
Forecasting and supply planning performance monitoring

Guidance Manual on Forecasting and Supply Planning

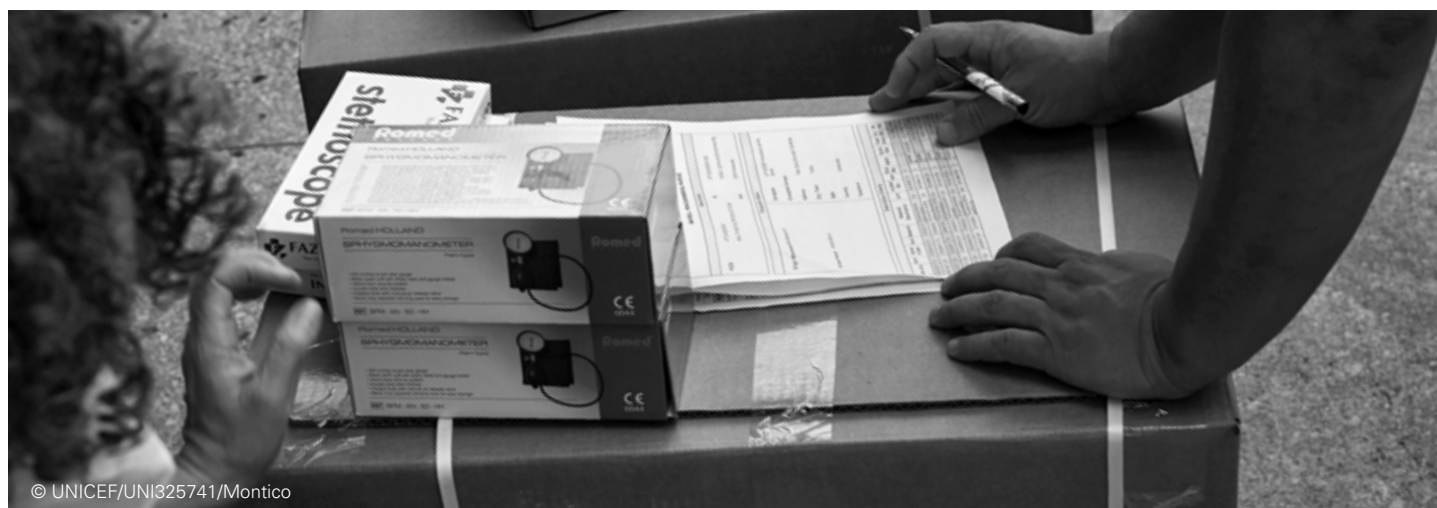
for Vaccines and other
Immunization Supplies

Contents

Forecasting and supply planning performance monitoring

This guidance manual provides an overview as to why it is important to monitor the performance of forecasting and supply planning (FSP), the steps involved in monitoring FSP performance, the key performance indicators (KPIs) that countries can consider, and examples illustrating the steps involved in computing specific KPIs. The document is organized into the following sections.

- Acronyms
- Definition of terms
- 1. Why monitor forecasting and supply planning performance?**
Explains why it is important to monitor the performance of FSP
- 2. Steps for monitoring forecasting and supply planning performance**
Provides an overview of the steps involved in monitoring forecasting and supply planning performance
- 3. Key performance indicators**
Discusses the key performance indicators that programme managers can use for monitoring forecasting and supply planning performance
- 4. Illustrative examples**
Provides practical examples for estimating forecast demand ratio, forecast accuracy, supply plan accuracy and funding adequacy
- Key takeaways
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Acronyms

Acronym	Definition
DHIS2	District Health Information System 2
EPI	Expanded Programme on Immunization
FDR	Forecast demand ratio
FSP	Forecasting and supply planning
KPI	Key performance indicator
LMIS	Logistics management information system
PCV	Pneumococcal conjugate vaccine
SMT	Stock Management Tool

Definition of terms

Term	Definition
Consumption	The quantity of product administered to end users over a defined period of time, including reasonable waste that will be experienced during service delivery for vaccines.
Forecast	The quantity of doses of each vaccine that are estimated to be consumed or utilized for a specific period in the future. This term and projected vaccine demand are used interchangeably throughout the guide.
Key performance indicator (KPI)	An objective measure of performance that indicates current performance and can be used to monitor progress towards the achievement of set targets over time.
Reporting rate	The proportion of expected reports that were submitted.
Stock-out	A situation in which no usable product is available for use.

