



CLINTON HEALTH ACCESS INITIATIVE
(CHAI)

User Manual of v2016 of CHAI Simple Tool for
quantification of adult and pediatric ARV

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This quantification user manual was created to assist Ministry of Health-HIV programs in their procurement planning for HIV medicines. This manual can be used by site-level, regional, and national-level personnel to assist in their quantification efforts as needed.

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Introduction

The basic goals of national medicines policies and public sector pharmaceutical supply systems are to provide access to needed medicines and suppliers, promote the rational use of medicines. Various strategies exist to achieve these goals through different combinations of public and private sector involvement in the procurement and supply management (PSM) cycle.

The purpose of this documentation is to:

- Describe basic principles of quantification of ARVs
- Document the use of CHAI Simple Tools for quantification of adult and pediatric ARVs including assumptions for key input data based on Cambodia situation

Basic principles of quantification

Overview

Quantification is an exercise that involves estimating supply needs for a public health program. A robust and accurate forecast ensures that sufficient quantities of commodities including ARVs are procured accordingly to patient scale-up targets, taking into consideration assumptions for service delivery and other programmatic factors. A good quantification can help avoid stock-outs and wastages due to excess stock.

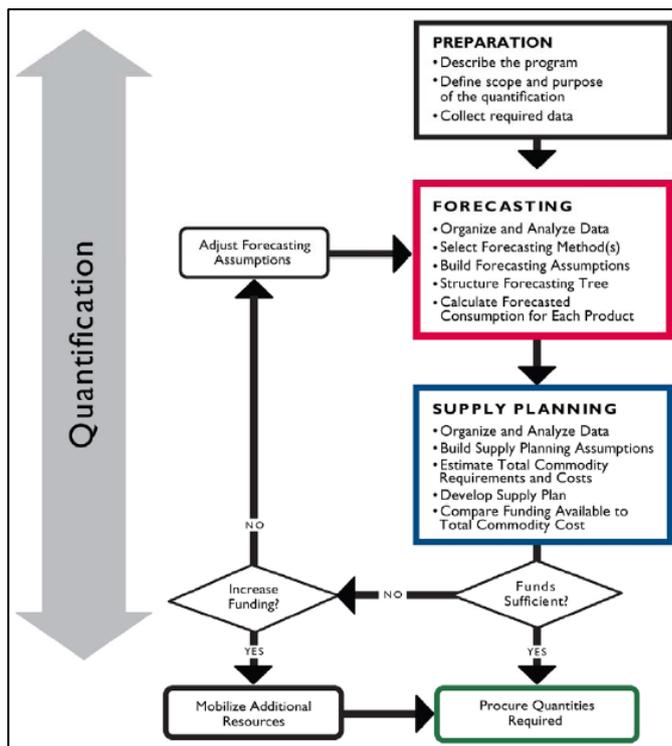


Figure 1 Flowchart of quantification process for public health commodities¹

¹ http://deliver.jsi.com/dlvr_content/resources/allpubs/guidelines/QuantHealthComm.pdf

Methods of forecasting

There are two main methods for forecasting of ARVs: the consumption method or morbidity method. The main differences being the basis in which the forecast starts with.

The consumption method estimates the number of products expected to be consumed based on historical or past consumption trends.

The morbidity method estimates the number of patients expected to be treated and then calculating the number of products to be consumed.

Type of data required:

Consumption method	Morbidity method
<u>Historical Consumption Data</u> <ul style="list-style-type: none">Quantity of each product dispensed or used during past 12-month period (when data are available or can be estimated)	<u>Morbidity Data</u> <ul style="list-style-type: none">Number of patients per ART regimen treated in the past 12 month period (when data are available or can be estimated)Estimated incidence or prevalence rates of HIV/AIDS occurring within a defined population group such as pregnant women and most-at-risk groups.

Often, it may be necessary to compare the results from both consumption and morbidity methods of quantification.

CHAI Simple Tool for forecasting of adult and pediatric ARVs

Overview

The CHAI Simple Tool is a *morbidity-based* forecasting tool that allows for the quantification of ARV needs for a period of three years for a HIV/AIDS treatment program.

Configuration

No special configuration is required to use the tool on personal computers. Both files are small (< 3,000KB), easy to download and do not take up much space on your computer. The user can copy and paste it as a regular file in any location on his/her computer. For proper management of data and quantification for easier budgeting, it is best to put the tools of quantification of adults and children in the same folder.

Content

Each quantification tool uses several interconnected Excel sheets that link to user input from one former Excel sheet to populate automatic calculations in a subsequent sheet. Use of this tool does not require extensive Excel knowledge, although some basic understanding of the software would facilitate full comprehension of the tool.

There are two separate Excel files for the quantification of ARVs for adults and for pediatric patients, comprising of 10 worksheets for the adult quantification tool and 10 for the pediatric tool. Each file contains spreadsheets for user input (pink colored cells) and automatically generated outputs or results (white colored cells). In order to facilitate the needed budget for procuring your next ARV order, the 2016 update to this tool has an additional output sheet to cost the overall quantification.

On every worksheet, certain backend calculations needed to create the final outputs in the tool will be in hidden or in protected tables. **It is therefore required that users do not modify these tables and keep them protected.**

General Instructions

1. Users must only fill in input cells that are highlighted in pink
2. There should not be any modification of any other cells, unless customization of the tool is required and where possible, a proficient user of Excel should be responsible for modification of any formulas and cells.

Required Inputs and Outputs by Section

Prior to using the CHAI Simple Tool, please review the data required for the tool to generate an ARV quantification, as per the sections specified below:

1st Section: General ART Inputs

This section contains the title of the tool and some initial instructions for its overall use. It then asks the user for the following general ART inputs:

- Current number of patients on ART in country and scale-up targets in next 3 years
- Percentages related to patient movement within therapeutic line (i.e. migration from first line -1L- to second line -2L-, loss to follow-up, attrition, etc.)
- Number of months of needed national security (buffer) stock to supplement ARV order

2nd Section: Breakdown by regimen

This section asks the user to specify regimen breakdowns related to the first two sets of general inputs stated above, as per the below:

- Regimen breakdown of existing patients on ART
- Regimen breakdown for new patients on ART in next 3 years beginning 1L
- Regimen breakdown for existing patients on ART switching to 2L, or 3L

3rd Section: Proactive substitution of regimens

This section asks the user to specify any proactive regimen substitutions (i.e. when voluntarily switching a group of patients *showing no signs of treatment failure* from one regimen to another *within the same therapeutic line of treatment*) due to a therapeutic revision of national guidelines over the next 3 years. In most cases, proactive substitution occurs due to a national phase-out of a certain molecule or formulation (e.g. demotion of d4Tor ddl – as seen in many CHAI consortium countries since 2010)

4th Section: Breakdown by form and formulation

This section asks the user to select the form of each regimen identified in section 2. *This selection should be based on what formulations can be procured in country.* This is done by selecting the form of each regimen: whether it uses three single molecules (S+S+S), a dual + single molecule (D+S), or a triple (T) fixed dose combination (FDC). The user will therefore need to specify the following form breakdowns for each regimen:

Year 1: triple, dual + single, singles

Year 2: triple, dual + single, singles

Year 3: triple, dual + single, singles

5th Section: Dosage by formulation

This section provides the user with dosage per day of each ARV formulation. This is a useful reference tool and provides additional clarity on consumption of each molecule based on formulation choices identified in the previous section. This is the last user input section of the tool related to morbidity.

6th Section: Monthly number of patients by regimen

Based on previous inputs, this section generates the monthly number of patients by regimen over 3 years. It requires no user input as this is generated with automatic calculations, and is a good way to verify the validity of previous inputs based on how this section calculates projected monthly patient growth.

7th Section: Theoretical monthly consumption by formulation (Output 1)

Based on previous inputs, this section generates the theoretical monthly consumption for each formulation. **The sum of monthly consumption over 3 years represents the theoretical ARV demand of your quantification.** This is the first output of the tool.

***Note:** A table at the end of this section also calculates additional consumption based on implementation of Nevirapine induction implementation for new ART initiates. Implementation of this practice is specified in the first section of the tool, under general inputs.*

8th Section: Current stock and pipeline (Output 2)

This section asks the user to input current and pipeline stock levels, along with expiries by month. Based on this and calculated consumption in the previous section, **the tool automatically generates a current stock supply plan, for the user to assess current monthly stock levels prior to placing the quantified ARV order.** This is the second output of the tool.

***Note:** This stock information will then be deducted from the theoretical demand calculated in the previous section to determine the actual quantification needs.*

9th Section: Quantification needs to order (Output 3)

This section provides the main outputs of this quantification tool, indicating the amount of each formulation to order based on current/projected morbidity and stock levels. This is done with the following two output tables:

- Procurement supply plan: monthly number of boxes to order by formulation**
- Projected monthly stock supply plan after placing the quantified ARV order**

10th Section: Cost or ARV order (Output 4)

If the user specifies previous pricing obtained for each formulation, this section then outputs the cost over three years of the quantified ARV order. This is the last output of the tool.

