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The Cost-Effectiveness of Health Aid

AN EXPLORATORY QUANTITATIVE ANALYSIS

Victoria Y. Fan, Brian S. Webster, Venkatesh Subramanian, Karen A. Grépin, David A. Watkins, and Joseph L. Dieleman

Abstract

One approach to development assistance for health, or health aid, emphasizes the *ex ante* selection of cost-effective health interventions, an approach that began with the World Development Report (1993) on *Investing in Health* and has since been adopted by the Effective Altruism community. But just how much of health aid is cost-effective? In this paper, we examine projects in the Organisation for Economic Co-operation and Development (OECD) Creditor Reporting System, the standard dataset that measures and characterizes development assistance for health, for the years 2019 to 2021, and count the number of projects that refer to interventions from a list of highly cost-effective interventions as defined by the Disease Control Priorities Project, third edition. This exploratory quantitative analysis indicates that 61% of projects used a key word/phrase of a cost-effective intervention. There were 11.9 interventions mapped per project on average. There is little evidence that donors tailor the set of interventions to country income levels by cost-effectiveness. Policymakers may benefit from reviewing the full portfolio of interventions covered by domestic and external resources.

WORKING PAPER 700 • AUGUST 2024

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The authors gratefully acknowledge comments from Justin Sandefur, Han Sheng Chia, Ranil Dissanayake, Austen Davis, Tom Drake, Kalipso Chalkidou, Ole Norheim, and seminar participants at the Center for Global Development.

Victoria Y. Fan, Brian S. Webster, Venkatesh Subramanian, Karen A. Grépin, David A. Watkins, and Joseph L. Dieleman. 2024. "The Cost-Effectiveness of Health Aid: An Exploratory Quantitative Analysis." CGD Working Paper 700. Washington, DC: Center for Global Development. https://www.cgdev.org/publication/cost-effectiveness-health-aid-exploratory-quantitative-analysis

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Introduction

Low- and middle-income countries seeking to improve the health of their nations are confronted with several challenges together: inflation and debt crises, stagnating levels of development assistance for health, lackluster performance on the Sustainable Development Goal for health, and growing calls to address excessive fragmentation in global health donor agency landscape[1] while the future of flagship vertical programs such as PEPFAR are questioned.[2–4]

One common approach for national policy makers to better manage resource constraints is to ensure health spending is more efficient. Efficiency can manifest in two forms – technical and allocative efficiency. While technical efficiency asks whether a given intervention is delivered at lowest cost, allocative efficiency asks whether the portfolio of interventions gives good value for money or good health for money, and whether investments can be shifted to more cost-effective interventions.[5,6,14] Hence, when resources are finite, policy makers are responsible for ensuring that every dollar spent yields the maximum possible health benefit for both economic and ethical reasons. Focus on cost-effectiveness has grown since the World Development Report 1993 on Investing in Health first identified a list of highly cost-effective health interventions.[7] The metric of cost-effectiveness is typically defined in terms of dollars per disability-adjusted life year (DALY) averted.

Parallel to these discussions on cost-effectiveness are debates on aid effectiveness and frameworks like the Paris Declaration on Aid Effectiveness, which have emphasized the need for better alignment, ownership, and accountability in aid delivery.[8] The Center for Global Development report, "When Will We Ever Learn?", followed by its subsequent report "Breakthrough to Policy Use" underscored the chronic challenge of evaluating the impacts and effectiveness, let alone cost-effectiveness, of aid interventions.[9,10] Past work by Fan et al. (2013) found that identifying the list of interventions for HIV/AIDS for the Global Fund was challenging, with only 35% of project grants identifying descriptions of interventions, regardless of cost-effective.[11] Past research has also shown that the health-aid portfolio was also unknown even to domestic policy makers in the country.[5,12] While in-depth case studies of agencies can reveal agency-specific findings on investments by intervention, questions remain about the cost-effectiveness of the overall portfolio across donor agencies and governments.

Assessing the global portfolio of health aid, also known as development assistance for health, is challenging. The OECD Creditor Reporting System (CRS) data is considered the de facto standard for tracking international aid, offering comprehensive and detailed information on aid projects, their objectives, and their financial allocations. The Institute for Health Metrics and Evaluation (IHME) has significantly contributed to understanding the financing of global health. By employing keyword analysis of OECD CRS project data, IHME has provided granular insights into how health aid is distributed across a variety of disease conditions, but not for the distribution of aid by the specific health intervention.[13] We are aware of one example in which the OECD CRS data was used to assess health interventions: Results for Development (R4D) used a keyword analysis in attempting

to identify which projects in the OECD CRS data supported nutrition interventions.[14] Variations in keyword analyses have been also applied to other health aid data, reliant on news reports.[15,16] There are no standard approaches to extracting information on interventions from aid data.

Despite the discourse on aid effectiveness and value for money in development and global health, there remains a significant gap: we still do not know how much of health aid is directed towards cost-effective interventions, as narrowly defined by the incremental cost-effectiveness ratio (ICER). Such a framing of the cost-effectiveness of a given intervention or portfolio of interventions ignores the broader context of decision-making. Nevertheless, there has been past research with league tables of ICERs by country, but the actual selection of interventions as supported by government or external financing remains unknown.[17,18] This paper does *not* argue that cost-effectiveness is the only criteria or a necessary criteria for making decisions on what should be financed by countries or donors. Rather, this working paper examines a descriptive rather than normative question about the extent to which health aid projects are cost-effective – and the ability of presently available data to shed light on this question.

