USAID MEDICINES, TECHNOLOGIES, AND PHARMACEUTICAL SERVICES (MTaPS) PROGRAM

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COSTING PHARMACEUTICAL BENEFITS PACKAGES IN ASIAN COUNTRIES

Part 1: Review of existing tools for estimating financial outlays for a defined pharmaceutical benefits package

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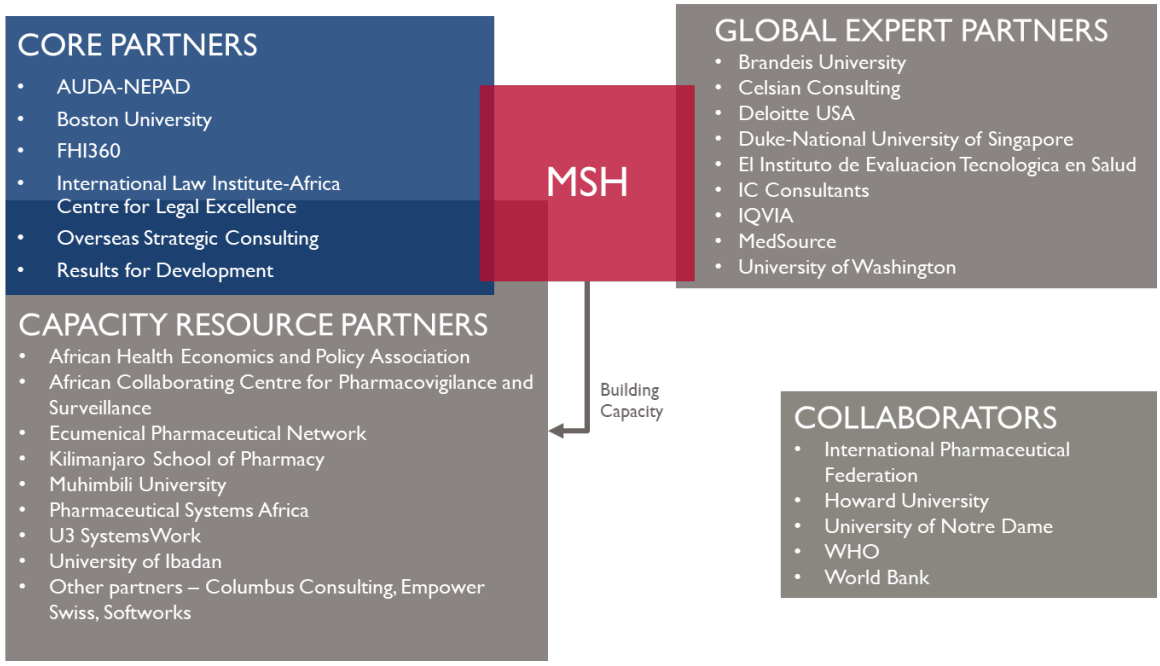
About the USAID MTaPS Program

The USAID Medicines, Technologies, and Pharmaceutical Services (MTaPS) Program enables low- and middle-income countries to strengthen their pharmaceutical systems, which is pivotal to higher-performing health systems. MTaPS focuses on improving access to essential medical products and related services and on the appropriate use of medicines to ensure better health outcomes for all populations. The program brings expertise honed over decades of seminal pharmaceutical systems experience across more than 40 countries. The MTaPS approach builds sustainable gains in countries by including all actors in health care—government, civil society, the private sector, and academia. The program is implemented by a consortium of global and local partners and led by Management Sciences for Health (MSH), a global health nonprofit.

The MTaPS Consortium



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PROJECT SUMMARY

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	Global Expert Partners	Brandeis University, Deloitte USA, Duke-National University of Singapore, El Instituto de Evaluacion Technologica en Salud, IC Consultants, Imperial Health Sciences, MedSource, QuintilesIMS, University of Washington
	Capacity Resource Partners	African Health Economics and Policy Association, Ecumenical Pharmaceutical Network, U3 SystemsWork, University of Ibadan, University of Ghana's World Health Organizations (WHO) Pharmacovigilance Collaborating Center, Kilimanjaro School of Pharmacy, Muhimbili University, Pharmaceutical Systems Africa
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Acronyms and Abbreviations

ABCE	access, bottlenecks, costs, and equity
CAH	Child and Adolescent Health Tool
CHCET	Child Health Cost Estimation Tool
cMYP	Comprehensive Multi-Year Plan Costing and Financing Tool
CORE Plus	Cost Revenue Analysis Tool Plus
CPR	contraceptive prevalence rate
DMPPT	Decision Makers Program Planning Tool
DRG	diagnostic-related group
ECD	early childhood development
FP	family planning
GAP	gather, analyze, plan
HFG	Health, Finance, and Governance Project
IAWG	Inter-Agency Working Group
iCCM	integrated community case management
LiST	Lives Saved Tool
LMIC	low- and middle-income country
MBB	marginal budgeting for bottlenecks
MDG	Millennium Development Goal
MNCH	maternal, newborn, and child health
MOH	Ministry of Health
MPS-iHTP	making pregnancy safer-integrated health technology package
MSH	Management Sciences for Health
MTaPS	Medicines, Technologies, and Pharmaceutical Services
OHT	One Health Tool
PCBF	Planning, Costing, and Budgeting Framework
PMTCT	prevention of mother-to-child transmission
RH	reproductive health
RMNCH	reproductive, maternal, neonatal, and child health
RNM	resource needs model

SECT	Standardized ECD Costing Tool
TB	tuberculosis
TIPAC	Tool for Integrated Planning and Costing
UHC	universal health coverage
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	US Agency for International Development
WHO	World Health Organization

Contents

Background 7

Purpose of the Report 7

Defining Pharmaceutical Benefits Packages 8

Methods 8

Findings 10

Analysis: Guidance and Tools for Costing Pharmaceutical Benefits Packages 19

Conclusion and Recommendations 21

References 22

Bibliography 23

1. Background

All countries, regardless of development status, face challenges regarding the allocation of limited resources to achieve universal health coverage (UHC). This challenge is especially pressing for low- and middle-income countries (LMICs) as they transition from reliance on external donors to domestic funding. For countries in the Asian region to improve access to medicines, move toward self-reliance, and ultimately meet their UHC objectives (equitable access to quality health services and protection from financial risk), countries must place a greater emphasis on transparency, governance, evidence-based decision-making, and local capacity to improve resource allocation and efficiencies in the system.

