EVALUATING SAVING LIVES AT BIRTH

Costing Tool for Healthcare Innovators: An Excel-Based Tool for Capturing Historical and Scale-up Costs of an Innovation

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EXECUTIVE SUMMARY

PURPOSE OF THE REPORT

The Duke University team worked with select innovations from the Saving Lives at Birth (SL@B) program – a Grand Challenge for development, **to create a new Excel-based costing tool to assist healthcare innovators as they better understand and track their costs, and navigate their scale-up pathways**.

The objectives of this costing brief are to:

- Present the process of developing the Excel-based Costing Tool for innovators
- Demonstrate the value proposition of the Costing Tool for innovators and funders
- Describe key assumptions made while developing the Costing Tool, its salient features as well as strengths and weaknesses

The first step in developing the Costing Tool was to conduct a literature review on both the costing of healthcare innovations, and existing cost data collection tools. Based on this review of existing cost data collection tools, and discussions with SL@B innovators, we developed four-pronged selection criteria that addressed specific requirements and constraints health innovators in general face. **This four-pronged, innovator-friendly criteria** includes:

1. ***Minimal supervision requirement***: a tool that does not require excessive technical knowledge, programming experience or continuous expert assistance before it can be used by an innovator.
2. ***Ease of use***: a tool that has categories which are easily identifiable by an innovator such as salaries, supplies cost, training, travel, etc., making it easier for innovators to use. In addition, the tool should also provide option to capture costs for categories which might not have been pre-populated in the tool.
3. ***Mixed categories of types of innovations***: a tool that includes a broad range of cost categories to capture data from a vast range of healthcare innovations such as devices and diagnostics, mHealth solutions, drugs and vaccines, and service delivery approaches.
4. ***Minimal computational requirements***: a tool that doesn't require internet access or specific computer hardware to operate.

Using these criteria, we assessed a range of tools that had been used by innovators and funders to understand the costs of scaling up. However, **none of the existing tools fully satisfied the four-pronged selection criteria**. For example, tools like P2I and iHTP focus heavily on projects related to clinical interventions, while the CorePlus tool mainly focuses on primary health care interventions, and LiST requires significant technical support, and has a steep learning curve before it can be used (Johns Hopkins Bloomberg School of Public Health, 2019) (MSH, 2019) (WHO, 2019) (Terry, Yamey, Miyazaki-Krause, Gunn, & Reeder, 2018). These limitations will likely be a significant impediment to successfully collect cost data from innovators as many of the innovators will not have expertise to use tools such as LiST. Furthermore, given the diversity of innovations, tools such as P2I, iHTP, and CorePlus are not flexible enough to capture data from a wide range of innovations. **This highlights an important gap that could be filled by an innovator-friendly costing tool, which is flexible, and easy to use under minimal supervision with mixed cost-categories**.

To that end, **the Duke team developed a new Excel-based Costing Tool that is particularly relevant and useful for SL@B innovators and other innovators in the healthcare space**. The tool was developed through an iterative process that included frequent consultations with SL@B innovators to reach a deep understanding of the types of cost data used in their financial documents, and the typical cost categories they use. The team then designed the tool to mirror these cost categories, thereby offering familiarity and ease of use. In addition, the tool is flexible enough to be adapted by users such as governments, NGOs, project planners, and funders/donors.

Selected SL@B innovators pilot tested the tool and provided feedback that informed the development of the tool. Figure 1 is a snapshot of what the tool is capable of, including reasons why an innovator may choose to use it.

Figure 1: Costing Tool for Innovators: What It Is and Is Not, and Why

What this tool IS

- Excel-based cost collection template targeting health innovators
- Template to collect historical costs of innovation implementation
- Template to project costs for future implementation
- Template to list assumptions of cost projections

What this tool IS NOT

- Template for revenue data collection
- The only resource to collect cost data

Why use this tool

- To more clearly communicate costs between innovators and funders
- To systematically capture both historical and future innovation implementation costs
- To help inform plans for future growth and expenditures of the innovation
- To help identify areas for further economic, technical and financial support

The cost data collected via the Costing Tool was used **to conduct a cost-effectiveness analysis (CEA)** of select SL@B innovations. Conducting economic evaluations is necessary to understand the population-level impact of each innovation (measured as cost per life saved and cost per years of lives saved). Therefore, **the costing of the select grantees has benefits for both the innovators as well as other stakeholders, including but not limited to SL@B funders, implementation countries, and regional governments**. The costing tool also better informs and prepares the expansion of the innovations and possible future innovation award. Figure 2 shows the benefits of costing for health innovators and funders:

