COUNTRY FORECAST STRENGTHENING:

KEY FINDINGS ON BEST PRACTICES USED IN COUNTRIES WITH HIGH FORECAST ACCURACY PERFORMANCE

Contents

Executive summary

In 2018 the United Nations Children's Fund (UNICEF) Office of Internal Audit and Investigations (OIAI) conducted an audit that assessed immunization activities in three programme countries, as well as the support provided to those countries by UNICEF Programme Division and Supply Division. One agreed action from the audit was to develop and implement a tailored strategy and an action plan to support the strengthening of country capacity to develop more accurate vaccine forecasts and thus more effectively achieve national vaccine programme goals.

To address this OIAI recommendation, a two-phased approach was developed and initiated in 2020. The first phase consisted of implementing an assessment to learn from countries that routinely produce accurate forecasts. The second phase involves developing tools and coordinating activities based on these learnings, as well as other international best practices in forecasting, and directly supporting countries to strengthen their forecasting capacity.

This report summarizes the findings from the assessment conducted in the learning phase, the purpose of which was to identify the key success factors for the development of accurate forecasts. Eight countries in four regions (ECA, ESA, MENA, WCA[1]) were tactically selected to participate in this assessment. The qualitative assessment combined structured focus group interviews with a written questionnaire. Various topics related to forecasting processes, timelines, data quality, team dynamics and budget planning were explored.

The key themes and findings that emerged from the assessment were:

- *Strong partner relationships and collaborations are the foundation of an effective and accurate country forecast process. The continuity and longevity of forecasting staff in critical forecasting leadership roles strengthens and builds confidence in these collaborations.*

- *Quality data is a critical input in accurate forecasting. It not only supports effective budget advocacy but also helps to respond to the introduction of new vaccines or emergency scenarios.*

- *Forecasting processes and teams are largely driven by the institutional knowledge and practices of experienced staff – rather than through overly formalized and documented processes.*

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[1] 1 ECA = Europe and Central Asia, ESA = Eastern and Southern Africa, MENA = Middle East and North Africa, WCA = West and Central Africa

- *The alignment of the forecasting process with government budgeting is a key success factor in forecast accuracy. In many countries, vaccine forecasts often directly translate into government vaccine budget commitments.*

- *Forecasting knowledge and skills are largely learned on the job and capacity building should be approached in a more formal and structured way to ensure broader health system competencies in vaccine forecasting best practice.*

- *Forecasting key performance indicators (KPIs) are not consistently implemented across countries, which limits the tracking and continuous improvement of forecast accuracy.*

While these critical success factors were identified in countries that have already achieved a high degree of forecasting accuracy, they provide important lessons learned for countries that have yet to achieve consistent performance in forecast accuracy. As a next step, UNICEF Supply Division and Programme Division will launch the second phase of the country forecasting initiative, which proposes developing a forecasting 'toolbox'. This toolbox will contain various guidelines, tools and training resources to more effectively support countries to strengthen their forecasting capacity. These resources will integrate learnings from this assessment with forecasting international best practices and will draw on UNICEF's global expertise in vaccine forecasting and supply chain system strengthening.

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1. Methodology

A mixed methods approach was used to explore and better understand the critical success factors for forecast accuracy. Eight countries in four UNICEF regions (ECA, ESA, MENA and WCA) were tactically selected from a list of the top 30 countries demonstrating forecast accuracy[2]. The countries selected had all achieved an average of 75 per cent forecast accuracy or above for the past three years (2017–2019). To ensure the diversity of the sample, the geographic location of the countries and their level of vaccine procurement, by volume and value, were also taken into account. In addition, three countries that had recently graduated from Gavi, the Vaccine Alliance support (Armenia, Georgia and Moldova) were added to the final list of countries to further ensure the diversity of country contexts.

The final list of countries participating in this learning exercise was as follows: Armenia, Burkina Faso, Georgia, Moldova, Morocco, Senegal, Uzbekistan and Zambia.