Methods

This paper uses two data sources: the list of highly cost-effective interventions as defined by the Disease Control Priorities Project, third edition (DCP3); and the project data from the OECD Creditor Reporting System (CRS) for 2019 to 2021. Projects in the CRS are characterized by the extent to which they contain a key word/phrase from the DCP3. Analyses were conducted in Python Jupyter Notebooks and Stata.

A list of highly cost-effective interventions

The DCP3 includes a listing of 218 highly cost-effective interventions enumerated by Jamison et al.[19] and Annex 3F of Chapter 3, Volume 9 of the DCP3.[18] Henceforth, we refer to an intervention as one of these 218 highly cost-effective interventions. These interventions were categorized by Watkins et al. into four levels of relative cost-effectiveness, as measured by the intervention's ICER, a measure of dollars per disability-adjusted life year averted (or quality-adjusted life year gained) on a scale with 4 as most cost-effective and 1 as least cost-effective (with 0 as having insufficient evidence).[18] The DCP3's ICER thresholds for the groupings crudely corresponded to the World Bank country income classification: category 4 had an ICER less than $250, category 3 between $251 and $1300, category 2 between $1301 and $4100, and category 1 greater than $4100.

We manually generated a set of 881 key words/phrases, including acronyms and tenses, using this list of 218 interventions in English. For each intervention, a key word/phrase is given greater weight to the degree that it uniquely refers to that intervention. A key word/phrase that appears

in multiple interventions is assigned a lower weight because it is less able to uniquely identify a specific intervention. First, we calculate the frequency that each key word/phrase appears in all 218 interventions. Next, for each intervention, we rank the global frequency of the key words/phrases, such that a higher ordinal rank (i.e. a lower absolute number) indicates a higher frequency. We then divide the rank by the sum of the ranks for all key words/phrases for that intervention, thereby generating a weight for each key word/phrase.[i] For each intervention, weights for each key word/phrase range from 0 to 1.

Project data for health aid

We use project data, and specifically project descriptions, for health aid from 2019 to 2021 downloaded in July-August of 2023 from the OECD CRS data which covers bilateral, multilateral, and private development aid activities.[20] We include projects with the following sector codes: General Health (I.2.a), Basic Health (I.2.b), Non-Communicable Diseases (I.2.c), Population Policies or Programmes and Reproductive Health (I.3), and Water Supply and Sanitation (I.4). The years 2019 to 2021 were selected for this study because the DCP3 list was published in 2017–2018 and because project descriptions may not change as much over this three-year period of time, at least when compared to older project descriptions. Projects with fewer than four characters in their project description are discarded. Project descriptions in a language other than English were translated to English using Google Translate in August of 2023. Other variables used were donor name, donor agency name, recipient name, amounts disbursed in US dollars.

Mapping intervention keywords to project descriptions

For each project description, we identify each instance in which an intervention-associated key word/phrase appears, and by extension, its associated interventions. For each project, an intervention is assigned a match score by summing the weights of the associated key words/phrases that appear in the project description. A higher intervention match score indicates a combination of more key words/phrases present or more unique key words/phrases specific to that intervention. Each project could contain multiple interventions, and projects were assigned individual match scores for each intervention that key words/phrases indicated could be present.

Once mapping is completed, we tabulate the number of projects containing intervention matches by match score and by ICER category. We then compare these totals across the World Bank income classifications of the country recipients.

i For example, the DCP3 lists "Management of preterm labor with corticosteroids, including early detection at health centers" as a cost-effective intervention. We identify 4 key words from this intervention: preterm, labor, corticosteroids, and management. The word "management" is ranked first as it appears in the most cost-effective interventions, followed by "labor" (second) and "corticosteroids" (third). "Preterm" is ranked fourth, as it appears least frequently in the list of interventions. The grand total of the rankings for this intervention is 10 (1+2+3+4). For this intervention, the "management" is assigned a weight of 0.1 (1/10), and "preterm" a weight of 0.4 (4/10).

We also consider variations based on the profile of the donor. We regressed the total number of projects originating from a donor against the total value of projects from that donor within the OECD CRS and record the residual between the predicted total value of projects and the actual amount. The donors with the four lowest residuals (WHO, Spain, Switzerland, and Italy) were categorized as high frequency and low amount donors. Those with the highest residuals whose project total was below the median donor project total (Asian Infrastructure Investment Bank, Council of Europe Development Bank, Global Alliance for Vaccines and Immunization, and Mastercard Foundation) were categorized as low frequency and high amount. All others were classified as standard.

Additionally, we use linear regressions to establish if the share of projects containing intervention-matches from an individual donor is correlated with the number of projects originating from that donor (or the average length of the project descriptions from that donor).

Results

Of the 52,505 health aid projects identified in this study, 32,043 or 61% of all projects matched to at least one intervention with at least one associated key word/phrase, i.e. a match score greater than 0 – see Table 1.

The portfolio of projects was increasingly restricted by the highest intervention match score found within a given project. For a match score threshold of at least 0.4, the number of projects with a matched intervention drops to 7,490 or 23% of all projects that had at least one intervention match. Only 797 projects or 2% of all projects that matched had a match score at least 0.8. The distribution of matches by match score and by ICER category for individual years 2019–2021 of project data were similar (results not shown, available upon request). Notably, the COVID-19 pandemic occurred over the period of this data examined for this study (2020–21).

For convenience, the country recipients with project data over 2019–2021 are classified in Table 1 by their 2019 World Bank Income Classification. However, in the actual analysis, countries are classified by their contemporary World Bank Income Classification. In 2019, of the 136 countries, 28 were low-income, 50 were lower-middle, 53 were upper-middle, and 5 were high-income.