Figure 2: Value Proposition for Innovators and Funders

Innovators	Funders
• Captures historical costs and future costs of implementation of the innovation at scale • Supports planning and prioritizing allocation of resources for future growth of the project • Captures yearly costs of project implementation, required for conducting a CEA • Identifies economic data gaps that need technical support	• Better understand the financial viability of an innovation before supporting scale-up • Better understand the impact of an innovation per unit of expenditure • Better understand the potential cost challenges during future expansion and scale-up of an innovation • Better understand implementation costs under different scale-up scenarios

1 INTRODUCTION

Saving Lives at Birth (SL@B) is a Global Health Grand Challenge funded by a consortium of donors including the United States Agency for International Development (USAID), the Norwegian Agency for Development Cooperation (NORAD), the Bill and Melinda Gates Foundation (BMGF), Grand Challenges Canada (GCC), the U.K. Department for International Development (DFID), and the Korea International Cooperation Agency (KOICA). Since its launch in 2011, **SL@B has funded 116 unique innovations focused on reducing maternal and neonatal mortality**. The SL@B portfolio spans different types of innovations: devices and diagnostics, mHealth solutions, drugs and vaccines, and service delivery approaches. These innovations are funded under three grant categories: seed – to support development of early stage ideas; validation – to test the effectiveness of an innovation, and transition-to-Scale (TTS) – to support scaling of an innovation (Lalli, et al., 2018). The Duke University team was tasked with measuring the effectiveness and impact of SL@B innovations. The team decided to conduct cost-effectiveness analysis (CEA) of the implementation of the innovations during the scale-up period to measure the impact of the innovations.

CEA requires two important pieces of information – cost data of the current and future implementation of the innovation, and lives saved estimates. **SL@B TTS innovations were the focus of cost data collection given they are in a position to provide historical data as well as projections of future costs to scale to the national level**.

The TTS SL@B innovators were not required to provide scale-up cost projections as part of their project deliverables. They were only required to provide annual budget requests, which do not necessarily reflect actual overall expenditures incurred while implementing the project. Moreover, budget data only provides proposed cost information for the grant period, which can be up to two to four years. If an innovator plans to take the innovation to scale, it is imperative to forecast the cost of future implementation and scale-up which may go beyond the funding period.

The Duke team learned that there's not a consummate tool to collect the necessary cost data discussed above. To address this gap, the team developed an Excel-based tool to enable innovators to collect historical cost data and make projections of costs required for national scale-up of their innovations. The tool has flexible features that allow using reasonable assumptions to project costs over into the future until 2030, which aligns with the Sustainable Development Goals (SDG) timeline. In addition to the flexibility, the tool is easy to use under minimal supervision and able to accommodate mixed cost-categories. The cost projections made using the tool could help SL@B and other healthcare innovators and funders assess the viability of a proposed scale-up strategy.

The Duke Team developed an Excel-based tool to enable innovators collect historical cost data and make projections of costs required for national scale-up of their innovations.

2 DEVELOPING A COSTING TOOL FOR SL@B INNOVATIONS

Based on our experience collaborating with SL@B innovators, they generally have limited time and resources for estimating project costs. Therefore, **the Duke Team designed a costing tool that does not require a lot of time for training and assistance**. We aimed to have cost categories similar to the categories used by the innovators in their SL@B budget documents. In addition, most innovations based in low-and-middle income countries have limitations in accessing internet, and hence can face challenges using software-based costing tools that require certain computer specifications or an internet connection. Therefore, **the newly developed tool was designed as low-tech to improve acceptability and uptake**. Furthermore, the tool is flexible enough to allow cost data entry in varied categories given that healthcare innovations span different types of innovations, ranging from devices and diagnostics to service delivery approaches. The tool also provides a platform to capture assumptions related to implementation costs. Therefore, the costing tool reflects the following priority criteria in order to be useful for SL@B and other healthcare innovators:

1. Could be used with minimal supervision and training
2. Cost categories that can be easily populated based on data that is currently collected by the innovators
3. Flexible enough to include mixed categories of interventions given the diversity of innovations
4. Usable on a computer without an internet connection with minimal computational requirements

A literature review was conducted to understand the existing tools used for cost data collection for health interventions. Several tools reviewed can perform costing for a range of complex interventions, and some of these tools are automated and connected to many WHO databases making calculations efficient for the users who have expertise in using these tools. However, none of the tools satisfy all the criteria identified above to collect cost data for SL@B innovations. For example, tools like **P2I and iHTP** developed by WHO's Special Programme for Research and Training in Tropical Diseases are focused on clinical interventions, but not all innovations are clinical. SL@B funds a diverse set of innovations, therefore, these tools might have a limited use for certain SL@B innovators/ other healthcare innovators, and are likely to require significant retrofitting. iHTP is software-based and requires a clinical expert and a lot of technical assistance before it could be used by innovators without the required expertise (WHO, 2019). The main barrier identified with iHTP is the fair amount of training required prior to use. P2I is an Excel-based tool, but it has a specific focus on financing Research & Development costs for health products which does not encompass all the stages of a SL@B/other healthcare innovation's pathway. In addition, P2I is a portfolio costing tool, not an organizational costing tool (Terry, Yamey, Miyazaki-Krause, Gunn, & Reeder, 2018). Therefore, these tools were deemed difficult to use to collect cost data for innovations that do not fit into their focus areas.

