PEOPLE THAT DELIVER

Promoting sustainable workforce excellence in health supply chain management

Workforce optimisation tool

User Guide

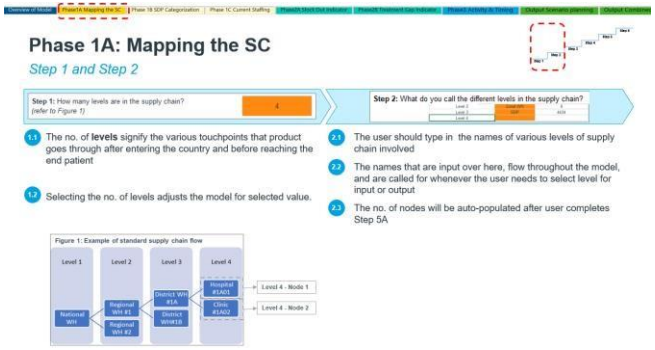
The workforce optimisation tool – user guide is intended to be used as a refence for working with the Excel tool

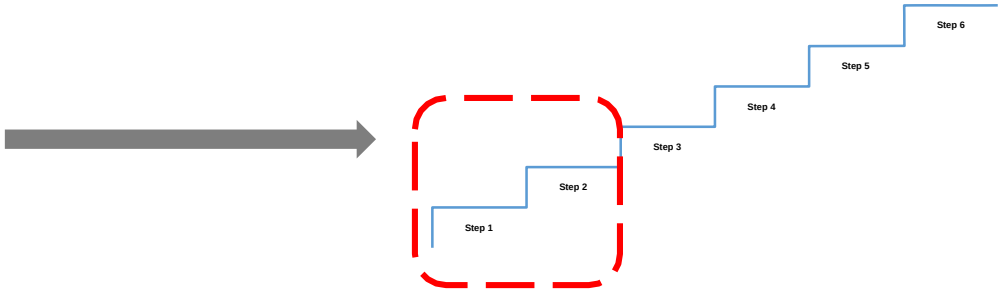
Overview of this guide

- This user guide follows the same flow as the tool and each slide has a legend representing the tabs of the excel tool
  - The red box indicates the reference to the tab in the tool

Overview of Model | Phase1A Mapping the SC | Phase 1B SDP Categorization | Phase 1C Current Staffing | Phase2A Stock Out Indicator | Phase2B Treatment Gap Indicator | Phase3 Activity & Timing | Output Scenario planning | Output Combined

- The user guide is organised by phases (tabs) and follows the sequential order of the steps. Each phase is a separate section in the user guide and starts with an overview slide
- This slide gives a high level overview of the steps in the process using a staircase graphic. The top right corner of each slide is tagged to reference the step of the phase





The Excel tool prompts the user when and where to enter data and tells the user what data is needed for each step

Overview of standard functions of input sheets

Elements of an input sheet

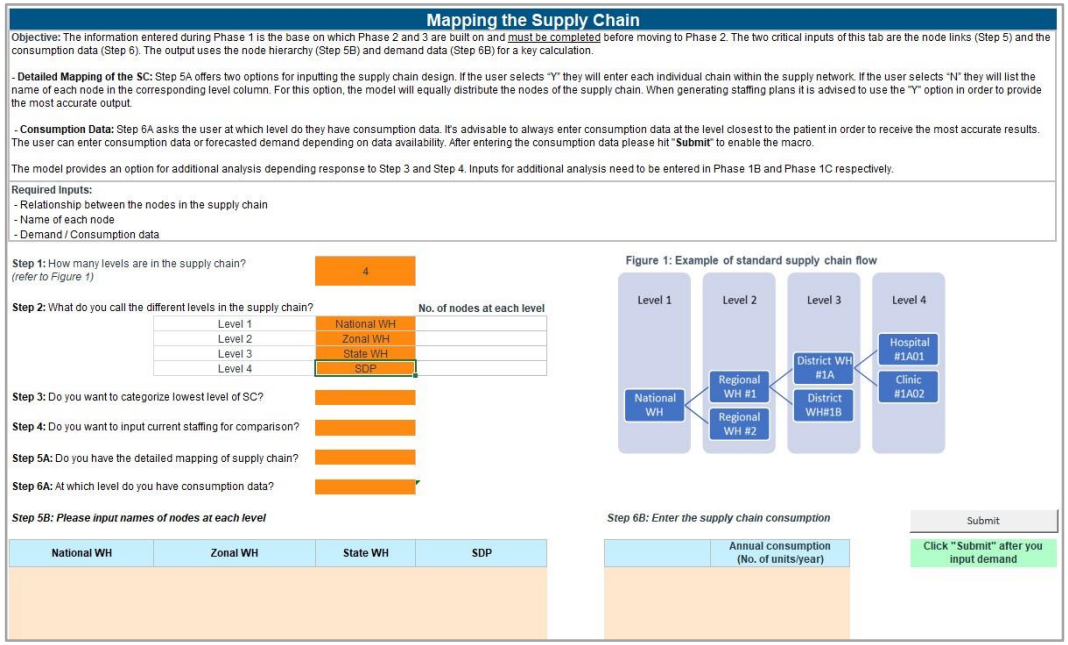
Every input sheet states the objective and data requirements needed to complete the steps

The user is prompted to follow sequential "**steps**" that are bolded and numbered within the spreadsheet

The tool incorporates colour coding to assist the user throughout the spreadsheet

- **Orange Cells** – User enters data
- **Blue Cells** – Cells have been populated with data provided by the users
- **Green Cells** – Instructions to the user

Example input sheet



Mapping the Supply Chain

Objective: The information entered during Phase 1 is the base on which Phase 2 and 3 are built on and must be completed before moving to Phase 2. The two critical inputs of this tab are the node links (Step 5) and the consumption data (Step 6). The output uses the node hierarchy (Step 5B) and demand data (Step 6B) for a key calculation.