Why monitor forecasting and supply planning performance?

Monitoring FSP performance helps programmes monitor their progress against set performance targets using pre-identified indicators. Following the estimation of KPIs, programmes should define corrective measures and actions/recommendations for improvement, including clear assignment of responsibilities.

Programmes are heavily encouraged to always assess and identify underlying causes of poor performance

and develop an improvement plan to ensure sustained progress towards set targets. KPIs provide an objective basis for this monitoring, as discussed in section 3 of this document.

Steps for monitoring forecasting and supply planning performance

The key steps in monitoring FSP performance are summarized in the following table.

#	Task	Description	Guidance	Responsible
1	Planning for the monitoring exercise			
1.1	Decide on the KPIs for monitoring FSP performance.	Ahead of monitoring, the programme should agree on the KPIs that will be used to monitor FSP performance.	<p>Section 3 provides a list of KPIs that countries can adopt.</p> <p>When selecting the KPIs, programmes should ensure that appropriate structures and resources are put in place to guarantee routine tracking.</p> <p>To ensure sustainability, the FSP team should advocate selected FSP KPIs to be integrated into the overall programme performance framework.</p>	<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – Expanded Programme on Immunization (EPI) programme
1.2	Establish baseline performance and set performance targets, including timeline and the frequency of monitoring.	<p>The programme should establish baseline performance in order to monitor changes in performance.</p> <p>Programmes should set targets and establish a timeline in order to monitor whether expected progress is being made.</p> <p>Programmes should define how frequently each indicator is measured in order to ensure regular performance monitoring.</p>	<p>When setting performance targets, programmes should consider baseline performance and the resources available to drive improvement.</p> <p>It is recommended that programmes define allowable deviation from set performance targets as a measure to know when to identify underlying causes of suboptimal performance.</p> <p>Section 3 provides a list of recommended KPI targets and monitoring frequency that countries can adapt.</p>	<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme

#	Task	Description	Guidance	Responsible
1 Planning for the monitoring exercise				
1.3	Define data-collection method, data sources and responsibilities.	<p>Programmes should ensure that measures are put in place for collecting the necessary data to inform the KPIs. Tools and methods for collecting the data should be defined (e.g., using government tools such as the District Health Information System 2 [DHIS2], the logistics management information system [LMIS] and the Stock Management Tool [SMT]).</p> <p>Programmes should define responsibilities for collecting required data.</p>		<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme
2 Actual tracking of performance				
2.1	Collate required data for KPI computation.	This step involves collating the data required to compute the agreed KPIs.		<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme
2.2	Adjust data where applicable.	This step is only applicable when there is a need to adjust collated data. For example, there may be a need to adjust consumption for low reporting and stock-out.		<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme
2.3	Estimate KPI.	At this stage, the KPI is calculated.	Section 3 provides guidance on the steps involved in estimating KPIs.	<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme
2.4	Determine whether the performance target was met.	This involves comparing the actual performance with the target to determine whether the established benchmark has been met.	<p>If the observed performance is within allowable range, no further action is required. The team should continue regular monitoring activities.</p> <p>When the observed performance is not within the allowable range, the team should proceed with the next steps.</p>	<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme

#	Task	Description	Guidance	Responsible
2	Actual tracking of performance			
2.5	Determine the underlying causes of not meeting performance.	Identifying the causes of poor performance will help the programme develop an improvement plan.		<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme
2.6	Develop an improvement plan.	At this stage, an improvement plan is developed based on the underlying reasons for suboptimal performance, as identified.		<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme
2.7	Implement the improvement plan and continue monitoring.	At this stage, the programme implements the improvement plan and continues to monitor FSP performance.		<ul style="list-style-type: none"> – FSP team (technical lead) – Entity responsible for leadership oversight – EPI programme

Key performance indicators

The KPIs discussed in this section are listed in Table 1. They are broadly classified as input, process and output indicators. However, the list provided is not exhaustive and countries can choose additional indicators based on the needs and their supply chain maturity level.

