COSTING TOOL TO SUPPORT SCALING UP LEVEL-2 INPATIENT CARE FOR SMALL AND SICK NEWBORNS

User Manual

June 2023

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INTRODUCTION & OVERVIEW

Welcome to the User Guide of the **Small and Sick Newborn Costing Tool,** commissioned by the Global Financing Facility to support planning & budgeting for scaling-up inpatient care for small and sick newborns at district level units.

The tool includes planning & budgeting modules for infrastructure, equipment, human resources, and quality of care strategies. Each of these modules takes the user through the various steps required to identify and cost country standards for small and sick newborn care. There are also two cost analytics modules. The first one shows how capital and recurrent costs vary across typical facilities in the country. The second one can be used to estimate the costs of a scale-up scenario over several years.

The user guide provides instructions for using the costing tool. Although it provides some practical recommendations about issues to consider when setting country standards and developing system strategies, the focus remains on the steps involved in using the costing tool and not on the broader technical issues, which are out of scope.

The tool will be available as a web-based application and, in the meantime, we are making available a Microsoft Excel file that works with Office Version 365. Supporting resources include the Haryana case study and the report on Costing the Scale-up of Small and Sick Newborn Care in Zambia, which were also commissioned by the Global Financing Facility. The Zambia report is included as an Annex.

BACKGROUND

Achieving the Sustainable Development Goal of less than 12 neonatal deaths per 1,000 live births by 2030 requires urgent action to scale-up facility care for small and sick newborns. This is reflected in the Every Newborn Action Plan 2020-2025, which set a target of a functional Level-II inpatient newborn unit to care for small and sick newborns in at least 80% of districts.

Many countries around the world have or are in the process of adopting standards and guidelines to ensure the scale-up delivers good quality of care. However, many face the challenge of unpacking 'what it takes' and how much it would cost to fulfill the system requirements of those quality-of-care standards.

To support this exercise, the Global Financing Facility commissioned the development of an Excel-based costing tool that aids planning & budgeting across 'hard' domains such as infrastructure and equipment as well as 'soft' domains, including facility quality of care and other system strategies.

The tool development was informed by global evidence on best-practice (1 - 8) and by implementation lessons drawn from a case study of Haryana, India (9), a setting where the scale-up was directly managed by the government. Global evidence informed the structure of the tool, default menus and assumptions, which were validated against findings from the case study.

The tool was piloted in Zambia during the second half of 2022 and involved assembling and validating country standards for quality of care; collecting and validating cost data; and modeling costs across various facility typologies. The tool estimates were used to allocate one million dollars of funding and informed the analysis of 'what it takes' and how much it costs to implement the system requirements of good quality of care standards for small and sick newborns.

APPROACH

The main purpose of the tool is to support planning & budgeting for the scale-up of small and sick newborn care delivered according to national standards. It was thus important that the tool covered all core domains of delivering quality care and that costings captured the system parameters set by country standards, while accounting for variations in facility characteristics and costs across the country.

To cost all core domains, without overburdening users with a large data collection exercise for cost inputs, the tool uses rules-based costing and provides users with the opportunity to revise modelled estimates as required.

A systematic step-by-step process

The costing tool is organized along the lines of a planning guide, providing a systematic framework to help users identify and cost the system requirements for facilities to fulfill country standards of care for small and sick newborns.

Each planning & budgeting module in the tool corresponds to a domain of care: infrastructure, equipment, human resources, quality of care strategies at facility level and quality of care strategies at national and regional level.

All modules start with an overview and are organized in logical sequential steps that take the user through the system requirements under each domain. To facilitate the use of the tool, under each step there are brief explanatory notes (See example below for infrastructure)

This step-by-step approach in the planning and budgeting modules imply that first, an important number of user inputs such as setting country standards and identifying supporting implementation strategies are included in the corresponding planning & budgeting modules.

Second, relevant cost calculations also happen in these worksheets and there are review steps to sense-checking results as you go along. These review steps make the tool calculations transparent and can significantly aid the planning & budgeting process as they help you understand the impact of system parameters and what drives the results.

PLANNING AND BUDGETING FOR BUILDING/INFRASTRUCTURE
MODULE OVERVIEW
Enter country infrastructure standards, including:
*The required parameters to estimate the number of beds at each facility size
* Minimum floor space per bed
* Minimum floor space per facility area & facility circulation areas
If detailed country standards are not available, to initiate discussions in country, they can be sourced from the GFF case study or international guidelines
Review required floor space & associated costings for each type of facility, including building maintenance.
Remember:
Light blue cells are user inputs.
Yellow cells are tool calculations not to be manually changed

1.2. Enter formula parameters to estimate number of required beds based on population need:

Based on international guidelines & the GFF case study, approx. 15% of live births require special care & 7 days of ALoS ~ 3 beds per 1,000 live births

QoC strategies, inc. protocols and criteria for admission & discharge should be in place to ensure bed strength is adequate

In some instances UNICEF recommended 80% occupancy bed rate

Leave target occupancy bed rate blank if 100%

% of live births requiring special care	15%	**User Notes**
Target average length of stay (days)	7	Parameters based on UNICEF Guidelines &
Target occupancy bed rate	80%	GFF Case study

Costings are thus tailored to the system parameters of each country, which need to be set by the user. And users can take advantage of the fact that the costing tool algorithms, similar to implementation, require information on the 'specifics' of those system parameters to ground planning and budgeting discussions. Going through those 'specifics' in a systematic way can also focus discussions on 'what it takes' to set up a district level facility complying with country standards.

For example, to collect accurate cost data for equipment devices, technical specifications need to be included. And to estimate the number of devices required for each facility, the user needs to specify the type of inpatient beds, the facility ancillary areas and the corresponding equipment/bed or equipment/facility ratios for each device.

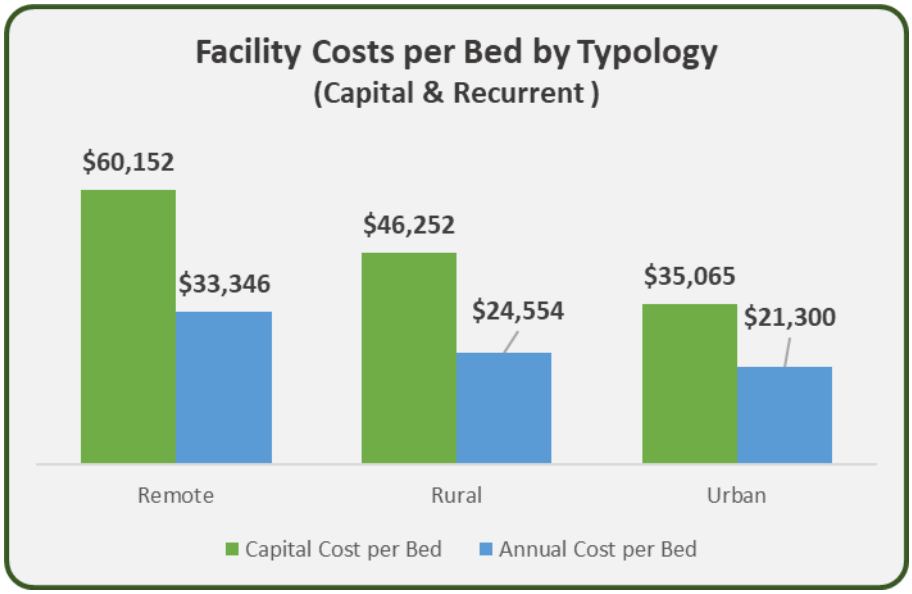
The use of facility typologies

Estimating detailed costings for each facility in a country would require extensive data collection, including Health Facility Assessments, and cost modeling for individual facilities, which might be impractical. On the other hand, facility characteristics and costs are likely to vary across the country. For example, facilities are likely to serve populations of different sizes and other factors such as location might affect the cost of service delivery. Estimating one single set of facility costs will fail to account for such diversity.

So, to capture cost variation across facilities in a country and to aid in producing more realistic scale-up budgets without the need for a massive data collection exercise, the tool allows you to simultaneously cost the typologies with minimal additional inputs. These typologies include Size (small, medium & large); cost/location (mid, high & very high cost); construction type (new construction & rehabilitation); equipment needs (major, partial & limited) and recruitment challenges (standard, hard-to-recruit & most challenging).

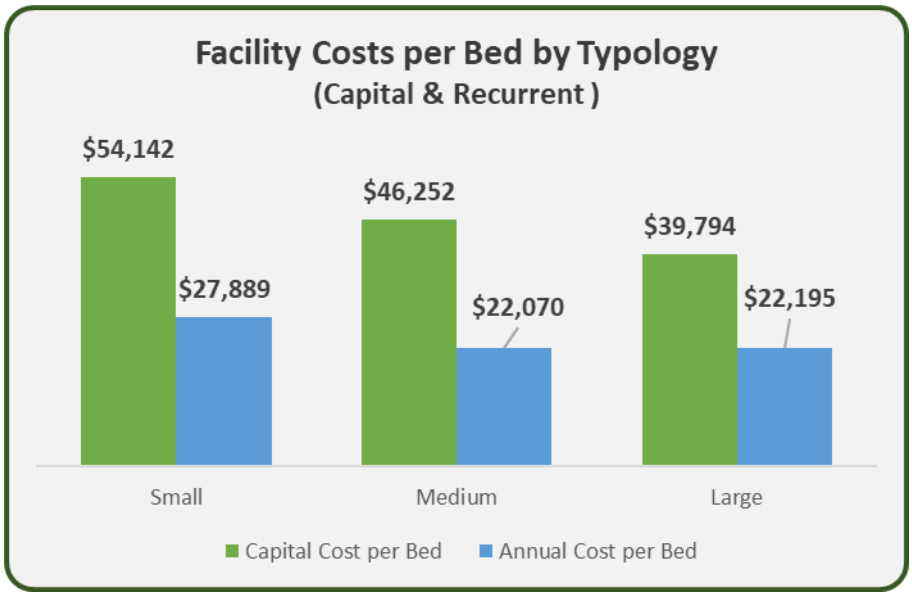
As you can see, the mix and match can produce a large number of unique combinations of facility characteristics for which system parameters and costs can be simultaneously estimated. See for example a potential mix of typologies and expected costs per bed in a hypothetical scenario that typifies remote, rural, and urban facilities in a country.

Typical Facility Name/Description:	Remote	Rural	Urban
SIZE	Small	Medium	Large
COST/LOCATION	Very High Cost	High Cost	Mid Cost
CONSTRUCTION TYPE	New Construction	New Construction	New Construction
EQUIPMENT NEEDS	Major need	Major need	Major need
RECRUITMENT CHALLENGES	Most Challenging	Hard-to-Recruit	Standard area



The simultaneous costing of typologies in the tool allows you to examine the impact that individual facility characteristics have on costs and implementation, for example by showing what it takes and how much it costs to deliver services for the mix of the typologies shown above. And you can rapidly cost other mix and match of typologies such as the one below, where the only characteristic that changes across facilities is the size.

Typical Facility Name/Description:	Small	Medium	Large
SIZE	Small	Medium	Large
COST/LOCATION	High Cost	High Cost	High Cost
CONSTRUCTION TYPE	New Construction	New Construction	New Construction
EQUIPMENT NEEDS	Major need	Major need	Major need
RECRUITMENT CHALLENGES	Standard area	Standard area	Standard area



As discussed under the various planning & budgeting modules, you can also take advantage of the tool typologies to estimate a range of values rather than a single point estimate (i.e. mid-cost, high-cost and very high cost), which give you a more realistic picture of the expected facility costs as it captures some of the inherent uncertainty in this type of modeling exercise.

Normative costings

The tool costings are normative, that is, the model estimates how much it will cost to deliver quality of care at each facility based on national standards and system parameters set under each planning & budgeting module. So, the first step under each module is to identify the specific system requirements of country standards, which drive the tool costing estimates.

Balancing accuracy and model complexity

In producing a comprehensive set of costings for the scale-up it was important to balance accuracy of costing estimates versus a data-hungry and complex model that would risk overburdening users. The following guiding principles informed the overall costing approach:

First, more detailed costings are produced for large items or when greater level of detail supports more effective planning, as is the case with human resources and equipment devices.

Second, to prevent users spending a disproportionate amount of time and effort collecting data for less strategic items, such as those representing small costs, alternatives to the ingredient costing approach are used. For example, for items like supervision or coaching visits, users are asked to provide an average cost per person, which is usually available in various planning and budgeting documents, rather than detailed costs for individual 'ingredients' such as travelling, per diems and allowances. For other small items such as maintenance a rules-based approach (i.e., the percentage of a new building value) is used.

Third, even for larger items, rules-based costing is used if we judged that data were not readily available in many settings or if collecting such information would have involved a considerably large data collection exercise.

For example, as discussed under the relevant equipment module, detailed costings for consumables and renewables would need estimating the number required every year for each device and collecting unit price data. This would have substantially increased the data requirements of the model. So, in this case we also opted for a rules-based approach to facilitate obtaining cost estimates during the planning and budgeting phase. However, the tool allows users with access to more detailed information or historical data to override rules-based calculations.

Limitations

Facilities, not individual health interventions, are the main unit of analysis. The tool does not include epidemiological modeling to estimate the expected intervention coverage and associated health benefits of scaling-up Level-2 facilities in a country. All costs are estimated at facility or higher levels, without allocation to individual interventions.

Since the tool aims at supporting planning & budgeting processes, the focus is on estimating the 'cash flow' associated with the scale-up. All costings are based on available direct market prices without further adjustments. This needs to be taken into consideration if the tool estimates are used to inform economic evaluations.

STRUCTURE

While the web application is developed, the tool will consist of a single Excel file (.xlsm) with 10 worksheets, including one with general information. The information worksheet describes the tool version and date of release; presents the primary objective, which is to support planning & budgeting for scaling-up good quality of care delivered at Level 2 district facilities for small and sick newborns; and gives basic tips for using the tool. There is also a navigation menu, shown below.

As can be seen, the core of the tool consists of: A blue colored tab for general inputs including basic system parameters and unit costs; six green colored tabs for planning & budgeting; and two dark teal tabs for cost analytics including a summary of costs by facility typology and the development of a scale-up cost scenario.

The green colored tabs for planning & budgeting start with the 'hard' domains of infrastructure, equipment, and human resources. Most of their inputs, including for system parameters related to country standards are easily systematized. For example, floor space standards are set in square meters per bed or per facility area. Essential equipment standards are set as the number of devices per bed/facility. Staff ratios are set as the number of required staff per facility size. The tool has thus standardized the list of system inputs for each of these domains, which are used for automatic calculation of costs.

The last two green colored tabs correspond to the 'soft' domains relating to quality of care strategies, whose system and cost inputs cannot be easily systematized within the type of standardized parameters required for the automatic calculation of costs within the tool. They cover quality of care strategies at facility level that have not been costed in the previous modules as well as national and regional strategies. These higher level strategies include those related to managing and providing oversight to the scale-up as well as those focused on system development, such as supply chain management. For these domains, there is a wide range of potential strategies with nuances in their design and implementation that stakeholders need to consider during the co-design process to ensure they are fit for purpose in the local context.

So instead of attempting to standardize their system parameters the tool organizes these strategies in a systematic way and with reminder notes that can serve as a checklist. This checklist prompts users to consider if the required strategies are in place and if they entail additional costs to be funded by the scale-up. In the event that those strategies involve additional costs, they need to be entered by the user.

Although the tool could potentially be used to cost individual components, there are important linkages between the various domains that call for an all-around exercise that includes all of them. For example, the required number of equipment devices is influenced by the distribution of in-patient beds within each facility. Likewise, if the purchase of a vehicle for referral transport is included, this might also have implications for human resource costs as drivers might be needed.

TOOL STRUCTURE & NAVIGATION MENU

MODULES

General Inputs for Planning & Budgeting

In this module the user:
* enters general information on the scale-up;
* selects typologies for costings;
* enters basic unit costs for infrastructure, equipment & human resources.

Planning & Budgeting the Scale up

These modules are the core of the tool and provide step-by-step guidance to:
* set country standards applicable to each domain;
* review the standards and associated costs by typology;
* identify & cost supporting system strategies.

Cost Analytics

These modules provide additional data analytics to support strategic decision-making:
* Cost analytics for each care domain and facility typology
* Costing a scale-up scenario

1.General Inputs

2.Infrastructure

3.Equipment & Other Part One - Setting Equipment Requirements

4.Equipment & Other Part Two - Costing & Strategies

5.Human_Resources

6.Quality of Care @ Facility Level

7.Quality of Care @ National & Regional Levels

8.Facility Typology Analytics

9.Scale-up Costing Scenario

THE COUNTRY PROCESS

Before discussing each of the tool modules, it is important to understand what the country process entails, from setting the objectives and scope of the exercise to assembling the necessary input data required by the tool.

And since the primary objective is to support planning & budgeting for the scale-up of small and sick newborn care, we will also examine how the process of using the costing tool can contribute to developing more realistic plans & budgets.

DEFINING THE OBJECTIVE & SCOPE

The objectives of the planning & budgeting exercise for the scale-up need to be identified at the outset of the tool application. These objectives can include for example identifying how many facilities complying with country standards could be funded within a given resource envelope; unpacking 'what it takes' to set up those facilities with a view to define a strategic roadmap for the scale-up; or estimating the expected costs to achieve the Every Newborn Action Plan target of 80% of districts with a functional facility delivering care for small and sick newborns.

The application of the costing tool can serve any of these objectives. For example, in the planning and budgeting modules we discuss how the intermediate system and costing results can be used to inform stakeholder discussions on 'what it takes' to implement country standards. In the last two modules we discuss how the tool data analytics can be used to inform the strategic direction of the scale-up or to estimate the costs of a scaling-up scenario.

The scope of the costing tool application will however be dictated by the extent to which detailed country standards and guidelines for small and sick newborn care are available. This scope will define the various ways in which you can use the costing tool to support planning & budgeting as well as the level of involvement required from stakeholders during the exercise. We have thus identified the following two scenarios:

Scenario One: Detailed country standards and guidelines are available

This scenario represents a country that has already developed some detailed guidelines and standards to establish a district level facility (i.e., Level 2) delivering care to small and sick newborns.

In this scenario, a light involvement of stakeholders might be feasible, at least regarding reviewing and validating the country standards applicable to infrastructure, equipment, and human resources (the 'hard' domains). However, they might still need to devote their efforts to the development of the 'soft' strategies for delivering good quality of care, if they are not already in place.

Scenario Two: No detailed country standards and guidelines are available

This scenario represents a country that has perhaps adopted broad international standards but is yet to develop detailed standards and guidelines. In this scenario the tool can be used to support their development.

For example, you could first draw on international evidence to undertake a rapid modeling exercise of a scenario that adapts suitable international standards to the local context and cost them. You could then use the results of this exercise, including the system parameters modeled under each domain to bring

stakeholders together to unpack those results. The purpose of the exercise is not to use modeling to supersede the country process of developing country standards, but rather to use the modeling results to initiate those discussions.

Stakeholders can then identify the next steps for detailing country standards and draw on the costing tool to help ground those discussions. As we discussed earlier, the costing tool, like implementation, requires 'specifics' on the system requirements to fulfill standards of care, so it can provide a reality check for stakeholders to ensure that standards are detailed enough for costing and for providing guidance during implementation.

We will revisit these two country scenarios when discussing the tasks involved in assembling the information required for the costing tool application.

GETTING STARTED

Reading the user manual and going through each of the worksheets in the costing tool will help you become familiar with how the tool works and the type of information required. The Zambia report included in the annex will be useful to illustrate the level of detail required for this exercise (i.e., in terms of system parameters for infrastructure, human resources and equipment), as well as the type of analytical work that the use of the tool facilitates in country.

Setting up a team

The composition of the team leading the tool application will vary, but would generally consist of a team leader, a technical advisor, and a research assistant/data collector. Broadly speaking, the following mix of skills would be recommended: knowledge and experience of small and sick newborn care; a good understanding of the country health delivery system; familiarity with the relevant standards of care at national and/or international level; a basic understanding of Microsoft Excel; experience in engaging stakeholders and facilitating workshops; and some experience in costing, budgeting and data collection and validation.

In addition to leadership from the Ministry of Health, the group of stakeholders supporting the tool application might include nurses and doctors working with small and sick newborns, academics as well as relevant representatives from government agencies and Development Partners.

Environmental scanning

Once you are familiar with the type of information needed to use the costing tool, the first step is to undertake an environmental scanning with focus on country standards and guidelines for delivering Level 2 facility care for small and sick newborns. This should be done even before developing a plan for data collection, validation, and analytical work, as this will depend on the results of the environmental scanning.

Even for countries in Scenario One, it is likely that there are gaps in the available information. And the less detailed the country guidelines, the more time will be required to identify the system parameters that are applicable in the local context and the more time stakeholders will need to invest in validating those parameters. This is true not only for the tool application, but for developing a realistic plan and budget for the scale-up.

The objective of the environmental scanning is to provide context for the exercise and, more importantly, to examine the information provided by the country standards and guidelines, which are the primary source for the tool system parameters, such as the floor space requirements per bed or the number of nurses per facility.

Generally, available documentation on quality of care strategies or planning and management of a similar facility scale-up process will be useful to inform the modeling of relevant strategies. This information might be available from recent project reports and evaluations and should be included in the environmental scanning. However, it is likely that this information is best identified at later stages of the project during the stakeholders' engagement and discussions.

The environmental scanning should also include relevant policy and planning documents, such as plans, investment cases and situational analysis covering newborn care. These documents are useful to provide context and could also aid identifying system strategies to improve quality of care.

Country guidelines and standards

Once the country guidelines and standards have been sourced, you need to identify the level of detail available in these documents, such as the list of devices, their specification and the number of devices required per bed and/or per facility. Then you extract the relevant information; clearly identify gaps; use international guidelines to fill them in and validate system parameters with stakeholders.

There are some added benefits of this process. First, information gaps in country standards can hamper implementation if expectations are not clear and facility managers need to reinvent the wheel every time a facility is set up. Second, the process of validating country standards and guidelines provides stakeholders with the opportunity to examine if the required standards are adequate to deliver quality of care and realistic given the current system constraints.

In an ideal world, detailed information on all the system parameters is already available in country standards and guidelines. However, if this is not the case, the question then becomes: what is the minimum information that you need to get started with this exercise?

The minimum information in terms of system parameters has been included under the General Inputs sheet as shown below. This includes the type of inpatient beds; the list of facility areas; the list of essential equipment devices and staff categories.

Note that the corresponding planning & budgeting modules are built upon these lists, so securing this information is a crucial first step to get started with the exercise and plan the data collection, validation, stakeholder consultations and analytical work required.

STEP 2 -ENTER BASIC INFRASTRUCTURE STANDARDS & UNIT COSTS FOR CONSTRUCTION

STEP 2.1 - Infrastructure Standards - Enter type of in-patient beds required at SNCUs

Note: This is only for in-patient beds. So if a facility has a separate area for accommodation of mothers/family members do not include those beds here

Type of In-patient Beds	User Notes
Standard In-Patient Care	
High-Care Beds	
Kangaroo Mother Care Beds	

2.2. Infrastructure Standards - Enter the other type of facility areas required, such as outpatient care, ancillary and support services

Note: Include here areas for any non-inpatient beds such as those for family members

Type of Facility Service Areas	User Notes
Triage/receiving room	
Counselling area	
Family facilities (exc. Lodger mother bed areas)	
Nursing station	
Nurses & Doctors Rest Areas with attached restroom	
Pantry with dining area	
Storage unit	
Clean utility	
Dirty utility	
Lodger mother bed areas	
Meeting & teaching room	
Unit office	

STEP 3. ENTER LIST OF ESSENTIAL EQUIPMENT REQUIRED & UNIT COSTS

3.1. Enter list of essential equipment and unit price (inclusive of warranty) for each piece of equipment

Equipment list to be sourced from country standards & guidelines. If required, also include list of equipment for mothers and for referral transports.

If unavailable, as a starting point for discussions in country, the list can be sourced from the GFF case study or international guidelines

The planning & budgeting module for equipment includes more detailed inputs (i.e. required number of pieces of equipment) that build upon the list entered here.

LIST OF ESSENTIAL EQUIPMENT	Unit price inc. warranty	User Notes
Closed incubator		
Bassinet (washable)		
Transport incubator		
Overhead servo incubator		
Heat shield		
Wall suction unit		
Phototherapy units		
Transcutaneous bilirubinometer		
Electronic Scale		
Glucometer		
Thermometer		
Nasal CPAP (complete)		

STEP 4. ENTER LIST OF HUMAN RESOURCE CATEGORIES REQUIRED AND UNIT COSTS

4.1 Enter list of categories of required facility staff, annual cost per FTE & cost loading for hard to recruit areas if applicable

Categories of required staff should be sourced from country standards & guidelines.

If unavailable, the list can be sourced from the GFF case study or international guidelines as a starting point for discussions in country.

The planning & budgeting module for human resources uses includes more detailed information such as the required numbers @ each facility, which builds upon the list entered here

Leave blank cost loading if hard-to-recruit areas not costed

Categories of Required Staff & Annual Costs per FTE			User Notes
	Standard area	Hard-to-recruit	
Staff Category	All costs inc. salaries, allowances, etc.	% Cost loading/mark-up to apply	
Neonatologist			
Medical Officer			
Medical Licentiates			
Clinical Officers			
Registered Paediatric/Neonatal Nurses			
Registered Nurses			
Midwives			
Administrative, secretarial, derical staff			
House Keepers			
Infection Control Staff			
Data Registry Clerk			
Nutritionist/Nutritional Demonstrators			
Bio-medical technologists			
Security Guards			
Drivers			
Ambulance Call Centre Staff			

ASSEMBLING THE REQUIRED INFORMATION & OTHER ANALYTICAL WORK

Once the scope of the exercise has been set, the stakeholders engaged, and the environmental scanning undertaken the next steps focus on assembling and validating inputs; estimating costs and undertaking other analytical work as required to support the objectives of the exercise.

These processes will vary from setting to setting, depending on the level of engagement of stakeholders and whether or not there are on-going mechanisms to support the planning & budgeting for the scale-up. However, to illustrate what these processes might entail, we describe some of the tasks involved, which take into consideration the two country scenarios earlier discussed.

Scenario One: Detailed country standards and guidelines are available

In this scenario detailed facility guidelines are available, so the minimum information to get started can be sourced from available country documentation. It is also highly probable that at least some of the additional parameters required, such as number of equipment devices and staff-bed ratios for nurses and doctors, is also documented. So, a considerable amount of work and modeling can be undertaken with relatively light inputs from stakeholders as shown by the Zambia pilot (See Annex).

With a view to assemble the required information and undertake the analytical work, tasks might be organized as follows:

1. Identify system parameters requested in the General Inputs Sheet and extract the relevant information from available country documentation
2. Identify and address gaps in the extracted information drawing on international evidence as required. For example, you might decide to include additional support staff if the guidelines only mention nurses and doctors.
3. Validate & finalize the list of parameters to be entered in the General Inputs Sheet
4. Confirm the scope of the exercise, including facility typologies to be costed
5. Start data collection of cost inputs included in the General Inputs sheet. This will allow you to undertake rapid modeling exercises to support the work of stakeholders when validating system parameters.
6. Identify additional information on system parameters requested in Planning & Budgeting Sheets for Infrastructure, Equipment and Human Resources

7. Extract from country documentation the additional information required for those parameters as applicable to the facility typologies included in the exercise
8. Review the extracted information and address gaps
9. Collect additional cost data inputs required in Planning & Budgeting Sheets for Infrastructure, Equipment and Human Resources
10. Use the costing tool to model expected costs of implementing country standards and document system parameters used.
11. First country workshop with the larger group of stakeholders to: (a) review and validate system and cost parameters for the 'hard' domains in light of the costing estimates produced and (b) review the tool reminder menus for 'soft' quality of care strategies to identify those potentially applicable in the country.
12. Strategy development for 'soft' quality of care strategies and undertake further data collection and triangulation to ensure those strategies are included and costed
13. Second country workshop with the large group of stakeholders to (a) present estimates with the revised system parameters and (b) validate the quality of care strategies included and their costs.
14. Undertake further analytical work, including the report.
15. Disseminate results and identify required steps to continue supporting the planning & budgeting of the scale-up.

