



Swaziland Ministry of Health

Quantification of HIV and AIDS Commodities for April 2014 through March 2016, Swaziland

January 2014



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ACRONYMS

3TC	lamivudine
ABC	abacavir
AIDS	acquired immunodeficiency syndrome
AMC	average monthly consumption
APMR	ART Patients Monitoring and Reporting [system]
ART	antiretroviral therapy
ARV	antiretroviral
ATV	atazanavir
AZT	zidovudine
CHAI	Clinton Health Access Initiative
CMS	Central Medical Stores
D4T	stavudine
DDI	didanosine
DMU	Data Management Unit [at CMS]
EFV	efavirenz
FY	fiscal year
GoS	Government of Swaziland
HIV	human immunodeficiency virus
HMIS	health management information systems
INH	isoniazid
IPT	isoniazid preventive therapy
LMIS	logistics management information systems
LPV/r	lopinavir/ritonavir
MoH	Ministry of Health
MSH	Management Sciences for Health
NVP	nevirapine
PEPFAR	US President's Emergency Plan for AIDS Relief
PMTCT	prevention of mother-to-child transmission
PO	per os
RPM Plus	Rational Pharmaceutical Management Plus
RTV	ritonavir
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SID	Strategic Information Department
SNAP	Swaziland National ART Programme
SQL	Structured Query Language
SZL	Swazi lilangeni
TDF	tenofovir
TWG	technical working group
UNAIDS	United Nations Joint Programme on HIV/AIDS
USAID	United States Agency for International Development
USD	United States dollar
WHO	World Health Organization

EXECUTIVE SUMMARY

Swaziland faces daunting health challenges. It has the highest HIV prevalence rate in the world, currently at 31% among 15- to 49-year-olds. HIV and AIDS remain the greatest public health and socioeconomic development challenges for Swaziland. The Government of Swaziland (GoS) has made significant progress in addressing the epidemic through a series of strategic plans and frameworks. A regular and systematic quantification of HIV and AIDS commodities is one of the interventions necessary to ensure that adequate resources are availed without interruption. The scope of the quantification was national, covering all HIV and AIDS commodities through government funding. The commodities to be quantified include antiretroviral medicines (ARVs) for antiretroviral therapy (ART), medicines for prevention of mother-to-child transmission (PMTCT), medicines for opportunistic infections (e.g., co-trimoxazole prophylaxis), medicines for isoniazid preventive therapy (IPT) such as isoniazid (INH), and medicines for Kaposi's sarcoma. In total, 35 line items were quantified covering the period April 2014 through March 2016. A detailed 24-month supply plan taking into consideration service capacity, current stock availability, and outstanding shipment was prepared for the fiscal years (FY) April 2014 through March 2016. Various quantification methodologies and tools have been employed based on the nature of the program and availability of required data.

Approximately SZL 386.3 million (approximately 36.8 million in United States dollars [USD]) is required for the period from April 2014 through March 2016 with SZL 171 million and 215.3 million attributed to year I and year II, respectively. For year I, out of all line items, the ARV requirement comprises the largest proportion at SZL 156.5 million (91.5% of the budget) for FY 2014–15. The other 8.5% accounts for co-trimoxazole, INH, and medicines for Kaposi's sarcoma. Of the ARV requirements, adult first-line ARVs account for over two-thirds (69.8%), and requirements for all pediatric and PMTCT medicines account for 8.2% and 11.7%, respectively. Comparison of procurement cost of products showed that TDF+3TC+EFV 300+300+600 of 30 tablets comprise almost 50% of the procurement budget followed by AZT+3TC+NVP 300+150+200 mg of 60 tablets at 11.8%. Budget requirement and patient utilization of these two products are increasing due to new WHO guideline recommendations and implementation.

The results of the quantification exercise have already been submitted to the Ministry of Finance and used for the FY 2014–15 tender.

The main challenges encountered during completion of the quantification exercise were the following:

- Inadequate human resources, especially the lack of pharmacy personnel at the facility level, and a relatively weak health system
- Relatively higher ART attrition rate compared to other African countries
- Patient data inaccuracy and incompleteness at ART sites
- Relatively poor inventory management at ART sites

- Longer lead time in allocating and releasing funds for procurement
- Inadequate funding and delayed disbursement process
- Delayed payment processes, which hinder on-time, regular delivery of HIV commodities
- Poor reporting and communication between ART-initiating clinics and refill clinics in terms of stock reporting and ordering
- Poor performance from some suppliers

The following recommendations were suggested to improve the quantification, procurement, and supply chain management of HIV and AIDS commodities:

- Strengthen in-country pharmacy personnel training
- Strengthen the ART patient-retention strategy
- Strengthen continuous supportive supervision and mentorship to alleviate challenges related to poor data quality and inventory management
- Advocate for on-time release of adequate funding
- Advocate for an improved process of payments of suppliers
- Build the capacity of regional clinical supervisors to bridge the communication between ART-initiating facilities and refill clinics on stock reporting and ordering
- Put a suppliers' performance management system in place and engage suppliers regularly.

INTRODUCTION

Country Profile

Swaziland faces daunting health challenges. It has the highest HIV prevalence rate in the world, currently at 31% among 15- to 49-year-olds.¹ In 2009, mortality from AIDS-related causes amounted to 0.6% of the population (about 7,000 of a total population of 1.185 million). Since 2004, when Swaziland first officially acknowledged the AIDS crisis, it has mounted an impressive response. According to the 2011 *UNAIDS World AIDS Day Report*, Swaziland is close to achieving universal access to HIV and AIDS treatment.²

HIV/AIDS in Swaziland

HIV and AIDS remain the greatest public health and socioeconomic development challenges for Swaziland. The GoS has made significant progress in addressing the epidemic through a series of strategic plans and frameworks. Despite these efforts, Swaziland still bears a high HIV disease burden. As a result, the extended National Strategic Framework for HIV and AIDS was developed to shift the national response paradigm not only from focusing on results, but also to rethinking its investment for HIV and AIDS. The HIV/AIDS epidemic continues to pose a major threat to the nation, and its impact is already felt in all sectors. Epidemiological review indicates an increase in HIV prevalence among pregnant women, from 3.9% in 1992 to 41.1% in 2010. The 2010 prenatal care sentinel surveillance survey showed that prevalence has stabilized between 42% and 41% and that HIV prevalence is highest among those ages 30–34 years (53.8%) and lowest among those ages 15–19 years (20.4%).³

The Swaziland National ART Programme (SNAP) was established in 2003 as a unit of the Swaziland MoH. The priority intervention for the program is the provision of high-quality treatment, care, and support for all adults, adolescents, and children living with HIV/AIDS in the Kingdom of Swaziland through the provision of ART, PMTCT, and related services.

HIV and AIDS commodities are vital for the successful implementation of ART and PMTCT programs. Therefore, SNAP, in collaboration with CMS and partners such as the USAID/SIAPS Program and CHAI, conduct annual HIV and AIDS commodity demand planning and budgeting and submit financial requirement to GoS.

¹Government of Swaziland. 2012. *Swaziland HIV Incidence Measurement Survey (SHIMS)*. Mbabane: GoS.

²United Nations Joint Programme on HIV/AIDS. 2011. *UNAIDS World AIDS Day Report 2011*. Geneva: UNAIDS.

³United Nations Joint Programme on HIV/AIDS. 2012. *Swaziland Country Report on Monitoring the Political Declaration on HIV and AIDS*. Geneva: UNAIDS.

Supply Chain Management for HIV/AIDS Commodities

Selection

HIV and AIDS commodities in Swaziland are selected based on the country's ART and PMTCT guidelines. The guidelines are systematically updated based on the new findings and recommendations provided by WHO. All HIV and AIDS commodities are included in the *National Standard Treatment Guidelines and Essential Medicines List*.

Quantification and Procurement of HIV and AIDS Commodities

In Swaziland, forecasting and supply planning of HIV and AIDS commodities are conducted through the ART Forecasting and Supply Planning Technical Working Group (TWG), which was established in 2011 with defined roles and responsibilities. The TWG is led by the CMS, and its membership is comprised of the Baylor Pediatrics Clinic, the Mbabane Government Hospital, and partners such as PEPFAR/US Centers for Disease Control and Prevention, USAID/SIAPS, CHAI, the University Research Co., Médecins Sans Frontières (Doctors Without Borders), the United Nations Children's Fund, the Elizabeth Glaser Pediatric AIDS Foundation, and the International Center for AIDS Care and Treatment Programs..

Annual forecasting of two years' demand and quarterly supply planning is conducted by the TWG. Once annual forecasting is done, estimated one year quantities and budgets are submitted to the MoH Planning Unit and Procurement Unit. The morbidity method of forecasting is usually used to quantify ARV requirements; however, the consumption method is used to quantify co-trimoxazole, INH, and medicines for Kaposi's sarcoma, based on the available data. During the quarterly supply planning exercise, stock on hand, consumption and losses/adjustments, and outstanding shipment data aggregated from central and facility level are used to determine which products are needed, in what quantities, and when the products should be brought into the country. The result from the supply planning exercise is used to generate a purchase request. The Procurement Unit prepares bid documents for HIV and AIDS commodities and floats open tenders every fiscal year. A pre-tender adjudication meeting is conducted with bidders to clarify any issues related to the tender or bid. Tender evaluation is then conducted through the National Drug Advisory Committee (an evaluation committee). Once the tender evaluation process has been finalized, the tenders are approved and then awarded to successful bidders by the National Tender Board. After successful bidders have been notified, they sign a contract agreement on the terms and condition of the tender.

Warehouse and Distribution of HIV and AIDS Commodities

CMS is responsible for receiving, storing, and distributing all HIV and AIDS commodities. The warehouse and distribution activity is integrated with other essential health commodities. HIV/AIDS commodities and essential medicines are distributed monthly to health facilities, based on orders from those facilities. In April 2011, the supply chain system for HIV and AIDS commodities was redesigned in such a way that facilities would maintain a maximum stock of three months and minimum of two months. The reporting and ordering period continued to be monthly. A logistics management information systems (LMIS) tool was designed. A two-day

training on how to implement the newly designed LMIS was conducted and facilitated by USAID/Strengthening Pharmaceutical Systems and CHAI. To date, more than 200 health workers from 98 ART-initiating and refill facilities have been trained and have started implementing the system. At CMS, the Data Management Unit (DMU) was established to collect, collate, analyze, and generate stock and patient-related information for decision making.

The distribution of the commodities to facilities is staggered throughout the month according to the set schedule for the four administrative regions of the country as shown in table 1.

Table 1. HIV and AIDS Commodity Distribution Schedule from CMS to Facilities

Region	When orders are received at CMS	When commodities are distributed to health facilities
Shiselweni	First week of the month	First week of the month
Lubombo		Second week of the month
Hhohho		Third week of the month
Manzini		Last week of the month

The flow diagram in figure 1 shows that the ART LMIS report order form is sent from refill clinics to ART-initiating sites. ART-initiating sites will check the report and order coming from refill sites and resupply accordingly.