Of the 218 highly cost-effective interventions enumerated by DCP3, 203 interventions matched to at least one project with at least one key word/phrase. There were 15 interventions that did not match at all to any project – see Appendix 1. Of the 203 interventions with a matched project, 33% were classified as most cost-effective, i.e. category 4, followed by 18% in category 3, 10% in category 2, and 7% in category 1 (Table 1). There were 66 interventions labeled as lacking an ICER (Table 1).

TABLE 1. Summary statistics of health aid project data and mapped interventions, 2019–2021

Metric	N	%
Health aid projects	**52,505**	**100%**
Projects without intervention match	20,462	39%
Projects with at least one intervention match	32,043	61%
Projects with at least one intervention match		
Match score > 0	32,043	100%
Match score ≥ .2	27,821	87%
Match score ≥ .4	7,490	23%
Match score ≥ .6	3,538	11%
Match score ≥ .8	797	2%
Number of donors	130	...
Number of country recipients	143	...
Countries receiving project with intervention match	**136**	**100%**
Low-income countries (LIC)	28	21%
Lower-middle income countries (LMIC)	50	37%
Upper-middle income countries (UMIC)	53	39%
High-income countries (HIC)	5	4%
Cost-effective interventions	**218**	**100%**
Interventions without matched project	15	7%
Interventions with matched project (Score > 0)	203	93%
Interventions with matched project (Score > 0)	**203**	**100%**
Category 4 (<$251)	66	33%
Category 3 ($251–$1,300)	37	18%
Category 2 ($1,301–$4,100)	20	10%
Category 1 (>$4,100)	14	7%
Other	66	33%
Project-intervention matches by match score threshold		
Match score > 0	**380,357**	**100%**
Category 4 (<$251)	126,657	33%
Category 3 ($251–$1,300)	76,844	20%
Category 2 ($1,301–$4,100)	51,273	13%
Category 1 (>$4,100)	26,683	7%
Other	98,900	26%
Match score ≥ .4	**12,223**	**100%**
Category 4 (<$251)	5,355	44%
Category 3 ($251–$1,300)	951	8%
Category 2 ($1,301–$4,100)	2,053	17%
Category 1 (>$4,100)	1,169	10%
Other	2,695	22%

TABLE 1. (Continued)

Metric	N	%
Match score ≥ .8	**836**	**100%**
Category 4 (<$251)	153	18%
Category 3 ($251–$1,300)	79	9%
Category 2 ($1,301–$4,100)	469	56%
Category 1 (>$4,100)	9	1%
Other	126	15%

Notes: Country recipients excluded regional recipients but included administrative units that lacked a World Bank income classification.

As multiple interventions could be mapped to a given project, we also examined occurrences of individual intervention matches within the projects examined. Without match score restrictions, there were 380,357 project-intervention matches, or 11.9 interventions mapped per project on average (Table 1).

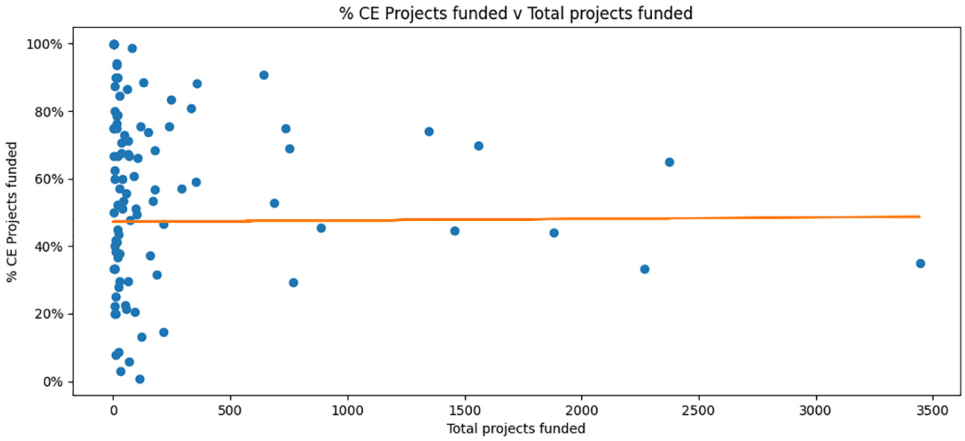
Project-intervention matches were examined by the ICER category and by match score threshold. In the sample of all projects with at least one match, the majority of matches were classified as category 4 (33%) or category 3 (20%) – see Table 1. Another 20% were classified as category 2 (13%) or category 1 (7%) or were classified under the other category (26%). A comparable distribution across these categories is also observed when restricting the project-intervention matches with a match score of at least 0.4. Because the distribution across the ICER categories changes with the match score threshold applied, these results may not be explained solely by the composition of the intervention key words/phrases.

Increases in the match score can be interpreted in two ways: the project descriptions have an intervention with more key words or phrases; or the key words or phrases are more specific and unique to that intervention. When the project data are restricted to a match score of at least 0.8, the distribution along the ICER category shifts to those in category 2, 56% of all project-intervention matches (Table 1).

Next, we examined project-intervention matches by ICER category of the intervention *and* the income classification of the country recipient in addition to increasing match scores – see Appendix 2. The distribution of project-intervention matches by country recipient income classification is similar to the overall distribution for all countries, especially at lower match score thresholds. We further stratified the project-intervention matches by a classification of donor model. There is little variation in the distribution of project-intervention matches by donor model.

