QUANTIFICATION OF ANTI-TUBERCULOSIS COMMODITIES FOR SEPTEMBER 2019–DECEMBER 2022, PHILIPPINES

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ABOUT THE DEPARTMENT OF HEALTH NATIONAL TB CONTROL PROGRAM

The National Tuberculosis Control Program (NTP) is one of the public health programs being managed and coordinated by the Public Health Service Team of the Department of Health (DOH). The NTP has a mandate to develop TB control policies, standards, and guidelines; formulate the national strategic plan; provide leadership and technical assistance to the lower health offices/units; manage data; and monitor and evaluate the performance of the program. The NTP has a vision of TB-free Philippines with a mission of reducing the TB burden and the catastrophic costs of TB-affected households and responsively delivering TB control services nationwide in collaboration with national, regional, and local government agencies and nongovernmental and international organizations.

ABOUT MTAPS

The goal of the USAID Medicines, Technologies, and Pharmaceutical Services (MTaPS) Program is to enable low- and middle-income countries to strengthen their pharmaceutical systems to ensure sustainable access to and appropriate use of safe, effective, quality-assured, and affordable essential medicines and medicine-related pharmaceutical services. Toward this end, the MTaPS result areas include strengthening pharmaceutical-sector governance; increasing institutional and human resource capacity for pharmaceutical management and services, including regulation of medical products; increasing availability and use of pharmaceutical information for decision making and advancing the global learning agenda; optimizing pharmaceutical-sector financing, including resource allocation and use; and improving pharmaceutical services, including product availability and patient-centered care, to achieve desired health outcomes.

RECOMMENDED CITATION

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ACRONYMS

CHD	Center for Health Development
DOH	Department of Health
DSM	drug and supplies management
FDA	Food and Drugs Administration
F&L	freight and logistics
GDF	Global Drug Facility
GF	Global Fund
LTBI	latent TB infection
DR	drug resistant
DS	drug sensitive
ITIS	Integrated TB Information System
MTaPS	Medicines, Technologies, and Pharmaceutical Services
NTP	National Tuberculosis Control Program
PhilSTEP	Philippine Strategic Tuberculosis Elimination Plan
PMIS	Pharmaceutical Management Information System
PS	Procurement Service
PSCMT	Procurement and Supply Chain Management Team
SCMO	Supply Chain Management Office
STR	shorter treatment regimen
USAID	US Agency for International Development
WHO	World Health Organization

CONTENTS

EXECUTIVE SUMMARY

According to the Philippines DOH 2016 Annual Report, TB case detection and treatment success rates exceeded the national targets of 93.6% and 90%, respectively. However, TB remains a major health problem in the country and is one of the leading causes of mortality. The Philippines remains one of 30 high TB burden countries in the world, with an estimated 1 million Filipinos living with active TB and an incidence rate of 554 per 100,000 population. The Government of the Philippines has committed to diagnose, notify, and treat 2.5 million people, acknowledging that TB is a major public health concern. To achieve the planned targets, continuous availability of anti-TB commodities is vital. Evidence-based quantification is one of the functions of good supply chain management to ensure that the right anti-TB commodities in the right quantities and at the right time are quantified, procured, and available at service delivery points.

The DOH conducts annual quantifications for anti-TB commodities to meet the need of public-sector facilities in the country. The objective of the quantification is to review the current data on program targets, performance, and future strategies to estimate quantities and cost requirements of anti-TB commodities needed for prevention, diagnosis, and treatment for September 2019–December 2022.

The morbidity method of quantification and a quantification tool called QuanTB were used to produce results by quantity and value. A procurement plan was developed based on two scenarios—scenario 1 with six-month minimum stock and scenario 2 with one-month minimum stock. Stock on order but not yet received; usable stock available as of June 30, 2019; program minimum and maximum stock levels; lead time; and buffer stocks were also used. The final result of the quantification exercise was a procurement (supply) plan for September 2019–December 2022, including specific quantities of each product that are required, with a proposed delivery date. Tables 1 and 2 present the procurement value, including fright and logistics (F&L) costs, for the procurement period for all anti-TB commodities quantified for scenarios 1 and 2. However, details of requirements with quantity and value for both scenarios are described in this report elsewhere.

Table 1: Summary of procurement requirements by value—scenario 1

PRODUCT CATEGORY	2019	2020	2021	2022	TOTAL	%
Second-line anti-TB medicines	$1,444,371	$14,100,861	$21,888,507	$11,476,453	$48,910,192	46%
First-line anti-TB and LTBI medicines	$8,009,516	$3,357,883	$17,931,236	$11,288,076	$40,586,711	38%
GeneXpert machines	$14,444,258	$0	$2,725,332	$0	$17,169,590	16%
Total	$23,898,145	$17,458,744	$42,545,075	$22,764,529	$106,666,493	100%

Table 2: Summary of procurement requirements by value—scenario 2

PRODUCT CATEGORY	2019	2020	2021	2022	TOTAL	%
Second-line anti-TB medicines	$312,900	$7,255,204	$20,334,419	$11,393,786	$39,296,309	45%
First-line anti-TB and LTBI medicines	$1,055,665	$2,182,220	$16,790,788	$11,202,535	$31,231,208	36%
GeneXpert machines	$9,039,017	$5,405,241	$2,725,332	$0	$17,169,590	19%
Total	$10,407,582	$14,842,665	$39,850,539	$22,596,321	$87,697,107	100%

BACKGROUND

COUNTRY PROFILE

The Philippines remains one of 30 high TB burden countries in the world, with an estimated 1 million Filipinos living with active TB and an incidence rate of 554 per 100,000 population.[1] According to the DOH 2016 Annual Report, TB case detection and treatment success rates exceeded the national targets of 93.6% and 90%, respectively. However, TB remains a major health problem in the country and one of the leading causes of mortality.

EFFORTS TO ELIMINATE TUBERCULOSIS

The national target to treat 2.5 million cases by 2022, as committed by the Government of the Philippines at the UN High-Level Meeting in September 2018, triggered greater strides in addressing TB as a major public health concern.[2] Among the major interventions is an effort to intensify TB case finding, especially among high-risk groups and vulnerable populations and the use of the World Health Organization (WHO)-recommended rapid molecular test (GeneXpert MTB/Rif), which needs significant scale up in terms of number of instruments to achieve the target of diagnosing, notifying, and curing 2.5 million Filipinos and reducing the incidence to 427[3] per 100,000 population by 2022. To achieve the above targets, continuous availability of anti-TB commodities is critical. In alignment with the National Objective of Health, the DOH continues to enhance its management of the supply chain to eliminate TB in the country. Proper quantification of anti-TB commodities is one supply chain function and has a significant role in ensuring that the right quantity of products is estimated to procure and distribute to service delivery points.

DOH SUPPLY CHAIN MANAGEMENT FOR ANTI-TB COMMODITIES

The DOH, through the PSCMT, manages the procurement and supply chain for medicines and health commodities of all health programs for the country, including TB. The PSCMT is divided into the Supply Chain Management Office (SCMO) and Procurement Service (PS). PS manages the procurement and bidding processes for first-line anti-TB medicines, while the Global Drug Facility (GDF) procures second-line anti-TB medicines funded by the Global Fund (GF). The SCMO, in coordination with the NTP, oversees warehousing and distribution at the central level down to the Center for Health Development (CHD) level (previously called regional level) and to TB treatment facilities. At the CHD level, warehousing and further distribution of DOH commodities are managed through the regional supply officers. Last-mile distributions of commodities are up to the rural health units as the service delivery points. First-line anti-TB medicines commodities follow the regular DOH supply chain, while second-line anti-TB medicines and GeneXpert cartridges flow from central warehouses to the service delivery point through the GF-supported outsourced warehouse and distribution services.

[1] WHO. 2018. Tuberculosis Country Profile, Philippines
[2] Department of Health. 2017. Philippine Strategic TB Elimination Plan (2017–2022)
[3] Department of Health. 2018. National Objectives for Health Philippines 2017–2022. Manila, Philippines

In addition to the PSCMT, the NTP manages other functions for anti-TB commodities through its Drug and Supply Management (DSM) unit. The NTP DSM unit oversees functions such as budget forecasting, quantification, allocation planning at the central level, and monitoring.

Monthly consumption and stock on hand data of first-line anti-TB medicines at health facilities are reported quarterly through the Pharmaceutical Management Information System (PMIS)—a web-based system used to upload summary stock data. Monthly summary consumption and stock on hand data for second-line anti-TB medicines are reported through an Excel tool.

The DOH PSCMT and NTP work with various DOH offices involved in supply chain, including:

- Food and Drugs Administration (FDA) as the national regulatory authority for medicines in the country
- Pharmaceutical Division implements policies for pharmaceutical access through appropriate selection of TB products
- Knowledge and Management Information and Technology Services manages DOH information systems such as the Integrated TB Information System (ITIS)
- National Tuberculosis Reference Laboratory manages distribution of TB diagnostic commodities

SCOPE AND OBJECTIVE OF THE QUANTIFICATION

SCOPE OF THE QUANTIFICATION

The quantification covers all patients who are and will be using anti-TB commodities from the public sector, including patients who are notified and referred to public health facilities from the private sector. Anti-TB commodities considered include those for first- and second-line TB (i.e., drug-sensitive [DS] and drug-resistant [DR] TB) and latent TB infection (LTBI) treatments as well as GeneXpert machines. All DR-TB cases are assumed to get their medicines from the public sector, while some portion of DS-TB cases are assumed to get their medicines from the private sector. The requirements for patients getting their medicines from private sector are not included in the quantification. The quantification covers September 2019 to December 2022. This forecast considers the Philippine Strategic Tuberculosis Elimination Plan (PhilSTEP-1) targets in terms of both diagnosis and treatment and patients already enrolled on treatment, whereas the supply plan is done after considering a number of factors, including forecasted quantities, stock on hand, expiration dates, stock on order, minimum and maximum stock levels, lead times, and procurement and F&L costs.

OBJECTIVES

The main objective of the quantification was to estimate the requirements of TB and ancillary medicine (such as pyridoxine) and GeneXpert machines for September 2019 to December 2022. The results of the quantification will be used for procurement and for planning, mobilizing, and securing financial resources.

The main objectives of the quantification exercise were to:

- Determine the forecast quantities (future consumptions of anti-TB medicines) and requirements of GeneXpert machines for September 2019–2022
- Produce procurement requirements of anti-TB medicines and GeneXpert machines by quantity and acquisition costs for September 2019–December 2022
- Utilize the results of the quantification to mobilize and secure the required budget to procure these commodities in the specified time period
- Increase capacity of local staff in quantification of health commodities in general and of anti-TB commodities in particular

QUANTIFICATION PROCESSES, METHODOLOGIES, AND TOOLS

PREPARATORY ACTIVITIES

Preparatory activities—such as defining data requirements, developing data collection tools, and collecting data and the desk review of existing documents—were carried out in collaboration with different stakeholders.