- **Detailed Mapping of the SC:** Step 5A offers two options for inputting the supply chain design. If the user selects "Y" they will enter each individual chain within the supply network. If the user selects "N" they will list the name of each node in the corresponding level column. For this option, the model will equally distribute the nodes of the supply chain. When generating staffing plans it is advised to use the "Y" option in order to provide the most accurate output.

- **Consumption Data:** Step 6A asks the user at which level do they have consumption data. It's advisable to always enter consumption data at the level closest to the patient in order to receive the most accurate results. The user can enter consumption data or forecasted demand depending on data availability. After entering the consumption data please hit "**Submit**" to enable the macro.

The model provides an option for additional analysis depending response to Step 3 and Step 4. Inputs for additional analysis need to be entered in Phase 1B and Phase 1C respectively.

Required Inputs:
- Relationship between the nodes in the supply chain
- Name of each node
- Demand / Consumption data

Step 1: How many levels are in the supply chain? *(refer to Figure 1)* — 4

Step 2: What do you call the different levels in the supply chain?

		No. of nodes at each level
Level 1	National WH	
Level 2	Zonal WH	
Level 3	State WH	
Level 4	SDP	

Step 3: Do you want to categorize lowest level of SC?

Step 4: Do you want to input current staffing for comparison?

Step 5A: Do you have the detailed mapping of supply chain?

Step 6A: At which level do you have consumption data?

Step 5B: Please input names of nodes at each level

National WH	Zonal WH	State WH	SDP

Figure 1: Example of standard supply chain flow

Step 6B: Enter the supply chain consumption

	Annual consumption (No. of units/year)

Submit

Click "Submit" after you input demand

Table of contents

Click on the tab to review the instructions

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Phase 1: Mapping the Supply Chain

Overview

Step 1

- Select the number of supply chain levels from drop down

Step 2

- Enter the name of all the levels in the supply chain
- Number of nodes will be populated after Step 5

Step 3

- Preliminary optional step for Phase 1B
- Select "Y" to categorise the lowest level of SC

Step 4

- Preliminary optional step for Phase 1C
- Allows for granular analysis of results

Step 5

- Give information around nodes of supply chain for all levels
- Give connection information, if available

Step 6

- Enter consumption data (forecasted or historical) to get demand based staffing
- For best results, data should be for lowest level of SC

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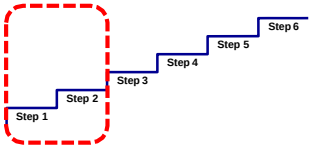
Phase 1A: Mapping the SC

Step 1 and step 2



Step 1: How many levels are in the supply chain? *(refer to Figure 1)* — 4

Step 2: What do you call the different levels in the supply chain?

Level 2	Zonal WH	6
Level 3	SDP	4434
Level 4		

1.1 The number of **levels** signify the various touchpoints that product goes through after entering the country and before reaching the end patient

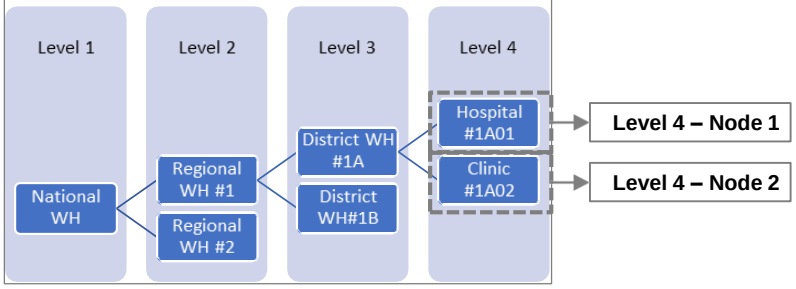
1.2 Selecting the number of levels adjusts the tool for selected value

2.1 The user types in the names of various levels of supply chain involved

2.2 The names that are entered here flow throughout the tool, and are used to select level for input or output

2.3 The number of nodes will be auto-populated after user completes Step 5A

Figure 1: Example of standard supply chain flow



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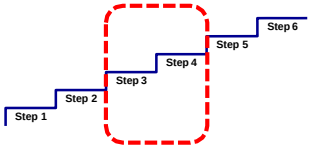
Phase 1A: Mapping the SC

Step 3 and step 4



3.1 The user selects “Y” if the lowest level of SC aren’t all consistent in terms of SC activities

- For example, if the SC activities and time to complete activities for a urban hospital are different from a rural health clinic, the user may want to categorize these to input different activities or timings for them

3.2 If user selects “N”, all activities and their average time will be considered same for all nodes

3.2 If “Y” The user is required to move to “Phase1B: SDP Categorization” tab to give further information on categorization

4.1 The user should select “Y” if they have information on current staffing across different roles for each node and level

4.2 If “Y” user is required to go to ”Phase 1C: Current Staffing” tab to input information

4.3 Giving current staffing as an input allows user to perform comparative analysis of current situation and optimized results better hence drawing better insights from tool

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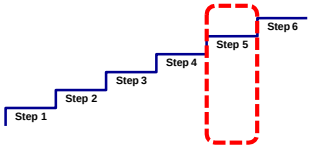
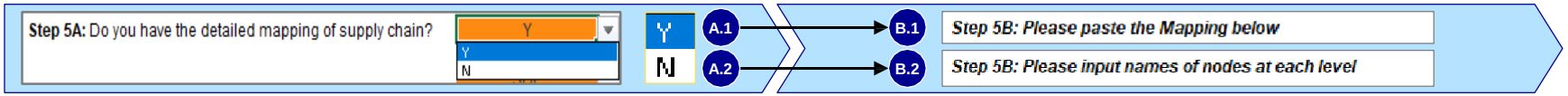
Phase 1A: Mapping the SC