Another tool the Duke team examined was the **CorePlus tool**. This is a spreadsheet-based tool developed by Management Sciences for Health with a minimal training requirement. The tool caters mainly to costing primary health care interventions, possibly creating impediment for some innovations that are implemented at tertiary level hospitals (MSH, 2019). Another spreadsheet-based tool is the **Costing and Budgeting Framework (PCBF)**, also developed by Management Sciences for Health which is flexible for all kinds of health interventions, but requires the user to input all the activities and categories into the tool by themselves (MSH, 2019). This process increases innovators' workload and effort to use the tool.

Finally, we examined the **Lives Saved Costing Tool (LiST)** which is currently an extensively used tool by a diverse set of users such as governments, donor agencies, NGOs, program managers, etc. (Johns Hopkins Bloomberg School of Public Health, 2019). LiST is a tool with many strengths which makes it very popular among its peers. The LiST Costing Module follows simple ingredients-based cost categories to calculate the intervention's as well as the overall program's cost.[1] It also provides automated output in the form of time series for intervention cost and program cost. Given its extensive features, LiST requires a steep learning curve that makes it cumbersome for innovators or other non-experts to use.

1: Program cost refers to the expenditure incurred in areas not directly related to the intervention such as infrastructure, monitoring and evaluation, advocacy, transport, etc.

To address the identified gaps, the Duke team used the above-mentioned criteria to develop an innovator-friendly excel-based tool. Figure 3 summarizes the basic principles that were followed while creating the new cost collection tool.

Figure 3: Building Blocks of the New Costing Tool

In addition to creating the tool based on the building blocks shown in Figure 3, cost categories identified from SL@B innovators budget documents and interviews were used to ensure innovator familiarity with cost categories to enable them to easily populate the tool. Although the Costing Tool was designed for SL@B innovators, it is flexible enough for other projects and non-SL@B innovations.

SALIENT FEATURES OF THE NEW COSTING TOOL

- **Contains clear instructions** to use and record cost data, based on the relevant allocation of indirect costs (rent, utilities, insurance, marketing, etc.) and the direct costs (material, labor, equipment, training, travel, etc.).
- **Captures historical costs** of implementation of the project and **future implementation costs** until year 2030 with different parameter assumptions.
- **Produces visualizations of cost inputs** for better understanding of variations in costs across multiple years and cost categories.
- Flexible enough to **allow varying levels** of beneficiaries, procedures, and number of users, consistent with the innovators' program and expenses.
- **For long-lasting assets**, such as facilities, machinery, vehicles etc., the tool allows the **inclusion of their economic life** (or the rate of depreciation of the asset per year) and the anticipated costs of replacement (if the year of replacement falls before 2030).
- **Provides options for innovators to enter all/any assumptions made** while entering the cost data in the "assumptions" sheet of the tool.