Scenario Two: No detailed country standards and guidelines are available

As earlier discussed, under scenario two there are no available country standards and guidelines, or the existing documents provide only very generic information. As a result, it is not possible to identify the lists of types of beds, facility areas, equipment and human resources required, which for the purposes of modeling would need to be adapted from available international evidence.

If stakeholders decide to draw on available international evidence to undertake a rapid modeling exercise to support the development of facility standards and guidelines, the following process and tasks might be advisable:

1. Identify in the international literature a setting with detailed standards and guidelines that are appropriate to inform the choice of initial parameters in the local context.
2. Select a facility size typology for the exercise and decide which other typologies (i.e., cost/location) would be useful.
3. For the selected facility size typology extract information on system parameters required by the costing tool. Include those in the General Inputs Sheet, as well as Planning & Budgeting Sheets for 'hard' domains, i.e., infrastructure, equipment, and human resources.
4. Collect basic cost input data requested in the Inputs Sheet. Additional cost inputs in other planning & budgeting sheets might be collected if considered important to support discussions of stakeholders.
5. Country workshop to discuss the results of the modeling exercise and develop a plan of work for the country to develop country standards and guidelines with the level of detail required to effectively inform the scale-up of Level 2 facility care delivered to small and sick newborns.
6. Undertake further analytical work, including report writing
7. Disseminate results and identify required steps to continue supporting the development of country guidelines and the future planning & budgeting of the scale-up.

In this scenario, a rapid modeling exercise is undertaken to provide an order of magnitude for the cost estimates and illustrate the level of detailed information required in terms of system parameters to provide guidance to those managing the scale-up and implementation.

Since there are no commonly accepted international standards, including for staff and equipment ratios, important variations across available guidelines are found and a few considerations are warranted when examining the available evidence and the suitability of those standards in the local context.

First, it is important to consider that there are linkages between domains, for example the distribution of the type of beds will have an impact on the required equipment and human resources. So, there needs to be consistency in the source of system parameters when drawing on international evidence to undertake the modeling exercise.

Second, for facility parameters related to infrastructure and human resources, developing, and costing alternative standards might not be very time consuming, since the lists are relatively short and cost data relatively easy to secure. So, in some instances you might consider modeling alternative infrastructure and/or human resource standards to aid the discussions. This can include for example, floor space per bed or number of nurses per facility.

However, modeling alternative equipment standards might require substantial work. There are significant differences in the devices listed in international guides available; and collecting data on costs might be more time consuming as you might need to source it from more than one vendor. It is thus advisable to take these issues into consideration when deciding whether or not to estimate costs for alternative international equipment standards.

GETTING READY TO USE THE TOOL

You need a basic understanding of Microsoft Excel to use the tool. At a minimum, you need to be comfortable opening and saving your work, entering information into cells, and clicking on the tabs to move from one worksheet to the next one. No knowledge of functions, formulae or any advanced features is required.

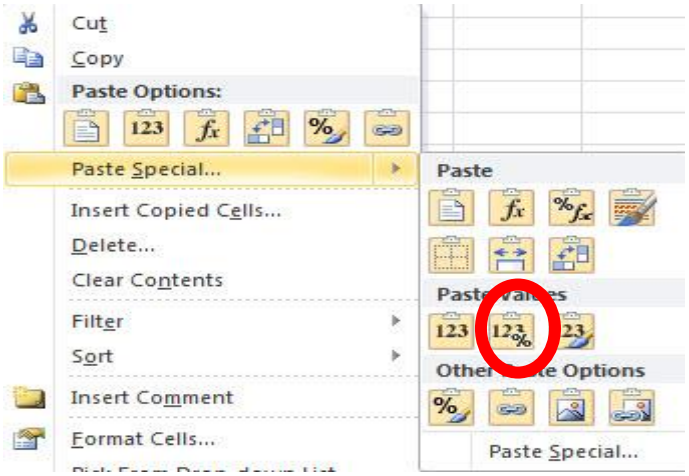
While the web application is being developed, we are making the tool temporarily available as a Microsoft Excel file (Version Office 365). Note however that unlike a web application, there are software compatibility issues when working with Excel files. Versions 2019 and earlier are not fully compatible and should not be used as some commands will not work.

When using a Microsfot Excel file, for the tool to operate correctly all macros need to be enabled. To enable macros, go to the Excel menu and select the following:

- ✓ File -- Options -- Trust Center -- Trust center settings -- Macro Settings -- Enable all macros. Or select "Enable content" at the prompt when first opening the file.
- ✓ Some office versions by default block all macros from files downloaded from the internet. If this happens, close the file and before opening the file, right click on the file and select:
- ✓ Properties -- General -- Unblock

The web application will allow easy transferring of data. In the meantime, if you are working with the Microsoft Excel file and want to copy a table or cell from the costing tool and paste it in another workbook to undertake further analysis, this can be easily done through the usual Excel commands. However, special care should be given to avoid errors. Do not simply copy the cells and paste them. Use only Paste Values & Number formatting as follows:

- ✓ Open the file where you want the data to be transferred.
- ✓ Then go to the costing too and select the corresponding cells you want to transfer, right click, and select copy.
- ✓ Go to the file where you are transferring the data and select the corresponding worksheet and cell where you want to paste the data. Then select Paste Special -- Paste Values –Values & Number Formatting, as shown below.



To use the tool, you do not need knowledge of how to build or format charts in Microsoft Excel. In case you want to copy a chart and paste it into a PowerPoint or Word document, you just need to select the chart, right click, select copy and paste it. Experienced users are also able to change the title and other selected features of each chart.

NAVIGATING THE TOOL

As noted earlier, the tool has been designed to support planning & budgeting through an intuitive step-by-step approach. Steps under each module have been organized in sequential order. It is recommended that users first get familiar with the tool structure and worksheets before using it.

Each module and worksheet in the tool starts with a brief overview describing what users are expected to do and a few important issues to consider when working through a particular module. To facilitate using the tool there are explanatory notes for steps under each worksheet.

Once you are familiar with the tool and the country process described above, start filling in the General Inputs sheet. Then it is advisable to proceed with the other planning & budgeting sheets in sequential order starting with the infrastructure domain. For each planning & budgeting domain go step by step and do not skip any steps.

Make sure you sense-check preliminary results under the review steps. Once you are satisfied with those estimates, take the time to explore the summary of results by facility typology shown in the Facility Typology Costs worksheet. You can then proceed to the Scale-up Costing Scenario sheet if it is of added value for stakeholders.

To facilitate navigating each worksheet the following coloring standards are used: All the major steps are named in light green-colored cells. All user inputs are in blue colored cells. To facilitate the documentation of the modeling, there are specifically designed cells for users to enter comments or notes. Cells with darker blue indicate user inputs that override tool calculations. Calculations and 'reminder' menus for quality of care strategies are in yellow colored cells. Some cells will become red colored if potential errors are identified.

Light blue cells are user inputs.
Yellow cells are tool calculations or contain reminder menus for strategies. They cannot be manually changed by the user
Cells in dark blue are suggested sub-categories of strategies. They can be changed by the user.

WHY THERE IS NO AUTOMATIC DEFAULT DATA & OPTIONS TO FILL-IN GAPS

In some countries undertaking this exercise, there might be gaps related to country standards for the various domains of delivering care to small and sick newborns. And sometimes filling in some of those gaps and showing some preliminary results to key stakeholders will help ground country discussions.

In these instances, the use of automatic default data can considerably speed up modeling and calculations. However, from a planning & budgeting perspective, which entails major risks. It is easy to produce numbers with automatic default data and on the surface, they might look reasonable, but the automatization of the process discourages a careful assessment of the default indicators, their applicability in the local context and the implications for the scale-up.

Since the emphasis of the tool is on supporting planning & budgeting to guide the implementation of the scale-up to ensure good quality of care, we have decided not to include any automatic default data.

SOME ADDITIONAL TIPS

The workbook structure, coding, and worksheets, as well as cells with formulae are **password protected**. This has been done to prevent users inadvertently modifying or deleting built-in formulas, which would lead to errors in the tool calculations.

Enter data into the blue cells and use the user comment cells (also in blue) to document your decisions. It is easy to forget the source of some inputs or the rationale behind them! This will save you lots of time when drafting the report or the PowerPoint presentations.

If you have **entered a value and want to change it**, just delete it, and enter the new value.

Remember that as with any costing exercise, **all cost inputs in the tool should be entered using the same currency and base year**.

Do not use 'cut and paste' or 'copy and paste' commands to enter data in the light-blue cells. For validation purposes, data entry cells have validation and conditional formatting that will give you a warning if an inappropriate value has been entered. Unfortunately, this formatting gets overridden if information is pasted into a cell.

As you work through the various worksheets in the tool, you might decide to **return to earlier steps or earlier worksheets and change a particular value**. If you do so, make sure you double check that any data entries that you have made in subsequent steps and worksheets are still valid and complete.

If you want to adjust the screen view to facilitate for example data entry or review of results, use zoom and the freeze panes feature.

Do not skip any steps.

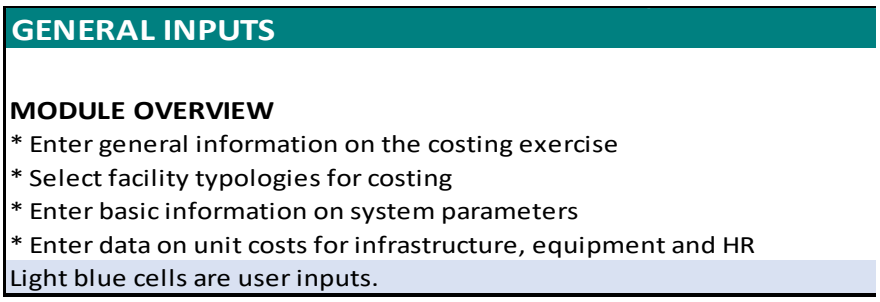
Take time to sense-check preliminary results as suggested in the review steps.

To ensure that results are accurate, review at each step the country specific data that you have entered. Resolve any alerts or error messages before proceeding any further. Pay special attention to the units you use to enter figures. For example, check that all costing data is entered in the same currency and for the same base year. Also check that the percentages you have entered are correct.

While working with the Excel file, remember always to save your work frequently. Also make sure that the file is saved in a safe location that can be easily accessed in the future.

GENERAL INPUTS

As described in the costing tool in this worksheet, you enter basic information on the scope of the exercise, selects the facility typologies to be included and enters general information on system parameters as well as cost inputs.



STEP 1 – GENERAL INFORMATION ON THE COSTING EXERCISE

As shown below, the tool includes some basic notes to facilitate inputting data. Here general information on the costing exercise is entered and the user is reminded that all costs should be entered in the same currency and for the same base year. That is, you cannot enter some costs in USD and others in local currency. Likewise, all costing data should correspond to the same year. This is a basic principle for any costing exercise to ensure you are comparing apples with apples.

For example, if you collected data on equipment prices from vendors in the year 2023 and staff salaries also for the year 2023 but sourced the cost of construction from a report dating from 2018, those costs are not comparable due to the effect of inflation.

So, you need to make sure that all cost inputs correspond to the same currency and year. In most cases you will be able to collect data for the same year, usually the year in which you are undertaking the costing exercise. However, in cases where some of the cost data collected is historical, those costs need to be adjusted by inflation before data entry.

Note that since all costs are entered for the same year and currency, annual costs for the scenario are presented in constant currency (i.e., constant dollars), which adjusts for the effect of inflation and allows us to compare costs over the years.

STEP 1 - PROVIDE GENERAL INFORMATION ON THE COSTING EXERCISE

1.1 - Name of the Costing Scenario

Name:	**BASE SCENARIO**

1.2 - Select currency used for cost inputs & document exchange rate used for any conversions.
Remember that all costs should be measured using the same currency.

		User Notes
Currency to be used for all cost inputs:	**USD**	Some costs like construction provided in USD. Others like equipment were converted from Kwacha
Exchange Rate of local currency for conversions of final estimates: 1 USD =	17	

1.2- Select base year for costings and financing
Remember all costs should be measured for the same base year.

		User Notes
All the tool costings and financing inputs are for base year:	2022	

STEP 2 – FACILITY TYPOLOGIES FOR COSTING

To capture the diversity of facilities and variations in costs across the country, the costing tool includes five typologies with up to three different categories each. The mix and match can produce many 'unique' alternative typologies for which costs can be estimated.

You are encouraged to use as many typologies as relevant for the scale-up exercise. These typologies allow you to examine how system parameters and costs vary according to individual facility characteristics, which provides useful insights for the scale-up. As discussed under the planning & budgeting modules, the use of typologies also provide you with the opportunity to estimate a range, rather than a single point, of cost estimates.

In this step you decide the typologies to be included and for which costs will be estimated:

Facility Size:

You can use the costing tool to model system parameters and estimate costs for up to three different facility sizes (small, medium & large). As discussed under the planning & budgeting modules, system parameters, including number of beds, equipment and human resource requirements need to be set for each facility size.

As expected, facility size has a large impact on costs. And observed economies or diseconomies of scale might prompt a reconsideration of the strategic scope of the scale-up. Should resources be invested in fewer, but larger facilities serving larger population catchment areas or higher numbers of smaller facilities serving smaller population catchment areas? So, although it is the only typology that requires detailed

modelling of system parameters for each category, there are important benefits of including the three categories (small, medium & large) in the exercise.

Facility Cost/location:

Costs are likely to vary across locations and the tool allows for up to three different cost/location typologies (mid, high & very high cost). Note that we use the term mid cost rather than low cost to reflect the fact that even in those areas, the costs associated with establishing district level facilities delivering quality of care to small and sick newborns might be substantial.

In some countries these categories for example might correspond to urban, rural & remote areas. In other instances, including this typology can help you explore the sensitivity of the results to a range of cost estimates.

Facility Construction:

This typology allows you to control for construction costs varying significantly depending on whether setting up the space for the small and sick newborn unit requires new construction or rehabilitation.

Facility equipment needs:

Facilities are likely to vary in the extent to which the required equipment as per country standards is available. However, providing detailed estimates for each facility will require facility surveys and costing the gap between what is required based on the country standards and what is available at each facility. Instead, the tool allows you to identify three categories of need (major, partial & limited), for which to estimate the approximate cost of the equipment needed, with minimum additional inputs.

Facility recruitment:

This facility typology aims at capturing differences in human resource costs due to incentives for recruiting and retaining staff in difficult to recruit areas. The tool allows three categories: standard, hard-to-recruit & most challenging recruitment locations. They could represent for example urban, rural, and remote areas, aligning with the cost/location typology above.

STEP 2 - SELECT FACILITY TYPOLOGIES FOR COSTING

Select facility typologies for costing. Need to select at least one option for each typology

Please make sure you select from the drop down menu ("Yes", "No"). Do not copy/paste, cut/paste into these cell

		User Notes
SIZE	**To be included ?**	As per country discussions and guidelines
Small	Yes	
Medium	Yes	
Large	Yes	
COST/LOCATION		Used to model sensitivity to cost parameters and/or variations across locations
Mid Cost	Yes	
High Cost	Yes	
Very High Cost	Yes	
CONSTRUCTION TYPE		As per country discussions
New Construction	Yes	
Rehabilitation	Yes	
EQUIPMENT NEEDS		Included after country meetings, partly to reflect equipment availability funded by DPs in some areas
Major	Yes	
Partial	Yes	
Limited	Yes	
RECRUITMENT CHALLENGES		Represent urban, rural (~20% hardship allowance) & remote (~25% hardship allowance)
Standard	Yes	
Hard-to-Recruit	Yes	
Most Challenging	Yes	

You need to select at least one category per typology and failing to do so will prompt an error message, as shown below.

RECRUITMENT CHALLENGES		Represent urban, rural (~20% hardship allowance) & remote (~25% hardship allowance)	ERROR, NEED TO SELECT A CATEGORY
Standard	No		
Hard-to-Recruit	No		
Most Challenging	No		

To include or exclude a typology, just use the dropdown menu, and select Yes or No. As noted earlier, try to include as many typologies as relevant. Remember that the benefits of including facility size typologies in the exercise more than outweigh the additional data requirements and that including the other typologies can also provide added insights with minimal additional effort.

Also note that facility typologies included in this step are used as headings to collect additional inputs or produce estimates. The tool has in-built formulae to ensure that final costs are estimated only for typologies that have been included in this step. So, make sure you use the drop-down menu to indicate if the typology is included in this exercise or not. **Do not copy/paste or cut/paste answers into these cells as it removes the cell data validation, which is important to ensure estimates are correct**.

STEP 3 – INFRASTRUCTURE

In terms of infrastructure standards, you should first enter the type of inpatient beds (up to five), followed by facility service areas (up to 15). Make sure that only inpatient beds are entered in the former. So do not include beds for family members not staying with the newborn, which should be included under facility service areas. Ideally, this information should be sourced from country standards/guidelines and validated as required against the latest best-practice.

3.1 Infrastructure Standards - Enter type of inpatient beds required at SNCUs

Enter only inpatient beds. Beds for family members not staying with the newborn should not be included here.

	User Notes
Type of Inpatient Beds	
Standard Inpatient Care	
High-Care Beds	
Kangaroo Mother Care Beds	

3.2. Infrastructure Standards - Enter the other facility areas, such as outpatient care, ancillary and support services

Any areas for accommodation of family members not staying with the newborn should be included here.

	User Notes
Type of Facility Service Areas	
Triage/receiving room	
Counselling area	
Family facilities (exc. Lodger mother bed areas)	
Nursing station	
Nurses & Doctors Rest Areas with attached restroom	
Pantry with dining area	
Storage unit	
Clean utility	
Dirty utility	
Lodger mother bed areas	Revisit to incorporate no separation policy for all babies
Meeting & teaching room	
Unit office	

In terms of costs, you are required to enter the average cost per square meter of construction for a district facility (Level 2) delivering inpatient care to small and sick newborns. Several issues should be noted here.

First, this is the average cost of construction for this type of facility, which takes into consideration that some areas such as those for high care beds incur higher costs than other areas such as the utilities room. This average will provide a reasonable ballpark estimate for the purposes of planning & budgeting the scale-up and can be used as an indicative budget for individual facilities.

However, bear in mind that as with any construction project, during implementation those indicative estimates will be revised to account for individual facility floor plans and the associated itemized costings produced by surveyors (i.e., the cost per sq. mt. of drywall, concrete, masonry, and other)

Second, cost input data should reflect the cost of building a facility according to country standards and guidelines. So, if these guidelines include standard floor plans that have been costed, use these costs.

If that information is not available, you can identify a recent project that built such a district level unit for small and sick newborns. Unfortunately, in some countries there might not be such a facility. In those instances, country experts, such as those managing hospital construction budgets at national, regional or facility level will be able to provide reasonable estimates.

Third, costs will be different for new construction and rehabilitation. If you are only able to secure costs for new construction, a rule of thumb to be validated by country experts is that rehabilitation costs are between 50 to 60% of new construction costs.

Fourth, if you include several facility cost/location typologies (mid, high & very high cost) it is likely that only one set of costs will be available. In that instance, you can consult with local experts about the cost loadings or percentages that should be applied to estimate costs for the other locations.

For example, if you have obtained the cost of construction in an urban area (mid-cost location) as $500 per square meter and have no other data for rural (high cost) and remote (very high cost) consult with local experts the cost loadings that can be applied (i.e., + 20% for high cost and + 30% for very high cost).

3.3. Enter average construction costs per Sq mt of SNCU

If no data on rehabilitation costs, note that based on the GFF case study rehabilitation costs are approximately 50% to 60% of new construction costs

Average Cost per Square Meter of Construction (by Typology)			User Notes
	Type of Construction		
Costing Typology	New Construction	Rehabilitation	
Mid Cost	$480	$290	$600 per sq mt. for new construction validated with DoH. Rehab based on case study. Other costs to model sensitivity to variations.
High Cost	$600	$360	
Very High Cost	$720	$440	

To account for the recurrent annual costs associated with building maintenance, the tool requests entering a percentage of a new building's value. A standard rule of thumb is to use 1%. Since maintenance is estimated as a percentage of a new building's value, new construction needs to be included as one of the typologies to be costed in this exercise. Otherwise, the estimated building maintenance costs will be 0.

3.4. Enter estimated annual cost of building maintenance (as % of the cost of building a new unit)

If country data are not available, a standard rule of thumb such as 1% can be used.

Building Maintenance	As % of new building value	User Notes
Annual building maintenance costs	1%	Based on standard assumptions

STEP 4 – ESSENTIAL EQUIPMENT

Here you are asked to enter the list of essential equipment required for Level 2 facilities delivering care to small and sick newborns as well as some basic cost inputs. A standardized list of equipment like that required by the costing tool is highly beneficial as it facilitates large-scale purchases and contract negotiations. It also improves integration of equipment within the network of care and facilitates maintenance as well as the network supply of spare parts and consumables.

The equipment list should ideally be sourced from country guidelines and reviewed based on the latest available evidence to ensure all required equipment for sick and small newborns and their mothers providing Kangaroo Mother Care is included.

Note that the range of items covered in country guidelines will vary across countries. Some countries might include major equipment as well as consumables and pieces of furniture. In others the list might be

restricted to medical equipment only. In any case, it is advisable to restrict the list to essential equipment. That is not to include equipment considered desirable, but not essential.

The tool includes the cost of furniture and the cost of equipment consumables and spare parts as separate items to be costed in the planning & budgeting module for equipment. You should bear this in mind when deciding which items to include in the equipment list to avoid double counting. Also take into consideration the efficiency of data collection and the purpose of this exercise.

Once you have decided the type of items to be included in the equipment list, they need to be extracted from the country guidelines. During this process, you might need to review not only the list of equipment for the inpatient beds, but also for other facility areas such as triage. This list will be the starting point for discussions with stakeholders and will also be used for collecting cost data. When making the initial list it is thus advisable to be as comprehensive as possible. Also remember to document in detail any information gaps, such as lack of equipment specification, and make notes of any decisions made (i.e., excluded or added devices).

Changes to the original list are to be expected during stakeholders' discussions as they will need to ensure the list reflects the latest evidence-base and policy developments. Stakeholders will also consider other issues such as the following:

Should the list include equipment for referral transport? For example, if there is a current government policy to strengthen referral systems that will provide equipment for ambulances, such equipment does not need to be included here, but otherwise it will be advisable to include it.

And what about equipment devices shared with other hospital units? In some cases, the absence of shared hospital equipment such as mobile x-ray and blood gas analyzer, which has a deleterious effect on the good quality of care provided, is unlikely to be addressed by other hospital budgets in the near future. Stakeholders might decide to include the total cost of those items of shared equipment as part of the scale-up plan and budget for small and sick newborns. So, for shared equipment included in the list enter the total unit cost only if this device will be entirely funded out of the small and sick newborns' budget. Otherwise, apportion the unit cost to reflect the percentage that will be covered by the program. For example, if the unit cost for the shared device was $3,000 but only 20% will be funded by the program, enter $600 ($3,000 x 20%).

To identify the best source for equipment cost data, you might need to consult with those in charge of procuring hospital equipment. They might have records of recent tenders or purchases that can be used or might suggest that you need to approach individual vendors.

When detailed technical specifications of equipment are available, they should be used for securing unit costs. This will ensure that any variations in unit costs from alternative sources or vendors does not reflect differences in technical specifications, but other aspects such as brands or market mark-ups. However, this might not always be feasible, in which case it is important to discuss the implications for the data collection exercise.

In this and other instances, collecting equipment unit cost data from alternative sources will provide useful information for planning the scale-up (See for example, the Zambia Report included in the Annex). Note however that if alternative equipment prices are collected, different models need to be run to estimate those cost scenarios. That is, unlike costing facility typologies, costing alternative equipment price scenarios cannot be done within the same model. For this reason, only one set of prices is included in inputs.

STEP 4. ENTER LIST OF ESSENTIAL EQUIPMENT (as per standards) & UNIT COSTS

4.1. Enter list of essential equipment and unit price (inclusive of warranty) for each device

Equipment list to be sourced from country standards & guidelines. Also include devices required for mothers and for referral transport.
If standards are not available, as a starting point for discussions, the list can be sourced from the GFF case study or international guidelines
Note: you can enter data manually or to facilitate data entry you can also copy/paste into these cells

LIST OF ESSENTIAL EQUIPMENT	Unit price inc. warranty	User Notes
Closed incubator	$3,912	This model uses mid-point estimate of equipment cost for Zambia for all equipment
Bassinet (washable)	$518	
Transport incubator	$1,193	
Overhead servo incubator	$1,618	
Heat shield	$105	
Wall suction unit	$915	
Phototherapy units	$1,832	
Transcutaneous bilirubinometer	$457	
Electronic Scale	$382	

When collecting unit cost data for equipment, it is important to note the associated warranty and equipment servicing conditions as this will have implications for the design and cost of equipment maintenance strategies. So, the tool asks for a brief description of the equipment warranty included in unit costs, to ensure this is given consideration when modeling other equipment strategies.

4.2. Provide a brief description of warranty, including number of years

Brief Warranty Description:
Only 1 year warranty available in country

The next two steps under equipment, vehicle, and commodities, relate to costs associated with facility ambulance vehicles as part of any referral support strategies. They include the cost of purchasing an ambulance vehicle and the associated annual fuel and maintenance costs. The latter need to be entered for the facility cost/location typologies included in the exercise. This cost can be easily sourced in the country and will be used later to estimate total facility costs.

To facilitate gathering this information the tool provides some pointers such as the fact that a liter of fuel lasts 12 to 15 kilometers and that maintenance costs can be estimated as a percentage of fuel costs. In Zambia we used a rule of thumb of maintenance costs representing 50% of fuel costs.

Note that referral costs associated with personnel, such as the driver's salary, are included under human resources. Other referral strategies, such as cash transfers for mothers and families, are costed under the Planning & Budgeting module for Quality-of-Care strategies at facility level.

4.3. Enter unit price of ambulance vehicle

Leave blank if referral transport strategies do not include purchasing ambulance vehicles
Ambulance equipment should be costed separately. See Step 4.1

		User Notes
Ambulance vehicle price:	$80,000	Included in country discussions

4.4. Enter ambulance average fuel and maintenance costs per kilometer by location typology

Note that a litre of fuel would last approximately 12 to 15 kilometers
In the absence of data, maintenance costs can be set as a percentage of fuel cost.

Location Typology	Fuel Cost per Km.	Maintenance Cost per Km	User Notes
Mid Cost	$0.080	$0.040	Fuel cost sourced from the web and conservative assumption of maintenance cost = 50% of fuel, validated in country
High Cost	$0.090	$0.045	
Very High Cost	$0.100	$0.050	

STEP 5 – HUMAN RESOURCES

Human resources are the foundation for delivering good quality of care to small and sick newborns, so countries need to ensure that facilities have the right staff, with the right skills, in the right numbers and with the right support systems.

Here you need to enter the initial list of types/categories of human resources required to deliver care. The list should include clinical staff as well as support staff, such as biomedical technologists, lactation specialists/nutritionists, paramedics, cleaners, security guards, data officers and others.

Unit costs should include the annual salary as well as allowances and other work benefits for a full-time equivalent person. If facilities in hard-to-recruit or most challenging to recruit areas are included in the costing exercise the corresponding salaries should include any allowances provided as an incentive to recruit staff in those areas.

STEP 5. ENTER LIST OF FACILITY HUMAN RESOURCES -CLINICAL & SUPPORT- (As per standards) AND UNIT COSTS

5.1 Enter categories of facility staff and annual cost per FTE for facility typologies included

Categories should include clinical & support staff needed. To besourced from country standards & guidelines.

If not available, the list can be sourced from the GFF case study or international guidelines as a starting point for discussions in country.