The data collection tools used were developed internally by the forecasting team at UNICEF Supply Division and Programme Division. The data collection process combined a structured interview with a written survey. Interviewees and survey respondents were primarily government officials responsible for the forecasting process, although they also included supporting staff members from UNICEF country offices. The structured interviews used open-ended questions to explore the forecasting process in a more comprehensive way (Annex C). Questions focused on, but were not limited to, issues regarding forecasting timelines, data quality and technology, performance monitoring, team dynamics, advocacy and budgeting. The structured interviews were focus group-based and conducted through remote interview sessions on conference calls.

The written survey consisted of yes or no questions about the implementation of international standards in forecasting, which were identified in grey literature from the international public health sector (John Snow, Inc, 2017, Management Sciences for Health, 2012, United States Agency for International Development, 2014). The survey was sent to the countries to complete ahead of the focus group interviews. After the interviews, follow-up questions were sent to country teams for further clarification, as required. One additional meeting was conducted with UNICEF Supply Division Procurement Services to discuss and further clarify the country vaccine procurement and budgeting context.

The oral and written assessments were conducted in both English and French, and in other languages, supported by English translations. The data and information collected was then compiled and analysed using qualitative methods to identify and synthesize recurring themes.

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[2] Forecast accuracy is the percentage of forecasted products that is actualized through procurement.

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2. Assessment findings

The following is a summary of findings, organized according to the two sections of the country assessment. They reflect, assess and summarize the responses offered by the countries participating in the data collection.

Section I: Forecasting process

A. Forecasting making a positive difference

The countries interviewed all reported that the forecasting process made a positive difference to their procurement and supply planning process. In five of the eight countries interviewed, the positive impact on budget advocacy and building government commitment was particularly noted. Countries also reported that the forecasting process directly informed ministry of finance decision-making with respect to the allocation of budgetary resources.

A key takeaway from the countries was that good advocacy requires good forecasting. Credibleforecasts were identified as a decisive enabling factor for dialogues on routine funding allocations and on emergency funding with donors such as Gavi. Interviewees noted that, when addressing emergencies such as outbreaks, accelerated resource decision-making was facilitated by the ready availability of a forecast backed by quality data.

B. Description of the forecasting process

The initial requirement for data preparation prior to developing the forecast was a common theme reported by countries. The timelines involved generally reflected the complexity (e.g. scale of the programme, systems used) of the country situation as well as the task at hand. All countries largely followed the annual UNICEF forecast exercise timeline. In general, the first iteration of the vaccine forecast was completed by the end of September of a given year, with the second iteration completed around the end of November. The procurement plan was finalized by the end of the calendar year.

Instances were identified in which the budgeting annual cycle and/or the planning cycle did not align with forecasting and so timeline adjustments were needed. For example, in countries where the government budget was approved earlier than November, it was necessary for the forecasting team to make additional forecast adjustments.

Different approaches to forecast development were noted. While some countries followed a structured process involving well defined meetings, in terms of scope and participation, most countries had a less structured approach to preparing the necessary documents and liaising with the relevant stakeholders. All countries conducted stakeholder workshops (in one instance, the workshop was residential) to consolidate data and viewpoints.

The forecasting process, led by government entities with coordination support from UNICEF, relied on stakeholders, namely World Health Organization (WHO), donors and other civil society organizations. Partner tasks and roles included secretariat support, technical assistance, funding, data preparation and systems support. Support from partners, particularly UNICEF, also included the provision of a forecasting tool and general coordination of activities.

The long-term service of key forecasting team members was repeatedly reported as an important factor in cultivating trust between the stakeholders and in achieving the dexterity necessary to produce high-quality data.

C. Challenges in forecasting

There were a variety of country-specific examples of challenges to producing credible forecasts.Common issues reported were:

- High turnover of government staff.

- Late receipt of the Gavi decision letters indicating the funded amounts.

- Information system issues that restricted the ability to provide timely, accurate national data.

