NATIONAL OPTIMIZED TREATMENT COSTING TOOL

USER'S GUIDE

JULY 2017

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I. ACRONYMS

ACT	Acceleration of Children's HIV/AIDS Treatment Initiative
APR	Annual Progress Report
ART	Antiretroviral Therapy
ARV	Antiretroviral Drugs
CBCTS	Community-Based Care, Treatment and Support
CBTC	Community-Based Testing and Counseling
CDC	Center for Disease Control and Prevention
COP	Country Operational Plan
DOD	Department of Defense
EA	Expenditure Analysis
EATAP	Expenditure Analysis Technical Assistance to Partners
FBCTS	Facility-Based Care, Treatment and Support
FSW	Female Sex Workers
HSS	Health Systems Strengthening
HTC	HIV Testing and Counseling
KP	Key Population
LAB	Laboratory
M&O	Management & Operations
MAT	Medication Assisted Therapy
MSMTG	Men Who Have Sex with Men and Transgender
OI	Opportunistic Infections
OTC	Optimized Treatment Costing tool
OVC	Orphans and Vulnerable Children
OVP	Other Vulnerable Populations
PBAC	PEPFAR Budget Allocation Calculator
PEP	Post Exposure Prophylaxis
PEPFAR	President's Emergency Plan for AIDS Relief
PITC	Provider-Initiated Testing and Counseling
PMTCT	Prevention of Mother to Child Transmission
PP	Priority Populations
PREV	Prevention
PWID	People Who Inject Drugs
RTK	Rapid Test Kits
SI	Strategic Information
UE	Unit Expenditure
USAID	United States Agency for International Development
USG	United States Government
VCT	Voluntary Counseling and Testing
VMMC	Voluntary Medical Male Circumcision

II.   INTRODUCTION

The National Optimized Treatment Costing (OTC) tool is a tool designed to calculate total and unit costs of different optimized treatment scenarios for antiretroviral therapy (ART). When national level data are entered, the tool can help policymakers undertaking overall national strategic planning. The primary intent of the OTC tool is to serve as a user-friendly tool where cost data from ongoing studies and/or expenditure data can be used to build, compare and conduct analyses.

The tool is designed to answer questions such as:

- Where will cost savings occur when treatment scenarios are changed?
- Which optimized treatment scenario provides the greatest cost savings?
- What is the total projected cost for different treatment scenarios annually for the next five years, by patient type (with sub-totals for key components)?
- What is the overall unit cost by patient type for different treatment scenarios?

The tool *cannot* answer questions such as:

- What is the most **cost-effective** optimized treatment scenario? (i.e., new HIV infections are not calculated)
- What is the impact of optimized treatment scenarios on numbers of people requiring treatment? (i.e., there are no parameters regarding continuation, lost-to-follow-up, etc. – all patient populations are provided by the user)
- What is the impact of optimized treatment scenarios on the ARV pipeline required? (e.g., switching from monthly to quarterly ARV supply)

The OTC tool compares the cost of a "Current" scenario with the cost of up to three different user-specified optimized treatment scenarios. There are several steps in setting up the tool. First, the "Current" practice scenario is specified for each of five policy levers (Task allocation for facility-level provider visits, Visits, Laboratory tests, Antiretroviral drugs (ARVs), and Other commodities). Then, up to three optimized treatment scenarios are specified for each of the five policy levers in their individual worksheets. Finally, in the "Inputs-Scenario selection" tab, the user can mix and match among the five policy levers to create up to three different overall scenarios. This allows for a great deal of flexibility, as there are many different combinations possible among the five policy levers. For example, one overall scenario could be a combination of all of the second "optimized treatment" scenarios (Task allocation #2, Visits #2, Labs #2, ARVs #2, Other #2) while a second overall scenario could utilize a mix of "optimized treatment" scenarios (e.g., Task allocation #1, Visits #2, Labs #3, ARVs #1, Other #3). The outputs from the three overall scenarios are then compared with the outputs from the "Current" scenario. Outputs includes total cost and unit cost/expenditure, disaggregated by key components and by patient type (newly initiating, stable, unstable for each of adults, children, PMTCT clients, and key populations). The OTC tool was developed under the technical guidance of the EATAP management team; input was also provided by many teams at USAID.

Data requirements include (see Figure 1):

Figure 1: List of required data

Program data
1. Number of patients for five years, by patient type (newly initiating, stable, unstable for each of adult, pediatric, PMTCT and key populations)
2. Number and type of service delivery visits per year for "Current" and for up to three "Optimized" scenarios by patient type (some of the "Optimized" scenarios may be the result of policy discussion rather than actual data)
3. Number and type of lab tests per year for "Current" and for up to three "Optimized" scenarios by patient type (some of the "Optimized" scenarios may be the result of policy discussion rather than actual data)
4. Regimen mix for ARVs per year for "Current" and up to three "Optimized" scenarios by patient type (some of the "Optimized" scenarios may be the result of policy discussion rather than actual data)
5. Amount of "Other commodities" (e.g., condoms, cotrimoxazole) per year for "Current" and up to three "Optimized" scenarios by patient type (some of the "Optimized" scenarios may be the result of policy discussion rather than actual data)
Cost/Financial Data
6. Number of minutes by cadre for facility-based provider visits for "Current" and up to three "Optimized" scenarios by patient type (some of the "Optimized" scenarios may be the result of policy discussion rather than actual data)
7. Wages by cadre including benefits and training costs
8. Unit cost of all service delivery visits (non-wage facility visit unit costs, other visits as specified)
9. Unit cost of ARVs, lab tests and other commodities
10. Previous Unit Expenditures for FBCTS, PMTCT and CBCTS (for comparison purposes)

The purpose of this User's Guide is to outline, step-by-step, the process of entering inputs and generating results using National OTC. Users are encouraged to maintain careful notes and input these notes into the relevant sections of the "Notes Page" so that there is a clear justification for each assumption and also so future users of the tool can better understand how previous estimates were developed. Each worksheet has a Notes section associated with it.

III. GETTING STARTED

III.1 Background

National Optimized Treatment Costing (OTC) tool is an Excel workbook   The tool is used in conjunction with data gathered from facility visits and implementing partners, as well as other sources. In addition, note that cost data from ongoing studies and/or expenditure data can be used to build and/or compare scenarios.

Please note that all figures presented in this User's Manual are presented for illustrative purposes only and are not based on any actual budgets, unit expenditures, targets or pipeline figures. Also, the

workbook is protected; data can be entered in the light blue cells, while all other cells are protected and cannot be modified.

III.2 Navigation

OTC contains the following twelve worksheets:
- Instructions
- Acronyms
- Task allocation
- Visits
- Labs
- ARVs
- Other comm
- Input-Pop&Costs
- Inputs-Scenario selection
- Summary
- Unit Costs
- Notes

The tool was designed so that users input data moving from left to right; once this process is completed, the final tabs are used for creating scenarios and displaying output. As such, at the beginning of the application the user should first glance quickly at the "Inputs-Scenario selection" tab, in order to get an idea of how the scenarios will be created and manipulated, and then return to the beginning of the workbook to begin filling in the data.

