The Learning Network for Countries in Transition (LNCT)

- A platform dedicated to supporting countries as they transition away from Gavi support to full domestic financing of their national immunization programs.
- LNCT, pronounced "linked"
- 15 member countries from various regions, in various stages of the Gavi transition process
- Audience is country practitioners and policymakers involved in financing and managing immunization programs in Gavi transitioning countries



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Vaccine Forecasting & Budgeting

LNCT Procurement Webinar Series (2 of 3)

2 July 2018

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Outline

 Planning for vaccine forecasting and budgeting – processes and steps

2. Forecasting and budgeting – methods and tools

Forecasting and budgeting tools and best practices





Why vaccine forecasting and budgeting is critical for immunization program performance

Under-estimation

- Shortages & stock-outs
- Low coverage
- Credibility of services
- Poor budgeting...



Over-estimation

- Poor handling, inefficiencies
- Wastages of resources
- Poor budgeting...











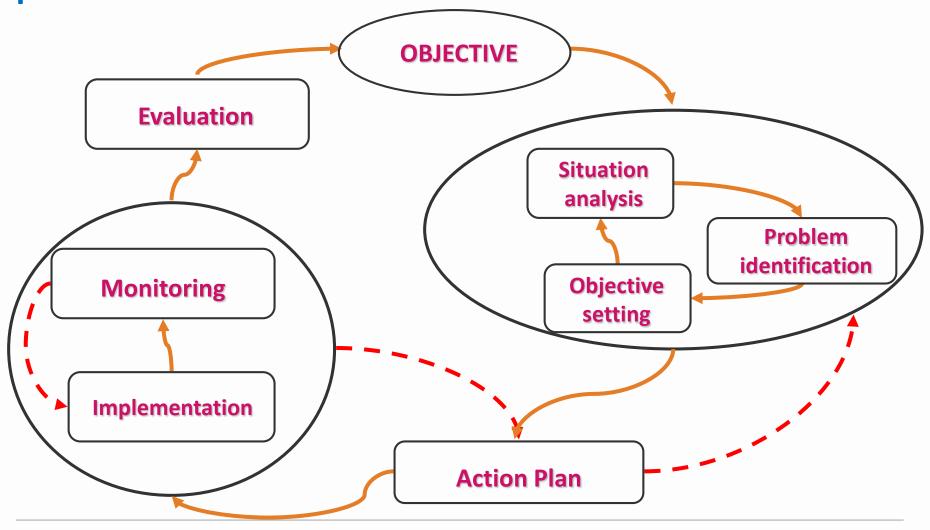
Planning for vaccine forecasting and budgeting:

- 1. Planning the <u>actions</u> needed to reach different EPI objectives: *Most important step!*
- 2. Forecasting the <u>resources</u> needed to implement identified actions





Planning actions needed is an intense thinking process





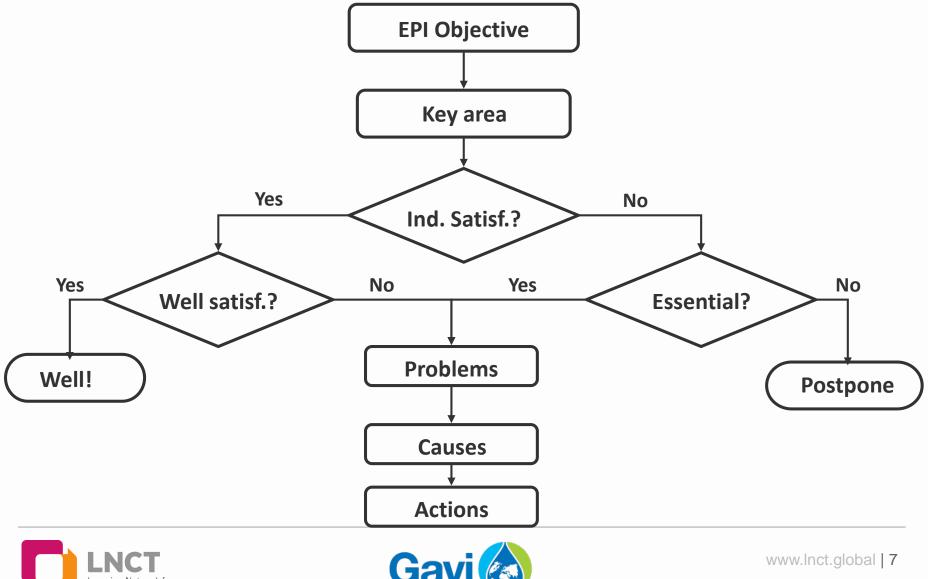


World Health Organization

Situation analysis and objective setting: expel of Effective Vaccine Management (EVM)