Table 1: Key performance indicators

Indicator type	Name
Input	– Completeness of FSP data
Process	– Frequency of FSP review
Output	<ul style="list-style-type: none"> – Forecast demand ratio (FDR) or forecast accuracy – Supply plan accuracy – Funding adequacy

Note: Countries can choose to use either FDR or forecast accuracy to monitor the alignment of forecast with actual consumption.



Each of the indicators is discussed under the following subheadings.

Subheading	Description
Indicator	Name of the indicator
Definition	Definition of the indicator
Purpose	The usefulness of the indicator
Supply chain level	Level of the supply chain at which the KPI should be computed
Frequency	How often the indicator should be computed
Data needed	The data required to estimate the KPI
Data sources	The sources of the data required for estimating the KPI
Formula	The formula for estimating the KPI, including numerator and denominator where applicable
Analysis steps	The key calculation steps involved in estimating the KPI
Interpretation	How KPIs should be interpreted
Performance target	The performance benchmark that countries should aim for. Each country should consider their baseline performance and resources available for improving performance when setting this target.
Potential corrective actions	Actions that can be taken to improve performance

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A. Input indicator

Indicator	Completeness of FSP data
Definition	Measures whether the required FSP data set is available
Purpose	Helps the programme improve the quality of FSP output
Supply chain level	National level
Frequency	At least once every three months, preferably during the regular FSP review exercise
Data needed	All FSP data as listed in Chapter 3 'Preparing for forecasting and supply planning'
Data sources	Multiple sources as listed in Chapter 3
Formula	$\frac{\text{Number of available FSP data}}{\text{Total number of required FSP data}} \times 100$
Analysis steps	<ol style="list-style-type: none"> I. Count the number of available FSP data. II. Count the total number of required FSP data. III. Divide the number of available FSP data by the total number of required FSP data. IV. Multiply the estimate by 100 per cent.
Interpretation	The closer the estimate is to 100 per cent, the more complete FSP data are. An estimate of 100 per cent indicates that all FSP data are available.
Performance target	100 per cent
Potential corrective actions	Work with the EPI team to put measures in place to ensure that missing data are available for FSP.



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B. Process indicator

Indicator	Frequency of FSP review
Definition	Measures how often FSP is reviewed to determine whether any corrective action(s) is/are required to ensure uninterrupted product availability
Purpose	Helps the programme monitor the performance of FSP, including recommendations from the precedent FSP exercise
Supply chain level	National level
Frequency	At least once every three months (quarter)
Data needed	Number of FSP reviews conducted
Data sources	FSP review report
Formula	Number of FSP reviews conducted with evidence of the report
Analysis steps	Count the number of FSP reviews conducted with evidence of the report
Interpretation	One indicates that FSP review was conducted with evidence of report. Zero indicates that FSP review was not conducted.
Performance target	One per quarter
Potential corrective actions	Work with the EPI team to set up a system for FSP review.



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C. Output indicators

Indicator	Forecast demand ratio (FDR)
Definition	The ratio of actual consumption of a given product during a particular period compared to the consumption forecasted for the same period
Purpose	Helps programmes ascertain whether their forecast and actual consumption are aligned and whether any corrective action is required to prevent stock-out or wastage
Supply chain level	National level
Frequency	Every three months
Data needed	<ul style="list-style-type: none"> – Forecast by product – Actual consumption by product (opening balance + receipts – closing balance of product) or issues data from the lowest distribution point – Reporting rate – Days of stock-out
Data sources	<p>Forecast</p> <ul style="list-style-type: none"> – FSP report/populated forecasting tool <p>Consumption, reporting rate, days of stock-out</p> <ul style="list-style-type: none"> – LMIS – Monthly immunization reports – Stock ledgers/cards
Formula	$\frac{\text{Doses consumed per product in a period}}{\text{Doses forecasted per product for the same period}}$
Analysis steps	<ol style="list-style-type: none"> I. Collate forecast and consumption data. II. Adjust consumption data for poor reporting and/or stock-out. III. Divide doses consumed per product in a period by doses forecasted per product for the same period.