Section IV below contains details about each of the input tabs, while Section V describes both the "Inputs-Scenario selection" tab, including how to vary selections, and the material in the output tabs.

IV.   INPUT WORKSHEETS

This section provides more detail about the different input worksheets in OTC. A summary of all of the worksheets is first provided, followed by a detailed description for each individual worksheet of the data requirements and data input procedure.

IV. 1 Summary of worksheets

The first two worksheets—*Introduction* and *Acronyms* - are fixed and should not be altered by the user. The *Introduction* worksheet provides basic user instructions. The *Acronyms* worksheet provides a summary of all acronyms used throughout OTC.

Worksheets three to seven record the data for current treatment practice and defines up to three optimized treatment scenarios for each of the five policy levers. Worksheet eight records number of patients by patient type for five years; salaries for clinical staff; and all other unit costs for visits and commodities used in the tool. Examples of data sources include primary data from service providers, e.g., data on costs and service utilization, and macro-level policy documents that contain information, e.g., data for national targets for adults on ART. Note that, even if some variables are set to zero, the

model will still calculate results (e.g., staff wages set to zero will then result in personnel costs equal to zero for provider visits).

Worksheet nine ("Inputs-Scenario selection") allows the user to create up to three different optimized overall scenarios by altering any one (or all) of the following key policy levers: task shifting of clinical staff at the facility; types and numbers of service delivery visits; types and numbers of laboratory tests; distribution of ARV regimens within a population group; and use of other treatment commodities such as non-ARV drugs. The background optimized treatment scenario choices for each of these levers are defined in their respective worksheets (worksheets three to seven, described immediately above).

Worksheets ten and eleven display the results of the analysis. In "Summary," total costs for the five years are displayed, disaggregated by patient type and also by key cost components. In "Unit Costs," the calculated unit costs for all four scenarios ("Current" plus the three "Optimized" scenarios) by patient type are compared.

Worksheet twelve, *Notes,* is where documentation for individual worksheets is recorded; e.g., the basis or the source for the data might be entered here. Worksheets three to eleven contain a "Notes page" button, located at the top left. By clicking on the "Notes page" button, the user will be taken to the *Notes* worksheet which contains a worksheet-specific space for documenting notes. Once notes have been completed, there is a "Return" button in the *Notes* worksheet which takes the user back to the original worksheet.

IV. 2 Individual policy lever worksheets

The following worksheets - *Task allocation; Visits; Labs; ARVs;* and *Other comm* - are where data should be entered representing current treatment practice, and where different optimized treatment scenarios (up to three) are defined. Default lists of personnel types, number and type of visits, laboratory tests, ARVs, and other commodities have been provided in the top ("Current") panel, but can be modified by the user. These lists are then utilized in the different optimization scenarios below; that is, they cannot be altered in any of the three optimized scenarios below, and initial default values are also harmonized with the top panel.

Please note: If the impact of a new technology is to be examined in any of the lower panels (e.g., new personnel type, ARV drone delivery), it must be included in the initial list in the top panel.

Data to populate the different optimized scenarios can be derived from a number of sources:
- Primary research gathering data for the sole purpose of populating OTC
- Data (including time-use data) from ongoing studies (e.g., those conducted by EQUIP, etc.)
- Data (including time-use data) gathered in-country for another purpose that can be adapted
- Data (including time-use data) gathered in another country that can be adapted
- Data derived from the published literature
- ART treatment and other guidelines (e.g., WHO, PEPFAR, etc.)
- Input from expert groups gathered to provide input into possible treatment scenarios

Since some of the optimized treatment approaches may be new, there may not be actual data measuring the proposed approach. Thus expert group input may be a good source, both for validating existing data assumptions and for developing data for use in the new approaches.

Worksheet three: Task allocation

This worksheet records the staff time (in minutes) required to deliver treatment services for a provider visit at a facility to one patient for one visit (see Figure 2).. Data are recorded by different population groups (Adult ART; Pediatric ART; PMTCT; and Key Populations) and by patient type (Newly initiating on ART; Stable on ART; Unstable on ART). Data for this worksheet can be gathered from individual facilities within the country, e.g., by asking staff directly the average time they spent during a visit. If data are collected for multiple facilities, then staff time can be averaged across the facilities. In addition, other data sources may be able to provide these data, such as studies in the literature or possibly national data sources.

Figure 2: Task allocation at facility for one provider visit: Current and optimized scenarios

Column A reflects the different staff cadres involved in delivering services; since the cells are in light blue, labels can be edited to reflect each country setting. The first set of data (rows 8 to 25 under the heading "Current Practice") is entered in columns B through N representing the current treatment scenario, for each patient type. So, for example, the data above show that doctors spend 20 minutes for each provider visit at a facility for each patient type in the "Current Practice" scenario.

The three subsequent panels allow the user to define up to three different optimized treatment scenarios. As described above, staff cadre labels cannot be changed, however the values in columns B through N can all be changed for all three scenarios; note that the initial values are programmed to reflect the values from the "Current" scenario.

Note that the name of each optimized scenario should be entered into its respective cell (e.g., for the first optimized scenario it is cell B27, shown in Figure 2 above), while a more complete description of the scenario should also be entered in its respective cell (e.g., for the first optimized scenario it is cell G27). The names and descriptions of the optimized scenarios will be used later when setting up the overall scenarios and examining outputs to identify the various results. Data sources for the optimized scenarios include primary data collection carried out for this application, as well as data that might be available from other studies (e.g., data from EQUIP studies, etc.), official guidance documents or expert groups. Note that, for this tab, time-use data are required, which are rare in the published literature.

The first optimized scenario in Figure 1, named "50% to nurses," shifts 50% of the doctor's time as shown in the "Current" scenario to the nurse, so that 10 minutes is deducted from the 20 minutes of doctor's time in the "Current" scenario (resulting in 10 minutes in the first optimized scenario), and 10 minutes is added to the nurse's time (resulting in 20 minutes in the first optimized scenario). Further details of scenario development are provided in Section V.

Worksheet four: Visits

This worksheet records the average annual number of service delivery visits per patient (by population group and by patient type) (see Figure 3). Data are gathered from all service delivery modes (e.g. clinic visits; pharmacy service delivery modes; community/outreach service delivery modes, etc.) within a country for the existing practice.

Data on the current annual number of visits are entered in columns B-N in rows 8-17 under the heading "Current Practice." For example, Figure 3 shows that the current treatment scenario for adult patients who are newly initiating ART is that they have, on average, 10 clinic visits, 2 Community adherence counseling visits, and 2 Other delivery visits in their first year.