Step 5 – Supply chain links





A.1 Select "**Y**" if:

- **A1–1** The user has visibility to the hierarchy between various levels of SC i.e. Information on which node of level 1 supplies to which node of level 2 and so on
- **A1–2** Paste the information in **Step 5B** in form of linear mapping (see B.1 for an example). Ensure that all entries for 1 node occur together in list

A.2 Select "**N**" if:

- **A2–1** The user doesn't have the SC hierarchy
- **A2–2** **Step 5B** prompts user to in feed the names of each node for all SC levels
- **A2–3** This option reduces the accuracy of volume dependent staffing for levels at which consumption data is not entered

B.1 Illustrative input (Mapping)

Level 1	Level 2	Level 3
L1N1	L2N1	L3N1
L1N1	L2N1	L3N2
L1N1	L2N2	L3N3
L1N2	L2N3	L3N4
L1N2	L2N3	L3N5

B.2 Illustrative input (Node names)

Level 1	Level 2	Level 3
L1N1 (Level 1 Node 1)	L2N1	L3N1
L1N2 (Level 1 Node 2)	L2N2	L3N2
	L2N3	L3N3
		L3N4
		L3N5

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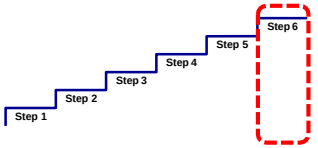
Phase 1A: Mapping the SC

Step 6 – Consumption input



Step 6A: At which level do you have consumption data? SDP (National WH, Zonal WH, SDP)

Step 6B: Enter the supply chain consumption

A.1 The user is provided a dropdown of levels input in Step 2 to select level at which consumption data is available

A.2 Consumption units can either be the quantity ordered or quantity received

A.3 If data is available for multiple levels user should prefer lowest level available for best results

A.4 The user can input forecasted demand to get information for future staffing

A.5 User then inputs the consumption data in **Step 6B**

B.1 Illustrative input

Level 3	Annual consumption (number of units/year)
L3N1	28
L3N2	73755
L3N3	23830
L3N4	1269
L3N5	222

Submit

Click "Submit" after you input demand

Clicking "**Submit**" triggers a macro which might take ~1 min of wait time

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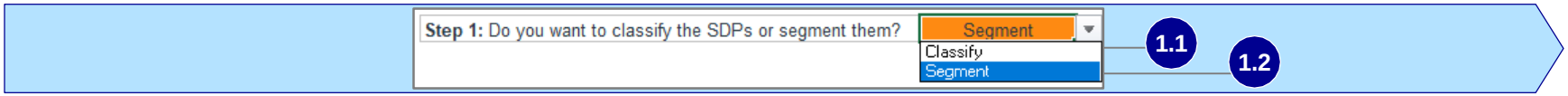
Phase 1B: Segmentation sheet

Optional step for better results



1.1 If user wants to classify based on type of node, e.g.,: Hospital, Clinic, health post etc.

Step 2: Please define different classes for SDPs	
Category 1	
Category 2	
Category 3	

1.1–1 The user is required to input the name of categories he/she wants to classify the nodes into

1.1–2 The user needs to manually classify each node into one of three categories input earlier in "Final Categorisation"

1.1–3 In this case demand-based segmentation is for reference

SDP	Demand based Segmentation	Final Categorizatior

1.2 If user wants to segment nodes based on volume flowing through them

Step 2: Please give max percentile limits for segmentation	
High	40%
Medium	60%
Low	100%

1.2–1 The user is required to input the percentile boundaries for high, medium and low categories

1.2–2 In the above example, all SDPs forming the top 40 percentile of total demand are categorised as high and so on

Calculate
Click "Calculate" to know segments based on demand

Demand segmentation to be considered after clicking "**Calculate**"

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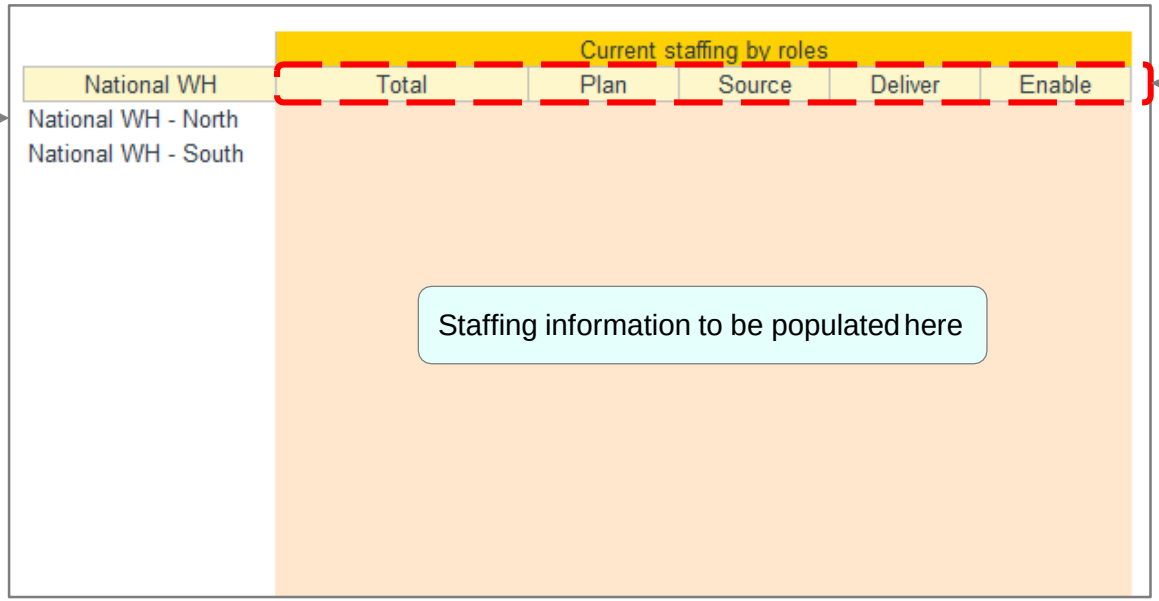
Phase 1C: Current Staffing