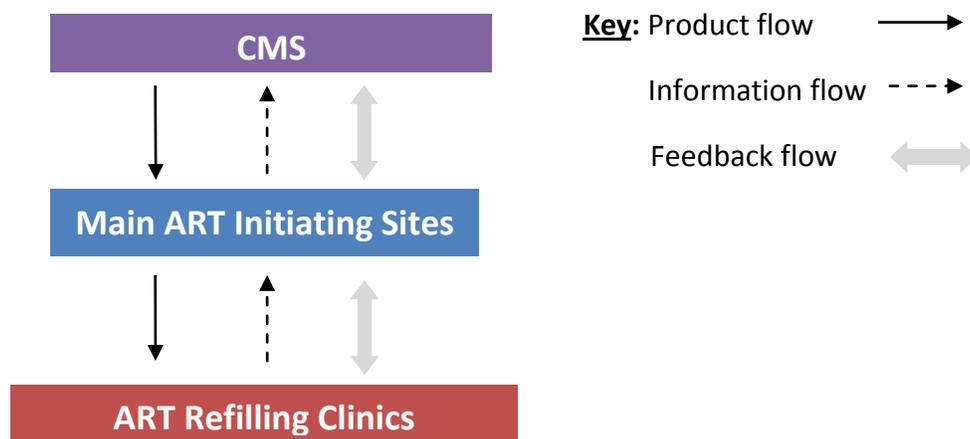


Figure 1. Movement of HIV and AIDS commodities and information

ART-initiating sites aggregate the data of stock they have issued to clinics and their own monthly dispensed-to-users quantities. The aggregated data are considered to be their monthly consumption. Facilities calculate their average monthly consumption (AMC) based on the average of the last two previous months' and the current month's consumption. The AMC is used to calculate their maximum stock quantity that, in turn, is used to estimate their order quantity, as shown in figure 2.

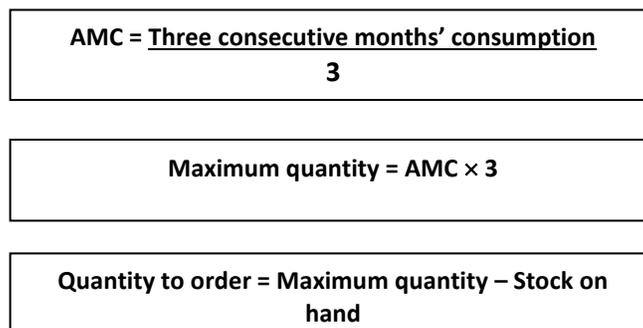


Figure 2. Estimating order quantity

The inventory management system for HIV and AIDS commodities in Swaziland is designed in such a way that facilities are expected to maintain a maximum of three months of stock and a minimum of two months of stock. The maximum and minimum stock levels at the central level (i.e., CMS) are seven and four months, respectively. The inventory control system and LMIS are supported by inventory control tools such as stock cards at the facility level and an electronic inventory and warehouse management system called RxSolution[®] at health facilities and at CMS. RxSolution is software developed by a USAID-funded project, Rational Pharmaceutical Management Plus (RPM Plus), which was implemented by MSH. It uses an SQL database. Currently RxSolution implementation is being supported by the USAID/SIAPS Program.

GOALS, OBJECTIVES, AND SCOPE OF QUANTIFICATION

Goals

- Complete the National HIV and AIDS Commodities Quantification for the FY April 2014 through March 2016
- Develop a two-year supply plan for the FY April 2014 through March 2016

Objectives

- Update the national HIV and AIDS commodity quantification conducted in November 2012
- Review methodologies and tools; validate any assumptions made
- Discuss data sources and data gaps; determine how to address gaps
- Complete quantification of products
- Determine funding requirements and resources
- Develop a system for regular updates of quantifications and supply plans

Scope of Quantification

The scope of the quantification was national, covering all HIV and AIDS commodities that are procured through government funding. The commodities to be quantified include ARVs for HIV treatment, PMTCT medicines, medicines for opportunistic infections (e.g., co-trimoxazole prophylaxis), INH that is used in IPT, and medicines for Kaposi's sarcoma. The forecast covers the period from April 2014 through March 2016. A detailed 24-month supply plan taking into consideration service capacity, current stock availability, and outstanding shipment was prepared for FY April 2014 through March 2016.

QUANTIFICATION METHODOLOGY AND PROCESSES

Forecasting and Supply Planning TWG

The Forecasting and Supply Planning TWG met on October 18, 2013. The objective of the meeting was to discuss the steps in the quantification processes, new HIV guideline reviews and significant changes, data requirements and inputs, phase-out plans, and the next steps. The TWG discussed in depth and laid out the next steps, with shared roles and responsibilities of the TWG. The TWG also decided to have a National HIV and AIDS Commodity Quantification Consultative meeting with the bigger group of partners and stakeholders.

Data Collection and Document Review

Available data were collected on each of the programs from the beginning of July 2012 through the end of June 2013. The main data types collected were the following:

- Number of patients on ART from July 2012 through June 2013 from HMIS/SID
- Number and percentage of patients between pediatrics and adults
- Number and percentage of patients (both pediatric and adult) by regimen both from SID and CMS/DMU

Data collected were then compiled, analyzed, and evaluated during consultative meeting. Discussions and revisions were made on the assumptions and data inputs for the forecast.

The following major data sources and documents were reviewed as part of the data collection process:

- Previous national quantification reports (2013 and 2014)
- National guidelines for ART and PMTCT
- Annual reports for ART and PMTCT
- Swaziland preliminary HIV estimates and projections (Spectrum software 2013)
- APMR ART reports—June 2012 through June 2013
- LMIS ART reports—June 2012 through June 2013

Quantification Consultative Meeting

In addition to reviewing the documents and data sources listed above, CMS organized a half-day consultative meeting, held on November 5, 2013 at Mountain Inn. It was attended by 22 participants from different organizations. (See annexes 1 and 3 for the agenda of the quantification consultative meeting and the list of participants, respectively. Annex 2 contains the invitation letter.)

The objectives of the consultative meeting were to—

- Review and validate the available data, assumptions, and methodologies
- Build additional assumptions based on new guidelines and changes, trends and targets, and future programmatic goals
- Reach a consensus and draw agreed-upon assumptions, data, methodologies, scenarios, and recommendations for the current quantification exercise

The meeting was attended by various HIV care and treatment partners, program managers, and clinical experts to clarify questions on the data's completeness, quality, and sources. The available data and assumptions were then organized, analyzed, and triangulated for the quantification input.

CMS shared two presentations. The first, a one-year progress report of the CMS/DMU, included the consumption pattern of key HIV and AIDS commodities, patient proportions on different regimens (for both pediatrics and adults), health facility reporting rates, data quality improvements, and other achievements of the DMU. The second presentation focused on the available information that had been generated from different sources. The main sources were SID and DMU. Thereafter, CMS made presentations focusing on each of the program areas, namely ART and PMTCT, and presentations on the data to be used, forecasting assumptions, forecasting methodologies, and the process to be implemented.

In general, a consensus was reached on most of the data, assumptions, methodologies, and processes to be used for the quantification of each of the commodity groups. Further analysis of the data and follow-up discussions with program managers and SID were needed, however, especially for some of second-line ART data for existing patients.

Forecasting Methods and Tools

Based on the feedback given during the consultative quantification meeting and further discussions, the morbidity method of forecasting was applied for ART and PMTCT programs; however, the consumption method of forecasting was applied for co-trimoxazole, medicines for Kaposi's sarcoma, and INH prophylaxis. Results were produced in terms of quantities and values.

The morbidity method was selected for ART and PMTCT programs because these programs are still in scale-up mode with specific targets set for the number of patients to be enrolled in the programs. In addition, since steady rate status in the program has not yet been attained and regimens could potentially be changed or switched, past consumption data do not provide a strong indicator of the future requirements. Furthermore, new WHO ART guidelines (2013), formulations, and regimens are being introduced to the programs. Commodity requirements for ART and PMTCT were determined using Quantimed[®], a Microsoft Access[®]-based pharmaceutical cost-estimation tool developed by the RPM Plus Program, with funding from USAID. The use of Quantimed facilitates the creation of alternative scenarios that reflect the consideration of different values for certain variables such as the percentage of the population on

each regimen and the proportion on a different formulation within a particular regimen. The forecast in Quantimed is calculated on a month-by-month basis to reflect more accurately the changing numbers of patients on treatments and, hence, the change in forecasted consumption. The Quantimed month-by-month output quantities for each product have, therefore, been imported directly into the supply planning tool, PipeLine[®], to derive a sound supply and procurement plan.

The consumption method was selected for co-trimoxazole, INH, and Kaposi's sarcoma medicines because the targets provided the previous years were not in line with the actual consumption on the ground and, hence, resulted in over-quantification. Microsoft Excel[®] was used to forecast requirement for co-trimoxazole, INH prophylaxis, and medicines for Kaposi's sarcoma.

The specific forecasting methodologies, key assumptions, and forecasting results by quantity and value for the forecast period for each commodity category are included in the "Quantification Assumptions and Outputs" section of this report.

The prices used for valuation were derived from the current tender for HIV and AIDS commodities (2013 and 2014) and were assumed to remain constant during the forecast period. The tender price includes the price of the product plus freight and logistics costs. However, due to local currency high inflation rate, prices of commodities are expected to increase by 20-25%. When tender prices were not available, such as for the new formulations to be introduced starting July 2014, an estimated price for the Supply Chain Management Systems Quantimed database was used.

The forecasting results in this report are the forecasted consumptions and corresponding costs (morbidity requirements), however, the supply plan result reflects forecasted consumption and account for buffer stock, minimum and maximum inventory levels, stock on hand, and outstanding shipments.

Analysis was also done to show the implication of the results. The key lessons and opportunities, challenges, and recommendations were also drawn throughout the process and have been included in this report (see "Discussion and Analysis").

Dissemination Workshop

The results of the forecasting exercise will be shared in a half-day, breakfast dissemination workshop (day and venue to be determined). The objectives of this workshop will be to—

- Share the results of the quantification exercise
- Review and validate the data and assumptions used for the quantification
- Define funding requirements
- Discuss and draw recommendations for regular forecasting and supply planning

Draft reports of the quantification results including the driving assumptions will be compiled and shared with the programs for review and comments before finalization of this report.

QUANTIFICATION ASSUMPTIONS AND OUTPUTS

ARVs for ART and PMTCT

The following assumptions were adopted for the forecast of adult first-line, adult second-line, and pediatric ARVs.

General ART Assumptions

- The forecast period is April 2014 through March 2016.
- The morbidity method of forecasting was used for ARVs since the ART program is still in a scale-up mode and since new formulations and regimens are being introduced to the program.
- The following scale-up rates of net increases of new patients on ART per month were used for the forecast (*source*: SNAP).
 - The addition of 1,200 net new adult patients per month was used for the forecast period from April 1 through June 30, 2014.
 - The addition of 1,500 net new adult patients per month was used for the forecast period from July 1, 2014 through March 30, 2016.
 - A net addition of 133 new pediatric patients is expected during the forecast period.
- The total baseline number of adult ART patients was 88,638 as of end of June 2013. This number is the actual reported total from the *SID ART Quarterly Report* generated from the ART Patients Monitoring and Reporting (APMR) system. See table 2.
- The total baseline number of pediatric ART patients was 7,643 as of end of June 2013. The source of these data is the *SID ART Quarterly Report* generated from the APMR. See table 3.
- The annual attrition rate was considered to be 13%, which is monthly attrition of 1.08% from the previous month's total.
- The first- and second-line populations were 96% and 4%, respectively
- ARV regimens and doses were based on the current national ART guidelines to be in use through June 30, 2014. Starting July 1, 2014, the newly revised national ART guidelines will be used. Both treatment guidelines were assumed to be implemented effectively at all levels according to the timeline.
- New formulations such as ATV+RTV 300+100 mg 30 tablets and ABC+3TC 600+300 mg scored 30 tablets will be introduced as of July 2014.