- Lack of capacity building and training materials in forecasting.

- Faulty buffer stock calculations (25 per cent was used as a default, if data was unavailable).

- Difficulties securing timely disbursement of government money, even after budgetary approval.

- The COVID-19 emergency, which diverted priorities both in terms of delivering the vaccine activities and preparing the forecast. This issue was specific to the current context but may be extrapolated to any sudden emergency.

Other issues included security concerns limiting travel, cold chain equipment capacity and the procurement of non-routine vaccines.

D. Enabling factors for forecast accuracy

Common enablers reported by the respondents were:

- solid teamwork between stakeholders, facilitated by the experience, trust andlong-term service of those responsible for the forecasting process;

- the familiarity of all stakeholders with the UNICEF forecast template;

- the leveraging of support: first, from UNICEF Supply Division; and second, from UNICEF regional offices and WHO, as sources of external technical assistance;

- the ongoing involvement of national ministries of finance in the forecasting process.

E. Interlinking for forecasting and budgeting processes

Forecasting processes, procedures and timelines varied from country to country. Processes, of varying degrees of complexity, were largely driven by governmental budget systems and cycles. Since the final forecasts were generally not known until November, most countries reported some kind of budgetary adaption, involving updating budgets once the final demand forecast was known.

It was reported that when government finance personnel participated in the forecasting process, the ministry of finance's trust and participation in the process increased, which ultimately strengthened government confidence and buy-in of the forecasting data. Multiyear forecasts were also identified as an effective mechanism for earmarking government funding for the longer term and then facilitating the required annual budgetary sign-offs.

F. Leadership in the forecasting process

The forecasting process was generally led by senior personnel in the ministry of health, who were based in various departments (e.g. Expanded Programme on Immunization, Public Health, Immunization). Other ministerial staff, notably finance personnel, also participated in the process. The governmental lead was important for local ownership of the process and output.

It was noted that stakeholders from international agencies such as UNICEF and WHO, usually at the country office level, typically supported the forecasting process. Depending on the complexity, regional offices were sometimes involved as well. The forecasting process was integrated to varying levels with local governmental processes (e.g. the vaccine tool outputs could be 'cut and pasted' into governmental forecasting templates in some cases but required rework prior to adoption in others).

G. Forecasting meetings

The forecasting process required a variety of different governmental and external stakeholder meetings. The principal objectives of the meetings were to identify, collect and prepare the data for budget development. The agenda of these meetings included populating the UNICEF forecast template, requesting and considering expert advice and finalizing forecast projections.

In most countries, such activities were organized into multi-day workshops. In a few countries, however, these meetings were conducted in a more collegiate manner, on a more informal basis and without a structured framework. These countries did not commonly report the clear definition of team members and roles, meeting record keeping or other documented forecast-related terms of

references – unless these actions were specifically mandated by ministerial edicts or requirements. However, none of the countries highlighted this unstructured approach as having a negative impact on the forecast process or its accuracy.

H. Data for decision-making in forecasting

The UNICEF forecast template was accepted without exception by the countries, as it facilitates the planning process and is beneficial in providing transparent grounds for budget and procurement advocacy and decision-making. Locally developed information systems were involved in the provision of health and/or logistics data. These tailored systems varied in degrees of completeness, accuracy and timeliness. There were no common international commercial information systems or solutions across the countries interviewed.

Multiyear planning and budgeting was invaluable in those countries where it was implemented. Vaccine forecast data also informed and supported associated planning activities such as provision of cold chain equipment, transitioning of existing and new vaccines, estimation of storage requirements and preparation for disease outbreaks.

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Section II: International standards in forecasting

The findings in this section come from the survey with 15 yes or no questions.

A. Teams

Seven of the eight countries reported having a forecasting team. Most of the countries participating in the survey reported that these governmental and UNICEF teams comprised staff who had been in their respective roles for many years, with length of service ranging from 5 to 40 years (as reported by one country). Long-term service and continuity were identified as key enabling factors in establishing the strong working relationships and effective partnerships required to implement the forecasting processes.