The user can then define up to three different optimized treatment scenarios in the three subsequent panels. Again, data sources for these inputs include primary source data gathering to populate this tool, data from other studies (e.g., those conducted by EQUIP, etc.), official guidelines and expert groups. In this case, most likely ART treatment guidelines may help in determining new scenarios, along with expert opinion and any relevant data.

As described above for the "Task allocation" tab, labels should be entered both naming and describing the different scenarios. In the example provided in Figure 3, the name of the first optimized scenario is labeled "Decrease provider visits" in cell B:19. This scenario reduces the number of provider visits for everyone by 50%; the label for its description reads, "Provider visits are decreased by half" in cell G:19. Further details of scenario development are provided in Section V.

Please note one difference here compared to the other policy lever worksheets: "Provider visit" is fixed, i.e., it cannot be changed or written over (it is color-coded white, a protected cell, rather than light blue,

a data entry cell). This is because the values in the "Task allocation" worksheet apply to Provider visits, and as such there will always have to be that particular visit in order for the calculations to function properly.

Figure 3: Visits - Current practice and optimized scenarios

	Adult ART			Pediatric ART			PMTCT				Key Populations		
Facility type	Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	HIV Exposed Infants	Newly initiating	Stable	Unstable
Enter Current Practice of annual visits below													
Current Practice													
Provider visit	10	2	6	10	2	6	10	2	6	10	10	2	6
Facility ARV pickup													
Facility adherence counseling													
Community ARV pickup													
Community adherence counseling	2	5	3	2	5	3	2	5	3	2	2	5	3
ATM ARV delivery													
Drone delivery													
Other delivery	2	5	3	2	5	3	2	5	3	2	2	5	3
Other adherence counseling													
Other													
Enter up to 3 optimized treatment scenarios below. Remember to both name and describe each scenario in the appropriate box.													
Visits optimized #1 Decrease provider visits	<<Enter name of scenario here	Provider visits are decreased in half.											
	Enter scenario description here>>>												
Provider visit	5	1	3	5	1	3	5	1	3	5	5	1	3
Facility ARV pickup													
Facility adherence counseling													
Community ARV pickup													
Community adherence counseling	2	5	3	2	5	3	2	5	3	2	2	5	3
ATM ARV delivery													
Drone delivery													
Other delivery	2	5	3	2	5	3	2	5	3	2	2	5	3
Other adherence counseling													
Other													
Visits optimized #2 Default to Current #2	<<Enter name of scenario here	All initial values reflect Current Practice #2.											
	Enter scenario description here>>>												
Provider visit	10	2	6	10	2	6	10	2	6	10	10	2	6
Facility ARV pickup													
Facility adherence counseling													
Community ARV pickup													
Community adherence counseling	2	5	3	2	5	3	2	5	3	2	2	5	3

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Worksheet five: Labs

This worksheet records information on the average annual number of laboratory tests per patient, by population group and by patient type (see Figure 4). Data can be obtained from facilities, country policy or standard protocol documents, or other guidance documents. Entering zeroes will simply result in zero costs calculated for the lab tests subcategory.

Similar to the previous policy lever tabs, the names of the lab tests should be entered in Column A for the "Current Practice" scenario; these names will be repeated in the optimized scenarios below, so be sure to enter any new lab tests that might be coming available in the next five years that would be included in optimized scenarios. The number of annual laboratory tests according to the current treatment protocol are then entered in columns B-N in rows 6-15 under the heading "Current Practice."

The three subsequent sections enable up to three optimized scenarios to be defined. These scenarios can be based on newly-gathered data, new guidelines, expert opinion, etc. In the case of new lab tests coming available in the next five years, data are probably not available to enter into the optimized scenario specifications; sometimes even the manufacturer's documentation can be used to infer number, frequency and price of new tests. In the example provided in Figure 4, the name of the first optimized scenario is labeled "Reduced VL for Stable" in cell B:19. This scenario reduces the number of VL tests required by stable patients from two per year (as in "Current") to one per year. Further details of scenario development are provided in Section V.

Figure 4: Laboratory tests - Current practice and optimized scenarios

Worksheet six: ARVs

In this worksheet the percentage of patients on different treatment regimens are entered for each patient type (see Figure 5). These data are calculated from patient data gathered at the facility level or from other guidance documents. If no ARVs are being purchased, zeroes should be entered everywhere, and the results will display zero costs for the ARV subtotal (i.e., the tool will still display results for other subtotals, as well as totals).

The default labels for the first four regimens are "Adult 1st line," "Adult 2nd line," "Pediatric 1st line," and "Pediatric 2nd line." Given the rapidly changing ARV landscape, this worksheet explicitly makes room to enter up to four new 1st line regimens (3 adult, 1 pediatric) and two new 2nd line regimens (1 adult, 1 pediatric). Any of the names of the different regimens can be changed; note, however, that the designation of adult vs. pediatric needs to be maintained for calculation purposes.

This worksheet contains subsequent sections that enables up to three optimized scenarios to be defined. Data can be obtained from guidance documents or expert groups, or any other sources described above. As an example, the first optimized scenario in Figure 5 is labeled "20% to DTG" in cell B:19, that is, 20% of all adult patients will be switched to DTG; in this case, the percentage of all adults on the "Adult 1st line" in the "Current Practice" is reduced by 20 percentage points in the new optimized scenario. Further details of scenario development are provided in Section V.

Figure 5: ARVs - Current practice and optimized scenarios

		Adult ART			Pediatric ART			PMTCT				Key Populations		
	ARV type	Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	HIV Exposed Infants	Newly initiating	Stable	Unstable
2	the scenario in the indicated box to the left, as well as describe the scenario in the box to the right. Initial values for each optimized scenario are set to Current Practice.													
3	ANNUAL PERCENTAGE ON ARV 1st AND 2nd LINE ARV REGIMENS BY PATIENT TYPE													
6	In the first panel, enter Current Practice of percentage of patients on 1st line or 2nd line ARV regimens by patient type below. In the second and third panels, enter the names of possible future 1st line/2nd line regimens; these may be used in the optimized treatment scenarios below.													
7	Current Practice													
8	Adult 1st line	100%	80%	20%				100%	80%	20%		100%	80%	20%
9	Adult 2nd line		20%	80%					20%	80%			20%	80%
10	Pediatric 1st line				100%	80%	20%					100%		
11	Pediatric 2nd line					20%	80%							
12	Enter possible future 1st line ARV regimens below.													
13	DTG													
14	Other Adult 1st line #2													
15	Other Adult 1st line #3													
16	Other Pediatric 1st line #1													
17	Enter possible future 2nd line ARV regimens below.													
18	Other Adult 2nd line #1													
19	Other Adult 2nd line #2													
20														
21	Enter up to 3 optimized treatment scenarios below. Remember to both name and describe each scenario in the appropriate box.													
22/23	ARVs optimized #1	20% to DTG		<<Enter name of scenario here / Enter scenario description here>>>			Move 20% of all adult patients on 1st line to DTG (newly initiating, stable, unstable)							
24	Adult 1st line	80%	60%					100%	80%	20%		100%	80%	20%
25	Adult 2nd line		20%	80%					20%	80%			20%	80%
26	Pediatric 1st line				100%	80%	20%					100%		
27	Pediatric 2nd line					20%	80%							
28	DTG	20%	20%	20%										
29	Other Adult 1st line #2													
30	Other Adult 1st line #3													
31	Other Pediatric 1st line #													
32	Other Adult 2nd line #1													
33	Other Adult 2nd line #2													
34														
35/36	ARVs optimized #2	Default to Current #2		<<Enter name of scenario here / Enter scenario description here>>>			All initial values reflect Current Practice #2.							