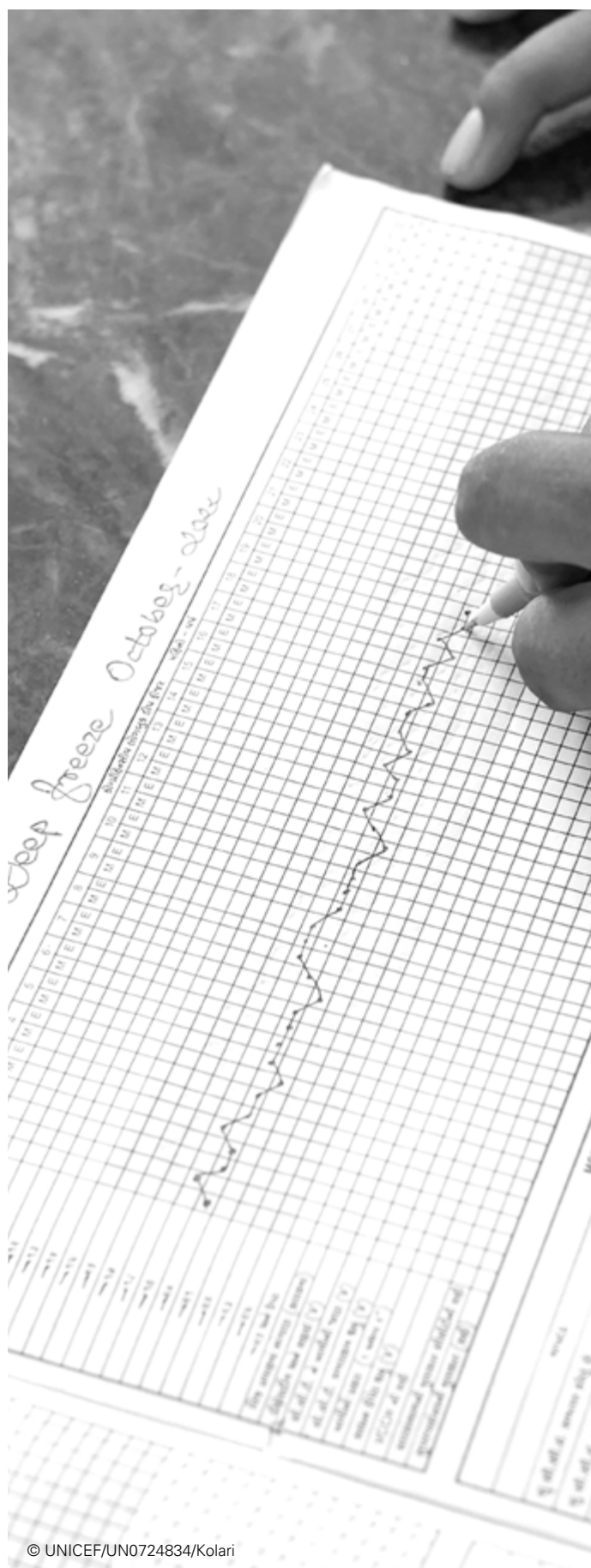
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Indicator	Forecast demand ratio (FDR)
Interpretation	<ul style="list-style-type: none"> – Forecasted demand ratio below 1: actual consumption (through administration and wastage) was less than the forecasted consumption for a given period. – Forecasted demand ratio above 1: actual consumption (through administration and wastage) was more than the forecasted consumption for a given period. – A forecasted demand ratio of 1 implies that the forecasted consumption is the same as actual vaccine consumption.
Performance target	0.8–1.2
Potential corrective actions	<p>Address underlying causes when performance target is not met. Such causes could include inaccurate assumptions (target population, coverage and wastage), e.g., higher wastage than expected due to poor adherence to multidose vial policy or poor maintenance of cold chain equipment.</p> <p>Possible actions include:</p> <ul style="list-style-type: none"> – Fast-tracking (FDR>1.2) or delay (FDR<0.8) products on order – Revising forecast and supply plan if required



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Indicator	Forecast accuracy
Definition	Measures how closely the forecast aligns with actual consumption
Purpose	Helps programmes ascertain whether forecast and actual consumption are aligned and whether any corrective action is required to prevent stock-out or wastage
Supply chain level	National level
Frequency	Every three months
Data needed	<ul style="list-style-type: none"> – Forecast by product – Actual consumption by product (opening balance + receipts – closing balance of product) or issues data from the lowest distribution point – Reporting rate – Days of stock-out
Data sources	<p>Forecast</p> <ul style="list-style-type: none"> – FSP report/populated forecasting tool <p>Consumption, reporting rate, days of stock-out</p> <ul style="list-style-type: none"> – LMIS – Monthly immunization reports – Stock ledgers/cards
Formula for forecast accuracy*	$1 - \frac{ \text{Forecast} - \text{actual consumption} }{\text{Actual consumption}} \times 100$