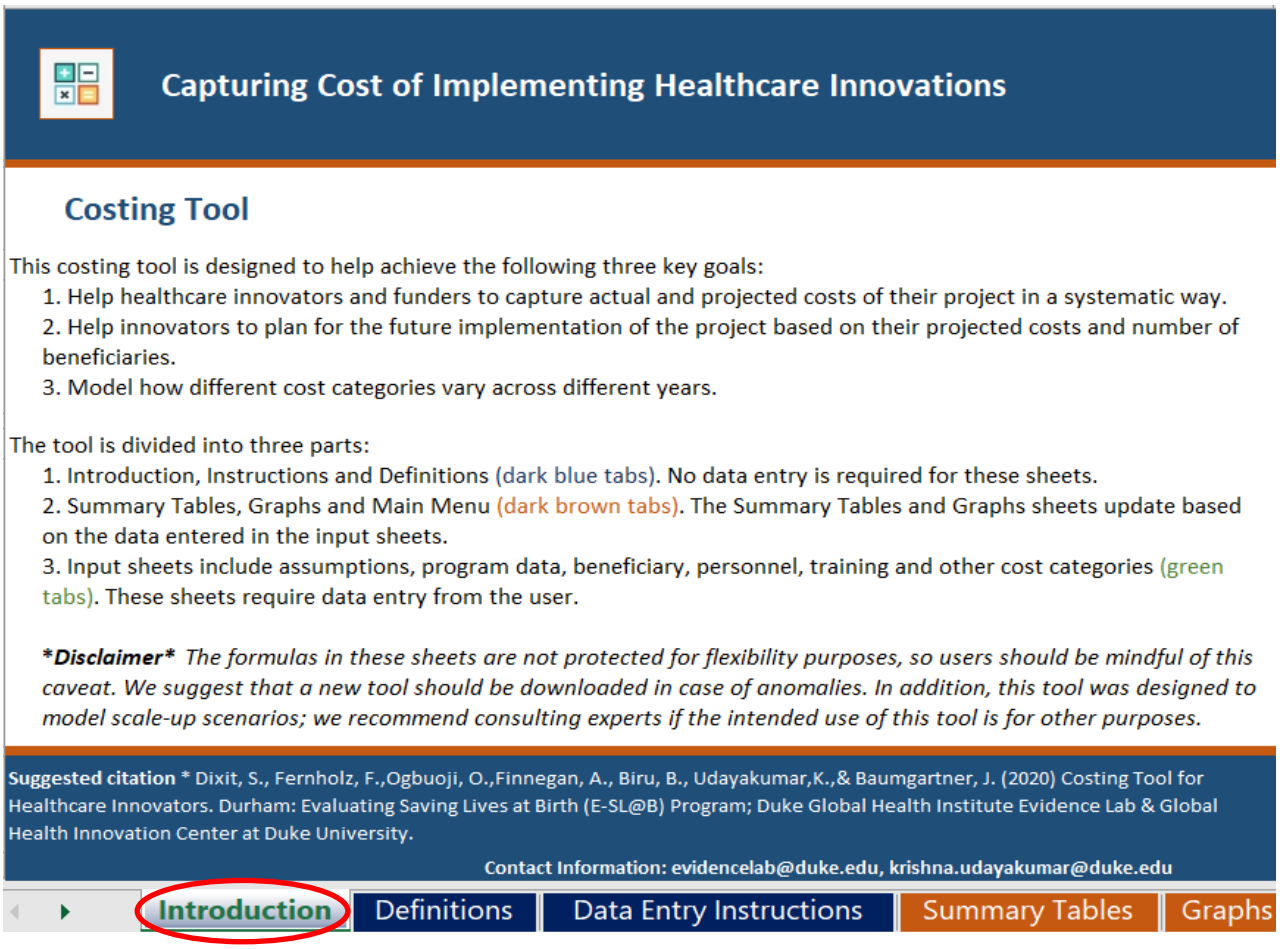
LIMITATIONS OF THE NEW COSTING TOOL

- As a cost collection tool, it **does not have the ability to collect project revenues**. However, users could modify the tool to include an option for capturing revenue data as well.
- It does not have the ability to conduct CEA. CEA needs to be performed separately using the collected cost data.
- All the data, including assumptions do not automatically get generated; they need to be entered manually.
- The tool is generic and flexible for different kinds of innovators to capture cost data during their scale-up. Therefore, it does not constrain or guide an innovator when to increase or decrease the cost during the scale-up.
- The tool currently **can only model one scenario**. However, an innovator can make copies of the tool and can populate different scenarios of scale-up in different copies. The innovator can then use the summary tables and graphs to make comparisons of different scale-up strategies.
- Most SL@B innovators found the costing tool easy and intuitive to use. However, the main challenge many innovators faced was with the **projection of the cost data during the expansion phase of the innovation**. This requires technical support to help innovators think through different scale-up scenarios and how these scenarios might impact the cost projections.

3 ILLUSTRATION OF THE NEW COSTING TOOL FOR INNOVATORS

This section describes and visually illustrates the Costing Tool. The first tab as shown below in Figure 4 is comprised of an introductory page that guides innovators on how to use the Tool.

Figure 4: Introductory Page of the Costing Tool



Source: (Dixit, et al., 2020)