Alignment meetings with the DOH NTP were held August 20–21, 2019, to:

- Discuss and agree on the objective of the quantification
- Understand data requirements and pending data to be collected
- Agree on timelines for the quantification exercise and expected results from the exercise
- Confirm participation of staff for a two-day orientation workshop on quantification principles and processes

ORIENTATION ON QUANTIFICATION

A two-day orientation workshop on quantification was conducted for DOH staff and implementing partners August 22–23, 2019, to:

- Introduce the concept of quantification (forecasting and supply planning), including key principles, data requirements, methods, steps, and processes
- Describe applications of quantification and early warning systems in supply chain management of health commodities
- Describe common challenges, lessons learned, possible strategies, and synergies related to supply chain management of health commodities
- Make recommendations for the mitigation of identified challenges
- Develop a plan of action to produce three-year quantification results

DATA ORGANIZATION, ANALYSIS, PRESENTATION, AND VALIDATION

The collected data were organized, analyzed, and prepared August 26 and 27, 2019, for presentation and validation to DOH stakeholders. Data presentation and validation meetings were held August 28 and 30, 2019, with the DOH NTP. The objectives of the meetings were to:

- Review and validate the available data and assumptions
- Build additional assumptions
- Agree on input data, assumptions, scenarios, and methodologies for the current quantification

- Draw recommendations for future strengthening of the whole health commodity supply chain management, focusing specifically on quantification-related activities

During the meetings, the analyzed data were presented, reviewed, and validated. The available data, potential scenarios, and methodologies were discussed. Strengths and weakness of the available data were identified and discussed to guide assumption building for the quantification exercise. The discussions also helped to build more assumptions and reach consensus on data, assumptions, methodologies, and scenarios to be applied for the quantification. Practical challenges were identified, and possible solutions were recommended. Attendees at the meetings included the NTP program manager; NTP DSM officers; technical officers of TB development partners, including WHO, USAID, GF, and USAID implementing partners; and MTaPS senior technical advisors. Data and assumptions were then further analyzed and organized for input into the quantification tools (QuanTB and Excel).

Based on feedback provided during the meetings and further discussions with stakeholders, the morbidity method of forecasting was chosen as the main forecasting method because:

- The data for the morbidity method are relatively more reliable than for the consumption method
- The NTP is scaling up TB services and implementing a new treatment guideline, indicating that past consumption or issue data do not necessarily reflect future consumption
- The consumption data generated through the PMIS were incomplete

QuanTB is used to carry out both forecasting and supply planning of anti-TB medicines, while Excel is used for the quantification of GeneXpert machines. QuanTB is an open source, Java-based quantification and early warning tool developed by Management Sciences for Health for improving availability and reducing stock-outs of anti-TB and ancillary medicines.

MAJOR DATA AND SOURCES

The following are the major data used for the quantification and their sources.

Table 3: Major data and sources

DATA	SOURCE
Population projection	DOH Epidemiology Office
Incidence of TB	DOH-PhilSTEP-1 and WHO report
Target number of DS- and DR-TB cases for diagnosis and treatment (includes target for coverage)	DOH-PhilSTEP-1, NTP performance report through ITIS
Service statistics (number of cases diagnosed and treated by group) – case notifications	ITIS, DOH-PhilSTEP-1, WHO
Attrition rates	DOH NTP, validation meetings expert opinion
Source mix (public vs private proportion) – mandatory notifications	ITIS
DS- and DR-TB regimens, formulations, and dosages	TB standard treatment guidelines manual of procedures

DATA	SOURCE
Actual number of cases treated for LTBI; target number of LTBI cases to be treated	Race to End TB Monitoring Tool (http://tbdashboard.doh.gov.ph/#!/layouts/dashboard-fullview.htm)
LTBI treatment regimens, formulation, and dosages	Standard treatment guidelines; NTP manual of procedures
Consumption and stock on hand data for first-line anti-TB medicines at health facilities as of June 30, 2019	Pharmacy Division PMIS
Stock on hand data for first-line anti-TB medicines at CHD warehouses; outstanding shipment with expected date of delivery as of June 30, 2019	DOH/SCMO NTP DSM team and PS
Lead times	DOH NTP discussion
Unit costs of products	DOH, GDF
Minimum and maximum stock levels	DOH NTP discussion

QUANTIFICATION OUTPUT

MAJOR ASSUMPTIONS USED FOR THE QUANTIFICATION

DS-TB AND DR-TB TARGETS FOR TREATMENT

Population projections and new WHO estimates of TB incidence were used to calculate the number of new TB cases for each year. Target coverage as stipulated in the DOH-PhilSTEP-1 was applied on the total new TB cases to calculate the target number of cases for treatment. Significant differences were identified between the incidence estimates of DOH-PhilSTEP-1 and WHO, with DOH-PhilSTEP-1 being lower than WHO for the quantification period. However, it was agreed to take the new WHO estimates and keep the incidence of 554 TB cases per 100,000 population constant throughout the quantification period. This implies a higher number of estimated TB cases than what is stated in DOH-PhilSTEP-1 (table 4).

Table 4: Population projections, estimated TB incidence, and total number of TB cases

	2017	2018	2019	2020	2021	2022
Population	104,921,597	106,168,803	108,020,395	109,908,955	111,835,329	113,800,381
Incidence rate (new WHO estimates)	554	554	554	554	554	554
Estimated number of all forms of TB	581,266	588,175	598,433	608,896	619,568	630,454
Target treatment coverage	*64.1%*	*65.1%*	*78.3%*	*90.0%*	*90.0%*	*90.0%*
Number of TB cases to be treated	372,491	382,948	468,586	548,006	557,611	567,409

Comparison of past performance against targets shows that the achievement in 2018 was slightly higher than the DOH-PhilSTEP-1 targets (table 5). That could be due to lower incidence rates used for the year compared to the new estimates.

Table 5: Comparison of TB notifications

NO.		2016	2017	2018	2019	2020	2021	2022
1	DOH PhilSTEP-1: Target TB notification		372,894	371,888	437,291	486,382	463,472	437,335
2	NEW (based on new incidence and coverage): Target TB notification		372,491	382,948	468,586	546,563	554,565	567,409
3	DOH: Actual TB notification	345,174	320,932	377,641	n/a	n/a	n/a	n/a
	WHO: Actual TB notification	345,144	317,266	382,543	n/a	n/a	n/a	n/a
	% of #3/#1		86%	102%	n/a	n/a	n/a	n/a
	% of #3/#2		86%	99%	n/a	n/a	n/a	n/a

The total number of estimated DR-TB cases was assumed to be 18,000 for each quantification year, based on new WHO and NTP estimates. The number of DR-TB notifications for 2018 was 6,271—showing only about 34.5% coverage. The coverage is planned to increase to 90% by 2022, and the number of DR-TB cases was calculated accordingly for the quantification period. The estimated number of DR-TB cases was deducted from the estimated TB cases to get the DS-TB case notifications. Table 6 provides details on the target number of new DR-TB cases for treatment for the quantification period.

Table 6: Estimates of DR-TB and DS-TB notifications

	2017	2018	2019	2020	2021	2022
Total estimated DR cases (WHO)	18,000	18,000	18,000	18,000	18,000	18,000
DR-TB coverage	31.6%	34.5%	59%	70%	80%	90%
Actual/target for treatment (DR-TB)	5,689	6,271	10,580	12,600	14,400	16,200
Actual/target for treatment (DS-TB)	366,802	376,677	458,006	535,406	543,211	551,209
Total actual/target for TB treatment	372,491	382,948	468,586	548,006	557,611	567,409

The proportion of DR-TB notifications compared to the total TB notifications in the public sector, excluding the private sector, is estimated to increase from 2.62% in 2019 to 3.34% in 2022, based on actual achievements in the past and assuming slight increases in the future. These estimates are significantly lower than the proportions estimated in DOH-PhilSTEP-1 (figure 1).

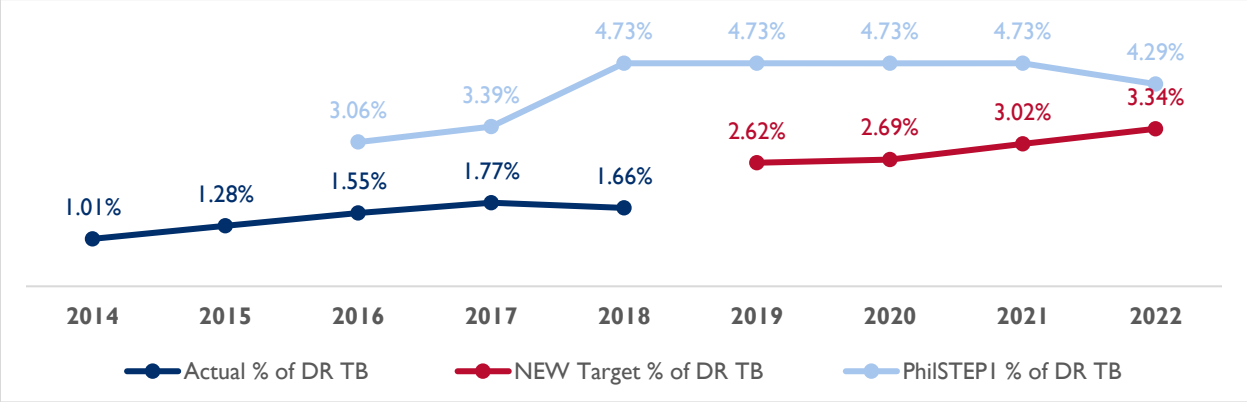

Figure 1: Percentage of DR-TB notifications out of all TB notifications in the public sector

The proportion of child DS-TB cases to total DS-TB estimates was assumed to be 10% for 2019 and predicted to reach 13% by 2022. This was based on the achievement in 2018 (10.75%) and assuming a 1% annual increase (figure 2).