B. Capacity building

Elements of capacity building in forecasting were undertaken in all countries. In general, the methods used to implement this capacity building were peer-to-peer or in-service training. The lack of standardized international materials for this purpose was widely reported by the countries as an issue. While a desire for more formal training in forecasting processes and tools was expressed, it was noted that this gap in formal training has not proven to be an obstacle to the development of accurate forecasts. Personnel involved in forecasting were largely self-taught and established effective forecasting systems and competencies without the benefit of more formal training and exposure to international best practice.

C. UNICEF timelines

The timeline, which encompasses the UNICEF forecasting exercise, was observed and adhered to by all countries, independent of their own forecast planning and budgeting cycles.

D. Standard operating procedures (SOPs)

Five of the eight countries have developed SOPs based on empirical evidence and team members' experience. However, these SOPs focus on specific activities, such as budgeting and planning and do not address the overall forecasting process.

E. Meetings

Forecasting decision-making meetings were mainly informal and not usually documented. While all country teams convened at least once a year, some countries reported continuing to meet at regular intervals throughout the year to routinely track supply and performance. Half the countries kept meeting records and used them as reference for follow-up.

F. UNICEF forecast template

All countries indicated familiarity with the UNICEF forecast template in their national forecasting process and a seamless adherence to the timelines suggested by UNICEF Supply Division. Each country collated health and logistics data through their own national systems.

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G. Availability of recent forecasting reports

All countries could identify submission of recent forecasting reports.

H. Data

In the development of forecasts, countries reported using data elements such as pipeline quantities, funding, shipment data and product lead time. In addition, data relating to stock-on- hand, wastage, coverage, services, morbidity, demographics and programmes also informed the forecasts. It should be noted that most of these data points are required in the UNICEF forecast template, which was used by all the countries. The accuracy of this data was not explored during this survey.

I. Decentralized data availability

Sub-national data was facilitated through the deployment of various health information and logistics systems. Each country had a uniquely developed system, electronic in some cases and paper-based in others.

J. Data triangulation

Six of the eight countries reported using other sources of data to triangulate the forecasting data. The processes involved were not identified.

K. Logistics strategy

Seven of the eight countries indicated they had a vaccine logistics strategy that informed the projected level of vaccine buffer stock used in their national forecast. The one country that did not have a national logistics strategy reported using a default buffer level of 25 per cent.

L. Planning

All countries undertook the annual forecasting process, and half conducted regular follow-up supply reviews throughout the year.

M. KPIs and follow-up

Half the countries employed KPIs for forecasting performance tracking. However, each of thosecountries had its own KPI design and methodology, which presents a barrier to international comparison. The remaining countries did not employ any form of forecast performance monitoring.

3. Summary of key themes

In the qualitative review and analysis of the information and data collected, the following themesand notable observations emerged from the country interviews.

A. Strong partner relationships and collaborations are the foundation of an effective and accurate country forecast process. The continuity and longevity of forecasting staff incritical forecasting leadership roles strengthens and builds confidence in these collaborations.

The role of strong relationships between government counterparts and UNICEF was a themethat emerged repeatedly in the country interviews. These relationships were often built over the course of many years – in some cases even decades – resulting in a high degree of trust and transparency between government counterparts and UNICEF. As vaccine forecasting is inherently a collaborative process involving multiple stakeholders with various data collection,validation, analysis and ownership roles, effective partner relationships are critical to ensuring the national and multidisciplinary coordination of the country forecasting process.

The confidence in UNICEF's technical expertise further cements UNICEF's role as a trustedcountry forecasting partner.

B. Quality data is a critical input in accurate forecasting. It not only supports effectivebudget advocacy but also helps to respond to the introduction of new vaccines oremergency scenarios.