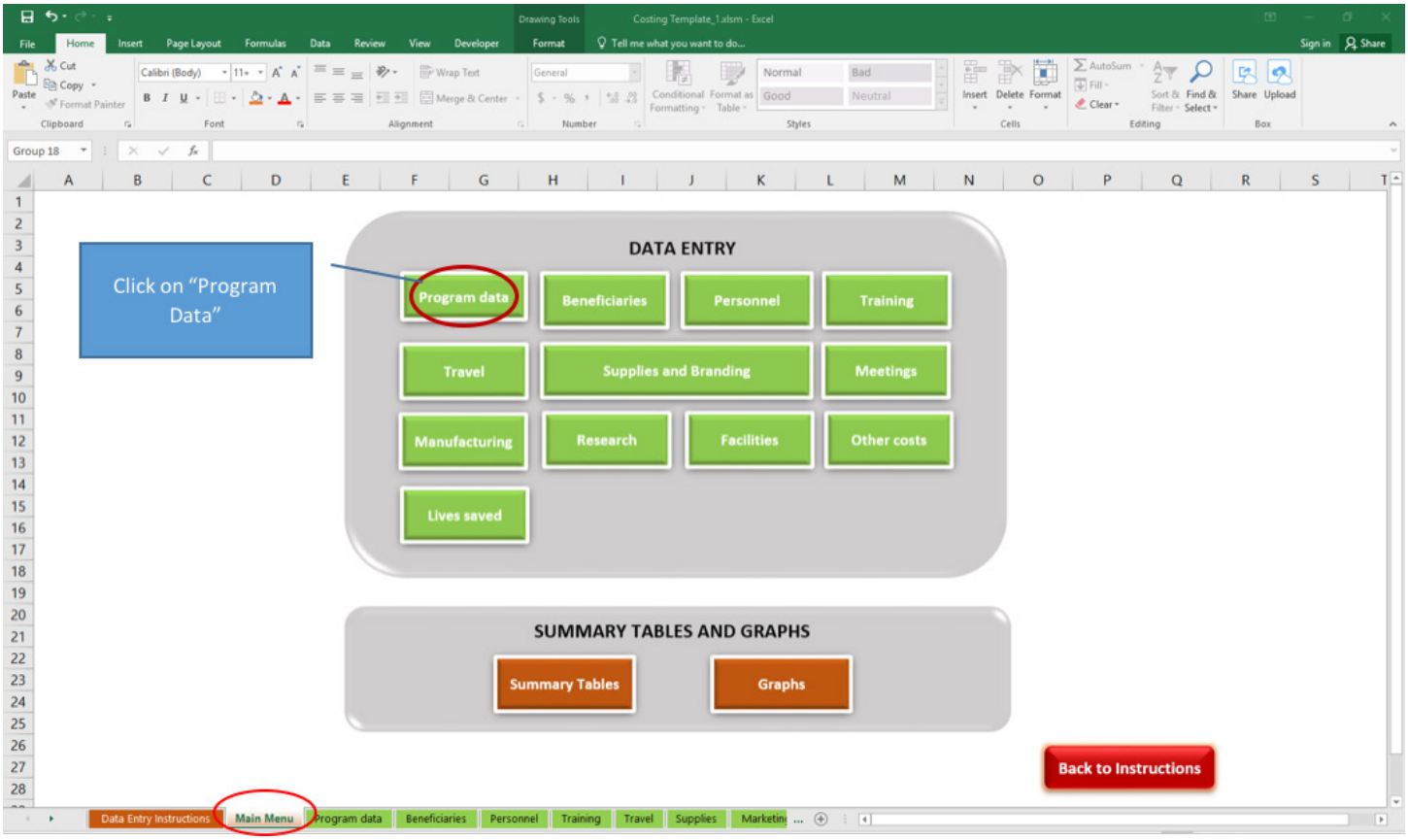
HOW TO USE THE NEW COSTING TOOL

The following are step-by-step instructions on using the costing tool:

Step 1 (Figure 5):

- Go to "Main Menu" sheet of the costing tool.
- Then, click on the green button named "Program data".

Figure 5: Main Menu Sheet

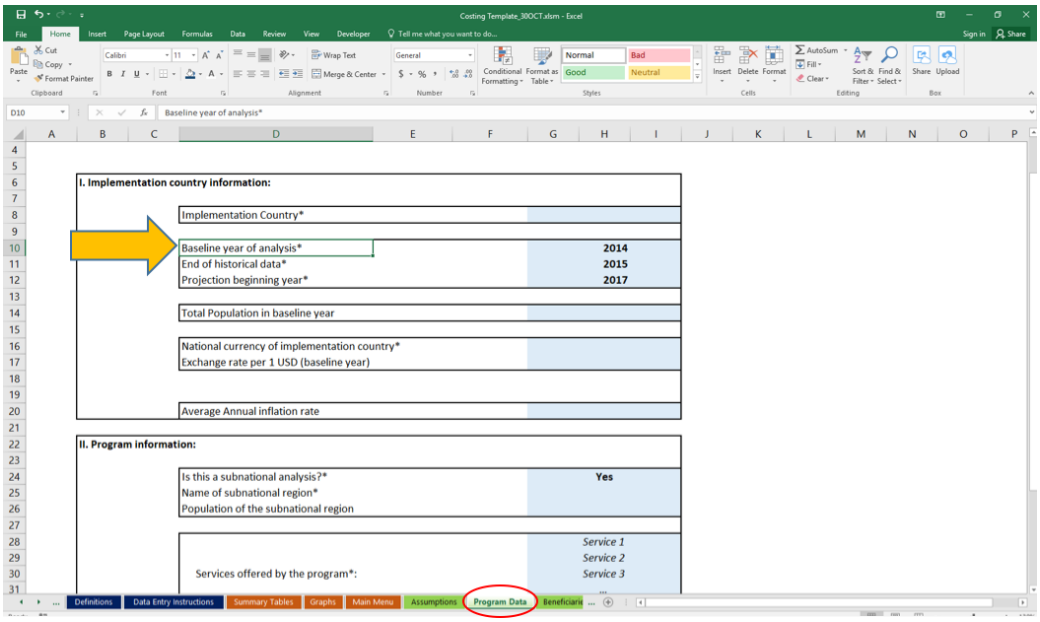


Source: (Dixit, et al., 2020)