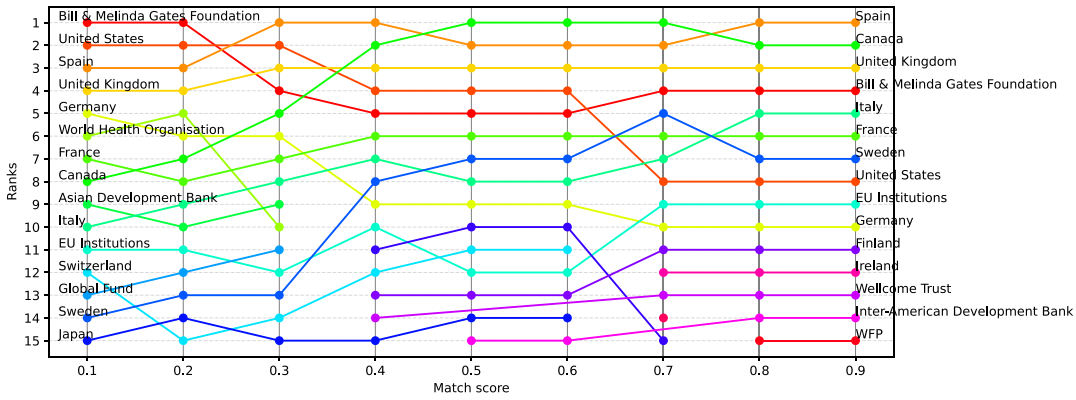
Next, we analyzed the correlation between the number of projects by donor and the percentage of projects which had an intervention match, and found zero correlation (see Figure 1), regardless of match score threshold. We also found a positive correlation between the length of the project description and the percentage of projects with an intervention match (see Appendix 3).

FIGURE 1. Percentage of cost-effective projects and total number of projects funded by donor country



We proceeded to examine the ranking of individual donors by the number of projects with an intervention match using a progressively larger match score, revealing the changing distribution of donors – see Figure 2. Using a relatively generous match score of at least 0.1, the Gates Foundation, USA, and Spain have the largest number of projects that include cost-effective interventions. However, as the sample of projects is restricted with a higher match score indicating higher intervention specificity, the ranking changes. In moving from a match score of at least 0.1 to 0.9, the US drops from second to eighth, while Canada jumps from eighth to second, Italy from tenth to fifth, and Sweden from fourteenth to seventh.

FIGURE 2. Donors ranked by number of cost-effective projects and by match score



We rank-ordered donor agencies, for which there are multiple agencies per donor, using the number of projects with match scores ≥ 0.8 and examined the distribution of the project-intervention matches by cost-effectiveness. See Table 2. Global Affairs Canada, US Agency for International Development, the Bill & Melinda Gates Foundation, Municipalities of Spain, and the International Development Research Centre of Canada were the top five donor agencies in terms of numbers of projects with a match score of at least 0.8. These scores do not account for the distribution in the interventions across the ICER category (see Table 2 for donor breakdown by ICER category).

TABLE 2. Donor agencies ranked by number of projects with a match score ≥ 0.8

Rank	Government Agency/ Organization	Country	Projects with Intervention Match ≥ .8	Project Level Interventions with Matches ≥ .8	ICER Category 4 (<$251)		ICER Category 3 ($251–$1,300)		ICER Category 2 ($1,301–$4,100)		ICER Category 1 (>$4,100)		Other	
					n	%	n	%	n	%	n	%	n	%
Total Dataset			**797**	**836**	**153**	**18.3%**	**79**	**9.4%**	**469**	**56.1%**	**9**	**1.1%**	**126**	**15.1%**
1	Global Affairs Canada	Canada	148	155	15	9.7%	4	2.6%	132	85.2%	0	0.0%	4	2.6%
2	Municipalities	Spain	60	63	10	15.9%	6	9.5%	36	57.1%	0	0.0%	11	17.5%
3	Agency for International Development	United States	55	55	18	32.7%	3	5.5%	24	43.6%	0	0.0%	10	18.2%
3	Bill & Melinda Gates Foundation	United States*	55	56	6	10.7%	7	12.5%	1	1.8%	0	0.0%	42	75.0%
5	Department for Business, Innovation and Skills	United Kingdom	37	46	16	34.8%	8	17.4%	9	19.6%	5	10.9%	8	17.4%
6	International Development Research Centre	Canada	34	38	9	23.7%	2	5.3%	21	55.3%	1	2.6%	5	13.2%
7	Wellcome Trust	United Kingdom*	31	34	8	23.5%	3	8.8%	6	17.6%	2	5.9%	15	44.1%
8	Swedish International Development Authority	Sweden	30	33	3	9.1%	1	3.0%	29	87.9%	0	0.0%	0	0.0%
9	Ministry of Foreign Affairs	Finland	22	23	2	8.7%	0	0.0%	21	91.3%	0	0.0%	0	0.0%
10	Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung	Germany	18	18	1	5.6%	0	0.0%	17	94.4%	0	0.0%	0	0.0%
11	Charity Projects Ltd (Comic Relief)	United Kingdom*	17	17	8	47.1%	0	0.0%	9	52.9%	0	0.0%	0	0.0%
12	Swiss Agency for Development and Co-operation	Switzerland	13	13	1	7.7%	1	7.7%	11	84.6%	0	0.0%	0	0.0%
12	French Development Agency	France	13	13	6	46.2%	0	0.0%	6	46.2%	0	0.0%	1	7.7%

TABLE 2. (Continued)

