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Applying Design Thinking for Health Benefit Package Expansion

A Framework and Comparative Review of Current Tools

VICTORIA Y. FAN · JUBILEE AHAZIE

Abstract

Countries moving towards universal health coverage are challenged about what new health benefits and interventions they will add to their national health programs. Currently, there are three general approaches that countries use to expand their benefit packages: essential services or essential package list; health technology assessment agency driven approaches; and technical assistance and consultancies. Countries need comprehensive, easy-to-use tools to plan the pathway of adding interventions, which we call benefit package expansion. Such tools can complement approaches to benefit package expansion driven by agencies or technical assistance. We propose a new framework organized in three layers (Inner Core, Outer Core, and Mantle, or IOM framework) that outlines the features or characteristics to consider when designing and building a tool for benefit package expansion planning. The layers of the IOM framework refer to: (1) Inner Core—scoping the set of interventions; (2) Outer Core—cost and benefit information of the interventions; and (3) Mantle—additional considerations such as accessibility and documentation. In this study, we use this IOM framework to identify and review four existing tools that may support benefit package expansion. Based on our review applying a decision-matrix method (a modified Pugh method) that is standard in design thinking, we describe and compare the functionality and usability of these tools, their scope of interventions, information on interventions and services, and customizability for local country contexts. Compared to other tools, HIPtool was more comprehensive in terms of interventions and rated higher on Mantle dimensions of user accessibility, whereas OneHealth tool rated well on intervention costs and benefits. There remains a need for a central coordinating entity in the global health architecture to serve as a repository of tools for designing benefit packages for universal health coverage as well as reinforcing the importance of benefit package design as a crucial part of progressing towards universal health coverage.

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The benefit package expansion pathway: How countries expand benefit packages

Around the world, countries are experiencing polycrises, including a severe macroeconomic climate, growing inflation, debt distress, and looming recession on top of recovery from the pandemic. Despite these challenging times, several countries are moving towards universal health coverage and are seeking to expand benefit packages through national health programs including national health insurance programs. A benefits package is "the set of health services and products that can be feasibly financed and provided for everyone, given a particular country's actual circumstances" (Glassman et al., 2017).

Policymakers and planners in countries seeking to expand their benefit package, i.e., add more benefits or interventions, typically as part of one's national health program, can seek guidance on their benefit package through at least three main approaches (see Figure 1). The first approach would be for a planner to use a list of "essential interventions or services", e.g., an approach reflected in the World Health Organization's Universal Health Coverage (UHC) Compendium with 475 interventions, or alternatively, the Disease Control Priorities project, which recommends an essential UHC package of 218 interventions (*UHC Compendium*, n.d.; Jamison et al., 2018).

If countries have already completed the minimum essential package outlined by the WHO, country policymakers and planners may rely on technical assistance to help determine what interventions to add as they expand their benefit package. The form of technical assistance can include private consultants, peer-to-peer government exchange, or international agencies. Regardless of who provides such guidance, however, one-off engagements of technical assistance typically provide ad hoc guidance or may rely on a political, non-transparent process (Glassman & Chalkidou, 2012). Such guidance may miss out on a broad set of generalizable knowledge or internationally informed experiences about how other countries expanded their benefits. As a result, some countries may look to and mimic "more advanced" nations, without detailed consideration of what is appropriate or relevant for their specific local country context.