Learning Network for Countries in Transition





Example of Effective Vaccine Management (EVM) Action Plan



EVN	l impro	vement	plan E	PI-Ten	<u> </u>				Date:	22 July 2014
					Total Budget:	\$325,425	\$170,975	\$103,475	\$50,975	
	EVM level(s)	EVM criterion 💌	Task description		Interventions v	Budget 💌	Year_1 💌	Year_2 💌		Completion indicator
		E1	Organize annual meeting with customs to provide report on vaccine arrivals and updates on plans for next year		Coordination meetings	\$1,500				Meeting report
	PR		Conduct a controlled temperature monitoring study using WHO protocol to determine the temperature profile of the vaccine supply chain in the country	High	Study	\$30,000				Study report
	PR		Equip cold/freezer rooms with continuous temperature monitoring devices	High	Procurement and installation of temperature loggers	\$30,000	\$30,000	\$0	\$0	Equipment installation report
	SP		Establish temperature reading and plotting during weekends and holidays	High	Supportive supervision	\$0			\$0	Offical memo from MCH/EPI
	LDL		Equip all lowest distribution level stores with continuous temperature monitoring devices (type 30-days temperature recorders)	High	Procurement and installation of temperature recorders	\$1,500	\$1,500			Equipment installation report
6	LDL		Organize a 2-day training session for staff at the lowest distribution level store on the implemention of adequate	High	Training	\$6,000	\$6,000	\$0	\$0	Training agenda and report
7	SP		Equip all service delivery level refrigerators with continuous temperature monitoring devices (type 30-days temperature recorders)	High	Procurement and installation of temperature recorders	\$15,000	\$7,500	\$7,500	\$0	Equipment installation report
8	SP		Organize regional training sessions for staff at the service delivery level on the implemention of adequate temperature	High	Training	\$30,000	\$15,000	\$15,000	\$0	Training agenda and report
9	PR, LDL, SP	E2	Revise and implement the temperature monitoring chart to formally include alarm events and remedial actions to be	High	Management and coordination	\$6,300	\$2,100	\$2,100		Copy of national template at the facilities
	SP	E2	Establish a monthly review of temperature records and alarm events during supervisory visits	Medium	Supportive supervision	\$0				Filled temperature chart
11	SP	E2, E3	Organize regional training sessions for the staff on what to do in event of emergency, to include different kinds of	Medium	Training	\$30,000	\$15,000	\$15,000	\$0	Training agenda and report
		E4	Provide the national vaccine store with telephone and internet connectivity	Medium	Management and coordination	\$0				Phone number and email address
13	SP		Provide fire extinguishers for all health centres lacking at least one, and ensure annual maintenance checks for all fire extinguishers	Medium	Procurement and installation of fire extinguishers	\$45,000	\$15,000	\$15,000	\$15,000	





Optimizing demand forecasting: Resources needed



- Material resources:
 - Vaccines & supplies (syringes, safety boxes)
 - Equipment: cold chain, transport, disposal ...
 - Consumable: fuel, electricity, spare parts, etc.
- Human resources:
 - Staff, volunteers, sub-contractors, etc.
- Financial resources
 - Costs of material & human resources
 - Other costs: insurance, etc.
 - Split into investment/replacement & operating costs



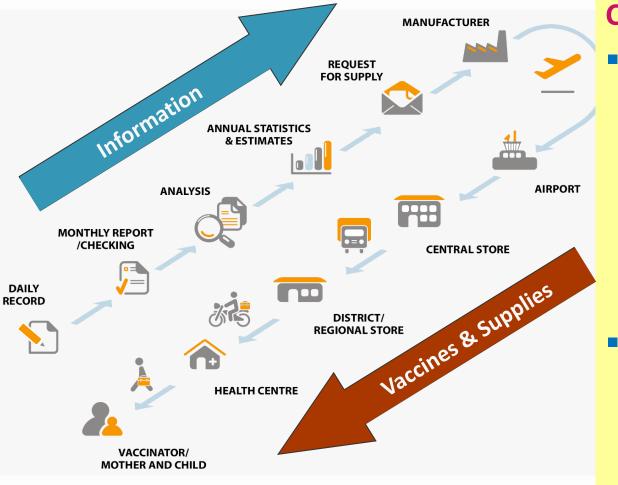
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Vaccine specifications and their implications for demand projection

Immunization vaccine delivery system





Challenges...