Note: Column headings will be blank if a typology was not included

List of Human Resources Required & Annual Costs per FTE				
	STAFF RECRUITMENT FACILITY TYPOLOGIES			
	Standard area	Hard-to-Recruit	Most Challenging	
Staff Category (Clinical & Support)	Annual costs inc. salaries, allowances, etc.	Annual costs inc. salaries, allowances, recruitment area incentives	Annual costs inc. salaries, allowances, & recruitment area incentives	User Notes
Neonatologist	$25,917	$31,100	$32,396	
Medical Officer	$25,917	$31,100	$32,396	
Medical Licentiates	$7,533	$9,040	$9,416	
Clinical Officers	$5,386	$6,463	$6,733	

You are also asked to enter the average cost of supervision/mentoring visits from regions to facilities. These costs should be all inclusive. They will be used to estimate facility costs in the Planning & Budgeting module for the various facility cost/location typologies included.

5.2 Enter average costs of supervision/mentoring visits from regions to facilities, including allowances, perdiems, transport

Supervision/Mentoring/Coaching Visits - Unit Costs	$	User Notes
Average cost per supervision, mentoring and coaching visit from regions to SNCUs:	$165	Includes daily susbsistence allowances for 2 provincial officials ($56 each) and a driver ($33) and $20 fuel

STEP 6 –LOADINGS OR MARK-UPS TO CAPTURE COST DIFFERENCES

Cost loadings or mark-ups are a percentage used to reflect the increased price of service delivery in high or very high cost locations.

So, in this step you are asked to enter the percentage of cost loadings/mark-ups that will be used to adjust the cost of items such as mandatory training and supervision, or quality of care strategies across facility locations in the country.

Local managers and budget officials will be able to indicate the appropriate cost loadings to apply based on their experience. In some contexts, it might be appropriate to use similar cost loadings or mark-ups to those used for construction and/or fuel costs, discussed above.

To facilitate estimating these cost loadings, the tool uses as reference the costs of supervision entered in the previous step and there are explanatory notes with an example.

We have also included a review step that shows the cost of supervision visits across each location/cost typology after applying the cost loadings. This review step enables you to check that cost loadings or mark-ups have been entered correctly. As noted in the tool if you think there is a mistake, you just need to go back and change the cost loadings entered.

STEP 6. ENTER & VALIDATE COST LOADINGS OR MARK-UPS TO CAPTURE VARIATIONS ACROSS LOCATION/COST TYPOLOGIES

6.1. Enter % of cost loadings/mark-ups to be applied to supervision/mentoring visits and other QoC strategies at facility level. Enter 0 or leave blank if none
If for example, costs entered in step 5.2. reflect a mid-cost location and are likely to be 10% higher in high cost locations and 20% higher in very high cost locations: Enter 0 for mid cost, 10% for high cost and 20% for very high cost
Only cost/location typologies included in the exercise are shown here.

Cost loadings/mark-ups by typology	%	User Notes
Mid Cost	0%	Costs above reflect a mid-cost ~urban location
High Cost	10%	
Very High Cost	20%	

6.2. Review costs of supervision/mentoring visits after applying cost loadings
This table shows unit costs in step 5.2. by facility/cost location typology, after applying cost loadings/mark-ups in Step 6.1.
Here you have the opportunity to review how cost loadings are applied to ensure that percentages entered in Step 6.1. are accurate
If you think there is a mistake in these calculations, go back to Step 6.1. and change the cost loadings entered.

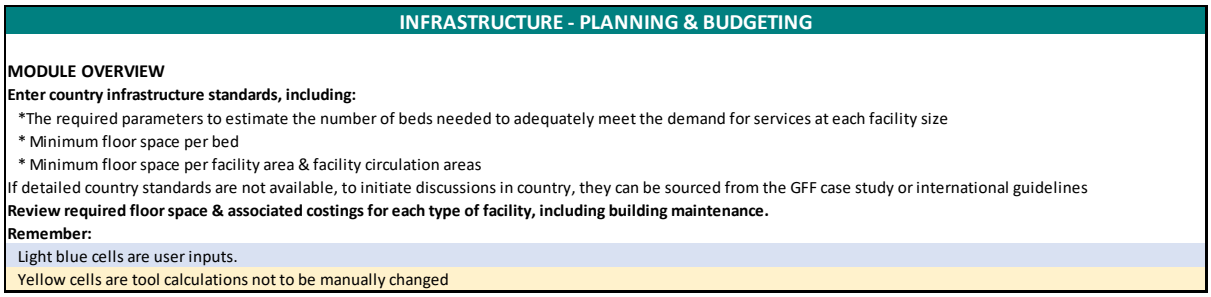
Unit costs of Supervision visits after applying cost loadings	$
Mid Cost	$165
High Cost	$182
Very High Cost	$198

INFRASTRUCTURE PLANNING & BUDGETING

In this module, you need to characterize each facility size typology (small, medium & large) included in General Inputs. The module starts with the formula to calculate the number of beds and then asks the user to enter the types of inpatient beds. The following steps relate to setting the minimum floor space requirements and estimating infrastructure construction costs.

Remember that if not all typologies were included in the exercise some row and column headings for the relevant tables will be blank. That is, for example if you only included small and medium size facilities, those are the only two column headings that you will see. The third column, which would have been for large facilities, will appear with a blank column heading. **Do not enter data in those rows or columns**.

If you have not included all typologies, tables summarizing results will also have blank row and/or column headings. The corresponding cells with the tool calculations will be shown as 0.



STEP 1 – ESTIMATE & VALIDATE NUMBER OF INPATIENT BEDS REQUIRED TO MEET DEMAND

In this step, the user calculates the number of required beds for the facility size typologies included (i.e., small, medium & large). The tool calculates the number of required beds based on the expected number of small and sick newborn admissions as well as the expected average length of stay and the target occupancy bed rate for the facility.

As shown below, to estimate the number of admissions, you need to enter the average number of live births in the catchment area and the percentage of live births requiring special care. Length of stay and the expected occupancy bed rate are also entered here. The tool provides brief notes to help you identify some of these values, based on international guidance. It also stresses that quality of care strategies such as those related to protocols and criteria for admission and discharge need to be in place to ensure that bed strength remains adequate.

Population & service parameters

So, in Step 1.1 the user enters the average number of live births in the average catchment area for what would be a small, medium, or large facility.

In Step 1.2 you enter the percentage of those live births that would require special care, the average length of stay and the percentage of bed occupancy rate targeted.

Note that international guidelines for Bangladesh, India, Zambia and the GFF case study suggest a rule of thumb of three beds per 1,000 live births. This assumes 15% live births requiring special care and an average length of stay of seven days. The total number of beds thus estimated is adjusted by the proposed occupancy rate, which some UNICEF experts suggest could be set at 80%. If this parameter is left blank, the tool assumes 100% occupancy rates.

So, unless locally available evidence suggests otherwise, the above indicated parameters can be used and have been included in the costing tool notes

The following formula is used to estimate the number of beds required at each facility:

- ✓ Expected admissions = Live births in catchment area x Percentage of live births requiring special care
- ✓ Required bed days = Expected admissions x Average Length of Stay
- ✓ Number of beds = Required Bed days ÷ 365 days

The total number of beds thus estimated is then adjusted by the occupancy rates entered.

STEP 1 - ESTIMATE & VALIDATE THE NUMBER OF BEDS REQUIRED TO MEET THE DEMAND FOR SERVICES

The tool calculates the expected number of facility admissions by typology based on: number of live births in catchment area and % of live births requiring special care.
The number of beds is estimated based on expected admissions, ALoS and target occupancy bed rate

1.1. Enter the expected average number of live births in the catchment area for what would be a typical small, medium and large facility

Leave cells blank if facility typology is not being costed

	Facility Size Typology			User Notes
	Small	Medium	Large	Modelled backwards, based on standard
Average number of live births in catchment area	2,500	3,300	5,000	number of beds in guidelines.

1.2. Enter formula parameters to estimate number of required beds based on population need:

Based on international guidelines & the GFF case study, approx. 15% of live births require special care & 7 days of ALoS ~ 3 beds per 1,000 live births
QoC strategies, inc. protocols and criteria for admission & discharge should be in place to ensure bed strength is adequate
In some instances UNICEF recommended 80% occupancy bed rate
Leave target occupancy bed rate blank if 100%

% of live births requiring special care	15%	**User Notes**
Target average length of stay (days)	7	Parameters based on UNICEF Guidelines &
Target occupancy bed rate	80%	GFF Case study

Review number of admissions and required inpatient beds

Step 1.3 asks you to review the expected number of admissions and inpatient beds calculated as per the above formula. Note that the total number of beds is rounded up. So, whether the estimated total is 7.2 or 7.8 beds, the model rounds it up to 8 for all calculations such as floor space requirements.

In some instances, country standards for infrastructure, equipment and human resources have already been set for facilities of a predetermined number of beds, as was the case in Zambia. However, it will still be useful to go through these steps to ensure that those facility sizes are adequate to meet the demand of a typical population catchment area. For this reason, we have included in the tool this first step, instead of simply asking directly for the number of required beds for each facility size.

1.3. Review expected number of admissions and newborn beds required by typology,

These figures are estimated based on expected live births entered in Step 1.1. and other parameters entered in Step 1.2

Service Delivery Parameters	Small	Medium	Large
Expected annual number of admissions (#)	375	495	750
Number of beds required (#)	9	12	18

STEP 2 – ESTIMATE TYPE OF INPATIENT BEDS

After estimating the total number of facility beds, you need to identify how many inpatient beds of each type (listed under General Inputs) are required at each facility size.

The tool has in-built validation formulae so if the total does not add up to the number of beds for each facility estimated in the previous step, a warning sign will be displayed.

If you see a warning sign as below asking to check bed numbers, just review the numbers for each type of bed that you entered to make sure they add up to the required number of inpatient beds for that typology.

Note that if you decide to proceed notwithstanding the warning sign, all infrastructure calculations (total floor space and cost) will be 0 and there will be another warning sign in the equipment module.

STEP 2 - IDENTIFY NUMBERS FOR EACH TYPE OF INPATIENT BED

Enter here the number of beds for each type of inpatient bed listed under general inputs.

Total Number of Beds should equal number of beds required in Step 1.3 above. Otherwise a warning sign would appear and infrastructure totals will be 0

Inpatient Areas (Type of Beds)	Number of beds			User Notes
	Small	Medium	Large	Based on guidelines, reviewed during
Standard Inpatient Care	3	3	6	discussions
High-Care Beds	2	3	4	
Kangaroo Mother Care Beds	2	6	8	
Total Number of Beds to Check	**Check bed numbers**	**12**	**18**	

STEP 3 – SET COUNTRY FLOOR SPACE REQUIREMENTS

Facility floor standards cover a wide range of unit design and construction aspects beyond the minimum space required. Amongst other issues they include space configuration; electrical, gas and mechanical needs; lighting, temperature, and ventilation; digital infrastructure and fire safety and mitigation systems.

As expected, these floor standards will have an impact on **construction prices** and so should be reflected in the unit cost of construction entered in the General Inputs sheet. For example, based on the GFF case study, it has been estimated that civil works account only for between 45% to 59% of construction costs, with the remaining costs attributed to medical gas management systems, electrical works and fire alarm and firefighting systems.

Here the focus is on measuring the floor space area required to deliver good quality care to small and sick newborns, which will provide us with the total **square meters of construction required** for each of the facility size typologies costed.

Minimum floor space per inpatient bed & facility area

In Step 3.1 you enter the required square meters per inpatient bed and in Step 3.2 facility totals are reviewed.

Then in Step 3.3 enter the required square meters per individual facility area, which correspond to those listed in General Inputs.

STEP 3 - SET COUNTRY FLOOR SPACE STANDARDS

3.1 - Set minimum floor space (square meters) per each type of inpatient bed

Floor space standards for inpatient beds should take into consideration no-separation policies

Sq. Mt. per Type of Bed		User Notes
Inpatient Areas (Type of Beds)	**Sq. Mt per Bed**	Based on guidelines, reviewed during discussions to include no separation policy for Standard inpatient care. However, no separation policy for High-Care beds. Might need review based on latest evidence
Standard Inpatient Care	12	
High-Care Beds	10	
Kangaroo Mother Care Beds	12	
	0	
	0	

3.2. Review minimum floor space for inpatient care areas by facility size typology

If Total inpatient care area = 0 the typology has not been costed or there is a mistake in the number of beds entered in Step 2.

Total inpatient care area (Sq. Mt.) by Facility Size			
	Small	**Medium**	**Large**
Type of inpatient care area	**Sq. Mts per facility**	**Sq. Mts per facility**	**Sq. Mts per facility**
Standard Inpatient Care	36	36	72
High-Care Beds	20	30	40
Kangaroo Mother Care Beds	48	72	96
	0	0	0
	0	0	0
Total inpatient care area (Sq. Mt.)	**104**	**138**	**208**

3.3. Set minimum floor space (square meters) for outpatient care, ancillary and support services as applicable

Floor standards for other areas by facility size				User Notes
Facility Service Area	**Small (Sq. Mt.)**	**Medium (Sq. Mt.)**	**Large (Sq. Mt.)**	
Triage/receiving room	12	12	20	Based on country discussions aimed at balancing what is realistic and what is optimal. Lodger mother beds for mothers of children in high-care beds. Might need future review based on latest evidence.
Counselling area	12	12	12	
Family facilities (exc. Lodger mother bed areas)	12	12	18	
Nursing station	10	10	15	
Nurses & Doctors Rest Areas with attached restroom	10	10	15	
Pantry with dining area	15	15	20	
Storage unit	7	7	10	
Clean utility	7	7	10	
Dirty utility	7	7	10	
Lodger mother bed areas	24	36	48	
Meeting & teaching room	20	20	30	
Unit office	10	10	15	
Total	**146**	**158**	**223**	

Facility circulation areas

There is also allowance for including a minimum percentage of floor space for circulation, such as corridors and entrance (Step 3.4), which in the GFF case study was set at 30%. This percentage is then applied to the total area of the unit. The cells' data validation will give you a warning if by mistake negative values have been entered or if the percentage of circulation space is greater than 100%.

3.4. Set floor space standards for circulation areas (i.e. corridors, entrance)

		User Notes
Minimum floor space for circulation as % of SNCU total area	**10%**	No clarity at the meeting, though people thought 30% recommended by case study was probably too high, so modelled at 10%

STEP 4 – REVIEW FLOOR SPACE REQUIREMENTS AND INFRASTRUCTURE COSTS BY TYPOLOGY

The standard formula for costs is quantity x price. As noted in the costing tool, the total cost of construction is estimated as square meters of facility construction (i.e., quantity) times the unit cost of construction (i.e., price).

Review floor space

In step 4.1. you will review the total floor space requirements for each facility size typology. The table shows subtotals for inpatient and other facility areas, so you are able to examine their relative contribution to facility space requirements.

4.1. Review total floor space required to deliver good quality of care by facility size typology

Total floor space = 0 if typology not costed or errors in number of beds

Square Meters of Floor Space by SNCU facility size			
Service Areas - Floor Space	**Small**	**Medium**	**Large**
Inpatient care areas (Sq. Mts.)	104	138	208
Other facility areas (Sq. Mts.)	146	158	223
Circulation space (Sq. Mts.)	25	30	43
Total floor space (Sq. Mts.)	**275**	**326**	**474**

Review construction costs

Then in Steps 4.2 and 4.3 you review the total construction costs for each facility typology costed. Note that if you have included all facility size, cost/location, and construction typologies, 18 construction cost values will be estimated. They will range from a minimum value representing a small facility in a mid-cost location and in need of rehabilitation to a maximum value representing a large facility in a very high-cost location and in need of new construction.

4.2. Review infrastructure costs for facilities requiring new construction by size and location/cost typologies

Estimates are based on facility floor space and construction costs per square meter.

	NEW CONSTRUCTION - Total Costs		
Facility Costs by Typology	**Small**	**Medium**	**Large**
Mid Cost	$132,000	$156,288	$227,568
High Cost	$165,000	$195,360	$284,460
Very High Cost	$198,000	$234,432	$341,352

4.3. Review infrastructure costs for facilities requiring rehabilitation by size and location/cost typologies

Estimates are based on facility floor space and construction costs per square meter.

	REHABILITATION - Total Costs		
Facility Costs by Typology	**Small**	**Medium**	**Large**
Mid Cost	$79,750	$94,424	$137,489
High Cost	$99,000	$117,216	$170,676
Very High Cost	$121,000	$143,264	$208,604

There are in-built validation algorithms in the tool to prevent erroneous calculations. So, if there are mistakes in the number of inpatient beds or accidentally some data are entered for facility typologies not included in the exercise, the corresponding estimates will be 0. For example, we show below results for Step 4.1. when the large size facility typology has not been included when selecting typologies in the General Inputs sheet. The heading of column three is blank and total costs are 0.

However, as a general rule, whenever results seem odd, review that inputs are correct and take note that as discussed earlier, if by mistake you have copy/pasted values into cells the data validation rules were overridden.

STEP 5 – REVIEW BUILDING MAINTENANCE COSTS

The final step in this module asks you to review the estimated annual costs of building maintenance, which are calculated as a percentage of the value of a new facility building. Remember that this building maintenance percentage is one of the inputs collected in the General Inputs sheet under infrastructure. The percentage is then applied to the new construction values for each typology estimated in the previous step. Also remember that if you have not included new construction in the typologies included, this cost cannot be estimated and will show as 0.

STEP 5 - Review annual cost of building maintenance based on inputs and building values

These costs are estimated as a percentage of new building values

Costs will be 0 if the new construction typology has not been included in costings or if no % of building maintenance was entered in inputs

Annual building maintenance costs by typology	Small	Medium	Large
Mid Cost	$1,320	$1,563	$2,276
High Cost	$1,650	$1,954	$2,845
Very High Cost	$1,980	$2,344	$3,414

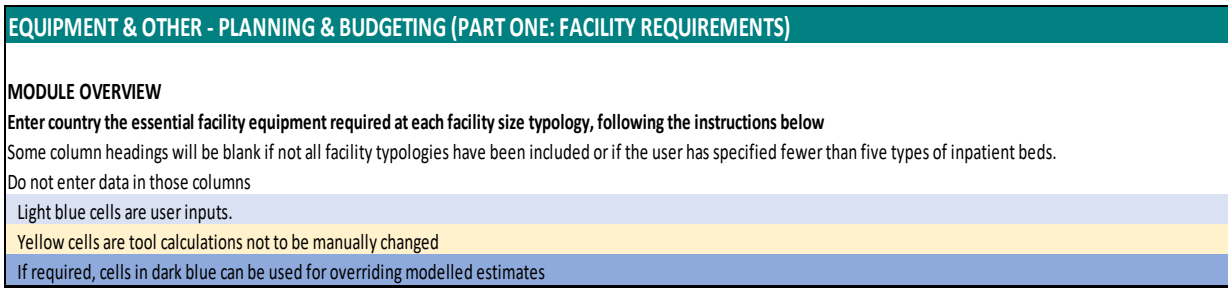
EQUIPMENT & OTHER - PLANNING & BUDGETING (1)

Planning & budgeting for equipment, commodities & referral vehicles is organized in two worksheets. The first one focuses on setting equipment standards. The associated costs for equipping a facility are reviewed in the second worksheet, where the user also costs commodities and referral vehicles.

In the first worksheet discussed here, the user sets equipment standards for each of the facility size typologies included in the exercise (small, medium & large).

These standards are set for each equipment device listed in the General Inputs sheet. Remember that if not all typologies were included in the exercise some row and column headings for the relevant tables will be blank. That is, for example if you only included small and medium size facilities, those are the only two column headings that you will see. The third column, which would have been for large facilities, will appear with a blank column heading. Do not enter data in those rows or columns.

Note that if not all typologies have been included, tables summarizing results will also have blank row and/or column headings. The corresponding cells with results will be shown as 0.


EQUIPMENT & OTHER - PLANNING & BUDGETING (PART ONE: FACILITY REQUIREMENTS)

MODULE OVERVIEW

Enter country the essential facility equipment required at each facility size typology, following the instructions below

Some column headings will be blank if not all facility typologies have been included or if the user has specified fewer than five types of inpatient beds.

Do not enter data in those columns

Light blue cells are user inputs.

Yellow cells are tool calculations not to be manually changed

If required, cells in dark blue can be used for overriding modelled estimates

STEP 1 – SET NUMBER OF ESSENTIAL DEVICES REQUIRED & REVIEW ESTIMATES

As noted in the tool and explained in detail below, first, for each of the devices listed you should enter the number of items required per type of bed. Then you should enter the additional items of each device required for other facility areas. The resulting number of equipment devices is calculated, and you can review these estimates and modify them, as required.

Number of devices required per type of bed

First enter the number of equipment devices required per bed. The type of beds listed here correspond to those ones in the General Inputs sheet. So, if less than five types of beds have been included, there will be empty column headings as shown below, which should be left blank.

Any figures entered here represent equipment requirements for that type of bed, which is applicable to all facility size typologies. Make sure you enter data in the right columns.

Note that decimals are allowed. So, if one equipment device is required per three beds, enter 0.33 as shown below.

The data validation in these cells will not allow you to enter negative numbers. However, if you copy/paste or cut/paste information into these cells, the in-built data validation will stop working, which can lead to erroneous calculations.

Equipment Name	First, enter required items per type of inpatient bed				
	Standard Inpatient Care	High-Care Beds	Kangaroo Mother Care Beds		
Closed incubator	0.33	0.33	0.33		
Bassinet (washable)	1	1	1		
Transport incubator					
Overhead servo incubator		1			
Heat shield		1			
Wall suction unit					

Additional devices required

Second, enter any additional equipment numbers required at a facility. This should be done separately for each facility size typology and should take into consideration equipment requirements that are applicable to the entire unit, to individual facility areas or to referral transport. Shared equipment that is at least partially funded out of the small and sick newborn unit budget should also be included here.

Since requirements are set at facility level, to prevent user errors, no decimals are allowed in these columns. For shared equipment whose total cost is not funded out of the program resources, you should still enter the required number, that is, enter 1 even if only 20% of that device is funded out of the unit budget. Remember that as discussed under General Inputs, the unit costs entered for shared input should reflect the proportion of the costs funded by the unit budget. So, any adjustments to reflect proportional funding for shared equipment should be made adjusting unit costs, not the quantity of equipment required.

Second, enter additional required items @ facility		
Additional items @Small	Additional items @Medium	Additional items @Large
2	2	2
3	4	6

Review estimated number of devices by facility size

Third, review total facility equipment requirements calculated for each facility size typology. The number of required items for each device is calculated as: Inpatient beds requirements (number of items required per type of bed x numbers of each type of bed) *plus* additional items required at each facility.

If the calculation results in numbers with decimals (i.e., 4.20 devices), the costing tool formula rounds up these totals. So, it is very important that you review the estimated number of required equipment devices, which can be modified in the next step.

Equipment Name	First, enter required items per type of inpatient bed					Second, enter additional required items @ facility			Third, review estimated facility requirements		
	Standard Inpatient Care	High-Care Beds	Kangaroo Mother Care Beds			Additional items @Small	Additional items @Medium	Additional items @Large	Small	Medium	Large
Closed incubator	0.33	0.33	0.33						3	4	6
Bassinet (washable)	1	1	1						9	12	18
Transport incubator						2	2	2	2	2	2
Overhead servo incubator		1							2	3	4
Heat shield		1							2	3	4
Wall suction unit						3	4	6	3	4	6

Option to revise modeled estimates

Fourth, if after reviewing the modeled estimate for a particular device, you want to change it, the corresponding figure should be entered here in the dark-blue cells. This could happen for example if the rounding up of estimates needs to be revised down.

In this event, enter the revised estimate in the corresponding cell and leave the rest blank. Make sure you only enter data in dark blue cells for those devices for which you want to override modeled estimates.

If you wish to skip the previous steps because for example country guidance provides the total number of items per facility, you can just go ahead and enter those figures in the dark-blue cells and leave cells in the previous columns blank. However, consider that even in these instances going through the previous steps will provide the opportunity to sense-check equipment standards.

Final numbers to be used in calculations

Fifth, review the estimates that will be used in the final cost calculations. If you have not entered any data in the dark-blue cells, these numbers will correspond to those in the previous step. However, if you have entered some user-defined numbers in the dark blue cells, these values will be a combination of modeled and user-defined figures.

Fourth, enter user-defined numbers here. Note they override modelled estimates			User Notes	Fifth, review essential equipment numbers to be used in final calculations		
Small	Medium	Large		Small	Medium	Large
				3	4	6
				9	12	18
				2	2	2
				2	3	4
				2	3	4
				3	4	6

EQUIPMENT & OTHER PLANNING & BUDGETING (2)

In this worksheet the user reviews the total costs of equipping a facility as per the standards previously set and estimates additional related costs such as equipment distribution and maintenance.

This worksheet also includes steps for costing ambulance vehicles. Finally, there are also steps for costing drugs and medical supplies. They have been included here to minimize the risk of double counting since an important proportion of medical supplies might be costed as part of equipment consumables, renewables, and supplies.

Remember that if not all typologies were included in the exercise some row and column headings for the relevant tables will be blank. That is, for example if you only included small and medium size facilities, those are the only two column headings that you will see. The third column, which would have been for large facilities, will appear with a blank column heading. Do not enter data in those rows or columns.

EQUIPMENT - PLANNING & BUDGETING (PART TWO COSTINGS)

MODULE OVERVIEW
Review facility equipment cost calculations for each facility size typology, including:
* Total facility equipment cost & devices accounting for the largest cost share
This review step will help users understand what drives facility equipment costs
Consider, estimate and review other equipment related costs
*Equipment acquisition DOES NOT account for the vast majority of all equipment related costs.
* Equipment related costs to be considered and included in these calculations are:
** Transport and distribution to facilities as well as installation
** Annual costs of consumables, medical supplies and renewables
** One-Off buffer stocks required as part of maintenance strategies
** Annual cost of spare parts required as part of maintenance strategies
** Other preventive and corrective maintenance strategies
Estimate costs of ambulance vehicles, fuel and maintenance
Estimate and review cost of medicines and supplies not costed above
To facilitate estimates, the tool uses rules-based costing. However if available, user-defined estimates can be entered in the dark-blue cells
Remember:
Light blue cells are user inputs.
Yellow cells are tool calculations not to be manually changed
If required, cells in dark blue can be used for overriding modelled estimates. They can also be used to enter direct costs

STEP 1 – REVIEW FACILITY EQUIPMENT COSTS BY TYPOLOGY

The first step involves reviewing the equipment acquisition value for each facility size typology included. For transparency purposes and to help you analyze major cost drivers for each typology, the summary table includes:

- Total cost of equipping a facility, which represents the equipment acquisition value for a fully equipped facility as per country standards
- Facility costs for each device (value and as % of total equipment facility costs)
- A reminder column with the standard number of items required per device, set in the previous worksheet (light gray font).
- A reminder column with the unit price of each device entered in the General Inputs worksheet (light gray font).

Reviewing and validating the total cost of equipping a facility as suggested in this step is critical to ensure the robustness of the results. First, equipment acquisition costs are a significant component of one-off capital investments required to set up a facility. Second, these estimates are also used under the following steps to calculate various equipment-related costs.

In this table you can also identify those devices that account for the largest share of costs (automatically highlighted in the tool), which will be very useful during planning and budgeting discussions.

For example, across various scenarios in Zambia five devices (out of 65 costed) accounted for over half of all equipment costs. This finding does not seem to be an isolated case. A few devices accounting for a large share of equipment costs were also documented in the GFF case study of Haryana.

STEP 1. REVIEW TOTAL FACILITY EQUIPMENT COSTS AND IDENTIFY THE TYPE OF EQUIPMENT ACCOUNTING FOR THE LARGEST SHARE OF COSTS

To examine key costing drivers information on the required number of items and unit prices is also included in this table. Devices accounting for the largest share of costs are highlighted.
Note that calculations will be 0 if that facility typology was not costed or the equipment was not included.