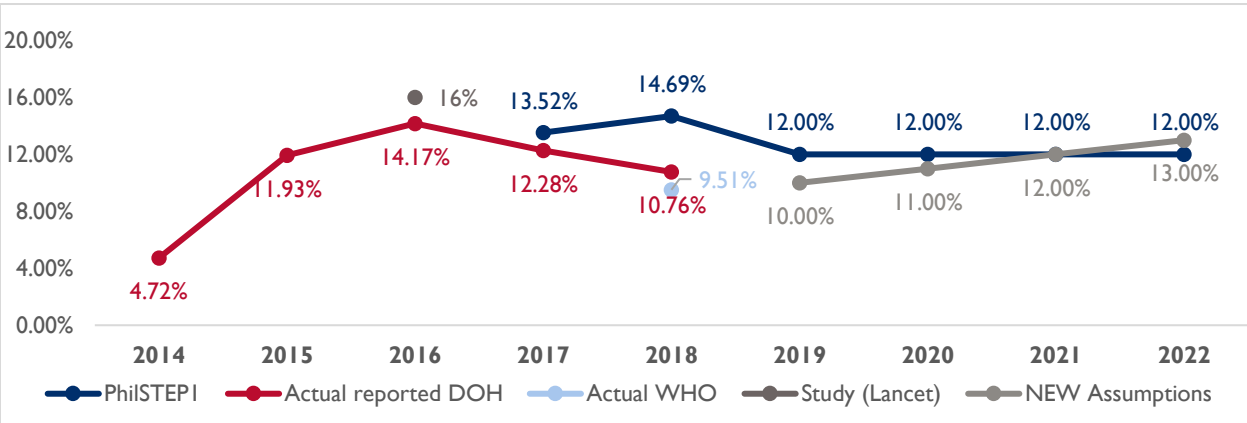

Figure 2: Percentage of children with DS-TB out of all DS-TB cases

The proportion of child DR-TB notifications was assumed based on current trends, with 0.73% of the total DR-TB case notifications were assumed to be children for the quantification period (figure 3).

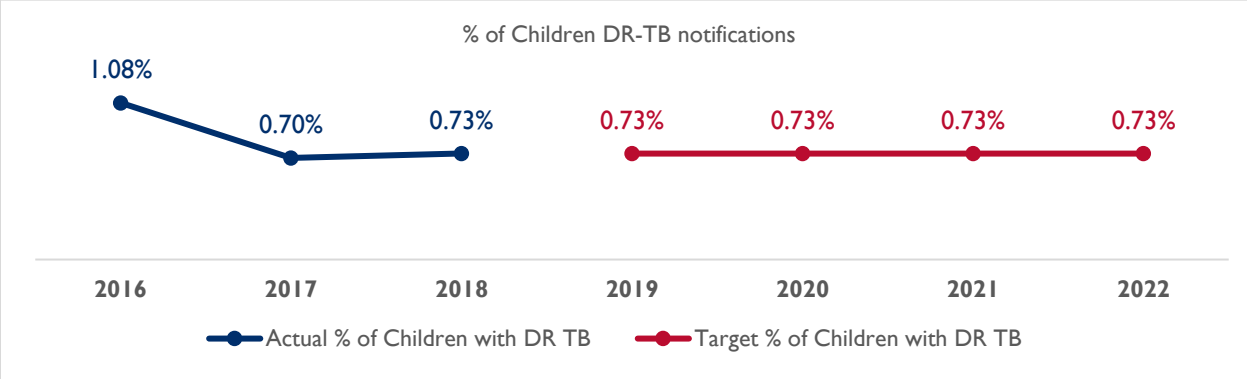

Figure 3: Percentage of children with DR-TB out of all DR-TB cases

The contribution of DS-TB notifications from the private sector (mandatory notifications) is predicted to increase from 10% in 2018 to 15% starting in 2020 (table 7).

Table 7: Private-sector contribution to DS-TB case notifications

DS-TB CASE NOTIFICATION	2018	2019	2020	2021	2022
% private-sector contribution	10%	14%	15%	15%	15%

Table 8: Summary of DS-TB notifications

	2019	2020	2021	2022
Total DS-TB treatment cases	458,006	535,406	543,211	551,209
Public-sector DS-TB cases	393,886	455,095	461,729	468,527
Private-sector DS-TB cases	64,120	80,311	81,482	82,682
Adult DS-TB cases: public sector	354,497	405,035	406,322	407,618
Child DS-TB cases: public sector	39,389	50,060	55,407	60,909

Table 9: Summary of DR-TB notifications

	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total DR-TB cases	2,732	4,047	5,352	5,689	6,271	10,580	12,600	14,400	16,200
# adult (99.37% from 2019)	2,716	4,017	5,294	5,649	6,225	10,503	12,508	14,295	16,082
# children (0.73% from 2019)	16	30	58	40	46	77	92	105	118

An attrition rate of 30% is assumed for the quantification of DR-TB medicines based on service data and expert opinion. The attrition rate was applied using QuanTB to calculate net requirements.

LTBI TARGETS FOR TREATMENT

LTBI treatment targets for the quantification period are provided by the NTP from the Race to End TB Monitoring Tool.[4] LTBI treatment of children 5 to 14 years is assumed to start in 2020 (table 10).

Table 10: LTBI treatment targets

YEAR	< 5 YEAR CONTACTS	PLHIV	5–14 YEAR CONTACTS
2019	163,984	5,155	-
2020	255,351	5,258	104,177
2021	278,084	5,701	63,819
2022	292,727	6,389	26,136

TREATMENT REGIMENS, FORMULATIONS, AND DOSAGES

TB treatment regimens, formulations, and dosages are taken from the National TB treatment guideline manual of procedures (table 11).

Table 11: DS-TB and LTBI regimens, formulations, and dosages used for forecasting

CONDITION	REGIMENS	FORMULATIONS	DOSE	%
DS-TB adults	2RHZE/4RH (100%)	RHZE (150/75/400/275mg)	3 tabs/day for 56 days	100%
		RH (150/75mg)	3 tabs/day for 112 days	100%
DS-TB children (< 15 years)	2RHZE/4RH (20%)	RHZE (150/75/400/275mg)	2 tabs/day for 56 days	100%
		RH (150/75mg)	2 tabs/day for 112 days	100%
	2RHZ(E)/4RH (80%) through Dec 2020	R 200mg/5ml, 120ml susp.	6 ml (15mg x 15) for 7 days 168 days	100%
		H 200mg/5ml, 120ml syrup	4 ml (10mg x 15) for 7 days 168 days	100%
		Z 250mg/5ml, 120ml susp.	9.5 ml (30mg x 15) for 7 days 56 days	100%
		E 400mg tablets	1 tab/day for 56 days	100%
	2RHZ(E)/4RH (80%) beginning in Jan 2021	RHZ (75/50/150mg) disp.	3 tabs/day for 56 days	100%
		E 100mg disp.	3 tabs/day for 56 days	100%
		RH (75/50mg) disp.	3 tabs/day for 112 days	100%
LTBI–PLHIV and 5–14 year contact	6H	INH 300 mg	1 tab/day for 168 days	100%
LTBI < 5 contact	6H	INH 100 mg	1 tab/day for 168 days	100%

DR-TB regimens and respective proportions (table 12) are assumed based on reports and adjustments by expert opinion. Beginning in July 2020, it is assumed that more than 95% of new DR-TB patients will be started on the standard long oral regimens with fluoroquinolones.

[4] http://tbdashboard.doh.gov.ph/#!/layouts/landingpage.html

Table 12: List and proportion of DR-TB regimens

NO.	REGIMEN	JULY–DEC 2019	JAN–JUN 2020	JUL–DEC 2020	2021	2022
1	Standard STR with Am	40.00%	20.00%	0.00%	0.00%	0.00%
2	Modified STR Patients FQs	23.40%	32.70%	0.00%	0.00%	0.00%
3	Modified STR Patients FQr	1.60%	1.60%	0.00%	0.00%	0.00%
4	Standard LOR FQs	32.50%	42.52%	95.22%	95.22%	95.22%
5	Standard LOR FQs pediatrics	0.00%	0.58%	0.58%	0.58%	0.58%
6	Standard LOR FQr	2.40%	2.40%	4.00%	4.00%	4.00%
7	ITR	0.10%	0.20%	0.20%	0.20%	0.20%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%

Table 13 contains the list of first- and second-line anti-TB medicines, with their abbreviations, used to make up the above regimens.

Table 13: List of anti-TB medicines and their short name

PRODUCT NAME	SHORT NAME
Amikacin	Am
Capreomycin	Cm
Imipenem	Imi/Cls
Kanamycin	Km
Amoxicillin/Clavulanic acid	Amx/Clv
Bedaquiline	Bdq
Clofazimine	Cfz
Cycloserine	Cs
Delamanid	Dlm
Ethambutol	E
Isoniazid	H
Levofloxacin	Lfx
Linezolid	Lnz
Moxifloxacin	Mfx
Para-aminosalicylic acid	PAS
Protionamide	Pto
Rifampicin	R
Rifampicin + Isoniazid	RH
Rifampicin + Isoniazid + Pyrazinamide	RHZ
Rifampicin + Isoniazid + Pyrazinamide + Ethambutol	RHZE
Rifapentine	Rpt
Pyridoxine	Vit-B6
Pyrazinamide	Z

SUPPLY PLANNING ASSUMPTIONS

The lead times for supply planning are divided into three sections based on four important milestones:

- **Planning to order:** The amount of time, after finalizing the forecast and supply plan of all commodities to be procured, required to have the required budget approvals. It is only when the budget is approved that PS will award bidders and generate a purchase order or notice to proceed. This lead time keeps ticking until the notice to proceed is generated.

- **Order to deliver:** The amount of time that it will take after the notice to proceed is sent to the supplier until commodities are delivered to the central warehouse according to the specific quantities and dates of delivery stated in the notice to proceed or purchase order.

- **FDA QC testing time:** The average time taken by FDA to test the quality of commodities once they are delivered to the central warehouse until the test result is completed and commodities are cleared for distribution.

Table 14: Procurement lead times

	PLANNING TO ORDER	ORDER TO DELIVER	FDA QC TESTING TIME	TOTAL
Lead Time (GOP)*	7 months	3 months	1 month	11 months
Lead Time (GDF)	3 months	6 months	0 months	9 months

GOP: Government of Philippines

**Note: The lead times for DOH procurement are not well defined and could be much longer than 11 months. Procurement should be initiated well in advance considering the long processing lead time.*

Two scenarios are considered for the minimum and maximum stock levels of anti-TB commodities. Scenario 1 applies a total minimum stock level of six months, while scenario 2 applies one month of minimum stock. The best strategy is to define process calendars and set and use standard minimum and maximum stock levels for the country to avoid shortages and/or over stock in the supply chain system. Using only one month as the minimum national stock level could lead to shortages and stock-outs.

- Unit prices of products were taken from the respective procurement agent based on information from the most recent procurement documents. Unit prices for first-line TB medicines were taken from the DOH PS, and those of second-line medicines were taken from the GDF.

- F&L costs of 10% was assumed for procurement of both first- and second-line anti-TB medicines.