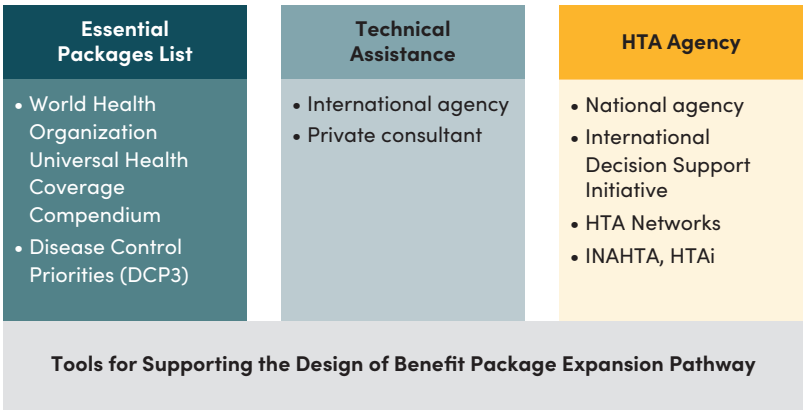
Aside from the use of an essential list or relying on one-off technical assistance, planners may use a third approach of creating a public agency or developing policies that systematically examine interventions for consideration to be added to a benefit package. National HTA agencies include the Health Intervention and Technology Assessment Program (HITAP) in Thailand, the HTAIn in India, and the National Institute for Health and Care Excellent (NICE) in the UK. The International Decision Support Initiative as well as the Health Technology Assessment (HTA) Network and the International Network of Agencies for Health Technology Assessment (INAHTA) with its 53 agencies or Health Technology Assessment International (HTAi) are emblematic of this approach. Rather than one-off engagements or static lists, this approach emphasizes the role of institutions and organizations that have the capacity to carry out this function of HTA. HTAs are typically done for "a test, device,

medicine, vaccine, procedure, program or system", relying on a combination of economic evaluation that examines cost-effectiveness, stakeholder engagement, budget impact analysis, and policy adoption (Glassman & Chalkidou, 2012).

HTA agencies have several advantages over using a predefined list (Glassman et al., 2017; Glassman & Chalkidou, 2012), though agencies vary considerably across countries. Further, agencies are not necessarily tasked with reviewing a package or set of interventions to be added, but may default to reviewing a single intervention, e.g., a new drug, to consider whether to add it to the benefit package. In other words, the decision to add a new intervention is not necessarily done while simultaneously considering other new interventions to be added as part of a single policy decision. Thus, countries seeking to rapidly expand their benefit package may find that a HTA agency is not fully equipped to provide guidance about expanding to add a more comprehensive package of interventions.

Thus, the crux of the problem for planners is the "benefit package expansion pathway", i.e., how do countries expand from a smaller set of interventions to a larger set of interventions in terms of what is covered? In high-income countries, national health programs typically cover tens and thousands of drugs and clinical interventions, which is far greater than the 218 or 475 interventions outlined in the essential lists. We call this pathway for how countries go from a few hundred interventions to several thousand interventions as the "benefit package expansion pathway." The benefit expansion pathway applies to lower income countries which may consider how to reach the essential list (e.g., 218 interventions), as well as higher income countries considering how to go beyond the essential list. There is a need for tools and knowledge that help planners to discover and make evidence-based decisions to best expand the benefit package in ways that are appropriate for their country context in light of multiple considerations such as cost-effectiveness, equity, social determinants, key populations, and so on.

FIGURE 1. Three approaches to benefit package design



Source: Authors.

In this paper, we define a tool as a device that is used to help carry out a particular function, with the function being expanding a benefit package. Specifically, we define a 'benefit package expansion tool' (BPET) as a tool that country planners can use to prioritize multiple benefits or interventions that could be included as part of an expanded package or set of services. Such a BPET may be more functional than a mere list of essential interventions (outlined in the first approach in Figure 1) or may support technical assistance experts or HTA agencies (as outlined in the second and third approaches). The BPET may be used in a complementary way to these approaches and reduces the costs of planning to any planner that seeks to expand their benefit package. BPETs, therefore, are a global public good by conferring knowledge and information that can be used in multiple settings.

Design thinking is a "methodology for creative problem solving", widely used by engineers widely to design new tools (Camacho, 2016). In this paper, we use and apply a design thinking approach to outline and identify key design features (also known as design specifications) of a BPET with the target audience being national and local planners rather than academic researchers or international agencies. Specifically, we propose a new framework comprised of three layers (Inner Core, Outer Core, and Mantle, or IOM) that organizes these key design features of a BPET, covering the intervention set, intervention cost and benefits, and other information. We note that this design thinking approach is for designing the BPET, which is distinct from the process of designing the benefit package. The objective and the purpose of the BPET is to help to design the benefit package, but the focus of this paper is not the design of the benefit package but rather the design of the *tool* that helps with designing the benefit package.