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Indicator	Forecast accuracy
Analysis steps	<ol style="list-style-type: none"> I. Collate forecast and consumption data. II. Adjust consumption data for poor reporting and/or stock-out. III. Calculate forecast error (Forecast – actual consumption) IV. Determine absolute forecast error Forecast – actual consumption V. Determine absolute percentage forecast error $\frac{ Forecast - actual consumption }{Actual consumption} \times 100$ <i>*Forecast accuracy is 0% if absolute percentage forecast error is >100%</i> VI. Determine forecast accuracy 100% – % absolute forecast error <i>When adjustment is required, adjusted consumption is the same as actual consumption</i>
Interpretation	The closer the forecast accuracy is to 100%, the more accurate the forecast is.
Performance target	≥80% **
Potential corrective actions	<p>Address underlying causes when performance target is not met. Such causes could be inaccurate assumptions (target population, coverage and wastage), e.g., higher wastage than expected due to poor adherence to multidose vial policy or poor maintenance of cold chain equipment.</p> <p>Possible actions include:</p> <ul style="list-style-type: none"> – Fast-tracking (forecast error is negative, and forecast accuracy is <80%) or delay (forecast error is positive and forecast accuracy is <80%) products on order – Revising forecast and supply plan if required

* The forecast accuracy method described is only one out of the several methods that can be used to measure forecast error. Each method has its pros and cons, as discussed in Chapter 17 of 'Demand Forecasting for Executives and Professionals'.

** Performance target is context-dependent, and countries should aim to produce more accurate forecasts over time.



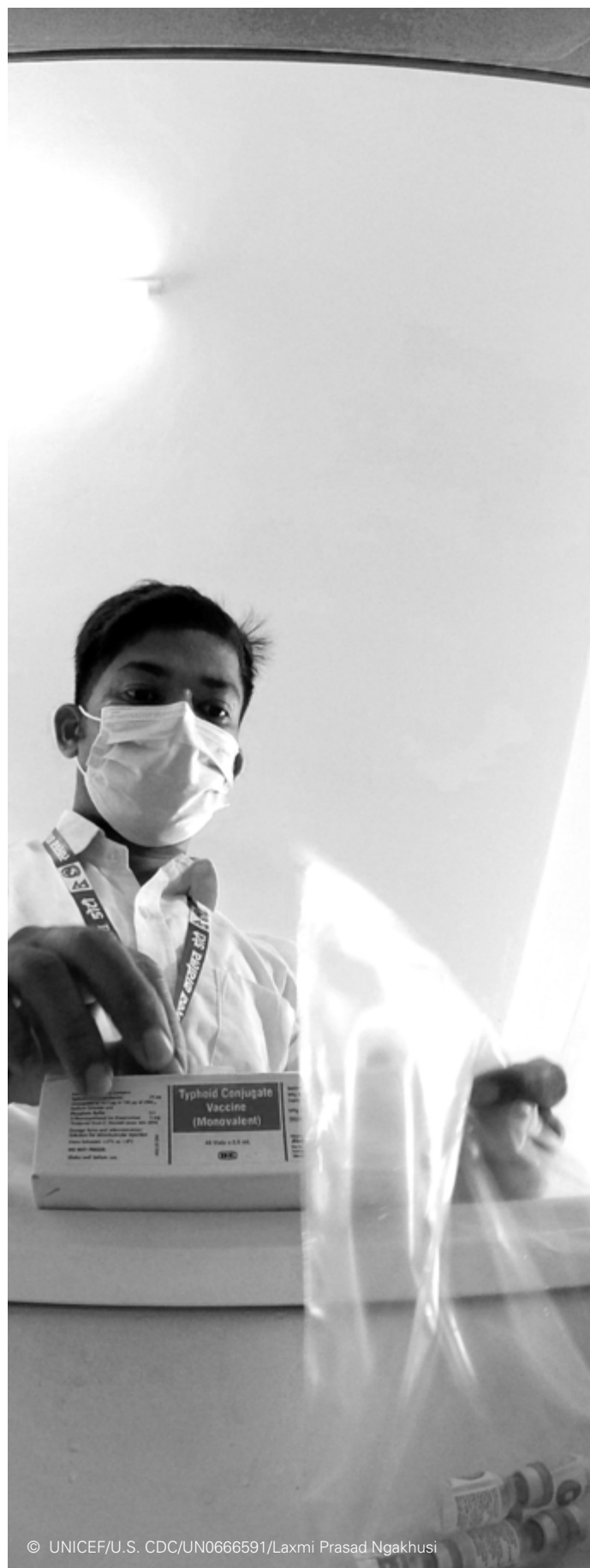
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Indicator	Supply plan accuracy
Definition	Measures how closely the quantities in the supply plan align with the commodity quantity in confirmed orders for the product under review
Purpose	Helps programmes ascertain whether orders are being placed in line with the country's supply plan
Supply chain level	National level
Frequency	Every three months
Data needed	<ul style="list-style-type: none"> – Planned quantity of shipments for the review period – Confirmed quantity of product ordered for the review period
Data sources	<ul style="list-style-type: none"> – FSP report/populated forecasting tool – Supply plan – Procurement tracker – Purchase orders
Formula	$1 - \frac{ \text{Planned shipments} - \text{actual quantity ordered} }{\text{Actual quantity ordered}} \times 100$