Pharmaceutical systems, a sub-system of the broader health system, encompass a set of interdependent, multi-step activities that involve numerous stakeholders. A pharmaceutical system consists of all structures, people, resources, processes, and their interactions within the broader health system that aim to ensure equitable and timely access to safe, effective, quality pharmaceutical products and related services that promote appropriate and cost-effective use to improve health outcomes [1]. This complexity, coupled with the large amounts of money involved, makes them susceptible to mismanagement and corruption. Poor governance in the pharmaceutical sector and weak regulatory capacity and processes can diminish access to pharmaceutical products, drive up medicine prices, and waste scarce resources. Additionally, these weaknesses can harm individuals, for example, by allowing substandard or falsified products to enter markets. Similarly, inadequate monitoring of new medicines can result in missing critical evidence on adverse events among patients.

Countries without evidence-informed systems for setting health coverage priorities are at greater risk of poorly allocating resources, such as developing broad and ill-defined benefit packages, procurement of unsafe or unnecessary medical technologies and medicines, or incentivizing providers to use high-cost technology and medicines without proven health benefits. These factors can all contribute to higher health care costs.

Finally, in many health systems, pharmaceutical spending is growing faster than other types of health spending (human resources, health information system costs, etc.) [2]. This further highlights the need to purchase health commodities based on their value in improving overall health outcomes relative to their price, instead of solely looking at the price. Taking a value-based approach to pharmaceutical purchasing would help countries slow health spending escalation without sacrificing access to safe and reliable medicines.

2. Purpose Of The Report

This report aims to review and compare existing tools (in use in Asian countries and elsewhere) to forecast total spending on pharmaceutical benefits coverage. The tools reviewed can support efforts to conduct actuarial studies with detailed costing, project health benefit-package costs, and build coverage scenarios, especially in LMICs in the region. We evaluate whether there is value in consolidating and/or modifying existing or forthcoming tools for the Asia region and identify which tool is best suited for pharmaceutical benefit package costing efforts.

This report seeks to remedy that gap, keeping in mind that the overall goal of such an analysis is to inform decision making to promote access to quality essential health care services, financial risk protection, and access to safe, effective, quality, and affordable essential medicines.

3. Defining Pharmaceutical Benefits Packages

Forecasting total spending on a pharmaceutical benefits package—hereafter referred to as "costing" a pharmaceutical benefits package—is fundamental to understanding how much public and/or private payers will spend on a given pharmaceutical coverage scenario, given a series of assumptions on disease incidence; health care utilization and cost-sharing among eligible populations; variation in pricing for different treatments; and expected adherence by providers to standard treatment guidelines. Costing can also help policy makers understand how much health spending is expected to change under a variety of scenarios for new or revised pharmaceutical coverage schemes.

A pharmaceutical benefits package has been defined as an explicit list of medicines and related commodities selected for the treatment of an explicit list of health interventions for eligible beneficiaries; these medicines and commodities are eligible for prescribing, dispensing, and reimbursement and can be paid for by the pooled funds of the health system [3]. It is usually a subset of the broader health benefits package. Defining and managing a pharmaceutical benefits package is important for maximizing efficiency, effectiveness, and oversight of pharmaceutical programs. It entails:

- Selecting optimal lists of medicines
- Provider engagement at the moment of care
- Promoting operational efficiency
- Containing costs, initially by costing the package and subsequently by monitoring costs to ensure alignment and containment, and adjusting the package to include innovative or remove less optimal medicines
- Regularly reviewing financial soundness and sustainability
- Tracking improvements in patient outcomes [3]

4. Methods

We conducted a literature review to identify and review existing tools to forecast total spending on pharmaceutical benefits coverage. First, we searched for examples of impact evaluations and systematic reviews on interventions or activities that aimed to forecast total spending for pharmaceutical benefits coverage. Examples of costing tools, processes, and methodologies that have been well researched and trialed to assess their suitability or performance were found. We also used search terms for donors and organizations that supported costing tool development since this could illuminate the primary reason for developing costing tools. For example, a tool mainly developed by UNFPA would likely be focused on family planning (FP) interventions; a tool developed by UNICEF, such as marginal budgeting for bottlenecks (MBBs), would likely be focused on maternal, newborn, and child health (MNCH) interventions. We included key words for donors that supported the costing process. For instance, applying a keyword like "funding" or a specific donor (e.g., WHO, UNFPA, UNICEF, or World Bank) provided additional information to classify our studies.

Second, we conducted a literature search of published country-costing studies to understand the rationale for countries' use of selected tools. We searched in databases, such as PubMed, Hinari, Health Systems Evidence, Google scholar, etc., using keywords, such as costing, interventions costing,

interventions cost, interventions budgeting, and pharmaceutical package. All relevant items identified through the database search were exported to EPPI-Reviewer 4, a review management software, and then manually screened for suitability. Upon screening against the selection criteria (see the end of this section for selection criteria), a record of all decisions taken (include/exclude/ unsure, using the EPPI reviewer coding process) was kept in EPPI-Reviewer and MS Word, as appropriate. The literature review also provided costing examples relevant to pharmaceutical-benefit package-costing conducted by some countries in Asia. To select the most appropriate costing tool for pharmaceutical benefits packages, we reviewed country costing studies to understand the rationale for using the selected tools. We also reviewed existing costing tools to identify the most suitable ones for pharmaceutical benefits package costing.

Using costing as a keyword yielded many studies (n = 4,618). Most of them were excluded because of duplication or lack of relevance. Adding additional criteria, such as budgeting and costing tools, narrowed the number of documents (n = 837). Language, tool relevancy, non-health related topics, and health intervention type were used to further reduce the number of costing studies (n = 370). Some studies were not free to download or difficult to retrieve (country documents), which led to further reductions (n = 120). After screening the abstracts and full text, we excluded additional documents in EPPI reviewer software (n = 90). At this stage, we manually searched additional costing reports and added 15 costing studies (n = 105). We finally included 69 reports after additional full text screening, and, because some of them were difficult to download (n = 11), a final 58 full documents on costing methodologies were reviewed (figure 1).