- To calculate DDI 400 mg and 250 mg requirements, the weight proportions for adults >60 kg to those <60 kg was assumed to be 40% and 60%, respectively (*source*: experts' opinions during the consultative meeting).

Table 2. Adult First- and Second-Line ART Targets for Existing and New Patients

Month	July 2013	November 2013	March 2014	July 2014	November 2014	March 2015	July 2015	November 2015	March 2016
Existing first-line, month start	85,092	81,465	77,991	74,666	71,483	68,435	75,495	72,276	69,195
Existing first-line, month end	84,171	80,582	77,147	73,857	70,709	78,003	74,677	71,493	68,445
New first-line, month end (cumulative)	2,160	10,698	19,077	27,603	36,883	46,023	55,488	64,804	73,979
Existing second-line, month start	3,546	3,394	3,250	3,111	2,978	2,851	2,730	2,614	2,502
New second-line, month start (cumulative)	0	357	708	1,053	1,441	1,823	2,630	3,002	3,368
Total second-line, month start (cumulative)	3,546	3,752	3,958	4,164	4,419	4,674	5,360	5,615	5,871

Table 3. Pediatric First- and Second-Line ART Targets for Existing and New Patients

Beginning Month	July 2013	November 2013	March 2014	July 2014	November 2014	March 2015	July 2015	November 2015	March 2016
Total patients, month start	7,643	7,317	7,005	6,707	6,421	6,147	5,885	5,634	5,394
Attrition during the month	83	79	76	73	70	67	64	61	58
Total existing patients, month end (after attrition)	7,560	7,238	6,929	6,634	6,351	6,080	5,821	5,573	5,335
Total pediatric patients on ART	7,643	8,175	8,707	9,239	9,771	10,303	10,835	11,367	11,899
Total new beginning (cumulative)	0	858	1,702	2,532	3,350	4,156	4,950	5,733	6,505

Adult ART Assumptions

Based on the current ART guidelines for Swaziland, on the new ART guidelines for Swaziland (to be implemented starting July 2014), on APMR and LMIS data as of June 2013, and in some instances, on experts' opinions, the following adult ART assumptions were made:

- The first-line regimens shown in table 4 with the respective proportions were assumed to be used for existing patients during the forecast period.

Quantification Assumptions and Outputs

- The first-line regimens shown in table 5 with the respective proportions were assumed to be used for new patients during the forecast period.
- The second-line regimens shown in table 6 with the respective proportions were assumed to be used for existing second-line patients during the forecast period.
- The regimens shown in table 7 with the respective proportions were assumed to be used for new second-line patients (i.e., patients switched from first-line to second-line treatment) during the forecast period.

Table 4. First-Line Regimens to be used by Existing Adult Patients

Regimen description	Percentage of episodes	Note/source
TDF+3TC+EFV	44.60	LMIS end of June 2013
AZT+3TC+NVP	31.39	Average of LMIS and APMR
AZT+3TC+EFV	14.67	LMIS data
TDF+3TC+NVP	6.11	LMIS and was part of the new co-pack
D4T+3TC+NVP	1.00	APMR
D4T+3TC+EFV	1.00	APMR
ABC+3TC+EFV	0.85	Average of APMR and LMIS
ABC+3TC+NVP	0.35	Average APMR and LMIS
AZT+3TC+ABC	0.02	APMR
TDF+3TC+ABC	0.01	APMR
Total	100.00%	

Table 5. First-Line Regimens to be used by New Adult Patients during the Forecast Period

Regimen description	Percentage of episodes	Note/source
TDF+3TC+EFV	72.65	Last year's proportion from APMR was taken.
AZT+3TC+EFV	15.15	This regimen is preferred over NVP for the new guideline, and data were swapped between EFV and NVP from APMR June 2013.
TDF+3TC+NVP	5.29	APMR data
AZT+3TC+NVP	4.77	Swapped APMR 2013 data between AZT/3TC/NVP and EFV
ABC+3TC+EFV	0.94	APMR data from the end of June
D4T+3TC+EFV	0.41	APMR
D4T+3TC+NVP	0.39	APMR
ABC+3TC+NVP	0.37	APMR
AZT+3TC+ABC	0.03	APMR
Total	100.00	

Table 6. Second-Line Regimens to be used by Existing Adult Patients during the Forecast Period

Regimen description	Percentage of episodes	Note/source
ABC+3TC+LPV/r	39.00	Source: APMR and LMIS
TDF+3TC+LPV/r	23.58	Note: Distributed the TDF/3TC/EFV/AZT percentage differences between APMR and LMIS to the top three regimens
AZT+3TC+LPV/r	21.94	
D4T+3TC+LPV/r	3.88	APMR
TDF+3TC+EFV+AZT	3.55	LMIS
ABC+DDI+LPV/r	2.62	APMR
AZT+DDI+LPV/r	2.42	APMR
AZT+3TC+TDF+LPV/r	1.45	APMR
AZT+3TC+LPV/r+ABC	0.68	APMR
AZT+3TC+SQV+RTV	0.68	APMR
AZT+3TC+IDV+RTV	0.10	APMR
TDF+ABC+LPV/r	0.10	APMR
Total	100.00	

Table 7. Second-Line Regimens to be used by New Adult Patients during the Forecast Period

Regimen description	Percentage of episodes	Note/source
TDF+3TC+ATV/r	50.00	New ART guidelines
AZT+3TC+ATV/r	50.00	
Total	100.00	

Pediatric ART Assumptions

- The average weight proportions for both existing and new first- and second-line pediatric patients are shown in table 8.
- Based on the current ART guidelines for Swaziland, on the new ART guidelines (to be implemented in July 2014), on APMR and LMIS data as of June 2013, and in some instances on experts' opinions, the following pediatric ART assumptions were made:
 - The regimens shown in table 9 with the respective proportions were assumed to be used for existing first- and second-line pediatric patients in the 0–13.9 kg weight band during the forecast period.
 - The regimens shown in table 10 with the respective proportions were assumed to be used for existing first- and second-line pediatric patients in the 14–34.9 kg weight band during the forecast period.
 - The regimens shown in table 11 with the respective proportions were assumed to be used for existing first- and second-line pediatric patients in the ≥35 kg weight band during the forecast period.

- The regimens shown in table 12 with the respective proportions were assumed to be used for new pediatric first- and second-line patients in the 0–34.9 kg weight band during the forecast period.
- The regimens shown in table 13 with the respective proportions were assumed to be used for new pediatric first- and second-line patients in the ≥35 kg weight band during the forecast period.

Table 8. Average Weight Proportion of the Pediatrics Population during the Forecast Period

Weight (kg)	Percentage of children	Weight (kg)	Percentage of children
0–5.9	5.98	20–24.9	12.71
6–9.9	20.56	25–34.9	13.83
10–13.9	16.45	35+	12.34
14–19.9	18.13	Total	100.00

Table 9. Pediatric First- and Second-line Regimens for Existing Pediatric Patients in the 0–13.9 kg Weight Band

Regimen description	Percentage of episodes	Note/source
AZT+3TC+NVP	52.68	
D4T+3TC+NVP	37.57	
AZT+3TC+LPV/r	5.46	APMR
D4T+3TC+LPV/r	4.15	
D4T+3TC+ABC	0.11	
AZT+3TC+ABC	0.03	
Total	100.00	

Table 10. Pediatric First- and Second-line Regimens for Existing Pediatric Patients in the 14–34.9 kg Weight Band

Regimen description	Percentage of episodes
AZT+3TC+NVP	46.14
D4T+3TC+NVP	32.90
AZT+3TC+EFV	7.88
AZT+3TC+LPV/r	4.78
D4T+3TC+EFV	4.55
D4T+3TC+LPV/r	3.63
D4T+3TC+ABC	0.09
AZT+3TC+ABC	0.03
Total	100.00

Table 11. Pediatric First- and Second-line Regimens for Existing Pediatric Patients in the ≥35 kg Weight Band

Regimen description	Percentage of episodes
AZT+3TC+NVP	44.30
D4T+3TC+NVP	31.60
AZT+3TC+EFV	7.57
AZT+3TC+LPV/r	4.59
D4T+3TC+EFV	4.37
D4T+3TC+LPV/r	3.49
TDF+3TC+EFV	3.43
TDF+3TC+NVP	0.53
D4T+3TC+ABC	0.09
AZT+3TC+ABC	0.03
Total	100.00

Table 12. Pediatric First- and Second-line Regimens for New Patients and Patients Switching to Second-line Regimens in the 0–34.9 kg Weight Band

Regimen description	Percentage of episodes
ABC+3TC+LPV/r	90.00
D4T+3TC+NVP	6.00
AZT+3TC+NVP	4.00
Total	100.00

Table 13. Pediatric First- and Second-line Regimens—New First-line Patients and Patients Switching to Second-line Regimen—in the ≥35 kg Weight Band

Regimen description	Percentage of episodes
ABC+3TC+EFV	42.67
ABC+3TC+LPV/r	34.67
TDF+3TC+EFV	9.29
AZT+3TC+EFV	8.73
AZT+3TC+NVP	3.95
TDF+3TC+LPV/r	0.69
Total	100.00

General PMTCT Assumptions

- The forecast period is April 2014 through March 2016.
- The morbidity method of forecasting was used to forecast for the ARVs since the PMTCT program is still in a scale-up mode and since new regimens and formulations are being introduced to the program.
- The number of HIV-positive pregnant women, including those currently on ART (for their own health) and those in need of PMTCT, was obtained from the Spectrum software

Quantification Assumptions and Outputs

for Swaziland as provided by the program. Only 80% of all HIV-positive women were assumed to be in need of PMTCT.

- Option B+ will be implemented in July 2014.
- A net total of 692 new mother and baby PMTCT patients will be enrolled every month.
- The pediatric PMTCT dose of NVP syrup is, on average, 17.86 mg/day for 42 days.
- Target and scale-up were as shown in tables 14–16.

Table 14. PMTCT Option B+ Target

Month	July 2014	November 2014	March 2015	July 2015	November 2015	March 2016
Number of PMTCT Mothers Month starting	0	4,776	9,552	14,328	19,104	23,880
Number of PMTCT Mothers Month ending	1,194	5,970	10,746	15,522	20,298	25,074

Table 15. PMTCT Target for Pediatric Patients

Date	July 2014	November 2014	March 2015	July 2015	November 2015	March 2016
Number of PMTCT babies month starting	0	2,768	5,536	8,304	11,072	13,840
Number of PMTCT babies month ending	692	3,460	6,228	8,996	11,764	14,532

Table 16. PMTCT for Option B+ and Pediatric Regimen to be used

Regimen description	Percentage of episodes	Note
AZT+3TC+EFV	5.00	PMTCT experts' opinion 95% on TDF and 5% on AZT close monitoring on implementation
TDF/3TC/EFV	95.00	

Medicines for Opportunistic Infections and Prophylaxis

General Opportunistic Infection and Prophylaxis Assumptions

- The forecast period is April 2014 through March 2016.
- The consumption method of forecasting was used because the morbidity data and future target implementations are not reliable.