Rank	Government Agency/ Organization	Country	Projects with Intervention Match ≥ .8	Project Level Interventions with Matches ≥ .8	ICER Category 4 (<$251)		ICER Category 3 ($251–$1,300)		ICER Category 2 ($1,301–$4,100)		ICER Category 1 (>$4,100)		Other	
					n	%	n	%	n	%	n	%	n	%
14	Spanish Agency for International Development Co-operation	Spain	12	13	1	7.7%	1	7.7%	9	69.2%	0	0.0%	2	15.4%
15	Ministry of Foreign Affairs	Japan	11	11	3	27.3%	1	9.1%	7	63.6%	0	0.0%	0	0.0%
16	Earmarked fiscal flows to NGOs & religious organisations	Italy	10	10	1	10.0%	5	50.0%	3	30.0%	0	0.0%	1	10.0%
17	Department of Foreign Affairs	Ireland	9	10	4	40.0%	0	0.0%	6	60.0%	0	0.0%	0	0.0%
17	Australian Government	Australia	9	9	1	11.1%	0	0.0%	8	88.9%	0	0.0%	0	0.0%
17	Comunidad Autónoma de Andalucía	Spain	9	9	1	11.1%	0	0.0%	7	77.8%	0	0.0%	1	11.1%
17	Comunidad Autónoma de Galicia	Spain	9	9	0	0.0%	1	11.1%	8	88.9%	0	0.0%	0	0.0%
17	Ministry of Foreign Affairs	France	9	9	4	44.4%	0	0.0%	5	55.6%	0	0.0%	0	0.0%
17	The Swedish Research Council	Sweden	9	9	4	44.4%	1	11.1%	2	22.2%	0	0.0%	2	22.2%
23	Norwegian Agency for Development Co-operation	Norway	8	8	0	0.0%	0	0.0%	7	87.5%	0	0.0%	1	12.5%
23	Ministry of Foreign Affairs of the Netherlands	Netherlands	8	8	0	0.0%	0	0.0%	6	75.0%	0	0.0%	2	25.0%
23	Comunidad Foral de Navarra	Spain	8	8	1	12.5%	0	0.0%	7	87.5%	0	0.0%	0	0.0%
26	Department for International Development	United Kingdom	6	6	1	16.7%	4	66.7%	1	16.7%	0	0.0%	0	0.0%

Notes: Agency totals are limited to projects with only one donor and one agency. Of the 797 projects examined, 13 involved multiple agencies, one involved multiple donors, and one involved multiple agencies and donors. * Denote NGOs, philanthropies, or other organizations not affiliated with the national government.

Excluding philanthropies and private foundations, the number of government agencies per donor country varied significantly (Table 3). Spain had the largest number of government agencies that had at least one intervention match. Of the 28 unique Spanish agencies with an intervention match, 15 of these agencies had a match of at least 0.8. In contrast, Germany had 23 separate agencies listed on projects with an intervention match, but only 3 with matches of 0.8 or higher. The typical donor had between 1 and 3 distinct agencies with at least 1 match, of which 1 agency may have had a match score of least 0.8.

Donors that had a higher number of agencies with matches also had a higher number of agencies with match scores of 0.8 or higher (Pearson correlation coefficient 0.7977). Governments listed in Figure 2 that rose in ranking as match scores were restricted also had a higher share of their agencies receive a match of at least 0.8. For the national governments whose ranking rose in Figure 2, half of their agencies on average recorded at least 1 match of least 0.8. Among national governments whose ranking fell in Figure 2, only a quarter of agencies on average recorded a match of at least 0.8. Table 3 lists all government agencies with a match and with a match score of at least 0.8.

TABLE 3. Number of government agencies per donor country with an intervention match

Donor	Donor Agencies with a Match	Donor Agencies with a Match ≥ .8
Spain	28	15
Germany	23	3
United States	12	3
United Kingdom	11	7
France	11	3
Italy	10	4
United Arab Emirates	9	0
Austria	8	3
Lithuania	7	0
Saudia Arabia	6	2
Czech Republic	6	1
Qatar	6	0
Slovenia	6	0
Canada	5	4
Korea	5	2
Norway	5	2
Switzerland	5	2
Hungary	5	1
Portugal	5	1
Slovak Republic	5	1
Sweden	4	2
Poland	4	1
Romania	4	1
Belgium	3	2

TABLE 3. (Continued)

Donor	Donor Agencies with a Match	Donor Agencies with a Match ≥ .8
EU Institutions	3	2
Finland	3	1
Japan	3	1
Croatia	3	0
Greece	3	0
Kuwait	3	0
Latvia	3	0
Iceland	2	1
Ireland	2	1
Türkey	2	0
Australia	1	1
Denmark	1	1
Netherlands	1	1
Cyprus	1	0
Dutch Postcode Lottery	1	0
Estonia	1	0
German Postcode Lottery	1	0
Liechtenstein	1	0
Luxembourg	1	0
Malta	1	0
Monaco	1	0
New Zealand	1	0
Swedish Postcode Lottery	1	0
Thailand	1	0

Notes: Limited to projects with only one donor and one agency. Of the 797 projects examined, 13 involved multiple agencies, one involved multiple donors, and one involved multiple agencies and donors.

Discussion

This study mapped a list of highly cost-effective interventions to a list of health aid projects. We find evidence that donors do include highly cost-effective interventions in the majority of health projects. However, the share of projects with a match drops as the match score threshold is increased. Few projects have matches with scores of least 0.8.

We emphasize that the findings in this paper are descriptive and not normative; we do not make any claims that donors or countries should necessarily invest in cost-effective interventions. The usual disclaimers about economic evaluation hold: cost-effectiveness is only one criterion to inform decision-making.

This paper does not make judgements or take an ideological stance about the 61% of projects with cost-effective interventions. Those projects which lack cost-effective interventions may be oriented towards health systems, sector-wide approaches, primary care, or other integrated approaches. One could argue that integrated approaches offer more country ownership in determining what interventions are covered and that elevating the importance of a list of cost-effective interventions is a form of micro-management. The counterargument is that the lack of cost-effective interventions in project descriptions may merit an examination of their value for money.