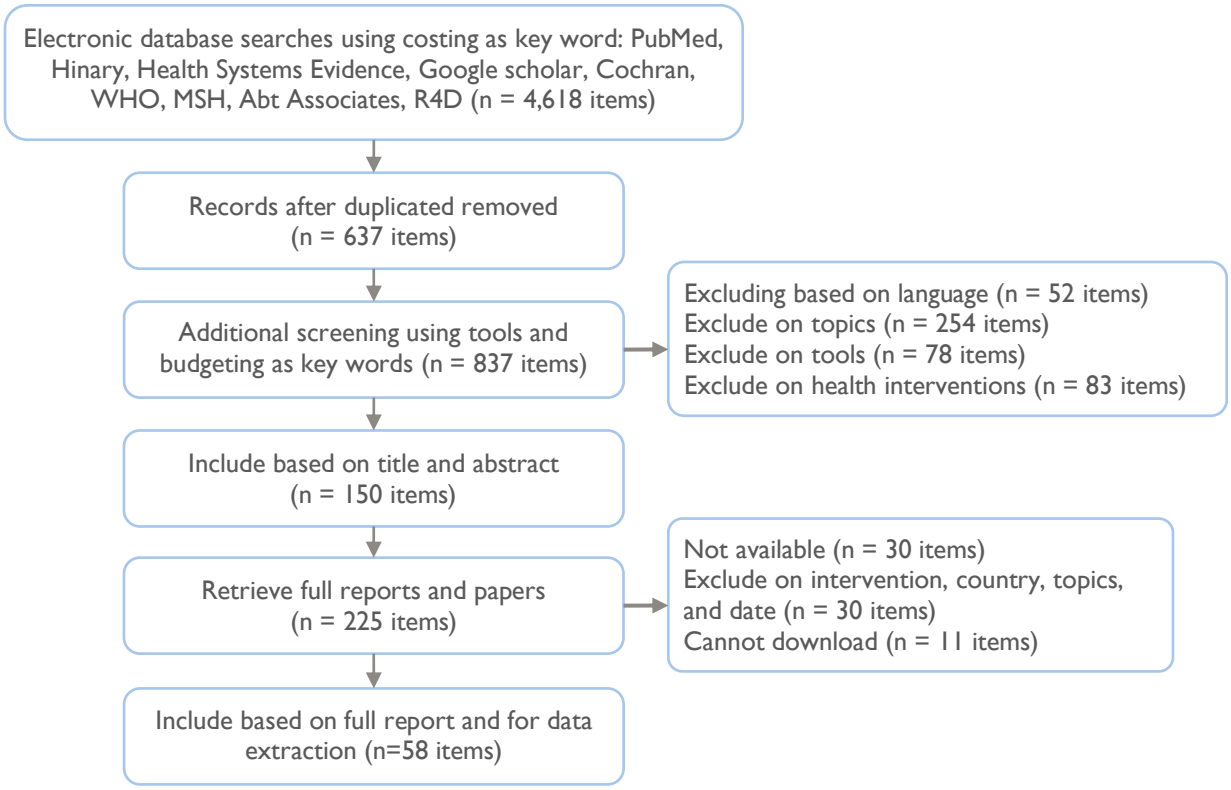

Figure 1. Flow chart diagram of search results and identification of studies, policy briefs, and reports

Finally, we sent emails to global costing experts identified through a WHO costing workshop to identify any other existing costing methodologies and tools. Responses were consistent with tools and costing

methodology suggestions that had been retrieved through our review approach above. The latest WHO costing workshop took place in Geneva December 3-5, 2019.

Identified tools were then examined against a set of criteria:

- **A: Electronic/software-based:** Is the tool software-based, with flexibility for user to customize some modules?
- **B: Treatment guidelines:** Does the tool address diseases with default treatment guidelines with flexibility for customizing treatment guidelines?
- **C: Modular:** Is the tool modular, allowing flexibility for disease-specific pharmaceutical package costing?
- **D: Pharmaceutical package and forecasting:** Is the tool able to build a pharmaceutical package for each disease and forecast drug quantities and cost?
- **E: Multiple programs/diseases:** Does the tool allow a multiple disease configuration to support countries' benefit package lists?
- **F: Established:** Has the tool been recommended by experts? Has it been used multiple times by countries (implying lesser need for capacity building)?
- **G: Projections:** Could the tool be used for pharmaceutical data costing and projections over multiple years?

5. FINDINGS

Through the literature review, we found that there are currently no systematic or literature reviews that explicitly define a preferred approach to costing pharmaceutical benefits packages or that detail how such estimations could be used to support UHC policy discussions. So far, no rigorous synthesis has been prepared on how to approach pharmaceutical benefit costing as part of a more comprehensive health benefits-package costing effort. However, there are various costing tools. Table 1 below summarizes the range of costing tools identified through this literature review. Table 2 summarizes examples of how countries have used various tools in their costing studies according to tool, costing domain, and interventions suitable for each tool. The lists summarize the key tools used for costing health interventions.