- The following assumptions and considerations were made:
 - One-year CMS issue data are considered, and adjusted AMC was calculated.
 - The annual average increase or decrease trend in consumption of each product over the forecast period was assumed to be constant based on the trend evidenced in issue data generated by RxSolution from April 2012 through March 2013.
 - Current stock on hand and shelf-life and outstanding shipments are taken into consideration to calculate shipment quantities.

Quantification Results

ART and PMTCT Forecast Results

Based on the consensus reached during the consultative quantification workshop and on follow-up discussions with program managers and using the morbidity method and Quantimed as a forecasting tool, the forecasts shown in table 17 were made for the April 2014 through March 2016 period. This result does not include available stock, lead time stock, buffer stock, and outstanding shipments.

Table 17. Summary of ARVs Requirement by Value (SZL, USD)

Category	Year I (2014-15)		Year II (2015-16)		Total	
	SZL	USD	SZL	USD	SZL	USD
Adult first line	101,556,900.83	9,672,085.97	133,678,320.70	12,731,268.88	235,235,221.53	22,403,354.85
Adult second line	15,105,958.74	1,438,662.76	18,361,075.16	1,748,673.86	33,467,033.90	3,187,336.62
Pediatric first and second line	12,112,115.25	1,153,534.81	15,661,771.25	1,491,597.29	27,773,886.50	2,645,132.10
PMTCT mother option B+	10,251,710.82	976,353.43	29,177,893.99	2,778,847.10	39,429,604.81	3,755,200.53
PMTCT for infants	599,237.48	57,070.24	599,237.48	57,070.24	1,198,474.96	114,140.48
Grand total	139,625,923.12	13,297,707.21	197,478,298.58	18,807,457.37	337,104,221.70	32,105,164.58

Note: USD 1 = SZL 10.50 was considered at the time of developing this report.

Of the total amount of approximately SZL 337.1 million (approximately USD 32.1 million) required for the period April 2014 through March 2016, the requirement for adult first-line ARVs accounts for over two-thirds (69.8%), and requirements for all pediatric and PMTCT medicines account for 8.2% and 11.7%, respectively. Figures 3–5 contain the details for the shares of requirements for each subcategory. Tables 18 and 19 list the total ARV requirements.

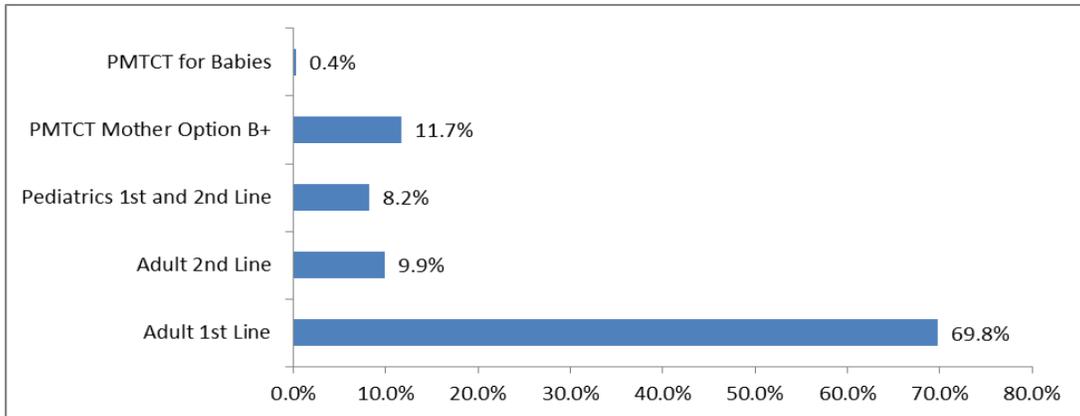


Figure 3. Percentage requirement by value for each category of ARVs for two years

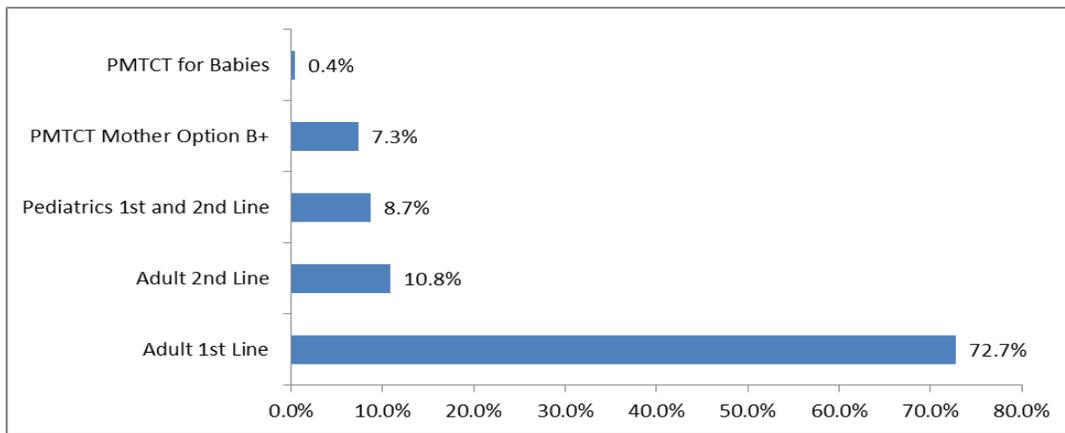


Figure 4. Percentage requirement by value for each category of ARVs (April 2014 through March 2015)

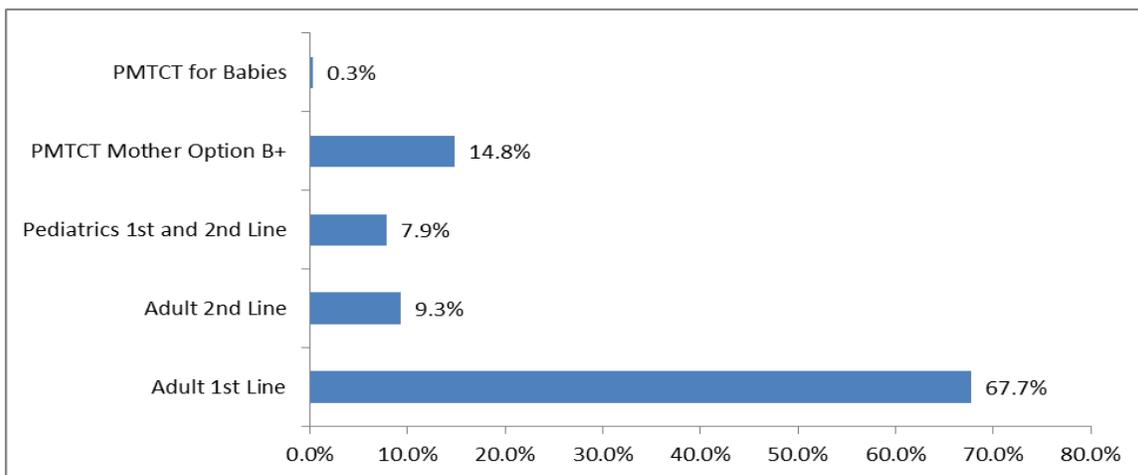


Figure 5. Percentage requirement by value for each category of ARVs (April 2015 through March 2016)

Table 18. Total ARV Requirements by Pack—Adult, Pediatric, and PMTCT ARVs

Product description	Units/pack	Cost/pack (SZL)	Total year I	Total year II	Grand total
Abacavir + lamivudine 600+300 mg/tablet	30	76.00	37,967	47,098	85,065
Didanosine EC 250 mg/capsule	30	130.60	712	624	1,336
Efavirenz 200 mg/tablet	90	91.20	16,021	23,465	39,486
Lamivudine + zidovudine 30 + 60 mg/tablet	60	21.91	10,968	9,621	20,589
Atazanavir + ritonavir 300 + 100 mg/tablet	30	200.00	23,987	41,193	65,180
Nevirapine 200 mg/tablet	60	23.58	3,787	4,930	8,717
Abacavir 60 mg/tablet	60	79.90	2,672	4,208	6,880
Saquinavir 200 mg/capsule	270	755.67	267	234	501
Lamivudine + zidovudine + nevirapine 30 + 60 + 50 mg/tablet	60	36.55	60,103	54,844	114,947
Lamivudine + stavudine 60+12 mg/tablet	60	25.00	3,755	3,294	7,049
Lamivudine + stavudine + nevirapine 60 + 12 + 100 mg/tablet	60	34.40	22,560	21,381	43,941
Lamivudine + zidovudine 150 + 300 mg/tablet	60	61.51	186,028	248,678	434,706
Abacavir 300 mg/tablet	60	103.11	1,206	1,058	2,264
Abacavir-lamivudine 60 + 30 mg/tab	60	43.29	62,073	100,332	162,405
Lamivudine + zidovudine + nevirapine 150 + 300 + 200 mg/tablet	60	73.01	297,016	302,263	599,279
Stavudine 30 mg/capsule	60	19.50	12,618	13,321	25,939
Lamivudine + stavudine + nevirapine 150 + 30 + 200 mg/tablet	60	43.57	16,413	16,864	33,277
Efavirenz + lamivudine + tenofovir 600 + 300 + 300 mg/tablet	30	109.35	620,271	1,018,041	1,638,312
Didanosine enteric coated 400 mg/capsule	30	181.92	1,067	936	2,003
Efavirenz 600 mg/tablet	30	32.22	181,691	241,104	422,795
Indinavir 400 mg/capsule	180	610.50	35	31	66
Lamivudine 150 mg/tablet	60	19.30	12,600	13,305	25,905
Lopinavir + ritonavir 80 + 20 mg/ml	60	45.94	38,876	56,771	95,647
Lopinavir + ritonavir 100 + 25 mg/tablet	60	52.87	1,626	1,426	3,052
Lopinavir + ritonavir 200 + 50 mg/tablet	120	179.96	36,526	33,181	69,707
Nevirapine 10 mg/ml suspension (PO)	25	24.05	24,916	24,916	49,832
Ritonavir 100 mg/capsule	84	62.19	590	518	1,107
Tenofovir disoproxil fumarate 300 mg/tablet	30	38.85	636	566	1,202
Tenofovir + lamivudine 300+300 mg/tablet	30	45.46	21,213	29,113	50,326
Zidovudine 300 mg/tablet	60	49.62	2,339	2,177	4,516
Tenofovir + lamivudine + nevirapine 300 + 300 + 200 mg/co-packed tablet	30	83.60	64,013	79,997	144,010

Note: USD 1 = SZL 10.50 was considered at the time of developing this report.