Planning:

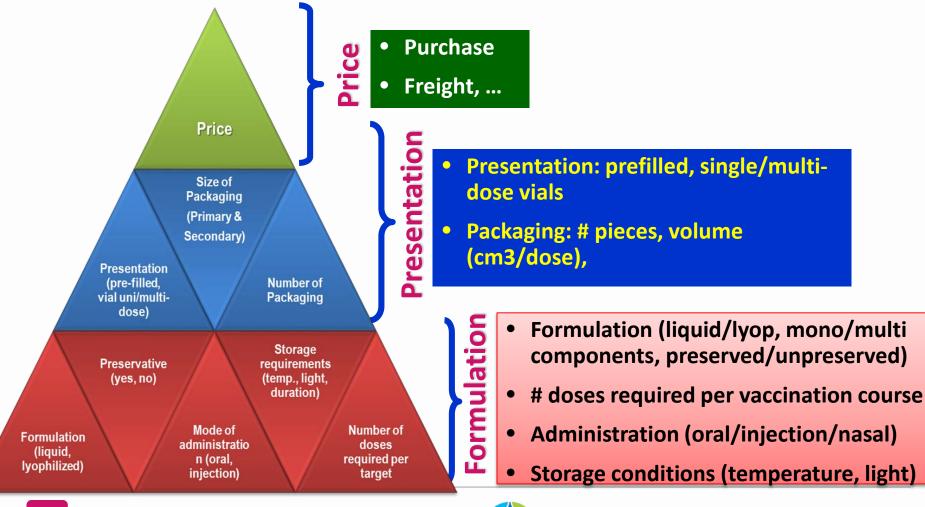
- Estimating adequate quantities of vaccines and safe injection equipment
- Defining adequate capacities for storage and transport
- Monitoring:
 - Collecting consistent data
 - Processing relevant indicators





Optimizing demand forecasting and budgeting: Vaccine characteristics & specification inputs





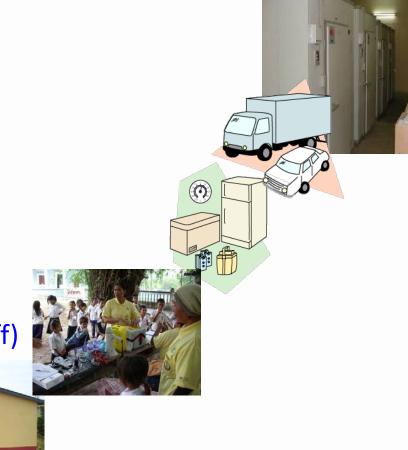




Optimizing demand forecasting and budgeting: Outputs from forecasting

- Amount of supplies needed
 - vaccines
 - injection equipment
- Capacities needed
 - storage (cold and ambient)
 - cooling/freezing packs (transport & vaccination)
 - transportation (shipping containers, vans)
 - vaccination force (sessions, staff)
- Amount waste generated
 - empty vials/ampoules
 - used syringes





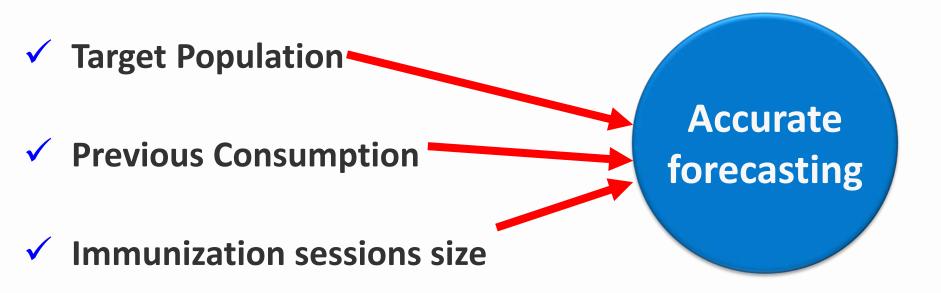


World Health Organization

Forecasting and budgeting – methods and best practices

Optimizing demand forecasting and budgeting: Methods for estimation of vaccine needs





Consistent method and reliable data are key to ensure accurate forecasting of vaccines needs at all levels.





Estimation of vaccine needs: Target populations method



Formulae for estimating demand



where,

- P_{target} VC_{overage} No._{doses} F_{wastage}
- = Target Population
- = Vaccination Coverage
- = Number of doses required per target
- = Wastage Factor





Estimation of vaccine needs: Target populations method

- Target Population (P_{target})
- Vaccination coverage (V_{coverage})
- No. of doses per target (No._{doses})
- Wastage factor (F_{wastage})

<u>Routine</u>:

- Total birth (~1-4% total population)
- Surviving infants (~1-3.5% total population)
- Pregnant women (~2-5% total population)
- Adolescent girls (~2% total population)

<u>SIAs</u>:

- < 5years (~20% Nids, MCV campaigns)
- <15years (~45% MCV campaigns)
- CBAW (~20% MNT campaigns)
- other targets



- Target population (P_{target})
- Vaccination coverage (V_{coverage})
- No. of doses (No._{doses})
- Wastage factor (F_{wastage})

Routine:• BCG= 1 dose• MCV= 1-2 doses• Polio= 3-4 doses• DTP&comb= 3-4 doses• Pneumo= 3 doses• Rotavirus= 2-3 doses

<u>SIAs</u>:

Number of rounds

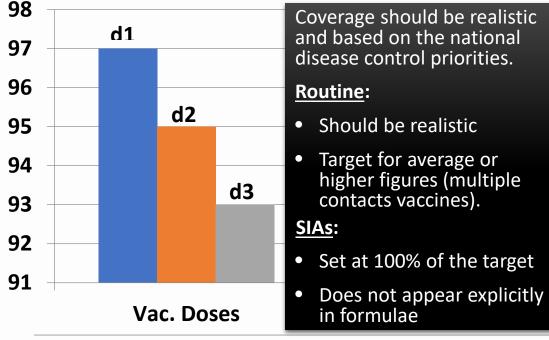




Estimation of vaccine needs: Target populations method

Vaccination coverage

- Target population (P_{target})
- Vac. coverage (V_{coverage})
- No. of doses per target (No._{doses})
- Wastage factor (F_{wastage})



ountries in Transition



Wastage factor

- Target population (P_{target})
- Vaccination coverage (V_{coverage})
- No. of doses per target (No._{doses})
- Wastage factor (F_{wastage})



Wastage <i>rate</i>	5	20	50	80
Wastage <i>factor</i>	1.05	1.25	2.0	5

World Health Organization

Estimation of vaccine & injection equipment needs: Target populations method



Annual Vaccines	<u>Annual doses</u> = target population x Vaccination coverage x No. of doses per target x wastage factor + <u>buffer stock</u>						
Buffer Stock "Provision made to cover unforeseen circumstances, i.e. increased demand, delayed deliveries,"	= annual demand x duration of buffer stock / 12months <u>Note</u> : for multiyear forecasts, buffer should be rolled out and incremented.						
Syringes for Injection	 (1) No. of injection syringes = target population x Vaccination coverage x No. of injections per target x wastage factor (1.11) (2) No. of injection syringes = No. of vaccine doses 						
Syringes for Dilution	No. of dilution syringes = No. of vaccine vials (of reconstituted vaccines)						
Safety Boxes	No. of safety boxes (2.5l) = Total No. of syringes / 70 (<i>content</i>) No. of safety boxes (5l) = Total No. of syringes / 100 (<i>content</i>)						





Estimation of vaccine needs: Methods for analysis of needs



Method-1: per injection

- Likely avoid over estimation of the quantity of syringes needed,
- Minimizes the over-stocking of syringes within the system.

However,

- Creates a fear of scarcity of syringes at the beginning,
- More complex implementation of the "bundling" during the first distribution.

Method-2: per dose

- Increases the availability of safe injection equipment,
- Simplifies implementation of the "bundling" during the first distribution,

However,

- May over-estimate the number of syringes,
- Requires rigorous monitoring to avoid over-stocking syringes on the field.





Estimation of vaccine needs: General observations on forecasting methods



Remarks:

- Planning parameters not always reflect the field reality
- Required efforts for optimisation often neglected during the selection of the planning parameters
- Often overlook the "mathematics" over the "art" of the estimation

However,

- Target population method remains the most suitable method for vaccine forecasts at higher levels (provincial, national, global),
- Especially in absence of reliable data on the implementation of services (new vaccines, reorganization of services, etc.).





EPI-Logistics Forecasting Tool

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Toolbox Approach

- Need for tools
 - data requirements large and diversified
 - Need for evidence based decision making
- There is tool for every job toolbox vs "Swiss knife"











Purpose of EPI-Logistics Forecasting Tool



- Conduct the estimations of multiyear requirements for receiving, storing and distributing, of vaccines, syringes and safety boxes including logistic operational support
- Carry out scenario analysis permitting managers to review the impact of their planning:
 - with regards to introduction/changing of vaccines
 - conducting operations in support of vaccination strategy
- Contribute to multiyear plan and budget development
- Provide inputs to cMYP for vaccines, supplies, cold chain & supply chain operations





Description and use of Forecasting Tool



- The tool has been developed using Microsoft Excel
- 11 worksheets: data entry, planning, output and data source sheets
- Facilitates decision making in support for the purchase of supplies for the immunization programs
- Supports the planning of the processes and structures required to achieve efficient logistical operations in support of:
 - Warehouse operations (storage, transportation and distribution of supplies)
 - vaccination operation





Instructions for Use



Getting started

- Keep original template or download from WHO website: <u>http://webitpreview.who.int/entity/immuniz</u> <u>ation_delivery/systems_policy/logistics/en/</u>
- Save as with new name: Exple: EPI_forecasting_country_year.xls

General principles:

- "Pop up" instructions appear in cells to guide data entry – *No instruction – no entry!*
- All sheets protected (no password)
- "Copy / paste special value" can be use to upload external data
- Dropdown lists refer to data sources that can be updated



Cold chain and logistics planning tool

:: Logisitics planning tool 2009 [xls 4.87Mb] .: Outil de planification logistique 2009 [xls 4.87Mb]