Optional steps for better results

Similarmatrix for all levels is visible in "Current staffing tab"



Auto populated column based on **Step 5B** input

The staffing information at most granular level helps to generate better insights in comparative analysis on output tab

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Phase 2: Optimization Objective Indicators

Overview

Step 1

- Select whether the required inputs are available or not

Step 2

- Select the SC level at which the data is to be entered

Step 3

Input data for optimisation objective

Phase 2A*

The tab is pre set to collect for stock out rates but can be updated to support any supply chain KPI

Phase 2B

The tab is set for calculating the treatment gap for the selected program and redistribute staffing accordingly

*User should keep in mind that other SC KPIs that are considered “good” when minimized fit best with this model

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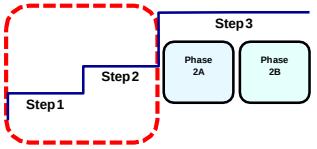
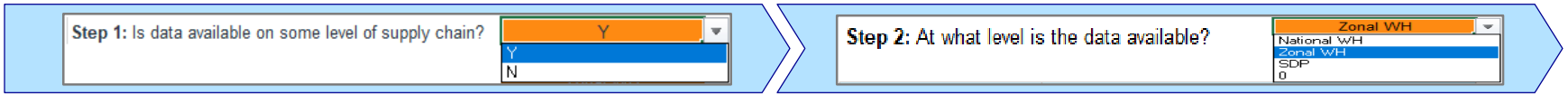
Phase 2: Selecting the benchmark

Step 1 & 2 – Common





1.1 The user selects “Y”, if required data is available.

1.2 If “N”, user can manually select the benchmark in phase 3

2.1 The user should select one of the levels entered in phase 1 at which the required data is available

2.2 If data is available at some other level, user can use proxies to get data for at least one of SC level

2.3 Benchmark in phase 3 will be auto suggested for level selected in step 2, for other levels user needs to select benchmark manually

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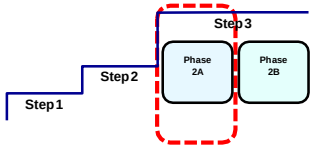
Phase 2A: Stock out indicator

Step 3 – Stock outs



Step 3: Enter Data to select benchmark

3.1 Zonal WH	3.2 Stock Out Rate	3.3 Categorization

3.4 Suggested node for benchmark	
Zonal WH	Anambra

3.1.1 Auto populated field from what the user entered in phase 1A

3.2.1 The user enters the stock out rate for all the nodes

3.2.2 In case stock out rate is not available, user can input another supply chain KPI which needs to be minimised for SC optimisation

3.3.1 Categorisation is done automatically based on user input

3.3.2 This column is for user reference

3.4.1 The node with minimum stock out rate is suggested as the benchmark

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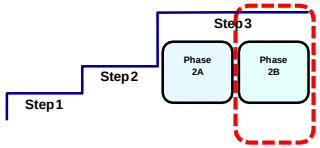
Phase 2B: Treatment gap indicator

Step 3 – Treatment gaps



Step 3: Enter Data to calculate treatment gap

User Input Fields

Auto Populated Fields

3.1 Zonal WH	3.2 Total Population	3.3 % Population affected	3.4 Current # of people receiving treatment	Total no. of patients	Gap in Treatment	% patients receiving treatment	Coverage
							Low
							Medium
							Medium

3.1.1 Auto populated field from what the user entered in phase 1A

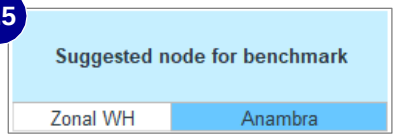
3.2.1 Enter total population for the region covered by a particular node

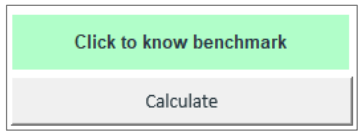
3.3.1 Enter the prevalence % that is related to demand entered in phase 1A - Step 6

3.4.1 Current number of patients receiving treatment from the SC

3.4.2 Treatment data should relate to demand in phase 1A – Step 6

3.5





3.5.1 The node within top 40 percentile of "**total patients**" and min. "**gap in treatment**" is suggested as the benchmark