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Note one characteristic unique to this worksheet. When the sum of the regimen percentages do not sum within a patient type, an error in red appears, "Sum≠100" (see Figure 6 below). This is to ensure that all patients are counted as receiving some kind of regimen.

Figure 6: Illustration of error when sum of regimen percentages does not equal 100

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Notes page							**Antiretroviral drugs**						
2	Instructions: Enter the percentage of patients on 1st line and 2nd line ARVs for each patient type below. The first panel should contain data regarding current practice; regimens may be entered and/or changed here, including possible future regimens. The next 3 panels allow data to be added for up to 3 optimized treatment scenarios . You should name the scenario in the indicated box to the left, as well as describe the scenario in the box to the right. Initial values for each optimized scenario are set to Current Practice.													
3		ANNUAL PERCENTAGE ON ARV 1st AND 2nd LINE ARV REGIMENS BY PATIENT TYPE												
4	ARV type	Adult ART			Pediatric ART			PMTCT				Key Populations		
5		Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	HIV Exposed Infants	Newly initiating	Stable	Unstable
6	In the first panel, enter Current Practice of percentage of patients on 1st line or 2nd line ARV regimens by patient type below. In the second and third panels, enter the names of possible future 1st line/2nd line regimens; these may be used in the optimized treatment scenarios below.													
7	Current Practice													
8	Adult 1st line	90%	80%	20%				100%	80%	20%		100%	80%	20%
9	Adult 2nd line		20%	80%					20%	80%			20%	80%
10	Pediatric 1st line				100%	80%	20%				100%			
11	Pediatric 2nd line					20%	80%							
12	Enter possible future 1st line ARV regimens below.													
13	DTG													
14	Other Adult 1st line #2													
15	Other Adult 1st line #3													
16	Other Pediatric 1st line #1													
17	Enter possible future 2nd line ARV regimens below.													
18	Other Adult 2nd line #1													
19	Other Adult 2nd line #2													
20		Sum ≠ 100%												
21	Enter up to 3 optimized treatment scenarios below. Remember to both name and describe each scenario in the appropriate box.													
22	ARVs optimized #1	20% to DTG		<<Enter name of scenario here				Move 20% of all adult patients on 1st line to DTG (newly initiating, stable, unstable)						
23				Enter scenario description here>>>										
24	Adult 1st line	80%	60%					100%	80%	20%		100%	80%	20%

Worksheet seven: Other commodities

In this worksheet the percentages of patients on other treatments are entered (see Figure 7). There are a few default treatments listed (e.g., cotrimoxazole) but there are many lines for users to enter other treatments, as these tend to be country-specific. The data can be gathered either from facility visits or from standard guidance documents. The worksheet contains subsequent sections that enables up to three optimized scenarios to be defined and named.

In the example provided in Figure 7, the name of the first optimized scenario is labeled "Add Isoniazid" in cell B:19. This scenario adds Isoniazid for all ART patients receiving Cotrimoxazole. Further details of scenario development are provided in Section V.

Figure 7: Other commodities - Current practice and optimized scenarios

	Other commodities	Adult ART			Pediatric ART			PMTCT				Key Populations		
		Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	Newly initiating	Stable	Unstable	HIV Exposed Infants	Newly initiating	Stable	Unstable
3	*ANNUAL PERCENTAGE RECEIVING OTHER COMMODITIES BY PATIENT TYPE*													
6	Enter Current Practice of percentage of patients receiving other commodities below													
7	**Current Practice**													
8	Cotrimoxazole	100%		100%	100%		100%	100%		100%		100%		100%
9	Fluconazole													
10	Isoniazid													
11	OI #1													
12	OI #2													
13	OI #3													
14	OI #4													
15	OI #5													
16	Condoms (Number)													
17	Other													
18	Enter up to 3 optimized treatment scenarios below. Remember to both name and describe each scenario in the appropriate box.													
19	**Other commodities**	Add Isoniazid		<<Enter name of scenario here			Add isoniazid to those receiving cotrimoxazole							
20	**optimized #1**			Enter scenario description here>>>										
21	Cotrimoxazole	100%		100%	100%		100%	100%		100%		100%		100%
22	Fluconazole													
23	Isoniazid	100%		100%	100%		100%	100%		100%		100%		100%
24	OI #1													
25	OI #2													
26	OI #3													
27	OI #4													
28	OI #5													
29	Condoms (Number)													
30	Other													
31	**Other commodities**	Default to Current #2		<<Enter name of scenario here			All initial values reflect Current Practice #2.							
32	**optimized #2**			Enter scenario description here>>>										
33	Cotrimoxazole	100%		100%	100%		100%	100%		100%		100%		100%
34	Fluconazole													
35	Isoniazid													
36	OI #1													
37	OI #2													

Sheet tabs: Instructions | Acronyms | Task allocation | Visits | Labs | ARVs | **Other comm** | Input-Pop&Costs | Inputs-Scenario selection | Summary | UE charts | Notes

(Header banner: "Other commodities". Instructions: Enter the percentage of patients using other commodities for each patient type below. The first panel should contain data regarding current practice; names can be entered or changed here. The next 3 panels allow data to be added for up to 3 optimized treatment scenarios. You should name the scenario in the indicated box to the left, as well as describe the scenario in the box to the right. Initial values for each optimized scenario are set to Current Practice. Light blue cells are data entry cells.)

Worksheet eight: Input-Pop&Costs

This worksheet requires inputs for patient populations and all cost-related data. There are seven different sections of data to be entered: patient population inputs, wages and benefits of clinical staff, clinic unit costs, other visit costs, costs of ARVs, costs of laboratory tests, and costs of other commodities. Note that there are no "Current" vs. "Optimized" values for these data; there is only one constant value.

The first step is to specify the first year of the projection in cell B3 (see Figure 8).

In order to enter the patient population, enter the actual numbers for each patient population where specified. Note that, in either case, the number of Key Population patients must be entered in the final panel where specified (line 39).

In all cases, the percentage of each population group on the different regimens is required; note that the ARV regimen for HIV Exposed Infants is assumed to be the Pediatric 1st line ARV regimen.