Table 19. Total ARV Requirements by Value (SZL)–Adult, Pediatric, and PMTCT ARVs

Product description	Units/ pack	Cost/ pack (SZL)	Total year I (SZL)	Total year II (SZL)	Grand total (SZL)
Abacavir + lamivudine 600+300 mg/tablet	30	76.00	2,885,504.63	3,579,460.62	6,464,965.25
Didanosine enteric coated 250 mg/capsule BP	30	130.60	92,934.96	81,542.29	174,477.25
Efavirenz 200 mg/tablet	90	91.20	1,461,084.78	2,139,995.81	3,601,080.59
Lamivudine + zidovudine 30+60 mg/tablet	60	21.91	240,306.32	210,788.44	451,094.76
Atazanavir + ritonavir 300+100 mg/tablet	30	200.00	4,797,353.22	8,238,686.47	13,036,039.69
Nevirapine 200 mg/tablet	60	23.58	89,295.50	116,257.26	205,552.76
Abacavir 60 mg/tablet	60	79.90	213,474.16	336,233.86	549,708.02
Saquinavir 200 mg/capsule	270	755.67	201,498.01	176,793.20	378,291.21
Lamivudine + zidovudine + nevirapine 30+60+50 mg/tablet	60	36.55	2,196,758.00	2,004,536.07	4,201,294.07
Lamivudine + stavudine 60+12 mg/tablet	60	25.00	93,870.83	82,340.41	176,211.24
Lamivudine + stavudine + nevirapine 60+12+100 mg/tablet	60	34.40	776,048.01	735,489.84	1,511,537.85
Lamivudine + zidovudine 150+300 mg/tablet	60	61.51	11,442,555.22	15,296,160.69	26,738,715.91
Abacavir 300 mg/tablet	60	103.11	124,338.63	109,097.26	233,435.89
Abacavir + lamivudine 60+30 mg/tablet	60	43.29	2,687,136.71	4,343,361.69	7,030,498.40
Lamivudine + zidovudine + nevirapine 150+300+200 mg/tablet	60	73.01	21,685,145.81	22,068,211.04	43,753,356.85
Stavudine 30 mg/capsule	60	19.50	246,058.14	259,762.42	505,820.56
Lamivudine + stavudine + nevirapine 150+30+200 mg/tablet	60	43.57	715,103.52	734,779.00	1,449,882.52
Efavirenz + lamivudine + tenofovir 600+300+300 mg/tablet	30	109.35	67,826,800.00	111,322,936.56	179,149,736.56
Didanosine enteric coated 400 mg/capsule	30	181.92	194,169.28	170,362.02	364,531.30
Efavirenz 600 mg/tablet	30	32.22	5,854,081.88	7,768,371.96	13,622,453.84
Indinavir 400 mg/capsule	180	610.50	21,564.22	18,918.72	40,482.94
Lamivudine 150 mg/tablet	60	19.30	243,188.68	256,794.86	499,983.54
Lopinavir + ritonavir 80+20 mg/ml	60	45.94	1,785,946.59	2,608,049.01	4,393,995.60
Lopinavir + ritonavir 100+25 mg/tablet	60	52.87	85,975.43	75,416.41	161,391.84
Lopinavir + ritonavir 200+50 mg/tablet	120	179.96	6,573,193.57	5,971,290.35	12,544,483.92
Nevirapine 10 mg/ml suspension	25	24.05	599,237.47	599,237.47	1,198,474.94
Ritonavir 100 mg/capsule	84	62.19	36,686.18	32,188.51	68,874.69
Tenofovir 300 mg/tablet	30	38.85	24,708.60	21,978.74	46,687.34
Tenofovir + lamivudine 300+300 mg/tablet	30	45.46	964,359.62	1,323,469.37	2,287,828.99
Zidovudine 300 mg/tablet	60	49.62	116,083.50	108,002.89	224,086.39
Tenofovir + lamivudine + nevirapine 300+300+200 mg/tablet	30	83.60	5,351,461.65	6,687,785.34	12,039,246.99
Grand total (SZL)			139,625,923.12	197,478,298.58	337,104,221.70

Note: USD 1 = SZL 10.50 was considered at the time of developing this report.

Co-Trimoxazole, INH Prophylaxis, and Medicines for Kaposi's Sarcoma Forecast

The TWG has adopted the consumption method of forecasting for co-trimoxazole, INH, and Kaposi's sarcoma medicines since the morbidity method wasn't practically implemented and resulted in overstocks, particularly of co-trimoxazole and INH medicines during the FY 2012–13. Based on the consensus reached during meetings and follow-up discussions, the forecasts shown in tables 20 and 21 were made for the forecast period from April 2014 through March 2016. This result does not include available stock, lead time stock, buffer stock, or outstanding shipments.

Table 20. Total Co-Trimoxazole, INH, and Kaposi's Sarcoma Medicine Requirements by Pack

Product description	Unit price (SZL)	Total year I quantity
Bleomycin injection 15 units vial	292.00	2,472
Co-trimoxazole 120 mg, 100 tablets	8.40	62,364
Co-trimoxazole 480 mg, 1,000 tablets	56.07	5,052
Co-trimoxazole 960 mg, 1,000 tablets	199.00	56,484
Dapsone tablets 100 mg, 100 tablets	150.00	5,364
Doxorubicin (premixed) injection 50 mg/ml, 2.5 ml	325.00	1,704
INH 300 mg of 100	32.90	22,404
Vinblastine injection mg/ml, 10 ml vial	240.00	336
Vincristine Injection 2 mg/2 ml, 2 ml vial	80.50	1,884

Note: USD 1 = SZL 10.50 was considered at the time of developing this report.

Table 21. Total Co-Trimoxazole, INH, and Kaposi's Sarcoma Medicine Requirements by Value

Product description	Unit price (SZL)	Total year I quantity	Total year I cost (SZL)
Bleomycin injection 15 units vial	292.00	2,472	721,824.00
Co-trimoxazole 120 mg, 100 tablets	8.40	62,364	523,857.60
Co-trimoxazole 480 mg, 1000 tablets	56.07	5,052	283,265.64
Co-trimoxazole 960 mg, 1000 tablets	199.00	56,484	11,240,316.00
Dapsone tablets 100 mg, 100 tablets	150.00	5,364	804,600.00
Doxorubicin (premixed) injection 50 mg/ml, 2.5 ml	325.00	1,704	553,800.00
INH 300 mg of 100	32.90	22,404	737,091.60
Vinblastine injection mg/ml, 10 ml vial	240.00	336	80,640.00
Vincristine Injection 2 mg/2 ml, 2 ml vial	80.50	1,884	151,662.00
		Total	15,097,056.84

Note: USD 1 = SZL 10.50 was considered at the time of developing this report.

HIV and AIDS Commodity Supply Plan Result

Supply planning is the process of estimating quantities required to fill the supply pipeline and of determining the total costs, lead times, and arrival dates of shipments to ensure optimal procurement and delivery schedules. In conducting regular supply planning, critical data such as the following should be available:

- Forecasted consumption
- Current available usable stock
- Any losses or adjustments, including anticipated ones, due to expiry or damage
- Outstanding shipments with their expected delivery dates

Supply Plan Assumptions

Table 22 shows the minimum, maximum, and desired stock levels at the health facilities and the CMS level used to calculate the quantities of each product that should be procured every procurement period.

Table 22. Minimum, Maximum, and Desired Stock Levels at CMS and Health Facilities

Levels	Minimum stock level	Maximum stock level
CMS	4	7
Facilities	2	3
Program	6	10
Shipment interval to CMS	3 months	
Desired stock level	10 months of stock	

Table 23 shows the estimated lead times for the different phases of quantification and procurement processes, which will be taken to make products available in Swaziland. The lead times are divided into thirds based on important milestones: from planning to ordering, from ordering to shipping, and from shipping to receiving. The lead times to reach each milestone have a critical impact on the procurement processes and the availability sufficient quantities of health products at the right time.

- *Planning*: Finalizing the forecast and supply plan of all the commodities to be procured and having the required approvals and budgets
- *Ordering*: Placing the orders of commodities with specific quantities and dates of delivery based on the supply plan
- *Shipping*: Sending of the commodities from the source or from the vendor to the recipient or to CMS
- *Receiving*: Getting the commodities in CMS and ready for distribution and use

Table 23. Lead Times

Parameters/processes	Lead time
Planning to ordering	2 months
Ordering to shipping	1 month
Shipping to receiving	1 month

Based on the forecast consumption, available usable stock, outstanding shipments, and other supply plan parameters (e.g., lead time stock level and buffer stock), the quantities and costs shown in table 24 were calculated. Table 24 shows detailed HIV and AIDS commodity procurement requirements by quantity, value, and delivery date for year I (April 2014 through March 2015). In summary, the total HIV and AIDS commodity procurement requirements for year I was estimated to be SZL 171,029,283 (approximately USD 16,304,030). However, an increase in ART commodity prices of 20-25% is expected due to high inflation in the local currency.

Quantification Assumptions and Outputs

Table 24. HIV and AIDS Commodity Supply and Procurement Requirements Plan by Quantity, Date of Delivery, and Value for Year I (April 2014 through March 2015)

Product description	Unit price (SZL)	Q1 Delivery: End of June 2014		Q2 Delivery: End of September 2014		Q3 Delivery: End of December 2014		Q4 Delivery: End of March 2015	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Abacavir 60 mg scored 60 tablets	79.90	432	SZL 34,517	648	SZL 51,775	864	SZL 69,034	1,080	SZL 86,292
Abacavir + lamivudine 60+30 mg 60 tablets	41.25	7,937	SZL 327,401	30,438	SZL 1,255,568	22,455	SZL 926,269	24,792	SZL 1,022,670
Abacavir + lamivudine 600+300 mg scored 30 tablets	13.52	25,830	SZL 349,222	6,660	SZL 90,043	10,440	SZL 141,149	11,970	SZL 161,834
Atazanavir + ritonavir 300+100 mg 30 tablets	25.00	12,646	SZL 316,150	4,499	SZL 112,475	7,467	SZL 186,675	12,220	SZL 305,500
Bleomycin injection 15 units vial	292.00	618	SZL 180,456	618	SZL 180,456	618	SZL 180,456	618	SZL 180,456
Co-trimoxazole 120 mg, 100 tablets	8.40	15,591	SZL 130,964	15,591	SZL 130,964	15,591	SZL 130,964	15,591	SZL 130,964
Co-trimoxazole 480 mg, 1,000 tablets	56.07	1,253	SZL 70,256	1,263	SZL 70,816	1,263	SZL 70,816	1,263	SZL 70,816
Co-trimoxazole 960 mg, 1,000 tablets	199.00	14,141	SZL 2,814,059	14,121	SZL 2,810,079	14,121	SZL 2,810,079	14,121	SZL 2,810,079
Dapsone tablets 100 mg, 100 tablets	150.00	1,341	SZL 201,150	1,341	SZL 201,150	1,341	SZL 201,150	1,341	SZL 201,150
Didanosine 400 mg, 30 capsules	181.92	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0
Doxorubicin (premixed) injection 50 mg/ml, 2.5 ml	325.00	0	SZL 0	852	SZL 276,900	0	SZL 0	852	SZL 276,900
Efavirenz 200 mg 90 capsules	75.25	3,040	SZL 228,760	6,280	SZL 472,570	5,360	SZL 403,340	5,800	SZL 436,450
Efavirenz 600 mg 30 tablets	32.22	35,424	SZL 1,141,361	59,232	SZL 1,908,455	51,792	SZL 1,668,738	73,632	SZL 2,372,423
Efavirenz + lamivudine + tenofovir 600+300+300 mg 30 tablets	109.35	77,489	SZL 8,473,422	200,070	SZL 21,877,655	214,020	SZL 23,403,087	287,776	SZL 31,468,306
Indinavir 400 mg 180 capsules	610.50	0	SZL 0	0	SZL 0	0	SZL 0	24	SZL 14,652
Isoniazid 300 mg, 100 tablets	32.90	0	SZL 0	0	SZL 0	0	SZL 0	5,373	SZL 176,772
Lamivudine + stavudine 60+12 mg dispersible 60 tablets	23.10	0	SZL 0	0	SZL 0	5,505	SZL 127,166	2,541	SZL 58,697
Lamivudine + stavudine + nevirapine 150+30+200 mg 60 tablets	43.57	0	SZL 0	0	SZL 0	2,250	SZL 98,033	5,040	SZL 219,593
Lamivudine + stavudine + nevirapine 60+12+100 mg dispersible 60 tablets	61.40	6,681	SZL 410,213	6,798	SZL 417,397	6,965	SZL 427,651	6,774	SZL 415,924
Lamivudine + zidovudine 150+300 mg 60 tablets	61.51	35,940	SZL 2,210,669	61,620	SZL 3,790,246	53,340	SZL 3,280,943	75,660	SZL 4,653,847
Lamivudine + zidovudine 30+60 mg 60 tablets	19.69	7,276	SZL 143,264	7,487	SZL 147,419	7,738	SZL 152,361	7,440	SZL 146,494
Lamivudine + zidovudine + nevirapine 150+300+200 mg 60 tablets	73.01	34,080	SZL 2,488,181	72,240	SZL 5,274,242	67,440	SZL 4,923,794	102,192	SZL 7,461,038