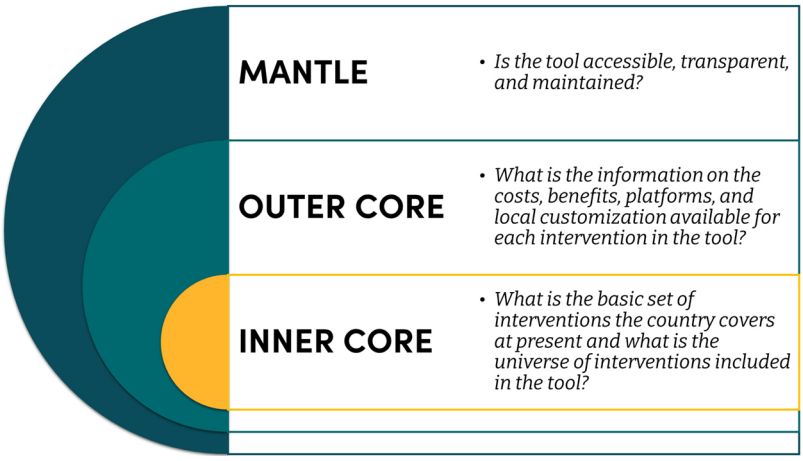
Using a new framework, we identify and review four existing benefit package tools and their strengths and weaknesses, by using the decision-matrix method (or a modified Pugh method) standard in design thinking and methodology (Pugh, 1981). This method requires an identification of the key design features by understanding the intended user, in this case, the national or local planner. Thus, the IOM framework that we propose outlines a list of design features that may be salient to a national or local planner, although market research of national or local planners as well as user testing of a piloted BPET can help to determine the relevance of these proposed design features.

A framework for the design features of a benefit package expansion tool

To understand the terrain of benefit package expansion and the key design features that the BPET should have, we propose the IOM framework of Inner Core, Outer Core, and Mantle of design features (see Figure 2 and Table 1). Drawing on a geological metaphor, we utilize the layers of the earth to describe the different categorical layers of design features to consider when designing the BPET. Table 1 lists key design features and questions, grouped by layer, for tool designers to consider. The IOM framework proposes a hierarchy of the importance of design features, in which the Inner

Core is the most important category of design features, followed by the Outer Core and the Mantle. The layers of the IOM framework refer to: (1) Inner Core—scoping the set of interventions; (2) Outer Core—cost and benefit information of the interventions; and (3) Mantle—additional considerations such as accessibility and documentation.

FIGURE 2. IOM framework for designing a benefit package expansion tool (BPET)



Source: Authors.

In this IOM framework, the first layer, which we call the "Inner Core" of design features, helps tool designers to identify the interventions that a country may currently include in a benefits package and cover an inclusive set of interventions that could be added. This layer represents the basic challenge for what a national or local planner faces in determining what interventions to add and what interventions are currently covered. This is the most fundamental layer and recognizes that, even if information on costs and benefits of interventions are unavailable for a local setting, the identification, listing, and classification of the interventions is a minimum and necessary step (Fan, 2022). Tool designers, as they design a new BPET and if their target audience is country policymakers, should consider a more inclusive—if not comprehensive—set of interventions to be included in the tool. Table 1 shows that the Inner Core comprises four subcategories of design features: current benefit package, scope and number of interventions, menu organization, and default data.

The second layer, which we label the "Outer Core", is complementary to the Inner Core or first layer. The Outer Core layer identifies the kind of information a tool should be able to provide for *each* intervention identified in the Inner Core. Some of the information includes costs and benefits of each intervention and the ability to customize interventions to suit local contexts. This layer is used most frequently in cost-effectiveness and cost-benefit analysis but are not often systematically available for comparison for any given country, let alone for multiple countries and multiple interventions. In the absence of incomplete and uncertain information and many known unknowns, the identification of costs and benefits, however perpetually incomplete (or out-of-date or not locally

tailored), is a second step for thinking through what interventions a country seeks to include as it expands its benefit package. Table 1 presents the Outer Core consisting of six subcategories of design features: intervention costs, intervention benefits, intervention platform and context, intervention customization to local contexts, population impact, and local data customization.