ASSUMPTIONS FOR GENEXPERT MACHINES

GeneXpert machines are quantified based on the target number of TB diagnostic tests to be performed using the machines, as stipulated in the DOH-PhilSTEP-1. Table 15 provides details on the performance and target number of laboratory diagnostic tests for TB. All TB diagnostic tests are assumed to be performed using GeneXpert machines by 2022, a significant increase over 39.63% in 2018.

Table 15: TB testing targets vs actual performance

	2015	2016	2017	2018	2019	2020	2021	2022
Actual DSSM	814,321	901,350	804,801	710,531				
Actual GeneXpert tests performed	75,249	156,668	277,436	466,391				
PhilSTEP-1: DSSM test targets			1,080,576	1,620,331	1,438,746	720,292	312,832	0
PhilSTEP-1: GeneXpert test targets			411,000	611,000	1,185,000	2,198,000	2,468,000	2,602,194
Actual total lab tests performed	889,570	1,058,018	1,082,237	1,176,922				
Estimated total lab test targets			1,491,576	2,231,331	2,623,746	2,918,292	2,780,832	2,602,194
Actual % GeneXpert test performance	8.46%	14.81%	25.64%	39.63%				
PhilSTEP-1: % GeneXpert test targets			27.55%	27.38%	45.16%	75.32%	88.75%	100.00%

Tables 16 and 17 provide details on the target number of GeneXpert tests and the corresponding number of additional machines required to achieve the target. The calculations are based on the assumptions that machines will be functional throughout the year and that each machine will be used to perform 2,250 tests each year. Two scenarios were considered for the estimation of additional machine requirements. In both scenarios, 100% of the testing targets are assumed to be achieved starting in January 2021. In the first scenario, 93% of the testing targets are achieved in 2020. In the second scenario, only 80% of the testing targets are achieved in 2020. The second scenario was developed in case achieving 93% in 2020 became impossible considering the short time and challenges regarding availability of funds to procure additional machines.

Table 16: GeneXpert machine and total test to be done—scenario 1

YEAR	PHILSTEP-1 TESTING TARGET	NUMBER OF MACHINES	TESTS PER MACHINE	REPORTED/ TARGETED TESTS	PERFORMANCE/ TARGET (%)	ADDITIONAL MACHINES TO REACH TARGET	TOTAL MACHINES	% ACHIEVED WITH ADDITIONAL MACHINES
2017	411,000			277,436	68%			
2018	611,000			466,456	76%			
2019	1,185,000	488	2,250	1,098,000	93%			
2020	2,198,000	588	2,250	1,323,000	60%	318	906	93%
2021	2,468,000	779	2,250	1,752,750	71%	0	1,097	100%
2022	2,602,194	779	2,250	1,752,750	67%	60	1,157	100%

Table 17: GeneXpert machine and total test to be done—scenario 2

YEAR	PHILSTEP-I TESTING TARGET	NUMBER OF MACHINES	TESTS PER MACHINE	REPORTED/ TARGETED TESTS	PERFORMANCE /TARGET (%)	ADDITIONAL MACHINES REQUIRED TO REACH TARGET	TOTAL MACHINES	% ACHIEVEMENT WITH ADDITIONAL MACHINE
2017	411,000			277,436	68%			
2018	611,000			466,456	76%			
2019	1,185,000	488	2,250	1,098,000	93%			
2020	2,198,000	588	2,250	1,323,000	60%	**199**	787	80%
2021	2,468,000	779	2,250	1,752,750	71%	**119**	1,097	100%
2022	2,602,194	779	2,250	1,752,750	67%	**60**	1,157	100%

- Unit prices were taken from the latest procurement of GeneXpert machines.
- F&L costs of 10% were assumed for procurement of GeneXpert machines.

QUANTIFICATION RESULTS FOR FIRST- AND SECOND-LINE ANTI-TB MEDICINES

Based on the data and assumptions described above, the following forecast and procurement requirements are estimated based on two scenarios for the quantification period.

FORECAST REQUIREMENTS

Based on the data and assumptions considered so far, the following forecasted quantities for each commodity were calculated for two scenarios. The forecast result is the quantity of commodities that will be required by clients at the service delivery point, not including buffer stock. Tables 18 and 19 show the forecast quantities for the quantification period for first-line, LTBI and second-line medicines, respectively.

Table 18: First-line anti-TB and LTBI medicines forecast requirement by quantity for the quantification period

PRODUCT	PACK SIZE	JULY–DEC 2019	2020	2021	2022	TOTAL
Ethambutol 100mg tablet(s)	100	0	0	71,698	81,585	153,283
Isoniazid 100mg tablet(s)	100	0	0	0	0	0
Isoniazid 200mg/5ml	120	90,433	219,989	42,380	0	352,802
Isoniazid 300mg tablet(s)	672	834	526	0	0	1,360
Rifampicin 200mg/5ml	120	135,649	329,983	63,570	0	529,202
2-FDC RH (150/75) tablet	336	176,347	411,524	413,180	415,202	1,416,253
2-FDC RH (75/50) tablet	84	0	0	130,345	190,243	320,588
3-FDC RHZ (75/50/150) tablet	84	0	0	85,355	97,125	182,480
4-FDC RHZE (150/75/400/275) tablet	168	200,401	411,683	413,636	415,665	1,441,385
Pyrazinamide 250mg/5ml	120	81,914	186,189	6,952	0	275,055

Table 19: Second-line anti-TB medicines forecast requirement by quantity for the quantification period

PRODUCT	PACK SIZE	JULY–DEC 2019	2020	2021	2022	TOTAL
Amikacin 500mg/2ml injection	10	41,733	35,276	0	0	77,009
Capreomycin 1,000mg injection	10	1,455	0	0	0	1,455
Imipenem + Cilastatin 500mg+500mg injection	10	1,278	3,086	4,471	4,989	13,824
Kanamycin 1,000mg injection	50	1,499	0	0	0	1,499
Amoxicillin + Clavulanic acid 875mg+125mg tablet	100	96	231	335	374	1,036
Bedaquiline 100mg tablet(s)	188	2,524	8,883	10,142	11,338	32,887
Clofazimine 50mg capsule(s)	100	0	31	101	121	253
Clofazimine 100mg capsule(s)	100	9,344	30,553	42,312	55,850	138,059
Cycloserine 125mg capsule(s)	100	0	143	472	565	1,180
Cycloserine 250mg capsule(s)	100	6,462	7,165	5,715	7,129	26,471
Delamanid 50mg tablet(s)	672	154	502	476	531	1,663
Ethambutol 400mg tablet(s)	672	3,261	5,179	146	0	8,586
Levofloxacin 100mg tablet(s)	100	0	143	472	565	1,180
Levofloxacin 250mg tablet(s)	100	9,426	46,753	80,758	107,197	244,134
Levofloxacin 500mg tablet(s)	100	4,925	23,376	40,379	53,599	122,279
Linezolid 600mg tablet(s)	100	4,069	22,427	42,315	56,096	124,907
Moxifloxacin 400mg tablet(s)	100	10,396	13,041	265	0	23,702
PAS 4,000mg sachet	30	3,226	2,154	745	831	6,956
Protionamide 250mg tablet(s)	100	12,977	8,451	0	0	21,428
Pyrazinamide 500mg tablet(s)	672	3,210	3,459	59	0	6,728
Pyridoxine 50mg tablet(s)	50	30,647	67,182	93,148	122,586	313,563

PROCUREMENT (SUPPLY PLAN) REQUIREMENTS: SCENARIO 1 (MINIMUM STOCK OF SIX MONTHS)

Procurement requirements by quantity and value for the quantification period based on scenario 1 (i.e., at a minimum, six months of stock of each medicine is maintained nationally at any time during the quantification period) are presented below with recommended delivery dates.

Tables 20 and 21 present emergency procurement that should be conducted as soon as possible (in 2019) for first- and second-line anti-TB medicines, respectively.

Table 20: First-line anti-TB and LTBI medicines for emergency procurement by quantity and value

S.N.	MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
1	H(100) tablet(s)	427,889	551,977
2	H(300) tablet(s)	19,098	258,205
3	R(200mg/5ml)	353,843	212,306
4	2-FDC RH (150/75) tablet(s)	143,602	3,963,415

S.N.	MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
5	4-FDC RHZE (150/75/400/275) tablet(s)	167,076	2,171,988
6	Z(250mg/5ml) ml	205,813	123,488
		Total	7,281,379
		Total with 10% F&L	8,009,516

Table 21: Second-line anti-TB medicines for emergency procurement by quantity and value

S.N.	MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
1	Imi/Cls(500/500) injection	1,637.00	58,932
2	Cs(125) capsule(s)	16.00	680
3	Cs(250) capsule(s)	624.00	16,723
4	E(400) tablet(s)	1,772.00	42,705
5	Lfx(100) tablet(s)	16.00	1,440
6	Lfx(250) tablet(s)	25,845.00	97,694
7	Lnz(600) tablet(s)	7,683.00	1,075,620
8	Vit-B6(50) tablet(s)	27,528.00	19,270
		Total	1,313,064
		Total with 10% F&L	1,444,371

Tables 22 and 23 present first- and second-line anti-TB medicines procurement requirements that should be delivered by March 31, 2020.

Table 22: First-line anti-TB and LTBI medicines procurement requirements by quantity and value for delivery by March 31, 2020

	ORDER DATE	JUNE 30, 2019
	DELIVERY DATE	MARCH 31, 2020
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
H(100) tablet(s)	116,183	149,876
H(300) tablet(s)	3,287	44,440
R(200mg/5ml)	83,425	50,055
Z(250mg/5ml)	46,440	27,864
	Total	272,235
	Total with 10% F&L	299,459

Table 23: Second-line anti-TB medicines procurement requirements by quantity and value for delivery by March 31, 2020

	ORDER DATE	JUNE 30, 2019
	DELIVERY DATE	MARCH 31, 2020
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Cfz(100) capsule(s)	53	5,207
E(400) tablet(s)	879	21,184
Lfx(250) tablet(s)	14,114	53,351
Vit-B6(50) tablet(s)	17,132	11,992
	Total	91,734
	Total with 10% F&L	100,907

Tables 24 and 25 present first- and second-line anti-TB medicines procurement requirements that should be delivered by June 30, 2020.