Quantification of HIV and AIDS Commodities for April 2014 through March 2016

Product description	Unit price (SZL)	Q1 Delivery: End of June 2014		Q2 Delivery: End of September 2014		Q3 Delivery: End of December 2014		Q4 Delivery: End of March 2015	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Lamivudine + zidovudine + nevirapine 30+60+50 mg dispersible 60 tablets	36.55	24,460	SZL 894,013	24,600	SZL 899,130	24,881	SZL 909,401	24,543	SZL 897,047
Lopinavir + ritonavir 80+20 mg/ml [Kaletra] oral suspension cool bottle 60 ml	35.94	12,970	SZL 466,142	15,630	SZL 561,742	12,970	SZL 466,142	14,030	SZL 504,238
Lopinavir + ritonavir 100+25mg 120 tablets	52.87	0	SZL 0	1,933	SZL 102,198	2,031	SZL 107,379	1,921	SZL 101,563
Lopinavir + ritonavir 200+50 mg 120 tablets	206.25	10,795	SZL 2,226,469	10,933	SZL 2,254,931	11,119	SZL 2,293,294	10,931	SZL 2,254,519
Nevirapine 10 mg/ml oral suspension, 25 ml	22.00	0	SZL 0	0	SZL 0	0	SZL 0	4,200	SZL 92,400
Ritonavir 100 mg [Norvir] Cool 84 capsules	62.19	40	SZL 2,488	200	SZL 12,438	120	SZL 7,463	120	SZL 7,463
Saquinavir 200 mg [Invirase] 270 capsules	755.67	112	SZL 84,635	140	SZL 105,794	56	SZL 42,318	56	SZL 42,318
Stavudine 30 mg 60 capsules	19.50	2,458	SZL 47,931	2,146	SZL 41,847	1,818	SZL 35,451	2,174	SZL 42,393
Tenofovir 300 mg 30 tablets	39.68	3,913	SZL 155,268	4,193	SZL 166,378	4,511	SZL 178,996	4,126	SZL 163,720
Tenofovir + lamivudine + nevirapine 300+300 + 200 mg blister co-pack of 30 + 60 tablets	83.60	0	SZL 0	0	SZL 0	11,045	SZL 923,362	25,004	SZL 2,090,334
Tenofovir + lamivudine 300 + 300 mg 30 tablets	45.46	3,840	SZL 174,566	6,432	SZL 292,399	6,192	SZL 281,488	8,928	SZL 405,867
Vinblastine injection mg/ml, 10 ml vial	240.00	0	SZL 0	168	SZL 40,320	84	SZL 20,160	34	SZL 8,160
Vincristine injection 2 mg/2 ml, 2 ml vial	80.50	628	SZL 50,554	0	SZL 0	942	SZL 75,831	471	SZL 37,916
Subtotal by quarter for year I			SZL 23,622,111		SZL 43,545,387		SZL 44,542,990		SZL 59,318,795

Note: USD 1 = SZL 10.50 was considered at the time of developing this report.

Table 25 shows detailed HIV and AIDS commodity procurement requirements by quantity, value, and delivery date for year II (April 2015 through March 2016). In summary, the total HIV and AIDS commodity procurement requirements for year II was estimated to be SZL 215,290,298 (approximately USD 20,523,384).

Quantification Assumptions and Outputs

Table 25. HIV and AIDS Commodity Supply and Procurement Requirements Plan by Quantity, Date of Delivery, and Value for Year II (April 2015 through March 2016)

Product Description	Unit Price (SZL)	Q1 June 2015		Q2 September 2015		Q3 December 2015		Q4 March 2016	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Abacavir 60 mg scored 60 tablets	79.90	1,080	SZL 86,292	1,296	SZL 103,550	1,296	SZL 103,550	1,296	SZL 103,550
Abacavir + lamivudine 60+30 mg 60 tablets	41.25	27,088	SZL 1,117,380	29,410	SZL 1,213,163	31,675	SZL 1,306,594	31,371	SZL 1,294,054
Abacavir + lamivudine 600+300 mg scored 30 tablets	13.52	11,970	SZL 161,834	12,330	SZL 166,702	12,870	SZL 174,002	12,960	SZL 175,219
Atazanavir + ritonavir 300+100 mg 30 tablets	25.00	10,458	SZL 261,450	11,278	SZL 281,950	12,099	SZL 302,475	12,181	SZL 304,525
Bleomycin injection 15 units vial	292.00	618	SZL 180,456	618	SZL 180,456	618	SZL 180,456	618	SZL 180,456
Co-trimoxazole 120 mg, 100 tablets	8.40	15,591	SZL 130,964	15,591	SZL 130,964	15,591	SZL 130,964	15,591	SZL 130,964
Co-trimoxazole 480 mg, 1,000 tablets	56.07	1,263	SZL 70,816	1,263	SZL 70,816	1,263	SZL 70,816	1,263	SZL 70,816
Co-trimoxazole 960 mg, 1,000 tablets	199.00	14,121	SZL 2,810,079	14,121	SZL 2,810,079	14,121	SZL 2,810,079	14,121	SZL 2,810,079
Dapsone tablets 100 mg, 100 tablets	150.00	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0
Didanosine 400 mg, 30 capsules	181.92	93	SZL 16,919	216	SZL 39,295	207	SZL 37,657	221	SZL 40,204
Doxorubicin (premixed) injection 50 mg/ml, 2.5 ml	325.00	426	SZL 138,450	426	SZL 138,450	426	SZL 138,450	852	SZL 276,900
Efavirenz 200 mg 90 capsules	75.25	6,280	SZL 472,570	6,680	SZL 502,670	7,160	SZL 538,790	7,080	SZL 532,770
Efavirenz 600 mg 30 tablets	32.22	62,640	SZL 2,018,261	65,520	SZL 2,111,054	68,352	SZL 2,202,301	68,064	SZL 2,193,022
Efavirenz + lamivudine + tenofovir 600+300+300 mg 30 tablets	109.35	273,600	SZL 29,918,160	296,010	SZL 32,368,694	318,240	SZL 34,799,544	315,540	SZL 34,504,299
Indinavir 400 mg 180 capsules	610.50	0	SZL 0	24	SZL 14,652	0	SZL 0	0	SZL 0
Isoniazid 300 mg, 100 tablets	32.90	0	SZL 0	0	SZL 0	7,440	SZL 244,776	5,601	SZL 184,273
Lamivudine + stavudine 60/12 mg dispersible 60 tablets	23.10	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0
Lamivudine + stavudine + nevirapine 150/30/200 mg 60 tablets	43.57	4,140	SZL 180,380	4,230	SZL 184,301	4,140	SZL 180,380	4,140	SZL 180,380
Lamivudine + stavudine + nevirapine 60+12+100 mg dispersible 60 tablets	61.40	0	SZL 0	3,975	SZL 244,065	5,156	SZL 316,578	5,170	SZL 317,438
Lamivudine + zidovudine 150+300 mg 60 tablets	61.51	64,740	SZL 3,982,157	67,740	SZL 4,166,687	70,740	SZL 4,351,217	70,440	SZL 4,332,764
Lamivudine + zidovudine 30+60 mg 60 tablets	19.69	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0
Lamivudine + zidovudine + nevirapine 150+300+200 mg 60 tablets	73.01	74,208	SZL 5,417,926	73,104	SZL 5,337,323	72,000	SZL 5,256,720	72,240	SZL 5,274,242
Lamivudine + zidovudine + nevirapine 30+60+50 mg dispersible 60 tablets	36.55	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0

Quantification of HIV and AIDS Commodities for April 2014 through March 2016

Product Description	Unit Price (SZL)	Q1 June 2015		Q2 September 2015		Q3 December 2015		Q4 March 2016	
		Qty	Cost	Qty	Cost	Qty	Cost	Qty	Cost
Lopinavir + ritonavir 80+20 mg/ml [Kaletra] oral suspension cool bottle 60 ml	35.94	15,130	SZL 543,772	16,210	SZL 582,587	17,280	SZL 621,043	17,150	SZL 616,371
Lopinavir + ritonavir 100+25 mg 120 tablets	52.87	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0
Lopinavir + ritonavir 200+50 mg 120 tablets	206.25	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0
Nevirapine 10 mg/ml oral suspension, 25 ml	22.00	6,230	SZL 137,060	6,230	SZL 137,060	6,230	SZL 137,060	6,230	SZL 137,060
Ritonavir 100 mg [Norvir] cool 84 capsules	62.19	120	SZL 7,463	160	SZL 9,950	80	SZL 4,975	160	SZL 9,950
Saquinavir 200 mg [Invirase] 270 capsules	755.67	56	SZL 42,318	56	SZL 42,318	56	SZL 42,318	56	SZL 42,318
Stavudine 30 mg 60 capsules	19.50	3,168	SZL 61,776	3,312	SZL 64,584	3,312	SZL 64,584	3,312	SZL 64,584
Tenofovir 300 mg 30 tablets	39.68	0	SZL 0	0	SZL 0	0	SZL 0	0	SZL 0
Tenofovir + lamivudine + nevirapine 300+300+200 mg blister co-pack of 30 + 60 tablets	83.60	20,561	SZL 1,718,900	21,250	SZL 1,776,500	21,931	SZL 1,833,432	21,863	SZL 1,827,747
Tenofovir + lamivudine 300+300 mg 30 tablets	45.46	7,632	SZL 346,951	7,968	SZL 362,225	8,304	SZL 377,500	8,304	SZL 377,500
Vinblastine injection mg/ml, 10 ml vial	240.00	124	SZL 29,760	84	SZL 20,160	84	SZL 20,160	168	SZL 40,320
Vincristine injection 2 mg/2 ml, 2 ml vial	80.50	0	SZL 0	421	SZL 33,891	471	SZL 37,916	471	SZL 37,916
Subtotal by quarter for year II			SZL 49,852,094		SZL 53,094,146		SZL 56,284,337		SZL 56,059,721

Note: USD 1 = SZL 10.50 was considered at the time of developing this report.

DISCUSSION AND ANALYSIS

Of the total forecast amount of approximately SZL 386.3 million (approximately USD 36.8 million) required for the period from April 2014 through March 2016, the requirement for adult first-line ARVs accounts for over two-thirds (69.8%), and the requirements for all pediatric and for PMTCT medicines account for 8.2% and 11.7%, respectively. A comparison of procurement cost of the different products showed that TDF+3TC+EFV 300+300+600 mg (30 tablets) accounts for almost 50% of the procurement budget followed by AZT+3TC+NVP 300+150+200 mg (60 tablets) at 11.8%. Budget requirements and the patient utilization rate for these two products are on the rise due to the new WHO guideline implementation. Figures 6 and 7 show the top 10 products consist of high proportion of budgets for years I and II.