Figure 8: Patient population inputs

Notes page	**Inputs for Patient Populations and Cost Data**				

Instructions: Inputs for patient populations and all cost-related data should be entered here. First, specify the first year of the projection (cell B3). Then there are six different sections: I. Population inputs, II. Wages and benefits of clinical staff, III. Other visit costs, IV. ARVs, V. Laboratory tests, and VI. Other commodities. Each section begins with instructions specific to that section. Light blue cells are data entry cells. Note that, if some costs are not available, results can be calculated without them (i.e., the unavailable costs will be equal to zero).

| Enter first year of projection here>>> | 2016 | |

I. Patient population inputs

Instructions: At a minimum, enter the total number of ART patients supported by PEPFAR (adult, pediatric, PMTCT, HIV exposed infants) in line 9, by year, along with associated percentages (lines 12, 20, 28, 29); *or* enter the actual numbers for each patient population where specified (lines 14, 22, 31, 32). Enter the number of Key Population patients in the final panel where specified (line 39). In all cases, the % of each population group on the different regimens is required; HIV Exposed Infants are assumed to be on the Pediatric 1st line regimen.

Year	2016	2017	2018	2019	2020	
National Target Patients on ART	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	
Total Patients on ART supported by **National Government**	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	<<<Enter total number of patie
Total Patients on ART supported by **Global Fund**	-	-	-	-	-	
Total Patients on ART supported by **PEPFAR**	-	-	-	-	-	
Total Patients to be analyzed	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Percent of ART Patients who are Adults (%)	80%	80%	80%	80%	80%	
Adult Patients on ART	800,000	800,000	800,000	800,000	800,000	
Percent of Adult Patients newly initiating (1st line)	10%	10%	10%	10%	10%	
Percent of Adult Patients stable (1st line)	60%	60%	60%	60%	60%	
Percent of Adult Patients stable (2nd line)	20%	20%	20%	20%	20%	
Percent of Adult Patients Unstable (1st line)	5%	5%	5%	5%	5%	
Percent of Adult Patients Unstable (2nd line)	5%	5%	5%	5%	5%	
Percent of ART Patients who are Pediatrics (%)	10%	10%	10%	10%	10%	
Pediatric Patients on ART	100,000	100,000	100,000	100,000	100,000	
Percent of Pediatric Patients newly initiating (1st line)	10%	10%	10%	10%	10%	
Percent of Pediatric Patients stable (1st line)	60%	60%	60%	60%	60%	
Percent of Pediatric Patients stable (2nd line)	20%	20%	20%	20%	20%	
Percent of Pediatric Patients Unstable (1st line)	5%	5%	5%	5%	5%	
Percent of Pediatric Patients Unstable (2nd line)	5%	5%	5%	5%	5%	
Percent of ART Patients who are PMTCT (%)	8%	8%	8%	8%	8%	
Percent of ART Patients who are HIV Exposed Infants (%)	2%	2%	2%	2%	2%	

The second major section for data entry in this worksheet is the information required to calculate the annual salary for each cadre of worker (see Figure 9). Note that the list of Personnel Types is read from the earlier "Task allocation" worksheet, and cannot be changed (the cells are white). In column B, enter the annual, full-time equivalent (FTE) salary for each personnel type that is paid for by PEPFAR. These data can be gathered from facility administrators or local/national authorities. Then either confirm or change the values for benefits (assumed to be 10% of wages) and training (assumed to be 10% of wages + benefits). Note that, if training is included as a separate line item in the facility unit cost (described further below), it should not be included here, and can be zeroed out. The user should also input the hours worked per week and the number of weeks worked per year; the default assumptions are that each FTE works 40 hours per week and 48 weeks per year, but again, these assumptions can be changed.

Figure 9: Wages and benefits information for clinical staff

	A	B	C	D	E	F	G	H
1	Notes page	Inputs for Patient Populations and Cost Data						
2	Instructions: Inputs for patient populations and all cost-related data should be entered here. First, specify the first year of the projection (cell B3). Then there are six different sections: I. Population inputs, II. Wages and benefits of clinical staff, III. Other visit costs, IV. ARVs, V. Laboratory tests, and VI. Other commodities. Each section begins with instructions specific to that section. Light blue cells are data entry cells. Note that, if some costs are not available, results can be produced without them.							
45	**II. Wages and benefits of clinical staff**							
46	Instructions: Enter the annual salary for each personnel type, along with benefits and in-service trainings costs. The default value for benefits is 10% of annual salary, while the default value for in-service training is 10% of total salary (salary+benefits); these values can be changed. Then enter the average number of hours worked per week for each type, and the number of weeks worked per year, for each personnel							
47	Personnel Type	Salary per Year	Benefits per Year	In-Service Training	Hours worked per Week	Weeks worked per Year		
48	Doctors	$20,000	$2,000	$2,200	40	48		
49	Nurses	$5,000	$500	$550	40	48		
50	Midwives	$10,000	$1,000	$1,100	40	48		
51	Social workers	$10,000	$1,000	$1,100	40	48		
52	Clinical officers	$15,000	$1,500	$1,650	40	48		
53	Medical assistants				40	48		
54	Nursing assistants				40	48		
55	Lab technicians	$5,000	$500	$550	40	48		
56	Pharmacy technicians	$5,000	$500	$550	40	48		
57	Auxiliary nurses				40	48		
58	Auxiliary midwives				40	48		
59	Facility administrators				40	48		
60	Human resource managers				40	48		
61	M&E advisors				40	48		
62	Community volunteers				40	48		
63	Other #1				40	48		
64	Other #2				40	48		
65	Other #3				40	48		
66	**III. Clinic unit costs (excluding ARVs, labs, or direct staff costs)**							
	Instructions: Enter the cost per patient per clinic visit, i.e., the unit cost, for each component of a clinic visit. Note that the costs of ARVs and							

The third panel of data to be entered is the remainder of the unit costs for clinic visits – i.e., they do *not* include direct staff costs, which are calculated based on the data just entered. In addition, because costs of ARVs, laboratory tests and other commodities (as specified) are calculated separately, these costs should *not* be included here, either. These data are likely to be based on facility-level interviews, but might also be available in the published literature.

Figure 10 below shows the *direct* and *indirect* unit cost information for providing treatment services excluding commodities (e.g. ARVs; lab tests; and other commodities as specified) and direct staff salaries. Direct costs include consumable (e.g., syringes, gloves) and nonconsumable supplies (e.g., gowns). Indirect costs can be classified into capital (e.g., buildings and equipment) and recurrent (e.g., ongoing maintenance and utilities, support staff, management/supervision) costs. After indirect costs are apportioned according to patient load, the unit cost is calculated by dividing annual costs by the total number of patients served in one year.