Equipment Name	Facility Equipment Costs ($)			Facility Equipment Costs as % of total			Facility Equipment Numbers (as calculated in the 3.Equipment_Numbers worksheet)			Unit price ($) from 1.General Inputs
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	
Closed incubator	$11,735.29	$15,647.06	$23,470.59	7.4%	8.6%	10.1%	3	4	6	$3,912
Bassinet (washable)	$4,658.82	$6,211.76	$9,317.65	2.9%	3.4%	4.0%	9	12	18	$518
Transport incubator	$2,385.88	$2,385.88	$2,385.88	1.5%	1.3%	1.0%	2	2	2	$1,193
Overhead servo incubator	$3,235.62	$4,853.44	$6,471.25	2.0%	2.7%	2.8%	2	3	4	$1,618
Heat shield	$210.35	$315.53	$420.71	0.1%	0.2%	0.2%	2	3	4	$105
Wall suction unit	$2,744.12	$3,658.82	$5,488.24	1.7%	2.0%	2.4%	3	4	6	$915

STEP 2 – ESTIMATE COSTS OF EQUIPMENT TRANSPORT, DISTRIBUTION & INSTALLATION

In some countries the unit price of each device is all inclusive, that is, it includes at least a one-year warranty as well as transport, distribution, and installation costs. In these cases, users just need to leave cells blank and comment in the user notes that transport was not costed separately because it was already included in the equipment acquisition value.

In other cases, however, transport, distribution and installation costs are not included in vendors' prices and need to be estimated separately.

Rules-based costing

Detailed costings would require users to enter the costs of transport, distribution, and installation for each device. Instead, and with a view to facilitate data collection, the tool uses rules-based costing and estimates those costs as a percentage of total equipment acquisition value.

To account for cost variations across facility cost/location typologies, different percentages can be used to estimate costs for each typology included. This information can be sourced from recent projects funding facility equipment. For example, in Zambia, UNICEF information suggested that these costs would be equivalent to 20%, 30% and 40% of equipment acquisition value for mid, high & very high-cost locations, respectively.

So, in step 2.1 the user enters the estimated costs as a percentage of equipment acquisition value for each typology and has the opportunity to revise calculated costs as required.

We acknowledge that this basic rules-based approach has limitations. For example, less expensive, but heavier and larger equipment might have higher distribution costs compared to more costly but smaller equipment.

However, in the absence of country asset databases with this type of information, rules-based costing used judiciously can provide a useful approximation of true costs without overburdening users requesting transport cost data for each item. Additionally, by including all three facility cost/location typologies, the

user can obtain a range of estimates for each facility size, which helps to account for the uncertainty of modelled costs.

Also note that if detailed information is available, user-defined figures can be entered in the dark blue cells. These cells can also be used to override the tool rules-based calculations for one or all typologies.

Review final costs by typology

In Step 2.2 the user reviews and verifies estimated costs that will be used for final results. Note that if you have entered both a percentage and a user-defined value, the latter overrides the former and is used for the final cost calculations. To prevent any misunderstanding that might lead to erroneous calculations, in this step the user has the opportunity to verify the final costs that will be used for each size and location/cost typology.

STEP 2 - ESTIMATE & VALIDATE COSTS OF EQUIPMENT TRANSPORT, DISTRIBUTION AND INSTALLATION

If equipment prices DO NOT include transport, distribution and installation costs, estimate those costs for each facility typology.

Transport, distribution and installation costs can be significant, so if they are not included in equipment acquisition value, they can be calculated here

Note: Leave cells blank if transport, distribution and installation cost sare included in equipment acquisition value

2.1. Estimate costs as a percentage of equipment acquisition value for each typology and revise/modify estimates if required

Enter % of equipment value or user-defined costs. Note that user-defined costs will override any modelled estimates

In Zambia, 20%, 30% & 40% estimates were used based on Unicef experience in country

		Estimated model costs			Enter user-defined costs here. Note they override modelled estimates			User Notes
Equipment Transport, Distribution and Installation Costs as a % of Equipment Acquisition Value, by Location Typology	% of equipment value	Small	Medium	Large	Small	Medium	Large	
Mid Cost	20%	$31,757	$36,550	$46,399				High costs noted at country meetings. Percentages (20%, 30% & 40%) based on Unicef recommendations
High Cost	30%	$47,636	$54,825	$69,599				
Very High Cost	40%	$63,515	$73,100	$92,799				

2.2. Review costs that will be used for final results

Final transport, distribution & installation costs by typolog	Small	Medium	Large
Mid Cost	$31,757	$36,550	$46,399
High Cost	$47,636	$54,825	$69,599
Very High Cost	$63,515	$73,100	$92,799

STEP 3 – ESTIMATE ANNUAL COSTS OF EQUIPMENT CONSUMABLES & RENEWABLES

An adequate supply of equipment, consumables & renewables is essential for quality of care. To ensure availability all year round, annual health budgets need to reflect this important recurrent expenditure.

Rules-based costing

As procurement and supply management systems are strengthened in the country, information will become available on consumables and renewables required for each facility device during the year. This would allow for individual cost estimates by consumables/renewables and aggregated by each device.

However, in many countries this information might not be readily available. Such granular cost estimates would also require collecting data on the number of required consumables/renewables for each device and their unit prices. For the purposes of the costing tool and to minimize the data collection burden, we have opted for a rules-based approach: the overall annual cost of equipment consumables and renewables is estimated as a percentage of the equipment acquisition value.

In Step 3.1 the user enters the estimated percentages by facility cost/location typology. Remember that these figures represent what the supply of consumables & renewables would cost on average for a facility

fully equipped as per country standards. This information can be sourced from facility managers or procurement and supply teams from the Ministry of Health or development partners.

For example, in Zambia, we consulted with UNICEF experts who suggested that based on their experience in the country and in India, an estimate of 30% to 40% of equipment acquisition value would be reasonable to account for the required annual costs of equipment consumables and renewables of a fully functional facility.

When applying this rules-based costing, it is important to consider the devices included in the list and adjust estimates as required in the dark blue cells.

For example, if the equipment list includes shared items at 100% of their value, this rules-based costing will overestimate the cost of consumables and renewables for the unit as it will include 100% of those costs, even though the unit is not responsible for consumables used by other patients. This will be particularly problematic in instances where those shared items account for a large proportion of the equipment acquisition value.

If this is the case, the estimated consumables and renewables cost would need to be adjusted downwards in the dark-blue cells also included in this step, to reflect the fact that only a proportion of consumable costs for shared equipment will be allocated to the unit budget. This can be easily done, for example by running a separate 'temporary' model with the same parameters, but with costs of shared equipment apportioned in the General Inputs sheet (i.e., at 20% rather than 100%). Then as shown below you enter the values for consumables and renewables that were estimated by the 'temporary' model and make a note of the adjustments made.

Review final costs by typology

In Step 3.2 the user has the opportunity to review costs by facility size and cost/location typologies, which will be used in the final cost calculations. The final figures used will reflect modeled estimates unless they have been overridden by the user in the dark-blue cells.

STEP 3. ESTIMATE & VALIDATE ANNUAL COSTS OF EQUIPMENT CONSUMABLES AND RENEWABLES

3.1. Estimate costs as a percentage of equipment acquisition value for each typology and revise/modify estimates if required

Enter % of equipment value or user-defined costs. Note that user-defined costs will override any modelled estimates

Note UNICEF experience in India & Zambia suggests 30% to 40% might be reasonable estimates.

		Estimated model costs			Enter user-defined costs here. Note they override modelled estimates			User Notes
Annual Costs Consumables and Renewables as % of Equipment Value	% of Equipment Value	Small	Medium	Large	Small	Medium	Large	
Mid Cost	30%	$47,636	$54,825	$69,599	$39,223	$46,412	$58,433	Based on Unicef recommendations (30 to 40% depending on equipment). However, adjusted for shared equipment (SSN account for a fifth of consumable costs). Base scenario
High Cost	35%	$55,576	$63,963	$81,199	$45,760	$54,147	$68,171	
Very High Cost	40%	$63,515	$73,100	$92,799	$52,297	$61,882	$77,910	

3.2. Review costs that will be used for final results.

Final annual costs of consumables and renewables by typ	Small	Medium	Large
Mid Cost	$39,223	$46,412	$58,433
High Cost	$45,760	$54,147	$68,171
Very High Cost	$52,297	$61,882	$77,910

STEP 4 – ESTIMATE ANNUAL COSTS OF SPARE PARTS

Ensuring an adequate supply of spare parts is a critical maintenance strategy. In some settings it might be useful to account for the cost of spare parts separately, which can be done here. The steps to estimate the annual cost of spare parts are similar to those described under Steps 2 & 3 above.

The tool uses rules-based costing and requests the user to estimate these costs as a percentage of equipment acquisition value for each facility location/cost typology (Step 4.1).

Estimated costs can be overridden in dark blue cells and the user has the opportunity to review and verify the costs to be used in the final calculations (Step 4.2).

Separate or included in overall maintenance?

Note that sometimes it might be difficult to obtain the required estimates for spare parts as they are generally included in overall maintenance costs. So, in this instance it is advisable to skip this step and estimate the overall cost of maintenance strategies, inclusive of spare parts. In this event, leave cells blank and make a comment in the User Notes so that you will remember later that these costs were included in regular maintenance.

STEP 4. ESTIMATE & VALIDATE ANNUAL COSTS OF SPARE PARTS

4.1. Estimate costs as a percentage of equipment acquisition value for each typology and revise/modify estimates if required

Enter % of equipment value or user-defined costs. Note that user-defined costs will override any modelled estimates

Leave cells blank if spare parts costed in Step 5 below (maintenance strategies)

		Estimated model costs			Enter user-defined costs here. Note they override modelled estimates			User Notes
Equipment Value	**%**	**Small**	**Medium**	**Large**	**Small**	**Medium**	**Large**	
Mid Cost		$0	$0	$0				Due to lack of data, costed as part of maintenance below.
High Cost		$0	$0	$0				
Very High Cost		$0	$0	$0				

4.2. Verify costs that will be used for final results.

Final Annual Cost of Spare Parts by Typology	Small	Medium	Large
Mid Cost	$0	$0	$0
High Cost	$0	$0	$0
Very High Cost	$0	$0	$0

STEP 5 – ESTIMATE ANNUAL COSTS OF MAINTENANCE STRATEGIES

Strategies to prevent the occurrence of equipment failures (preventive maintenance) and to fix and or replace equipment when those failures happen (corrective maintenance) are critical for delivering good quality of care. Designing and implementing equipment maintenance strategies requires a whole system approach addressing amongst other factors, supply and distribution systems, the need for standard maintenance procedures, adequate budgeting and capacity building for medical staff and specialized technicians.

Detailed maintenance strategies and plans cannot be costed in the tool as they require tailored costings that reflect the nuances of each preventive and corrective management strategy and their supporting systems. Instead, the costing tool aims at providing an overall estimate that can help as a starting point for discussions and which reminds users to include maintenance strategy costs in scale-up budgets.

Rules-based costing

For the above purpose and in line with previous steps, the tool uses a rules-based approach that estimates maintenance costs as a percentage of equipment acquisition value, while also allowing the user to override those estimates as required (Step 5.1).

As noted in the costing tool, maintenance costs of 10 to 15% of the equipment acquisition value might be reasonable in settings like Zambia. These or any other estimates used in rules-based costing will need to be sourced or validated with facility managers and country experts. If detailed maintenance strategy costings are available, figures can be entered in the dark-blue cells directly.

Note that if rules-based costing is used, similar to consumables & renewables, adjustments might need to be made if shared equipment has been included. You can follow the same steps described above.

Review final costs by typology

Cost estimates by facility typology that will be used in the final results can be reviewed and verified in Step 5.2. Remember that as discussed earlier, caution needs to be exercised when using rules-based costings such as setting costs as a percentage of equipment acquisition values. The uncertainty of the estimates can however be accounted for by including the three cost/location typologies. They will provide you with three-point estimates for each facility size which give you an indicative range of the expected maintenance costs.

STEP 5. ESTIMATE & VALIDATE ANNUAL COSTS OF MAINTENANCE STRATEGIES (PREVENTIVE & CORRECTIVE)

Note that costs related to human resources, such as specialised staff (i.e. engineers) or mandatory training for health staff should be costed under human resources
Remember to include spare parts if not costed separately

5.1. Estimate costs as a percentage of equipment acquisition value for each typology and revise/modify estimates if required

Enter % of equipment value or user-defined costs. Note that user-defined costs will override any modelled estimates
Note UNICEF experience in India & Zambia suggests 10 to 15% might be reasonable for annual expenditure on maintenance in Zambia

		Estimated model costs			Enter user-defined costs here. Note they override modelled estimates		
Maintenance strategies as % of equipment acquisition value	%	Small	Medium	Large	Small	Medium	Large
Mid Cost	10%	$15,879	$18,275	$23,200	$13,074	$15,471	$19,478
High Cost	12%	$19,054	$21,930	$27,840	$15,689	$18,565	$23,374
Very High Cost	15%	$23,818	$27,413	$34,799	$19,611	$23,206	$29,216

5.2. Review costs that will be used for final results.

Fianl Annual Costs of Preventive and Corrective Maintenance Strategies	Small	Medium	Large
Mid Cost	$13,074	$15,471	$19,478
High Cost	$15,689	$18,565	$23,374
Very High Cost	$19,611	$23,206	$29,216

STEP 6 – REVIEW ANNUAL COST OF SPARE PARTS & MAINTENANCE STRATEGIES

In this step you are asked to review the total cost of spare parts & maintenance, to prevent double counting and ensure that annual allocations for maintenance strategies, including spare parts, are adequate. If all facility size and cost-location typologies have been included in the exercise, up to nine-point estimates are produced.

In the event that spare parts are costed as part of maintenance strategies in Step 5, figures in this table will be the same as those in the previous step. Also note that these represent the costs that will be displayed in the final summary of facility cost charts and tables (Facility Typology Analytics). They are categorized as recurrent regular maintenance costs, to distinguish them from costs on consumables & renewables.

STEP 6. REVIEW TOTAL ANNUAL COSTS OF SPARE PARTS + MAINTENANCE STRATEGIES

Review that estimated annual maintenance costs, including spare parts, are adequate

Review of Total Annual Maintenance Costs (Spare Parts + Preventive & Corrective) by Typology	Small	Medium	Large
Mid Cost	$13,074	$15,471	$19,478
High Cost	$15,689	$18,565	$23,374
Very High Cost	$19,611	$23,206	$29,216

STEP 7 – ESTIMATE & VALIDATE COSTS OF EQUIPMENT BUFFER STOCKS

In some contexts, it might be advisable to include in the scale-up budget the cost of equipment buffer stocks that can be accessed by individual facilities in the event of equipment failure. As a rule of thumb UNICEF recommends 10% of buffer stocks to be managed at regional level. In this step you enter the estimated percentage of buffer stocks required by facility cost/location typology.

Note that the tool algorithm applies these percentages to the equipment acquisition value, without distribution and installation costs. That is so because there are no installation costs for buffer stocks and transport and distribution costs of equipment reflect transport and distribution to facilities, not to regional centers.

The tool allows for different costs by facility size/location typology to be entered in Step 7.1, although the same percentage can be entered for all typologies. Costs thus calculated can then be reviewed in Step 7.2. If no buffer stocks are included, leave blank or write 0.

7.1. Estimate the expected one-off costs of buffer stocks (inclusive of transport/distribution) as a % of equipment replacement value.
Enter the expected cost (as a percentage of equipment value) of any buffer stocks required.
The tool calculations assume this is a percentage of new equipment value (excluding distribution costs)
UNICEF recommends 10% of buffer stocks to be managed at regional level.

Once-Off Equipment Buffer Stock Costs as % of equipment value	%	User Notes
Mid Cost	10%	Differences to account for difference in transport costs. Applies also to shared equipment
High Cost	12%	
Very High Cost	15%	

7.2. Review Once-Off Equipment Buffer Stock Costs by Facility Typology

Once-Off Equipment Buffer Stock Costs	Small	Medium	Large
Mid Cost	$15,879	$18,275	$23,200
High Cost	$19,054	$21,930	$27,840
Very High Cost	$23,818	$27,413	$34,799

STEP 8 – ESTIMATE & VALIDATE COSTS OF FACILITY FURNITURE & OTHER NOT INCLUDED ABOVE

Here the user estimates additional costs related to facility furniture, such as lockers for staff, mothers and family or office equipment, which has not been included under the list of essential equipment in the General Inputs worksheet.

In Step 8.1. estimated amounts (not percentages) to cover costs for those additional items should be entered for each facility size typology included. Then, similar to equipment, in Step 8.2., distribution costs should be entered as a percentage of furniture acquisition value by facility cost/location typology.

In Step 8.3 you can review costs of furniture (inclusive of distribution) which are presented by facility size and cost/location typologies. If all typologies have been included in the model, up to nine-point estimates will be calculated. As noted earlier, they will provide you with a reasonable range to account for uncertainty of modelled estimates when discussing results with stakeholders.

STEP 8. ESTIMATE & VALIDATE COSTS OF FACILITY FURNITURE & OTHER NOT INCLUDED IN ESSENTIAL EQUIPMENT

8.1. Enter acquisition costs of additional furniture not included in equipment
Facility level costs should be entered here to ensure these expenses are properly accounted for.
Can include costs for furniture items, such as staff office chairs and desks, wardrobes and mothers' beds as well as office equipment such as laptops.
Enter total amount, not percentages.

Additional furniture and equipment	Small ($)	Medium ($)	Large ($)	User Notes
Acquisition Costs of Additional Furniture	$15,000	$18,000	$20,000	Includes costs of office furniture, mother beds & 2 laptops

8.2. Enter furniture distribution costs for location typologies as a percentage of furniture acquisition value. Leave blank if distribution costs included in acquisition costs
Note: These costs are expected to be lower than for equipment due to issues such as installation.

Furniture distribution costs by location typology	% of furniture value	User Notes
Mid Cost	10%	Equipment includes installation, so lower costs for furniture
High Cost	12%	
Very High Cost	15%	

8.3. Review furniture costs (Acquisition value + distribution) by typology

Review of Furniture costs including distribution by typology	Small	Medium	Large
Mid Cost	$16,500	$19,800	$22,000
High Cost	$16,800	$20,160	$22,400
Very High Cost	$17,250	$20,700	$23,000

STEP 9 – ESTIMATE DIFFERENTIAL NEEDS OF EQUIPMENT AND FURNITURE BY TYPOLOGY

Facilities are likely to vary in the extent to which the required equipment is available and so will need different amounts of equipment investments to fill the gap. The costing tool uses the Facility Equipment Needs typology (major, partial & limited), to adjust the required capital investments accordingly.

This step displays the Equipment Needs typologies that have been included for costing in General Inputs. For each typology, a percentage representing the percentage of equipment acquisition value investments that are needed for that typology should be entered.

As noted in the costing tool, to estimate the cost of fully equipping and furnishing a facility as per country standards 100% should be entered under the major need category.

For partial and limited need, the percentages entered should reflect the percentage of investment required to address the gap. The higher the percentage entered, the higher the investments needed. So, if you enter 40% for facilities with partial need, the tool will apply this percentage to equipment and furniture values.

These figures can be easily sourced from local experts during country workshops.

STEP 9. ESTIMATE DIFFERENTIAL NEEDS OF EQUIPMENT AND FURNITURE BY TYPOLOGY

Enter % of equipment and furniture investments needed by typology
Adjusts investments needed at each typology, based on current availability
The higher the percentage, the higher the investment need
To estimate the cost of fully equipping and furnishing a facility enter 100% under major need

Facilities in need of SNCU essential equipment:	As % of acquisition value
Major need	100%
Partial need	45%
Limited need	15%

STEP 10 – ESTIMATE & VALIDATE REFERRAL AMBULANCE COSTS

A core component of delivering good quality of care for small and sick newborns is a functioning referral and transport system. Associated costs related to 'soft' elements such as community engagement and systems for developing referral networks are not costed under this module but can be included in the planning & budgeting module for quality-of-care strategies.

Here we only estimate the cost of 'hard' elements such as acquiring an ambulance vehicle and associated fuel and maintenance costs.

In terms of the vehicle cost, note that required equipment such as transport ventilators should be included under the list of facility equipment in the General Inputs sheet and should be costed in the equipment planning & budgeting module. This will ensure that the list of facility equipment is comprehensive and that all the other associated costs, such as transport and maintenance, are also accounted for.

Capital costs

In Step 10.1. enter the number of ambulance vehicles required to support in and out referrals by each facility size typology. This can be identified during country workshops and can be validated against estimates of admissions requiring referrals in Step 10.3 as discussed below. Leave it blank if no ambulance vehicles are included.

In Step 10.2., you review the cost of ambulance vehicles which is estimated based on the unit costs entered in the General Inputs sheet and the required vehicles by facility entered above.

STEP 10. ESTIMATE & VALIDATE AMBULANCE VEHICLE COSTS TO SUPPORT CARE COORDINATION AND REFERRALS

10.1. Enter Ambulance Vehicle Requirements at each facility

Enter number of referral vehicles required at each facility size

Ambulance Vehicles Required	Small	Medium	Large
Number of Vehicles Required per Facility	1	1	1

10.2. Review Cost of Ambulance Vehicles, based on unit prices from inputs and required numbers

Ambulance Vehicle Acquisition Costs	Small	Medium	Large
Acquisition costs of ambulance vehicle	$80,000	$80,000	$80,000

Annual costs

Step 10.3 involves estimating the average percentage of admissions requiring referrals and the average number of kilometers per referral trip. These parameters can also be sourced during the country workshops and will be used to estimate the expected number of referrals and fuel and maintenance costs.

10.3. Enter service parameters required to estimate annual fuel and maintenance costs of ambulance vehicle

Referral Service Parameters		User Notes
% of admissions expected to require ambulance referrals	50%	Based on GFF case study showing relatively high proportion of in-referrals
Average number of kilometers per referral round trip	150	Average validated in country. Note relatively minor cost of referrals, so not large impact on overall cost estimates

The results review table is shown In Step 10.4. The first row displays the expected number of admissions requiring referrals, which is calculated based on the number of newborn admissions for each facility size typology. As noted in the costing tool, these estimates can also be used to cross-validate the required

number of vehicles per facility entered in Step 10.1. Are the required vehicles adequate to provide referrals for the estimated number of admissions at each facility typology?

This table also shows the estimated recurrent costs for fuel and maintenance. Results are presented by facility size and cost/location typologies.

10.4. Review number of admissions requiring ambulance referrals and associated recurrent costs per facility size
When reviewing this table, consider if the number of vehicles required in Step 10.1 are adequate for the number of referrals

	Small	Medium	Large
# of admissions requiring referrals based on service parameters:	188	248	375
Recurrent Annual Ambulance Costs (Fuel + Maintenance)	**Small**	**Medium**	**Large**
Mid Cost	$3,375	$4,455	$6,750
High Cost	$3,797	$5,012	$7,594
Very High Cost	$4,219	$5,569	$8,438
Annual Ambulance Fuel Costs	Small	Medium	Large
Mid Cost	$2,250	$2,970	$4,500
High Cost	$2,531	$3,341	$5,063
Very High Cost	$2,813	$3,713	$5,625
Annual Ambulance Maintenance Costs	Small	Medium	Large
Mid Cost	$1,125	$1,485	$2,250
High Cost	$1,266	$1,671	$2,531
Very High Cost	$1,406	$1,856	$2,813

STEP 11 – ESTIMATE & VALIDATE THE COST OF MEDICINES & SUPPLIES

Detailed costings for medicines to treat small and sick newborns require epidemiological modeling, which is outside the scope of the costing tool. Instead, information on the average cost of medicines per newborn admission is used to calculate annual costs at facility level.

Costs per newborn admission

In Step 11.1. the user is asked to enter this information, which should exclude equipment consumables, and reagents costed in Step 3.1. above. In settings where data is available from a facility operating as per country standards and that has not experienced shortages of medicines or other system failures affecting service volume and quality of care, their average per capita expenditure on medicines and supplies can be used as a guide. If this data is not available, discuss with country experts other sources of available information or a range of estimates that could be reasonable.

Review & validate costs by typology

Similar to previous steps, in Step 11.2 the user reviews calculated costs by typology, which incorporate adjustments by cost/location based on cost loading data entered in the general inputs sheet. If required, user-defined costs can be entered in the dark-blue cells to override the tool calculations.

Finally in Step 11.3. the user reviews the costs that will be used in the final results, which will be equivalent to the estimated model costs, unless they have been overridden.

11.1. Enter estimated costs of medicines per newborn admission

Note that equipment consumables including reagents that have been costed above should not be included here

		User Notes
Annual costs of medicines & supplies per newborn admission ($)		

11.2. Review costs of medicines by typology after applying cost loadings from inputs and enter revised estimates if required

Costs are estimated based on the number of admissions at each facility and adjusted by cost loadings/mark-ups for facility location/cost typologies

If required, use the dark-blue cells to override modelled estimates.

	Estimated model costs			Enter user-defined costs here. Note they override modelled estimates		
Annual costs of medicines by Facility Typology	**Small**	**Medium**	**Large**	**Small**	**Medium**	**Large**
Mid Cost	$0	$0	$0			
High Cost	$0	$0	$0			
Very High Cost	$0	$0	$0			

11.3. Review costs that will be used for final results.

Check annual facility costs of drugs and medicines to be used	Small	Medium	Large
Mid Cost	$0	$0	$0
High Cost	$0	$0	$0
Very High Cost	$0	$0	$0

HUMAN RESOURCES PLANNING & BUDGETING

In this module you set and cost human resource standards for ensuring a sufficient number of health workers and support staff is available to provide good quality of care 24x7.

To ensure staff are supported to continuously develop their careers, abilities, skills and knowledge, development strategies related to mentoring, supervision, and coaching visits as well as mandatory in-service training are also costed in this module.

Note that the costing tool treats higher education courses to upskill human resources as a strategy to be planned and costed at higher levels. These courses are thus not costed under this module but in the Quality of Care at National and Regional levels, discussed below.

The human resources costing & budgeting module also includes costing strategies for recruiting and retaining staff in facilities classified as hard-to-recruit and/or most challenging recruitment areas.

Other human resource strategies, not included above, should be costed as part of the Quality of Care at Facility level planning & budgeting module, also discussed below.

HUMAN RESOURCES - PLANNING & BUDGETING
MODULE OVERVIEW
Set country standards for Human Resources at each facility size typology & estimate associated costs
* Enter numbers of FTE facility staff required, as per country standards
* Review annual cosst of staff salaries by typology
Set country standards for supervision/mentoring/coaching visits & estimate associated costs
* Set minimum number of visits required at each facility
* Review expected annual costs
Set country standards for mandatory in-service training & enter estimated costs
* Identify mandatory in-service trainings
* Estimate and review annual cost at facility level
Note that higher education courses to upskill workforce are costed at national level in the QoC National and Regional Strategies Module
Identify and cost recruitment and retention strategies for hard-to-recruit and most challenging recruitment areas
* Identify strategies and estimate **capital** costs, such as those related to housing infrastructure or purchasing of motorbikes or other transport vehicles
* Identify strategies and estimate **recurrent annual** costs, such as those related to additional opportunities for professional collaboration and development
Note that strategies applicable to all areas, inlcuding standard, should be identified and costed in the previous steps or as part of Quality of Care Facility strategies
Remember:
Light blue cells are user inputs.
Yellow cells are tool calculations not to be manually changed
If required, cells in dark blue can be used for overriding modelled estimates

STEP 1 – ENTER THE REQUIRED NUMBERS OF CLINICAL AND SUPPORT STAFF & REVIEW COSTS

All tables under this step show the clinical and support staff comprising the interprofessional team required at each facility, which correspond to those listed in the General Inputs module Step 5.1.

Facility staff requirements

Here, in Step 1.1 the user should enter the number of full-time equivalent staff members required at each facility to ensure quality of care 24x7. These standards should be set for each facility size typology included in the exercise. Remember that if less than three typologies were included, there will be columns with blank headings, indicating that no data should be entered into those cells. For example, if you decided only to cost

small and medium size facilities, the third column that would have corresponded to large facilities will be blank.