For the third and final layer, the "Mantle", we identify and describe supplemental features that should help to legitimize the tool and keep the tool relevant and up to date. These are more focused on user-friendly considerations compared to the other design features in the Inner Core and Outer Core. The Mantle design features includes the way in which the tool is accessed, its ease of use for national planners, and so on. This last layer covers five subcategories of design features, as shown in Table 1: accessibility, data and transparency, maintenance, limitations, and support.

TABLE 1. IOM framework of design features for designing a BPET

Inner Core	**Current Benefit Package**	Does the tool allow the country to identify and define what is currently included in its benefit package?
	Scope and Number of Interventions	How many interventions are included in the tool, and is each intervention identified? How many different disease areas are covered?
	Menu Organization	How does the menu organize and classify interventions into groups that would be relevant for selection? Is the menu organized by biomedical disease condition, age group, gender, delivery platform, level of care (e.g., primary, secondary, or tertiary), sector, or other grouping?
	Default Population Data	Are data about the epidemiology (diseases, gender, age), delivery platform, level of care (e.g., primary, secondary, or tertiary), sector, or other grouping also available in the tool in addition to the listing of the interventions?
Outer Core	**Intervention Costs**	Does the tool have information on costs of implementing each intervention? Does the tool allow the country to identify the current costs for delivering the benefit package?
	Intervention Benefits	Does the tool identify the benefits and effectiveness of each intervention?
	Intervention Platform and Context	Does the tool explain the particular context or requirements for a given intervention to be implemented or how a given intervention may be delivered?
	Intervention Customization to Local Contexts	Does the tool give guidance about how a given intervention may be adapted for local implementation, including different types of health workers, or different levels of care? Does the tool describe how a given intervention might be adapted by users to align with local priorities?
	Population Impact	Does the tool help the user consider the population that might benefit from each intervention using country-level information on population distributions, disease distributions, or other subgroups and vulnerable populations?
	Local Data Customization	Does the tool allow the user to incorporate or input local data about the population or disease distributions or other information on local costs and benefits?

TABLE 1. (Continued)

Mantle	**Accessibility**	How is the tool accessed? Is it web based and universal to different operating systems? Is it mobile friendly? Or does the tool require special download and installation? Does the tool allow for autonomous use, or does it require guided use from the developers or other consultants? Is the tool accessible to a non-technical user?
	Data and Transparency	What are the sources of the evidence on costs and benefits? Does the tool explain where each data point comes from?
	Maintenance	How frequently is the tool updated? Who maintains the tool? How does user-entered information feed into or crowdsource into community knowledge?
	Limitations	Does the tool acknowledge limitations including information gaps? Does the tool incorporate uncertainty in calculations?
	Support	Does the tool state how to appropriately use the tool including demos, tutorials, and training? Is there a support line or contact for troubleshooting?

Source: Authors.

A decision-matrix review of current tools

In this section, we apply our IOM framework of design features for a benefit package expansion tool to carry out a decision-matrix review of tools currently for benefit package design. Like shopping for a car or other consumer product, it is not obvious which car is best suited to one's needs unless one has first identified the key design features in advance that are most important for the intended user. This review of benefit package tools serves akin to a "Consumer Reports™" for national or local planners who are thinking through their benefit package design expansion pathway and need to decide which tools to invest their staff time and resources to learn and use. This decision-matrix review can help national planners to select a tool best suited to their needs.

We first identified four available tools for benefit packages: HIPtool, Optima, OneHealth, and the WHO UHC Compendium (see Table 2). We chose these tools because they were adopted by an international agency and appeared to cover a broad range of diseases and conditions, although we acknowledge there are other tools available. Each tool was designed with different objectives and considerations in mind. We also acknowledge that national or local planner may not have the luxury to do a comprehensive review of all tools, are limited in their review based on resources and time, and that the selection of tools may be ad hoc or opportunistic. We apply our IOM framework as a guide to review each tool's design, functionality, and usability that may assist a national or local planner to design which tool to use, if any, to expand a health benefits package. We further acknowledge that the scoring of these tools may be a means (or a tool) to develop capacity in benefit package design, and that planners may also wish to use Table 1 as a means to rate other tools of interest.