Figure 10: Clinic unit costs (excluding direct staff, ARVs, labs, other commodities as specified)

	A	B	C	D	E	F
1	Notes page	**Inputs for Patient Populations and Cost Data**				
2	Instructions: Inputs for patient populations and all cost-related data should be entered here. First, specify the first year of the projection (cell B3 different sections: I. Population inputs, II. Wages and benefits of clinical staff, III. Other visit costs, IV. ARVs, V. Laboratory tests, and VI. Other co begins with instructions specific to that section. Light blue cells are data entry cells. Note that, if some costs are not available, results can be prod					
66	**III. Clinic unit costs (excluding ARVs, labs, or direct staff costs)**					
67	Instructions: Enter the cost per patient per clinic visit, i.e., the unit cost, for each component of a clinic visit. Note that the costs of ARVs and laboratory tests should be excluded from the Consumable supplies costs,as they are calculated separately. Direct staff costs are also not included here, as they are calculated directly above; indirect staff costs should be included here (support staff, management/supervision).					
68	**Direct costs per visit**					
69	Consumable supplies costs (less ARVs and labs)	$5.00	Costs of ARVs and labs should be excluded			
70	Non-consumable supplies costs	$1.00				
71	Training costs (less in-service training from above)	$1.20	In-service training costs should be excluded			
72	**Indirect costs per visit**					
73	Capital costs	$0.40				
74	Maintenance and utility costs	$3.00				
75	Support staff costs	$1.00				
76	Management and supervision costs	$1.00				
77	TOTAL UNIT COST PER VISIT	$12.60				
78	**IV. Other visit costs (cost per visit excluding ARVs)**					

The fourth panel of information to be entered is the unit cost of all of the other visits, as specified in the "Visits" tab, excluding ARV costs, which are calculated elsewhere. Note that the visit types are read in from the earlier tab, and cannot be changed here (see Figure 11). Recall that any new type of visit needs to be entered in the "Visits" tab, and will then be reflected here.

Figure 11: Other visit unit costs (excluding ARV costs)

IV. Other visit costs (cost per visit excluding ARVs)		
Instructions: Enter the cost per patient per visit, i.e., the unit cost, for each visit type. ARV costs should be excluded.		
Facility ARV pickup	$10.00	ARV costs should be excluded
Facility adherence counseling	$5.00	
Community ARV pickup	$5.00	ARV costs should be excluded
Community adherence counseling	$5.00	
ATM ARV delivery	$0.50	ARV costs should be excluded
Drone delivery		ARV costs should be excluded
Other delivery		ARV costs should be excluded
Other adherence counseling		
Other		
V. ARV costs		

The fifth panel of data required is for ARV costs. Again, note that the regimens listed are read in from the "ARVs" tab. Enter the average monthly unit price for each regimen for both "Drugs only" and also for "Other charges." Please note that the price entered for both "Drugs only" and "Other charges" should be per unit, not a lump sum amount. The default value for "Other charges" is 17% of the "Drugs only" price (see Figure 12), but this can be changed.

Figure 12: ARV costs by regimen per unit (not lump-sum)

	A	B	C	D	E	F
1	**Notes page**	**Inputs for Patient Populations and Cost Data**				
2	Instructions: Inputs for patient populations and all cost-related data should be entered here. First, specify the first year of the projection (cell B3. different sections: I. Population inputs, II. Wages and benefits of clinical staff, III. Other visit costs, IV. ARVs, V. Laboratory tests, and VI. Other co begins with instructions specific to that section. Light blue cells are data entry cells. Note that, if some costs are not available, results can be proc					
89	**V. ARV costs**					
90	Instructions: Enter the average monthly unit price for each regimen, including only the PEPFAR portion. The price entered for both "Drugs only" and "Other charges" should be per unit, not a lump sum amount. The default value for "Other charges" is 17% of the "Drugs only" price.					
91	Patient and Regimen Type	Unit Price Per Month Drugs Only	Unit Price Per Month Other Charges			
92	Adult 1st line	$10.00	$1.70			
93	Adult 2nd line	$20.00	$3.40			
94	Pediatric 1st line	$10.00	$1.70			
95	Pediatric 2nd line	$20.00	$3.40			
96	DTG	$5.00	$0.85			
97	Other Adult 1st line #2					
98	Other Adult 1st line #3					
99	Other Pediatric 1st line #1					
100	Other Adult 2nd line #1					
101	Other Adult 2nd line #2					
102	**VI. Laboratory costs**					

The sixth set of data to be entered is the cost of laboratory tests, the names of which are read from the "Labs" tab. Enter the average unit price for each laboratory test. The price entered for both "Product" and "Other charges" should be per test, not a lump sum amount. The default value for "Other charges" is 17% of the Product price, but this can be changed (see Figure 13).

Figure 13: PEPFAR-specific laboratory test unit costs (not lump-sum)

	A	B	C	D	E	F
1	**Notes page**	**Inputs for Patient Populations and Cost Data**				
2	Instructions: Inputs for patient populations and all cost-related data should be entered here. First, specify the first year of the projection (cell B3). different sections: I. Population inputs, II. Wages and benefits of clinical staff, III. Other visit costs, IV. ARVs, V. Laboratory tests, and VI. Other comm begins with instructions specific to that section. Light blue cells are data entry cells. Note that, if some costs are not available, results can be produc					
102	**VI. Laboratory costs**					
103	ould be per test, not a lump sum amount. The default value for "Other charges" is 17% of the Product price.					
104	Type of laboratory test	Unit Price of Product	Unit Price Other Charges			
105	Viral load - plasma	$25.00	$4.25			
106	Viral load - DBS	$25.00	$4.25			
107	CD4 - POC	$10.00	$1.70			
108	CD4 - lab	$10.00	$1.70			
109	CBC					
110	HIV RTK (confirmatory)	$1.00	$0.17			
111	HIV EIA (confirmatory)					
112	EID (confirmatory, <18 mos.)	$2.00	$0.34			
113	VL POC (lower cost)					
114	Other					
115	**VII. Other commodities**					
	Instructions: Enter the average unit price for each of the commodities, including only the PEPFAR portion. The unit cost (including other charges) for adult patients should be entered in column B, while the unit (including other charges) for pediatric patients should be entered in					

Finally, the last set of information required is for the unit costs of the other commodities specified in the labels found in the tab "Other comm." Enter the average unit price for each of the commodities as previously specified. The unit cost (including other charges) for adult patients should be entered in column B, while the unit (including other charges) for pediatric patients should be entered in column C (see Figure 14).