Users should draw on country standards and guidelines determining staff/facility ratios necessary to deliver quality of care. If those ratios are not specified, international guidance can be used as a starting point for discussions. Stakeholders would then need to consider contextual issues such as number of shifts and working hours as well as any economies or diseconomies of scale that might impact the number of required staff per each facility size typology (small, medium & large) in the local context.

STEP 1 - ENTER & VALIDATE REQUIRED NUMBERS OF CLINICAL AND SUPPORT STAFF & REVIEW COSTS BY FACILITY TYPOLOGY

1.1. Enter required FTE staff numbers for each facility size typology

Required FTE numbers should be sourced from country standards and guidelines.

If not available, as a starting point for discussions in country, staff ratios can be sourced from the GFF case study or international guid

Note: If typology is not costed or staff not required, enter 0 or leave blank

	Required FTE per facility		
Staff Category (Clinical & Support)	**Small**	**Medium**	**Large**
Neonatologist	0	0	0.3
Medical Officer	1	1	2
Medical Licentiates	1	1	2
Clinical Officers	1	1	1
Registered Paediatric/Neonatal Nurses	8	8	10

Review & validate staff costs by typology

Once country standards on human resources are entered in the corresponding cells, the user reviews the total staff costs for each facility typology included (Steps 1.2, 1.3. & 1.4).

Step 1.2. shows the results for standard recruitment areas, Step 1.3 for hard-to-recruit areas & Step 1.4 for the most-challenging recruitment areas. If that staff recruitment typology (standard, hard-to-recruit & most challenging recruitment) was not included in the exercise, results will be shown as 0.

Note that under each review step you are able to compare results across facility sizes (small, medium & large). Be sure to review staff costs in detail since they are likely to represent the largest recurrent costs for delivering good quality-of-care to small and sick newborns.

To facilitate sense-checking results tables also show the percentage of costs for each staff category. This allows you to identify which categories are responsible for the largest share of costs and how that share varies or not with facility size.

To facilitate identifying what drives facility staff costs and validate results, those tables also include reminders of costs (i.e., salary and allowances) that were entered in General Inputs as well as the country standards (i.e., number of full-time equivalent staff members per facility) entered in the first step above.

1.2 Review facility staff costs by staff category for standard recruiting areas

STANDARD RECRUITING AREAS - ESSENTIAL STAFF	Annual Cost ($)			Percentage (%)			Unit costs from inputs
Staff Category (Clinical & Support)	Small	Medium	Large	Small	Medium	Large	Annual costs inc. salaries,
Neonatologist	$0	$0	$7,775	0%	0%	3%	$25,917
Medical Officer	$25,917	$25,917	$51,834	15%	15%	18%	$25,917
Medical Licentiates	$7,533	$7,533	$15,066	4%	4%	5%	$7,533
Clinical Officers	$5,386	$5,386	$5,386	3%	3%	2%	$5,386
Registered Paediatric/Neonatal Nurses	$47,176	$47,176	$58,970	27%	27%	21%	$5,897
Registered Nurses	$21,544	$21,544	$26,930	12%	12%	9%	$5,386
Midwives	$5,897	$5,897	$11,794	3%	3%	4%	$5,897
Administrative, secretarial, clerical staff	$4,918	$4,918	$4,918	3%	3%	2%	$4,918
House Keepers	$13,040	$13,040	$26,080	7%	7%	9%	$3,260
Infection Control Staff	$5,386	$5,386	$5,386	3%	3%	2%	$5,386
Data Registry Clerk	$3,785	$3,785	$3,785	2%	2%	1%	$3,785
Nutritionist/Nutritional Demonstrators	$19,132	$19,132	$38,264	11%	11%	13%	$4,783
Bio-medical technologists	$2,392	$2,392	$4,783	1%	1%	2%	$4,783
Security Guards	$9,780	$9,780	$19,560	6%	6%	7%	$3,260
Drivers	$3,423	$3,423	$3,423	2%	2%	1%	$3,423
Ambulance Call Centre Staff	$1,799	$1,799	$1,799	1%	1%	1%	$3,598
	$0	$0	$0	0%	0%	0%	$0
	$0	$0	$0	0%	0%	0%	$0
	$0	$0	$0	0%	0%	0%	$0
	$0	$0	$0	0%	0%	0%	$0
	$0	$0	$0	0%	0%	0%	$0
Annual Staff Costs	**$177,108**	**$177,108**	**$285,753**	100%	100%	100%	

If all facility typologies were included, that is facilities of small, medium & large sizes, as well as, standard, hard-to-recruit and most challenging recruitment areas, there will be nine-point estimates of staff salaries, ranging from a minimum value representing small facilities in standard recruiting areas to a maximum value representing large facilities in the most challenging to recruit areas.

So, in step 1.4 the table shows all the estimates for the facility typologies included so that the user can compare and examine how those costs vary with size and cost/location. If a typology has not been included the corresponding row or column heading will be blank and values will be shown as 0.

1.4. Review total facility staff salaries by typology.
Results will be 0 if typology not included

Annual Cost of Facility Staff Salaries	Small	Medium	Large
Standard area	$177,108	$177,108	$285,753
Hard-to-recruit	$206,921	$206,921	$332,731
Most Challenging	$214,374	$214,374	$344,476

STEP 2 – IDENTIFY AND COST HUMAN RESOURCE DEVELOPMENT STRATEGIES

Human resource development strategies aid facility staff develop their abilities, skills, and knowledge to deliver good quality of care. In this step the user identifies and costs two major staff development strategies, those related to mentoring, supervision, and coaching visits from regional areas to each facility as well as any mandatory in-service training for facility staff. Other human resource development strategies can be costed as part of Quality of Care in the following worksheet.

Mentoring, supervision & coaching

In Step 2.1 the user enters the number of regional visits to each facility in a year. Note that this is a very important element of quality of care, so it has been explicitly included to ensure it does not fall through the cracks, even though it is a relatively small cost item.

Estimated mentoring, supervision and coaching costs are reviewed in Step 2.2. To facilitate sense-checking the results, the corresponding unit costs are also shown in this table. Remember that in Step 5.2. of the General Inputs sheet, you entered the unit costs for each regional visit, which included transport, allowances, per diems and any other related costs. These costs were then adjusted by the cost loading/mark-up factors in General Inputs Step 6.

Note that unlike previous steps, there are no dark blue cells to revise modeled estimates. That is so, because the user has had the opportunity to review the cost loading/mark-up factors in General Inputs, based on the modeled estimates for these regional visits.

2.1. Enter number of mentoring/supervision/coaching visits to each facility required in a year:

	Small	Medium	Large	User Notes
Number of annual mentoring/supervision visits by regional staff to each facility =	4	4	4	Relatively small cost component

2.2. Review estimated annual costs of mentoring and supervision by facility size and cost/location typology after applying cost loadings from inputs

Mentoring/Supervision/Coaching	Small	Medium	Large	Unit costs - See General Inputs Step 6.2
Mid Cost	$660	$660	$660	$165
High Cost	$726	$726	$726	$182
Very High Cost	$792	$792	$792	$198

Mandatory in-service training

In Step 2.3. you identify individual mandatory in-service training packages, including refresher trainings, and enter the key costing parameters, as follows:

First, enter the name of the training package.

Second, enter the number of staff that needs to be trained at each facility size typology included. So, for example if the training is mandatory only for nurses, enter the number of nurses at each facility size.

Third, enter the number of days required for delivering the training package.

Fourth, enter training costs per person per day. These costs should be all inclusive, that is, they should include any per diems and allowances, as well as meals, training materials and tutor fees.

Fifth, enter the number of training sessions required at each facility in a year. So, if the training takes place every year, enter 1, but if the training is required every two years, enter 0.5.

Then in Step 2.4 the user reviews the individual training cost per year by facility size. These costs are estimated as the product of:

- ✓ number of trained staff by facility size **x** number of days **x** cost per person per day **x** number of training sessions in a year.

2.3. Identify mandatory in-service trainings & associated requirements and enter unit costs
Enter service parameters for mandatory in-service training.
If trainings will take place at a facility only once a year enter 1, if every 2 years, enter 0.5

First: Enter Name of Mandatory in-service training package	Second: enter number of staff trained @ each facility			Third, enter # of days	Fourth, enter Costs per Person per Day ($)	Fifth, enter number of training sessions in a year
	Small	Medium	Large			
Advanced Neonatal Training for all health staff	16	16	23	5	$60	0.5
Neonatal training for nutrition staff	4	4	8	3	$50	0.5

2.4. Review Individual Training Costs (Annual)

training package	Small	Medium	Large
Advanced Neonatal Training for all health staff	$2,400	$2,400	$3,450
Neonatal training for nutrition staff	$300	$300	$600
	$0	$0	$0
	$0	$0	$0
	$0	$0	$0
	$0	$0	$0
	$0	$0	$0
	$0	$0	$0
	$0	$0	$0
	$0	$0	$0
Total Annual In-Service Training Costs	**$2,700**	**$2,700**	**$4,050**

Note that total training costs by facility size shown in Step 2.4 will be adjusted by cost loading/mark-up percentages to estimate costs by facility cost-location typologies.

Adjusted costs are shown in Step 2.5 where the user can review total mandatory in-service training costs for each typology included. Dark-blue cells can be used to modify these estimates, similar to previous steps.

Since supervision visits and in-service training are relatively small cost items, they will be combined for presenting final results, so in Step 2.6 the user can review the total human resource development costs by typology.

2.5. Review Total Annual In-Service Training Costs by Facility Size and Location Typology after applying cost loadings/mark-ups from inputs. If r

				Enter user-defined costs here. Note they override modelled estimates		
Annual In-Service Training Costs	**Small**	**Medium**	**Large**	**Small**	**Medium**	**Large**
Mid Cost	$2,700	$2,700	$4,050			
High Cost	$2,970	$2,970	$4,455			
Very High Cost	$3,240	$3,240	$4,860			

2.6. Review total Human Resource Development Costs (In-Service Training + Supervision)

Annual Human Resource Development Costs (Supervision & In-service Training)	**Small**	**Medium**	**Large**
Mid Cost	$3,360	$3,360	$4,710
High Cost	$3,696	$3,696	$5,181
Very High Cost	$4,032	$4,032	$5,652

STEP 3 – IDENTIFY AND COST RECRUITMENT & RETENTION STRATEGIES

In this step the user identifies and costs **additional** strategies for recruiting and retaining staff in hard-to-recruit & most challenging recruitment areas. We have emphasized additional, because these strategies and costs exclude financial incentives such as hardship and other allowances targeting staff in these areas, which have already been included in salaries & allowances.

Since the tool aims at supporting budgeting, a distinction is made between one-off, capital investments and costs that need to be incurred annually.

In Step 3.1 the user identifies recruitment and retention strategies that involve capital investments, such as construction of new housing; or purchasing motorbikes or other vehicles for staff transportation. Those capital investment costs need to be entered for each of the facility typologies included. For example, if a motorbike is required for a team of nurses, examine if the same or different number of vehicles are required for nurses at each facility size and estimate the associated costs.

In Step 3.2 the user identifies those strategies involving annual recurrent costs, such as additional supervision, mentoring and coaching visits for staff in those areas or opportunities for professional collaboration. As in the previous steps, costs are entered for each facility typology included.

Note that the model does not make any additional cost adjustments due to facility cost-location factors for these strategies. That is so because facilities in the corresponding staff recruitment typology are likely to face the same cost structure. So, remember that total costs shown in these steps will be used for the final calculations without any further adjustments.

Step 3.1. Identify recruitment and retainment strategy and enter the amount of CAPITAL investments required.
For example, if new houses needs to be built for nurses and doctors, enter total costs per facility size typology
Leave blank if typology not included or if there are no additional strategies applicable

Name of Recruitment/Retetion strategy	Amount of CAPITAL costs required by facility					
	Hard-to-Recruit			Most Challenging		
	Small	Medium	Large	Small	Medium	Large
Strategy 1						
Strategy 2						
Strategy 3						
Strategy 4						
Strategy 5						
Total CAPITAL costs per facility	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Step 3.2. Identify recruitment and retainment strategy and enter the amount of RECURRENT costs required. Leave blank if typology not included or if there a
For example, if additional staff mentoring or collaboration opportunities are required, enter total costs per facility size typology
Note: Total will be 0 if facility typology not included

Name of Recruitment/Retetion strategy	Amount of RECURRENT costs per facility					
	Hard-to-Recruit			Most Challenging		
	Small	Medium	Large	Small	Medium	Large
Strategy 1						
Strategy 2						
Strategy 3						
Strategy 4						
Strategy 5						
Total RECURRENT costs per facility	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

QUALITY OF CARE (FACILITY) PLANNING & BUDGETING

In this module, the user identifies Quality of Care strategies at facility level and estimates the annual costs of those strategies. To ensure that these strategies do not fall through the cracks and are given consideration during planning & budgeting for the scale-up, a reminder menu with potential quality of care strategies is included here. This menu is not intended as a template, but rather as a reminder of issues that might deserve consideration and targeting by specific system strategies.

In some instances, you might find that many of the relevant facility strategies and costs associated with quality of care have been costed in the previous modules in which you have set the 'hard' system requirements to delivery good quality of care. However, even in this case it is still important to go through this module to ensure that 'soft' strategies associated with Quality of Care have been given consideration and included in the tool costings.

QUALITY OF CARE STRATEGIES AT FACILITY LEVEL - PLANNING & BUDGETING
MODULE OVERVIEW
Quality of Care strategies have been classified into the following categories:
Care Integration inc. referrals
Post-Discharge Follow-Up
Infection prevention & control inc. WASH
Family-centered care
Developmentally supportive care
Continuous Quality Improvement supported by effective use of data
Note this moudle should only be used to estimate annual recurrent costs.
Any capital investments needed should be costed as part of equipment or infrastructure.
Light blue cells are user inputs.
Yellow cells are tool calculations or contain reminder menus for strategies. They cannot be manually changed by the user
Cells in dark blue are suggested sub-categories of strategies. They can be changed by the user.

STEP 1 – IDENTIFY QUALITY OF CARE STRATEGIES & ESTIMATE ADDITIONAL ANNUAL COSTS

In this step the user identifies and costs additional quality of care strategies at facility level. Only recurrent costs should be entered here.

Note that all capital costs related to quality of care, such as infrastructure standards and equipment, should have been costed under the previous modules. Infrastructure and equipment standards, for example, take consideration of quality of care requirements at each facility such as ensuring neonatal units have water availability 24x7, and staff have access to laptops and other office equipment.

If while reviewing the reference menu of quality-of-care strategies, you notice that some capital investments are needed, go back to the corresponding module, and make the required adjustments. For example, if the cost of construction per square meter does not include fire alarm and firefighting systems, construction costs entered in the General Inputs sheet would need to be increased accordingly.

In terms of annual recurrent costs for quality-of-care strategies, it is also advisable that all salary costs associated with additional staff required for ensuring good quality of care, including support staff to assist with referrals, care coordination and data related tasks are included in the human resources module.

So, you notice that facility staff standards do not include for example the required staff for data management, you need to go back and include a data officer and enter the corresponding salary costs and

required full-time equivalent data officers at each facility. That is so, unless those functions have been outsourced, in which case costs should be entered under this module.

On the other hand, if on review of the strategies you find that relevant costs have been included elsewhere, (i.e., staff training for use of personal protective equipment is included in the mandatory trainings costed in the human resources module), it is advisable to make the corresponding note here.

Quality of Care strategies included in this module have been classified into the following categories:

- Care Integration including referral systems
- Post-Discharge Follow-Up
- Infection prevention & control including WASH
- Family-centered care
- Developmentally supportive care
- Continuous Quality Improvement supported by effective use of data
- Other

For each strategy, you can enter sub-categories (in dark blue cells) and individual strategies. Costs can only be entered in blue cells next to each individual strategy. Total costs for each of the facility size typologies included should be entered here. See the example below for Continuous Quality Improvement

	Additional annual facility costs required		
Continuous Quality Improvement supported by effective use of data	**Small**	**Medium**	**Large**
Actionable HIS/Data			
Available consumables (whiteboards, etc…)			
Adequate staffing to avoid overburdening clinical staff			
Staff training			
Other strategies to ensure protocols are in place and implemented			
Perinatal death reviews			
Staff training			
Supportive supervision			
Other CQI strategies:			
Team Reviews of SNCU data, including families feedback on services			
Regional meetings with higher and lower facilities to discuss gaps & strategies			
Supporting a QoC champion in each facility			
Annual Costs	**$0**	**$0**	**$0**

A reminder menu is included in the yellow cells. Similar to previous modules, those reminders are in light gray font and cells are locked so they cannot be changed. The issues and strategies included in the reminder menus have been drawn from the international literature and the GFF case study of Haryana. Note however that they are just reminders, and you can ignore them if they are not relevant to the local context.

See for example the reminder menu for **Care integration strategies**.

Reminder menu to flag potential strategies
In-Referrals from other facilities/community
Cash transfers to support local financing arrangements for drivers
Cash transfers for community health workers
Developing and disseminating admission and discharge protocols
Supportive supervision to health centers
Technical clinical support
Set up communication platform & system for updating emergency referral contacts
Out-referrals to Level 3 Facilities
Driver fees (if no driver included in Human Resources)
Annual vehicle maintenance
Annual fuel expenses
Developing and disseminating admission and discharge protocols
Set up communication platform & system for updating emergency referral contacts

STEP 2 – REVIEW & VALIDATE COSTS BY TYPOLOGY

Similar to other modules, here the user reviews the estimated facility costs for quality of care strategies and can revise totals, if required.

In Step 2.1 the user first reviews the annual additional costs of the quality of care strategies costed above. They are shown for each of the facility size typologies included.

Step 2.2 shows costs adjusted by the cost loading/mark-up factors entered in General Inputs to reflect differences in costs across facility cost/location typologies. If required, the user can revise those estimates in the dark-blue cells.

Finally, in Step 2.3 the user reviews the estimates that will be used in the final results, which correspond to the modeled estimates for each facility typology included, unless they have been overridden by the user in the dark-blue cells (not shown below).

STEP 2 - REVIEW ANNUAL ADDITIONAL COSTS OF QUALITY OF CARE STRATEGIES AND AGGREGATED COSTS FOR FINAL RESULTS

2.1. Review Annual Additional Costs of Quality of Care Strategies

Quality of Care Strategies - Annual Costs	Small	Medium	Large
Care Integration inc. referrals	$0	$0	$0
Post-Discharge Follow-Up	$0	$0	$0
Infection prevention & control inc. WASH	$0	$0	$0
Family-centered care	$0	$0	$0
Developmentally supportive care	$0	$0	$0
Continuous Quality Improvement supported by effective use of data	$0	$0	$0
Other	$0	$0	$0
Annual Cost of Quality of Care Strategies (Not costed elsewhere)	**$0**	**$0**	**$0**

2.2. Review Annual Costs of Quality of Care Strategies by Facility Size and Location Typology after applying cost loadings from inputs

This table uses cost loadings to estimate costs by facility location/cost typology

As required, estimates can be modified in the dark blue cells.

Annual Costs of QoC	Small	Medium	Large
Mid Cost	$0	$0	$0
High Cost	$0	$0	$0
Very High Cost	$0	$0	$0

2.3. Review costs that will be used for final results.

This table shows the costs to be used in the final estimates.

Annual Costs of QoC	Small	Medium	Large
Mid Cost	$0	$0	$0
High Cost	$0	$0	$0
Very High Cost	$0	$0	$0

QUALITY OF CARE (NATIONAL AND REGIONAL) PLANNING & BUDGETING

When planning & budgeting for the scale-up, it is important not to simply assume that current national and regional staffing levels have 'spare capacity' to manage and provide oversight of the scale-up, or to assume that existing systems are adequate to support the implementation of infrastructure, equipment, human resources, and other quality of care standards for small and sick newborn care.

NATIONAL & REGIONAL STRATEGIES - PLANNING & BUDGETING
MODULE OVERVIEW
Identify and cost higher level education courses to upskill human resources
* Estimate number of people that would receive a scholarship to attend identified courses
* Estimate tuition and living allowances expenses
Identify national and regional level strategies and associated annual costs
Review summary table and chart with total costs
Remember:
Light blue cells are user inputs.
Yellow cells are tool calculations or contain reminder notes about potential strategies. They cannot be manually changed by the user

At the very least, stakeholders should discuss what those national and regional systems and strategies look like and what they entail. To facilitate some of these discussions, this module is organized as follows:

STEP 1 – IDENTIFY & COST HIGHER EDUCATION COURSES TO UPSKILL HUMAN RESOURCES

As noted in the costing tool, in this step the user costs higher education courses to be funded against the scale-up budget:

First, the average number of trainees funded per year should be entered. If different annual intakes are expected, enter the average number, and make the corresponding comment in the user note.

Second, enter the estimated annual program tuition fees per person.

Third, enter other costs such as scholarship living allowances that will be provided to staff enrolling in the program.

Note that other costs associated with higher education courses, such as the resources required for a national review of existing curriculum can be costed under the human resource strategies below.

Step 1. Identify and cost the delivery of higher education courses to upskill human resources

Include here any higher education courses to be funded against the scale-up budget
First, enter the number of trainees funded per year
Second, enter the tuition fees per person per year
Third, enter other costs such as scholrship living allowances.

		Costs per trainee per year funded against the scale-up		
Higher Education Courses	Number of funded trainees per year	Tuition Fees per person per year	Scholarship Living Allowances & Additional Costs per person per year	Estimated Annual Cost - All Trainees
Advanced Diploma for Nurses - 1 year	10	$824	$5,642	$64,660
Masters of Science in neonatalogoy - 2 years	10	$1,529	$5,642	$71,710
Postgraduate Diploma in Neonatology - 1 year	10	$941	$25,917	$268,580
				$0
				$0
				$0
Annual Costs of Higher Education Courses				**$404,950**

STEP 2 – IDENTIFY & COST OTHER NATIONAL AND REGIONAL LEVEL STRATEGIES

The degree of decentralization in the country will dictate which management and system strategies would be most appropriate to implement at national or regional levels. So, both sets of strategies are identified and costed in this step. You just need to remember that if it is a regional or provincial level strategy, countrywide costs should be entered here.

For example, if you have estimated that 10 regions would be covered by the scale-up and that on average each would spend $1,000 supporting the dissemination and adoption of facility guidelines and protocols, the amount to be entered is $10,000 (10 regions x $1,000).

To facilitate discussions, the tool includes seven categories: high level oversight & management; infrastructure; equipment; supply chain management; human resources; quality of care guidelines (shown below); and continuous quality improvement.

As noted in the costing tool, the user should:

First, enter national and regional level strategies required to support the scale-up and facilities delivering good quality of care.

Second, enter startup costs including any capital investments that need to be incurred in year one of the scale-up

Third, enter annual costs for subsequent years

Templates for QoC guidelines, protocols and SoP	Start up Costs (Year One)	Annual Costs in Subsequent Years
Infrastructure, Equipment, Consumables & HR		
Evidence-base practice (clinical)		
Evidence-base practice (family centered care)		
Infection and prevention control		
Admission and discharge criteria & protocols, inc. post-discharge follow-up		
Other	$120,000	
Templates for QoC guidelines, protocols and SoP costs	**$120,000**	**$0**

For each category, there are reminder notes about potential issues for consideration, such as commissioning strategies for building and rehabilitating facilities and purchasing equipment. See the example below for **Continuous Quality Improvement** strategies.

Reminder notes about potential strategies
Consider for example strategies needed to support data management such as developing the national minimum dataset, as well as annual implementation reviews and a 3 or 5 year evaluation of the scale-up. Also consider any strategies required to support implementation of perinatal death reviews as required.

STEP 3 – REVIEW FINAL COSTS

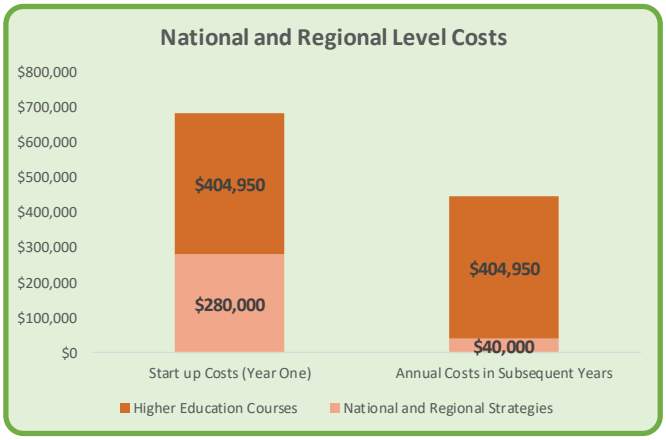
Here the user reviews the total cost of national and regional level strategies to support the scale-up, including costs estimated under Steps 1 & 2 above. A summary cost chart is also included in this module, as well as a note reminding users of the base year used for costings. Note that these costs are not allocated to individual facilities and so are not included in the Facility Typology Analytics module.

Step 3. Review cost of national and regional level strategies, including higher education courses

This table shows total national and regional level costs to support the scale-up and so are not included in facility typology cost analytics

All financial figures are in USD - Base Year (2022)

National & Regional Level Costs	Start up Costs (Year One)	Annual Costs in Subsequent Years
High level oversight and management	$0	$0
Infrastructure	$20,000	$0
Equipment	$40,000	$0
Supply Chain Management	$0	$0
Human Resources	$0	$0
Templates for QoC guidelines, protocols and SoP	$120,000	$0
Continuous Quality Improvement	$100,000	$40,000
Other	$0	$0
National and Regional Strategies	$280,000	$40,000
Higher Education Courses	$404,950	$404,950
Total Annual National and Regional Costs	**$684,950**	**$444,950**



FACILITY TYPOLOGY ANALYTICS

FACILITY TYPOLOGY ANALYTICS

MODULE OVERVIEW

Select facility typologies for calculating key system parameters and costs

Select facility typologies from the drop down menu

Review system parameters and costs by typology

In the planning & budgeting modules you have set the country facility standards and estimated how much it would cost to set up facilities that deliver good quality of care and how much it would cost to implement the supporting national and regional level strategies.

If you have taken advantage of the large number of facility typologies that can be costed simultaneously, in this module you will be able to examine variations in costs across facilities in the country by size; location; construction and equipment needs; and staff recruitment challenges.

Remember that multiple scenarios can be drawn from the different mix and match of typologies and different scenarios will be useful to highlight different strategic issues, as can be seen in the report we produced for Zambia and included in the Annex.

STEP 1 – SELECT THE MIX AND MATCH OF FACILITY TYPOLOGIES

In this step the user selects the typologies for which total costs will be displayed. Start by getting familiar with the mix-and-match selection of typologies and how results change. Remember that given the multiple combinations available, **a wide range of facility estimates** can be produced.

For example, just the mix and match of three typologies (size, cost and equipment needs) can produce 27 alternative cost estimates, ranging from the lowest estimate for a small facility in a mid-cost location and with limited needs of equipment to a large facility in a very high-cost location and with major needs of equipment. So, take the time to explore how costs change as different typologies change and consider the following issues:

First, examine which combinations make sense in the local context. For example, if there is a strong correlation between facility location and recruitment challenges, it is advisable to combine mid-cost with standard recruitment, high cost with hard-to-recruit areas and very high cost with most challenging to recruit areas.

Second, to understand what impact a particular variable (i.e., facility size) has on costs, all other things must be equal. So, for example, if you have included all typologies in this exercise, start by selecting the same typology categories for cost/location, construction type, equipment needs and recruitment challenges. Then choose the three facility size typologies (small, medium & large) as shown below. Finally, check results in the following step and notice how costs change.

Facility Typology	Facility Type 1	Facility Type 2	Facility Type 3
SIZE	Small	Medium	Large
COST/LOCATION	High Cost	High Cost	High Cost
CONSTRUCTION TYPE	New Construction	New Construction	New Construction
EQUIPMENT NEEDS	Major need	Major need	Major need
RECRUITMENT CHALLENGES	Standard area	Standard area	Standard area

Once you are familiar with the typologies and range of costs, you can start exploring the mix-and-match of typologies that would be most useful to aid planning & budgeting discussions.