The estimates from this paper may serve as a starting point for a conversation about how international choices are interfacing with national choices, and a more difficult conversation about how choices should be made. This paper focuses on the cost-effectiveness of development assistance for health, and should be placed in the broader context of the country's perspective for decision making and investment using all financing sources (i.e. including domestic sources), potentially even across all sectors (not just health). Ultimately, we default to the principle of country ownership and that countries should be empowered to lead and hold these discussions themselves, not the other way around.

There is little evidence that donors tailor the interventions in their projects to the income of the recipient countries. Little to no variation exists in the ICER categorization of intervention matches based on the World Bank income group classification of the recipient. The share of matches to an intervention with an ICER of between $1,301 and $4,100, for instance, is about 13–14% regardless of country income level (Appendix 2). In other words, donors may be advancing one-size-fits-all approaches and interventions to countries, regardless of income level. That said, when matches are restricted to those with scores of at least 0.8, the majority of cost-effective interventions are those that are relatively less cost-effective (categories 2 and 1), indicating that perhaps donors are specializing in interventions at higher rather than lower ICERs (case in point would be HIV/AIDS).

This paper has several limitations. We did not examine the ICER in continuous terms but rather kept to the categories provided by the DCP3. Future research could benefit from examining the ICER in a continuous, non-aggregated form. Another limitation of this study is that our match scoring system does not directly measure the probability that a project description with a keyword match in fact contains a specific policy intervention listed in the DCP3. Future research could embark on the application of generative artificial intelligence to read and code project descriptions. Future ground-truthing and validation study would involve a manual review of project descriptions against real world country portfolios in order to assess the degree to which false positives and false negatives are present within key word/phrase matches. Such a validation study would require in-depth collaboration with willing country policy makers in reviewing donor grants as well as the project descriptions. The validation study could also establish the real-world meaning of the scores, beyond the general sense that a higher score has more keywords and more uniquely identifying keywords.

Although the OECD CRS is the authoritative data source on health aid projects, the data provides high-level descriptions of projects. These project descriptions are not standardized and vary by language, phraseology, and level of detail used potentially idiosyncratic to each donor. Our ability to detect and identify key words/phrases of highly cost-effective interventions was conditional on the quantity and quality of project descriptions. The OECD could consider how the CRS can be adapted and revised, such as inclusion of the DCP3 list that can be selected for each project, or alternatives to revising and expanding the purpose codes.

This paper also deliberately does not assign a dollar amount of development assistance that is cost-effective. Doing so would require sophisticated accounting rules about how to divide up the portion of a project amount across multiple interventions. We did not pursue this approach because of the limitations in making determinations of what is cost-effective (i.e. a validation study is first necessary).

Future research would benefit from examining a recipient country's portfolio of cost-effective interventions (not the donor portfolio) and its distribution by ICER category. Recent work by Drake et al has argued that domestic finances should support essential health services, whereas health aid should primarily be used to expand the package of affordable services at the margin, i.e. interventions which are less cost-effective than the essential services.[21] This approach contrasts with the view that donors should necessarily fund the most cost-effective interventions, but our study also finds that donors mostly do not fund the interventions with lowest ICERs at present. Thus, calls for health-aid portfolios to cover less cost-effective interventions may be unnecessary.

Nevertheless, these normative questions should follow the descriptive questions. At present, this paper concludes that it remains difficult to assess what interventions are funded, let alone whether those interventions are cost-effective for donors. Past research has also shown that knowing the portfolio of interventions is also challenging even to domestic policy makers in the country, which may attributable in part to the reliance on international contractors.[12,22,23] Our research corroborates such past studies about the lack of transparency about what interventions are in fact covered.

This paper is agnostic about whether it is donors or countries that should pay for interventions which are more cost-effective. Any decision about how to share costs between countries and donors, however, should be made with a clear understanding of the current portfolio. Other considerations include questions about sustainability and aid fungibility, that is, whether countries reduce spending on health if they receive more health aid.[24,25]

References

1. *The Lusaka Agenda: Conclusions of the Future of Global Health Initiatives Process – FGHI*. Future of Global Health Initiatives; 2023:7. Accessed August 13, 2024. https://futureofghis.org/final-outputs/lusaka-agenda/
2. Moss K, Kates J. PEPFAR's Short-Term Reauthorization Sets an Uncertain Course for Its Long-Term Future. KFF. March 27, 2024. Accessed August 13, 2024. https://www.kff.org/policy-watch/pepfars-short-term-reauthorization-sets-an-uncertain-course-for-its-long-term-future/
3. Fan V, Gupta S. Five Ideas for the Future of Global Health Financing: The Road Not Yet Taken. Center for Global Development Development Blog. June 5, 2024. Accessed August 14, 2024. https://www.cgdev.org/blog/five-ideas-future-global-health-financing-road-not-yet-taken
4. Fan V, Gupta S. What's Rising Debt Got to Do With Health Spending? Center for Global Development Blog. doi:10.13140/RG.2.2.12386.20167
5. Glassman A, Fan V, Over M, Silverman R, McQueston K, Duran D. *More Health for the Money. Putting Incentives to Work for the Global Fund and Its Partners.* Center for Global Development; 2013. http://www.cgdev.org/sites/default/files/More-Health-for-the-Money.pdf
6. Glassman A, Chalkidou K. Priority-setting in health: building institutions for smarter public spending. *Wash DC Cent Glob Dev*. Published online 2012.
7. World Bank. *World Development Report 1993: Investing in Health*. The World Bank; 1993. Accessed May 12, 2018. http://documents.worldbank.org/curated/en/468831468340807129/World-development-report-1993-investing-in-health
8. OECD. *Paris Declaration on Aid Effectiveness*. Organisation for Economic Co-operation and Development; 2005. Accessed August 14, 2024. https://www.oecd-ilibrary.org/development/paris-declaration-on-aid-effectiveness_9789264098084-en
9. The Evaluation Gap Working Group. *When Will We Ever Learn? Improving Lives Through Impact Evaluation*. Center for Global Development; 2006. Accessed July 18, 2024. https://www.cgdev.org/publication/when-will-we-ever-learn-improving-lives-through-impact-evaluation
10. Kaufman J, Glassman A, Levine R, Madan Keller J. *Breakthrough to Policy Use*. Center for Global Development; 2022:34. Accessed August 14, 2024. https://pubs.cgdev.org/evidence-to-impact/
11. Fan V, Duran D, Silverman R, Glassman A. *HIV/AIDS Intervention Packages in Five Countries: A Review of Budget Data*. Center for Global Development; 2013. Accessed November 3, 2014. http://www.cgdev.org/publication/hivaids-intervention-packages-five-countries-review-budget-data