Click "**calculate**" to know the updated benchmark suggestion

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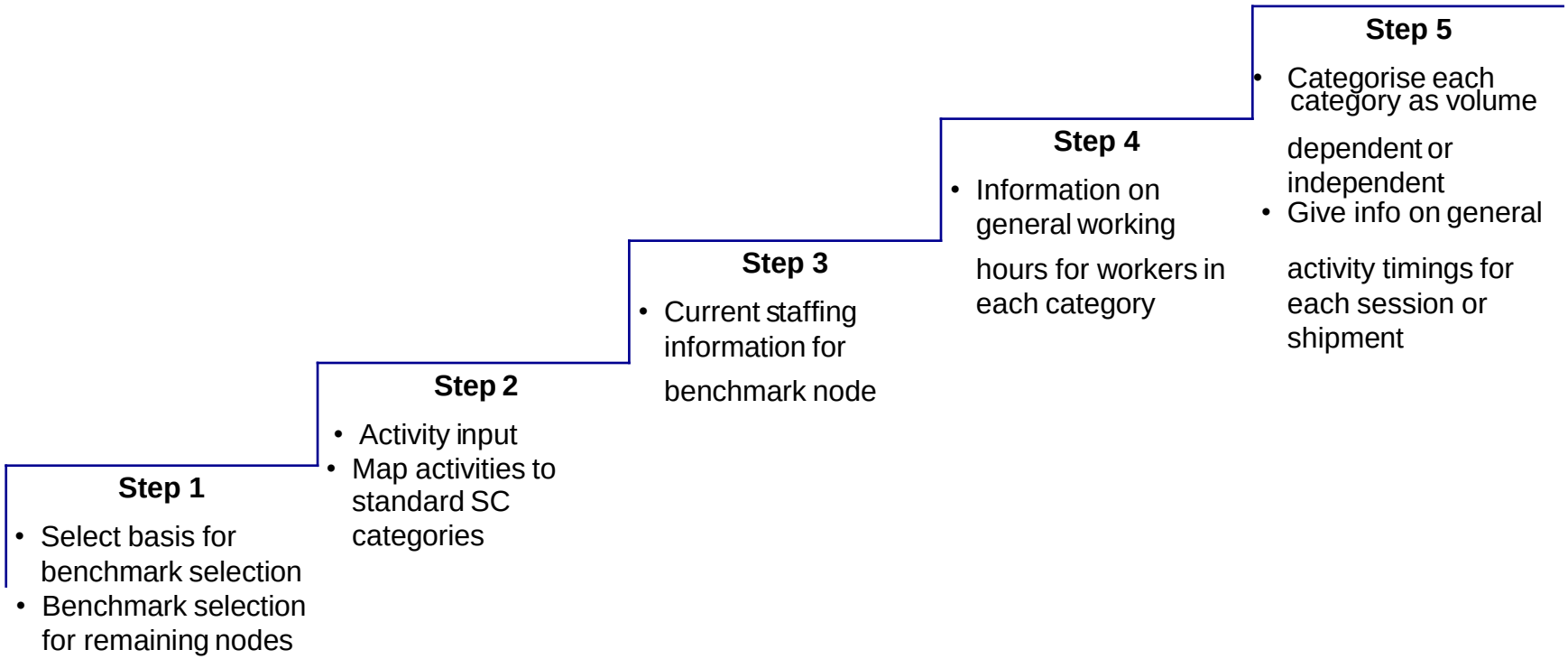
Phase 3: Activity & timing

Overview



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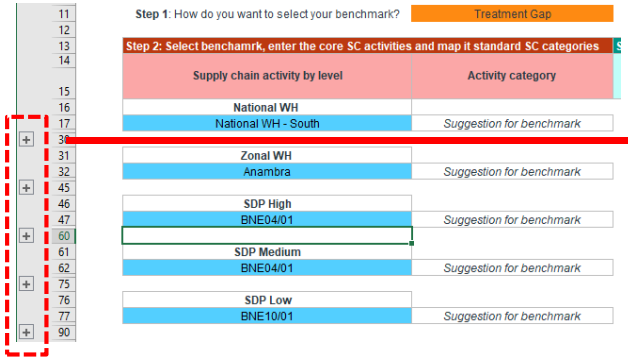
Phase 3: Activity & timing

Visual overview



Step 1: How do you want to select your benchmark? Treatment Gap

Step 2: Select benchamrk, enter the core SC activities and map it standard SC categories	
Supply chain activity by level	Activity category
National WH	
National WH - South	*Suggestion for benchmark*
Zonal WH	
Anambra	*Suggestion for benchmark*
SDP High	
BNE04/01	*Suggestion for benchmark*
SDP Medium	
BNE04/01	*Suggestion for benchmark*
SDP Low	
BNE10/01	*Suggestion for benchmark*

Click on "**+**" sign to follow Steps 2-5 individually for each level

Step 2: Select benchamrk, enter the core SC activities and map it standard SC categories		Step 3: Enter the staffing information for selected benchmark		Step 4: Enter general working hours information			Step 5: Enter the optimal numbers for that particular activity based on whether it is volume dependent or not				
								Volume independent		Volume dependent	
Supply chain activity by level	Activity category	No. of headcounts for each category	%time allocated	Avg working hours / HC / day	Working days / week	No. of holidays / year	Workload Indicator	Frequency of activity	Avg time (hrs) /activity	Avg. units/shipment	Avg Time spent (hrs) /shipment
National WH											
National WH - South	*Suggestion for benchmark*							Add input for highlighted cells after selecting type of workload			
Product dispensing and counseling	Deliver	5	100%	8	5	30	Volume dependent			5000	20
capture consumption	Enable - Contracts/ Agreements	1	100%	8	5	30	Volume independent	Monthly	2000		
update stock cards / system	Enable - Data & Info	2	100%	8	5	30	Volume independent	Monthly	2000		
Forecasting	Plan – SC	3	50%	8	5	30	Volume independent	Monthly	2000		
S&OP Meeting (cross functional meeting to validate fore	Plan – SC	3	50%	8	5	30	Volume independent	Monthly	2000		
Generate and place order to WH	Enable - Procurement	1	100%	8	5	30	Volume independent	Monthly	2000		
Unload delivery & verify received product against paperw	Plan - Procurement	2	50%	8	5	30	Volume dependent			5000	20
Stock product in pharmacy / facility	Plan - Procurement	2	50%	8	5	30	Volume dependent			5000	20
Expiry management (FEFO) and disposal	Enable - Performance	1	100%	8	5	30	Volume independent	Monthly	2000		
physical inventory count / audit	Return - to Supplier	3	33%	8	5	30	Volume independent	Monthly	2000		
physical inventory audit	Return - from Client	3	33%	8	5	30	Volume independent	Monthly	2000		
ensure good WH practices / audit	Procure	3	33%	8	5	30	Volume independent	Monthly	2000		