It is also important that as noted in the tool, you select from the dropdown menu, which shows only the typologies that you have included in the exercise. If you copy/paste into those cells, and inadvertently use a typology that has been excluded, all the relevant results will be zero.

Once you are satisfied with the facilities typified by the mix and match of typologies, you can provide a user-defined name for that 'typical' facility in the light-blue cells in Step 1.2.

Note that this is the name that will be used for displaying charts, so try to keep it short. If you leave it blank the names will appear as Facility Type 1, 2 & 3.

Step 1. Select Facility Typologies for displaying total costs

1.1. Select a costed typology by clicking on each cell & choose from the dropdown menu.

Remember do not copy/paste cut/paste into these cells. Only choose from the dropdown menu

Facility Typology	Facility Type 1	Facility Type 2	Facility Type 3
SIZE	Small	Medium	Large
COST/LOCATION	High Cost	High Cost	High Cost
CONSTRUCTION TYPE	New Construction	New Construction	New Construction
EQUIPMENT NEEDS	Major need	Major need	Major need
RECRUITMENT CHALLENGES	Standard area	Standard area	Standard area

1.2. Enter a short name for the 'typical' facility.

This name will be used for displaying charts, so try to keep it short

	Facility Type 1	Facility Type 2	Facility Type 3
User-defined name for the 'typical' facility:	**Remote**	**Rural**	**Urban**

STEP 2 – REVIEW FACILITY COST ANALYTICS

Here you can review the summary of facility costs displayed by the typologies chosen in the previous step. If some results are zero, you can check if the item was not costed, as it is the case below with Other QoC strategies. Also check that typologies in Step 1.1. were selected from the dropdown menu.

FACILITY COSTS (1)			
All financial figures are in USD - Base Year (2022)			
Service Parameter/Cost	**Remote**	**Rural**	**Urban**
Expected annual number of admissions (#)	375	495	750
Number of beds required (#)	9	12	18
Total floor space (Sq. Mts.)	275	326	474
FACILITY CAPITAL COSTS	***$541,370***	***$555,025***	***$631,164***
Infrastructure	$198,000	$195,360	$227,568
Equipment	$263,370	$279,665	$323,596
Equipment Acquisition	$158,787	$182,750	$231,997
Equipment Distribution	$63,515	$54,825	$46,399
Equipment Buffer Stocks	$23,818	$21,930	$23,200
Furniture & other	$17,250	$20,160	$22,000
Other Capital (2)	$80,000	$80,000	$80,000
FACILITY RECURRENT COSTS	***$300,113***	***$294,650***	***$383,399***
Human Resources	$218,406	$210,617	$290,463
Salaries	$214,374	$206,921	$285,753
Development & Incentives (3)	$4,032	$3,696	$4,710
Equipment	$71,908	$72,712	$77,911
Regular Maintenance (4)	$19,611	$18,565	$19,478
Consumables & Renewables	$52,297	$54,147	$58,433
Other Recurrent	$9,799	$11,321	$15,026
Drugs & Medical Supplies	$3,600	$4,356	$6,000
Ambulance Referral	$4,219	$5,012	$6,750
Building maintenance	$1,980	$1,954	$2,276
Other QoC (5)	$0	$0	$0
FACILITY CAPITAL COSTS ANALYSIS			
Capital Cost per Bed	$60,152	$46,252	$35,065
% Share	100%	100%	100%
Infrastructure	37%	35%	36%
Equipment	49%	50%	51%
Other Capital (2)	15%	14%	13%
FACILITY RECURRENT COSTS ANALYSIS			
Annual Cost per Bed	$33,346	$24,554	$21,300
Annual Cost per Newborn Admission	$800	$595	$511
% Share	100%	100%	100%
Human Resources	73%	71%	76%
Equipment	24%	25%	20%
Other Recurrent	3%	4%	4%

Notes:

(1) Table does not include costs of national & regional strategies

(2) Other capital includes ambulance & any capital costs associated with strategies to recruit and retain staff in hard-to-recruit and most-challenging recruitment facilities

(3) Development & Incentives includes supervision/coaching, mandatory in-service training and additional incentives to recruit and retains taff in hard-to-recruit and most-challenging recruitment facilities which were not costed as part of staff salaries and allowances

(4) Regular maintenance includes spare parts and maintenance strategies, except buffer stocks

(5) Other QoC includes strategies costed under the Quality of Care at facility level module

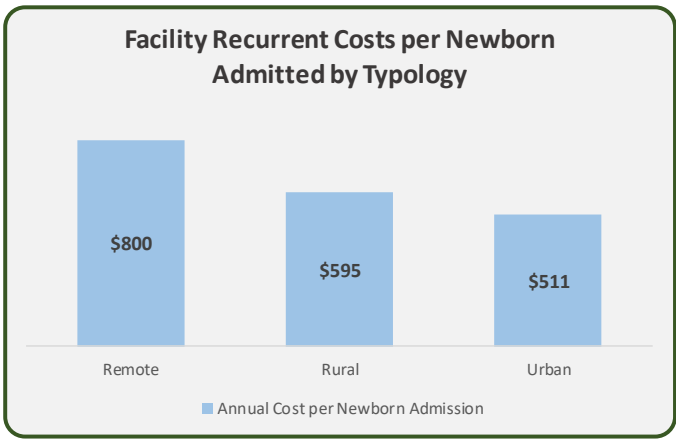
Of note:

- ✓ Remember that **only facility level costs** are displayed in this table. If you have costed national and regional level strategies to support the scale-up, those costs are not displayed in this table as they do not vary with facility typology.
- ✓ At the top of the table there is a comment indicating the **currency and base year** used for costings, which were entered in General Inputs.
- ✓ This table displays system parameters and costs **estimated in the planning & budgeting worksheets**. There are notes at the bottom of the table to explain a handful of costs that combine smaller items.

- ✓ If you have followed the step-by-step approach of each module sequentially, you will be able to easily **trace back how these values were estimated**. For example, salaries show the total estimates calculated in the Human Resources planning & budgeting worksheet, which were reviewed in Step 1.4. of that worksheet.
- ✓ The first section of the table shows the **service parameters** that were modeled under Infrastructure.
- ✓ The second section (**Facility Capital Costs**) shows capital costs: Infrastructure, Equipment and 'other.'
    - They represent the capital investments needed in the year a facility is set up to operate as per the country standards and guidelines.
- ✓ The third section (**Facility Recurrent Costs**) displays recurrent costs Human resources, equipment & other).
    - They represent the annual costs of operating a facility in compliance with country standards and guidelines.
- ✓ When looking at the total capital and recurrent costs, it would be important to **benchmark those estimates against available data**, which can help aid the discussions about fiscal space. For example:
    - How does the cost of setting up a fully operational facility compare against national investments in relevant programs such as facility infrastructure rehabilitation, or equipment upgrades?
    - How do estimated recurrent costs compare against current recurrent budgets?
- ✓ The fourth section (**Facility Capital Costs analysis**) provides costs per bed and the percentage share of infrastructure, equipment, and other capital.
- ✓ The fifth section (**Facility Recurrent Costs analysis**) shows annual recurrent costs per bed and per newborn admission and their distribution.
- ✓ Some issues to examine when looking specifically at the Capital and Recurrent cost analysis sections include:
    - To what extent are **costs per bed** lower (higher) for larger facilities, suggesting economies (diseconomies) of scale?
    - How does the **share of costs** vary across typologies such as facility cost/location or recruitment challenges?
- ✓ Remember that the main purpose of providing alternative facility typology costings is to give you the opportunity to **explore the costings and scenarios that provide the best insights** into the type of strategic decisions that need to be made during the scale-up.
- ✓ Once you have explored those scenarios and typologies, **be selective** and choose a few that will deliver the key messages for your audience.
- ✓ Sometimes, **different data analytics will be useful for** different audiences and at different points of the planning & budgeting cycle.
    - For example, in Zambia when we were discussing how best to allocate one million dollars for capital investments in a small number of facilities, it was important to produce costings by construction and equipment needs, since the facilities prioritized for funding showed important differences in these markers.
    - However, when writing the final report, the main focus was placed on facility size, to illustrate the importance of strategic decisions about the scope of the scale-up (larger & fewer facilities serving larger catchment areas vs. smaller & more facilities serving smaller catchment areas). We also emphasized the impact of differences in prices such as those related to equipment to make the case for strengthening equipment procurement management practices.

To facilitate data analytics there are charts of key results along with some of the questions that those graphs are addressing.

How do annual recurrent costs per bed vary by typology?



SCALE-UP COSTING SCENARIO

SCALE-UP COSTING SCENARIO
MODULE OVERVIEW
Complements the facilty typology analytics module by allowing the user to model the costs of a basic scale-up scenario
This scenario can be used to estimate how much it would cost to achieve the ENAP 2 targets.
It can also be used in planning & budgeting discussions to examine the impact of recurrent expenditure vs. capital investments
The analysis can also help users gauge how many facilities can funded within a limited resource envelope
The module steps include:
Review the characteristics of the 'typical' facilities that will be used for the scale-up scenario calculations
They represent the typologies used in the previous module (8.Facility_Typology_Analytics)
Select the start year of the scale-up scenario
Scale-up scenario projections shown for seven years. If the start year is 2024, the end year of the scenario will be 2030
Enter the percentage of recurrent costs to be funded in each scenario year
It is unlikely that facilities will be fully operational the year they are funded, so this percentage adjusts the recurrent expenditure in that year.
Enter the number of facilities that will be set up each year
To estimate scale-up costs, enter here the number of each 'typical' facility included in the scale-up
Review & validate the number of facilities and associated scale-up costs
Here the user can examine the impact of recurrent vs. captial costs
Review total scale-up costs (facility & national and regional levels)
Here the user can review all scale-up costs, including those incurred at national & regional levels
Review summary charts
Light blue cells are user inputs.
Yellow cells cannot be manually changed by the user

In the first six modules you set and costed country facility standards for delivering good quality of care to small and sick newborns at Level 2 facilities. Supporting national and regional level strategies were identified and costed in module seven. To capture variations in costs across the country, five facility typologies were included. with up to three categories. So, in module eight you have had the opportunity to explore how costs vary with facility characteristics as captured by the relevant typologies.

Once you have explored the typology costings and built the scenarios of alternative combinations of typologies that will be most useful to inform planning & budgeting discussions in the country, you can use this module to:

- ✓ Estimate the expected costs of a scale-up scenario.
- ✓ Examine the capital and recurrent budget implications of setting up new facilities.
- ✓ Explore the number of facilities that can be funded within a given resource envelope.

In this module you can estimate with minimum inputs the expected annual costs of a scale-up scenario using the last typologies chosen in the previous module (Facility Typology Analytics).

STEP 1 – REVIEW THE CHARACTERISTICS OF THE 'TYPICAL' FACILITIES TO BE INCLUDED IN THE SCENARIO

The idea behind this costing scenario is to choose the most 'typical' facilities in the country that would be included in the scale-up. For example, in some settings the most obvious selection would be urban, rural, and remote facilities.

So, if that is the case, select the characteristics that on average would typify those facilities. For example:

- ✓ Would urban facilities tend to be large and located in mid-cost areas and with standard recruitment challenges?
- ✓ In contrast would rural (remote) facilities tend to be of medium (small) size and located in high-cost and hard-to-recruit (very high cost and most challenging to recruit) areas?
- ✓ Would most facilities in the country, regardless of location need new construction and major equipment upgrades?

If the answer is yes to all these questions, the following mix-and-match of typologies (as shown in the Facility Cost Analytics module) would be appropriate for the scaling-up costing exercise.

1.1. Select a costed typology by clicking on each cell & choose from the dropdown menu.

Remember do not copy/paste cut/paste into these cells. Only choose from the dropdown menu

Facility Typology	Facility Type 1	Facility Type 2	Facility Type 3
SIZE	Small	Medium	Large
COST/LOCATION	Very High Cost	High Cost	Mid Cost
CONSTRUCTION TYPE	New Construction	New Construction	New Construction
EQUIPMENT NEEDS	Major need	Major need	Major need
RECRUITMENT CHALLENGES	Most Challenging	Hard-to-recruit	Standard area

1.2. Enter a short name for the 'typical' facility.

This name will be used for displaying charts, so try to keep it short

	Facility Type 1	Facility Type 2	Facility Type 3
User-defined name for the 'typical' facility:	**Remote**	**Rural**	**Urban**

So, to ensure that you are using the right typology mix for costing the scale-up scenario, the first step in this module is to review the typologies currently used.

STEP 1. REVIEW THE CHARACTERISTICS OF THE 'TYPICAL FACILITIES' THAT WILL BE USED FOR THE SCALE-UP SCENARIO CALCULATIONS

This table shows the current typologies modelled in Facility Typology Analytics (Module 8)
Costs for these typologies will be used for the scale-up scenario calculations
Make sure they represent the 'typical' facilities to be included in the scale-up
If you want to change any of the typologies, go back to the previous sheet (8.Facility_Typology_Analytics) and make the corresponding changes

User-defined name for the 'typical' facility:	Remote	Rural	Urban
SIZE	Small	Medium	Large
COST/LOCATION	Very High Cost	High Cost	Mid Cost
CONSTRUCTION TYPE	New Construction	New Construction	New Construction
EQUIPMENT NEEDS	Major need	Major need	Major need
RECRUITMENT CHALLENGES	Most Challenging	Hard-to-Recruit	Standard area

Note that typologies are displayed in yellow cells and so cannot be changed in this module. So, if you need to change any of the typologies, as indicated in the costing tool you just need to go back to the previous module (Step 1.1. as shown above) and make the required changes.

STEP 2 – SELECT THE START YEAR

As noted in the costing tool, here you select the start year for the scale-up, that is the year when the first group of facilities delivering small and sick newborn care will be funded to commence construction.

You can select any year after 2023 and projections will be shown for the subsequent seven years. That is if the scale-up starts in 2024 (2025), expected expenditure calculations will be shown until the year 2030 (2031).

Start year of the scale-up scenario:	2024

STEP 3 – ENTER THE PERCENTAGE OF RECURRENT FUNDS TO BE FUNDED IN THE FACILITY SET UP YEAR

The model assumes that 100% of facility capital costs, including infrastructure and equipment, is disbursed in the year the facility is set up. However, it is reasonable to assume that in that first year, for example, while the facility is under construction, recurrent costs such as those related to equipment maintenance will not be incurred.

So, in this step you should enter the estimated percentage of facility recurrent funds that will be financed the year the facility is set up. If you leave this cell blank, the model assumes no recurrent expenditure will be financed that first year. Also note that in subsequent years, 100% of the facility recurrent costs will be included.

% facility recurrent costs funded in the set up year:	10%

STEP 4 – ENTER THE NUMBER OF NEW FACILITIES SET UP EACH YEAR

The table in this step shows the 'typical' facilities described above and each year of the scale-up. Users need to enter for each 'typical' facility the number that will be set up every year. Leave blank or enter 0 if no facility will be set up that particular year.

For example, if the scale-up starts in 2024 and the plan is to build all facilities in the first three years, the table would look like the table below, with empty cells from 2027 onwards.

STEP 4. FOR EACH YEAR OF THE SCALE-UP ENTER THE NUMBER OF 'TYPICAL' FACILITIES SET UP

These 'typical' facilities represent the typologies selected by the user in Facility Typology_Cost_Charts

If there are no facilities set up in a particular year, leave blank o enter 0

	Enter number of **new** facilities included in the scale-up each year							
'Typical' Facilities in Country	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**Total**
Remote	5	6	2					13
Rural	5	7	3					15
Urban	5	7	3					15

STEP 5 – REVIEW & VALIDATE SCALE-UP SCENARIO ESTIMATES

In this step the user reviews capital and recurrent cost estimates for the scale-up scenario. They correspond to the number of facilities under each 'typical facility' entered in the previous step, multiplied by the capital and recurrent costs of that 'typical facility' as calculated in the previous module (Facility Typology Analytics)

Note that at the bottom of the table there is also a reminder note indicating the currency and base year for the calculations.

To facilitate validating the results and to aid the transparency of the tool estimates, this table also shows the distribution of recurrent costs. Figures in light gray show:

- Recurrent costs for new facilities, which have been adjusted by the percentage entered in Step 3.
- Recurrent costs for facilities established in previous years, which are included at 100%.

The disaggregation of recurrent costs by new and previously established facilities will be particularly useful to aid strategic discussions on budget allocation and sustainability.

For example, a scenario where a larger number of facilities are set up in the early years is useful to illustrate the need for proper allocation of budgets to recurrent expenditure to ensure those facilities already established can continue operating at full capacity and in compliance with country standards.

In the example below, although no facilities are set up in the last years of the scale-up, budgets remain substantial due to the recurrent expenditure associated with already established facilities.

STEP 5. REVIEW & VALIDATE SCALE-UP SCENARIO COSTS (CAPITAL & RECURRENT)

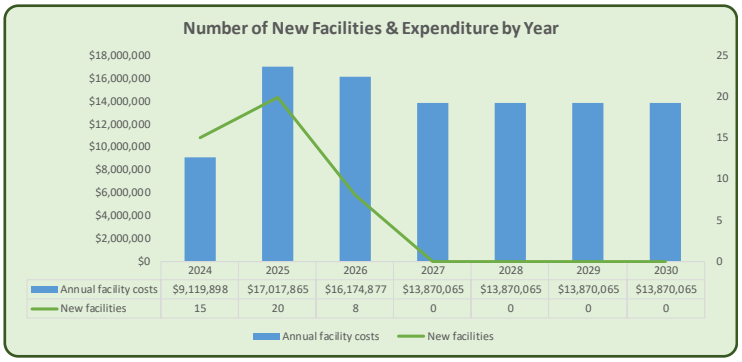
In this table you can review the total number of new facilities funded each year as well as the associated scale-up costs
This table shows capital expenditure for facilities funded in a year.
Annual recurrent costs are estimated separately for new facilities and for those set up in previous years
Remember that all costs in this table are presented for the Base Year and currency indicated in General Inputs

Scale-up Year	2024	2025	2026	2027
New facilities	**15**	**20**	**8**	**0**
Annual facility costs	**$9,126,876**	**$17,097,055**	**$16,342,575**	**$14,072,205**
Capital (%)	95%	68%	28%	0%
Recurrent (%)	5%	32%	72%	100%
Capital Costs ($)	$8,637,795	$11,551,542	$4,641,307	$0
Recurrent Costs ($)	$489,081	$5,545,512	$11,701,269	$14,072,205
Recurrent new facilities ($)	$489,081	$654,702	$263,437	$0
Recurrent facilities set up in previous years	$0	$4,890,810	$11,437,831	$14,072,205

Note: All financial figures are in USD - Base Year (2022)

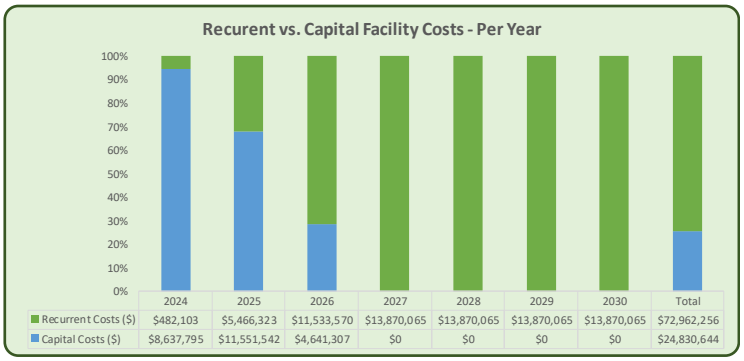
To facilitate the analysis, summary charts are also displayed. The first one shows the number of new facilities and the expected level of expenditure by year. The second one shows the distribution of capital and recurrent expenditure per year

How many new facilities are funded every year?
What are the expected levels of facility expenditure?



Note: All financial figures are in USD - Base Year (2022)

What about facility capital vs. recurrent costs?
How does the split change by year?



Note: All financial figures are in USD - Base Year (2022)

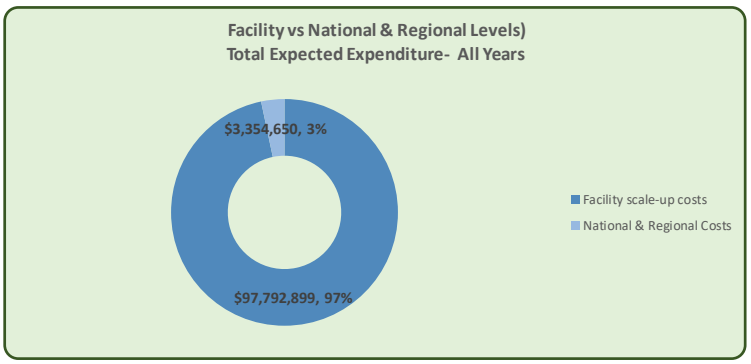
STEP 6 – REVIEW TOTAL SCALE-UP COSTS, INCLUDING NATIONAL & REGIONAL COSTS

The previous steps showed the scale-up costs at facility levels. Here the user can review the total costs of the scale-up, including estimates of the resources required to implement national and regional level strategies. A summary chart of the distribution of costs is also shown here.

STEP 6. REVIEW TOTAL SCALE-UP COSTS BY YEAR (FACILITY, NATIONAL AND REGIONAL LEVELS)
Review total scale-up costs, including national & regional level strategies, by year

	2024	2025	2026	2027	2028	2029	2030	Total
Facility scale-up costs	$9,119,898	$17,017,865	$16,174,877	$13,870,065	$13,870,065	$13,870,065	$13,870,065	$97,792,899
National & Regional Costs	$684,950	$444,950	$444,950	$444,950	$444,950	$444,950	$444,950	$3,354,650
TOTAL SCALE-UP COSTS	**$9,804,848**	**$17,462,815**	**$16,619,827**	**$14,315,015**	**$14,315,015**	**$14,315,015**	**$14,315,015**	**$101,147,549**
Note: All financial figures are in USD - Base Year (2022)								

How does the expected expenditure at national and regional levels compare with expenditure at facility level?



Note: All financial figures are in USD - Base Year (2022)

Annual costs & inflation

As noted in the costing tool, all costs are presented for the same base year. This means all costs are presented in constant prices using the base year indicated in General Inputs. Those costs are thus inflation adjusted and a total can be estimated (last column not shown above).

Let us look at the example above to unpack a few things:

When we say that all costs are measured for the same base year, it means that those costs are in constant dollars. And one (constant) dollar will buy the same amount of goods and services every year. That means, for example an office desk costs $300 (constant dollars) in 2022 and the same $300 (constant dollars) in 2024.

This is unlike current dollars, which refer to the current year and prices. They represent the nominal value of money without any consideration to changes in purchasing power. In times of high inflation, the same office desk that costed $300 (current dollars) in 2022 probably costs $400 (current dollars) in 2024.

So, when we measure costs over several years using constant dollars, which means that we can compare costs across years because any difference that we observe is 'real' and not due to the effect of inflation.

So, if we look again at the scale-up scenario cost estimates shown above, we can see that in 2026 $16.3 million (constant dollars) would be required to fund capital and recurrent expenditure. The required funding is substantially higher than that for 2024 ($9 million constant dollars) and slightly lower than in 2025 ($17 million constant dollars).

And you notice that the number of new facilities set up in 2026 (8 facilities) is substantially lower than in the other years (15 in 2024 & 20 in 2025), so you want to understand why those costs are still so high.

STEP 5. REVIEW & VALIDATE SCALE-UP SCENARIO COSTS (CAPITAL & RECURRENT)

In this table you can review the total number of new facilities funded each year as well as the associated scale-up costs
This table shows capital expenditure for facilities funded in a year.
Annual recurrent costs are estimated separately for new facilities and for those set up in previous years
Remember that all costs in this table are presented for the Base Year and currency indicated in General Inputs

Scale-up Year	2024	2025	2026	2027
New facilities	**15**	**20**	**8**	**0**
Annual facility costs	**$9,126,876**	**$17,097,055**	**$16,342,575**	**$14,072,205**
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Recurrent facilities set up in previous years	$0	$4,890,810	$11,437,831	$14,072,205

Note: All financial figures are in USD - Base Year (2022)

If costs in that table were measured in nominal currency, you would not know if the high costs in 2026 were due to the effect of inflation or were 'real'. However, because costs are measured in constant terms, we know that the observed higher costs are not due to the impact of inflation but due to other factors, such as the impact of recurrent expenditure associated with facilities set up in previous years.

This is indeed one of the main reasons to measure all annual costs in constant prices, so we can compare apples with apples.

However, remember that for the purpose of preparing annual budgets for a particular year, budget officials will need to convert those costs to current dollars using inflation data, such as the consumer price index. This can be easily done since the base year for the costings and the currency have been documented.

FURTHER ANALYTICS

Facilities that can be funded within a given resource envelope

The results of the scenario can be used to gauge the number of facilities that could be funded within a particular resource envelope. Since it provides a breakdown of recurrent costs showing the 'carry over' from facilities set up in previous years, you are able to easily estimate the amount of additional resources available after covering these costs.

For example, let us assume that the annual scale-up budget for 2027 is $14 million dollars and that we continue with the scenario modeled above. If we look again at those tables and focus on the recurrent costs of previously set up facilities, we can see that $13.9 million dollars of the scale-up budget in the year 2027 need to be devoted to fund the recurrent expenditure of facilities previously set up. And if we look at the expenditure associated with national and regional levels, this is expected to be around $445 thousand. Therefore, we can conclude that there is no funding available for setting up new facilities that year.

Scale-up Year	2024	2025	2026	2027
New facilities	**15**	**20**	**8**	**0**
Annual facility costs	**$9,119,898**	**$17,017,865**	**$16,174,877**	**$13,870,065**
Capital (%)	95%	68%	29%	0%
Recurrent (%)	5%	32%	71%	100%
Capital Costs ($)	$8,637,795	$11,551,542	$4,641,307	$0
Recurrent Costs ($)	$482,103	$5,466,323	$11,533,570	$13,870,065
Recurrent new facilities ($)	$482,103	$645,293	$259,611	$0
Recurrent facilities set up in previous years	$0	$4,821,030	$11,273,959	$13,870,065

Including an additional set of 'typical' facilities in the scale-up

In the event that you consider it necessary to include an additional set of 'typical' facilities in the scale-up costs, you just need to run an additional model with the new typologies and add up the results.

For example, in addition to the urban, rural, and remote facilities typified above, you might wish to include a new set of 'typical' facilities with lower needs. That is, as shown below, they are facilities with similar size, cost/location, and recruitment characteristics, but in need of rehabilitation (instead of new construction) and partial equipment (instead of major equipment).

	Typical Facilities to be included in the scale-up					
Typologies	Remote	Rural	Urban	Remote Low Need	Rural Low Need	Urban Low Need
SIZE	Small	Medium	Large	Small	Medium	Large
COST/LOCATION	Very High Cost	High Cost	Mid Cost	Very High Cost	High Cost	Mid Cost
CONSTRUCTION TYPE	New Construction	New Construction	New Construction	Rehabilitation	Rehabilitation	Rehabilitation
EQUIPMENT NEEDS	Major need	Major need	Major need	Partial Need	Partial Need	Partial Need
RECRUITMENT CHALLENGES	Most Challenging	Hard-to-recruit	Standard area	Most Challenging	Hard-to-recruit	Standard area

So, in this case you just need to follow these steps:

Second, review the number of facilities included in the scale-up under each of the six categories.

First, run a model with the first three 'typical' facilities (Remote, Rural & Urban) and copy the results of the scale-up scenario costing in a new workbook. Remember to always use copy/paste values.

Second, run a model with the second set of 'typical' facilities (Remote Low Need, Rural Low Need & Urban Low Need) and copy the results in the same workbook as above

Third, just add up the facility cost results from both scenarios.

A FINAL NOTE ON INTERPRETING & USING THE TOOL ANALYTICS

The General Inputs and the Planning & Budgeting modules (Modules 1 to 7) involve setting country standards, designing strategies and estimating the corresponding costs. The final two modules help users put together the costing estimates to inform planning & budgeting discussions for the scale-up. They include summary tables as well as charts.