Table 24: First-line anti-TB and LTBI medicines procurement requirements by quantity and value for delivery by June 30, 2020

	ORDER DATE	SEPTEMBER 30, 2019
	DELIVERY DATE	JUNE 30, 2020
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	28,260	600,525
H(100) tablet(s)	240,989	310,876
H(300) tablet(s)	5,077	68,641
R(200mg/5ml)	91,935	55,161
2-FDC RH (75/50) tablet(s)	26,386	73,881
3-FDC RHZ (75/50/150) tablet(s)	33,642	114,383
Z(250mg/5ml)	22,802	13,681
	Total	1,237,148
	Total with 10% F&L	1,360,862

Table 25: Second-line anti-TB medicines procurement requirements by quantity and value for delivery by June 30, 2020

	ORDER DATE	SEPTEMBER 30, 2019
	DELIVERY DATE	JUNE 30, 2020
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Imi/Cls(500/500) injection	247	8,892
Amx/Clv(875/125) tablet(s)	43	916
Bdq(100) tablet(s)	1,378	551,200
Cfz(100) capsule(s)	17,941	1,762,524

MEDICINES	ORDER DATE	SEPTEMBER 30, 2019
	DELIVERY DATE	JUNE 30, 2020
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Cs(125) capsule(s)	160	6,800
Dlm(50) tablet(s)	225	382,500
E(400) tablet(s)	405	9,761
Lfx(100) tablet(s)	160	14,400
Lfx(250) tablet(s)	33,714	127,439
Lfx(500) tablet(s)	15,332	97,205
Lnz(600) tablet(s)	8,749	1,224,860
Vit-B6(50) tablet(s)	39,236	27,465
	Total	4,213,962
	Total with 10% F&L	4,635,358

Tables 26 and 27 present first- and second-line anti-TB medicines procurement requirements that should be delivered by December 31, 2020.

Table 26: First-line anti-TB and LTBI medicines procurement requirements by quantity and value for delivery by December 31, 2020

MEDICINES	ORDER DATE	MARCH 31, 2020
	DELIVERY DATE	DECEMBER 31, 2020
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	37,123	788,864
H(100) tablet(s)	254,449	328,239
H(300) tablet(s)	1,962	26,526
2-FDC RH (75/50) tablet(s)	89,052	249,346
3-FDC RHZ (75/50/150) tablet(s)	44,195	150,263
	Total	1,543,238
	Total with 10% F&L	1,697,562

Table 27: Second-line anti-TB medicines procurement requirements by quantity and value for delivery by December 31, 2020

MEDICINES	ORDER DATE	MARCH 31, 2020
	DELIVERY DATE	DECEMBER 31, 2020
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Imi/Cls(500/500) injection	2,329	83,844
Amx/Clv(875/125) tablet(s)	266	5,666
Bdq(100) tablet(s)	5,180	2,072,000
Cfz (50) capsule(s)	38	1,881

MEDICINES	ORDER DATE	MARCH 31, 2020
	DELIVERY DATE	DECEMBER 31, 2020
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Cfz(100) capsule(s)	22,893	2,249,008
Cs(125) capsule(s)	254	10,795
Cs(250) capsule(s)	2,830	75,844
Dlm(50) tablet(s)	243	413,100
Lfx(100) tablet(s)	254	22,860
Lfx(250) tablet(s)	43,891	165,908
Lfx(500) tablet(s)	21,946	139,138
Lnz(600) tablet(s)	23,007	3,220,980
PAS 4,000mg sachet	455	16,926
Pto(250) tablet(s)	1	16
Vit-B6(50) tablet(s)	50,434	35,304
	Total	8,513,270
	Total with 10% F&L	9,364,597

Tables 28 and 29 present first- and second-line anti-TB medicines procurement requirements that should be delivered by June 30, 2021.

Table 28: First-line and LTBI medicines procurement requirements by quantity and value for delivery by June 30, 2021

MEDICINES	ORDER DATE	SEPTEMBER 30, 2020
	DELIVERY DATE	JUNE 30, 2021
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	40,152	853,230
H(100) tablet(s)	258,606	333,602
H(300) tablet(s)	3,046	41,182
2-FDC RH (150/75) tablet(s)	110,040	3,037,104
2-FDC RH (75/50) tablet(s)	90,874	254,447
3-FDC RHZ (75/50/150) tablet(s)	47,800	162,520
4-FDC RHZE (150/75/400/275) tablet(s)	112,937	1,468,181
	Total	6,150,266
	Total with 10% F&L	6,765,292

Table 29: Second-line anti-TB medicines procurement requirement by quantity and value for delivery by June 30, 2021

	ORDER DATE	SEPTEMBER 30, 2020
	DELIVERY DATE	JUNE 30, 2021
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Imi/Cls(500/500) injection	2,392	86,112
Amx/Clv(875/125) tablet(s)	179	3,813
Bdq(100) tablet(s)	5,471	2,188,400
Cfz (50) capsule(s)	58	2,871
Cfz(100) capsule(s)	26,683	2,621,338
Cs(125) capsule(s)	271	11,518
Cs(250) capsule(s)	3,406	91,281
Dlm(50) tablet(s)	254	431,800
Lfx(100) tablet(s)	271	24,390
Lfx(250) tablet(s)	51,215	193,593
Lfx(500) tablet(s)	25,607	162,348
Lnz(600) tablet(s)	26,801	3,752,140
PAS 4,000mg sachet	398	14,806
Vit-B6(50) tablet(s)	58,570	40,999
	Total	9,625,409
	Total with 10% F&L	10,587,950

Tables 30 and 31 present first- and second-line anti-TB medicines procurement requirements that should be delivered by December 31, 2021.

Table 30: First-line and LTBI medicines procurement requirements by quantity and value for delivery by December 31, 2021

	ORDER DATE	MARCH 31, 2021
	DELIVERY DATE	DECEMBER 31, 2021
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	40,805	867,106
H(100) tablet(s)	267,846	345,521
H(300) tablet(s)	3,100	41,912
2-FDC RH (150/75) tablet(s)	208,798	5,762,825
2-FDC RH (75/50) tablet(s)	97,891	274,095
3-FDC RHZ (75/50/150) tablet(s)	48,577	165,162
4-FDC RHZE (150/75/400/275) tablet(s)	207,249	2,694,237
	Total	10,150,858
	Total with 10% F&L	11,165,944

Table 31: Second-line anti-TB medicines procurement requirements by quantity and value for delivery by December 31, 2021

	ORDER DATE	MARCH 31, 2021
	DELIVERY DATE	DECEMBER 31, 2021
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Imi/Cls(500/500) injection	2,576	92,736
Amx/Clv(875/125) tablet(s)	193	4,111
Bdq(100) tablet(s)	5,757	2,302,800
Cfz (50) capsule(s)	61	3,020
Cfz(100) capsule(s)	28,598	2,809,468
Cs(125) capsule(s)	288	12,240
Cs(250) capsule(s)	3,653	97,900
Dlm(50) tablet(s)	272	462,400
Lfx(100) tablet(s)	288	25,920
Lfx(250) tablet(s)	54,890	207,484
Lfx(500) tablet(s)	27,445	174,001
Lnz(600) tablet(s)	28,723	4,021,220
PAS 4,000mg sachet	430	15,996
Vit-B6(50) tablet(s)	62,770	43,939
	Total	10,273,235
	Total with 10% F&L	11,300,558

Tables 32 and 33 present first- and second-line anti-TB medicines procurement requirements that should be delivered by June 30, 2022.

Table 32: First-line and LTBI medicines procurement requirements by quantity and value for delivery by June 30, 2022

	ORDER DATE	SEPTEMBER 30, 2021
	DELIVERY DATE	JUNE 30, 2022
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	41,661	885,296
H(100) tablet(s)	272,235	351,183
H(300) tablet(s)	3,150	42,588
2-FDC RH (150/75) tablet(s)	209,724	5,788,382
2-FDC RH (75/50) tablet(s)	98,310	275,268
3-FDC RHZ (75/50/150) tablet(s)	49,597	168,630
4-FDC RHZE (150/75/400/275) tablet(s)	211,580	2,750,540
	Total	10,261,887
	Total with 10% F&L	11,288,076

Table 33: Second-line anti-TB medicines procurement requirements by quantity and value for delivery by June 30, 20222

MEDICINES	ORDER DATE DELIVERY DATE ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	SEPTEMBER 30, 2021 JUNE 30, 2022 COST (USD)
Imi/Cls(500/500) injection	2,472	88,992
Amx/Clv(875/125) tablet(s)	186	3,962
Bdq(100) tablet(s)	5,472	2,188,800
Cfz (50) capsule(s)	59	2,921
Cfz(100) capsule(s)	29,674	2,915,174
Cs(125) capsule(s)	302	12,835
Cs(250) capsule(s)	3,774	101,143
Dlm(50) tablet(s)	273	464,100
Lfx(100) tablet(s)	302	27,180
Lfx(250) tablet(s)	56,956	215,294
Lfx(500) tablet(s)	28,478	180,551
Lnz(600) tablet(s)	29,795	4,171,300
PAS 4,000mg sachet	411	15,289
Vit-B6(50) tablet(s)	65,110	45,577
Z(500) tablet(s)	1	22
	Total	10,433,140
	Total with 10% F&L	11,476,454

Figure 4 presents the total procurement requirement value for first- and second-line anti-TB medicines during the quantification period (2019–2022).

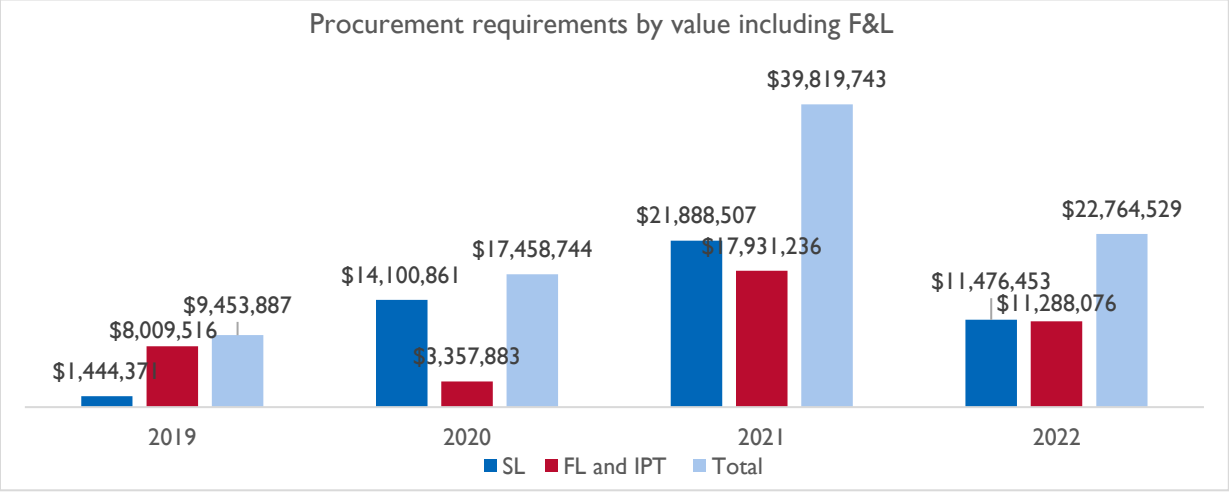

Figure 4: Procurement requirements by value, September 2019–December 2022

PROCUREMENT (SUPPLY PLAN) REQUIREMENTS: SCENARIO 2 (MINIMUM STOCK OF ONE MONTH)

Procurement requirement by quantity and value for the quantification period based on scenario 2 (i.e., at a minimum, one month of stock of each medicine is maintained nationally at any time during the quantification period) is presented below.