A common trait shared by the countries interviewed was a commitment to quality data. Each country deployed a diverse range of tools, technology and procedures. The use of the UNICEF forecasting template over the course of many years contributed to ensuring a certain degree of standardization and local partners' confidence in the data. It was noted that data preparation was a key activity in the country forecasting process, while a strong familiarity with the forecasting process on the part of coordinating partners further contributed to the production and demand for high quality data.

Nonetheless, the countries interviewed did report challenges related to data quality. These included the reliance on manual data systems, which makes data collection a burdensome and time-consuming activity, and barriers to the timely and accurate collection of data from sub-national regions. Some countries identified opportunities to further strengthen quality in the forecasting process through the standardization of forecasting assumptions and more standardized guidance on wastage rates and buffer stock targets.

C. Forecasting processes and teams are largely driven by the institutional knowledgeand practices of experienced staff – rather than through overly formalized and documented processes.

Although the countries interviewed for this assessment achieved high levels of forecast accuracy, there appeared to be little evidence that forecasting processes were formalized in these countries. For example, none of the countries had documented forecasting SOPs, and only two of the eight national forecasting committees had any form of written terms of reference documenting the committee's scope of work or team member responsibilities. In addition, no countries reported having national health forecasting strategy documents to guide forecasting or planning activities. While the benefits of a relatively informal forecasting planning approach permit flexibility to changing circumstances, there is also a risk of not achieving the systemic benefits gained from advanced planning. The lack of documented processes potentially limits forecasting capacity and competencies to a small group of experienced and knowledgeable stakeholders and thus undermines sustainability.

D. The alignment of the forecasting process with government budgeting is a keysuccess factor in forecast accuracy. In many countries, vaccine forecastsoften directly translate into government vaccine budget commitments.

There was a very clear and purposeful alignment of the forecasting process with the national budgeting timelines, and the direct translation of vaccine forecasts into vaccine budgets was commonly observed among the countries participating in the survey. In addition, it was reported that the ministry of finance was actively involved in the forecasting process in many of these countries, further demonstrating the interconnectedness of forecasting and financial planning and evidence of the typically strong governmental commitment to a collaborative forecasting partnership approach in these countries. However, some countries reported budget allocation issues, with forecasts not directly translating into vaccine budgets. Moreover, despite the engagement of ministry of finance personnel in the forecasting process, it must be emphasized that several countries specifically reported that delays to the disbursement of funds were a reoccurring challenge in the forecasting and supply planning process.

E. Forecasting knowledge and skills are largely learned on the job and capacity building should be approached in a more formal and structured way to ensure broader health system competencies in vaccine forecasting best practice.

The overwhelming majority of the government and UNICEF teams interviewed for this assessment reported having received no training or formal introduction to forecasting methods or principles. One person even reported that, despite a 40-year career, he had never been formally trained in forecasting concepts or tools.

In a testament to staff innovation and commitment to self-reliant learning, forecasting expertise was observed to be largely gained through peer-to-peer learning and on-the-job training. However, high staff turnover, as well as an aging workforce, undermines national forecasting capacity and further emphasizes the need to more broadly train national staff in forecasting skills and competencies. To ensure that country forecasting capacity and skills are more sustainable and in line with international best practice, a more formal and strategic approach to training staff in various forecasting principles, methods and tools should be explored at the country level.

F. Forecasting KPIs are not consistently implemented across countries, which limits the tracking and continuous improvement of forecast accuracy.

Half of the countries surveyed implemented some form of performance monitoring using KPIs. These KPIs play an important role in understanding performance against forecast accuracy targets. In addition, they create performance feedback loops to promote accountability and guide continuous improvement efforts. While it is encouraging that some of the countries have established frameworks to strengthen their forecasting performance, it must be noted that these performance indicators are highly country-specific, which limits cross-country comparison.