CHAI Simple tool for forecasting Adult ARVs

Navigating the tool: Quantification steps by Excel worksheet

The updated version of this tool contains 10 Excel worksheets with several calculation tables. Each worksheet represents one quantification step needed to build the three-year forecast. The overall forecast is completed by following each quantification step, as per the worksheet order below:

Note: All screenshots displayed in this section of the manual will be referred to in examples provided below

First worksheet (General Inputs): Enter general baseline quantification inputs

Simple Adult ARV Forecasting Tool

Instructions - Please see Manual for detailed instruction of use of this tool

 Inputs - To be filled by user
 Outputs - User must **NOT** modify

1. Inputs

Quantification start (MM/YYYY) Mar-17 **Note:** The date of the stock data and the patient data must match in order to ensure the integrity of the quantification

Number of patients currently on ART
 1L 7,410 2L 1,675 3L 20 Year 0 - total: 9,105

Annual inclusions (new patients only!)
 Year 1 1,000 Year 2 1,000 Year 3 1,000

Annual 1L -> 2L migration (%)
 Year 1 6.2% Year 2 6.2% Year 3 6.2%*

Annual 2L -> 3L migration (%)
 Year 1 0.7% Year 2 0.7% Year 3 0.7%*

Annual attrition rate (%)
 1L 1.5% 2L 1.5% 3L 0.0%*

NVP lead-in dosing Yes (see "Consumption" tab - row 58 - for NVP dual-FDC induction calculations)

Percentage of a bottle required for each induction (%) 100%

Number of months of security stock 6

Projected annual totals below

Year 1 - total	Year 2 - total	Year 3 - total	
10,105	11,105	12,105	before applying attrition and migration rates
9,931	10,777	11,610	after applying attrition and migration rates

NEW!

1. General Inputs
2. Protocols
3. ARV Substitutions
4. Formulations
5. Dosing
6. Patients
7. Consumption
8. SOH & Pipeline
9. Ordering
10. Cost

Screenshot example of first worksheet of tool - General Inputs

-Beginning of quantification period: Please enter a start date from which you will start the quantification. The period should preferably be prospective from the date of year being forecasted and must be consistent with latest available stock data.

Example: In March 2017, you use the tool to quantify ARV needs for Y2018-2020, so the beginning of the forecast period will start in January 2018 and the baseline data (current stock and morbidity) from which the forecast will be projected is March 2017.

CAVEAT: It is important to start the quantification process far enough in advance to receive your future ARV order without causing interruptions to patients' drug supply (e.g. 2017 procurement lead time for Cambodia MoH from time of forecast to ARV receipt in central warehouse = 10 months)

-Number of patients currently on ART: Please enter the number of patients at the end of the period preceding the beginning of the quantification.

Example: At the end of March 2017 = 9,105 adult patients.

-Annual Inclusions (new patients per year): Please enter the *additional* number of patients expected to be on ARVs within the first, second, and third forecasting year. Only new patients should be entered so make sure to subtract current ART patients when referring to annual ART targets

Example: If Y2018 ART target is 10,105 patients on ART → 10,105 – 9,105 = 1,000 new patients

-Annual migration rate (1L to 2L and 2L to 3L): Please enter the rate representing the current percentage of patients being switched second-line ART, and (if applicable) the percentage of second-line patients requiring third-line. There are various reasons why patients do not respond to their first-line ART regimen (poor adherence, treatment failure...), all of which should be considered when calculating 1L to 2L migration rate. This percentage can be kept the same for Y1, Y2, and Y3 of the forecast, unless a national program foresees major therapeutic adjustments for their ART cohort, which would impact this migration percentage from one year to the next.

Example: Current data availability indicates 4% of 1L patients switching to 2L annually and no third line treatment program is currently rolled out nationally

→ Y1 1Lto2L = Y2 1Lto2L = Y3 1Lto2L= 4% → Y1 2Lto3L = Y2 2Lto3L = Y3 2Lto3L= 0%

CAVEAT: Migration rates to third line should be kept at 0% if no national treatment protocol has been rolled out for a given country.

-Annual attrition rate: Please enter the attrition rate as a percentage of patients lost during treatment due to death or voluntary discontinuation (lost to follow up) in the previous year. It is expressed as a percentage of the total number of patients on ART. If the difference in attrition rates for first line vs second line patients is unknown, enter the same rate for both treatment lines. **If no national treatment protocol exists for 3L patients, keep 3L attrition rate blank.**

Example: 1L attrition rate = 2L attrition rate = 1.5%.

-NVP lead-in dosing (Dual induction): Please enter a yes (Y) or not (N) if national treatment guidelines recommend induction of Nevirapine (NVP) when patients are starting ART regimens that include NVP. Dual Induction means new ART initiates starting a NVP-based regimen will receive half the NVP dose for 14 days in order to minimize the side effects of the drug. This therefore requires quantification adjustments when a NVP-based regimen is available as a triple FDC

Example: Given that 5% of new ART initiates will use AZT/3TC/NVP and a triple FDC formulation is selected for that regimen → entering “yes” for NVP lead-in dosing means new initiates will receive dual FDC AZT/3TC 300/150mg + single NVP 200mg for 14 days to allow for administration of single dose NVP, and AZT/3TC/NVP 300/150/200mg FDC for the remainder of the month and all subsequent months.

-Percentage of bottle for each induction: Please specify the percentage of the bottle of the dual FDC required for each patient induced during the 14 day period. This is typically linked to dispensing practice of pharmacists – whether in bottles or pills when the full bottle amount will not be consumed in the first month of treatment. *The percentage will typically be either 100% or 50%, depending on #pills/bottle (bottle size) procured in-country*

Example: for each new patient taking AZT/3TC 300/150mg, NVP induction dosing for the dual FDC AZT/3TC 300/150mg (with 60pills/bottle packaging) in the first month of treatment:

Month1(M1) consumption= 2 pills/day * 14 days = 28 pills ~ 50% of a bottle

-Number of months of security (buffer) stock: Please enter the number of months of safety stock to be kept in central warehousing during your forecasting period. This depends on your budget for ARV procurement and central warehousing storage capacity, with 2 months being a recommended absolute minimum as emergency security stock.

CAVEAT: A minimum of 2 months of security stock is suggested as an absolute minimum to serve as an emergency supply in central warehousing. Do NOT enter 0 months or the Simple Tool will not generate a supply plan

Second worksheet (Protocols): Enter breakdown by regimen (Protocols)

2. Protocol Breakdown											
Regimens			Breakdown by protocol								
			Step 1. Existing Patients		Step 2. Projected New Patients (% of Total)			Step 3. Patients switching 1L - > 2L		Step 4. Patients switching 2L - > 3L	
			Y0	Y0%	Y1	Y2	Y3	Y1	Y2	Y3	
NEW! NEW!	1st Line		TDF + 3TC + EFV	6,000	81%	80.0%	80.0%	80.0%			
			TDF + FTC + EFV	0	0%						
			TDF + 3TC + DTG	0	0%	5.0%	10.0%	15.0%			
			TDF + FTC + DTG	0	0%						
			TDF + 3TC + NVP	600	8%	5.0%	5.0%	5.0%			
			TDF + FTC + NVP	0	0%	5.0%					
			AZT + 3TC + NVP	500	7%						
			AZT + 3TC + EFV	100	1%	5.0%	5.0%				
			AZT + 3TC + DTG	0	0%						
			ABC + 3TC + EFV	100	1%						
			ABC + 3TC + NVP	100	1%						
			ABC + 3TC + LPV/r	2	0%						
			AZT + 3TC + ABC	8	0%						
			+ + +		0%						
	4th drug suppl			ABC + + +	2						
4th drug suppl			TDF + + +	5							
Sub-total			7,410	100%	100.0%	100.0%	100.0%				
2nd Line			TDF + 3TC + LPV/r	400	5%	5.0%	5.0%	5.0%			
			ABC + 3TC + LPV/r	70	1%						
			AZT + 3TC + LPV/r	200	3%	15.0%	15.0%	15.0%			
			+ + +		0%						
			TDF + FTC + LPV/r	30	0%	5.0%	5.0%	5.0%			
			ABC + FTC + LPV/r		0%						
			+ + +		0%						

Screenshot example of second worksheet of tool - Protocols

In this section, the user is requested to provide information on the detailed breakdown of patients by both first-line and second-line regimens in a series of 4 steps described below:

-Step 1: Define all combinations of all first-line and second-line regimens currently in use by your existing patients. This is done by entering a patient number next to each regimen pre-populated in columns C to G. The pre-populated protocols roughly correspond to those recommended in the 2016 WHO guidelines, but the list can be modified given each country context. If a used regimen in your patient cohort does not appear in the list, adjust the regimens as needed.