Table 1. Summary of available costing tools and their suitability to costing pharmaceutical benefits packages

Tools	Summary description	A	B	C	D	E	F	G
Access, bottlenecks, costs, and equity (ABCE)	Initiated in 2011 [4], ABCE aims to collect and generate the evidence base for improving the cost-effectiveness and equity of health systems. ABCE focuses on health system service delivery and four components that contribute to the optimal delivery of health services: Access: Factors that improve or hinder contact with health facilities Bottlenecks: Supply-side limitations that can prevent receipt of proper care upon arriving at a health facility	x		x			x	

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	Costs: Range of financial measures across levels of the health system, from what a patient pays for care to what facilities pay to provide services Equity: Ways in which factors affect access to and use of health services for different populations in different places							
Adding it Up	Published in 2003 [5], Adding it Up is useful for general advocacy, but not for undertaking country-specific analysis. It is a tool for costs and benefits of meeting the contraceptive needs of adolescents in developing countries for: Improving adolescents' sexual and reproductive health (RH), including preventing unintended pregnancy, which is essential to their social and economic well-being Complications of pregnancy and childbirth that continue to lead to preventable deaths and ill-health among 15-19-year-old women in developing countries Adolescent childbearing, which is associated with lower educational attainment among mothers and can perpetuate a cycle of poverty from one generation to the next	x		x			x	
AIM, Goals	The Goals manual was published in August 2011 [6], the AIM manual in March 2009 [7]. Both tools determine the effect of resource allocation on achieving HIV/AIDS goals. The Goals model supports strategic planning at the national level by linking program goals and funding. The model can help answer key questions, such as: How much funding is required to achieve the goals of the strategic plan? What goals can be achieved with the available resources? What is the effect of alternate patterns of resource allocation on achieving program goals?	x		x			x	x
CastCost	CastCost manual was published in December 2010 [8]. CastCost is a series of linked Excel spreadsheets. In addition to the manual, instructions are embedded in the spreadsheet. CastCost produces detailed reports for program, policy, and logistics staff and a summary report for policy makers. It also provides graphs of past trends in contraceptive use for each method to help estimate future prevalence. It's useful for assessing resource needs/costs associated with commodities. It does not assess human resource needs or impacts.			x				x
Child Health Cost Estimation Tool (CHCET)/Child and Adolescent Health (CAH) Costing Tool	The tools were created in Senegal in 2008 [9]. CHCET is intended to cost the child health component of the MNCH package. CHCET estimates the resources needed to scale up proven health interventions to counter morbidity and mortality in children under 5. The CAH Tool was developed by the WHO Department of Child and Adolescent Health in partnership with the WHO Department of Health Systems Financing. The approach for costing is bottom-up (ingredients-based) estimates, using WHO standard methodology. The tool is intended for use by national-level child health program staff and other.			x			x	x
Comprehensive Multi-Year Plan Costing and Financing Tool (cMYP)	Estimate past and future costs and financing for immunization and analyze financing gaps and sustainability. cMYP was originally developed by WHO and UNICEF in 2005. In 2011 and 2012, a series of consultations were held with stakeholders to revise the tool [10].			x			x	x
Contraceptive Financial Sustainability Tool	The Contraceptive Financial Sustainability Tool gives countries the ability to examine the impact different modes of financing might have on each sector and to select the best options for the country program, making it extremely useful for planning purposes. The tool is useful for identifying funding gaps. It does not assess impacts (other than changes to the contraceptive prevalence rate [CPR]). The revised version of the tool was published in October 2011 [11].			x			x	x
Cost Revenue Analysis Tool Plus (CORE Plus)	MSH developed the original CORE tool in the mid-1990s in Zimbabwe and Guatemala. CORE Plus was adapted from CORE in the late 1990s in South Africa. CORE Plus is a spreadsheet-based tool that can determine projected and actual costs of integrated primary health care services broken down by individual		x	x			x	x

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	interventions. It is a bottom-up costing tool that estimates the standard cost for each intervention, broken down by drugs, tests, medical supplies, and staff. The standard costs are multiplied by the number of each type of intervention to determine total direct costs for a facility.							
Decision Makers Program Planning Tool (DMPPT)	The manual was published in 2009 [12]. Excel-based model that can estimate costs and effectiveness (infections averted) associated with different scenarios of male circumcision scale-up. The DMPPT was developed by the USAID Health Policy Initiative in collaboration with UNAIDS to enable decision makers to understand the potential cost and impact of various options for scaling up voluntary medical male circumcision services.						x	x
DemProj	The manual was published in 2007 [13]. DemProj is one of the most widely used software models for making population projections. The model is the main building block of the Spectrum suite of computer models, originally developed by Futures Group to utilize demographic projections as a basis for generating various FP, RH, and HIV/AIDS projections. It is normally used in conjunction with FamPlan.	x		x				x
EQUIST	Published in December 2012 [14], EQUIST is a medium-term analysis and strategic prioritizing and planning tool to address child and maternal health and nutrition inequities in developing and middle-income countries. It helps decision makers identify which populations are disadvantaged, why they are disadvantaged, and which combination of evidence-based high impact interventions and health system strengthening strategies would be needed to leave no one behind and produce UHC for achieving sustainable results.	x		x			x	x
FamPlan	Useful for assessing impacts of FP; best used as part of the Spectrum suite, particularly with DemProj; costing component is very simplified	x		x			x	x
Gather, Analyze, Plan (GAP)	GAP is useful for assessing resource needs/costs associated with commodities, but it does not assess impacts.						x	x
Integrated Community Case Management (iCCM) Tool	Published in October 2013, iCCM can be customized to program or country context and covers all aspects of the iCCM program, comprising start-up costs, training costs, community-level service delivery costs, as well as support, supervision, and management costs at all levels of the health system. Additionally, the tool has a financing element that can be used to show and program financing sources and show gaps in funding. iCCM is based in Excel and is open access, allowing the user to see all calculations and results in the model.			x			x	x
Impact 2	Updated in July 2018, Impact 2 is an innovative socio-demographic mathematical model that allows users to estimate the impact of their work and the wider social and economic benefits of offering access to contraception and safe abortion. Good simple tool for estimating impacts, but more often used for assessing specific projects rather than national-level estimates; demographic modelling is more simplified (does not account for HIV/AIDS); also does not incorporate costing.							x
Invest-FP calculator	Useful for assessing different service delivery modalities, particularly community-based strategies, and how much each will cost to achieve a CPR goal; does not assess impacts (beyond achieving a CPR goal)						x	
LiST	The Lives Saved Tool (LiST) is modelling software that has been in use for 10 years. The initial version was created as part of the work for the Child Survival Series published in The Lancet in 2003 [15]. LiST estimates the impact of scaling up MNCH and nutrition interventions in LMICs. LiST calculates changes in cause-specific mortality based on intervention coverage change, intervention effectiveness for that cause, and the percentage of cause-specific mortality sensitive to that intervention [16].						x	x
Malaria Cost Estimation Tool	The malaria costing tool was part of a set of tools developed by WHO to help managers and planners estimate the financial costs of providing priority public health interventions. The tool estimates the resource requirements of proven malaria interventions over a period of time. However, since the official release of the One Health Tool (OHT) in May 2012 by the UN Inter-Agency Working Group (IAWG) on Costing, the tool has been replaced by the malaria component within OHT.			x			x	x

