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Supply planning

Guidance Manual on Forecasting and Supply Planning

for Vaccines and other Immunization Supplies

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for every child

Contents

Supply planning

This guidance manual provides an overview of the supply planning concept, including the steps involved in estimating and costing commodity requirements. An example illustrating how commodity requirements can be estimated and costs determined is also provided. The document is organized into the following sections.

Acronyms

Acronym	Definition
EPI	Expanded Programme on Immunization
FSP	Forecasting and supply planning
QA	Quality assurance

Definition of terms

Term	Definition
Budgeting	The process of earmarking a specific amount for a purpose, such as procurement of health commodities.
Buffer	The additional quantity of the stock (other than forecasted consumption) needed to prevent stock-out and covers the stock required when deliveries are being awaited and other fluctuations in demand. Buffer stock can also be referred to as safety stock.
Consumption	The quantity of product administered to end users over a defined period and includes reasonable waste that will be experienced during service delivery for vaccines.
Forecasting	The process used to estimate the quantity of doses of each vaccine that will be consumed or utilized for a specific period in the future. This process can be based on observed trends or patterns from adjusted demographic, health services utilization and/or logistics data. The output of this process is the estimated projected consumption.
Forecasting and supply planning (FSP) consultation meetings	Meetings that target individuals with some specific skills and expertise that are not available within the FSP team to obtain required inputs for FSP.
FSP workshop	The platform for reviewing the historical programme and FSP performance, discussion and ratification of the FSP data and assumptions, and the final forecast and supply plan. The workshop should include a diverse group of stakeholders involved in programme planning and implementation.
Funding advocacy	The process of engaging and soliciting relevant stakeholders' support to ensure adequate funding for commodity procurement.
Lead time stock	The stock required between when an order is placed and when the product is delivered by a supplier to the customer (this can be a store or a health facility).
Maximum and minimum inventory control level	The stock level that must not be exceeded (maximum) and the lowest quantity of stock (minimum) that should be available under normal conditions per supply chain level as defined by the country's inventory policy. The maximum and minimum inventory levels are usually expressed in time periods (e.g., months).
Quality data	Data that are accurate, timely, consistent, reliable and complete.
Stock on hand	The quantity of available usable stock at a given point in time.
Supply planning	The process used to determine when, where and how many doses of each vaccine should be delivered to ensure adequate stock levels are maintained throughout the supply chain based on the forecasted consumption, stock status and inventory policies. The supply planning process estimates the total vaccine requirements.
Total commodity requirements	The quantity of each commodity needed to meet the forecasted consumption and ensure that adequate stock levels within the supply chain are maintained to ensure continuous commodity supply.

Overview of supply planning

Supply planning is how programmes estimate the total commodity requirements based on the forecast generated from the forecasting phase. Estimates generated during supply planning cover the quantity of product required to meet the forecasted consumption, the stock needed when deliveries are being awaited, and other fluctuations in demand. For products already in use, programmes must consider the stock that would be available at the beginning of a new implementation cycle to prevent the over- or underestimation of requirements. Overall, supply planning facilitates scheduling of shipments, budgeting, coordination of commodity funding, resource mobilization and ultimately the maintenance of optimal stock level in line with the country's inventory control policy. Countries without an inventory control policy are encouraged to have this in place.