A summary of the review of the tools is presented in Table 3, in a modified Pugh chart, developed using the decision-matrix methodology. For this study, we used a modified Pugh chart to reflect performance on the design specifications outlined in the IOM framework in absolute terms.
A typical Pugh chart often chooses as the benchmark the leading industry standard. Among the four tools selected for this study, it can be argued that there is no current leading benchmark or global standard of such tools. Thus, in the absence of a clear industry standard, performance is assessed in relative terms. Each tool was rated for each dimension of the IOM framework using one, two, or three stars, with three stars indicating adequacy in regard to the specific dimension, two stars indicating partial adequacy, and one star indicating an absence or significantly inadequate. Granted, these scores are ultimately subjective, and as such planners may also consider to rate tools individually along the dimensions in Table 1 before they decide to invest in using a tool.

TABLE 2. Brief overview of the four tools

HIPtool	• "... is a cloud-based, open-access, user-friendly, high-impact resource to assist with health intervention prioritization at the country level. It combines context-specific data on burden of disease and intervention effectiveness to help stakeholders identify funding priorities and targets."
Optima	• "Optima models have been used extensively to address investment choices related to numerous areas including HIV/AIDS, tuberculosis, malaria, viral hepatitis, nutrition and maternal and child health. Modeling groups... are continuing to extend the Optima approach, by developing new applications to inform investment of publicly-funded benefits packages for entire health systems, and for optimizing implementation options across diverse sectors."
One Health Tool	• "... is a model to be used for supporting national strategic health planning in low- and middle-income countries. The tool facilitates an assessment of resource needs associated with key strategic activities and their associated costs, with a focus on integrated planning and strengthening health systems."
WHO UHC Compendium	• "... is a database of health services and intersectoral interventions designed to assist countries in making progress towards Universal Health Coverage (UHC). It provides a strategic way to organize and present information and creates a framework to think about health services and health interventions."

Source: Excerpted from (HIPtool, n.d.; OneHealth Tool, n.d.; Optima, n.d.; UHC Compendium, n.d.).

TABLE 3. Comparative review of tools using the IOM framework

	HIPtool	Optima	OneHealth	WHO UHC Compendium
Current Benefit Packagee	★★★	★★★	★★★	★
Scope and Number of Interventions	★★	★	★★	★★★
Menu Organization	★★★	★★	★★★	★★★
Default Data	★★★	★★★	★★★	★
Intervention Costs	★★★	★★★	★★★	★
Intervention Benefits	★★★	★★★	★★★	★
Intervention Platform and Context	★★★	★	★★★	★★
Intervention Customization to Local Contexts	★★	★	★★★	★
Population Impact	★	★★★	★★★	★★
Local Data Customization	★★★	★★★	★★★	★
Accessibility	★★★	★	★	★★
Data and Transparency	★★★	★★	★★★	★★★
Maintenance	★★	★★★	★★	★★★
Limitations	★	★	★	★★★
Support	★	★★	★★	★

Notes: This figure is produced by the authors. Please refer to Table 4 for an explanation of the number of interventions and Table 1 for the questions that pertain to each dimension.

A decision-matrix review of Inner Core features

The Inner Core layer of design features focuses on identifying the list of interventions available in the tool and how those interventions are organized (See Table 3). The WHO UHC Compendium is the most comprehensive in the scope of interventions that may be included in a benefit package, with 475 interventions and 3,346 specific actions related to those interventions. Followed by the WHO UHC Compendium is the HIPtool with 218 EUHC interventions and 362 disease conditions, then OneHealth with 205 interventions, and finally Optima with about 45 interventions across the HIV, tuberculosis (TB), and nutrition models (see Table 4).

We note that there is no standard definition of what is an "intervention" or "program", but for this paper we use the term "intervention" to refer to "any activity undertaken with the objective of improving human health by preventing disease, by curing or reducing the severity or duration of an existing disease, or by restoring function lost through disease or injury" (Smith et al., 2015). For example, the WHO UHC Compendium uses the term "interventions" as well as "actions," a level more detailed than interventions. In contrast, Optima does not use the term "interventions" at all. Of the four tools, Optima was limited to three disease areas (HIV, TB and Nutrition), whereas the other tools covered a broader scope of disease areas. The WHO UHC Compendium was the most comprehensive, encompassing several disease areas. The "group" category contains five broad diseases areas (communicable diseases, foundations of care, growth development and ageing, noncommunicable

diseases and mental health, reproductive and sexual health), but the "subgroup" category includes 28 disease areas. Even more diseases areas are included in the "intervention category".