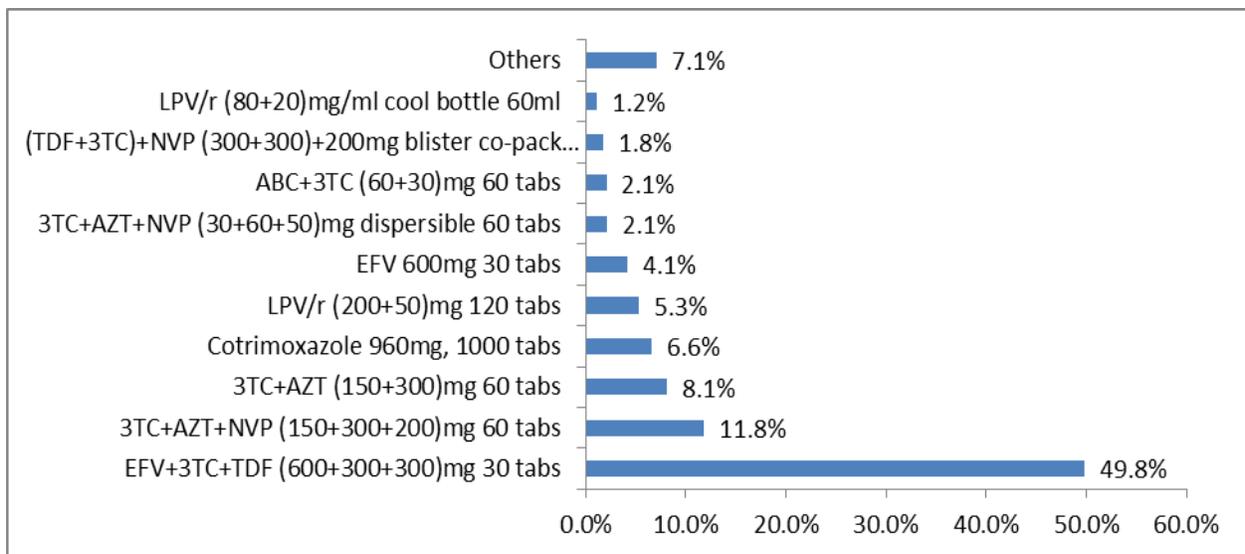


Figure 6. Procurement cost proportion for top 10 HIV and AIDS commodities in year I (April 2014 through March 2015)

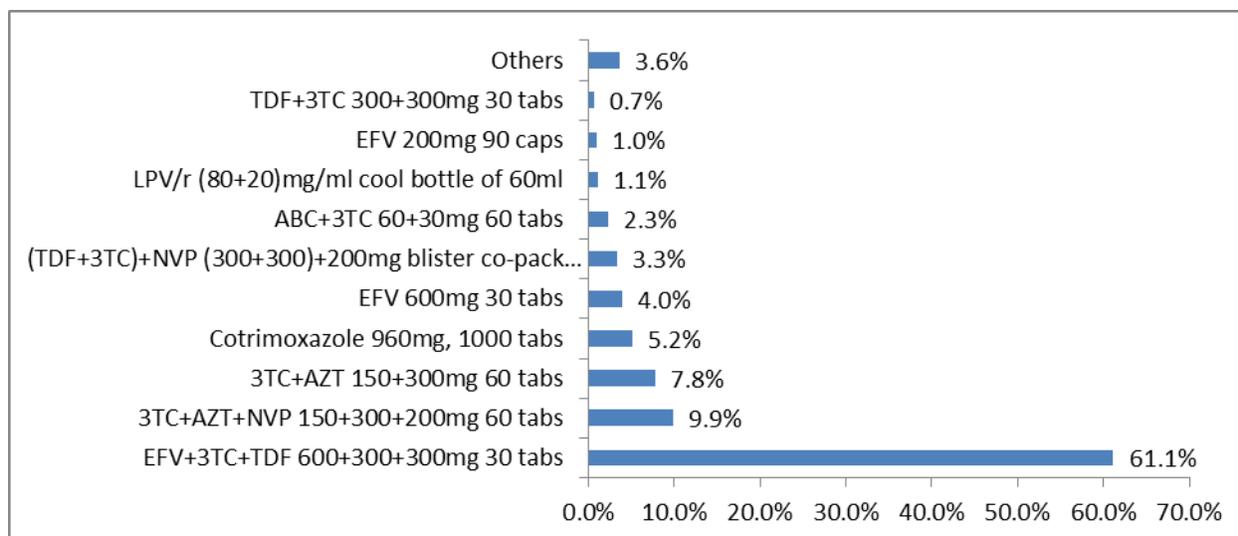


Figure 7. Procurement cost proportion for top 10 HIV and AIDS commodities in year II (April 2015 through March 2016)

Adult ARVs

TDF+3TC+EFV is currently being used by 44.60% of existing and 72.65% of newly initiating patients. The new preferred first-line regimen that was used for the forecast showed a shift toward more patients on TDF and fewer on AZT. Similarly, a shift is also expected for the non-nucleoside reverse transcriptase inhibitor for the forecast period from NVP to EFV due to issues relating to effectiveness, adherence, and adverse effects.

Figure 8 illustrates the trend of the top four adult first-line regimens proportions between FY 2013–14 and FY 2014–15. This trend also indicates that the country is moving toward implementing the WHO guideline by initiating new patients on a TDF-based regimen. Therefore, good management of selected regimens and their respective formulations from supplier to facility level is critical to ensuring continuous availability and successful ART program implementation.

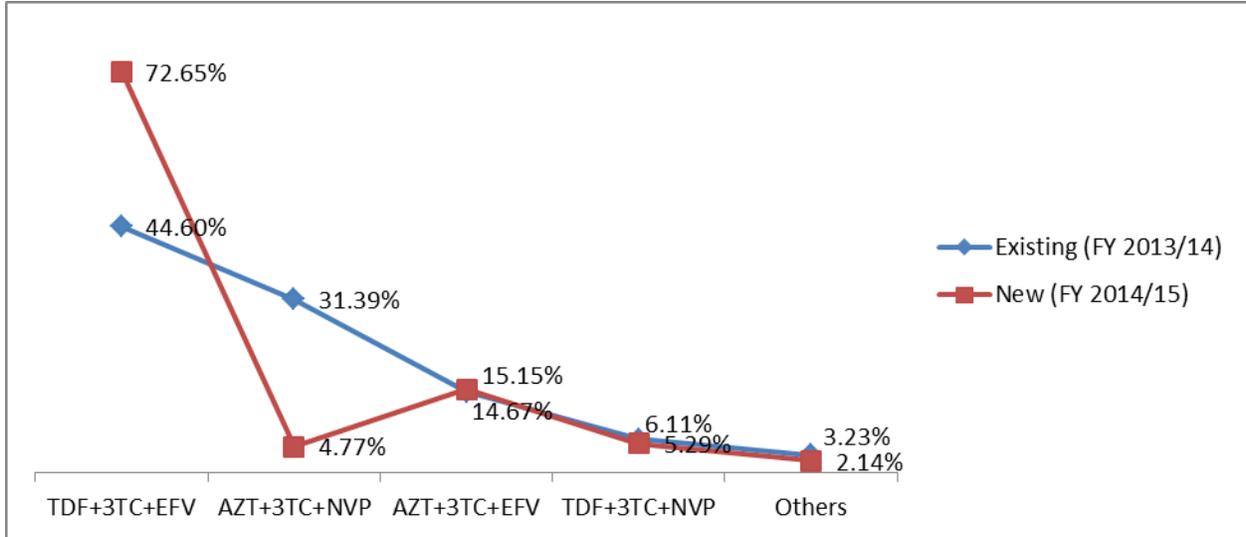


Figure 8. Forecast trend in first-line regimens for existing and new adult patients

In addition to the clinical advantages (i.e., effectiveness, minimal adverse effects, and adherence) use of TDF-based regimens, especially the fixed-dose combination TDF+3TC+EFV, has logistical and cost advantages because it is a single-tablet formulation. It is currently cheaper to buy compared to AZT- and ABC-based regimens (see below for cost comparison of regimens and formulations), and it requires less storage space. Figure 9 illustrates cost comparison of most common first- and second-line regimens per patient per year.

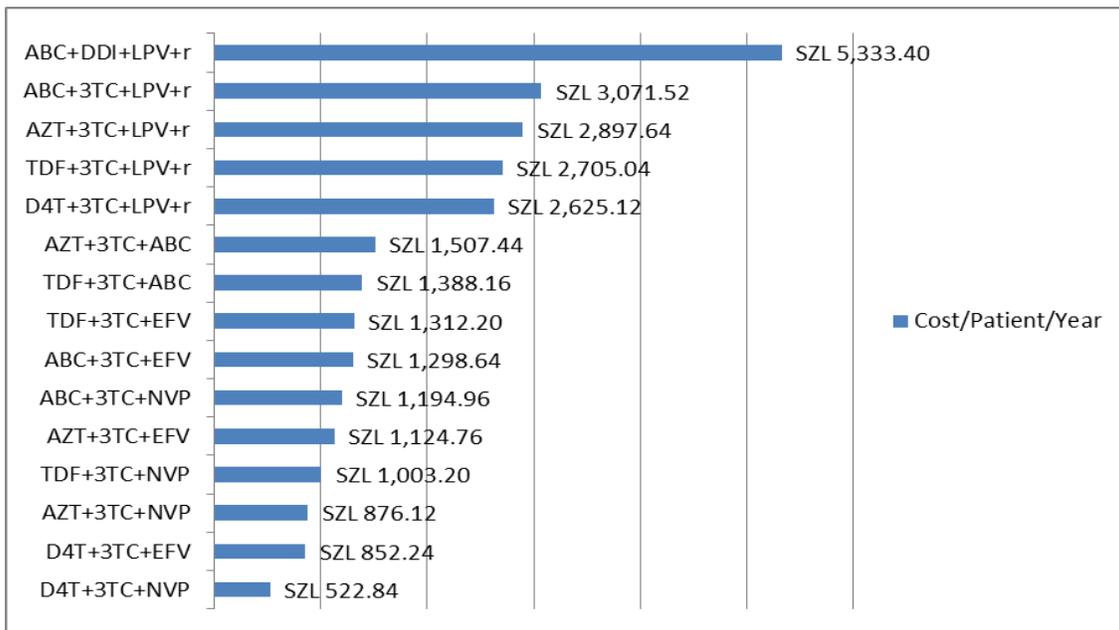


Figure 9. Comparison of costs per regimen per patient per year

ABC+DDI+LPV/r is the most expensive second-line regimen, and only 2.62% of existing second-line adult patients are on it. The most prescribed second-line regimen, however, ABC+3TC+LPV/r, which comprises 39.00% of existing adult second-line patients, stands to be the second most expensive regimen per patient per year.

The least expensive is a first-line regimen D4T+3TC+NVP, which is being phased out because of D4T toxicity and comprises only 1% of existing adult first-line patients. The difference between the most expensive and least expensive regimen is SZL 4,810.56 per patient per year, but the comparison of cost within first-line regimens shows that the most preferred regimen, TDF+3TC+EFV, which 44.60% of existing and 72.65% of newly initiated patients take, stands second next to AZT+3TC+ABC, which comprises only 0.02% of existing and 0.03% of new adult first-line patients. The second most consumed regimen, AZT+3TC+NVP costs SZL 876.12 per patient per year, which is relatively cheaper.

