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Examining aid fragmentation and collaboration opportunities in Cambodia's health sector

Suyeon Lee[1†] and Eunice Y. Park[2*†]

Abstract

Background Cambodia's health sector faces significant challenges exacerbated by aid fragmentation, where development aid is dispersed among numerous small, uncoordinated projects. This study examines the distribution of health sector aid among Cambodia's principal donors to identify priorities, overlaps, and potential collaboration opportunities, addressing the urgent need for aid efficiency and alignment with national health priorities.

Methods Utilizing OECD datasets and the Herfindahl-Hirschman Index (HHI) for the years 2010–2021, this study quantifies aid fragmentation within Cambodia's health sector. It analyzes aid allocations from the top five donors—United States, Australia, South Korea, Japan, and Germany—across various health projects and initiatives, evaluating the extent of fragmentation and identifying areas for potential donor collaboration.

Results This study's findings highlight a pervasive issue of aid fragmentation within Cambodia's health sector, evident through the sector's low HHI score. This indicates a widespread distribution of aid across numerous small-scale initiatives, rather than targeted, unified efforts. A notable example includes Japan and Korea, which exhibit lower HHI scores, indicating a more pronounced fragmentation in their aid allocation. These countries' contributions are spread across various sectors without a dominant focus, contrasting with the United States' significant dedication to infectious disease control. However, beyond this specific area, the US's aid distribution across other priority health areas shows signs of fragmentation. This scattered approach to aid allocation, even amidst instances of focused support, illustrates the overarching challenge of aligning donor contributions with the holistic needs of Cambodia's health infrastructure.

Conclusions This investigation highlights the critical need for enhanced collaboration and strategic harmonization among international donors to mitigate aid fragmentation in Cambodia's health sector. It underscores the importance of adopting integrated and priority-aligned aid strategies to improve the efficiency and impact of health aid. By fostering synergistic partnerships and harmonizing donor efforts, there is a potential to create a more cohesive support framework that resonates with Cambodia's comprehensive health requirements and contributes to sustainable health outcomes. Such harmonization not only aligns with Sustainable Development Goal 3 by

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optimizing health services and outcomes but also strengthens global partnerships under Sustainable Development Goal 17, fostering a unified approach to international development.

Keywords Aid fragmentation, Donor proliferation, Donor coordination, Health sector aid, Cambodia

Introduction

In the domain of international development aid, fragmentation presents a notable challenge, characterized by the dispersal of resources across a multitude of small, uncoordinated projects across various sectors [1]. Notably, a 2022 World Bank analysis reaffirms that fragmentation continues unabated, with profound impacts on sectors that benefit from coordinated and holistic approaches [2]. The health sector stands out in this context, not only for its intrinsic connection to public health outcomes and national development but also for its complex requirements. Successful health interventions often intertwine with elements of education, infrastructure, and governance, emphasizing the need for comprehensive and integrated approaches to effect sustainable health improvements. Thus, scrutinizing how aid is coordinated within the health sector is paramount, as collaborative and cross-disciplinary actions are key to realizing significant advancements in public health systems and enhancing overall resilience.

The concept of aid fragmentation is often viewed negatively, linked to consequences like increased transaction costs, administrative burdens, loss of local expertise, and unclear donor responsibilities [2–5]. Yet, some researchers, including [6], suggest that fragmentation can have benefits, arguing it introduces diverse perspectives that promote creativity and policy innovation, potentially aiding recipient nations. This is supported by literature suggesting that a variety of donor networks can expose recipient countries to a wider range of ideas and solutions [7, 8], and may offer a form of insurance against aid fluctuations, while also fostering competition among donors and enhancing the bargaining power of recipient countries [9–11].

Nonetheless, the presence of numerous donors, each with unique objectives and methodologies, introduces significant coordination challenges [12, 13]. This necessitates a consolidation of projects to align with coherent national development strategies. Effective coordination among donors is essential for aligning aid with the recipient government's priorities and maximizing resource efficiency. When aid is well-coordinated and utilizes local systems, it can strengthen public sector capacity and improve service delivery [14]. However, the task of overcoming aid fragmentation, complicated by the emergence of new donors like China and Russia, remains daunting [15, 16], posing a complex challenge to achieving cohesive and effective aid strategies.