In reviewing each of the worksheets, we have provided pointers to aid sense-checking results as you go along. In reviewing the final two modules, we have emphasized the use of the results to inform country planning & budgeting discussions.

The tool has an intuitive step-by-step structure with summary instructions under each step to facilitate the general use of the tool and to help you understand how costs are estimated and what drives the results.

This is important not only for ensuring the accuracy of the results and the transparency of the tool calculations, but also to aid the planning & budgeting process. Understanding what drives the results helps you identify 'what it takes' to implement country standards and the impact that the different variables have on costs.

So, we recommend that while working with the tool you consider the following issues:

TAKE ADVANTAGE OF THE FACT THAT THE TOOL, LIKE IMPLEMENTATION, ASKS FOR 'SPECIFICS'

A risk of planning guides and standards is that they might remain generic, failing to produce detailed guidance to implementers. Though assumptions can be made to estimate costs in these situations, modeling assumptions will be of limited help to those in charge of implementing the scale-up.

For example, stakeholders might agree that each facility should have an interprofessional team with the right set of skills and competencies, but to effectively plan and budget for the scale-up, we also need to know the 'specifics.' This includes what type of human resources are needed and the number of individual staff members required at each facility.

The same applies to all the other domains. For example, to ensure physical facilities are adequate and well equipped, standards need detailing so that managers know the size of the required inpatient care unit and the type and number of devices required at each facility.

As examined under each planning & budgeting module, the first steps always relate to setting the 'specifics' of those country standards. Using the costing tool can aid grounding stakeholder discussions so that they focus on what those 'specifics' are. And since the tool allows for rapid costing of standards, once they are set, the modeling results can facilitate the decision-making process as they reveal what it takes and how much it costs to implement them.

SENSE-CHECK RESULTS STEP-BY-STEP

The step-by-step approach of the tool and the inclusion of review steps aids the transparency of the tool calculations. All the intermediate calculations are shown to enable users to understand step-by-step how each estimate is calculated. This will allow you to understand what the key cost drivers are and sense-check the estimates.

So, when sense-checking preliminary results shown in the review steps, it is important to examine:

- ✓ Do those results seem accurate?
- ✓ What do they mean for the scale-up implementation?
- ✓ Are the expected system requirements for each facility realistic?
- ✓ Are they in line with quality of care standards?
- ✓ How much does it cost to implement them?
- ✓ Which are the items that contribute most to costs?

LEVERAGE THE LARGE NUMBER OF TYPOLOGIES THAT CAN BE SIMULTANEOUSLY COSTED

When modeling the costs of delivering facility services in a country, many variables are at play and one size does not fit all. So, take advantage of the large number of facility typologies that can be simultaneously costed.

Typologies can be used to present a range of estimates that incorporate some of the uncertainty inherent to this type of modeled estimates. Most importantly, as we discussed earlier, you can use the facility typology analytics to explore alternative scenarios illustrating the cost implications of decisions such as the size and location of new facilities.

IDENTIFY THE BEST DATA ANALYTICS TO INFORM STRATEGIC DECISION MAKING

Identify the key strategic decisions that can be informed by the costing tool and take advantage of the tool's ability to rapidly estimate costs to help stakeholders visualize those scenarios.

Examine and discuss the implications of the proposed country standards:

- ✓ What do they say about what it takes to set up a facility that delivers good quality of care to small and sick newborns?
- ✓ When looking at the scale-up, what are the salient gaps in terms of requirements?
- ✓ How much does it cost to set up facilities according to those standards?
- ✓ What are the implications in terms of recurrent budgets?

Remember that those standards are the key cost drivers, but most important, they are also critical to ensure good quality of care.

Also look at results to identify the items that represent the largest capital and recurrent costs and what drives those costs. For example, what are the devices accounting for the largest share of equipment costs? And, in addition to staff salaries are there other large recurrent costs? Examine if there are any salient economies or diseconomies of scale for each of the major cost items.

Review the reminder menus in the Quality of Care modules to check if the supporting systems are in place and if national and regional level strategies are adequate to ensure an efficient management and oversight of the scale-up.

REFERENCES

1. WHO. Standards for improving quality of care for small and sick newborns in health facilities. Geneva: WHO, 2020.
2. —. Human resource strategies to improve newborn care in health facilities in low- and middle-income countries. Geneva: WHO, 2020.
3. —. Survive and thrive: transforming care for every small and sick newborn. Geneva. Geneva: WHO, 2019.
4. Indian National Neonatology Forum, UNICEF. Toolkit for Setting Up Special Care Newborn Units, Stabilisation Units and Newborn Care Corners. New Delhi: UNICEF, 2011.
5. UNICEF, WHO and Bangladesh Neonatal Forum. Standard Operating Procedures for Newborn Care Services at Primary and Secondary Level Hospital. Dhaka: UNICEF, 2014.
6. Limpopo Initiative for Newborn Care. Norms and Standards for Essential Neonatal Care. Essential newborn care implementation toolkit. Limpopo: Limpopo Department of Health and University of Limpopo, 2013.
7. Global Expert Consultation of a Generic Model for Inpatient Care of Small and or Sick. WHO & UNICEF. Geneva: WHO & UNICEF, 2021.
8. NEST360. Newborn Implementation Toolkit. [Online] 2022. https://www.newborntoolkit.org/toolkit.
9. Trikka, Sonja. Caring for Small and Sick Newborns - India Experience. s.l.: Unpublished, 2022.

ANNEX – COSTING THE SCALE-UP OF SMALL AND SICK NEWBORN CARE IN ZAMBIA (REPORT)

GLOBAL FINANCING FACILITY

SUPPORTED BY WORLD BANK GROUP

COSTING THE SCALE-UP OF SMALL AND SICK NEWBORN CARE IN ZAMBIA

DRAFT REPORT FOR CONSULTATION

February 2023

A report prepared by Eliana Jiménez, Mary Nambao and Alison Morgan

EXECUTIVE SUMMARY

Costing the scale-up of Small and Sick Newborn Care Units requires countries to unpack 'what it takes' and 'how much it costs' to implement the system requirements of good quality of care standards.

During the second half of 2022, we piloted in Zambia a Beta Version of an Excel-based costing tool developed by GFF to cost setting-up **Small and Sick Newborn Care Units at Level I A District Hospitals**, across a range of typologies.

We costed a base scenario (new construction, major equipment needs at base prices, mid-point costs and salaries for standard recruiting areas) for three facility sizes: Small (9 beds), Medium (12 beds) & Large (18 beds). **Our base scenario results (USD 2022) show**:

Capital Costs with important economies of scale:

Facility Capital Costs (Total & per Bed) USD ('000)

- ✓ Small: $ 488 total & $ 54 per bed
- ✓ Medium: $ 555 total $ 46 per bed
- ✓ Large: $716 total & $40 per bed

Significant recurrent costs to ensure good quality of care with higher costs per bed for small units.

Facility Recurrent Costs (Total & per Bed) USD ('000)

- ✓ Small: $ 251 total & $ 28 per bed
- ✓ Medium: $ 265 total $ 22 per bed
- ✓ Large: $ 400 total & $ 22 per bed

Across various scenarios, when looking at individual core components, we find:

Construction prices can have a significant impact on capital costs. For example, new construction costs for a large facility range from US$ 198 to US $341 thousand across various cost locations.

For equipment & commodities:

- ✓ **Equipment acquisition prices vary significantly and have a large impact**. The total cost of equipping a facility at minimum price was less than half the cost under maximum prices.
- ✓ **Other one-off expenses are also substantial.** For example, equipment transport and installation costs across various locations are expected to represent between 20 to 40 percent of equipment acquisition values.
- ✓ **Recurrent equipment costs are also significant**. In our base scenario, they range from US$ 61 thousand in a small facility to US$ 92 thousand in a large unit.

Human resources represent between 68% to 73% of recurrent costs across facilities in our base scenario. **Staff costs per newborn are highest in small facilities (US$ 482) and lowest in medium units (US$ 365)**

Other costed facility-level Quality of Care strategies, such as recurrent funding for referral support systems, **are critical, but relatively low-cost** when compared to other components of the scale-up.

National investments to strengthen Quality of Care include higher education courses for nurses and doctors. Their annual costs amount to over US$ 400 thousand.

Other national and regional strategies to provide management, oversight, and support to the scale-up involve one-off costs of US$ 280 thousand and subsequent annual costs of US$ 40 thousand.

We hope this analysis aids high-level discussions, including decisions on the strategic scope of the scale-up, such as a focus on a larger number of facilities of smaller size *vs* fewer facilities of larger size and catchment areas.

In a sense, **our analysis articulates explicitly the pre-conditions of the theory of change behind the success of scaling-up** small and sick newborn care in Zambia.

We hope this prompts an in-depth review of the facility standards and implementation considerations that have informed our costing exercise.

CONTENTS

INTRODUCTION

The health system requirements to enable the fulfilment of WHO standards and the associated guidelines for the scale-up of Small and Sick Newborn Care Units have not been costed.

With a view to estimate a realistic budget that supports good quality of care, as prescribed by their own standard and guidelines, countries need to be able to unpack what it takes and how much it would cost to scale-up services.

This report presents the key results of a costing exercise undertaken in Zambia during the second half of 2022.

To estimate the cost of putting in place all the required elements to scale-up good quality of care, we used a Beta Version of an Excel-based costing tool developed by GFF. The tool has been populated using local data collected and validated in country.

We used various typologies of facilities to capture cost variations across the country, which allows us to unpack key cost drivers and their impact on budgets. We have also accounted for the expected impact that setting up a new facility has on recurrent expenditure.

We hope the report results and the populated costing tool will aid the development of a robust strategy for the scale-up of Small and Sick Newborn Care Units in Zambia.

The remaining of the report is organised as follows: After a summary description of methods, key results are briefly discussed, followed by conclusions. Detailed information on system parameters modelled as well as detailed cost results are presented in Annexes A1 to A4. Annex A5 lists the stakeholders who attended a country workshop and developed the revised list of system standards that informs our modelling.

THE COSTING TOOL & COUNTRY DATA

The GFF costing tool uses normative costings to examine how much it would cost and what it would take to scale-up good quality of care for small and sick newborns, delivered at Level I A district facilities (Zambia standards). We note that in the international literature these are usually classified as Level II facilities.

Global evidence on best-practice (1) (2) (3) (4) (5) (6) (7) (8), and implementation lessons drawn from a case study of Haryana, India (9), a setting where the scale-up was directly managed by the government were used to inform the tool development.

To produce a comprehensive set of costings, the tool includes planning and budgeting modules for infrastructure; equipment and commodities; human resources; quality of care strategies; as well as regional and national strategies required to effectively manage and support the scale-up.

An optional prioritisation module is also included, though it has not yet been used in Zambia. This module allows users to cost individual facilities and allocate limited budgets according to their priority ranking.

The first task under each planning and budgeting module is to setup step-by-step the relevant country standards and requirements for implementation, which provide the normative system parameters for costing.

We sourced facility standards from existing national guidelines (10) (11) for 9-bed (small), 12-bed (medium) and 18-bed (large) units.

Unfortunately, some of the current guidelines and standards lack enough detail to inform actual implementation and realistic costings. For example, they recommend that in addition to nurses, all units should have medical doctors and support staff such as nutritionists. (10) However, there is no information on what their required numbers would be, which is critical for human resource planning, costing, and budgeting.

To fill this gap we drew on the Haryana case study and available guidelines for India, (4) Bangladesh, (5) Sierra Leone, (7) and South

Africa (6) and produced a detailed list of system parameters. They were validated by stakeholders representing the DoH, development partners and service delivery staff at a country workshop in Lusaka on October 25th 2022 (Annex 5).

Since one of our objectives is to support discussions on 'what it takes' to scale-up good quality of care, the detailed standards were presented at the meeting and their costing implications discussed. As expected, this led to robust discussions and substantial revisions to the proposed facility standards were agreed at the meeting.

The agreed list of infrastructure standards, including number of beds and floor standards are detailed in Annex A1. The relevant equipment and staff ratios are included in Annex A2 and A3.

As noted in the annexes, stakeholders added system standards for 36-bed units, which in some cases were assumed to be double the required numbers for an 18-bed facility. However, due to time constraints there was insufficient discussion about factors that could lead to economies or diseconomies of scale. So these facilities are excluded from the current analysis.

A national consultant was engaged to collect costing data on key parameters such as equipment and staff salaries prior to the workshop. This involved reviewing government documentation such as staff salaries and allowances regulations, interviewing key informants, as well as sourcing equipment prices directly from twelve different vendors.

Stakeholders were unable to validate costing parameters on the spot, but the discussions flagged important parameters for validation and identified data gaps that should be addressed for providing realistic costings.

During the following months, representatives from the government, GFF and UNICEF Zambia collaborated online to validate existing cost data and assemble the additional inputs required to cost items such as equipment transport and consumables. Validated data for key costing parameters is presented in the corresponding Annexes or discussed in the relevant sections of the report. A more detailed documentation of all data and assumptions is used is included in the populated costing tool.

Since costs are likely to vary substantially across facilities, due to factors such as size and location, the tool uses typologies to account for such in-country cost variations. Five typologies (facility size, location, equipment needs, type of construction and recruitment) with up to three different categories each have been included in the tool. The mix and match can produce many 'unique' alternative typologies for which costs can be estimated and assigned to individual facilities based on those characteristics.

For this report we focus on selected typologies to explore the salient system and cost implications of decisions that policymakers and investors would normally face when planning and budgeting for the scale-up.

Those interested in more detailed results and further modelling are referred to the tool with the uploaded Zambia data, which includes data and modelling results for all five typologies and associated categories.

THE COSTS OF SETTING-UP SMALL AND SICK NEWBORN CARE UNIT

We examine below the overall costs of setting-up Small and Sick Newborn Care Units of different sizes, followed by a review of costs associated with individual scale-up components.

Costs were estimated from the budget holder's perspective and all results are presented in USD (2022), using an exchange rate of 1 Kwacha = 17 USD.

CAPITAL & RECURRENT COSTS FOR SMALL, MEDIUM & LARGE UNITS

We present costings of a base scenario for three facility sizes:

- ✓ Small: 9 beds & 375 annual newborn admissions
- ✓ Medium : 12 beds & 495 admissions
- ✓ Large: 18 beds & 750 admissions.

In our base scenario infrastructure costs are for new construction and all the required equipment, while human resources are costed for standard recruiting areas.

We modelled three-point cost estimates for construction, equipment and quality of care strategies to capture cost variations across locations. We acknowledge that investments in quality of care are costly, so we have named these location typologies mid-cost (rather than low cost), high-cost and very high-cost.

Unless indicated otherwise, we use the high-cost typology which represents a middle cost point in the country.

Our modelling results, summarised in Figures 1 and 2 and detailed in Annex A4 show that:

Capital Costs

- ✓ One-off capital costs are substantial and go from US$ 487 thousand for a small facility to US$ 717 thousand for a large unit.
- ✓ All equipment costs account for approximately 50% of capital costs across the three facilities.
- ✓ New construction as per the required standards account for 34% and 35% for small and medium units and 40 % of capital costs large facilities.
- ✓ The remaining capital costs are represented by acquisition of an ambulance to support referrals.
- ✓ There are important economies of scale. Capital costs per bed for a large facility are 14% lower than those modelled for a medium facility and 27% lower than those for a small one.

Recurrent Costs

- ✓ Recurrent costs are significant across all facilities. They range from US$ 251 thousand for a small facility to over US$ 400 thousand for a large unit.
- ✓ As expected, human resources account for most of the recurrent expenditure, representing approximately 68% to 73% across facilities.
- ✓ The remaining recurrent costs are mostly related to equipment and commodities, which are discussed in more detail in the following sections.
- ✓ When looking at costs per bed, medium-size and large facilities show similar recurrent costs. Both have recurrent costs per bed 20% lower than 9-bed facilities.
- ✓ Broadly similar results are observed when looking at costs per newborn admitted (See detailed base scenario results in Annex A4). This suggests that based on currently modelled facility standards, there are important inefficiencies for smaller facilities.

Figure 1 – Total Facility Costs by Typology - Capital & Recurrent (USD 2022)

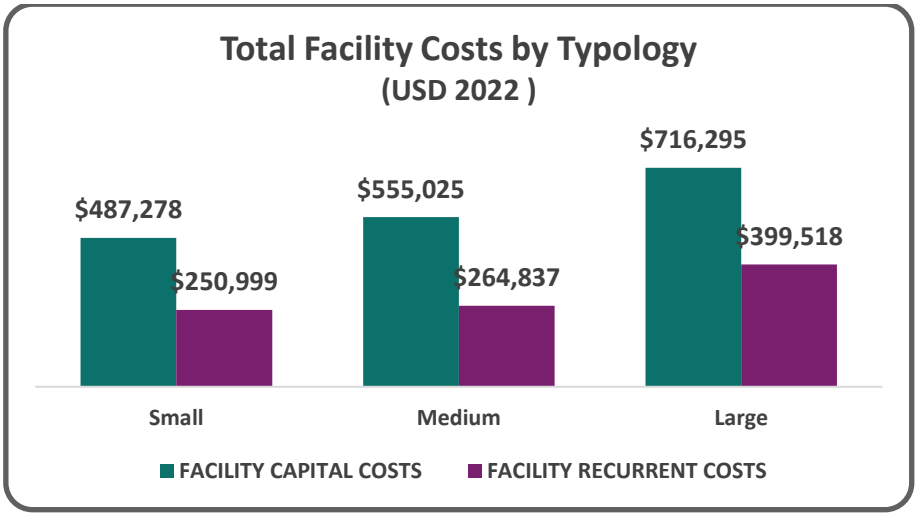
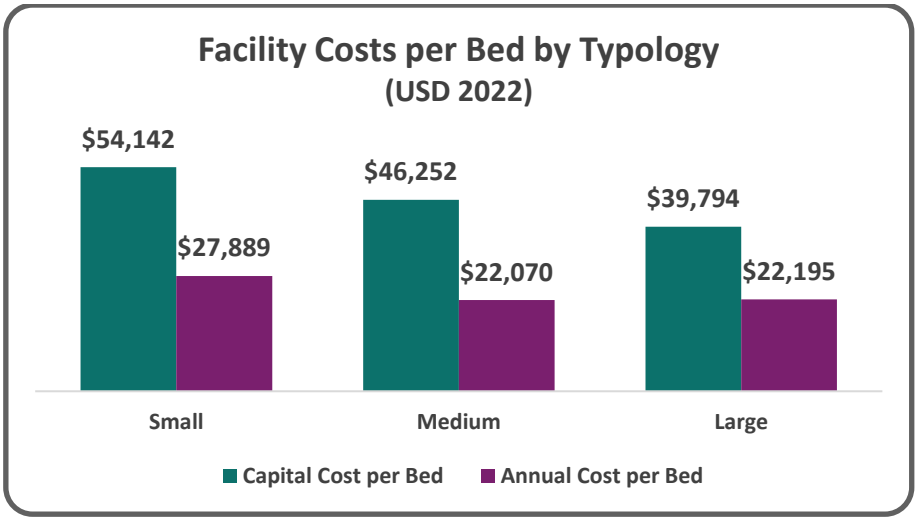


Figure 2 - Facility Costs per Bed by Typology - Capital & Recurrent (USD 2022)



INFRASTRUCTURE

We modelled how much it would cost the new construction of a facility as per the infrastructure standards summarised in Annex A1. We sourced cost per square meter from a key informant at the DoH. Costs were triangulated against available construction data, including for a tertiary hospital in Lusaka (12) and validated by the Department of Health.

Our base scenario uses a point estimate of US$600 per square meter of new construction.

Two additional estimates of US$ 480 and US $720 per square meter are also used to test the sensitivity of the results to construction prices and illustrate the variation of costs that could be expected across different locations in Zambia.

Our results summarized in Figure 3 show:

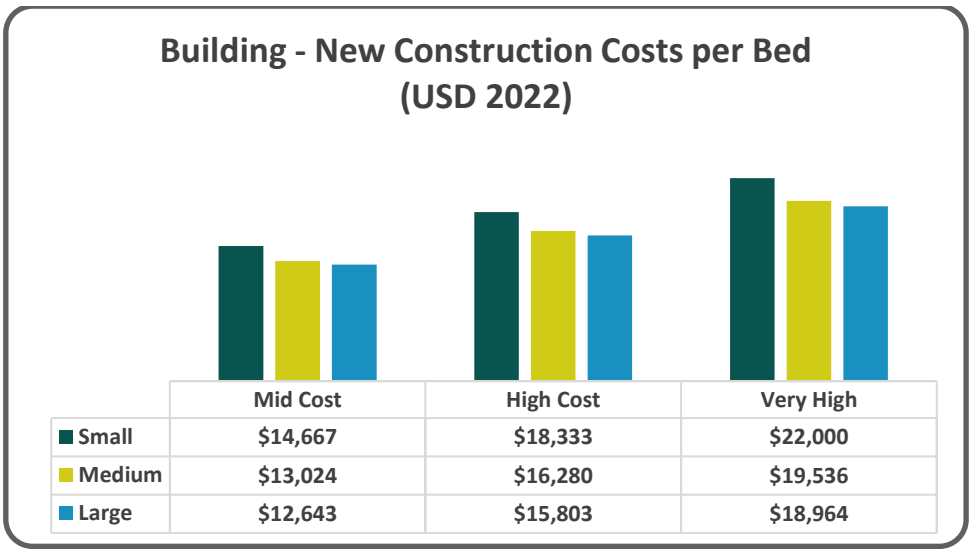
- ✓ As expected, construction prices can have a significant impact with total new construction costs ranging from:
  - US$ 132 to US$ 227 thousand (9-bed unit)
  - US$ 165 to US $285 thousand (12-bed unit)
  - US$ 198 to US $341 thousand (18-bed unit)

Infrastructure costs are also driven by facility floor standards, in particular the required space per bed, which varies by type of bed (Annex A1).

- ✓ In-patient areas account for approximately 38% to 44% of total floor space across the three facility sizes.
- ✓ There are important economies of scale, mostly driven by the required minimum space for other facility areas, which as expected do not increase in line with the number of beds (Annex A1).
- ✓ Circulation space standards, such as those related to corridors and entrance, would also affect total construction costs. Based on stakeholder discussions, we use a conservative estimate of circulation space equivalent to 10% of total floor space *vs.* 30% in Haryana.

Although results are not shown here, we also modelled costs for facilities in need of rehabilitation, available in the populated costing tool. We use the assumption of approximately 60% of new construction costs based on data from the Haryana case study. (9)

Figure 3 – Facility Building – New Construction Costs per Bed (USD 2022)



	Mid Cost	High Cost	Very High
Small	$14,667	$18,333	$22,000
Medium	$13,024	$16,280	$19,536
Large	$12,643	$15,803	$18,964

EQUIPMENT & COMMODITIES

We costed one-off and recurrent costs associated with Equipment & Commodities. Under capital costs we have included medical equipment acquisition value as well as transport, distribution and installation costs; furniture and other equipment; and the cost of a new ambulance. Recurrent costs include those associated with maintenance, consumables and renewables, other medical supplies, and ambulance referral expenses.

One-off Capital Costs

To cost purchasing the required equipment we sourced prices for 65 major pieces of equipment identified in national guidelines from twelve vendors (Annex A2). Though we requested prices inclusive of a three-year warranty, only one year was offered. Transport and installation costs were not included and have been estimated separately, based on information provided by UNICEF Zambia.

Equipment price data provided in Annex A2 shows that there are significant variations in individual equipment prices, also found in recent reports. (12) Of note:

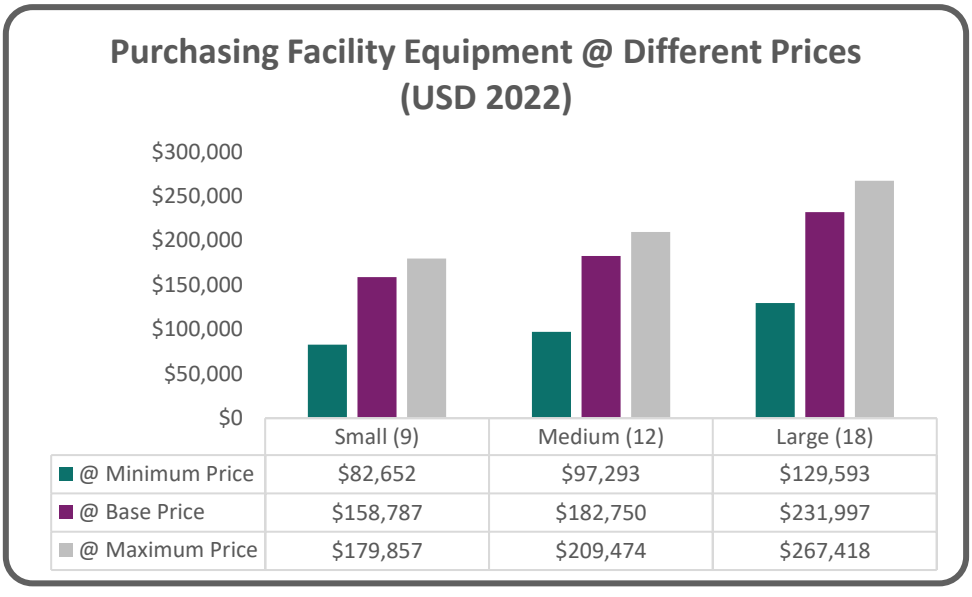
- ✓ The largest price difference is observed for mobile X-rays (US$ 27,831) with the maximum price equivalent to 6.3 times the minimum price.
- ✓ Pulsi oximeters and oxygen concentrators have lower individual prices and so smaller absolute differences, but maximum prices are 44 and 21 times higher than minimum prices, respectively.

Although market factors might be at play, such large differential most likely reflects different specifications & quality. Robust procurement systems, including detailed specifications for tenders are required to ensure good quality and good value for money.

As shown in Figure 4, in line with such large price differences, the total cost of equipping a facility at minimum prices is approximately half the cost of a scenario estimated using maximum prices.

Across various scenarios, even after excluding shared equipment (mobile X Ray and blood gas analyser), a few items account for approximately 50% of equipment costs. These include resuscitaire, ventilators, oxygen concentrators, phototherapy units and closed incubators.

Figure 4* – The Cost of Purchasing Facility Equipment (USD 2022)



	Small (9)	Medium (12)	Large (18)
@ Minimum Price	$82,652	$97,293	$129,593
@ Base Price	$158,787	$182,750	$231,997
@ Maximum Price	$179,857	$209,474	$267,418

Note: A base price is equivalent to the mid-point price available, although in cases where only two prices were available, the maximum price was used.

As shown in Table 1, summarising results for our base scenario, equipment acquisition costs are only the tip of the iceberg.

Other significant one-off costs include transport, installation, and distribution costs, which can range across cost location typologies from 20 to 40% of equipment acquisition value. We have used a 30% estimate for our base scenario.

We also costed buffer stocks to be managed at regional level to ensure a replacement is available when a piece of equipment breaks down at an individual facility. In line with recommendations from UNICEF head office, buffer stocks equivalent to 10% of equipment acquisition and transport costs were included.

To support in-referrals from lower level facilities and communities, as well as out-referrals, the cost of an ambulance vehicle has also been included. The cost shown in Table 1 does not include the required equipment, which was costed separately.