Generally, each of the second-line regimens per patient per year is more expensive than any of the first-line regimens per patient per year. Therefore, from both patient care and cost points of view, it is important to strengthen adherence of patients to ARV medication to minimize treatment failure and shifts to second-line regimens.

Pediatric ARVs

Pediatric regimens, formulations, and dosing are usually related to the weight distribution and body surface area due to issues related to the pharmacokinetic considerations of different ARVs. Therefore, for this forecasting exercise, the team has used the weight distribution for regimen, formulation, and dosing selection. Figure 10 illustrates the proportion of pediatric weight distribution used for the forecast.

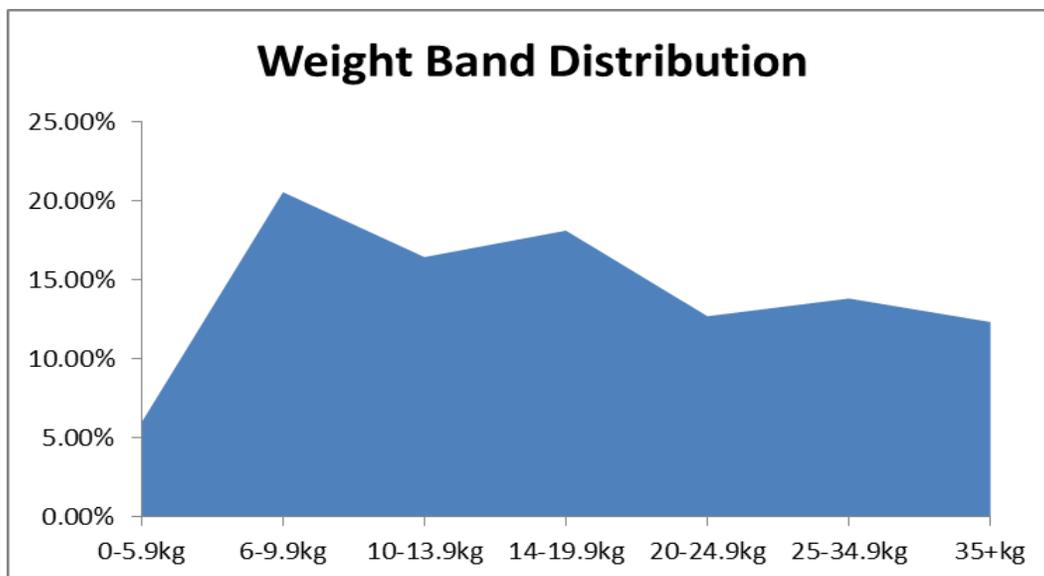


Figure 10. Weight band distribution of pediatric patients in Swaziland

The current Swaziland ART guideline (2010) recommends AZT+3TC+NVP and D4T+3TC+NVP as the preferred regimens for initiating pediatric patients, so 52.68%, 37.57%, and 5.46% existing pediatric patients are on AZT+3TC+NVP, D4T+3TC+NVP, and AZT+3TC+LPV/r, respectively, in weight band 0–13.9 kg. These guidelines will be followed until June 2014 and will be replaced, in July 2014, by the new ART guideline.

According to the new, revised ART guideline of Swaziland and WHO recommendation, an LPV/r-based regimen should be used as first-line ART for all HIV-infected children younger than three years (36 months) of age, regardless of non-nucleoside reverse transcriptase inhibitor exposure. If LPV/r is not feasible, treatment should be initiated with an NVP-based regimen (strong recommendation, moderate-quality evidence). Therefore, based on the new guideline starting in July 2014, new pediatric ART-initiating patients will be put on ABC+3TC+LPV/r (90%), D4T+3TC+NVP (6%), and AZT+3TC+NVP (4%). Figure 11 illustrates the proportion of pediatric regimen from FY 2013–14 to FY 2014–15.

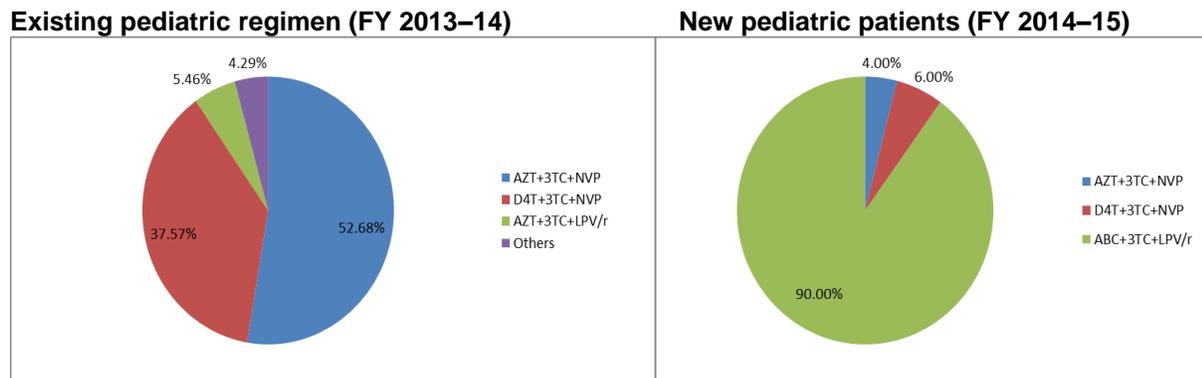


Figure 11. Most commonly prescribed regimens for existing and new pediatric patients

For adolescents infected with HIV (10 to 19 years old) weighing 35 kg or more the nucleoside reverse transcriptase inhibitor backbone for an ART regimen was aligned with that of adult’s regimen.

CHALLENGES AND RECOMMENDATIONS

Challenges

- Inadequate human resources, especially the lack of pharmacy personnel at the facility level, and a relatively weak health system
- Relatively higher ART attrition rate compared to other African countries
- Patient data inaccuracy and incompleteness at ART sites
- Relatively poor inventory management at ART sites
- Longer lead time in allocating and releasing funds for procurement
- Inadequate funding and delayed disbursement
- Delayed payment processes, which hinder on-time, regular delivery of HIV commodities
- Poor reporting and communication between ART-initiating and refill clinics in terms of stock reporting and ordering
- Poor performance from some suppliers

Recommendations

- Strengthen in-country pharmacy personnel training to fill gaps
- Strengthen ART patient-retention strategy
- Strengthen continuous supportive supervision and mentorship to alleviate challenges related to poor data quality and inventory management
- Advocate for on-time release of adequate funding
- Advocate for an improved process of payments of suppliers
- Build the capacity of regional clinical supervisors to bridge the communication between ART-initiating facilities and refill clinics on stock reporting and ordering
- Put a suppliers' performance management system in place and engage suppliers regularly.

ANNEX 1. AGENDA FOR QUANTIFICATION CONSULTATIVE MEETING



Swaziland Ministry of Health National HIV Commodity Quantification

Consultative Meeting

November 5, 2013 Mountain Inn

Objectives

- To review and validate the available data, assumptions, and methodologies
- To build additional assumptions based on—
 - New guidelines and changes
 - Trends and targets
 - Future programmatic goals
- To reach a consensus and draw agreed-upon assumptions, data, methodologies, and scenarios for the current quantification
- To draw up recommendations

Time	Session	Facilitators
8:30 a.m. – 8:45 a.m.	Registration and self-introductions	All
8:45 a.m. – 9:00 a.m.	Welcome and objectives of the meeting	Tibuyile, S
9:00 a.m. – 10:00 a.m.	National ART LMIS snapshot	Mavis, M.
10:00 a.m. – 10:20 a.m.	Coffee Break	
10:20 a.m. – 11:20 a.m.	Data presentation on ART, PMTCT, opportunistic infections, and IPT	Tibuyile, S.
11:20 a.m. – 12:45 p.m.	Discussion on data presentations, assumptions and decision making	Gashaw, S. Wenzile, M.
12:45 p.m. – 1:00 p.m.	Next steps and end of workshop <ul style="list-style-type: none"> • Forecasting exercise • Submission of budget • Dissemination • Tender advertisement and adjudication 	Tibuyile, S.
1:00 p.m.	Lunch and departure	

ANNEX 2. INVITATION LETTER QUANTIFICATION CONSULTATIVE MEETING

Telegrams:
Telex:
Telephone: (+268 404 2431)
Fax: (+268 404 2092)



MINISTRY OF HEALTH
P.O. BOX 5
MBABANE
SWAZILAND

THE KINGDOM OF SWAZILAND

24 October, 2013

To: See Distribution List

RE: HIV COMMODITIES QUANTIFICATION CONSULTATIVE WORKSHOP

Dear Madam/Sir,

The National ART Program and the Central Medical Store are coordinating the National Annual HIV Commodities Forecasting Exercise with the support and technical input of partners. The Ministry of Health views such a coordinated and integrated exercise as the most appropriate response to the scaling-up of ART and PMTCT service delivery in line with the planned implementation of the recent changes in guidelines recommended by World Health Organization (WHO) and adopted/adopted by the country.

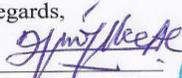
The period of the forecast is 2 years, from April 1 2014 to March 30, 2016 with 1 year supply plan (from April 1, 2014 to March 30, 2015). The scope of the forecast includes ARV medicines for ART and PMTCT, medicines for Opportunistic Infections (Cotrimoxazole, medicines for Kaposi Sarcoma), and INH for IPT. The result from the exercise will inform annual budgeting, tendering and procurement of HIV-care commodities.

The objective of the consultative workshop is to present relevant data for quantification, evaluate and validate them, entertain expert opinions, come up with probable assumptions, and agree on relevant data. Discussions will culminate in a summary of agreed and validated data, assumptions and recommendations for executing the forecast.

This consultative workshop will be held at **Mountain Inn on the 5th of November 2013 starting 8:30am** and will consist of a series of in-depth discussions among technical experts and working groups.

Considering the importance of this consultative workshop as a stepping stone for national quantification and supply planning for HIV programming, SNAP cordially requests your attendance to participate in the workshop and contribute to this important exercise.

Best Regards,

PP: 

Dr Velephi Okello
Senior Medical Officer
ART Program



ANNEX 3. LIST OF PARTICIPANTS FOR THE QUANTIFICATION CONSULTATIVE MEETING

MEETING ATTENDANCE FORM

#	Name and Surname	Organization	Cell number	Email address
1	Wanzile Nkhimkhulu	CHAI	76159247	wmthimkhulu@clintonhealthaccess.org
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5	Duncan Kochelani	Baylor	76029620	dkochelani@baylorsternland.org.sz
6	Eric Muzany	Baylor	76321741	muzanyeric@yahoofr
7	NANATO YANO	CHAI	78231497	nanatoyasnyano@clintonhealthaccess.org
8	SIFISO SLAMINI	MSH/SIAPS	76770075	sdlamin@msl.org
9	CAROLINE MIDDLECOTE	CHAI	78200599	cmiddlecote@clintonhealthaccess.org
10	Bernhold Henschel	RSF	076146678	RSFCH-SWAZILAND-DIRECTOR@GENEVA.RSF.ORG
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12	Gershaw Stiforaw	MSH	76600835	gstiforaw@msl.org
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15	Ulric GC	ICAP	7682855	ulricgc@columbia.edu
16	Kimberly Larkins	MSF	7611849	MSFCH-Nkhlangano-pharmacy@geneva.msf.org
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