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Supply planning steps

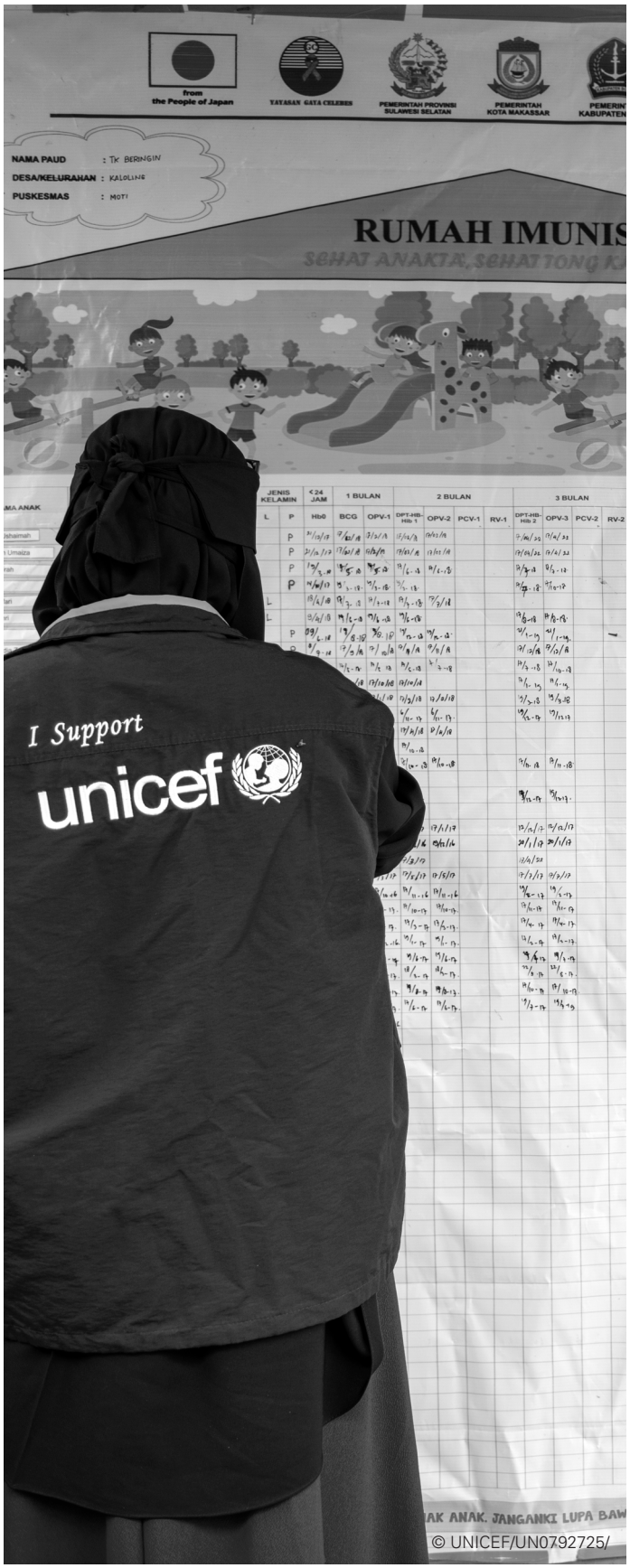
#	Task	Description	Guidance	Responsible
1	Review, ratify and collate supply planning data and assumptions	During the forecasting and supply planning (FSP) consultations and/or workshop: – The FSP team should present the supply planning data (Table 1) and assumptions, as well as associated analyses. – Stakeholders should review and ratify all supply planning data and assumptions, as well as associated analyses. – The FSP team should implement the ratified changes to the data and assumptions. – The FSP team should then collate ratified supply planning data and assumptions. This should cover the: – Entire supply planning period – Minimum data requirements for supply planning (Table 1)	The presentation by the FSP team should cover the type of data, source of data, quality considerations (availability, recency) and related analyses. When reviewing, the FSP team should discuss and proffer solution(s) to any issue related to the data and associated analyses. For example, when essential data is missing or of questionable quality, the team should formulate and agree on assumptions.	FSP team
2	Estimate commodity requirements	At this stage, the forecasting and supply planning stakeholders will determine the quantity of each product required to cover the forecasted consumption and to maintain the optimal stock levels throughout the supply chain.	The total commodity requirements will be determined by estimating the absolute commodity requirement based on the forecast and the programme's maximum and minimum inventory control policy or buffer rate from which the carryover stock[a] is deducted. In addition to the forecasted consumption, the maximum and minimum inventory control policy or buffer rate allows the programme to accommodate: – Lead time stock – Quantity required to cover fluctuations in demand – Quantity required to cover potential losses and expiries	FSP team

#	Task	Description	Guidance	Responsible
3	Determine when shipments should be delivered	This involves scheduling shipments to ensure that an optimal stock level is maintained.	When supply planning software is used, steps 2 and 3 can take place simultaneously. Shipments should be planned so that the programme does not fall below the minimum stock level (i.e., optimal stock level should be maintained) at any point within the FSP period. The available storage space and distribution capacity should also be considered when planning shipments.	FSP team
4	Cost commodity requirements	This involves estimating the cost of procuring the estimated product requirements.	It is highly recommended that the costing takes into consideration: – Shipping and handling cost (freight etc.) – Customs clearance fees, including taxes – In-country distribution costs – In-country storage costs – In-country sampling and quality assurance (QA) costs – Insurance costs Various tools and software can be used by countries for costing.	FSP team
5	Decide final quantity to procure	During this step, programmes should compare the total commodity funding requirements, with anticipated funding from both government and different donors/ funding institutions, to determine the final quantity to procure.	If the funding is anticipated to be available or can be mobilized, the team should decide to procure the total commodity requirements. If adequate funding is not available and cannot be mobilized through relevant advocacy initiatives, the team should revise the forecasting and/or supply planning assumptions and re-estimate total commodity requirements.	FSP team, Expanded Programme on Immunization (EPI)

[a] Estimated as the sum of the current stock on hand and stock on order, minus projected consumption and projected expiries for the remaining time in the current planning period.