Tables 34 and 35 present emergency procurement by quantity and value that should be procured and delivered as soon as possible.

Table 34: First-line and LTBI medicines emergency procurement by quantity and value

	MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
1	H(100) tablet(s)	348,730	449,862
2	H(300) tablet(s)	16,800	227,136
3	R(200mg/5ml)	296,774	178,064
4	Z(250mg/5ml)	174,389	104,633
		Total	959,695
		Total with 10% F&L	1,055,665

Table 35: Second-line anti-TB medicines emergency procurement by quantity and value

	MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
1	E(400) tablet(s)	978	23,570
2	Imi/Cls(500/500) injection	457	16,452
3	Lfx(250) tablet(s)	17,555	66,358
4	Lnz(600) tablet(s)	1,191	166,740
5	Vit-B6(50) tablet(s)	16,192	11,334
		Total	284,454
		Total with 10% F&L	312,899

Tables 36 and 37 present first- and second-line anti-TB medicines procurement requirements that should be delivered by June 30, 2020.

Table 36: First-line and LTBI medicines procurement requirements by quantity and value for delivery by June 30, 2020

		QUANTIFICATION DATE	SEPTEMBER 30, 2019
		DELIVERY DATE	JUNE 30, 2020
MEDICINES		ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
1	H(100) tablet(s)	234,921	303,048
2	H(300) tablet(s)	6,700	90,584
3	R(200mg/5ml)	168,859	101,315
4	Z(250mg/5ml)	93,714	56,228
		Total	551,175
		Total with 10% F&L	606,293

Table 37: Second-line anti-TB medicines procurement requirement by quantity and value for delivery by June 30, 2020

MEDICINES		QUANTIFICATION DATE	SEPTEMBER 30, 2019
		DELIVERY DATE	JUNE 30, 2020
		ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
1	Amx/Clv(875/125) tablet(s)	3	64
2	Cfz(100) capsule(s)	2,951	289,906
3	Cs(125) capsule(s)	2	85
4	Dlm(50) tablet(s)	33	56,100
5	E(400) tablet(s)	1,932	46,561
6	Lfx(100) dispersible tablet(s)	2	180
7	Lfx(250) tablet(s)	27,652	104,525
8	Lfx(500) tablet(s)	1,099	6,968
9	Lnz(600) tablet(s)	328	45,920
10	Vit-B6(50) tablet(s)	34,596	24,217
		Total	574,526
		Total with 10% F&L	631,978

Tables 38 and 39 present first- and second-line anti-TB medicines procurement requirements that should be delivered by Dec 31, 2020.

Table 38: First-line and LTBI medicines procurement requirement by quantity and value for delivery by December 31, 2020

MEDICINES	ORDER DATE	MARCH 31, 2020
	DELIVERY DATE	DECEMBER 31, 2020
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	34,355	730,044
H(100) tablet(s)	243,124	313,630
H(300) tablet(s)	3,388	45,806
2-FDC RH (75/50) tablet(s)	41,162	115,254
3-FDC RHZ (75/50/150) tablet(s)	40,898	139,053
Z(250mg/5ml)	6,952	4,171
	Total	1,347,958
	Total with 10% F&L	1,482,754

Table 39: Second-line anti-TB medicines procurement requirement by quantity and value for delivery by December 31, 2020

	ORDER DATE	MARCH 31, 2020
	DELIVERY DATE	DECEMBER 31, 2020
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Cm(1,000) injection	1	23
Imi/Cls(500/500) injection	1,814	65,304
Km(1,000) injection	1	46
Amx/Clv(875/125) tablet(s)	160	3,408
Bdq(100) tablet(s)	2,243	897,200
Cfz(100) capsule(s)	18,423	1,809,876
Cs(125) capsule(s)	214	9,095
Cs(250) capsule(s)	897	24,040
Dlm(50) tablet(s)	233	396,100
E(400) tablet(s)	146	3,519
Lfx(100) tablet(s)	214	19,260
Lfx(250) tablet(s)	34,939	132,069
Lfx(500) tablet(s)	17,470	110,760
Lnz(600) tablet(s)	18,312	2,563,680
PAS 4,000mg sachet	131	4,873
Pto(250) tablet(s)	1	16
R(200mg/5ml)	63,570	38,142
Vit-B6(50) tablet(s)	40,582	28,407
	Total	6,105,818
	Total with 10% F&L	6,716,4000

Tables 40 and 41 present first- and second-line anti-TB medicines procurement requirements that should be delivered by June 30, 2021.

Table 40: First-line and LTBI medicines procurement requirement by quantity and value for delivery by June 30, 2021

	ORDER DATE	SEPTEMBER 30, 2020
	DELIVERY DATE	JUNE 30, 2021
MEDICINES	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	37,343	793,539
H(100) tablet(s)	255,837	330,030
H(300) tablet(s)	3,051	41,250
2-FDC RH (150/75) tablet(s)	82,192	2,268,499
2-FDC RH (75/50) tablet(s)	89,184	249,715

MEDICINES	ORDER DATE	SEPTEMBER 30, 2020
	DELIVERY DATE	JUNE 30, 2021
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
3-FDC RHZ (75/50/150) tablet(s)	44,457	151,154
4-FDC RHZE (150/75/400/275) tablet(s)	106,861	1,389,193
	Total	5,223,380
	Total with 10% F&L	5,745,718

Table 41: Second-line anti-TB medicines procurement requirement by quantity and value for delivery by June 30, 2021

MEDICINES	ORDER DATE	SEPTEMBER 30, 2020
	DELIVERY DATE	JUNE 30, 2021
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Imi/Cls(500/500) injection	2,333	83,988
Amx/Clv(875/125) tablet(s)	175	3,728
Bdq(100) tablet(s)	5,117	2,046,800
Cfz (50) capsule(s)	46	2,277
Cfz(100) capsule(s)	23,889	2,346,855
Cs(125) capsule(s)	258	10,965
Cs(250) capsule(s)	3,115	83,482
Dlm(50) tablet(s)	243	413,100
Lfx(100) tablet(s)	258	23,220
Lfx(250) tablet(s)	45,818	173,192
Lfx(500) tablet(s)	22,909	145,243
Lnz(600) tablet(s)	24,002	3,360,280
PAS 4,000mg sachet	389	14,471
Vit-B6(50) tablet(s)	52,566	36,796
	Total	8,744,397
	Total with 10% F&L	9,618,837

Tables 42 and 43 present first- and second-line anti-TB medicines procurement requirements that should be delivered by Dec 31, 2021.

Table 42: First-line and LTBI medicines procurement requirement by quantity and value for delivery by December 31, 2021

MEDICINES	ORDER DATE	MARCH 31, 2021
	DELIVERY DATE	DECEMBER 31, 2021
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	40,537	861,411
H(100) tablet(s)	259,413	334,643
H(300) tablet(s)	3,039	41,087
2-FDC RH (150/75) tablet(s)	206,096	5,688,250
2-FDC RH (75/50) tablet(s)	92,210	258,188
3-FDC RHZ (75/50/150) tablet(s)	48,259	164,081
4-FDC RHZE (150/75/400/275) tablet(s)	207,178	2,693,314
	Total	10,040,974
	Total with 10% F&L	11,045,071

Table 43: Second-line anti-TB medicines procurement requirement by quantity and value for delivery by December 31, 2021

MEDICINES	ORDER DATE	MARCH 31, 2021
	DELIVERY DATE	DECEMBER 31, 2021
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Imi/Cls(500/500) injection	2,422	87,192
Amx/Clv(875/125) tablet(s)	182	3,877
Bdq(100) tablet(s)	5,582	2,232,800
Cfz (50) capsule(s)	59	2,921
Cfz(100) capsule(s)	26,928	2,645,407
Cs(125) capsule(s)	273	11,603
Cs(250) capsule(s)	3,439	92,165
Dlm(50) tablet(s)	258	438,600
Lfx(100) tablet(s)	273	24,570
Lfx(250) tablet(s)	51,686	195,373
Lfx(500) tablet(s)	25,843	163,845
Lnz(600) tablet(s)	27,048	3,786,720
PAS 4,000mg sachet	403	14,992
Vit-B6(50) tablet(s)	59,108	41,376
	Total	9,741,441
	Total with 10% F&L	10,715,585

Tables 44 and 45 present first- and second-line anti-TB medicines procurement requirements that should be delivered by June 30, 2022.

Table 44: First-line and LTBI medicines procurement requirement by quantity and value for delivery by June 30, 2022

MEDICINES	ORDER DATE	SEPTEMBER 30, 2021
	DELIVERY DATE	JUNE 30, 2022
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
E(100) tablet(s)	41,049	872,291
H(100) tablet(s)	269,309	347,409
H(300) tablet(s)	3,117	42,142
2-FDC RH (150/75) tablet(s)	209,106	5,771,326
2-FDC RH (75/50) tablet(s)	98,032	274,490
3-FDC RHZ (75/50/150) tablet(s)	48,867	166,148
4-FDC RHZE (150/75/400/275) tablet(s)	208,486	2,710,318
	Total	10,184,124
	Total with 10% F&L	11,202,536

Table 45: Second-line anti-TB medicines procurement requirement by quantity and value for delivery by June 30, 2022

MEDICINES	ORDER DATE	SEPTEMBER 30, 2021
	DELIVERY DATE	JUNE 30, 2022
	ADJUSTED QUANTITY TO ORDER ROUNDED UP TO PACK SIZE	COST (USD)
Imi/Cls(500/500) injection	2,567	92,412
Amx/Clv(875/125) tablet(s)	192	4,090
Bdq(100) tablet(s)	5,756	2,302,400
Cfz (50) capsule(s)	62	3,069
Cfz(100) capsule(s)	28,922	2,841,297
Cs(125) capsule(s)	293	12,453
Cs(250) capsule(s)	3,691	98,919
Dlm(50) tablet(s)	273	464,100
Lfx(100) tablet(s)	293	26,370
Lfx(250) tablet(s)	55,512	209,835
Lfx(500) tablet(s)	27,755	175,967
Lnz(600) tablet(s)	29,048	4,066,720
PAS 4,000mg sachet	428	15,922
Vit-B6(50) tablet(s)	63,478	44,435
Z(500) tablet(s)	1	22
	Total	10,358,011
	Total with 10% F&L	11,393,812