Step 2 (Figure 6):

- When you are in the "Program Data" sheet, fill in the required fields including implementation country, baseline year of analysis, end of historical data, projection beginning year, and other program information. **Note**: You should not forget to choose "Baseline year of information" as it is an important parameter for automatic calculations in other sheets.
- After you have entered the information in "Program Data" sheet, click on "Back to Main Menu", red button in "Program Data" sheet. This will take you back to the "Main Menu" sheet.
- **Note**: The tool is designed in such a way that the final year of cost projection is always 2030 irrespective of whatever year you choose in "Baseline year of analysis".

Figure 6: Program Data Sheet

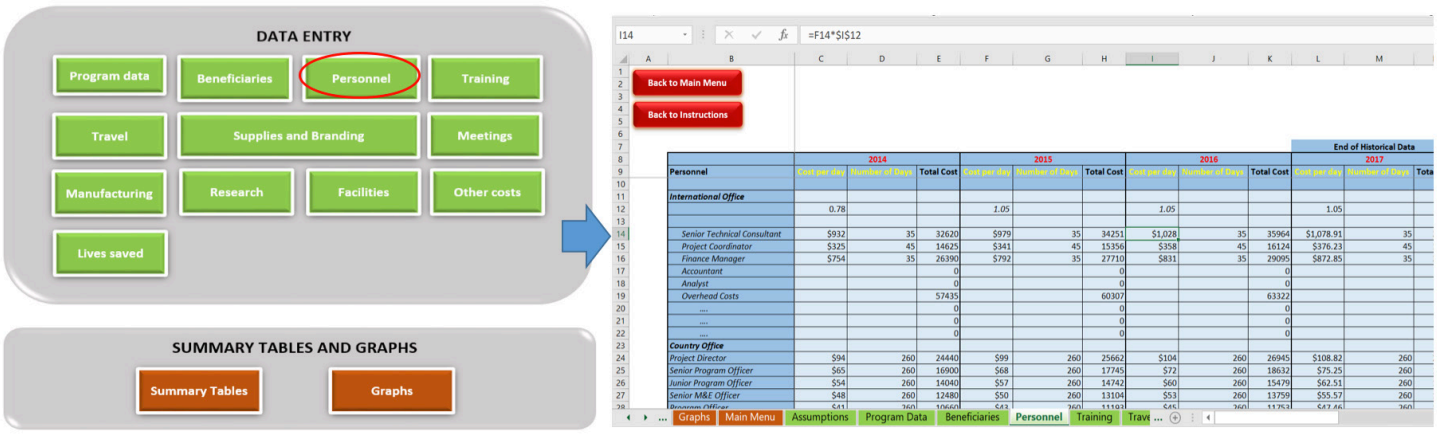


Source: (Dixit, et al., 2020)

Step 3 (Figure 7):

- In the "Main Menu" sheet, click on a category- green button- for which you want to enter data. For example, if you want to input cost information for project personnel (e.g. CEO, manager, nurse, community health worker), you click the "Personnel" green button which takes you to the personnel sheet where you enter the cost data for salaries and number of days for different levels of staff employed in various years.
- **Note**: Data should only be entered in light blue colored cells.
- There are spaces with "…" in the personnel tab to allow additional other staff positions specific to a project that are not already pre-populated in the sheet.
- When necessary, additional rows under the rows marked with "…" can be inserted.
- For each year, information for cost per day and number of days worked by different staff members (e.g. CEO, manager, nurse, community health worker) needs to be provided.
- After you have filled the "personnel" sheet with maximum available information, hit "Back to Main Menu" red button to come back to the "Main Menu" sheet.