Example: If 6,000 adults are using TDF+3TC+EFV in March 2017, please enter this patient total in cell I10.

After patient totals are specified for all 1L and 2L regimens currently in use, proceed to complete the next three steps in this section.

CAVEAT: To avoid a calculation error in the Simple tool, an automatic reminder is generated if your subtotal in cell I39 - representing your current total of 1L patients at the start of the quantification period – does not equal the total 1L patients indicated in the first worksheet under “Number of patients currently on ART”. That being said if you would like to add a fourth-drug used to supplement the tri-therapy of some of your ART patients (e.g. Monthly supplement of TDF needed for more complex patient cases), you can add this patient total in row 38 without generating an error message

-Step 2: Define the regimen breakdown for new ART patients in the coming 3 years (Y1, Y2, Y3).

This is done by entering a percentage next to each regimen recommended for new ART initiates in columns K,L,M for 1L patients, columns O, P,Q for 2L patients, and (if applicable) columns S, T, U for 3L patients. *This should be done as per the national guidelines of your country. Unless a national guidelines revision is planned in the upcoming three years, regimen breakdowns should be the same from one year to the next.*

Example: Among the 1,000 new patients targeted for year 2018, 5% will be on TDF+3TC+DTG, 5% on TDF+3TC+NVP, 5% on TDF+FTC+NVP, 5% on AZT + 3TC + EFV, and the remaining 80% on TDF+3TC+EFV.

CAVEAT: To avoid a calculation error in the Simple tool, your annual percentage totals for 1L, 2L, and 3L regimen breakdowns should *each* equal 100%. Percentage totals will be green if this is done correctly.

-Step 3: Define the regimen breakdown for current 1L ART patients migrating to 2L in the coming 3 years (Y1, Y2, Y3). As with step 2 above, this is done by entering a percentage next to each regimen recommended as per your national guidelines in columns O, P, and Q, for current 1L ART patients that will be migrating to 2L in the coming 3 years.

-Step 4: Define the regimen breakdown for current 2L ART patients migrating to 3L in the coming 3 years (Y1, Y2, Y3). *If national treatment guidelines exist for 3L patients in your country, enter a percentage next to each regimen recommended as per your treatment guidelines in columns S, T, and U for current 2L patients that will be migrating to 3L in the coming 3 years.*

Fourth worksheet (Formulations): Enter formulation/form breakdown by regimen

4. Formulation Breakdown										
Regimens				Regimen breakdown into formulations						
1st Line				Y0/Y1		Y2		Y3		
				S+S+S	D+S	T	S+S+S	D+S	T	
TDF	+	3TC	+	EFV		100%			100%	100%
TDF	+	FTC	+	EFV		100%			100%	100%
TDF	+	3TC	+	DTG		100%			100%	
TDF	+	FTC	+	DTG		100%			100%	
TDF	+	3TC	+	NVP		100%			100%	
TDF	+	FTC	+	NVP		100%			100%	
AZT	+	3TC	+	NVP			100%			100%
AZT	+	3TC	+	EFV		100%			100%	
AZT	+	3TC	+	DTG		100%			100%	
ABC	+	3TC	+	EFV		100%			100%	
ABC	+	3TC	+	NVP		100%			100%	
ABC	+	3TC	+	LPV/r		100%			100%	
AZT	+	3TC	+	ABC			100%			100%
	+		+		100%		100%		100%	
ABC	+		+		100%		100%		100%	
TDF	+		+		100%		100%		100%	
2nd Line										
TDF	+	3TC	+	LPV/r		100%			100%	
ABC	+	3TC	+	LPV/r		100%			100%	
AZT	+	3TC	+	LPV/r		100%			100%	
	+		+							

<--For all 4-drug regimens: de
<--For all 4-drug regimens: de

1. General Inputs / 2. Protocols / 3. ARV Substitutions / **4. Formulations** / 5. Dosing / 6. Patients / 7. Consumption / 8. SOH & Pipeline / 9. Ordering / 10. Cost

Screenshot example of fourth worksheet of tool - Formulations

-Specify the form breakdown for each regimen currently in use: This is done by selecting a percentage under each type of form that can make up a regimen. This will either comprise of 3 single molecules (S+S+S), a dual + single molecule (D+S) - indicating a regimen administered via dual fixed dose combination + a single molecule, or a triple (T) fixed dose combination molecule.

Example: For the 6,000 adult patients taking TDF/3TC/EFV in March 2017, the user must specify what percentage of these patients will receive this regimen using either:

- 1) 3 single molecules → S+S+S = TDF 300mg + 3TC 300mg + EFV 600mg
- 2) 2 molecules → TDF/3TC 300/300mg + EFV 600mg
- 3) 1 molecule → TDF/3TC/EFV 300/200/600mg fixed dose combination

Note that a combination is possible if pharmacists prescribe both the D+S and T for a regimen where both formulations are procured in-country (e.g. 25% D+S and 75% T). It is usually recommended, however, that the national HIV/AIDS program consider the selection and procurement of triple fixed dose combinations over single drugs whenever possible due to its significant ease of administration for better patient adherence and simplification of supply chain.

Depending on the country's situation, it is also possible to customize a shift from one type of formulation combination in Year 1 to another combination in Year 2. In all cases, each row in this table should add up to 100%.

CAVEAT: If the user selects a form that does not exist for a given regimen (based on 2014 formulation availability on market), the Simple tool will issue a warning message "irregular regimen choice" to correct this entry error (e.g. AZT/3TC/EFV is not available as a triple formulation)

Fifth worksheet (Dosing): Formulation dosing

5. Formulation Dosing						
Formulation Status Key:		Please specify which formulation is being used (by % split of molecule) for 3TC, DRV, ETV, and TLE: Please specify the packsize for TDF+3TC+EFV and RTV				
WHO - Recommended						
WHO - Special Circumstances						
Not Yet Available						
Product List						
ARV	Strength	Form	Units/Pack	WHO Status (2016)	Units/Day	% of Molecule
Singles						
3TC	150	tab	60	WHO - Recommended	2	80%
3TC	300	tab	30	WHO - Recommended	1	20%
ABC	300	tab	60	WHO - Recommended	2	100%
ATV/r	300/100	tab	30	WHO - Recommended	1	100%
AZT	300	tab	60	WHO - Recommended	2	100%
DRV	300	tab	120	WHO - Recommended	4	-
DRV	600	tab	60	WHO - Recommended	2	100%
DTG	50	tab	30	WHO - Recommended	1	100%
EFV	600	tab	30	WHO - Recommended	1	100%
FTC	200	tab	30	WHO - Recommended	1	100%
ETV	100	tab	120	WHO - Special Circumstances	4	100%
ETV	200	tab	60	WHO - Special Circumstances	2	100%
LPV/r	200/50	tab	120	WHO - Recommended	4	100%
NVP	200	tab	60	WHO - Recommended	2	100%
RAL	400	tab	60	WHO - Recommended	2	100%
RTV	100	tab	60	WHO - Recommended	1	100%
SQV	200	caps	270	WHO - Special Circumstances	4	100%
TDF	300	tab	30	WHO - Recommended	1	100%
	DRV/r 400/50	tab	60	Not Yet Available	1	
	TAF			Not Yet Available		
Duals						
1. General Inputs 2. Protocols 3. ARV Substitutions 4. Formulations 5. Dosing 6. Patients 7. Consumption 8. SOH & Pipeline 9. Ordering 10. Cost						

Screenshot example of fifth worksheet of tool - Dosing

This worksheet is principally a reference table indicating the dosages for all formulations that can be selected using the Simple tool, following molecule and regimen recommendations in the 2016 WHO guidelines, as seen in Column I. The status for each formulation should be updated prior to starting a fresh quantification exercise to stay aligned with the latest WHO treatment guideline updates. User input is required if a molecule is available on market in 2 different doses, as is the case for 3TC for adult formulation, **making sure that any percentage breakdown between the 2 different doses sums up to 100% to avoid a warning message in the Simple tool.**

Example: To include 3TC 300mg in your quantification (vs 3TC 150mg) - Enter the percentage breakdown of patients using the 300mg molecule vs the 150mg in cell K15

Sixth worksheet (Patients): Projected patient growth by regimen by month

6. Patients by protocol by quarter

Patients at the end of:

Patients per Regimen	Q1			Q2			Q3		
	Start	M1	M2	M3	M4	M5	M6	M7	M8
1st Line									
TDF+3TC+EFV	6,000	6,027	6,054	6,081	6,108	6,134	6,161	6,187	6,213
TDF+FTC+EFV									
TDF+3TC+DTG		4	8	12	17	21	542	615	628
TDF+FTC+DTG									
TDF+3TC+NVP	600	600	600	601	601	601	84	15	6
TDF+FTC+NVP		4	8	12	17	21	25	29	33
AZT+3TC+NVP	500	497	493	490	487	484	481	477	474
AZT+3TC+EFV	100	104	107	110	114	117	121	124	127
AZT+3TC+DTG									
ABC+3TC+EFV	100	99	99	98	97	97	96	95	95
ABC+3TC+NVP	100	99	99	98	97	97	96	95	95
ABC+3TC+LPV/r	2	2	2	2	2	2	2	2	2
AZT+3TC+ABC	8	8	8	8	8	8	8	8	8
ABC++	2	2	2	2	2	2	2	2	2
TDF++	5	5	5	5	5	5	5	5	5
Sub-total	7,417	7,452	7,486	7,520	7,554	7,587	7,621	7,654	7,687
% of total Population	81.2%	80.9%	80.7%	80.4%	80.2%	79.9%	79.7%	79.4%	79.2%

1. General Inputs / 2. Protocols / 3. ARV Substitutions / 4. Formulations / 5. Dosing / **6. Patients** / 7. Consumption / 8. SOH & Pipeline / 9. Ordering / 10. Cost

Screenshot example of sixth worksheet of tool – Patients

If the input data has been entered correctly in the previous worksheets, the first output table showing 3-year (36 month) patient growth by regimen will be automatically populated, with patient numbers appearing only for regimens in current or projected use. NO USER INPUT IS REQUIRED IN THIS WORKSHEET – IT SHOULD NOT BE MODIFIED.

CAVEAT: If cells next to a regimen actually used by patients do not populate and remain grey, this indicates an omission in a previous worksheet that needs to be re-verified by the user. It is equally important to verify that the total patient growth of your entire patient cohort - appearing in row 146 for 1L patients and row 180 for 2L patients – makes sense and aligns with patient targets indicated in the first worksheet of the Simple tool.

Seventh worksheet (Consumption): Projected patient consumption by formulation (theoretical demand)

7. Consumption forecast				Packs consumed during:													
Monthly Consumption of Formulations				Packs consumed during:													
Formulation	Molecule	% of Molecule	Btls/mth	Q1			Q2			Q3			Q4				
				M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12		
3TC (150) - 60 tab	3TC	80%	1.0														
3TC (300) - 30 tab	3TC	20%	1.0														
ABC (300) - 60 tab	ABC	100%	1.0	2	2	2	2	2	2	2	2	2	2	2	2	2	2
ABC+3TC (600/300) - 30 tab	ABC+3TC	100%	1.0	333	334	335	336	337	338	339	340	341	342	343			
ATV/r (300/100) - 30 tab	ATV/r	100%	1.0	174	207	222	230	236	240	244	247	251	255	258			
AZT (300) - 60 tab	AZT	100%	1.0														
AZT+3TC (300/150) - 60 tab	AZT+3TC	100%	1.0	305	314	323	332	341	350	359	368	377	386	395			
AZT+3TC+ABC (300/150/300) - 60 tab	AZT+3TC+ABC	100%	1.0	8	8	8	8	8	8	8	8	8	8	8	8	8	8
AZT+3TC+ATV/r ((300/150)+(300/100)) - 30 co-pck	AZT+3TC+ATV/r	100%	1.0	22	46	70	94	117	141	165	190	214	238	262			
AZT+3TC+NVP (300/150/200) - 60 tab	AZT+3TC+NVP	100%	1.0	499	496	492	489	486	483	480	476	473	470	467			
DRV (300) - 120 tab	DRV	0%	1.0														
DRV (600) - 60 tab	DRV	100%	1.0	26	26	27	27	28	28	29	29	30	30	31			
DTG (50) - 30 tab	DTG	100%	1.0	3	7	11	15	19	282	579	622	631	636	640			
EFV (600) - 30 tab	EFV	100%	1.0	202	205	208	210	213	216	219	221	224	227	230			
ETV (100) - 120 tab	ETV	100%	1.0	11	11	12	12	13	13	14	14	15	16	16			
ETV (200) - 60 tab	ETV	0%	1.0														
FTC (200) - 30 tab	FTC	100%	1.0														
LPV/r (200/50) - 120 tab	LPV/r	100%	1.0	660	592	548	516	492	472	456	443	433	426	420			
NVP (200) - 60 tab	NVP	100%	1.0	702	706	710	713	717	462	172	137	135	138	141			
RAL (400) - 60 tab	RAL	100%	1.0	11	11	12	12	13	13	14	14	15	16	16			
RTV (100) - 60 tab	RTV	100%	0.5	13	13	13	13	13	13	13	13	13	13	13			
SQV (200) - 270 caps	SQV	100%	0.4														
TDF (300) - 30 tab	TDF	100%	1.0	16	16	17	17	18	18	19	19	20	20	21			
TDF+3TC (300/300) - 30 tab	TDF+3TC	100%	1.0	993	952	916	885	859	837	818	802	788	777	768			
TDF+3TC+ATV/r ((300/300)+300+100) - 60 co-pck	TDF+3TC+ATV/r	100%	0.5	413	437	458	476	492	506	519	530	540	548	556			
TDF+3TC+EFV (300/300/400) - 30 tab	TDF+3TC+EFV	10%	1.0	602	605	607	610	613	615	618	620	623	626	628			
TDF+3TC+EFV (300/300/600) - 30 tab	TDF+3TC+EFV	90%	1.0	5,413	5,437	5,461	5,485	5,509	5,533	5,557	5,580	5,603	5,627	5,650			
TDF+FTC (300/200) - 30 tab	TDF+FTC	100%	1.0	134	142	150	158	166	174	181	189	197	205	212			

Screenshot example of seventh worksheet of tool – Consumption

If the input data has been entered correctly in the previous sections, an output table showing the monthly number of packs by formulation needed for your forecasted patient cohort will auto-populate. As a reminder of which are optimized products, the color coding at the left of each formulation reflects the user-selected WHO status specified in the Dosing Excel tab. THIS TABLE REQUIRES NO USER INPUT – IT SHOULD NOT BE MODIFIED.

This output table represents the projected monthly theoretical demand of your patient cohort over 3 years.

Below this output table is a second output table showing the annual number of new patients on triple FDC impacted by NVP induction, and therefore requiring dual formulations for 14 days. *Patient numbers in this table and the percentage inserted in “General inputs – Percentage of a bottle required for each induction” are then applied to top-up monthly consumption calculations of relevant dual FDC.* DO NOT MODIFY THIS TABLE

A final output table showing minimum security stock necessary (in packs) is available when scrolling to the right of the worksheet. This calculation is based on monthly consumption projections and number of months of security stock specified in the “General Inputs” tab.

Eighth worksheet (SOH & Pipeline): Enter Stock on Hand (SOH) and Orders in pipeline

Once the Simple tool has generated the 3-year theoretical demand for the patient cohort, users must now provide current and pipeline stock levels to generate a supply plan. This is done in 2 steps:

-Step 1 – Enter stock on hand in table below:

8. Current Stock Pipeline		For each formulation, input the stock currently on-hand in the cells corresponding to the expiry dates of each batch.																				
Stock On-Hand		Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	
Formulation																						
3TC (150) - 60 tab																						
3TC (300) - 30 tab																						
ABC (300) - 60 tab																						
ABC+3TC (600/300) - 30 tab																						
ATV/r (300/100) - 30 tab										100												200
AZT (300) - 60 tab																						
AZT+3TC (300/150) - 60 tab																						
AZT+3TC+ABC (300/150/300) - 60 tab																						
AZT+3TC+ATV/r ((300/150)+(300/100)) - 30 co-pck																						
AZT+3TC+NVP (300/150/200) - 60 tab																						

Screenshot example of first input table in eighth worksheet of tool –SOH & Pipeline

For each formulation, enter the current stock-on-hand- *in packs*- available at central warehousing in the cells corresponding to the expiry dates of each batch.

Example: If March 2017 central inventory indicates that 100 packs of ATV/r will expire in November 2017 and another 5,200 packs in October 2018, enter these stock levels under the corresponding month in the stock table.

NB: If you do not have stock for a given formulation, do not enter anything. The formulation will still be included in subsequent calculations of the Simple tool if it is one currently being used by patients.

CAVEAT: For all formulations shared with pediatric ART patients, please disregard a percentage of stock (e.g. 10 - 20% of SOH for each relevant formulation) that will then be entered into the Pediatric Simple Tool. This is needed to avoid a double calculation of needed security (buffer) stock to order when two supply plans are generated in the Adult and then Pediatric Simple tools respectively.