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Indicator	Supply plan accuracy
Analysis steps	<ol style="list-style-type: none"> I. Collate planned and actual order quantities by product. II. Calculate supply plan error (Planned shipments – actual quantity ordered) III. Determine absolute supply plan error [Planned shipments – actual quantity ordered] IV. Determine absolute percentage supply plan error $\frac{[\text{Planned shipments} - \text{actual quantity ordered}]}{\text{Actual quantity ordered}} \times 100$ *Supply plan accuracy is 0% if absolute percentage supply plan error is >100% V. Determine supply plan accuracy 100% – absolute % supply plan error
Interpretation	The closer the supply plan accuracy is to 100%, the more accurate the forecast is.
Performance target	≥80%
Potential corrective actions	<p>Address underlying causes when performance target is not met. Such causes could be a delay in fund release.</p> <p>Possible actions include:</p> <ul style="list-style-type: none"> – Advocating for timely fund release



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Indicator	Funding adequacy
Definition	Measures how closely the funding from both government and various donors/ funding institutions aligns with the total commodity funding requirements for the review period and how timely it is
Purpose	Helps programmes ascertain whether all commodity requirements are fully and timely funded
Supply chain level	National level
Frequency	Every three months
Data needed	<ul style="list-style-type: none"> – Total cost of commodities required for the review period – Actual funding available for procurement for the review period
Data sources	<ul style="list-style-type: none"> – FSP report – Budget tracker/financing document for procurement
Formula	$\frac{\text{Actual funding available for the review period}}{\text{Total commodity funding requirement for the review period}} \times 100$
Analysis steps	<ol style="list-style-type: none"> I. Collate the actual funding available for commodity procurement for the review period. II. Collate the total amount of funding required for commodity procurement for the review period. III. Divide the actual amount available by the total amount of funding required for commodity procurement.
Interpretation	<ul style="list-style-type: none"> – Funding adequacy below 100%: inadequate funding for a given period – Funding adequacy above 100%: more funding than needed for a given period – Funding adequacy of 100% implies that the exact amount of funding for a given period is available.
Performance target	≥100%
Potential corrective actions	<p>Address underlying causes when performance target is not met. Such causes could be a delay in fund release.</p> <p>When funding is inadequate, possible actions can include advocating for more resources and/or timely release.</p>



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Illustrative examples

This section contains practical examples for estimating FDR, forecast accuracy, supply plan accuracy and funding adequacy.

Forecast demand ratio and forecast accuracy

Country J plans to determine how well the forecast for pentavalent vaccine and pneumococcal conjugate vaccine (PCV) align with actual consumption for the first quarter of the year. The FSP team has collated the required data as shown in Table 2. Following the steps discussed in section 3, estimate (1) the FDR; (2) forecast accuracy. For each month, indicate whether the respective performance targets of 0.8–1.2 and $\geq 80\%$ for FDR and forecast accuracy were met.