Cover page and content



	В	C			D E F							
1		-										
2												
		EPI		А	B C							
3		L 1 (2		SUMMARY							
4			3		Sheets Content							
6			4	1	Input data sheets							
			5	1.1	data Plans for Routine Vaccination							
			6	1.2	Sias Plans for Supplementary Vaccination							
9			7	1.3	Stores Planning data for national and intermediate vaccine stores							
			8	2-	Results of the planning of vaccination activities (routine and supplementary)							
10		Language:	9	2.1	routine_national Multi-year forecast of Imm. Supplies & Storage Capacities for Routine at national level							
11		- 1	10	2.2	sias_national Forecast of Immunization Supplies & Storage Capacities for SIAs							
12		Country:	11	2.3	routine_interm Annual forecast of Immunization Supplies & Storage Capacities for Routine at Intermediate stores							
13		_	12	2.4	sias_interm Forecast of Vaccines, Safe Injection Supplies & Storage Capacities for Supplementary Vaccinations at Interr							
14		Vaccine procurement:	13	2.5	subnational Multi-year Forecast of Immunization Supplies & Storage Capacities for Routine for Subnational stores							
15			14	2.6	<u>CC_transportation</u> Summary of additional cold chain & vaccine shipment/transport needs for national & intermediate stores							
16		Date:	15	3	Summary tables of cold chain estimations required within new vaccines applications to GAVI support							
17		Ľ	16	3.1	gavi tables nat Cold chain capacities required at the national/primary vaccine store							
18			17	3.2	gavi_tables_interm Cold chain capacities required at the sub-national/intermediate vaccine stores							
19			18		Tables with reference data sources							
20			19	4.1	supplies VACCINES, SAFE INJECTION SUPPLIES & COLD CHAIN EQUIPMENT							
21			20	4.2	<u>CCEqpt</u> Refrigerator and freezer database							
22			21 22	4.3	CB&VC SPECIFICATIONS & PERFORMANCE OF COLD BOXES&VACCINES CARRIERS							
23			23		SPECIAL INSTRUCTIONS							
24			73	73 3.1 National/primary vaccine store: the following data should be enterred:								
25			74		o. Cost of clearing: indicate the cost of receiving vaccines and safe injection equipment at arrival in the country (clearing from customs, transport at							
26			75		o. Stock management cost: NO ENTRY figures are set as a certain percent of the total value of the stock. States of EVSUE collections of the stock of the stock of the stock.							
27			76		 status of EVSM: select the status of implementation of EVM assessment at the primary vaccine store (Certified, Self-assessment, not done). Available cold storage capacities: indicate the gross and net storage of the cold chain (positive & negative). 							
	► H\Cov	er / Index / data / Sias / Stores / rou	14 4	F F	Cover Index / data / Sias / Stores / routine_national / routine_interm / subnational / sias_national / sias_inter •							

Data entry sheets



- 1. Data: Data for planning routine and supplementary vaccinations
- 2. Sias: Data for planning supplementary vaccinations
- 3. Stores: Data on vaccine storage facilities and service points

Input data for planning vaccinations

- Planning data for routine vaccinations
 - Demographic data
 - Routine vaccination targets and plans
- Frequency of supplies & Storage at national level
 - Frequency of vaccine shipments
 - Estimation of population to be vaccinated
- Planning data for supplementary vaccinations
 - Vaccinations for disease control plans
 - Other interventions

- Data on national store
 - transit/handling fees
 - Status of EVM
 - Storage capacities (cold & dry storage)
- Data on sub-national stores
 - Total population
 - Storage capacities
 - Frequency of deliveries
 - Distance to supply
 - Cost (average) per delivery