Table 1: Minimum data requirements for supply planning

Supply planning data
Stock on hand – quantities, including expiry dates – as available from the most recent logistics reports.
Months of stock on hand (expressed as stock on hand divided by average monthly consumption)
Expected product shipments (stock on order)
Projected consumption for the remainder of the implementation year
Maximum and minimum inventory control level
Buffer rate
Established shipment intervals
Product information: – Registration status – Status on national essential medicines list – Prices – Vial size – Number of units per pack size
Supplier information and cost: – Product prices – Pack size – Lead time – Shipping and handling cost (freight etc.)
Funding information: – Funders/sources – Funding commitment – Fund disbursement schedule
Procurement mechanism and lead time
Distribution cost: – Customs clearance fees, including taxes – In-country distribution costs
Storage and other in-country costs: – In-country storage costs – In-country sampling and QA costs – Insurance costs



Estimating and costing of commodity requirements

Steps	Description	Formula	Comments
1	Determine absolute commodity requirement	**Forecast × (100% + buffer rate)**	
2	Estimate carryover stock	**(Stock on hand + stock on order) — (projected consumption + projected expiries)**	This only applies to products that are already in use. It will be nil for new products.
3	Determine adjusted commodity requirements (procurement quantities)	**Absolute commodity requirement — carryover stock**	
4	Determine product cost	**Adjusted commodity requirement × product price**	
5	Add other add-on costs	**Product cost + product add-on costs**	Add-on costs can include the following: – Shipping and handling cost (freight etc.) – Customs clearance fees, including taxes – In-country distribution costs – In-country storage costs – In-country sampling and QA costs – Insurance cost

Illustrative example

Case description

Country Y plans to determine the quantity of pentavalent vaccine to procure after forecasting 30 million doses for the upcoming year. The available inventory report indicates that the current in-country stock is 10 million doses, with an additional 5 million doses on order. Of the available stock, 500,000 doses may not be consumed before expiration, while the consumption for the remaining months in the current implementation year is estimated at 7 million doses. The average price of their preferred product is $0.9 per dose, and the country expects to spend approximately 10 per cent of the product cost on other add-on expenses, including product shipping, handling and distribution. The country's official buffer rate is 25 per cent.

Case summary

Supply planning assumptions	
Forecast	30 million doses for 12 months
Buffer rate	25%
Stock on hand	10 million doses
Stock on order	5 million doses to arrive by the end of the current implementing year
Projected consumption	7 million doses
Projected expiries	500,000 doses
Product cost	$0.9 per dose
Add-on cost	10% of the product cost

Solution

Steps	Description	Formula	Comments
1	Determine absolute commodity requirement	**Forecast × (100% + buffer rate)**	30,000,000 × (100% + 25%) = 37,500,000
2	Estimate carryover stock	**(Stock on hand + stock on order) − (projected consumption + projected expiries)**	(10,000,000 + 5,000,000) – (7,000,000 + 500,000) = 7,500,000
3	Determine adjusted commodity requirements (procurement quantities)	**Absolute commodity requirement − carryover stock**	37,500,000 – 7,500,000 = 30,000,000
4	Determine product cost	**Adjusted commodity requirement × product price**	30,000,000 × 0.9 = $27,000,000
5	Add other add-on costs	**Product cost + product add-on costs**	27,000,000 × 1.1 = $29,700,000

Budgeting and funding advocacy

The costed commodity requirements from the supply planning phase inform programme budgeting and funding advocacy.

The following are the key budgeting and funding advocacy considerations:

- When there is a funding gap or uncertainties about the availability and timely release of funds, the FSP team should work with the entity responsible for leadership oversight to initiate the process for funding advocacy.
- To build trust in the final FSP results, which is an important factor for funding advocacy, programmes should:
  - Have a standardized process and use quality data from established sources
  - Involve and/or consult the finance team during FSP processes
  - Ensure that all FSP data and assumptions are transparently documented and can be made available to relevant stakeholders for verification
  - Ensure that presentations and reports provide adequate visibility into the processes that generated the final forecast and supply plan
  - Ensure that presentations during funding advocacy, especially to higher-level government stakeholders, are led by an individual that understands the processes as well the data and assumptions that inform the final forecast and supply plan
- Where possible, programme should ensure that critical pieces of evidence such as assessment reports, (operational) research studies, etc., are made available to support higher-level funding allocation decisions.
- Longer term forecasts (e.g., five years) are useful for funding advocacy and strategic planning.

UNICEF Supply Division has developed a budgeting tool that can support budgeting and subsequent funding advocacy (see toolbox).

Key takeaways

- **Supply planning is the process by which programmes estimate the total commodity requirements**, and also determine when products should be delivered to ensure uninterrupted commodity availability.
- **Commodity requirements are estimated based on the forecast, the country's inventory management policy and projected carryover stock.**
- **Supply planning should inform commodity procurement, budgeting, resource mobilization and timing of fund release** to ensure optimal stock availability.

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