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Tools	Summary description	A	B	C	D	E	F	G
MBBs	The tool helps plan and forecast the potential cost and impact of scaling up investments to increase the intake, coverage, and quality of high-impact health interventions and preparing results-oriented expenditure programs and health budgets. It focuses on assessing the main bottlenecks to effective delivery of services and has broad Millennium Development Goal (MDG) scope. It does not directly compute impacts or costs. Since its inception in 2002, the tool has been used at country and sub-country levels in more than 17 countries across Africa and Asia.		x				x	x
MDG Analyses	Useful for general advocacy, but not a tool for undertaking country-specific analysis						x	x
Mother-Baby Package	The WHO Maternal Health and Safe Motherhood Programme developed the Mother-Baby Package to facilitate the development of national strategies and plans of action. It was presented at an international meeting in Geneva in 1994 [17]. It is useful for comparing costs of current and optimal packages for maternal and newborn interventions. The Mother-Baby Package consists of a cluster of interventions designed to support countries in attaining the goals of the Safe Motherhood Initiative. These interventions focus on FP to prevent unwanted and mistimed pregnancies, basic maternity care for all pregnancies, and special care to prevent and manage complications during pregnancy, delivery, and postpartum.						x	x
Making Pregnancy Safer-Integrated Health Technology Package (MPS-iHTP) costing tool	Detailed intervention planning for RMNCH (staff time minutes, drugs, commodities). The South African Medical Research Council in the late 1990s-early 2000s was WHO's initial partner in designing the original iHTP concept and methodology [9]. The MPS-iHTP provides guidance on the mix of technologies needed to provide key maternal and newborn health services; the services included correspond to WHO recommended interventions in the integrated management of pregnancy and childbirth clinical guidelines and tools. The iHTP tool is clearly a bottom-up tool. It allows for modeling based on population demographics, disease and health profiles, clinical practices, service provision and coverage, and technology requirements, as well as the availability and constraints of technology. It helps identify the required resources, such as medicines, equipment, supplies, physical infrastructure, and human resources. The iHTP tool is intended to cost the MNCH component of the package and the CHCET costs the child health component.	x		x			x	
OHT	The OHT is a software tool designed to inform sector-wide, national strategic health planning in LMICs. While many costing tools take a narrow disease-specific approach, the OHT attempts to link strategic objectives and targets of disease control and prevention programs to the required investments in health systems. The tool provides planners with a single framework for scenario analysis, costing, health impact analysis, budgeting, and financing strategies for all major diseases and health system components. The first version of OHT was piloted in 2011 in Burkina Faso.	x	x	x	x	x	x	x
PipeLine	The PipeLine 4.0 User's Guide was published in 2007. The PipeLine Monitoring and Procurement Planning System (PipeLine) was designed to enable program managers to plan optimal procurement and shipping schedules for health commodities and to monitor the stock status of health products. Program managers can use PipeLine to assist in planning, to estimate future product needs in terms of quantities and costs, to monitor the status of their procurement plans, and to generate reports. It has been used in more than 40 countries to manage program and national level health commodities planning. Policymakers, product suppliers, and donors can generate reports and manage RH commodities, essential medicines, antiretroviral testing and treatment, malaria testing and treatment, lab supplies, and TB treatment.	x	x	x			x	x
Planning, Costing, and Budgeting Framework (PCBF)	Developed by MSH in 2003 with subsequent modifications in 2007 [18], PCBF is an Excel spreadsheet workbook that allows users to clearly identify the linkages between all elements of a plan—the activities, strategies, objectives and goals, and budget that would be required to achieve these goals and objectives. The workbook consists of an example plan and a blank template plan.						x	x

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RAPID	Can be used for sectoral analysis if combined with other modules within the Spectrum suite; however, some IT restrictions mean it cannot easily be used alongside One Health costing			x			x	x
Reality Check	The user's guide was published in 2007. Reality Check generates data for evidence-based FP advocacy and strategic planning by examining the relationship between CPR and population to estimate the resources required to achieve a future goal and the potential impact of achieving that goal. This updated, user-friendly version of the tool and user's guide are available in English and French. Reality Check tool is a tool for FP goal setting, but it is less useful for costing analysis, and demographic modelling does not account for HIV/AIDS impacts.						x	x
Reproductive Health Costing Tool	Useful for assessing the cost of various RH interventions, including FP; now incorporated within One Health; is the outcome of a technical consultation held in Senegal in 2008 with users and developers of the tools						x	x
Resource needs model (RNM)	The user's guide was published in 2010. RNM calculates the total resources needed for prevention interventions, care and treatment, and orphan support for HIV/AIDS on a national level. RNM = An Excel worksheet for calculating the funding required for an expanded response to HIV/AIDS at the national level. It includes 14 prevention programs, six care and treatment programs and orphan support.	x	x	x			x	x
Standardized ECD Costing Tool (SECT)	The user's guide was published in September 2017 [19]. The Brookings Institution and the World Bank Strategic Impact Evaluation Fund developed SECT. It is a single tool that offers methodological consistency to costing early childhood development (ECD) programs across the full range of interventions, balancing flexibility and rigor. The utility of SECT is twofold. On the one hand, standardized and accurate cost data can strengthen the case for investment by enabling more precise cost-benefit and cost-effectiveness analysis. On the other hand, such data can lead to more informed, better investments by improving efficiency of administration so that actual and expected expenditures are better aligned, investments are made in most cost-effective interventions, and cost and quality trade-offs can be analyzed.			x			x	x
Tool for Integrated Planning and Costing (TIPAC)	TIPAC was created in December 2012. TIPAC is an Excel-based program that helps users accurately estimate the costs and funding gaps in public health programs. The NTD (neglected tropical diseases) TIPAC can be used in conjunction with existing national NTD strategic plans and budgets to effectively plan and coordinate future program resources.		x				x	x
UNFPA RH costing tool	Costing for RH interventions		x				x	x
Tool to Estimate Patients'Costs	The Tool to Estimate Patients' Costs was developed by KNCV Tuberculosis Foundation, WHO, and the Japan Anti-Tuberculosis Association in 2007-2008, coordinated by KNCV. The tool aims to: Make economic constraints to individuals and households more apparent Provide means to assess the impoverishing impact of TB on patients and their families Establish an evidence base upon which subsequent interventions can contribute to poverty reduction, increased equity in access to diagnosis and treatment, increased case detection, and better treatment adherence		x				x	x
WHO (Stop TB)	Published in 2006, the tool was developed by WHO Stop TB with USAID funding. It addresses MDG 6 and the targets endorsed by the Stop TB Partnership. The tool is structured around the Stop TB strategy and sets out the scale at which interventions should be implemented in each year to achieve MDG and Stop TB partnership targets, globally and for seven regions. The tool covers all interventions recommended in the WHO Stop TB strategy (interventions to detect and eradicate multidrug-resistant and HIV-TB).		x				x	x