Outputs from estimations



Multi-year forecast of Imm	. Supplies	& Storage	Capacities f	for Routine	at nationa	l level		Index
		2008	2009	2010	2011	2012	2013	Total 5-years
Total cost of supplies & logistics support								
Cost of vaccines		\$2,805,470	\$2,875,583	\$2,947,652	\$3,021,451	\$3,096,662	\$3,174,309	\$15,115,658
Traditional vaccines	Traditional	\$793,307	\$813,172	\$833,637	\$854,470	\$875,694	\$897,768	\$4,274,740
Underutilized vaccines	Underutilized	\$2,012,163	\$2,062,412	\$2,114,016	\$2,166,981	\$2,220,969	\$2,276,541	\$10,840,918
New vaccines	New	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Cost of safe injection supplies		\$100,472	\$105,784	\$107,796	\$110,535	\$113,323	\$116,188	\$553,626
Traditional vaccines	Traditional	\$43,517	\$44,537	\$45,654	\$46,797	\$48,022	\$49,220	\$234,231
Underutilized vaccines	Underutilized	\$56,955	\$58,362	\$59,793	\$61,322	\$62,818	\$64,419	\$306,714
New vaccines	New	\$0	\$2,885	\$2,349	\$2,416	\$2,483	\$2,550	\$12,682
Vaccine receiving, storage & stock managemen	nt	\$152,309	\$94,610	\$98,836	\$103,250	\$107,849	\$112,675	\$517,220
Vaccine ship	ment & clearing costs	\$84,164	\$87,993	\$92,002	\$96,192	\$100,558	\$105,141	\$481,885
Vaccine stor	ck management costs	\$3,156	\$3,300	\$3,450	\$3,607	\$3,771	\$3,943	\$18,071
Cold Chain addition	ional investment costs	\$61,736	\$0	\$0	\$0	\$0	\$0	\$0
Cold Chain additional	annual running costs	\$3,252	\$3,318	\$3,384	\$3,452	\$3,521	\$3,591	\$17,265
Safe injection equipment receiving, storage & s	stock management	\$21,828	\$30,724	\$34,340	\$39,139	\$44,027	\$49,059	\$197,289
cost of clearing	& handling at arrival	\$5,024	\$5,395	\$5,608	\$5,865	\$6,133	\$6,414	\$29,415
sto	ock management cost	t \$132	\$142	\$147	\$154	\$161	\$168	\$772
Cost of store	age space at ambient	\$16,672	\$25,188	\$28,585	\$33,120	\$37,733	\$42,477	\$42,477
TOTAL COST		\$3,080,078	\$3,106,702	\$3,188,624	\$3,274,375	\$3,361,861	\$3,452,231	\$16,383,794





Outputs from estimations: subnational



Subnational multiyear

Outputs of <u>multiyear</u> estimation of needs and scenario analysis for vaccines, safe injection equipment and storage capacities for a selected subnational store

Subnational annual

Outputs of estimating <u>annual</u> (for a selected year) needs or scenario analysis for vaccines, safe injection equipment and storage capacities at all subnational stores