4. Conclusion

The country forecasting improvement opportunities identified by this assessment include the continued standardization of forecasting processes and structures, the wider implementation of performance monitoring, and a more formalized approach to staff capacity building in forecasting best practices. Capacity building conducted at the country level should be supported by the development and implementation of a standardized multilingual toolkit, as proposed for the second phase of this initiative. It is also recommended that all the local forecasting leads be fully trained and oriented on forecasting processes, every year, including receiving advice on the prevailing performance of oversight arrangements.

The limited implementation of forecast accuracy performance frameworks is particularly important to note as an issue identified by this assessment. The broader implementation of forecast accuracy KPIs at the country level will help to more effectively measure the impact of country forecasting investments, whether they are in data quality, strategy development or staff training. The institutionalized implementation of forecast accuracy indicators[3] at the country level will help to establish valuable performance feedback loops to better guide forecast strengthening and other continuous improvement efforts.

The countries that participated in this assessment were all high performers with respect to forecast accuracy. Nonetheless, they all expressed an interest in further strengthening their processes and/or an interest in capacity building opportunities. This interest in continuous improvement is in itself perhaps another critical success factor for the forecast accuracy that these countries achieve year after year.

The vaccine forecasting process is a critical activity in the national vaccine programme resource planning and budgeting process. As demonstrated by many of the countries that participated in this assessment, forecasts often directly translate into national vaccine budgets and procurement planning, with minimal modification. As a result, the achievement of more accurate forecasts directly benefits national vaccine programmes and should be established as a priority area in future continuous improvement investments.

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3   As previously noted, internationally standardized forecast accuracy measures should ideally be explored to permit cross-country comparisons.

Annex A. Forecasting processes. Lessons learned and evaluative statements

Based on the responses to each question, overall lessons learned are identified and attributed to each country. Additionally, the table below seeks to make the response country specific. A **yes** (Y) response in the table should be interpreted as a country-specific positive approval of the point summarized in the statement, while a **no** (N) response means the summary statement was not identified in the country's response.

#	Summary of question (See annex A)	Lessons learned	Armenia	Burkina Faso	Georgia	Moldova	Morocco	Senegal	Uzbekistan	Zambia
1	Examples of forecasting making a positive difference	The forecasting has had a positive impact, particularly with respect to advocating/building government commitment and securing national procurement budget allocations.	Y	Y	Y	N	N	Y	N	Y
2	Description of forecasting process	The forecasting process is led through a collaborative process between the government and UNICEF. Despite the lack of formal guidelines or SOPs on the process, through multiple years of implementation, the process is largely institutionalized and clear.	Y	Y	Y	Y	Y	Y	Y	Y
3	Examples of challenges	Challenges include access to accurate and timely data, clarity on forecasting assumptions related to costs and requirements for new vaccines, and budget disbursements.	N	Y	N	N	Y	Y	Y	Y
4	Factors contributing to high forecasting accuracy	Strong government teams, accurate data, the long service of personnel and good working relationships are the cornerstones of an accurate forecast.	Y	Y	Y	Y	Y	Y	Y	Y
5	Integration of forecasting and budgeting processes	The forecast is used as an instrument to inform and secure the country's annual budget for vaccines.	Y	Y	Y	Y	Y	Y	Y	Y
6	Forecasting stakeholders and lead	The stakeholders, including the governments, actively collaborate in the development of their country's forecasts.	Y	Y	Y	Y	Y	Y	Y	Y
7	Implementation of forecasting meetings	Forecasting meetings are routinely conducted throughout the year to track performance.	Y	Y	N	N	Y	Y	Y	N
8	Use of forecasting data for decision-making	Countries are capable of measuring their forecasting accuracy to inform their performance monitoring.	Y	N	Y	N	Y	Y	Y	N

Annex B. References and literature reviewed

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Annex C. Country forecasting strengthening questionnaire

Questionnaire on forecasting processes in programme countries

Section I – General understanding of forecasting processes within the country

1. Have you experienced a critical supply situation in which the forecasting process has made a positive difference? If yes, please present an example.