Table 2. Selected country costing examples relevant to pharmaceutical benefits package costing							
Example name, date	**Commissioning organization**	**Implementing/support organization**	**Tools used**	**Purpose**	**Pharmaceutical package**	**Objectives**	**How results were used**
Cambodia Strategic Plan for HIV/AIDS and STI Prevention and Treatment costing, 2015	National Center for HIV/AIDS, Dermatology, and STDs	USAID's Health Finance and Governance (HFG) project	OHT	Costing of strategies under Cambodia's Health Sector HIV Strategic Plan 2014-2020	Tool provided comprehensive HIV interventions (first, second line, PMTCT, reagents, etc.), drug details by regimen, pill unit costs, total costs and drug quantities	To cost Cambodia's strategic plan for HIV/AIDS and STI prevention and treatment and build impact scenarios	Results supported Global Fund funding request through new funding model
Cambodia National Health Strategic Plan, 2018	Estimating health plan costs with the OHT, Cambodia	WHO Western Pacific Regional Office and Arin Dutta, Palladium; Sokkheang Lay of Ministry of Finance and Economy of Cambodia collaborated in the fiscal space analysis for Government of Cambodia	OHT	Estimating health plan costs with OHT, Cambodia	Tool provided comprehensive HIV interventions (first, second line, PMTCT, reagents, etc.), drug details by regimen, pill unit costs, total costs and drug quantities	To do resource and cost projections for entire Cambodian health sector using the OHT, during development of the third national health strategic plan 2016-2020	Results informed development of strategic plan and contributed to the evidence base for improved budgeting, resource mobilization strategies, and stronger overall public sector financial planning
Myanmar MNCH, 2015	Ministry of Health (MOH), child health division	WHO and UNICEF	OHT	Estimating health MNCH interventions cost with the OHT	Tool provided comprehensive MNCH interventions, drug details by pill unit costs, total costs, and drug quantities	To estimate cost of the National Strategic Plan for Newborn and Child Health Development (2015-2018)	Results informed policy discussion and contributed to resource mobilization strategies
Bangladesh Essential Service Package (ESP) costing, 2017	Health Economics Unit, Ministry of Health and Family Welfare,	WHO and HFG/USAID	OHT	Estimating the production cost of ESP by level of the health system	Tool provided comprehensive MNCH interventions, drug details by pill unit costs, total cost, and drug quantities	To estimate costs of core services of ESP by interventions and delivery channels using OHT; develop and strengthen capacity of a national OHT resource pool by engaging them in the process of ESP costing	Results informed country policy discussion on some specific area, such as maternal health, neonatal care, child health, adolescent health, noncommunicable diseases and nutrition

Table 2. Selected country costing examples relevant to pharmaceutical benefits package costing							
Example name, date	**Commissioning organization**	**Implementing/support organization**	**Tools used**	**Purpose**	**Pharmaceutical package**	**Objectives**	**How results were used**
Vietnam provider payment: costing of commune health, 2014	Joint Learning Network for Universal Health Coverage and its funder, the Rockefeller Foundation	Hoang Van Minh	Excel-based costing	Complements the national provider payment assessment	Provide an average total cost per intervention but no detail on the pharmaceutical package	To estimate the unit costs of primary care visits at commune health stations (CHSs) in selected areas in Vietnam and simulation of potential impacts of different provider payment reform options	To support Vietnam Social Security; evidence from this study intended to be used to revise the capitation payment system and payment rates in a way that adequately pays for primary care services delivered by CHSs
Vietnam HIV/AIDS strategic plan costing, 2017	Vietnam Authority for AIDS Control (VAAC)	USAID's HFG project	OHT	Conduct critical analytical reviews that will inform VAAC in the allocation and use of resources for its HIV response	Tool provided comprehensive HIV interventions (first, second line, PMTCT, reagents, etc.), drug details by regimen, pill unit costs, total costs, and drug quantities	To assess alignment of expenditures with national priorities, such as achieving 90-90-90 targets as articulated in the National Strategic Plan for HIV and the most recent investment case and inform future allocative decisions of the country's major HIV funding sources	Support Global Fund funding request through the new funding model
Aarogyasri Hospital Services and Benefit Packages Costing, 2011-12	Aarogyasri Health Care Trust under the aegis of the Indian MOH	Costing of services team of Aarogyasri Health Care Trust and the School of Management Studies at Hyderabad Central University	Excel-based costing	Understand and provide evidence-based information for restructuring, repricing, budget allocation, and rationalizing pay-ment systems for 938 Aarogyasri benefit packages	Provide an average total cost per intervention but no detail on the pharmaceutical package	To estimate and understand unit costs of services and high-volume/high-value procedures in small, medium, and large hospital settings; also build capacity and knowledge to empower the payer (Aarogyasri) in provider payment negotiation	Unit costs used for benchmarking during provider payment negotiations; results created awareness among policy makers about cost drivers, cost and price of services, and variances; standard methodology created to streamline the provider payment mechanism,