Table 2: Collated data for Country J

	Jan	Feb	Mar
Pentavalent vaccine			
Forecast	25,000,000	25,000,000	25,000,000
Consumption	22,000,000	24,000,000	28,000,000
Reporting rate	85%	85%	85%
Days of stock-out	0	0	0
PCV			
Forecast	20,000,000	20,000,000	20,000,000
Consumption	5,000,000	10,150,000	12,200,000
Reporting rate	85%	85%	85%
Days of stock-out	10	0	0

Solution: FDR

#	Task/Formula		Pentavalent vaccine		
			Jan	Feb	Mar
1	Collate monthly forecast and consumption data.	Forecast	25,000,000	25,000,000	25,000,000
		Consumption	22,000,000	24,000,000	28,000,000
2	Adjust consumption data for poor reporting and/or stock-out.	Reporting rate	25,882,353	28,235,294	32,941,176
		$MC \times \frac{100\%}{100\% - RR}$			
		Stock-out	25,882,353	28,235,294	32,941,176
		$UnadjMC \times \frac{MD}{MD - Dstockout}$			
3	Estimate FDR.		1.04	1.13	1.32
	$\frac{\text{Doses consumed per product in a period}}{\text{Doses forecasted per product for the same period}}$				
4	Performance target met?		Yes	Yes	No



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#	Task/Formula		PCV		
			Jan	Feb	Mar
1	Collate monthly forecast and consumption data.	Forecast	20,000,000	20,000,000	20,000,000
		Consumption	5,000,000	10,150,000	12,200,000
2	Adjust consumption data for poor reporting and/or stock-out.	Reporting rate	5,882,353	11,941,176	14,352,941
		$MC \times \frac{100\%}{100\% - RR}$			
		Stock-out	8,683,473	11,941,176	14,352,941
		$UnadjMC \times \frac{MD}{MD - Dstockout}$			
3	Estimate FDR.		0.43	0.60	0.72
	$\frac{\text{Doses consumed per product in a period}}{\text{Doses forecasted per product for the same period}}$				
4	Performance target met?		No	No	No



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Solution: Forecast accuracy

#	Task/Formula		Pentavalent vaccine		
			Jan	Feb	Mar
1	Collate monthly forecast and consumption data.	Forecast	25,000,000	25,000,000	25,000,000
		Consumption	22,000,000	24,000,000	28,000,000
2	Adjust consumption data for poor reporting and/or stock-out.	Reporting rate	25,882,353	28,235,294	32,941,176
		$MC \times \frac{100\%}{100\% - RR}$			
		Stock-out	25,882,353	28,235,294	32,941,176
		$UnadjMC \times \frac{MD}{MD - Dstockout}$			
3	Estimate forecast accuracy. $1 - \frac{ \text{Forecast} - \text{actual consumption} }{\text{Actual consumption}} \times 100$	Forecast error	-882,353	-3,235,294	-7,941,176
		Absolute forecast error	882,353	3,235,294	7,941,176
		% absolute forecast error*	3%	11%	24%
		Forecast accuracy	97%	89%	76%
4	Performance target met?		Yes	Yes	No

MC: monthly consumption; RR: reporting rate; UadjMC: unadjusted monthly consumption; MD: total number of days in the month; Dstock-out: total number of days of stock-out in the month

* Forecast accuracy is 0% for instances where % absolute forecast error is >100%.

#	Task/Formula		PCV		
			Jan	Feb	Mar
1	Collate monthly forecast and consumption data.	Forecast	20,000,000	20,000,000	20,000,000
		Consumption	5,000,000	10,150,000	12,200,000
2	Adjust consumption data for poor reporting and/or stock-out.	Reporting rate	5,882,353	11,941,176	14,352,941
		$MC \times \frac{100\%}{100\% - RR}$			
		Stock-out	8,683,473	11,941,176	14,352,941
		$UnadjMC \times \frac{MD}{MD - Dstockout}$			
3	Estimate forecast accuracy.	Forecast error	11,316,527	8,058,824	5,647,059
		$1 - \frac{ \text{Forecast} - \text{actual consumption} }{\text{Actual consumption}} \times 100$			
		Absolute forecast error	11,316,527	8,058,824	5,647,059
		% absolute forecast error*	130%	67%	39%
		Forecast accuracy	0%	33%	61%
4	Performance target met?		No	No	No

MC: monthly consumption; RR: reporting rate; UadjMC: unadjusted monthly consumption; MD: total number of days in the month; Dstock-out: total number of days of stock-out in the month

* Forecast accuracy is 0% for instances where % absolute forecast error is >100%.