Figure 7: Data Entry Sheet- Personnel Category



Source: (Dixit, et al., 2020)

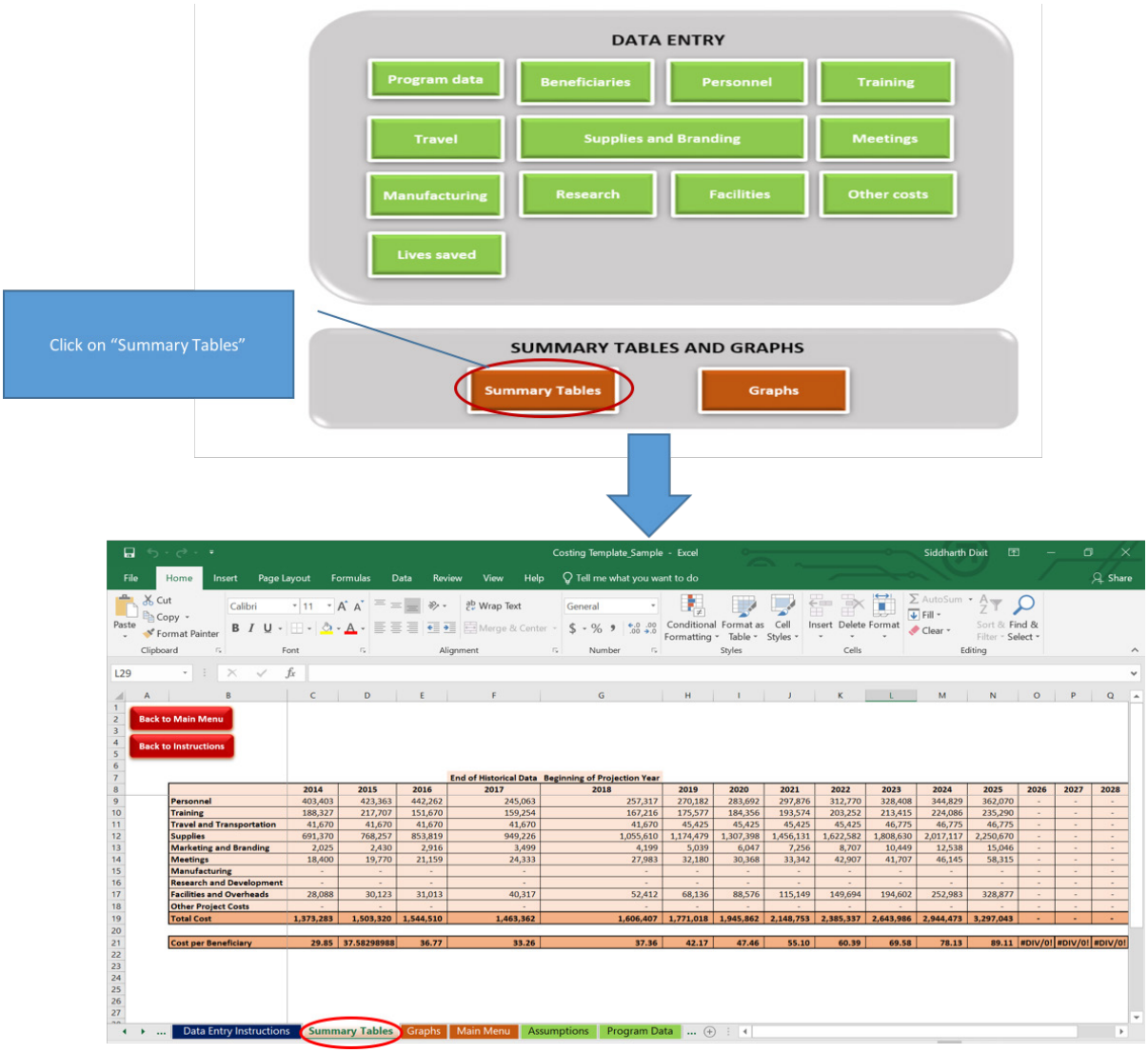
Step 4:

- When you are back in “Main Menu”, click on another category (green button) for which you want to enter data and proceed with the data entry.
- Every sheet follows similar procedures for data entry as explained for “Personnel” in Step 3.

Step 5 (Figure 8):

- After you have completed DATA ENTRY for all the cost categories including the beneficiary sheet, go back to “Main Menu”. There, you can click on “Summary Tables” (brown button) to review the consolidated costs for each cost category.

Figure 8: Summary Tables



Source: (Dixit, et al., 2020)