-Step 2 – Enter orders in the pipeline in the table starting at row 56:

Expected Deliveries		Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Formulation														
3TC (150) - 60 tab														
3TC (300) - 30 tab														
ABC (300) - 60 tab														
ABC+3TC (600/300) - 30 tab														
ATV/r (300/100) - 30 tab					5,000									
AZT (300) - 60 tab														
AZT+3TC (300/150) - 60 tab				10,000										
AZT+3TC+ABC (300/150/300) - 60 tab														
AZT+3TC+ATV/r ((300/150)+(300/100)) - 30 co-pck														
AZT+3TC+NVP (300/150/200) - 60 tab														
DRV (300) - 120 tab														
DRV (600) - 60 tab														
DTG (50) - 30 tab														
EFV (600) - 30 tab														
ETV (100) - 120 tab														

Screenshot example of second input table in eighth worksheet of tool – SOH & Pipeline

For each formulation, enter the anticipated pipeline stock volumes (i.e. stocks that have been procured and processed but not yet arrived in country) in packs, *according to the date of their expected availability for consumption at OI/ART site*. Users should therefore consider additional lead time between estimated time of shipment arrival at port and estimated time to conduct port/custom clearance, delivery to central warehouses and delivery to OI/ART sites.

Example: If a pipeline order is expected at customs in April 2017, enter the stock arrivals under May 2017, to factor in sufficient lead-time to have the stock ready for consumption

NB: If you do not have pipeline stock for a given formulation, do not enter anything.

-Output table: Current supply plan prior to placement of quantified ARV order

Stocks without additional orders	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
Formulation													
3TC (150) - 60 tab													
3TC (300) - 30 tab													
ABC (300) - 60 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
ABC+3TC (600/300) - 30 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
ATVr (300/100) - 30 tab	126	0	0	4,770	4,534	4,294	4,050	3,803	3,452	3,197	2,939	2,677	2,411
AZT (300) - 60 tab													
AZT+3TC (300/150) - 60 tab	0	0	9,677	9,345	9,004	8,654	8,295	7,927	7,550	7,164	6,769	6,365	5,952
AZT+3TC+ABC (300/150/300) - 60 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
AZT+3TC+ATVr ((300/150)+(300/100)) - 30 co-pck	0	0	0	0	0	0	0	0	0	0	0	0	0
AZT+3TC+NVP (300/150/200) - 60 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
DRV (300) - 120 tab													
DRV (600) - 60 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
DTG (50) - 30 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
EFV (600) - 30 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
ETV (100) - 120 tab	0	0	0	0	0	0	0	0	0	0	0	0	0
ETV (200) - 60 tab													
FTC (200) - 30 tab													
LPVr (200/50) - 120 tab	0	0	4,452	3,936	3,444	2,972	2,516	2,073	1,640	1,214	794	378	0

Screenshot example of output table in eighth worksheet of tool – SOH & Pipeline

If the input data has been entered correctly in the stock-on-hand and orders in the pipeline, the next output data table, showing monthly number of packs currently available for consumption will be automatically presented, starting from row 108 on this worksheet. **This output is meant to help the user understand how long the existing stock (including any planned deliveries) will last.**

The cells are automatically color-shaded according to the stock levels set by:

- **Green means OK:** Stock levels are above security stock (buffer stock)
- **Yellow means TENSION:** Stock levels are dipping into security (buffer) stocks
- **Red means STOCK-OUT:** stock levels are zero

This current supply plan is generated calculated automatically based on expected consumption, stock-on-hand, orders in the pipeline, and monthly security stock levels required (as per calculations in the output table of the “Consumption” tab). It can be a good tool for a comparative analysis of inventory and consumption after implementing the PSM plan of the previous forecasting cycle. **DO NOT MODIFY THIS TABLE**

Ninth worksheet (Ordering): Quantities to order by month and final supply plan

9. Orders													
When will the first orders be delivered to ART sites?													
Jan-18													
Quantity to be delivered to cover the expected demand and meet the security stock requirements for a given month are below - and then summed													
Formulation	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18
3TC (150) - 60 tab													
3TC (300) - 30 tab													
ABC (300) - 60 tab											14	2	2
ABC+3TC (600/300) - 30 tab											2,430	352	353
ATVr (300/100) - 30 tab													
AZT (300) - 60 tab													
AZT+3TC (300/150) - 60 tab													
AZT+3TC+ABC (300/150/300) - 60 tab											56	8	8
AZT+3TC+ATVr ((300/150)+(300/100)) - 30 co-pck											2,347	433	458
AZT+3TC+NVP (300/150/200) - 60 tab											3,206	446	443
EFV (300) - 120 tab													
DRV (600) - 60 tab											230	35	36
DTG (50) - 30 tab											4,563	669	673
EFV (600) - 30 tab											1,662	248	250
ETV (100) - 120 tab											126	21	21
ETV (200) - 60 tab													
FTC (200) - 30 tab													
LPVr (200/50) - 120 tab											1,814	468	477
NVP (200) - 60 tab											1,055	163	166
RAL (400) - 60 tab													
RTV (100) - 60 tab													
SDV (200) - 270 caps													
TDF (300) - 30 tab											159	25	26
TDF+3TC (300/300) - 30 tab											5,438	912	822
TDF+3TC+ATVr ((300/300)+300*100) - 60 co-pck											3,949	566	566
TDF+3TC+EFV (300/300/400) - 30 tab											4,450	646	648
TDF+3TC+EFV (300/300/600) - 30 tab											40,021	5,806	5,828
TDF+FTC (300/200) - 30 tab											1,596	243	247
TDF+FTC+EFV (300/200/600) - 30 tab													
Formulation	S1	S2	S3	S4	S5	S6	TOTAL						
3TC (150) - 60 tab													

Screenshot example of ninth worksheet of tool – Ordering

For this output table to automatically populate, the user need to specify in cell C5 the start date of the supply plan. This is usually the month in which the first orders would be expected to be delivered to ART sites (not the month of arrival in-country). All previous months, starting from quantification start month to supply plan start date will be greyed out to indicate that no order needs to be placed during that time period.

Each cell in the monthly order table indicates the quantity (in packs) to be ordered to cover the expected demand and meet the security stock requirements for a given month. To minimize the likelihood that security stock will be used while awaiting an order, any required top-ups to a country's security stock levels is added to the first month of overall order – which is reflected with the larger first month order seen in the supply plan. Depending on the ordering cycle (i.e. the number of months to procure for each time), the user should then sum up the needed order quantities accordingly.

Example: If a one-year order needs to be placed to cover ARV needs from January 2018 to December 2019, it will be necessary to sum up quantities from columns O to Z for each respective drug.

NOTE: Order projections are available up to 3 years after the quantification start month, but a three year order should NOT be placed with suppliers as a one-time lump quantity to avoid running out of available central warehousing space.

Factoring in the suggested monthly order quantities, the simple tool then generates a second output table showing a final supply plan AFTER the suggested ARV order has been placed. This shows the

monthly number of packs available for consumption AFTER placing the suggested ARV order, using the same color shading than in the supply plan generated in the previous worksheet. **This final supply plan is for adult patients ART ONLY and should be merged with pediatric ART supply plan for a complete picture. Please plan sufficient lead-time to procure the order so it arrives on the desired month specified in your supply plan (e.g. for high volume ARVs, the average lead-time from order placement with suppliers to in-country arrival is typically 3 months; further attention must be given to low volume and/or special circumstances ARV that typically require longer lead times.)**

Tenth worksheet (Cost): Cost of order

10. Order Summary							
<i>Enter the price per pack your country pays for each formulation in column E. Note that Reference Prices* are included to provide a basis of comparison but are Note: if you DON'T enter a 'Price Paid', the product will not be costed below and remain greyed out. Reference pricing comes from CHAI 2016 reference price li</i>							
Quarterly Volume and Cost of Stocks			Cost of incoming stocks:				
Formulation	Pack Price		Q1	Q2	Q3	Q4	C
	Reference Price*	Price Paid					
3TC (150) - 60 tab	\$2.25						
3TC (300) - 30 tab	--						
ABC (300) - 60 tab	\$11.50	\$12.0				\$192	
ABC+3TC (600/300) - 30 tab	\$12.75	\$14.0				\$38,948	\$
ATV/r (300/100) - 30 tab	\$16.00	\$16.5					
AZT (300) - 60 tab	\$6.25						
AZT+3TC (300/150) - 60 tab	\$6.60	\$6.6					
AZT+3TC+ABC (300/150/300) - 60 tab	\$20.00	\$20.0				\$1,280	
AZT+3TC+ATV/r ((300/150)+(300/100)) - 30 co-pck	\$24.00	\$26.0				\$72,280	\$
AZT+3TC+NVP (300/150/200) - 60 tab	\$8.20	\$8.2				\$29,946	\$
DRV (300) - 120 tab	--						
DRV (600) - 60 tab	\$75.00	\$75.0				\$19,875	
DTG (50) - 30 tab	\$3.67	\$4.0				\$20,952	
EFV (600) - 30 tab	\$3.40	\$3.3				\$6,303	
ETV (100) - 120 tab	--	\$66.0				\$9,702	
ETV (200) - 60 tab	--						
FTC (200) - 30 tab							
LPV/r (200/50) - 120 tab	\$20.00	\$19.0				\$43,358	\$
NVP (200) - 60 tab	\$2.50	\$2.2				\$2,680	
RAL (400) - 60 tab	\$50.00	\$8.0					
RTV (100) - 60 tab	\$7.50						