Figure 14: PEPFAR-specific unit costs for other commodities as specified

	A	B	C	D	E	F
1	Notes page	**Inputs for Patient Populations and Cost Data**				
2	Instructions: Inputs for patient populations and all cost-related data should be entered here. First, specify the first year of the projection (cell B3) different sections: I. Population inputs, II. Wages and benefits of clinical staff, III. Other visit costs, IV. ARVs, V. Laboratory tests, and VI. Other co begins with instructions specific to that section. Light blue cells are data entry cells. Note that, if some costs are not available, results can be prod					
115	**VII. Other commodities**					
116	Instructions: Enter the average unit price for each of the commodities, including only the PEPFAR portion. The unit cost (including other charges) for adult patients should be entered in column B, while the unit cost (including other charges) for pediatric patients should be entered in column C.					
117		Unit Cost for Adult Drug	Unit Cost for Pediatric Drug			
118	Cotrimoxazole	$6.00	$6.00			
119	Fluconazole					
120	Isoniazid	$1.00	$1.00			
121	OI #1					
122	OI #2					
123	OI #3					
124	OI #4					
125	OI #5					
126	Condoms (Number)					
127	Other					
128						

V.   SCENARIO CHOICE AND RESULTS

Worksheet nine: Inputs-Scenario selection

In this worksheet, all of the work setting up the different optimized scenarios for each of the five policy levers will be utilized. Enter your country name in cell B3. Then define up to three overall optimized scenarios to compare with the "Current" scenario by selecting an option from the respective drop-down menu for each of the five policy levers (Task allocation, Visits, Labs, ARVs, Other commodities). Name each overall Policy scenario in the appropriate box in column C, as that will be used in the display of the results. Note that the full description of each policy lever scenario (defined before) will appear automatically in column C, with a white (protected) background, under the named overall scenarios (which will be entered in the blue-highlighted cells).

Figure 15 below illustrates the result of selecting the first optimized Policy scenario for each of the five policy levers, as specified in the sample application in this user's guide:
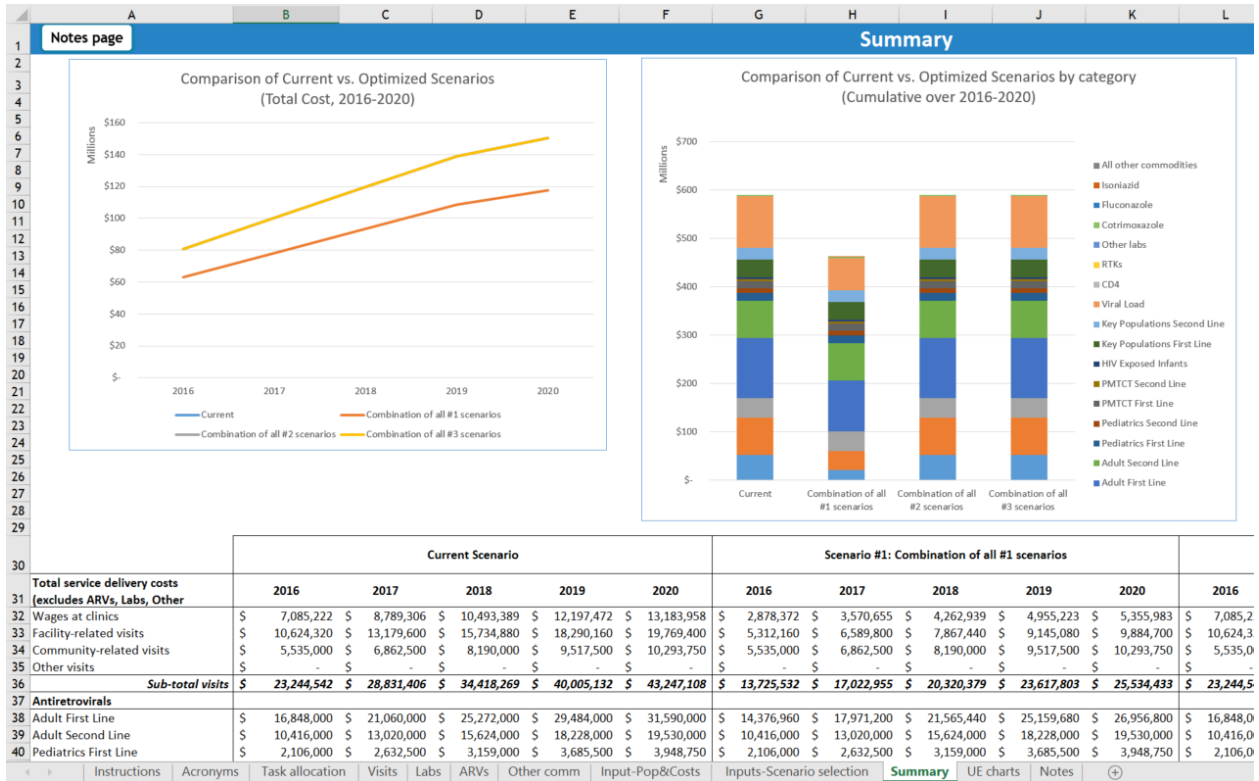
Figure 15: Scenario selection and naming

	A	B	C
1	Notes page		**Inputs - Scenario selection**
2		Instructions: Enter your country name in cell B3. Then define up to three optimized Scenarios to compare with the "Current" scenario by selecting an option from the respective drop-down menu for each of the five policy levers (Task allocation, Visits, Labs, ARVs, Other commodities). Name each scenario in the appropriate box in column C; note that the description of each policy lever scenario (defined before) will appear automatically.	
3	**Country Name**	Sample country	
4	**Policy scenarios**		
5	**Scenario #1**	Enter name of scenario here>>	Combination of all #1 scenarios
6	Task allocation	50% to nurses	50% of doctors' time per provider visit is shifted to nurses.
7	Visits	Decrease provider visits	Provider visits are decreased in half.
8	Labs	Reduced VL for Stable	The number of VL tests for stable patients is reduced to 1.
9	ARVs	20% to DTG	Move 20% of all adult patients on 1st line to DTG (newly initiating, stable, unstable)
10	Other commodities	Add Isoniazid	Add isoniazid to those receiving cotrimoxazole
11			
12	**Scenario #2**	Enter name of scenario here>>	Combination of all #2 scenarios
13	Task allocation	Default to Current #2	All initial values reflect Current Practice #2.
14	Visits	Default to Current #2	All initial values reflect Current Practice #2.
15	Labs	Default to Current #2	All initial values reflect Current Practice #2.
16	ARVs	Default to Current #2	All initial values reflect Current Practice #2.
17	Other commodities	Default to Current #2	All initial values reflect Current Practice #2.
18			
19	**Scenario #3**	Enter name of scenario here>>	Combination of all #3 scenarios
20	Task allocation	Default to Current #3	All initial values reflect Current Practice #3.
21	Visits	Default to Current #3	All initial values reflect Current Practice #3.
22	Labs	Default to Current #3	All initial values reflect Current Practice #3.
23	ARVs	Default to Current #3	All initial values reflect Current Practice #3.
24	Other commodities	Default to Current #3	All initial values reflect Current Practice #3.