Supply plan accuracy

Country J also plans to determine how well quantities in the supply plan for the pentavalent vaccine, PCV and measles vaccine align with confirmed orders for the year's first quarter. The FSP team has collated the required data, as shown in Table 3. Following the steps

discussed in section 3, estimate the quarterly supply plan accuracy. Indicate whether the performance target of $\geq 80\%$ for supply plan accuracy was met for each vaccine.

Table 3: Collated data for supply plan accuracy

Quarter 1	Penta	PCV	Measles
Planned shipment quantity	7,000,000	6,000,000	2,000,000
Actual quantity ordered	6,000,000	5,500,000	500,000

Solution

#	Task/Formula		Penta	PCV	Measles
1	Collate monthly forecast and consumption data.	Planned shipment quantity	7,000,000	6,000,000	2,000,000
		Actual quantity ordered	6,000,000	5,500,000	500,000
3	Supply plan accuracy	Supply plan error	1,000,000	500,000	1,500,000
1	$1 - \frac{ \text{Planned order quantity} - \text{actual order quantity} }{\text{Actual order quantity}} \times 100$	Absolute supply plan error	1,000,000	500,000	1,500,000
		*% absolute supply plan error	17%	9%	300%
		Supply plan accuracy	83%	91%	0%
4	Performance target met?		Yes	Yes	No

* Supply plan accuracy is 0% for instances where the % absolute error is $> 100\%$.

Funding adequacy

Country J plans to determine funding adequacy for the first quarter of the year. The FSP team has collated the funding details as shown in Table 4. Following the steps

discussed in section 3, estimate the funding adequacy for the quarter. Also, determine whether the performance target of 100 per cent was met for the quarter.

Table 4: Collated data for supply plan accuracy

Quarter 1	Vaccines (\$)	Immunization supplies (\$)	Total (\$)
Total funding required	20,000,000	2,000,000	22,000,000
Actual funding available	15,000,000	500,000	15,500,000

#	Task/Formula	Quarter 1
1	Collate monthly forecast and consumption data.	Total funding required 22,000,000
		----- Total funding available 15,500,000
3	Estimate funding adequacy. $\frac{\text{Total funding available}}{\text{Actual funding required}} \times 100$	$\frac{15,500,000}{22,000,000} \times 100 = 70.5\%$
4	Performance target met?	No



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Key takeaways

- By monitoring FSP performance, **programmes can monitor their progress against set performance targets** using pre-identified indicators.
- To ensure sustainability, **the FSP team should advocate for selected FSP KPIs to be integrated into the overall programme performance framework.**
- **When setting performance targets, countries should consider their baseline performance and the resources available for improving performance.**

References

Gavi, Bill & Melinda Gates Foundation, World Health Organization and United Nations Children's Fund, 'Data for Immunization Supply Chain (DISC) Indicators: Indicator reference sheets', December 2015.

John Snow, Inc., 'Quantification of Health Commodities: A guide to forecasting and supply planning for procurement', John Snow, Inc., Arlington, Va., 2017, <https://publications.jsi.com/JSIInternet/Inc/Common/download_pub.cfm?id=18172&lid=3>, accessed 3 November 2021.

Kolassa, Stephan, Bahman Rostami-Tabar and Enno Siemsen, 'Demand Forecasting for Executives and Professionals', 2023, <<https://dfep.netlify.app>>, accessed 22 June 2023.

UNICEF Supply Division, 'Strategies to Strengthen Country Vaccine Forecasting Capacity', May 2021.

USAID Deliver Project, Task Order 1, 'The Logistics Handbook: A practical guide for the supply chain management of health commodities', 2nd ed., USAID, Arlington, Va., 2011, <www.ghsupplychain.org/logistics-handbook>, accessed 4 May 2022.

USAID Global Health Supply Chain Program, 'Technical Assistance, National Supply Chain Assessment Task Order: Key performance indicators', NSCA 2.0, 2018. <www.ghsupplychain.org/key-initiatives/national-supply-chain-assessment-nsca-toolkit>, accessed 26 November 2021.



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