Importantly, this review shows that there is currently no tool that covers more interventions than the WHO UHC Compendium, which means that national and local planners who seek to expand a benefit package beyond the UHC Compendium will be at a loss for tools.

TABLE 4. Comparison of four tools by coverage of interventions

Tool	Indicator	Terminology
HIPtool	218 EUHC interventions and 362 disease conditions	Interventions
OneHealth	Approximately 205 interventions	Interventions
Optima	Approximately 45 interventions across the HIV, TB, and Nutrition	Programs
WHO UHC Compendium	475 interventions and 3,346 specific actions across a range of diseases and conditions	Interventions & Actions

Source: Authors.

The customizability and ordering of the interventions as well as selection of the interventions was the weakest of the WHO UHC Compendium, which functions primarily as a stationary list. The WHO UHC Compendium does not allow for countries to input or select their interventions into the system. In this regard, the WHO UHC Compendium serves more like a reference list, while the other tools, HIPtool, Optima, and OneHealth tools, enable a user (e.g., a national or local planner) to customize the current definition of a country's benefit package as well as add other interventions that may not otherwise be listed in the tool.

Each tool has its own way of organizing and classifying its interventions, though the WHO UHC Compendium has the most options (by WHO packages, by SDG global goals, by life course, and by sex). The HIPtool organizes by delivery platform and cause of burden. Unlike from the WHO UHC Compendium, the other tools have additional demographic and epidemiologic data that are integrated by default and available for immediate access through the tool.

A major weakness of the WHO UHC Compendium is its lack of machine-readable format. The list of interventions was not easily extracted into text and was manually extracted for this paper. Its lack of machine-readable format also limits its broader use by planners.

A decision-matrix review of Outer Core features

The Outer Core layer of design features examines the costs, benefits, platforms, and other local customization for each intervention in the tool (see Table 3). Complementary to the first layer, the Outer Core features help to specify key attributes and information on costs and benefits for each intervention listed. For intervention costs, all tools aside from the WHO UHC Compendium include some information on the cost of implementing interventions. The same can be said about

the intervention benefits such as cost-effectiveness or DALYs reduced or averted are included in the HIPtool, Optima, and OneHealth tools, but not for the WHO UHC Compendium, whose main advantage appears to be the comprehensiveness of the listing of interventions identified in the Inner Core. The need to identify local costs as well as local benefits and effectiveness is a common weakness across all tools, although the inclusion of any cost and benefit information (even if it is for a different country context) is a useful starting point for any national or local planner.

Regarding the intervention platform and context, three tools provide information on ways for interventions to be implemented. Both the HIPtool and OneHealth have delivery methods or delivery channel options, though details are sparse. The "action" category on the WHO UHC Compendium tool contains detailed actions to execute each intervention, although it lacks information on costs and benefits.

Only two tools discuss different tiers of hospitals or community care centers that provide a measure of specificity to local context (HIPtool and OneHealth). The other two tools do not include functions to address local interventions implementation. Similarly, only Optima and WHO UHC Compendium contain information about populations that benefit from the interventions either based on age or disease distributions, which are crucial particularly from a political economy perspective, gender perspective, equity perspective, or a vulnerability perspective in designing a benefit package expansion.

Three tools allow the user to input local data (HIPtool, Optima, and OneHealth) to ensure that the interventions can identify and reach subgroup key or vulnerable populations that may be particularly impacted by a health condition. Notably, only the OneHealth tool allows for the adaptation of subgroups, including vulnerable population (if specifically entered), unlike the other tools.

A decision-matrix review of Mantle features

The Mantle Layer, our third and final layer, of design features asks the overarching question of whether the tool is accessible, transparent, maintained, and acknowledge limitations (see Table 3).

In terms of accessibility and usability, three tools (HIPtool, Optima, and WHO UHC Compendium) are web based and can be accessed on different operating systems, whereas the OneHealth tool requires download and separate installation. The HIPtool and WHO UHC Compendium have a relatively easy-to-use web interface, while Optima requires more inputs by the user and require separate log-ins for each issue area, therefore making it difficult to navigate for an average non-technical user common to a national or local planner. The separate installation of OneHealth tool as a computer application may be a barrier to use. The OneHealth interface is also complex due to the presence of numerous functions with little to no explanation of what they are and what they do for a naïve user without guided assistance and limited autonomous use.