Table 2. Selected country costing examples relevant to pharmaceutical benefits package costing							
Example name, date	**Commissioning organization**	**Implementing/support organization**	**Tools used**	**Purpose**	**Pharmaceutical package**	**Objectives**	**How results were used**
							including tools and templates
Indonesia Casemix Costing; 2006, 2010, 2012	Indonesian MOH	National Casemix Center, MOH	Casemix software	Develop weights for diagnosis-related group (DRG) payments to hospitals for services provided to Jamkesmas (insurance scheme for the poor) patients in 2008 and then for rollout to BPJS (scheme for the poor, civil servants, and private sector) patients in 2014	Provide information on pharmacy, stock, hospital information, system financial administration, control, billing, laboratory, epidemiology	To estimate hospital costs to develop the Indonesian Case Based Group tariff	Results from the first and second costing exercises were used to pay hospitals that serve Jamkesmas patients. Results from the third costing exercise are being used to pay hospitals that serve BPJS patients.
Indonesia Health Facility Costing Exercise, 2010-2011	Indonesian MOH	GIZ, Oxford Policy Management, and Gadjah Mada University	Casemix software	Estimate the production cost of services at primary care facilities and hospitals	Provide information on pharmacy, stock, hospital information, system financial administration, control, billing, laboratory, epidemiology	To better understand the cost of delivering services in health facilities and to examine the drivers of cost variation among providers	Estimate capitated rates for health centers, compare results with Indonesian DRG costs in hospitals, and create awareness among policy makers about cost drivers and any implications for provider payment
Malaysia Primary Health Care Costing (COMPHEC), 2008-2009	Malaysian MOH	Institute for Health Systems Research and Putrajaya Health Clinic, MOH	Excel-based costing	Obtain more accurate data on resource consumption in Putrajaya Health Clinic	No data on pharmaceutical package	To estimate the cost of primary care services in a standalone, IT-based health clinic	Inform policy makers and stakeholders about the cost of services provided from the perspective of the MOH

Table 2. Selected country costing examples relevant to pharmaceutical benefits package costing							
Example name, date	**Commissioning organization**	**Implementing/support organization**	**Tools used**	**Purpose**	**Pharmaceutical package**	**Objectives**	**How results were used**
Malaysian DRG Costing, 2012, 2014	Malaysian MOH	Government hospitals	Casemix software	Establish a national health tariff for secondary care services	Provide information on pharmacy, stock, hospital information, system financial administration, control, billing, laboratory, epidemiology	To estimate unit costs to calculate case-group weights	Guide allocation of funds to hospitals
PhilHealth Case Rates, 2012	Philippine Health Insurance Corporation (PhilHealth)	PhilHealth	Excel-based costing	To shift from fee-for-service to case-based hospital payment.	Provide an average total cost per intervention but no detail on the pharmaceutical package	To develop case payment rates for groups of procedures and medical cases.	Develop procedures and/or medical cases reimbursed by PhilHealth
Vietnam MOH, HMU, and HSPI Costing of Health Services at District and Commune Level, 2012-2013	Department of Planning and Finance, Vietnamese MOH	Hanoi Medical University, Health Strategy and Policy Institute	Excel-based costing	To provide cost estimates to inform revision of Vietnam Social Security's capitation payment system	No detail on pharmaceutical package	To estimate the costs of operating district hospitals and commune health stations, focusing on the unit cost of discharges and outpatient visits	To use the historical costs of primary care services to inform capitation rate calculations
Central Asian Republic DRG Costing (capturing experience of several countries), 2008	National MOHs and insurance funds	USAID-funded ZdravPlus Health Care Project	Casemix software	To develop weight coefficients for DRGs	Provide information on pharmacy, stock, hospital information, system financial administration, control, billing, laboratory, epidemiology	To estimate the cost of bed-days in the clinical departments of hospitals	To calculate weight coefficients for DRGs for case-based payment

6. Analysis: Guidance and Tools for Costing Pharmaceutical Benefits Packages

Costing pharmaceutical benefits packages requires using comprehensive costing tools and streamlined processes to capture medical product quantities and unit costs and using indicators for monitoring and evaluation and controlling financial performance, such as the impact associated with implementing interventions. Various factors come into play when selecting tools for pharmaceutical benefits package costing.

- **Familiarity and support:** The tool has ongoing support from the programmers and a community of practice. It has been used to inform costing strategic planning processes, program-specific costings, such HIV/AIDS, malaria, etc., and UHC benefit package costing in almost 120 LMICs.

- **Versatility:** Some countries have used the tool for multiple rounds of costing. The tool incorporates the modules of most existing costing tools included in table 2; it serves as a unique costing and planning tool that combines health system, health services, and impact analysis modules.

- **Multiple-disease feature and flexibility:** The tool allows multiple disease configurations and has been used for actuarial studies in some countries for UHC benefit package implementation.

The greatest added value of applying a tool comes from assessing resource needs for the entire health sector across programs and system components. However, tools are being used in some countries to look at program-specific resource requirements and/or diseases (for example, to inform a national road map, planning and costing for maternal and child health, or an HIV strategic plan). The tool has also been used for UHC benefit package costing interventions. The tool is more robust and user-friendly than many other existing costing tools. The time needed to develop an application to inform benefit package costing interventions depends on the existing data, subject-matter experts, and coordination among critical actors.

As presented in table 1, there are a variety of tools, each with strengths and weaknesses, to support costing a long list of interventions, such as a pharmaceutical benefits package. Some tools, like MBB, PCBF, CastCost, DMPPT, iCCM, RNM, and TIPAC, are designed with Microsoft Excel. Tools designed with Excel generally do not offer the possibility for users to customize it for specific needs. Excel tools are predefined for specific diseases. For example, MBB is predefined for maternal and child health interventions and cMYP for FP interventions. Among the tools presented in table 1, except for the One Health software, no tool combines costing of health interventions, health system, and impact analysis (modeling).