Worksheet ten: Summary

There are three different sets of results in the tenth worksheet, which is labeled "Summary": total annual costs (in both chart and tables), a comparison of cumulative costs across all five years for all Policy scenarios; and finally a comparison of dollars saved and percentage savings of the "Current" vs. all of the optimized Policy scenarios.

The first set of results, the total annual cost, is displayed in a chart in the upper left-hand side of the worksheet. Further detail is provided in tabular form, with sub-totals by patient type and by scenario, beginning in line 30 (see Figure 16). Both the chart and the data from the tables can be copied and pasted into documents, as required. The data can also be copied and pasted into another Excel workbook, should further calculations or manipulations be required. In Figure 16, because only the first scenario contains parameters that are different from the "Current" scenario, that is the only scenario which shows a different set of values for the time period.

Figure 16: Total annual cost in chart and tabular formats

	Current Scenario					Scenario #1: Combination of all #1 scenarios					
Total service delivery costs (excludes ARVs, Labs, Other	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	2016
Wages at clinics	$ 7,085,222	$ 8,789,306	$ 10,493,389	$ 12,197,472	$ 13,183,958	$ 2,878,372	$ 3,570,655	$ 4,262,939	$ 4,955,223	$ 5,355,983	$ 7,085,2
Facility-related visits	$ 10,624,320	$ 13,179,600	$ 15,734,880	$ 18,290,160	$ 19,769,400	$ 5,312,160	$ 6,589,800	$ 7,867,440	$ 9,145,080	$ 9,884,700	$ 10,624,3
Community-related visits	$ 5,535,000	$ 6,862,500	$ 8,190,000	$ 9,517,500	$ 10,293,750	$ 5,535,000	$ 6,862,500	$ 8,190,000	$ 9,517,500	$ 10,293,750	$ 5,535,0(
Other visits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sub-total visits	$ 23,244,542	$ 28,831,406	$ 34,418,269	$ 40,005,132	$ 43,247,108	$ 13,725,532	$ 17,022,955	$ 20,320,379	$ 23,617,803	$ 25,534,433	$ 23,244,5
Antiretrovirals											
Adult First Line	$ 16,848,000	$ 21,060,000	$ 25,272,000	$ 29,484,000	$ 31,590,000	$ 14,376,960	$ 17,971,200	$ 21,565,440	$ 25,159,680	$ 26,956,800	$ 16,848,0(
Adult Second Line	$ 10,416,000	$ 13,020,000	$ 15,624,000	$ 18,228,000	$ 19,530,000	$ 10,416,000	$ 13,020,000	$ 15,624,000	$ 18,228,000	$ 19,530,000	$ 10,416,0(
Pediatrics First Line	$ 2,106,000	$ 2,632,500	$ 3,159,000	$ 3,685,500	$ 3,948,750	$ 2,106,000	$ 2,632,500	$ 3,159,000	$ 3,685,500	$ 3,948,750	$ 2,106,0(

The results are then aggregated and the cumulative comparison between "Current" and optimized Policy scenarios is displayed in the stacked bar charts beginning in column F. In addition, the comparison is carried further by calculating both the actual difference in the cumulative amounts for "Current" vs. optimized Policy scenarios, and the percentage difference between the cumulative amounts of "Current" and the optimized Policy scenarios, and displaying those results in tabular format beginning in column M. Note again that, since the only parameter changes in this sample were input for the first optimized Policy scenario, the stacked bar chart shows the same results for "Current" and the second and third optimized Policy scenarios. In addition, the only entry in the comparison table is for the first optimized Policy scenario; i.e., the second and third Policy scenarios are exactly the same as "Current" and thus do not show any cost savings (see Figure 17).

Figure 17: Comparison of cumulative amounts across scenarios
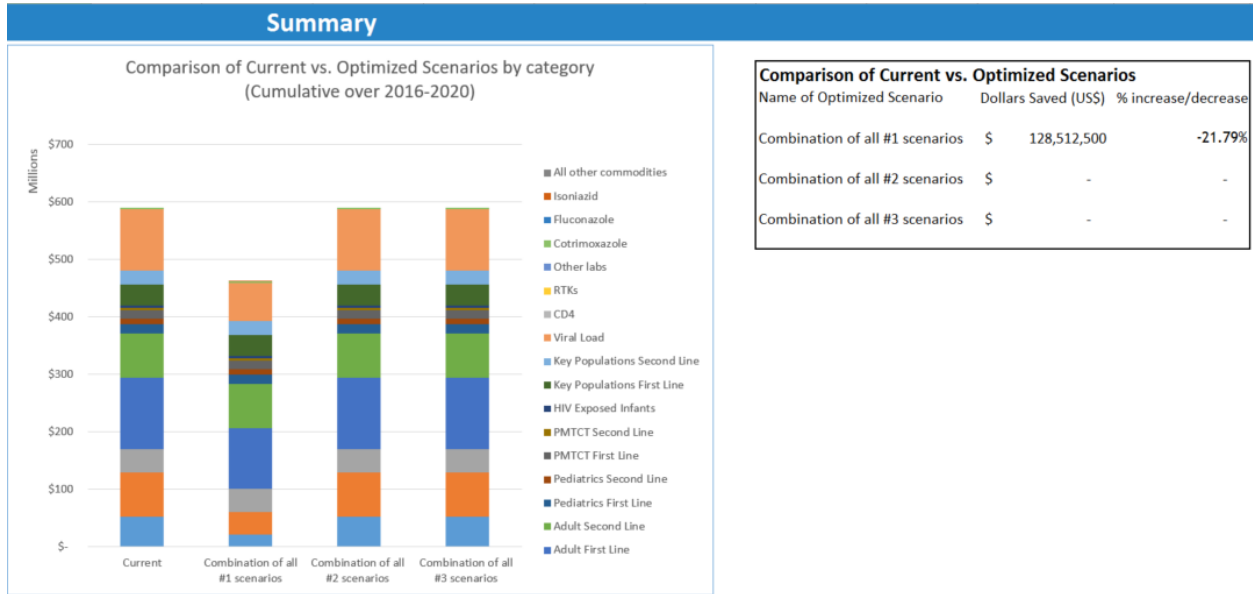
Worksheet eleven: Unit Cost tables

The final results worksheet is labeled "Unit Costs," and compares the unit costs calculated by the tool, by scenario and by patient type. Note that the unit costs calculated by National OTC do not include above-service delivery costs (e.g., program management or strategic information).

Several charts are displayed, and can be copied and pasted into documents, as required by the user (see Figure 19):

- Comparison of Adult ART Unit Cost by Patient Type and Scenario
- Comparison of Pediatric ART Unit Cost by Patient Type and Scenario
- Comparison of PMTCT ART Unit Cost by Patient Type and Scenario
- Comparison of Key Populations ART Unit Cost by Patient Type and Scenario

Figure 18: Unit Cost charts

Unit Costs (Five-year average)