Screenshot example of tenth worksheet of tool – Cost

In this worksheet, if a user specifies a price previously paid when procuring an ARV drug, the simple tool will calculate a quarterly cost based on the suggested ARV order on the previous worksheet. To guide the user when price previously paid is not known or available, 2016 CHAI reference prices² and current GPRM international reference prices³ are made available in column D. **Please note that no costs will appear in this output table if the user does not specify a price previously paid for each ARV drug in the pink cells in column E.**

An annual cost by product is then tabulated in a second output table, starting row 59 to quickly assess the overall cost of the quantification and any adjustments needed based on available ARV budgets.

--THIS COMPLETES THE WALKTHROUGH OF THE ADULT SIMPLE TOOL--

² http://www.clintonhealthaccess.org/content/uploads/2016/11/2016-CHAI-ARV-Reference-Price-List_FINAL.pdf

³ <http://www.who.int/hiv/amds/gprm/en/>

CHAI simple tool for forecasting Pediatric ARVs

Navigating the tool: Quantification steps by Excel worksheet

The pediatric Tool follows a similar logic process as the Adult Tool. In addition to the steps highlighted above, there are two additional levels of input needed before the quantification of pediatric ARVs can be calculated – both of which rely on weight distribution of the patients.

1. Weight distribution of entire pediatric cohort
2. Weight distribution by formulation

As with the Simple tool for adults, a walkthrough by Excel worksheet is therefore provided to highlight these two additional features, along with the differences between the adult and pediatric versions of simple tools for the remainder of the worksheets. **Please make sure to review the Adult Simple tool sections before starting your pediatric forecasting.**

First worksheet (General Inputs): Enter general baseline quantification inputs

Simple Pediatric ARV Forecasting Tool

Instructions - Please see Manual for detailed instruction of use of this tool

Inputs - To be filled by user

Outputs - User must **NOT** modify

1. Inputs

Quantification start (MM/YYYY) Mar-17 Note: The date of the stock data and the patient data must match in order to ensure the integrity of the quantification

Number of patients currently on ART Year 0 - total **554**

Annual inclusions Year 1: 40, Year 2: 60, Year 3: 60

Annual 1L -> 2L migration (%) Year 1: 6.2%, Year 2: 6.2%, Year 3: 6.2%*

Annual 2L -> 3L migration (%) Year 1: 0.7%, Year 2: 0.7%, Year 3: 0.7%*

Annual attrition rate (%) 1L: 3.0%, 2L: 3.0%, 3L: 0.0%*

NVP lead-in dosing Yes (see "Consumption" tab - row 113 - for NVP dual-FDC induction calculations)

Percentage of a bottle required for each induction (%) 100%

NEW! National ART Coverage rate (select range) Med: 65% - 80% (see "Protocols" tab for reference pediatric weight distributions)

Number of months of security stock 6

Note: Projected annual totals below

Year 1 - total	Year 2 - total	Year 3 - total
594	654	714
577	619	660

before applying attrition and migration
after applying attrition and migration r

1. General Inputs / 2. Protocols / 3. ARV Substitutions / 4. Formulations / 5. Form Breakdown / 5a. Dosing / 6. Patients / 7. Consumption / 8. SOH & Pipeline / 9. Ordering / 10. Cost

Screenshot example of first worksheet of pediatric tool - General Inputs

As with the Adult Simple Tool, this worksheet asks the user for the same general inputs of the ART patient – but isolating only pediatric patients (i.e. typically those under 15 years old) cohort as per the below:

- total number of pediatric on ART in-country
- annual migration rates from one therapeutic line of treatment to another (1L→2L→3L)
- current attrition rates for each therapeutic line of treatment (1L, 2L, 3L)
- National ART coverage rates

As with the Adult Simple tool, this worksheet asks users for the annual breakdown of each regimen by form of molecule – isolating which combination type of ARV will be used to administer the regimen (simple formulations only- S+S+S, one double FDC – D+S, or one triple FDC – T). As an optimized reference, the Simple Tool is pre-populated to favor use of fixed dose combinations wherever possible, but this can be adjusted based on formulations actually procured within each country setting.

Fifth worksheet (Form Breakdown): Enter Breakdown by formulation and weightband

5. Form Breakdown

1) Please enter the percentage breakdown of patients by weightband for each formulation. FDCs can be found at bottom of table. The sum of percentages in each column/weightband should add up to 100% for each molecule.
 2) Please input the correct Units/Pack for the formulations your country consumes, as some formulations have multiple pack sizes.

Product List										Breakdown of patients by weightband						% of patients using this molecule	Total
ARV	Strength	Description	Form	Units/Pack	IATT Status (September 2019)	0 - 5.9 kg	6 - 9.9 kg	10 - 13.9 kg	14 - 19.9 kg	20 - 24.5 kg	25 - 34.9 kg						
Singles Drug Formulations																	
3TC	0	dose in ml	susp	100	Neonatal Tx	100%	100%	100%				21%	100%				
3TC	150		tab	60	Adult				100%	100%	50%	43%					
3TC	300		tab	30	Adult						50%	17%					
ABC	-	dose in ml	susp	240	Non-Essential	100%						1%	100%				
ABC	300		tab	60	Adult						100%	33%					
ABC	60	dispersible	tab	60	Limited Use		100%	100%	100%	100%		66%					
ATV	100		caps	60	Limited Use			100%	100%			44%	65%				
ATV	200		caps	60	Non-Essential					100%		21%					
ATV	300		caps	20	Non-Essential												
ATV/r	300/100		tab	30	Adult						100%	100%	100%				
AZT	-	dose in ml	susp	100	Limited Use							-	120%				
AZT	100		caps	100	Non-Essential							-					
AZT	300		tab	60	Non-Essential						100%	33%					
AZT	60	dispersible	tab	60	Limited Use	100%	100%	100%	100%	100%	60%	87%					
DRV	0	dose in ml	susp	200	Non-Essential							-	100%				
DRV	150		tab	240	Non-Essential				100%	100%	100%	-					
DRV	75		tab	480	Limited Use							-					
EFV	0	dose in ml	susp	180	Non-Essential							-	114%				
EFV	200		caps	90	Non-Essential							-					
EFV	200		tab	30	Non-Essential							-					
EFV	200	scored	tab	90	Optimal			50%	100%	100%		57%					
EFV	50		caps	30	Non-Essential							-					
EFV	50		tab	30	Non-Essential			50%	50%			22%					

Formulation Status Key:
 Optimal (Green)
 Adult (Orange)
 Neonatal Tx (Yellow)
 Limited Use (Light Green)
 Non-Essential (Light Purple)

Can be lower than 100% if using ATV/r
Ensure sum of molecules for every w
Can exceed 100% if procure 50mg and

Screenshot example of fifth worksheet of pediatric tool – Form Breakdown

In this section, the user needs to specify the distribution of patients by dosage and form for each ARV drug (i.e. molecule family). Optimized products (favoring dispersible and FDC formulations whenever possible) have been pre-selected across weightbands but can be changed based on actual procurements and clinical treatment practices in your country.

Example: If half of pediatric patients over 25kg that receive single 3TC are prescribed the new adult dose 3TC 300mg, enter 50% for both the 300mg and 150mg dose in that weightband- as indicated by the purple circle above

CAVEAT: To avoid a calculation error in the tool, the sum for each weight band within the same family of a molecule must equal 100%. As indicated by the red circle – a reminder in red will appear if this percentage does not equal 100%.

This worksheet is principally a reference table indicating the dosages for all formulations that can be selected using the Simple tool, and now includes status of use in Column I, aligned with current recommendations by the IATT (Inter-Agency Task Team on prevention and treatment of HIV infection in pregnant women, mothers, and their children) pediatric formulary list, a technical sub-committee report of the IATT, WHO, and UNICEF. These recommendations change regularly to stay aligned with WHO treatment guideline updates and the availability of each formulation on the global ARV market,

so the IATT website⁴ should be consulted prior to a new quantification exercises for most up to date statuses.