12. Committee on the Outcome and Impact Evaluation of Global HIV/AIDS Programs Implemented Under the Lantos-Hyde Act of 2008, Board on Global Health, Board on Children, Youth, and Families, Institute of Medicine. *Evaluation of PEPFAR*. National Academies Press (US); 2013. Accessed August 13, 2024. http://www.ncbi.nlm.nih.gov/books/NBK207013/

13. Institute for Health Metrics and Evaluation (IHME). Financing Global Health | Institute for Health Metrics and Evaluation. 2024. Accessed July 18, 2024. https://www.healthdata.org/data-tools-practices/interactive-visuals/financing-global-health

14. Abbe C, McCarter MD, Nyaku A. *Tracking Aid for the WHA Nutrition Targets: Progress toward the Global Nutrition Goals between 2015 to 2021*. Results for Development; 2023. Accessed July 18, 2024. https://r4d.org/resources/tracking-aid-wha-nutrition-targets-global-spending-roadmap-better-data/

15. Guo B, Fan V, Strange A, Grépin KA. Understanding China's shifting priorities and priority-setting processes in development assistance for health. *Health Policy Plan*. 2024;39(Suppl 1): i65-i78. doi:10.1093/heapol/czad095

16. Grépin KA, Fan VY, Shen GC, Chen L. China's role as a global health donor in Africa: what can we learn from studying under reported resource flows? *Glob Health*. 2014;10(1):84. doi:10.1186/s12992-014-0084-6

17. Silke F, Earl L, Hsu J, et al. Cost-effectiveness of interventions for HIV/AIDS, malaria, syphilis, and tuberculosis in 128 countries: a meta-regression analysis. *Lancet Glob Health*. 2024;12(7):e1159–e1173. doi:10.1016/S2214-109X(24)00181-5

18. Watkins DA, Jamison DT, Mills A, et al. Universal Health Coverage and Essential Packages of Care. In: Jamison DT, Gelband H, Horton S, et al., eds. *Disease Control Priorities: Improving Health and Reducing Poverty*. 3rd ed. The International Bank for Reconstruction and Development / The World Bank; 2017. Accessed September 9, 2022. http://www.ncbi.nlm.nih.gov/books/NBK525285/

19. Jamison DT, Alwan A, Mock CN, et al. Universal health coverage and intersectoral action for health: key messages from Disease Control Priorities, 3rd edition. *Lancet Lond Engl*. 2018;391(10125):1108–1120. doi:10.1016/S0140-6736(17)32906-9

20. OECD. *Technical Guide to Terms and Data in the Creditor Reporting System (CRS) Aid Activities Database – OECD*. Accessed November 22, 2015. http://www.oecd.org/dac/stats/crsguide.htm

21. Drake T, Regan L, Baker T. *Reimagining Global Health Financing: How Refocusing Health Aid at the Margin Could Strengthen Health Systems and Futureproof Aid Financial Flows*. Center for Global Development; 2023:26. Accessed July 18, 2024. https://www.cgdev.org/publication/reimagining-global-health-financing-how-refocusing-health-aid-margin-could-strengthen

22. Fan V, Silverman R, Duran D, Glassman A. The financial flows of PEPFAR: a profile. *Cent Glob Dev Policy Pap*. 2013;27.

23. Fan V, Silverman R. What We're Looking For in the IOM Report on PEPFAR. Center for Global Development Blog.

24. Dieleman JL, Hanlon M. Measuring the displacement and replacement of government health expenditure. *Health Econ*. 2014;23(2):129–140. doi:10.1002/hec.3016

25. Dieleman JL, Graves CM, Hanlon M. The Fungibility of Health Aid: Reconsidering the Reconsidered. *J Dev Stud*. 2013;49(12):1755–1762. doi:10.1080/00220388.2013.844921

Appendix 1. DCP3 interventions without a project intervention match by ICER category

Intervention	ICER Category
Management of refractory febrile illness including etiologic diagnosis at reference microbiological laboratory	3
Management of septic arthritis	3
Pneumococcus vaccination	3
Tube thoracostomy	3
Cataract extraction and insertion of intraocular lens	4
Provision of aspirin for all cases of suspected acute myocardial infarction	4
Suturing laceration	4
Trauma laparotomy	4
Colostomy	Other
Dental extraction	Other
Elective surgical repair of common orthopedic injuries (for example, meniscal and ligamentous tears) in individuals with severe functional limitation	Other
Ensure influenza vaccine security at national and subnational level	Other
Escharotomy or fasciotomy	Other
Specialty pathology services	Other
Tubal ligation	Other

Appendix 2. Project-intervention matches by cost-effectiveness category and by income classification of country recipient