Figure 5 shows the summary procurement value for first- and second-line anti-TB medicines, including LTBI, for the quantification period

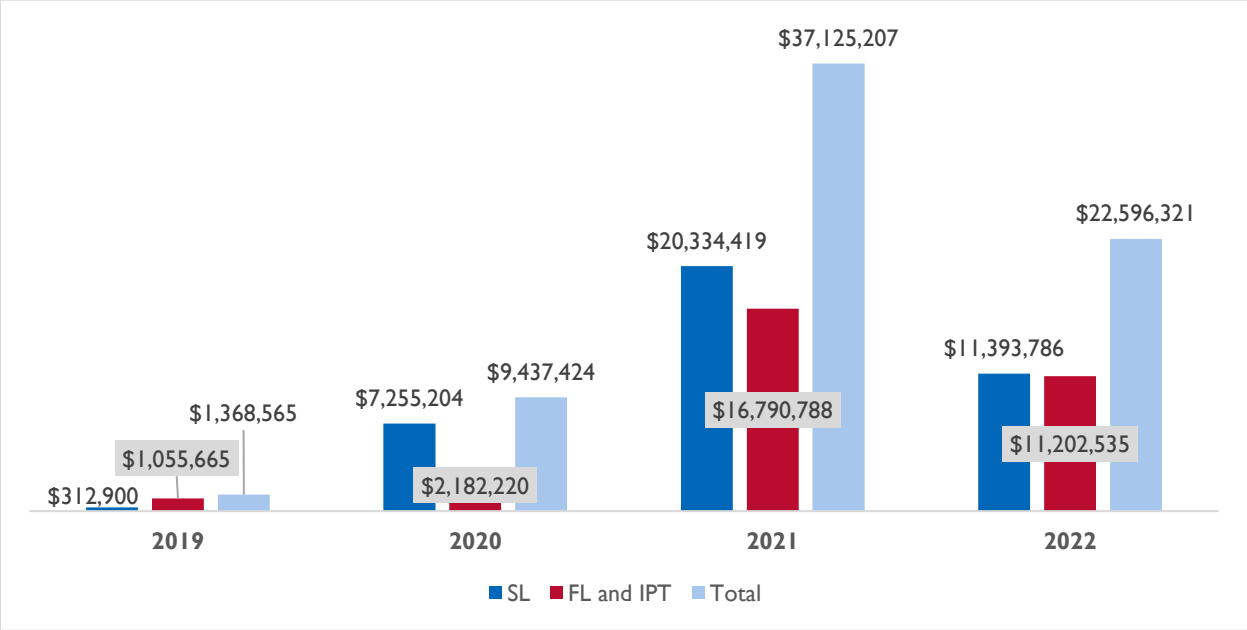

Figure 5: Procurement requirements by value from September 2019 to December 2022 for scenario 2

QUANTIFICATION RESULTS FOR GENEXPERT MACHINES

PROCUREMENT (SUPPLY PLAN) REQUIREMENTS

Table 46 provides procurement requirements for GeneXpert machines by quantity and value for the quantification period for the two scenarios.

- Scenario 1: 93% of the test targets are achieved with additional machines in 2020.
- Scenario 2: 80% of the test targets are achieved with additional machines in 2020.

In both scenarios, 100% of the testing targets are assumed to be achieved starting in January 2021. Note that the total sum of machines required for the three-year period remains the same for both scenarios.

It is also worth noting that the additional machines required for each year of the quantification period should be delivered and installed at service delivery points at the end of the previous year. For this to happen, the procurement has to be done in the previous year. For example, in the first scenario, 318 new machines are required at the beginning of 2020. Therefore, procurement has to be done in 2019, and the machines have to be functional by January 1, 2020.

Table 46: GeneXpert Machines procurement requirement by quantity and value

		SCENARIO 1		SCENARIO 2		COST (PHP) WITH 10% F&L	
YEAR	UNIT COST (PHP)	QUANTITY	COST (PHP)	QUANTITY	COST (PHP)	SCENARIO 1	SCENARIO 2
2020	2,188,524	318	695,950,632	199	435,516,276	765,545,695	479,067,904

YEAR	UNIT COST (PHP)	SCENARIO 1		SCENARIO 2		COST (PHP) WITH 10% F&L	
		QUANTITY	COST (PHP)	QUANTITY	COST (PHP)	SCENARIO 1	SCENARIO 2
2021	2,188,524	0	0	119	260,434,356	0	286,477,792
2022	2,188,524	60	131,311,440	60	131,311,440	144,442,584	144,442,584
Total (PHP)		378	827,262,072	378	827,262,072	909,988,279	909,988,279
Total (USD)			15,608,718		15,608,718	17,169,590	17,169,590

**1 USD = 53 PHP*

SUMMARY OF FUND REQUIREMENTS FOR MEDICINES AND GENEXPERT MACHINES—SCENARIO 1

Table 47 provides a summary of procurement requirements for scenario 1 by value for each year. In this summary, the procurement requirement for GeneXpert machines has been shifted to the year in which procurement should be conducted. Second-line anti-TB medicines account for 46% of the total procurement requirements by value; this is mainly due to high price of second-line anti-TB medicines compared to first line. The strategy in intensifying case finding, treating DS-TB, and enhancing adherence will help to not only achieve the target set by the DOH but also reduce the cost that would incur from treating DR-TB cases.

Table 47: Summary of procurement requirements by value – scenario 1

PRODUCT CATEGORY	2019	2020	2021	2022	TOTAL	%
Second-line anti-TB medicines	$1,444,371	$14,100,861	$21,888,507	$11,476,453	$48,910,192	46%
First-line anti-TB and LTBI medicines	$8,009,516	$3,357,883	$17,931,236	$11,288,076	$40,586,711	38%
GeneXpert machines	$14,444,258	$0	$2,725,332	$0	$17,169,590	16%
Total	$23,898,145	$17,458,744	$42,545,075	$22,764,529	$106,666,493	100%

SUMMARY OF FUNDING REQUIREMENTS FOR MEDICINES AND GENEXPERT MACHINES—SCENARIO 2

Table 48 provides a summary of procurement requirements for scenario 2 by value for each year. In this summary, it is worth noting that the procurement requirement for GeneXpert machines has been shifted to the year in which procurement should be conducted. As in scenario 1, second-line anti-TB medicines account for a high proportion (45%) of the total procurement requirement by value throughout the quantification period. The reason and the strategy mentioned in scenario 1 applies in scenario 2 as well.

Table 48: Summary of procurement requirements by value – scenario 2

PRODUCT CATEGORY	2019	2020	2021	2022	TOTAL	%
Second-line anti-TB medicines	$312,900	$7,255,204	$20,334,419	$11,393,786	$39,296,309	45%
First-line anti-TB and LTBI medicines	$1,055,665	$2,182,220	$16,790,788	$11,202,535	$31,231,208	36%
GeneXpert machines	$9,039,017	$5,405,241	$2,725,332	$0	$17,169,590	19%
Total	$10,407,582	$14,842,665	$39,850,539	$22,596,321	$87,697,107	100%

FUNDING GAP ANALYSIS

A funding gap analysis (comparison of the available budget with total procurement requirements by year) for second-line anti-TB medicines shows a total funding gap of approximately USD 2.47 million for scenario 1 (minimum stock level of six months at any given time) for 2019 and 2020. A similar analysis for scenario 2 (minimum stock of one month) has resulted in a funding surplus of approximately USD 5.5 million for the same period. This does not necessarily mean that the country would not have any funding gap for anti-TB commodities as maintaining a one-month minimum of stock is not recommended and will most likely cause stock-outs in the country. Information regarding availability of funding for first-line anti-TB medicines and GeneXpert machines for the same period was not available. Tables 49 and 50 provide details.

Table 49: Funding gap analysis of second-line anti-TB medicines, 2019 and 2020 – scenario 1

PRODUCT CATEGORY	YEAR		TOTAL TOTAL
	2019	2020	
Total requirement for second-line anti-TB medicines	$1,444,371	$14,100,861	$15,545,231
Available budget for second-line anti-TB medicines	$834,533	$12,236,765	$13,071,298
Funding gap	($609,838)	($1,864,096)	($2,473,933)

Table 50: Funding gap analysis of second-line anti-TB medicines, 2019 and 2020 – scenario 2

PRODUCT CATEGORY	YEAR		TOTAL
	2019	2020	
Total requirement for second-line anti-TB medicines	$312,900	$7,255,204	$7,568,103
Available budget for second-line anti-TB medicines	$834,533	$12,236,765	$13,071,298
Funding gap	$521,633	$4,981,561	$5,503,195

STOCK STATUS AND POSSIBLE EXPIRY

STOCK STATUS

Considering the data and assumptions used for quantification, including total enrolled cases, total expected cases, available stock, and outstanding shipments, the stock status of each medicine from the inventory date (June 30, 2019) to the quantification end date (December 2022) is presented in a color-coded dashboard (figure 6) as follow:

- Green: The available usable stock as of June 30, 2019, and how long (in months) it takes to be completely used
- Yellow: Outstanding shipment to be received after June 30, 2019, and how long (in months) it can be used
- Red: The period in which products will be stocked-out while there is expected consumption in the same period
- Gray: The period in which there is no expected consumption of the product

Stock-outs of first-line pediatric anti-TB medicines—Rifampicin (R) 200mg/5ml syrup and Pyrazinamide (Z)250mg/5ml syrup—were reported without pending order. Immediate emergency procurement is recommended to bring enough stock into the system.

When it comes to second-line anti-TB medicines, no stock-outs were reported as of June 30, 2019; however, Imipenem/Cilastatin (Imi/Cls)500/500mg injection was expected to be stocked-out by the end of July 2019 and Linezolid (Lnz)600mg tab by the end of September 2019. The pending orders of these two products need to be expedited to avoid stock-outs. Alternatively, emergency orders could be placed and delivered to resolve the problem. Tables 20 and 21 list and show the quantity of first- and second-line anti-TB medicines for emergency procurement, respectively.

POSSIBLE EXPIRY

Considering the data and assumptions used for quantification, including outstanding shipments and available stock, the quantification showed that there are products likely to expire before use. Table 51 shows individual products with their values that likely to expire between 2019 and 2023. To avoid wastage due to expiry, various options are recommended for each product. While most of the expiries are due to guideline changes, it is recommended that in the future supply chain systems be reviewed and analyzed before making policy changes such as treatment protocols.