Fifth worksheet (Dosing): Dosing by weightband

6. Dosing											
Formulations mirror inputs from tab '5. Form Breakdown'. All dosages have been pre-populated based on latest WHO reference dosing. Additional doses in higher weightbands only can be added by user if needed. Note: Dosing cells in white mirror forms percentages input into '5. Form Breakdown.' Those that are grey represent forms that have not been selected in '5. Form Breakdown.'											
Product List						Dose per day for weightband					
ARV	Strength	Description	Form	Units/Pack	IATT Status (September 2016)	0 - 5.9 kg	6 - 9.9 kg	10 - 13.9 kg	14 - 19.9 kg	20 - 24.5 kg	25 - 34.9 kg
Singles - Existing Formulations											
BTC	0	dose in ml	susp	100	Neonatal Tx	6.0	8.0	12.0			
BTC	150		tab	60	Adult				1.0	2.0	2.0
BTC	300		tab	30	Adult						1.0
ABC	0	dose in ml	susp	240	Non-Essential	6.0	8.0	12.0			
ABC	60	dispersible	tab	60	Limited Use	2.0	3.0	4.0	5.0	6.0	
ABC	300		tab	60	Adult		1.0	1.0	1.0	1.5	2.0
ATV	100		caps	60	Limited Use			1.0	2.0	2.0	2.0
NEW! ATV	200		caps	60	Non-Essential				1.0	1.0	
ATV	300		caps	30	Adult						1.0
ATV/r	300/100		tab	30	Adult						
AZT	0	dose in ml	susp	100	Limited Use	12.0	18.0	24.0			
AZT	60	dispersible	tab	60	Limited Use	2.0	3.0	4.0	5.0	6.0	
AZT	100		caps	100	Non-Essential		2.0	2.0	3.0	4.0	
AZT	300		tab	60	Non-Essential						2.0
DRV	75		tab	480	Limited Use			6.0	10.0	10.0	12.0
DRV	150		tab	240	Non-Essential			3.0	5.0	5.0	6.0
EFV	0	dose in ml	susp	180	Non-Essential			12.0	13.0	15.0	17.0
EFV	50		caps	30	Non-Essential			4.0	6.0	6.0	8.0
EFV	50		tab	30	Non-Essential			4.0	6.0	6.0	8.0
EFV	200	scored	tab	90	Optimal			1.0	1.5	1.5	2.0
EFV	200		tab	30	Non-Essential			1.0	1.5	1.5	2.0
EFV	200		caps	90	Non-Essential			1.0	1.5	1.5	2.0

Formulation Status Key:	
Optimal	
Adult	
Neonatal Tx	
Limited Use	
Non-Essential	

Note on ATV: administer with ritonavir

Error: Dose missing for weightband that

Note on DRV: administer with ritonavir

Note on EFV: administer if >3 yrs

Screenshot example of fifth worksheet of pediatric tool – Dosing

This worksheet serves as a reference table, showing the WHO's harmonized pediatric dosing recommendations of daily dose for each weight band for each formulation (capsules, pills, or mL) per patient per day, seen in the 2016 WHO Guidelines⁵. Only the cells in white must be filled, and represent a mirror image of active input cells with percentages in the fifth worksheet - formulation by weightband)- DO NOT MODIFY DOSAGES IN THIS TABLE

CAVEAT: If error message appears for "Dose missing" (as represented in screenshot above with blank cell circled), it is recommended that the user go back to the previous worksheet and either change the percentage allocation to ones with weightbands that include WHO-recommended dosing OR to consult physicians in country to confirm an acceptable dosing to be used for that particular weightband.

⁴ <http://www.emtct-iatt.org>

⁵ http://apps.who.int/iris/bitstream/10665/208825/1/9789241549684_eng.pdf?ua=1

Sixth worksheet (Patients): Monthly number of patients by regimen

6. Patients by protocol by quarter													
Patients per Regimen	Patients at the end of:												
	Start	Q1			Q2			Q3			Q4		
		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
1st Line													
ABC+3TC+NVP	15	14	13	12	11	10	9	9	8	7	7	6	
ABC+3TC+EFV	25	26	27	29	30	31	32	33	35	36	37	38	
ABC+3TC+LPV/r	15	17	19	20	22	23	25	26	28	29	30	31	
ABC+3TC+AZT													
AZT+3TC+EFV	45	45	44	44	44	43	43	43	42	42	42	41	
AZT+3TC+NVP	350	348	346	345	343	341	339	338	336	334	333	331	
AZT+3TC+LPV/r													
TDF+3TC+EFV	38	38	37	37	37	37	36	36	36	35	35	35	
TDF+3TC+NVP	12	12	12	12	12	12	11	11	11	11	11	11	
ABC++													
TDF++													
Sub-total	500	499	499	498	498	497	497	496	495	495	494	494	
% of total Population	87.7%	87.3%	86.9%	86.5%	86.2%	85.8%	85.4%	85.0%	84.7%	84.3%	83.9%	83.6%	83.2%
2nd Line													
ABC+3TC+ATV													
ABC+3TC+LPV/r	23	25	26	28	29	31	32	34	35	37	38	40	
AZT+3TC+LPV/r	12	12	13	13	13	13	14	14	14	14	15	15	

Screenshot example of sixth worksheet of pediatric tool – Patients

As with the Adult simple tool, if all inputs in previous steps have been correctly entered, this table will automatically tabulate the monthly evolution of patients using each regimen over 36 months – DO NOT MODIFY THIS TABLE.

Seventh worksheet (Consumption): Projected patient consumption by formulation (theoretical demand)

7. Consumption forecast																		
NO INPUTS IN THIS TAB!																		
Monthly Consumption of Formulations																		
Formulations in white have been forecasted for in '5. Form Breakdown'																		
Formulation	Molecule	% of Molecule	Btts/mth	Packs consumed during:														
				Q1		Q2		Q3		Q4		Q5						
				M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
3TC 0 - susp - dose in ml	3TC	21%	3.3															
3TC 150 - tab	3TC	63%	0.8															
3TC 300 - tab	3TC	17%	1.0															
ABC 0 - susp - dose in ml	ABC	1%	0.8															
ABC 300 - tab	ABC	33%	1.0															
ABC 60 - tab - dispersible	ABC	66%	2.5															
ABC+3TC 120/60 - tab - dispersible&scored	ABC+3TC	64%	2.5	129	135	141	146	152	157	163	168	174	179	184	190	196	203	
ABC+3TC 60/30 - tab	ABC+3TC	0%	0.0															
ABC+3TC 60/30 - tab - dispersible	ABC+3TC	3%	1.4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	
ABC+3TC 600/300 - tab	ABC+3TC	33%	1.0	27	28	30	31	32	33	34	35	37	38	39	40	41	43	
ABC+3TC+AZT 300/150/300 - tab	ABC+3TC+AZT	33%	1.0															
ABC+3TC+AZT 60/30/60 - tab	ABC+3TC+AZT	67%	2.5															
ATV 100 - caps	ATV	44%	0.8															
ATV 200 - caps	ATV	21%	0.5															
ATV 300 - caps	ATV	0%	0.0															
ATV/r 300/100 - tab	ATV/r	100%	1.0	4	4	4	5	5	5	6	6	6	6	7	7	7	8	
AZT 0 - susp - dose in ml	AZT	0%	0.0															
AZT 100 - caps	AZT	0%	0.0															
AZT 300 - tab	AZT	33%	1.0															
AZT 60 - tab - dispersible	AZT	67%	2.5															
AZT+3TC 300/150 - tab	AZT+3TC	33%	1.0	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
AZT+3TC 60/30 - tab	AZT+3TC	0%	0.0															
AZT+3TC 60/30 - tab - dispersible	AZT+3TC	67%	2.5	98	98	98	98	98	98	98	98	97	97	97	97	98	98	
AZT+3TC+NVP 300/150/200 - tab	AZT+3TC+NVP	33%	1.0	118	117	117	116	115	115	114	114	113	112	112	111	111	111	
AZT+3TC+NVP 60/30/50 - tab - dispersible	AZT+3TC+NVP	67%	2.5	579	576	573	570	567	564	562	559	556	553	550	548	545	543	
DRV 0 - susp - dose in ml	DRV	0%	0.0															
DRV 150 - tab	DRV	0%	0.0															
DRV 75 - tab	DRV	100%	0.6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	

Screenshot example of seventh worksheet of pediatric tool – Consumption

As with the Adult Simple tool, a 3-year monthly consumption is automatically calculated based on all formulations selected in previous sections. A second table starting row 113 shows the regimens impacted by new ART initiates on triple FDC that temporarily will use dual FDC formulations during NVP induction. A consumption top-up of all dual FDC formulations will automatically be tabulated for these instances.

Guidance on the use and administration of LPV/r oral pellets has been included starting in cell P113.