Sample of Project-Intervention Matches by Match Score	All Project-Intervention Matches		ICER Category									
			Category 4 (<$251)		Category 3 ($251–$1,300)		Category 2 ($1,301–$4,100)		Category 1 (>$4,100)		Other	
Project Level Match	**N**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Project Level Intervention Match (All)	380,357	100%	126,657	33.3%	76,844	20.2%	51,273	13.5%	26,683	7.0%	98,900	26.0%
Project Level Intervention Match (Score ≥ .4)	12,223	100%	5,355	43.8%	951	7.8%	2,053	16.8%	1,169	9.6%	2,695	22.0%
Project Level Intervention Match (Score ≥ .8)	836	100%	153	18.3%	79	9.4%	469	56.1%	9	1.1%	126	15.1%
By Recipient Income Category												
Project Level Match (All)												
Low Income Countries	87,261	100%	28,864	33.1%	16,913	19.4%	12,142	13.9%	6,201	7.1%	23,141	26.5%
Lower-Middle Income Countries	143,390	100%	46,448	32.4%	28,766	20.1%	20,126	14.0%	10,460	7.3%	37,590	26.2%
Upper-Middle Income Countries	62,836	100%	20,486	32.6%	13,106	20.9%	8,552	13.6%	4,642	7.4%	16,050	25.5%
High Income Countries	611	100%	204	33.4%	133	21.8%	81	13.3%	50	8.2%	143	23.4%
Unknown Recipient	34,754	100%	12,869	37.0%	7,485	21.5%	3,758	10.8%	1,874	5.4%	8,768	25.2%
No Income Group	803	100%	245	30.5%	170	21.2%	119	14.8%	73	9.1%	196	24.4%
Multiple Recipients	50,702	100%	17,541	34.6%	10,271	20.3%	6,495	12.8%	3,383	6.7%	13,012	25.7%
Project Level Match (Score ≥ .4)												
Low Income Countries	3,377	100%	1,640	48.6%	252	7.5%	506	15.0%	285	8.4%	694	20.6%
Lower-Middle Income Countries	4,460	100%	1,974	44.3%	338	7.6%	763	17.1%	453	10.2%	932	20.9%
Upper-Middle Income Countries	1,385	100%	574	41.4%	111	8.0%	257	18.6%	166	12.0%	277	20.0%
High Income Countries	19	100%	13	68.4%	1	5.3%	1	5.3%	3	15.8%	1	5.3%
Unknown Recipient	1,051	100%	406	38.6%	98	9.3%	145	13.8%	95	9.0%	307	29.2%
No Income Group	27	100%	10	37.0%	2	7.4%	3	11.1%	5	18.5%	7	25.9%
Multiple Recipients	1,904	100%	738	38.8%	149	7.8%	378	19.9%	162	8.5%	477	25.1%

(Continued)

Sample of Project-Intervention Matches by Match Score	All Project-Intervention Matches		ICER Category									
			Category 4 (<$251)		Category 3 ($251–$1,300)		Category 2 ($1,301–$4,100)		Category 1 (>$4,100)		Other	
Project Level Match (Score ≥ .8)												
Low Income Countries	215	100%	46	21.4%	5	2.3%	143	66.5%	0	0.0%	21	9.8%
Lower-Middle Income Countries	303	100%	54	17.8%	44	14.5%	168	55.4%	4	1.3%	33	10.9%
Upper-Middle Income Countries	81	100%	11	13.6%	10	12.3%	50	61.7%	2	2.5%	8	9.9%
High Income Countries	0	100%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Unknown Recipient	84	100%	10	11.9%	7	8.3%	19	22.6%	2	2.4%	46	54.8%
No Income Group	1	100%	0	0.0%	0	0.0%	1	100.0%	0	0.0%	0	0.0%
Multiple Recipients	152	100%	32	21.1%	13	8.6%	88	57.9%	1	0.7%	18	11.8%
By Donor Model												
Project Level Match (All)												
Standard Model	297,067	100%	100,295	33.8%	60,627	20.4%	39,579	13.3%	20,530	6.9%	76,036	25.6%
High Frequency, Low Amount Model	80,447	100%	25,427	31.6%	15,624	19.4%	11,330	14.1%	5,937	7.4%	22,129	27.5%
Low Frequency, High Amount Model	700	100%	194	27.7%	157	22.4%	82	11.7%	49	7.0%	218	31.1%
Multiple Donors	2,143	100%	741	34.6%	436	20.4%	282	13.2%	167	7.8%	517	24.1%
Project Level Match (Score ≥ .4)												
Standard Model	9,087	100%	3,981	43.8%	797	8.8%	1,381	15.2%	781	8.6%	2,147	23.6%
High Frequency, Low Amount Model	3,038	100%	1,341	44.1%	139	4.6%	661	21.8%	373	12.3%	524	17.3%
Low Frequency, High Amount Model	13	100%	1	7.7%	3	23.1%	0	0.0%	2	15.4%	7	53.9%
Multiple Donors	85	100%	32	37.7%	12	14.1%	11	12.9%	13	15.3%	17	20.0%
Project Level Match (Score ≥ .8)												
Standard Model	668	100%	132	19.8%	60	9.0%	362	54.2%	9	1.4%	105	15.7%
High Frequency, Low Amount Model	163	100%	20	12.3%	17	10.4%	105	64.4%	0	0.0%	21	12.9%
Low Frequency, High Amount Model	1	100%	0	0.0%	1	100%	0	0.0%	0	0.0%	0	0.0%
Multiple Donors	4	100%	1	25.0%	1	25.0%	2	50.0%	0	0.0%	0	0.0%

Appendix 3. Share of cost-effective projects and the length of project description