All of the tools are in English. None of the tools were in French or other languages that would make it more accessible to non-English speakers. The integration of Google Translate or other language translation functions could help to reduce language barriers.

Regarding data and transparency, three tools clearly state their sources, particularly the WHO UHC Compendium, which lists a source for each intervention and actions listed. Optima is the only tool that does not appear to list its sources for data within the tool itself, although they provide a link to a peer-reviewed academic article that describes the tool in detail.

Maintenance of the tools is somewhat unclear. The WHO UHC Compendium and HIPtool directly state when they were last updated (2021 and 2018, respectively), while Optima states that the default data is updated annually and OneHealth states when the latest version of the tool was released. All tools provide the contact of who manages the tool.

The WHO UHC Compendium is the only tool that distinctly lists its limitations. Optima does state some of the limitations for the COVID-19 model, but not for the others.

Discussion and conclusion

We find that the HIPtool rates well in terms of Mantle specifications or user accessibility by a non-technical user and is relatively comprehensive in the scope of interventions as well as data. Optima and OneHealth are both more sophisticated in terms of modeling and functions, but the former has limited default information and the latter does not rate as well in terms of Mantle specifications of user accessibility and user experience. Finally, the WHO UHC Compendium, as we noted earlier, is an essential list of interventions and actions but as a tool it does not offer additional information or functionality such as interactivity or customizability.

Each tool has their strengths and weaknesses, but all attempt to help with understanding and improving national health benefit packages. During the review of the tools, we experienced the perspective of being a new user to these tools, albeit with as much (or perhaps more) technical background and expertise than our intended users of national or local planners. Although confusion and frustration are expected with the use of any new tool, making tools as accessible and easy to use from a user design perspective is crucial.

As we reviewed the Inner Core design features of the four tools, we noted that the taxonomy and classification of interventions are not uniform across the tools (with perhaps the exception of the gender classification, i.e., classifying interventions based on gender). A new user may encounter confusion by differences in nomenclature and terminology, and the standardization of nomenclature and classification of interventions seems to be the direction and intended purpose of the WHO UHC Compendium. Other tools may benefit from using the WHO UHC Compendium's nomenclature and classification system and standards.

Designers of BPET should also consider how to harmonize against multiple digital health standards such as standard health informatics vocabularies and terminologies, such as International Classification of Diseases (ICD) for disease classification and International Classification of Health Interventions (ICHI) administered by the WHO, proprietary procedural classifications (e.g., Current Procedural Terminology or CPT (R) owned by the American Medical Association), or databases which house multiple terminologies (i.e., the OHDSI ATHENA database of standard vocabularies, which outlines a list of some 12927 CPT version 4 codes and 1353 HCPCS codes, for example) (*International Classification of Diseases (ICD)*, n.d.; *International Classification of Health Interventions (ICHI)*, n.d.; *CPT (Current Procedural Terminology)*, n.d.; Reich & Ostropolets, 2019; *Athena*, n.d.; Ostropolets et al., 2021). Granularity of the interventions in the classification or vocabulary is an important design feature in the Inner Core.

We note that there are limitations to our decision-matrix review, which is inherently subjective. Others reviewing these tools may come to different conclusions about the functionality and design features of these tools, particularly the designers of the tools themselves may have more knowledge about whether these tools have certain features or not. Nevertheless, from a general user perspective, we emphasize the importance of usability as a design feature for all the layers of the IOM framework. If there is cost information in the tool but it is not easily accessed, then it has limited usability.

These tools also provide a tremendous amount of information and list numerous interventions, but they are not intended to be stand-alone in the benefit package expansion pathway. These tools should complement the use of an HTA agency, or less preferably, one-off technical assistance. But not all countries have an HTA agency and there remains a need for efforts such as the International Decision Support Initiative to help promote the creation of HTA agencies and the "ecosystem" of HTA promoters and champions—and more broadly the combined use of economic and epidemiologic analyses for assessing the effectiveness and costs of interventions and technologies in health.