Eighth worksheet (SOH & Pipeline): Enter Stock on Hand (SOH) and Order in Pipeline

8. Current Stock and Pipeline		For each formulation, input the stock currently on-hand in the cells corresponding to the expiry dates of each batch. Only include stock that is allocated for pediatric patients (e.g. only input packs of A2T3TCNVP 300/150/200 allocated to pediatrics; rest of packs should be included in Adult F																		
Stock On-Hand (in packs)		Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-	
Formulation																				
3TC 0 - susp - dose in ml																				
3TC 150 - tab																				
3TC 300 - tab																				
ABC 0 - susp - dose in ml																				
ABC 300 - tab																				
ABC 60 - tab - dispersible																				
ABC+3TC 120/60 - tab - dispersible&scored																				
ABC+3TC 60/30 - tab																				
ABC+3TC 60/30 - tab - dispersible				200																
ABC+3TC 600/300 - tab																				
ABC+3TC+A2T 300/150/300 - tab																				
ABC+3TC+A2T 60/30/60 - tab																				
ATV 100 - caps																				
ATV 200 - caps																				
ATV 300 - caps																				
ATVr 300/100 - tab																				
A2T 0 - susp - dose in ml																				
A2T 100 - caps																				
A2T 300 - tab																				
A2T 60 - tab - dispersible																				
A2T+3TC 300/150 - tab																				
A2T+3TC 60/30 - tab																				
A2T+3TC 60/30 - tab - dispersible																				
A2T+3TC+NVP 300/150/200 - tab																				
A2T+3TC+NVP 60/30/50 - tab - dispersible																				
DRV 0 - susp - dose in ml																				
DRV 150 - tab																				
DRV 75 - tab																				
EFV 0 - susp - dose in ml																				
EFV 200 - caps																				
EFV 200 - tab																				
EFV 200 - tab - scored																				
EFV 60 - caps																				

Screenshot example of eighth worksheet of pediatric tool –SOH & Pipeline

As with the Adult Simple tool, the user must enter stock on hand and pipeline stock for all pediatric formulations and shared formulations shared with adult patients.

CAVEAT: As mentioned in the Adult Simple tool walkthrough (on pg. 18), the stock tally of all shared formulations for adult and pediatric patients must be split between the Adult and Pediatric simple tools (e.g. 80% vs 20%) to avoid the tool generating double the needed demand of security (buffer) stock in your supply plan, and overstocking your central warehousing.

A third table starting row 226 shows the current supply plan over three years, prior to placing an ARV order.

Ninth worksheet (Ordering): Quantities to order by month and final supply plan

9. Orders		Quantity to be delivered to cover the expected demand and meet the security stock requirements for a given month are below - and then summarized bi-annually and with														
When will the first orders be delivered? Jan-18		Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18
Formulation																
3TC 0 - susp - dose in ml																
3TC 150 - tab																
3TC 300 - tab																
ABC 0 - susp - dose in ml																
ABC 300 - tab																
ABC 60 - tab - dispersible																
ABC+3TC 120/60 - tab - dispersible&scored												1,424	231	238	245	252
ABC+3TC 60/30 - tab																
ABC+3TC 60/30 - tab - dispersible												41	7	7	7	7
ABC+3TC 600/300 - tab												300	49	50	51	53
ABC+3TC+AZT 300/150/300 - tab																
ABC+3TC+AZT 60/30/60 - tab																
ATV 100 - caps																
ATV 200 - caps																
ATV 300 - caps																
ATV/r 300/100 - tab																
AZT 0 - susp - dose in ml													6	9	9	10
AZT 100 - caps																
AZT 300 - tab																
AZT 60 - tab - dispersible																
AZT+3TC 300/150 - tab												140	20	20	20	20
AZT+3TC 60/30 - tab																
AZT+3TC 60/30 - tab - dispersible												684	98	98	98	98
AZT+3TC+NVP 300/150/200 - tab												774	109	109	108	108
AZT+3TC+NVP 60/30/50 - tab - dispersible												3,806	536	534	532	530
DRV 0 - susp - dose in ml																
DRV 150 - tab																
DRV 75 - tab												21	3	3	3	3
DRV 0 - susp - dose in ml																

Screenshot example of ninth worksheet of pediatric tool – Ordering

As with the Adult Simple tool, the user must enter the desired month of order arrival in cell C5 to populate the monthly suggested ARV order. Greyed out cells from quantification start (e.g. In March 2017) to order arrival month (e.g. January 2018) indicate consumption based on current stock still available in country. The first order month has higher order quantities to top up security stock levels in central warehousing. A final 3-year supply plan AFTER placement of the ARV order is then displayed starting row 112, using color shading following the legend specified in the screenshot above.

Tenth worksheet (Cost): Cost of pediatric ARV order

10. Order Summary											
<p>Enter the price per pack your country pays for each formulation in column C. Note that Reference Prices* are included to provide a basis of comparison but are not used to calculate the cost of incoming stocks. Note: if you DON'T enter a 'Price Paid', the product will not be costed below and remain greyed out. Reference pricing comes from CHAI 2016 reference price list and current GPRM prices</p>			<p>Cost of incoming stocks:</p>								
Quarterly Volume and Cost of Stocks (Ex-Works)			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Formulation	Pack Price										
	Reference Price*	Price Paid									
3TC 0 - susp - dose in ml	\$1.20										
3TC 150 - tab	\$2.25										
3TC 300 - tab											
ABC 0 - susp - dose in ml	\$8.00										
ABC 300 - tab	\$11.50										
ABC 60 - tab - dispersible	\$3.80										
ABC+3TC 120/60 - tab - dispersible&scored	\$3.50	\$4.00	\$0	\$0	\$0	\$6,620	\$2,940	\$3,192	\$3,436	\$3,676	\$3,908
ABC+3TC 60/30 - tab	--										
ABC+3TC 60/30 - tab - dispersible	\$3.50	\$3.50	\$0	\$0	\$0	\$168	\$74	\$81	\$84	\$91	\$95
ABC+3TC 600/300 - tab	\$12.75	\$13.00	\$0	\$0	\$0	\$4,537	\$2,002	\$2,171	\$2,340	\$2,496	\$2,665
ABC+3TC+AZT 300/150/300 - tab	\$20.00										
ABC+3TC+AZT 60/30/60 - tab	\$7.50										
ATV 100 - caps											
ATV 200 - caps	\$20.00										
ATV 300 - caps	\$17.00										
ATV/r 300/100 - tab	\$16.00	\$16.50	\$0	\$0	\$0	\$99	\$462	\$512	\$561	\$594	\$644
AZT 0 - susp - dose in ml	\$1.20										
AZT 100 - caps	--										
AZT 300 - tab	\$6.25										
AZT 60 - tab - dispersible	--										
AZT+3TC 300/150 - tab	\$6.60	\$6.50	\$0	\$0	\$0	\$1,040	\$390	\$390	\$390	\$390	\$390
AZT+3TC 60/30 - tab	--										
AZT+3TC 60/30 - tab - dispersible	\$2.00	\$2.00	\$0	\$0	\$0	\$1,564	\$588	\$588	\$588	\$588	\$588
AZT+3TC+NVP 300/150/200 - tab	\$8.20	\$8.20	\$0	\$0	\$0	\$7,241	\$2,665	\$2,640	\$2,608	\$2,583	\$2,558
AZT+3TC+NVP 60/30/50 - tab - dispersible	\$3.50	\$3.50	\$0	\$0	\$0	\$15,197	\$5,586	\$5,534	\$5,478	\$5,425	\$5,369
DRV 0 - susp - dose in ml	--										
DRV 150 - tab	--										
DRV 75 - tab	--	\$54.00	\$0	\$0	\$0	\$1,296	\$486	\$486	\$486	\$486	\$486

Screenshot example of tenth worksheet of pediatric tool – Cost

As with the Adult simple tool, this worksheet tabulates the cost of your ARV order, provided that the user enters a price previously paid for each formulation that is an active (white) cell, and therefore a used formulation by your pediatric cohort.

THE USER MUST ADD THIS PEDIATRIC ARV COST TO THE ARV COST IN THE ADULT TOOL TO OBTAIN AN OVERALL QUANTIFICATION COST THAT CAN BE COMPARED AGAINST AVAILABLE BUDGET IN-COUNTRY.

--THIS COMPLETES THE WALKTHROUGH OF THE PEDIATRIC SIMPLE TOOL--

References

Annex A – List of Input Sources to complete a quantification

- latest National Treatment Guidelines in your country
- latest WHO HIV treatment guidelines for adult and pediatric patients on ART
- latest national aggregate of site/hospital ART reports for both adult and pediatric ART cohort
- latest ARV stock inventory from ALL central warehousing units – including pipeline orders
- latest CHAI ceiling prices and GPRM prices
- current list of ARV procured in-country