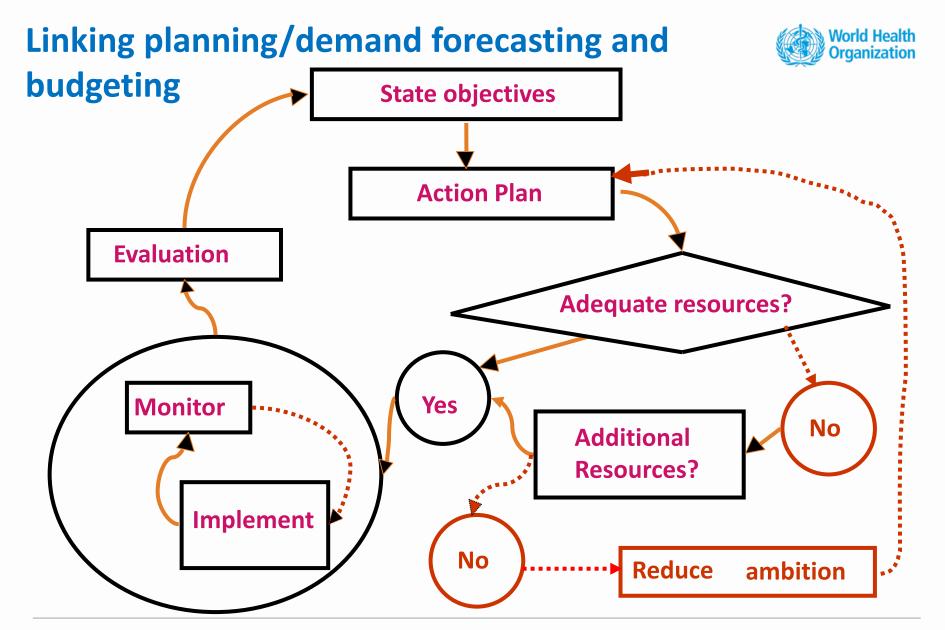
Multi-year Forecast of Immunization Supplies & Storage Capacities for Routine for Subnation								ndex						
Subnational store Province	Sur	2008	2009	2010	2011	2012	2013 1	otal 5-years						
Total cost of supplies & logistics support		\$963,085	\$988,235	\$1,012,937	\$1,038,311	\$1,063,757	\$1,090,767	\$5,194,006						
Cost of vaccines		\$929,797	\$953,272	\$977,154	\$1,001,617	\$1,026,072	\$1,052,265	\$5,010,379						
Traditional vaccines	Traditional	\$263,059	\$269,617	\$276,189	\$283,267	\$200 182		\$1.416.853				-		
Underutilized vaccines	Underutilized	\$666,738	\$683,655	\$700,964	\$718,350	Annual	forecast o	of Immuniz	zation Supp	olies & Stora	age Capacit	ies for Routi	ne at Interm	ediate store
New vaccines	New	\$0	\$0	\$0	\$0		Supp	ly chain level	Province	Province	Province	Province	Province	Province
Cost of safe injection supplies		\$33,288	\$34,963	\$35,783	\$36,694	Sc	cenario/Year	of estimation	2013	Nizwa	Sohar	Sur	Salalah	Ibri
Traditional vaccines	Traditional	\$14,429	\$14,812	\$15,134	\$15,538	Total cost o	f supplies & logi	stics support						
Underutilized vaccines	Underutilized	\$18,859	\$19,346	\$19,843	\$20,351	Cost of vacci	ines			\$526,486	\$526,48	\$1,052,26	\$526,486	\$526,486
New vaccines	New	\$0	\$805	\$805	\$805		Т	raditional vaccines	Traditional	\$148,821	\$148,82	\$297,59	\$148,821	\$148,821
Vaccine receiving, storage & stock management		\$349	\$8,294	\$4,398	\$444		Und	derutilized vaccines	Underutilized	\$377,665	\$377,66	\$754,66	\$377,665	\$377,665
Vaccine	Vaccine shipment & clearing costs			\$0	\$0			New vaccines	New	\$0) \$) s	\$0	\$0
Vaccine	stock management costs	\$349	\$243	\$254	\$266	Cost of safe	injection supplie	5		\$19,352	\$19,35.	\$38,50	\$19,352	\$19,352
Cold Chain a	dditional investment costs	\$0	\$7,937	\$3,968	\$0		Т	raditional vaccines	Traditional	\$8,182	\$8,18	\$16,29	\$8,182	\$8,182
Cold Chain additio	onal annual running costs	\$0	\$114	\$175	\$179		Unc	derutilized vaccines	Underutilized	\$10,700	\$10,70	\$21,33	\$10,700	\$10,700
Safe injection equipment receiving, storage & stor	k management	\$13,815	\$14,487	\$14,828	\$15,206			New vaccines	New	\$470	\$47	\$87	\$470	\$470
cost of clea	aring & handling at arrival	\$0	\$0	\$0	\$0	Vaccine rece	eiving, storage 8	stock manager	nent	\$218	\$14	\$10,92	\$2,804	\$2,804
	stock management cost	\$9	\$9	\$10	\$10	Vaccine shipment & clearing cost			\$0) S	S	\$0	\$0	
Cost of	storage space at ambient	\$13,806	\$14,478	\$14,818	\$15,196	Vaccine stock management cost			\$218	\$ \$14	\$29	\$145	\$145	
TOTAL COST		\$977,248	\$1,011,016	\$1,032,162	\$1,053,961	Cold Chain additional investment costs			\$0) \$	\$10,40	\$2,600	\$2,600	
						Cold Chain additional annual running costs			\$0) \$	\$23	\$59	\$59	
						Safe injectio	Safe injection equipment receiving, storage & stock manager			\$8,018	\$8,01	\$15,95	\$8,018	\$8,018
						cost of clearing & handling at arriva			\$0) s	S	\$0	\$0	
						stock management cos		\$6	i s	\$1	\$6	\$6		
							Cost of storage space at ambient			\$8,012	\$8,01	\$15,94	\$8,012	\$8,012
						TOTAL COST	-			\$554,074	\$554,00	\$1 117 64	\$556,660	\$556,660





Summary...

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Optimizing demand forecasting and budgeting: Planning prerequisites



EPI component	Objectives	Logistics implications			
Routine immunization	Coverage and equity	Stock acquiring:			
Disease control	Mass campaigns (Polio, measles, MNT & YF), Surveillance activities (AFP, IDS, etc.)	vaccines, supplies, equipment Storage & distribution: cold chain, transport			
Innovation	Introduction of new vaccines & technologies (PCV, RV, HPV,)	management Stock management:			
Integration with other programs: IMCI, Pneumo, AIDS, Adolescent health, etc.	Efficiency, economy of scale,	Equipment installation & maintenance Waste disposal: collect, disposal			