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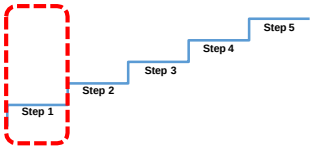
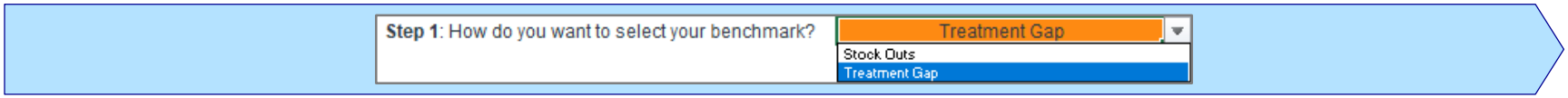
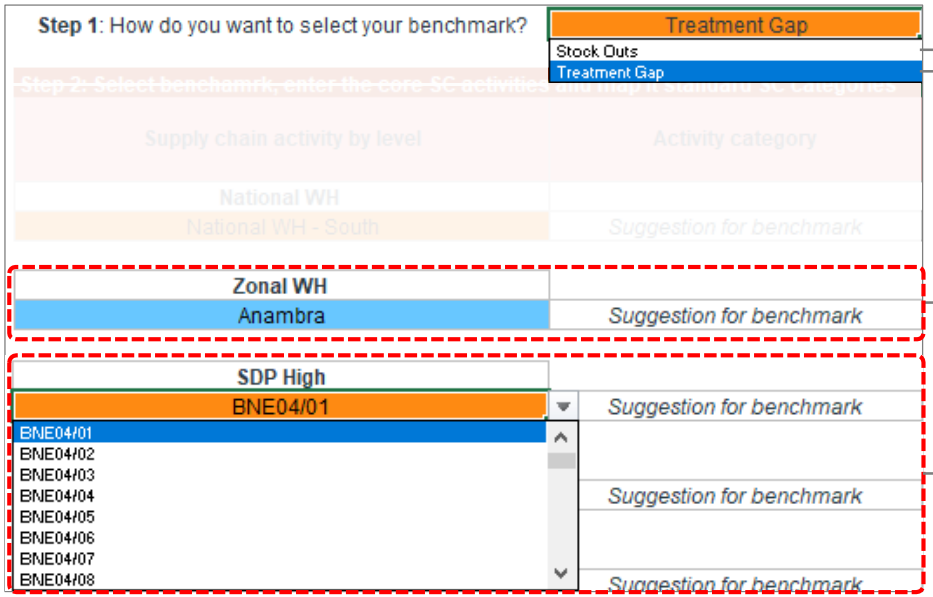
Phase 3: Activity & timing

Step 1 – Benchmark selection







11 The user should select the option based on the major objective to be achieved

12 Based on this selection the benchmark node from phase 2A or phase 2B will be populated as benchmark

13 The node at which stock out/treatment data has been entered is auto populated and is highlighted in **blue**

14 The user is required to select benchmark for **orange** cells from dropdown for his reference

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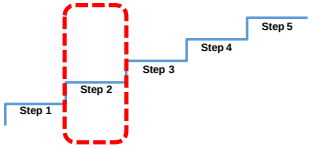
Phase 3: Activity & timing

Step 2 – Activity input



Step 2: Select benchamrk, enter the core SC activities and map it standard SC categories

2.1

Supply chain activity by level	Activity category
National WH	
National WH - South	*Suggestion for benchmark*
Product dispensing and counseling	Deliver
capture consumption	
update stock cards / system	
Forecasting	
S&OP Meeting (cross functional meeting to validate fore	Plan – SC
Generate and place order to WH	Enable - Procurement
Unload delivery & verify received product against paperw	Plan - Procurement
Stock product in pharmacy / facility	Plan - Procurement
Expiry management (FEFO) and disposal	Enable - Performance
physical inventory count / audit	Return - to Supplier
physical inventory audit	Return - from Client
ensure good WH practices / audit	Procure

2.2

Deliver
Enable
Plan
Source

2.1.1 The user should enter the activities taking place at the selected facility

2.2.1 Map each activity to standard SC activities from drop down

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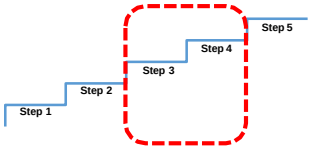
Phase 3: Activity & timing

Step 3 & 4 – Staffing and current working hours input



Step 3: Enter the staffing information for selected benchmark

Step 4: Enter general working hours information

3.1	3.2
No. of headcounts for each category	%time allocated

- 3.1•1 The user enters current staffing at benchmark for each activity or at activity category level based on availability
- 3.2.1• Enter in 100% for all if staffing is entered at activity level
- 3.2.2• If staffing is entered at activity category level then allocate the time for each activity

4.1	4.2	4.3
Avg working hours / HC / day	Working days / week	No. of holidays / year

- 4.1.1 Enter average working hours for a worker per day
- 4.2.1 Enter average working days per week
- 4.3.1 Enter planned holidays for the year in focus

These inputs together help determine the capacity of workers for each activity category

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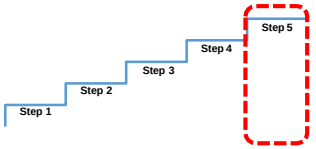
Phase 3: Activity & timing