Figure 6: Stock status of anti-TB medicines as of June 30, 2019

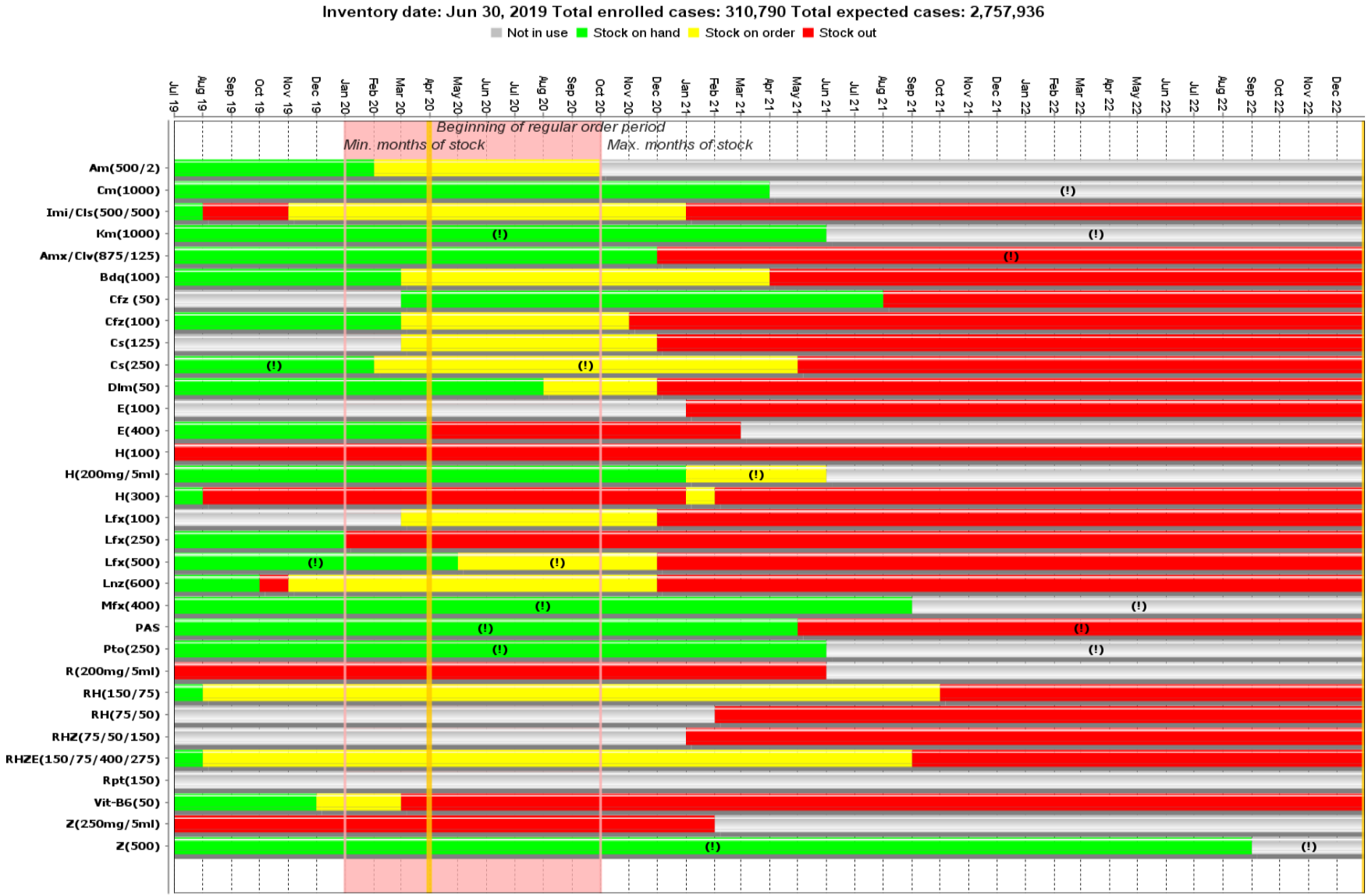

Table 51: Anti-TB medicines likely to expire and corresponding value

PRODUCT	2019	2020	2021	2022	2023	TOTAL	NOTES
Km 1,000mg inj. vial	$334,938	$32,447	$598,442			$965,827	Consider sharing with other countries
Mfx 400mg tabs			$309,601		$313,200	$622,801	No more use of Mfx after Feb 2021; consider cancelling the pending order of 1,080,000 tabs (GF)
Pto 250mg tabs		$206,773	$232,748			$439,521	Consider sharing with other countries
PAS 4,000mg sachet		$201,956	$76,703			$278,659	Consider sharing with other countries
Am 500mg/2ml inj.					$272,921	$272,921	This will not expire within the quantification period but its use will end by October 2020. The remaining stock after October 2020 could be shared with other countries.
H 200mg/5ml		$145,732			$121,572	$267,304	Unknown but will expire after Dec 2022; consider cancelling the pending order (29,400,000) or using for LTBI (DOH)
Cm 1,000mg inj.			$166,490			$166,490	Consider sharing with other countries
Lfx 500mg tabs	$7,406	$56,926				$64,332	Consider using in place of Lfx 250mg or sharing with other countries
Z 500mg tabs				$57,631		$57,631	Consider sharing with other countries
Cs 250mg caps		$28,898				$28,898	Consider sharing with other countries
Amx + Clacv 875mg+125mg tabs		$1,942				$1,942	Consider sharing with other programs
Total	$342,344	$674,674	$1,383,984	$57,631	$707,693	$3,166,326	

A significant proportion of expiry is attributed to Kanamycin 1000mg inj., which comprised 30.5% of all expiries during the quantification period, followed by Moxifloxacin (Mfx)400mg (19.67%) and Protionamide (Pto)250mg (13.88%). Therefore, implementing options recommended in table 50 would save resources before they expire. Figure 7 shows the proportion of various anti-TB medicines that will likely expire during the quantification period.

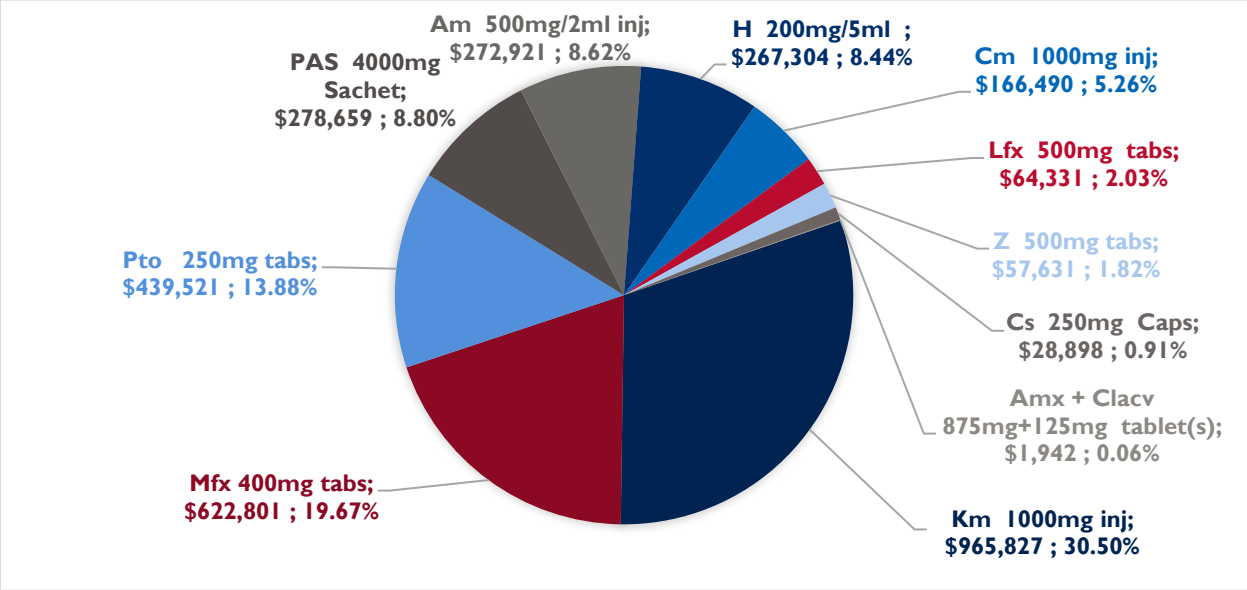

Figure 7: Anti-TB medicines likely to expire between 2019 and 2023 and comparisons by value

CHALLENGES AND RECOMMENDATIONS

Major challenges highlighted during the quantification exercises include:

- Contract terms, such as delivery dates, that are not strictly implemented
- Delivery dates of some products that are not clearly known
- Long lead times for planning, procurement, delivery, and product testing processes by FDA
- Inadequate and nonstandard reporting systems, including inconsistent data point description (e.g., lack of dates of reports, missing expiry dates, pack sizes or unit of measure, incomplete product description)
- Poor PMIS data quality, such as inaccuracy, poor reporting rate, and incompleteness
- Lack of provincial/city-level procurement and stock data
- Limited quantification capacity and coordination
- Inadequate implementation of program targets (PhilSTEP-1), which affects forecast and procurement
- Lack of weight and age breakdown, especially for pediatrics (lack of clarity on the percentage of pediatric patients taking adult formulations)
- Local government unit procurement data and fund allocation are not available
- Changing treatment guidelines without considering available stock, resulting in possible wastage
- Quantification system for first-line anti-TB medicines is weak compared to second line (e.g., QuanTB is not used to quantify first-line anti-TB medicines).
- Lack of clear information on public- vs private-sector contribution (mandatory notification doesn't necessarily mean treatment)
- Limited availability/utilization of funding
- Limited quantification capacity

Recommendations to address these challenges include:

- Standardizing and streamlining the information system for both first- and second-line anti-TB medicines
- Continuously reviewing program targets and service coverage (performance) and adjusting procurement quantities accordingly (regular supply planning)
- Optimizing process calendars to reduce lead time

- Standardizing and implementing procurement (shipment) data reporting from one source, preferably PS, with full description such as full product name, unit of measure, price, quantity, expected delivery date with optional expiry date, and supplier's name
- Utilizing QuanTB as a forecast and supply planning tool for both first- and second-line medicines
- Coordinating planning with supply chain when treatment guidelines and protocols are proposed to be revised/changed
- Building the capacity and institutionalizing quantification systems for all health commodities
- Conducting routine data analysis, quality audit, and data dissemination
- Using one month of stock as the minimum (buffer) stock is too risky—use six months instead
- Facilitating the emergency procurement as soon as possible so that those products can be delivered before end of 2019