by the lower level and the amount that was supplied or issued by this facility. This information is used to calculate the line order fill rate. The total order fill rate can be calculated later by determining the percentage of facilities in which quantity supplied was equal to the quantity ordered for all listed products.
6. Record any notes or comments about why orders weren't filled in their entirety.
7. Use as many pages as needed to collect data for all facilities to be visited during the assessment.

	NAME OF FACILITY PLACING ORDER:_____					
	MONTH 1		**MONTH 2**		**MONTH 3**	

	NAME OF FACILITY PLACING ORDER:_____					
	MONTH 1		**MONTH 2**		**MONTH 3**	
	Comments, Notes, Reasons for Underfilled Orders					

	NAME OF FACILITY PLACING ORDER:_____					
	MONTH 1		**MONTH 2**		**MONTH 3**	

Ask the person/people you interviewed if they want to ask you any questions.

Comments or general observations on products management:

Thank the person/people who talked with you. Reiterate how they have helped the program achieve its objectives, and assure them that the results will be used to develop improvements in logistics system performance.

Notes/Comments:

LIST OF LIAT INDICATORS

LIST OF LIAT INDICATORS

The following indicators can be measured using data collected from the Logistics Indicators Assessment Tool (LIAT). For a full description of each indicator refer to the *Monitoring and Evaluation Indicators for Assessing Logistics Systems Performance* publication available through USAID | DELIVER PROJECT.

MAIN AND RELATED LIAT INDICATORS

1. INDICATOR: Accuracy of Logistics Data for Inventory Management
    - RELATED INDICATOR: Percentage of facilities that keep accurate logistics data for inventory management.
    - RELATED INDICATOR: Percentage of facilities that completed and submitted an LMIS report for the most recent reporting period.

2. INDICATOR: Percentage of Facilities that Receive the Quantity of Products Ordered.
    - RELATED INDICATOR: Average duration of time between the dates and order was placed and when it was received.
    - RELATED INDICATOR: Percentage of facilities that received their last four orders according to schedule.

3. INDICATOR: Percentage Difference between the Quantity of Products Ordered and the Quantity of Products Received.

4. INDICATOR: Percentage of Facilities that Maintain Acceptable Storage Conditions.
    - RELATED INDICATOR: Percentage of Facilities meeting all (or a desired percent) of the storage conditions.

5. INDICATOR: Percentage of Facilities that Experienced a Stockout at Any Point during a Given Time Period.
    - RELATED INDICATOR: Percentage of facilities stocked out of any product on day of visit.
    - RELATED INDICATOR: Percentage of facilities fully stocked (all products) on the day of visit.
    - RELATED INDICATOR: Mean duration of stockouts.
    - RELATED INDICATOR: Mean number of products stocked out/in stock on day of visit.
    - RELATED INDICATOR: Percentage of products stocked out/not stocked out at any time during past 6 (or 12) months.
    - RELATED INDICATOR: Mean number of times each method was stocked out in the past 6 (or 12) months.

6. INDICATOR: Percentage of Facilities Whose Stock Levels Ensure Near-Term Product Availability.
    - RELATED INDICATOR: Percentage 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).
    - RELATED INDICATOR: Percentage of facilities with all full supply products adequately stocked for near-term availability.
    - RELATED INDICATOR: Percentage of facilities that are understocked, adequately stocked, and overstocked.

INDICATORS GUIDE FOR MEASURING FORECASTING PERFOMANCE:

7. INDICATOR: Mean Absolute Percentage Error (MAPE) between Forecasted Consumption and Actual Consumption of a Product.
    - RELATED INDICATOR: Average MAPE of multiple products.

8. INDICATOR: Percentage Difference between Consumption Forecasts and Actual Consumption.
    - RELATED INDICATOR: Average percentage difference between consumption forecasts and actual consumption.
    - RELATED INDICATOR: Mean level of forecast or discrepancy for a range of facilities, products, or both.
    - RELATED INDICATOR: Percentage of facilities with forecasts within 5 percent of actual consumption, by product.

INDICATORS FOR MEASURING WAREHOUSING AND INVENTORY MANAGEMENT PERFORMANCE:

9. INDICATOR: Order Fill Rate (or Percentage of Orders Placed that are Filled Correctly).

10. INDICATOR: Inventory Accuracy Rate (or Accuracy of Stock Balance for Inventory Management).
    - RELATED INDICATOR: Percentage discrepancy between stock record balance and physical inventory (by product).

11. INDICATOR: Percentage of Stock Wasted due to Expiration or Damage.
    - RELATED INDICATOR: Percentage of unusable stock due to expiration.
    - RELATED INDICATOR: Percentage of unusable stock due to damage.
    - RELATED INDICATOR: Value of unusable stock as a percentage of total item purchases.

12. INDICATOR: Order Turnaround Time.

13. INDICATOR: Inventory Turnover Rate.

INDICATORS FOR MEASURING DISTRIBUTION PERFORMANCE:

14. INDICATOR: Average Delivery Time.

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

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