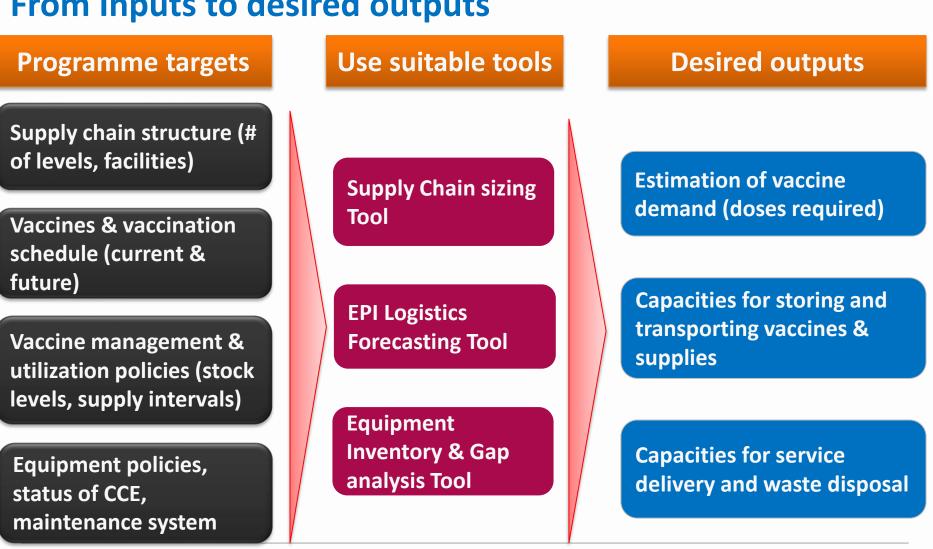
- Each of these program areas and their objectives have logistics implications, which translate in requirements
- Those requirements need to be reflected in the forecasting and budgeting exercise.





Optimizing demand forecasting and budgeting: From Inputs to desired outputs









Thank you!

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Link to the EPI Forecasting Tool



CLICK HERE







Q&A Discussion Summary (1 of 2)



• Who should be involved in the annual vaccine forecasting exercise? Is it only for logisticians?

- Setting objectives [for forecasting], is the responsibility of the program decision-makers. We want their perspective to reach everyone. The forecasting exercise itself can be delivered to the logisticians who make calculations on what the requirements will be to reach the targets. Then, presented to the decision-makers to mobilize the resources. It [forecasting] involves everyone from the top level down to the mid-level technicians.
- What is the most common mistake that countries make in vaccine forecasting and budgeting? Logan Brenzel, BMFG
 - One of the mistakes we are seeing most frequently is re-conducting the set scope. We are used to making our decisions this way, [thinking] it will be the same thing. This may work for the programs that have reached a level of maturity. So, doing it the same way without necessarily seeking and re-seeking again for more efficiency and saving of resources.
- Is there one tool that's recommended among the three tools that were presented? Easier, more accurate? Juliette Puret, Gavi
 - Different methods are being used. We are seeing people using the first [tool] mostly because it's probably easy to approximate the
 parameters. Otherwise, it may be good to go for the third one, but what this exercise would require would not be realistic [in some
 countries] to implement. It may take a long time to make the estimations, but it's well-done and gives a greater [more accurate]
 approximation.
- Is it feasible to implement vaccine forecasting for a facility-level immunization program? Oluwaseun Esan, Nigeria
 - Absolutely. This same approach can be done if microplanning processes are implemented in the program. Microplanning focuses on service delivery and provides for each district in different health areas.
- What is your advice and observations about the wastage rate and waste management as it relates to vaccine budgeting and forecasting? Miloud Kiddar
 - WHO and Gavi are investigating [this now] to find out the impact of wastage rate on the program sustainability to see if the higher the waste rate, the higher the demand will be. We didn't have a method that would be able to look at suggestions from the modeling using the distribution of session size that determined the wastage. This exercise will come up with conclusions by the end of the year and will [allow us to see] If I'm delivering my vaccines in this particular context if I vaccinate once a week, once a month what will be my wastage? It will allow you to predict that. Regarding waste management, it is the responsibility of immunization to take care [of] and plan to collect and dispose of the waste generated. We still need better, environmentally-friendly solutions that have yet to be developed.





Q&A Discussion Summary (2 of 2)



- How does internal displacement and refugee influx following conflict or disaster affect calculations? Kolawole Salami, Nigeria
 - This is a very disruptive factor in the forecasting. I think that some countries, like Jordan, factor in [for] some of this. The support should be there provided that you give some amount of calculations. If you have an idea of the refugee [situation], it can be estimated, but it is a challenging exercise.
- Some EPI managers tend to overestimate the quantity of vaccines needed, but now because of the financial constraints and the co-financing policies, have you seen any change in the way countries are forecasting the demand? Miloud Kaddar
 - Yes. But, still, I think there's a clear pattern that is showing countries loading more costs on the vaccine forecasting and even procuring. I remember 5 or 10 years ago some countries had stock for up to two years or even three years. Today, most of the countries [have stock] between 9 and 12 months. This is a sign that countries are more conscious [today].
- There are often gaps between the forecasting of needs and what actually gets put into the budget. How can we strengthen this linkage at the country-level?
 - One of the solutions is a multi-year forecast. This [approach could help] reduce the gap between the forecast and budget because those who are allocating countries' resources will have the visibility on the future and they can ensure that at least part, if not all, of the budget is allocated and secured.
- Do you suggest that EPI teams first consider the budget and then the number of doses needed or should they estimate the quantity needed and then look at the budget? Miloud Kaddar
 - The second estimate what you need and ask for that.





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