Step 5 – Activity classification and timing



Step 5: Enter the optimal numbers for that particular activity based on whether it is volume dependent or not

Workload Indicator	Volume independent		Volume dependent	
	Frequency of activity	Avg time (hrs) /activity	Avg. units/shipment	Avg Time spent (hrs) /shipment
	Add input [illegible] highlighted cells a[illegible] selecting type of workl[illegible]			
Volume dependent			5000	20
Volume independent	Monthly	2000		
Volume dependent / Volume independent	Monthly	2000		
Volume independent	Monthly	2000		
Volume independent		2000		
Volume independent		2000		
Volume dependent			5000	20
Volume dependent			5000	20

5.1 5.2 5.3 5.4 5.5

Volume dependent
Volume independent

Daily
Weekly
Monthly
Quarterly
Yearly

5.1.1 Categorise each activity as volume dependent or independent (refer to next slide for explanation)

5.2.1 Select the frequency for volume independent activities from drop down

5.3.1 Enter average time taken each time the selected activity takes place

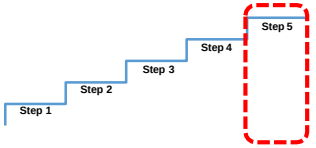
5.4.1 Enter average units being handled during each activity

5.5.1 Enter time taken to do each activity for selected number of units

PEOPLE THAT DELIVER

Phase 3: Activity & timing

Step 5 – A note on activity classification



Volume independent

Activities that are supposed to happen on a fixed schedule irrespective of demand and it take similar amount of time every time.

Example: Training sessions for workers, planning sessions for demand forecast

Volume dependent

Activities for which time taken is directly proportional to number of orders/shipments received are classified under this.

Example: Time for unloading the truck with 10000 units is double the time taken for 5000 units

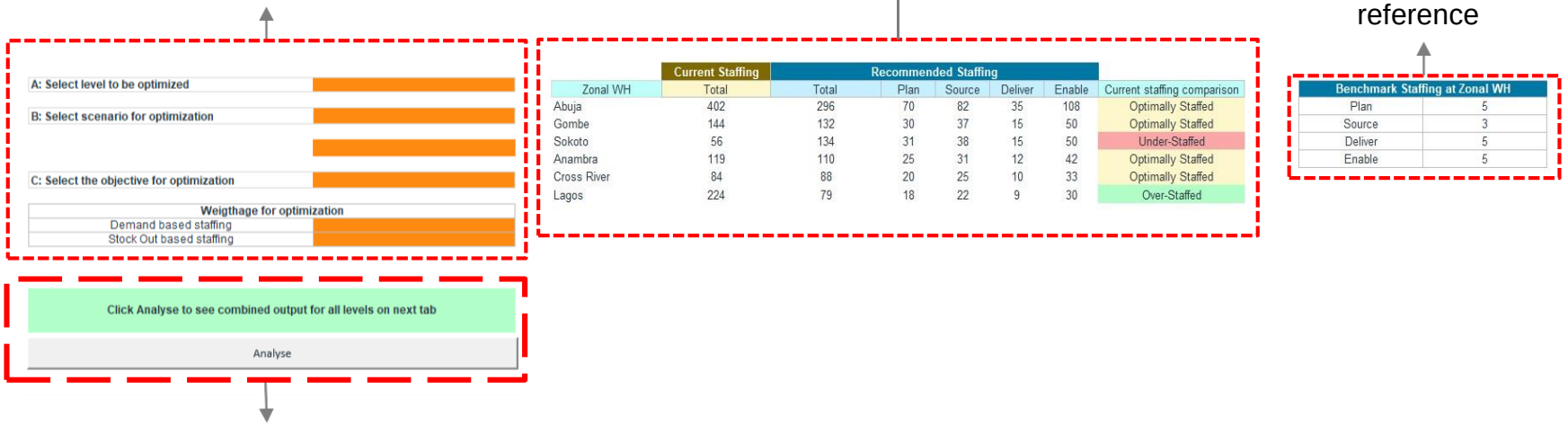
Output scenario planning

Overview

Set constraints and objectives for each level of SC

Output for selected level

Benchmark staffing for reference



	Current Staffing	Recommended Staffing					
Zonal WH	Total	Total	Plan	Source	Deliver	Enable	Current staffing comparison
Abuja	402	296	70	82	35	108	Optimally Staffed
Gombe	144	132	30	37	15	50	Optimally Staffed
Sokoto	56	134	31	38	15	50	Under-Staffed
Anambra	119	110	25	31	12	42	Optimally Staffed
Cross River	84	88	20	25	10	33	Optimally Staffed
Lagos	224	79	18	22	9	30	Over-Staffed

Benchmark Staffing at Zonal WH	
Plan	5
Source	3
Deliver	5
Enable	5

Click to update output combined tab for selected objectives and constraints for all levels

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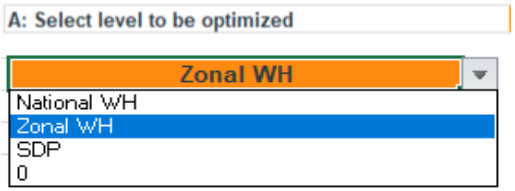
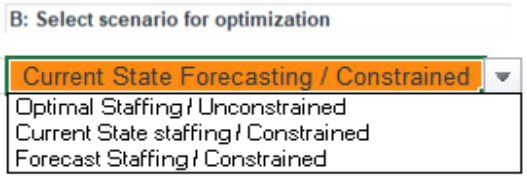
Output scenario planning

Constraints and objectives



Select level
From the drop down list the user will see the levels in their supply chain