2. Please describe the forecasting process in your country.

3. Please describe the challenges you have had to overcome in the forecasting process.

4. Please describe the factors you believe have the greatest influence on achieving high forecast accuracy in your country.

You may refer, but not limit yourself, to the following factors:

- practices that you improved or changed

- practices you introduced which overcame bottlenecks or issues

- personal and interpersonal skills you consider critical to the forecast process

- the UNICEF forecasting process, including the timeline

- the UNICEF forecasting template's user-friendliness.

5. Please describe how the country's national forecast and budgeting processes areinterlinked.

6. Please state who is leading the forecasting process.

- Please state who else is engaged in the process.

- Please describe the level of engagement and ownership of the government.

- Please describe the level of engagement and ownership of the key partners (e.g. UNICEF, WHO).

7. If forecasting meetings occur:

- How timely and well attended are the forecasting meetings?

- What is the level of participation and engagement by the members in the meetings?

- Please describe the process and timeliness of forecast approval, and the people involved.

8. Please describe how you use the forecast data to support decision-making.

Section II – Standards in forecasting

Forecasting capacity

Human resources

9. Is there a forecasting team (i.e. a specific team responsible for forecasting)? Note: The forecasting team can be any working group responsible for forecasting andsupply planning within the programme or an established unit within the ministry of health.

10. Is there a documented list of the forecasting team's members?

Note: The team should have a documented list of members, their organizations and theirfunctions within the team.

11. Does the forecasting team have written Terms of Reference?

12. Has the forecasting team received training, education or any technical support onforecasting?

Policies and procedures

13. Is the UNICEF timing/timeline for the forecasting process convenient?

14. Is there any policy, guidance or Standard Operating Procedure on forecasting and supply planning?

15. In the forecasting meetings:

   a. Do meeting minutes specify action points including accountability and deadlines?

   b. Are action points from previous minutes reviewed?

Technology

16. Is any standardized tool used during the forecasting and supply planning exercise?

Forecasting output

17. Is there any recent forecasting and supply plan (or report) available?

18. Does the plan (or report) cover the key components of a supply plan, i.e. does it include the following information:

    a. Quantities required to fill the supply pipeline (products/ commodity needs)?

    b. Funding requirements/costs?

    c. Shipment schedules?

    d. Specific lead times, where applicable?

    e. Description of the forecasting method?

19. Did the forecasting team have access to the essential data during the last forecastingand supply planning exercise, i.e. was the following data available:

    a. Stock-on-hand?

    b. Quantities issued/consumed during past period?

    c. Wastage data?

    d. Coverage data?

    e. Services data (e.g. number of visits, number of services provided, laboratory tests conducted, disease episodes treated or number of patients on treatment during past periods)?

    f. Morbidity data (e.g. incidence and prevalence of specific diseases/ healthconditions)?

    g. Demographic data (e.g. total population, population growth rates)?

    h. Information on current programmes (e.g. programme performance, plans, strategies and priorities, specific programme targets)?

20. Is data from decentralized levels (e.g. regions, districts, facilities) used to develop thenational forecast and supply plan?

21. Do you triangulate the data from different sources or tools (e.g. Expanded Programme on Immunization forecasting tool, Stock Management Tool, district vaccination data management tool (DVD/MT), district health information system, version 2 (DHIS 2), Visibility for Vaccines (ViVa))?

22. Have the forecast and supply plan been informed by available strategies (e.g. established national or programme-level maximum and minimum stock levels, established shipment intervals and current shipment delivery schedule, standard treatment guidelines, national essential medicines list)?

23. Are the forecast and supply plan
regularly reviewed and updated?If yes,
at what intervals?

24. Is the forecast accuracy (i.e. forecasted
demand ratio: calculated percentage
difference between forecasted
consumption and actual consumption)
calculated and used to inform the
forecast review meetings?
If yes, how often?

25. Is any key performance indicator
on forecasting regularly monitored
at the level of the ministry of health
or the Expanded Programme
on Immunization?
If yes, how often?

Notes

Notes