We chose One Health software for several reasons. One Health is a single mechanism for supporting the planning, costing, and budgeting of health sector priorities, including health system strengthening strategies. It provides a unified framework to strengthen integrated planning and represents a modular instrument for program-specific and sector-wide applications. One Health illustrates the health system implications of scaling up delivery of clinical interventions, shows the capital investment gap, and allows a comparison of costs with the estimated financial resources available. In this manner, the tool allows its users to generate scenarios and informs priority setting processes. The identification of impediments to intervention scale-up emphasizes the need to strengthen systems for sustainable long-term planning.

The tool enables the user to derive costs related to specific diseases and populations, such as maternal, newborn, reproductive, and child health; vaccinations; malaria; TB; HIV and AIDS; nutrition; and water, sanitation, and hygiene. In addition, it contains modules for human resources, infrastructure, logistics, fiscal space, program and channel analysis, intervention coverage and costing, bottleneck analysis, program costing, summary outputs, and budgeting.

The OHT contains modules for impact analysis, health service delivery, and health systems. Within each of these modules, the tool provides a predefined set of components, interventions, and inputs for the user to choose. If the user only wants to use one module or a sub-topic of a module, the tool will present outputs based on that limited information. If the user wants to use all three modules, such as in the case of a comprehensive health sector strategy, OHT will integrate data from these modules and present similar outputs.

OHT is a complete software package, in comparison to most of the costing tools in table 2. OHT can manage the costing of pharmaceutical benefits packages for more than 300 interventions, depending on how the user customizes the software. This tool seeks to leverage the most useful components of the tools that currently exist (table 2), such as budget mapping, bottleneck analysis, fiscal space analysis, detailed intervention planning for RMNCH (staff time minutes, drugs, commodities), impact for child and maternal health, cost and impact for HIV/AIDS interventions, impact for family interventions, costing RH interventions, intervention costing for child health, and overall framework for program activity costing. Routine improvements to the tool are overseen by an inter-agency group consisting of experts from UN agencies and development institutions (the IAWG-Costing Working Group). The software and its user manuals are available at no cost at the following link: https://www.avenirhealth.org/software-onehealth.php.

Box 1 gives a brief introduction to the OHT. An implementation guide for using the OHT to cost a pharmaceutical benefits package will be published separately in Part 2: Tailored guidance for estimating financial outlays for a defined pharmaceutical benefits package.

Box 1. Introduction to the OHT

OHT is a tool to inform the development of health sector strategic plans. The software was created to respond to country requests for a single tool that reflects the best aspects of numerous, disparate existing tools. OHT is a single mechanism to support the planning, costing, and budgeting of health sector priorities, including health system strengthening strategies. It provides a unified framework to strengthen integrated planning and represents a modular instrument for program-specific and sector-wide applications. OHT illustrates the health system implications of scaling up delivery of clinical interventions, shows the capital investment gap, and allows a comparison of costs with the estimated financial resources available. In this manner, the tool allows its users to generate scenarios and inform priority-setting processes. The identification of impediments to intervention scale-up emphasizes the need to strengthen systems for sustainable long-term planning.

OHT thus offers benefits to a multiplicity of users. At one extreme, health planners developing a comprehensive, multi-year health plan can use it to create a costed plan that addresses a country's critical health needs. Such planners can create and compare different scenarios for reaching the identified health sector priority goals. This could be used as part of a national strategic health planning exercise or as part of a proposal to a multilateral funding organization. At the other extreme, disease area planners can use the program modules to develop plans addressing their particular disease or population (such as HIV and AIDS) with reference to health systems as appropriate. Similarly, health system planners can use the systems modules to make medium- and long-range plans for human resources, infrastructure, logistics, etc., as appropriate. The added value of OHT is generated when multiple modules are used at the same time to identify synergies and to ensure that planning and costing processes consider systemic constraints.

A diagram for the OHT's functions is presented in figure 2.

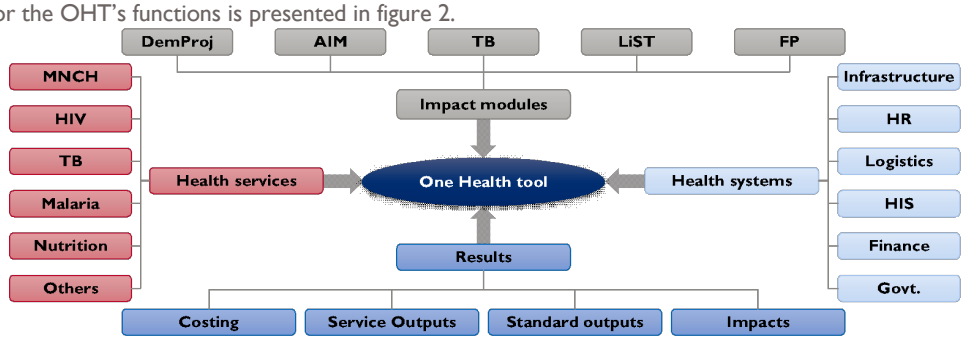

Figure 2. Diagram illustrating the components of OHT

7. Conclusion and Recommendations

After appraising the costing tools and studies, our recommendation of tool to support benefit package costing, pharmaceutical package costing, and forecasting is the OHT. More details will be provided in part 2 of this report to better describe the OHT.

There are various tools available to support costing of various disease interventions. Some tools are made for specific diseases, such as RNM for HIV interventions, Malaria Cost Estimation Tool for malaria interventions, MBBs for MNCH interventions, etc. However, these tools are not a good fit for pharmaceutical benefits package costing. Excel tools are not recommended for costing a long list of interventions or drugs because they are not user-friendly and are difficult to use for data projections. Few of the tools have built-in epidemiologic data, impact analysis capacity, and countries' population data.

After reviewing existing costing tools and what countries have done, we conclude that there is no need to develop a new costing application for pharmaceutical benefits package costing in the Asia region for various reasons:

- It takes time and resources to build a costing tool.
- Worldwide application necessitates country involvement and multiple consultations, with multiple rounds of testing and implementation.
- OHT is already sufficiently customizable.
- There are ongoing opportunities to adapt and improve the OHT itself; the latest meeting to update the tool was the IAWG meeting in Geneva December 3-5, 2019.

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