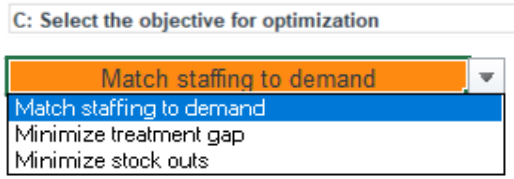
Choose a level in which to see the outcome of the scenario



Optimal staffing/unconstrained
Select scenario to know best case staffing

Current state staffing
Enter the constraint in highlighted cells as total number of current employees

Forecast staffing
Enter in number of maximum employees budgeted for



Match staffing demand
Ensure uninterrupted product flow based on demand

Minimise treatment gap
Staff with priority given to facilities which have the largest treatment gap

Minimise stock outs
Staff with priority given to facilities which have the largest stock out rate

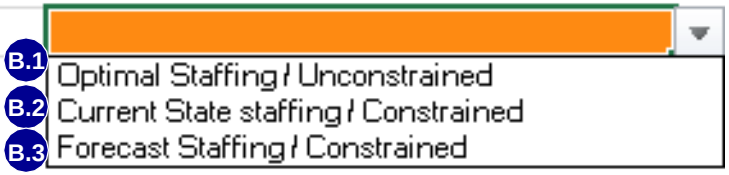
Output scenario planning

Level and scenario selection

A: Select level to be optimized

The user should select the level at which to see the output

B: Select scenario for optimization



B.1.1

The unconstrained scenario is selected to know the optimised staffing without any cap on maximum employees

B.2.1

- The user should select this option if they want to redistribute the current workforce in an optimal way

Total number of current employees

- As an additional step the user enters the total number of employees for the level selected in **Step A**

B.3.1

- The user should select this option if they have input the forecast demand in phase 1 – Step 6

Maximum employees at selected level budgeted for

- As an additional step the user inputs the maximum workers that can be staffed at level selected in **Step A**

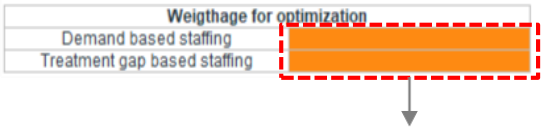
Objective selection for optimisation

C.1.1

This is the default objective which optimizes the staffing to meet demand at each node entered in phase 1-Step 6

C.2.1

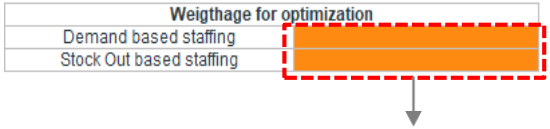
This objective gives user option to assign weightage to distribution based on treatment gaps demand based staffing.
Valid only for level selected in phase 2B



Sum should add up to 100%

C.3.1

This objective gives option to assign weightage to distribution based on stock out rate and to demand based staffing.
Valid only for level selected in phase 2A



Sum should add up to 100%

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Output scenario planning

Output for selected level

Click on **"+"** at top to look at current staffing by roles

	Current Staffing					Recommended Staffing					
Zonal WH	Total	Plan	Source	Deliver	Enable	Total	Plan	Source	Deliver	Enable	Current staffing comparison
Abuja	402	100	72	80	150	296	70	82	35	108	Optimally Staffed
Gombe	144	18	46	24	56	132	30	37	15	50	Optimally Staffed
Sokoto	56	10	26	10	10	134	31	38	15	50	Under-Staffed
Anambra	119	31	21	10	57	110	25	31	12	42	Optimally Staffed
Cross River	84	10	34	19	21	88	20	25	10	33	Optimally Staffed
Lagos	224	50	60	24	90	79	18	22	9	30	Over-Staffed

Current staffing based on inputs on phase 1C

Optimal staffing output based on scenarios and objectives selected

Optimally staffed if the gap between current and optimised is less that 50%

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Output combined

Output for all levels

	Current Staffing					Recommended Staffing					
	Total	Plan	Source	Deliver	Enable	Total	Plan	Source	Deliver	Enable	Current staffing comparison
National WH - North						263	115	39	57	52	Under-Staffed
National WH - South						209	79	39	39	52	Under-Staffed

Zonal WH	Current Staffing Total	Plan	Source	Deliver	Enable	Recommended Staffing Total	Plan	Source	Deliver	Enable	Current staffing comparison
Abuja	402	100	72	80	150	296	70	82	35	108	Optimally Staffed
Gombe	144	18	46	24	56	132	30	37	15	50	Optimally Staffed
Sokoto	56	10	26	10	10	134	31	38	15	50	Under-Staffed
Anambra	119	31	21	10	57	110	25	31	12	42	Optimally Staffed
Cross Riv.	84	10	34	19	21	88	20	25	10	33	Optimally Staffed
Lagos	224	50	60	24	90	79	18	22	9	30	Over-Staffed

	Current Staffing Total	Plan	Source	Deliver	Enable	Recommended Staffing Total	Plan	Source	Deliver	Enable	Current staffing comparison
BNE01/0						91	0	39	0	52	Under-Staffed
BNE03/0						92	0	39	0	52	Under-Staffed
BNE04/0						92	0	39	0	52	Under-Staffed
BNE04/0						91	0	39	0	52	Under-Staffed
BNE04/0						91	0	39	0	52	Under-Staffed
BNE04/0						91	0	39	0	52	Under-Staffed
BNE04/0						91	0	39	0	52	Under-Staffed
BNE04/0						91	0	39	0	52	Under-Staffed
BNE04/0						91	0	39	0	52	Under-Staffed
BNE04/0						91	0	39	0	52	Under-Staffed

- Combined output for all levels can be seen together along with current staffing by each category
- Combined tab can leveraged as direct staffing plan roll outs for entire country

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Thank You

Promoting sustainable workforce excellence in health supply chain management