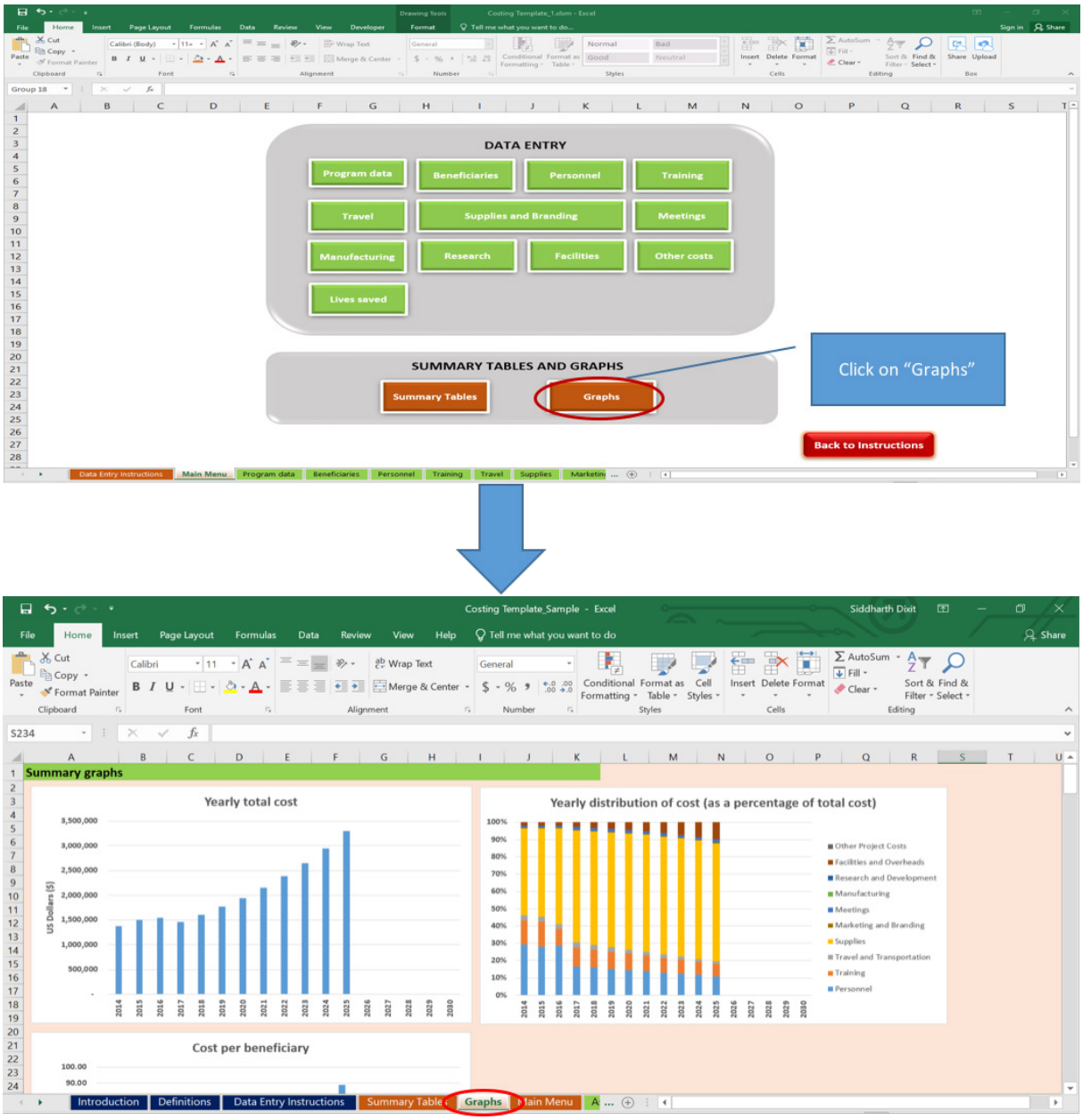
6.

Step 6 (Figure 9):

- You can look at the default graphs plotted using the data from the “Summary Tables” sheet by clicking on “Graphs” button in the “Main Menu” sheet.

The Duke team found that the graphical illustrations of the costing data produced by this Costing Tool are very helpful for facilitating discussions within innovation teams and their stakeholders about the financial aspects of scaling-up an innovation.

Figure 9: Data Visualization/ Graphs



Source: (Dixit, et al., 2020)

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Duke Global Health Innovation Center

The Duke Global Health Innovation Center's (GHIC) mission is to study and support the scaling and adaptation of innovations and related policy reforms, to address critical health challenges worldwide. The GHIC strives to have an impact on healthcare through scaling of health innovations, promoting policy and regulatory changes, and implementation projects in health systems. The GHIC links global health, health policy, and health innovation efforts across Duke University.

Duke Global Health Institute Evidence Lab

The Duke Global Health Institute (DGHI) Evidence Lab blends theory and practice and draws upon the research and policy expertise across Duke University to inform evaluations and to disseminate new evidence to policymakers, donors and diverse stakeholders to inform decision-making. With deep, on-the-ground knowledge and experience with a wide range of global health projects, our team offers research and practice-based understandings of regional health challenges. A core principle of the DGHI Evidence Lab is to strengthen the evaluation capacity of local project counterparts on collaborative projects.

Duke Center for International Development

The Duke Center for International Development (DCID), a unit within Duke University's Sanford School of Public Policy, advances international development policy and practice through interdisciplinary approaches to postgraduate education, mid-career training, international advising and research. DCID faculty and staff continuously strive to create programs that meet the specific needs of each client and student.

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