Table 1 – One-Off Equipment & Vehicle Costs by Facility Size Typology (USD 20222)

Facility Equipment & Vehicle – Capital Costs	Small (USD)	Medium (USD)	Large (USD)
Equipment Acquisition	$158,787	$182,750	$231,997
Equipment Distribution & Installation	$47,636	$54,825	$69,599
Equipment Buffer Stocks	$19,054	$21,930	$27,840
Furniture & other Equipment	$16,800	$20,160	$22,400
Ambulance Vehicle	$80,000	$80,000	$80,000
Total Equipment & Vehicle Costs	**$322,278**	**$359,665**	**$431,835**

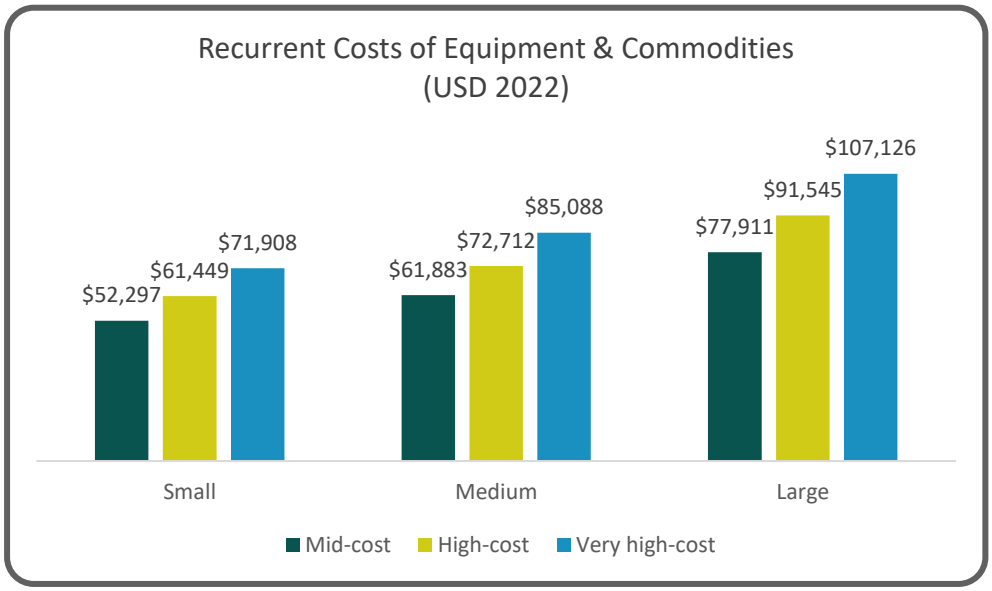
Recurrent Costs

Recurrent costs associated with equipment and commodities were estimated, mostly based on information provided by UNICEF Zambia office, drawing on their locally funded projects and validated against their recent experience in India. Of note:

- ✓ Costs are likely to vary by location and it has been estimated that annual expenditure on consumables and renewables represent between 30 to 40% of the equipment acquisition value.
- ✓ It is expected that an additional annual expenditure equivalent to 10%-15% of equipment acquisition value would be required each year for maintenance.
- ✓ As shown in Figure 5, after adjusting for costs of shared equipment, annual expenditure is expected to range from US$ 53 thousand for a 9-bed facility in a mid-cost location to US$107 thousand for an 18-bed facility in a very high-cost location.
- ✓ Across various scenarios approximately three quarters of equipment recurrent costs are represented by consumables and renewables.
- ✓ Costs of consumables and renewables per newborn admitted decrease with facility size. They are expected to range from:
  - US$ 105 to US $140 for 9-bed facilities
  - US$ 94 to US$ 125 for 12-bed facilities
  - US$ 78 to US$ 104 for 18-bed facilities

We have not been able to secure country data on the recurrent costs of medicines, which are not included above. However anecdotal evidence seems to suggest that they represent a relatively small proportion of other medical supplies costs such as consumables and renewables. For this exercise we are assuming an additional cost per newborn admitted of U$ 8, which would need further validation in-country.

Figure 5 – Recurrent Costs of Equipment & Commodities (USD 2022)



HUMAN RESOURCES

Staff costs represent the largest expected annual expenditure for individual facilities. In addition to salaries and allowances, we also included in-service training and supervision visits, which are critical for ensuring good quality of care, but represent barely 2% of total human resources expenditure. Other training costs are significant, but they are modelled at national level.

Facility staff costs were modelled based on stakeholders' decisions on the staff numbers required to deliver good quality of care at each facility.

As documented in Annex A3, required human resources include not only health staff, but also support personnel required for effective referral systems, infection and prevention control, maintenance and quality of care more generally.

As noted earlier, original numbers provided by GFF, based on the case study and national international guidelines were substantially reviewed by workshop participants, based on their clinical experience and other considerations such as number of working hours per shift. Though discussions were robust, there were time constraints that prevented a thorough review of agreed standards.

As shown in Table 2:

- ✓ Annual staff costs are the same for small and medium facilities since there was consensus that the same staff ratios should be applied. Note that for rural and remote areas where hardship allowances apply costs will be 20% and 25% higher.
- ✓ As expected, since 12-bed facilities would be delivering services for a higher number of newborns than 9-bed units, costs per newborn are substantially lower, even lower than those for 18-bed units.

Our estimates also suggest that:

- ✓ Nurses account for 34 % of salaries in large units vs. 42% for small and medium.
- ✓ Medical personnel represent 21% of salaries in large facilities vs. 15% for the other two.
- ✓ As a result of the large number of required nutritionists (4 for 9-bed and 12-bed units & 8 for 18-bed units) they account for 11% to 13% of staff costs.
- ✓ Security guards and cleaners account for 13% to 16% of salary costs.

Table 2 – Staff Costs for Standard Recruiting Areas by Facility Size (USD 2022)

Facility Staff Costs	Small (USD)	Medium (USD)	Large (USD)
Total Staff Costs	**$180,804**	**$180,804**	**$290,934**
Salaries	$177,108	$177,108	$285,753
Development	$3,696	$3,696	$5,181
Staff Costs per newborn admitted	**$482**	**$365**	**$388**

Quality of Care Strategies

An important number of Quality of Care strategies are costed under separate headings, such as ensuring adequate infrastructure, equipment and human resources. However, the costing tool provides a default menu of Quality of Care strategies to ensure they are given due consideration when planning and budgeting for the scale-up and do not fall through the cracks.

In addition to those examined above, our modelling also includes building maintenance costs equivalent to 1% of a new building value, which given the significant recurrent costs associated with human resources and equipment, represent less than a half percentage point of estimated recurrent costs.

We also estimated the recurrent costs for referrals, which are required to ensure adequate in-referrals from lower facilities and the community and out-referrals to higher facilities. Since salaries for one driver per facility are included in human resource costs, we only estimated ambulance fuel and maintenance costs. Annual estimates range from $3.4 thousand for a 9-bed facility in a mid-cost location to $8.4 thousand in an 18-bed unit in a very high-cost location.

Further in-country discussions might suggest additional quality strategies that need to be implemented and costed. For example, we were unable to cost information and communication campaigns targeting the community to ensure timely access, referrals and good quality follow-up care. Access to alternative sources of electricity and water were neither included in our strategies and costs.

National & Regional Strategies

Improving quality of care while scaling-up district facility services for small and sick newborns entails system changes across multiple domains and levels.

Effective local solutions to local problems must be supported by high-level systems, for example for assets management, and national oversight of the scale-up.

The costing tool includes a default menu of strategies that we have used to estimate national and regional costing summarized in Figure 6.

Higher Education Training costs (over U$ 400 thousand a year) includes annual tuition fees and scholarship allowances for one Advanced Diploma and a Master of Science in Neonatology for nurses, as well as a Postgraduate Diploma in Neonatology for doctors (10 students enrolled in each course every year).

We also included costs related to:

- ✓ commissioning of infrastructure and equipment including development of detailed equipment specifications ($60 thousand in year 1);
- ✓ development of national guidelines and templates ($ 120 thousand in year 1)

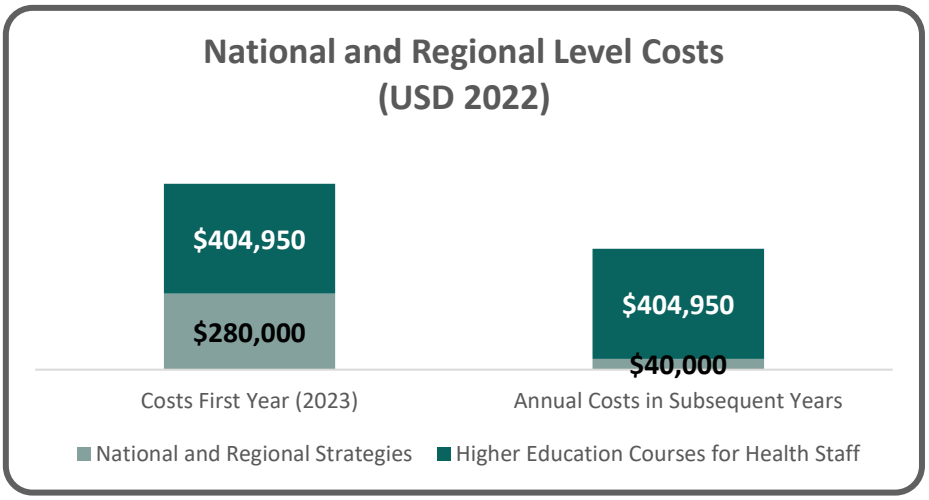
- ✓ Continuous quality of care strategies, including monitoring and evaluation and supporting the development of facility

systems for reporting adverse events ($100 thousand in year 1 plus additional annual costs of $40 thousand).

✓ For supply chain management, we have assumed no additional costs as they could be covered by national programs targeting the health sector in general.

✓ Other costs related to high-level management and oversight of the scale-up have not been included since their costing requires a defined strategy, still to be developed.

Figure 6 – National & Regional Level Costs (USD 2022)



WHAT NEXT FOR ZAMBIA?

Our results indicate that, as expected, scaling-up facility care for small and sick newborns requires substantive investments in infrastructure, equipment, human resources and quality of care more generally.

Recurrent costs can be significant and should be given due consideration in terms of sustainability and efficient use of resources.

High-level discussions on the strategic scope of scaling-up services are necessary to ensure the right facilities are set-up in the right places, supported by strong referral networks and adequate regional and national systems. This involves decisions such as whether to fund a larger number of smaller facilities or financing fewer facilities of larger sizes and catchment areas.

Such decisions need to be informed by realistic costings and implementation considerations, which are both influenced by what it takes for a facility to operate according to the national standards and guidelines.

We hope this analysis aids high-level discussions such as those on the scale-up of the scope and alternative facility standards.

We have taken advantage of the fact that our costing approach, like actual implementation, requires an explicit articulation of the specifics of standards and strategies for scaling-up care for small and sick newborns.

In a sense, our approach makes explicit the pre-conditions of the scale-up, which we hope will prompt a review of the facility standards and implementation considerations that underlie not only our costings, but the success of scaling-up good quality of care.

REFERENCES

1. **WHO.** *Standards for improving quality of care for small and sick newbons in health facilities.* Geneva : WHO, 2020.

2. —. *Human resource strategies to improve newborn care in health facilities in low- and middle-income countries.* Geneva : WHO, 2020.

3. —. *Survive and thrive: transforming care for every small and sick newborn. Geneva.* Geneva : WHO, 2019.

4. **Indian National Neonatology Forum, UNICEF.** *Toolkit for Setting Up Special Care Newborn Units, Stabilisation Units and Newborn Care Corners.* New Delhi : UNICEF, 2011.

5. **UNICEF, WHO and Bangladesh Neonatal Forum.** *Standard Operating Procedures for Newborn Care Services at Primary and Secondary Level Hospital.* Dhaka : UNICEF, 2014.

6. **Limpopo Initiative for Newborn Care.** *Norms and Standards for Essential Neonatal Care. Essential newborn care implementation toolkit.* Limpopo : Limpopo Department of Health and University of Limpopo, 2013.

7. *Global Expert Consulation of a Generic Model for Inpatient Care of Small and or Sick.* **WHO & UNICEF.** Geneva : WHO & UNICEF, 2021.

8. **NEST360.** Newborn Implementation Toolkit. [Online] 2022. https://www.newborntoolkit.org/toolkit.

9. **Trikka, Sonja.** *Caring for Small and Sick Newborns - India Experience.* s.l. : Unpublished, 2022.

10. **Republic of Zambia, Ministry of Health.** *Service Standards for Health Institutions Providing Neonatal Care in Zambia.* Lusaka : s.n., 2020.

11. —. *Standards for Improving the Quality of Health Care for Small and Sick Newborns in Health Facilities in Zambia (DRAFT).* Lusaka : s.n., 2022.

12. **Perez, APC.** *Neonatal Intensive Care Unit 100 Percent Design Report.* Washington, DC : USAID, 2020.

ANNEXES

A1 – Infrastructure Standards

Table A.1.1. Facility Sizes & Number and Type of Beds

Type of beds	Small	Medium	Large	Extended
All Inpatient Beds	**9**	**12**	**18**	**36**
Standard Inpatient Care	3	3	6	10
High-Care Beds	2	3	4	6
Kangaroo Mother Care Beds	4	6	8	20
Lodger Mother Beds	2	3	4	6

Table A.1.2. Minimum Floor Space per Type of Bed

Type of beds	Sq. Mt per Bed
Standard Inpatient Care	12
High-Care Beds	10
Kangaroo Mother Care Beds	12
Lodger Mother Beds	12

Table A.1.3 Minimum Floor Space per Area by Facility Size

Other Facility Service Areas	Small (9 beds)	Medium (12 beds)	Large (18 beds)	Extended (36 beds)
Triage/receiving room	12	12	20	30
Counselling area	0	0	0	12
Family facilities (exc. lodger mother beds)	8	8	12	30
Nursing station and unit office	10	10	15	20
Nurses & doctors rest areas	8	8	12	20
Pantry with dining area	0	0	0	30
Storage unit	7	7	10	15
Clean utility	7	7	10	15
Dirty utility	7	7	10	15
Neonatal unit office	10	10	15	20
Meeting room	20	20	30	30

A2 – Equipment - Standards & Prices

Table A.2.1 Type of Equipment and Requirements per Facility Size

Equipment_Name	Small (9 beds)	Medium (12 beds)	Large (18 beds)	Extended (36 beds)	Notes from National Service Standards (2020)
General Equipment					
Closed incubator	3	4	6	12	1 per 3 neonates
Bassinet (washable)	9	12	18	36	1 per SIC bed & KMC: Bassinets/cribs
Transport incubator	2	2	2	2	
Overhead servo incubator	2	3	4	6	1 per HC bed
Heat shield	2	3	4	6	1 per HC bed
Wall suction unit	3	4	6	12	1 per suction point
Phototherapy units	4	6	8	12	1 per 5-unit beds KMC: Phototherapy machines for jaundiced babies
Transcutaneous bilirubinometer	1	1	1	2	1 per unit
Electronic Scale	3	3	4	6	1 per unit cubicle & KMC requirements
Glucometer	4	4	4	6	1 per unit & ambulance, KMC and triage requirements
Thermometer	10	13	19	37	1 per baby & KMC and triage requirements
Equipment for respiratory support and oxygen therapy					
Nasal CPAP (complete)	4	5	6	8	1 per HC bed & Ambulance and triage requirements
Head boxes	0	0	0	0	1 per SIC & HC bed
Pulsi oximeters	10	13	19	37	1 per HC bed & 1 per 2 SIC beds & ambulance, KMC and triage requirements
Oxygen flow meter	9	12	18	36	1 double per unit bed
Oxygen cylinders	4	5	8	16	1 double per unit bed & ambulance

Equipment_Name	Small (9 beds)	Medium (12 beds)	Large (18 beds)	Extended (36 beds)	Notes from National Service Standards (2020)
Oxygen concentrators	10	13	19	37	1 double per unit bed & ambulance requirements
Oxygen blender	2	3	4	6	1 per HC bed
Oxygen analyser	1	2	2	3	1 per 2 HC bed
Apnoea monitors	2	3	4	6	1 per 2 HC bed
Trans illumination light	1	1	1	1	1 per unit & KMC and triage requirements
Chest drain kit	1	1	1	2	1 per unit and triage requirements
Fluid controllers and cardiac monitors					
Intravenous infusion controllers	2	2	2	4	1 per unit & ambulance requirements
Multiparameter monitors	2	3	4	6	1 per HC bed
BP monitor - portable	3	4	5	7	1 per HC bed & KMC requirements
Shared Equipment					
Mobile X Ray (digital as per specification pp. 143)	1	1	1	1	1 in the hospital
Blood gas analyser	0	0	1	1	1 in large hospitals
Resuscitation equipment					Note: In general requirements for ambulance
Resuscitaire	2	2	2	4	1 per unit & KMC requirements
Portable neonatal suction	2	2	2	4	1 per unit
Advanced Resuscitation trolley	1	1	1	2	1 per unit & KMC requirements
Laryngoscope, straight miller blade size 00,0, spare batteries and bulb	3	3	3	4	1 per advanced resuscitation trolley & KMC requirements
McGill's forceps	2	2	2	2	1 per advanced resuscitation trolley & triage requirements
Other					Listed separately in national guidelines
Transport ventilators	1	1	1	1	Ambulance

Equipment_Name	Small (9 beds)	Medium (12 beds)	Large (18 beds)	Extended (36 beds)	Notes from National Service Standards (2020)
One drip stand	3	3	3	3	Ambulance & triage requirements
Wall Mounted television set or educational material	1	1	1	1	KMC requirements
educational video tapes or flash drivers	1	1	1	1	KMC requirements
Upright fridge for the mothers	1	1	1	2	KMC requirements
Microwave	1	1	1	2	KMC requirements
Bucket for decontamination	3	3	3	6	KMC requirements
Heaters/ air conditioners	6	6	6	10	KMC & triage requirements
Wall thermometer	2	4	4	8	KMC requirements
Stethoscope	11	14	20	38	KMC & triage requirements
Suction machine	1	1	1	2	KMC requirements
Penguin Suckers	1	1	1	2	KMC requirements
Oxygen gauge	1	1	1	1	KMC requirements
Infantometer	2	2	2	2	KMC & triage Equipment
Hand held hearing screening device (auto-acoustic Emission)	1	1	1	1	KMC requirements
Pen torch	2	2	2	2	KMC & triage requirements
Tourniquet	1	1	1	1	KMC requirements
Infusion pumps	2	2	2	2	KMC & triage requirements
Ventilator	1	1	1	1	Triage requirements
Nebulizer	1	1	1	1	Triage requirements
Emergency trolley	1	1	1	1	Triage requirements
Syringe pumps	1	1	1	1	Triage requirements
Screens	1	1	1	1	Triage requirements

Equipment_Name	Small (9 beds)	Medium (12 beds)	Large (18 beds)	Extended (36 beds)	Notes from National Service Standards (2020)
Sharps box	1	1	1	1	Triage requirements
Diagnostic set (otoscope and ophthalmoscope)	1	1	1	1	Triage requirements
Paediatric BP machine with all the different cuff sizes (neonate, infant, child)	1	1	1	1	Triage requirements
Neonatal resuscitation emergency trolley with all drugs required for advanced neonatal resuscitation.	1	1	1	1	Triage requirements
Basic monitor (Pulse oximeter, Pulse rate, blood pressure and temperature).	1	1	1	1	Triage requirements
Oxygen masks.	1	1	1	1	Triage requirements
Drums	1	1	1	1	Triage requirements
Desktop Autoclave machine	1	1	1	1	Triage requirements
stainless steel cheatle forceps and holder	1	1	1	1	Triage requirements
Adult stethoscope	3	3	3	3	Not in national standards
Digital adult weighing scale	3	3	3	3	Not in national standards
Laryngoscope (with adult blades)	3	3	3	3	Not in national standards
Equipment maintenance toolbox	1	1	1	1	Not in national standards

Table A.2.2 Available Equipment Prices from Country Suppliers (US Dollars, 2022)

Equipment_Name	Minimum Price (USD)	Medium Price (USD)	Maximum Price (USD)
General Equipment			
Closed incubator	$1,835		$3,912
Bassinet (washable)	$321		$518
Transport incubator	$1,193		
Overhead servo incubator	$1,618		
Heat shield	$105		
Wall suction unit	$226		$915
Phototherapy units	$1,324	$1,832	$2,353
Transcutaneous bilirubinometer	$457		
Electronic Scale	$265	$382	$882
Glucometer	$15	$34	$46
Thermometer	$4	$5	$18
Equipment for respiratory support and oxygen therapy			
Nasal CPAP (complete)	$735	$1,471	$2,744
Head boxes	NA	NA	NA
Pulsi oximeters	$21	$550	$915
Oxygen flow meter	$71		$81
Oxygen cylinders	$28		$588
Oxygen concentrators	$912	$1,324	$1,794
Oxygen blender	$1,441		
Oxygen analyser	$247		
Apnoea monitors	$188		

Equipment_Name	Minimum Price (USD)	Medium Price (USD)	Maximum Price (USD)
Trans illumination light	$62	$144	$424
Chest drain kit	$44		
Fluid controllers and cardiac monitors			
Intravenous infusion controllers	$735		
Multiparameter monitors	$1,471	$2,029	$2,824
BP monitor - portable	$29		$38
Shared Equipment			
Mobile X Ray (digital as per specification pp. 143)	$5,588		$35,056
Blood gas analyser	$11,471		
Resuscitation equipment			
Resuscitaire	$3,824	$4,029	$4,235
Portable neonatal suction	$26		
Advanced Resuscitation trolley	$1,324		
Laryngoscope, straight miller blade size 00,0, spare batteries and bulb	$176		$232
McGill's forceps	$8		$24
Other			
Transport ventilators	$1,912		$8,529
One drip stand	$16	$76	$100
Wall Mounted television set or educational material	$434		
educational video tapes or flash drivers	$9		
Upright fridge for the mothers	$512		
Microwave	$147		
Bucket for decontamination	$6		
Heaters/ air conditioners	$529		

Equipment_Name	Minimum Price (USD)	Medium Price (USD)	Maximum Price (USD)
Wall thermometer	$4		$18
Stethoscope	$26		$92
Suction machine	$203		$529
Penguin Suckers	$17		$29
Oxygen gauge	$39		$74
Infantometer	$15		
Hand held hearing screening device (auto-acoustic Emission)	NA	NA	NA
Pen torch	$7		$18
Tourniquet	$18		
Infusion pumps	$420	$853	$1,588
Ventilator	$9,870		$11,324
Nebulizer	$42	$191	$235
Emergency trolley	$276		$1,765
Syringe pumps	$360		$2,647
Screens	$115		$176
Sharps box	$2		$4
Diagnostic set (otoscope and ophthalmoscope)	$174		$1,524
Paediatric BP machine with all the different cuff sizes (neonate, infant, child)	$26		$85
Neonatal resuscitation emergency trolley with all drugs required for advanced neonatal resuscitation.	$1,324		
Basic monitor (Pulse oximeter, Pulse rate, blood pressure and temperature).	$554		$2,029
Oxygen masks.	$2		$6
Drums	$85		
Desktop Autoclave machine	$3,676		

Equipment_Name	Minimum Price (USD)	Medium Price (USD)	Maximum Price (USD)
Stainless steel cheatle forceps and holder	$14		$50
Adult stethoscope	$26		$29
Digital adult weighing scale	$53		$74
Laryngoscope (with adult blades)	$118		$232
Equipment maintenance toolbox	NA	NA	NA

A3 – Human Resources - Standards & Salaries

Table A3.1 Required Staff Categories and FTE Numbers by Facility Size

Staff Category	Small	Medium	Large	Extended
Neonatologist	0	0	0.3	1
Medical Officer	1	1	2	4
Medical Licentiates	1	1	2	2
Clinical Officers	1	1	1	0
Registered Paediatric/Neonatal Nurses	8	8	10	15
Registered Nurses	4	4	5	5
Midwives	1	1	2	5
Administrative/clerical staff	1	1	1	2
House Keepers	4	4	8	8
Infection Control Staff	1	1	1	1
Data Registry Clerk	1	1	1	2
Nutritionist/Nutritional Demonstrators	4	4	8	8
Bio-medical technologists	0.5	0.5	1	1
Security Guards	3	3	6	6
Drivers	1	1	1	2
Ambulance Call Centre Staff	0.5	0.5	0.5	0.5

Table 3.2 Required Staff – Annual Salaries, including allowances (except hardship)

Staff Category	Annual Salaries & Allowances (USD 200)
Neonatologist	$25,917
Medical Officer	$25,917
Medical Licentiates	$7,533
Clinical Officers	$5,386
Registered Paediatric/Neonatal Nurses	$5,897
Registered Nurses	$5,386
Midwives	$5,897
Administrative/clerical staff	$4,918
House Keepers	$3,260
Infection Control Staff	$5,386
Data Registry Clerk	$3,785
Nutritionist/Nutritional Demonstrators	$4,783
Bio-medical technologists	$4,783
Security Guards	$3,260
Drivers	$3,423
Ambulance Call Centre Staff	$3,598

A4 – Facility Base Scenario Results

Table A4.1 Base Scenario* – Summary of Facility Service Parameters & Costs

Service Parameter/Cost	Small	Medium	Large
Expected annual number of admissions (#)	375	495	750
Number of beds required (#)	*9*	*12*	*18*
Total floor space (Sq. Mts.)	*275*	*326*	*474*
FACILITY CAPITAL COSTS (Total)	**$487,278**	**$555,025**	**$716,295**
Building	**$165,000**	**$195,360**	**$284,460**
Equipment	**$242,278**	**$279,665**	**$351,835**
Equipment Acquisition	*$158,787*	*$182,750*	*$231,997*
Equipment Distribution	*$47,636*	*$54,825*	*$69,599*
Equipment Buffer Stocks	*$19,054*	*$21,930*	*$27,840*
Furniture and other	*$16,800*	*$20,160*	*$22,400*
Ambulance Vehicle	**$80,000**	**$80,000**	**$80,000**
FACILITY RECURRENT COSTS (Total)	**$250,999**	**$264,837**	**$399,518**
Human Resources	**$180,804**	**$180,804**	**$290,934**
Salaries	*$177,108*	*$177,108*	*$285,753*
Development	*$3,696*	*$3,696*	*$5,181*
Equipment	**$61,449**	**$72,712**	**$91,545**
Regular Maintenance	*$15,689*	*$18,565*	*$23,374*
Consumables & Renewables	*$45,760*	*$54,147*	*$68,171*
Other	**$8,747**	**$11,321**	**$17,038**
Ambulance Referral	*$3,797*	*$5,012*	*$7,594*
Building maintenance	*$1,650*	*$1,954*	*$2,845*
Other	*$3,300*	*$4,356*	*$6,600*
FACILITY CAPITAL COSTS			
Capital Cost per Bed	**$54,142**	**$46,252**	**$39,794**
Building	*34%*	*35%*	*40%*
Equipment	*50%*	*50%*	*49%*
Ambulance Vehicle	*16%*	*14%*	*11%*
FACILITY RECURRENT COSTS			
Annual Cost per Bed	**$27,889**	**$22,070**	**$22,195**
Annual Cost per Newborn Admission	**$669**	**$535**	**$533**
Human Resources	*72%*	*68%*	*73%*
Equipment	*24%*	*27%*	*23%*
Other	*3%*	*4%*	*4%*

Typologies used for Base Scenario: New Construction, Major Equipment Needs (100%), High-cost Location (i.e. mid-point of cost estimates) and Standard Recruitment Area (i.e. no hardship allowances). Facility Equipment costed at base prices.

A5 - Small and Sick Newborn Care Costing Workshop – Lists of Participants

Table A5.1 List of Small and Sick Newborn Care Costing Workshop Participants

NAME	DESIGNATION	INSTITUTION
Alison Morgan	Senior Health Specialist	GFF
Gae C.N Mundundu	Newborn Care National Coordinator	MOH
Apurva Chaturvedi	Health Specialist UNICEF	UNICEF
Selia Ng'anjo	Obstetrician/Gynaecologist	WNH-UTH
Mervis Pepino	Public FinanceAssociate UNICEF	UNICEF
Mary Nambao	Liaison Officer	GFF
Aya Kagota	Health specialist	World Bank
Sylvia Machona	Paediatrician	WNH-UTH
Gertrude Kampekete	Chief Newborn officer	MOH-HO
Chamba Ilunga	Paediatrician	MOH-MGH
Vivian Diliwayo	Midwife	MOH-MGH
Mary K. Bwalya	NPO/CAH	WHO
Muntanga K. Mapani	Paediatrician	Levy-MOH
Kunda Mutesa Kapebwa	Neurologist	Neonatologist
Mary Nambao	Liaison Officer	GFF
Eliana Jimenez Soto	Consultant	GFF