One important caveat of this study is the focus on the expansion pathway for designing a benefit package. While we have argued that the expansion pathway is relevant in low- and middle-income countries, its relevance to high income countries is less apparent where the policy concern is for cost control. Benefits can theoretically be removed from a benefit package, particularly when there is a recession or other economic shock. This study and the tools assessed were not examined for their usefulness in revising or reducing benefits, although such tools may also be used for such purposes.

Another limitation of this study and of benefit package design in general is that offering a benefit on paper does not necessarily translate to access to those benefits in practice. These tools were not reviewed for the purpose of assessing implementation of benefits, and these tools generally are not intended for that purpose, which could be assessed using an effective coverage measure or other evaluation method. The ability for a tool to support decisions on expanding benefits on paper versus

increasing access to benefits in practice (i.e., greater coverage) is worth exploring for next generation development of tools for decision-making.

This study also does not assess the underlying data sources such as the expenditures by intervention or benefit. Public expenditure reviews, national health accounts data, budgetary data, and other sources of information on spending by intervention are useful for inputs into a benefit package, but they are not required to calculate the unit costs of a given intervention. These tools were not reviewed for the purpose of assessing the impacts on a budget, although budget impact analysis is an important method to inform benefit package design. The use of these tools alone is not sufficient for making decisions on expanding benefits but should be used as part of multiple inputs for making decisions for policy.

In light of the COVID-19 pandemic, the toolkit of interventions for pandemic preparedness and response have not been mapped against the lists of health interventions such as those in the UHC Compendium. There is a need to systematically list and cost interventions for pandemic preparedness and response (Fan, 2022; Fan, Glassman, & Smitham, 2023).

This IOM framework of design features argued that national and local planners are concerned primarily with the list of potential interventions to add to their benefit package. We argued that national and local planners must first identify that list of interventions is a crucial step before proceeding to measure or collect information on costs and benefits. In that regard, the classification and taxonomy of interventions are important and the role of global norm-setting institutions, namely, the World Health Organization, should play a leading role. We argued that this paper, like a "Consumer Reports™" may help to inform national and local planners as they decide which tool to use. This paper finds that the tools available for benefit package planning are quite limited, particularly if countries wish to go beyond the set of interventions identified in the WHO UHC Compendium.

There are other uses of this paper. All tools reviewed have limitations as identified in our decision-matrix review. Tool designers may benefit from this paper as they plan next generation software updates and revisions to make their tools more useful to national and local planners. Making a tool more useful also requires greater accessibility, including more autonomous use without additional support or guidance. This paper may inform product testing and pilots of existing tools or development of a new BPET as well as part of market research to better understand the needs and capacities of intended users which are national and local planners.

In a competitive world, there is value to having multiple tools available. Each tool has its comparative advantage as well as specialized uses and focuses, as well as different users. We are not advocating for a single tool to integrate all the tools.

Figure 1 illustrated the role of international agencies for technical assistance for benefit package expansion, but international agencies are also important for the design of essential package lists and regional or international entities such as iDSI. All of these tools are funded by international agencies or donor agencies, such as the Bill and Melinda Gates Foundation, the World Health Organization, the World Bank, US bilateral agencies, and others.

A central coordinating entity in the global health architecture can help to serve as a repository for such tools for design benefit packages for universal health coverage. Indeed, the World Bank's classic World Development Report (1993), which introduced the first edition of the Disease Control Priorities project, made popular the use of ranking of interventions by cost-effectiveness. With the 30-year anniversary of the WDR, this review on the tools for identifying interventions for benefit package is a small contribution in this lineage of applied policy research.

While the WHO may have its own "skin in the game" by producing its own tool, there is also value in the WHO serving as the convener or coordinator of different benefit package tools that countries may benefit from. WHO has a potentially important role for delivering science, knowledge, and evidence (Fan, Glassman, & Guzman, 2023). Global policymakers may consider how to institutionalize this cost-effectiveness and priority setting function, including the function of developing tools for cost-effectiveness and priority setting, in an international agency such as the World Bank or the World Health Organization. An international agency can also help to deploy tools in the context of a country's health system and institutional and governance arrangements, as well as building capacity to use the tools in supporting decision-making.

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