The concept of 'Harmonization' first outlined in the Rome Declaration on Harmonization (2003), was further articulated in the Paris Declaration of 2005 to mitigate the adverse effects of aid fragmentation such as elevated transaction costs and excessive administrative burdens on recipients [5]. This initiative set the stage for the Accra Agenda for Action (2008), which promoted enhanced donor complementarity and strategic division of labor. These principles were reaffirmed and expanded upon in the Busan Partnership for Effective Development Co-operation in 2011 and the establishment of the Global Partnership for Effective Development Co-operation in 2012. Together, these frameworks underscore the ongoing commitment to improving aid effectiveness through better coordination and partnership, a commitment echoed in Sustainable Development Goal 17 [18]. Specifically, Targets 17.16 and 17.17 of SDG 17 aim to enhance the global partnership for sustainable development and encourage effective public, public-private, and civil society partnerships. These targets are vital for mobilizing and sharing knowledge, expertise, technology, and financial resources to support the achievement of the SDGs, particularly in developing countries. Despite global consensus on the importance of harmonization, significant challenges remain in translating these policies into effective practice, highlighting gaps in donor coordination and implementation [2, 5, 17, 18].

Achieving harmonization within the health sector is notably challenging due to the strategic interests of high-income countries. These interests often prioritize health aid that addresses direct threats to their own populations, particularly in the context of a globally interconnected environment. The response to the COVID-19 pandemic highlighted this trend, with a significant portion of health aid being channeled towards the prevention and treatment of communicable diseases that pose international risks, occasionally at the expense of aligning with the healthcare priorities of recipient countries. The strategic misalignment between donors' interests and the health priorities of recipient countries often contradicts the global commitments advocated by the Universal Health Coverage (UHC) Partnership [19–22]. This partnership emphasizes the alignment of global health aid with national health systems to ensure comprehensive coverage that is responsive to the genuine health needs of populations. Similarly, principles derived from the Paris Declaration on Aid Effectiveness and the Accra Agenda for Action advocate for aligning with country priorities, utilizing local systems to mitigate aid fragmentation, and

fostering transparency and mutual accountability among stakeholders. By failing to align aid with the recipient countries' health priorities, donors inadvertently undermine these global commitments.

This study extends beyond documenting the existence of aid fragmentation in the Cambodian health sector. It proactively seeks to identify and articulate specific collaborative opportunities among leading donors, aiming to forge a more unified and impactful approach to health aid delivery. Previous research [16, 23] has indeed acknowledged the fragmentation dilemma; however, this study takes one step further by uncovering practical strategies at enhancing donor coordination. The ultimate goal is to propose strategies that enhance the impact of aid, aligning with both the national priorities of Cambodia and the broader goals of donor harmonization.

These objectives are pursued with an understanding that effective aid deployment can significantly influence health outcomes and that harmonization and alignment are indispensable to this process. The findings from this analysis are intended to serve as a comprehensive guide for international donors and the Cambodian government, highlighting opportunities for synergistic partnerships and better-coordinated aid strategies in the health sector.

Aid fragmentation in Cambodia

Cambodia stands out for its significant reliance on official development assistance (ODA), ranking as one of the most aid-dependent nations among developing countries (refer to Table 1). From 1992 to 2021, the country received over US$22 billion in official development assistance (ODA), positioning it as the world's second-largest per capita recipient of ODA. In 2020, the per capita aid in Cambodia was approximately US$84, markedly higher than the average for low-income countries, which stood at US$29. Despite a steady decline in ODA as a percentage of Gross National Income (GNI) since 2000, attributed to Cambodia's substantial economic growth, the country's transformation over the last three decades has been significantly supported by ODA. This assistance has been pivotal in fueling economic development and enhancing the well-being of the Cambodian population, underscoring a continued reliance on international support that exceeds the average for low-income countries.

The impact of development aid on poverty reduction in Cambodia is distinctly evident. Development aid has been instrumental in financing various development sectors, broadly contributing to the country's overall development. This includes key areas such as governance, administration, health, transportation, education, and rural development, as highlighted in a 2008 Brookings Report [24]. Moreover, the positive correlation between aid and poverty alleviation is further supported by recent data from the World Bank [25], which illustrates that Cambodia's significant economic expansion and the reduction in poverty have been driven by its openness to trade and robust levels of ODA [24, 25].

Transitioning to the health sector, there have been substantial improvements, particularly noted in life expectancy and maternal and child healthcare, achieved through partnerships with health-focused donors. These health sector enhancements align with the World Health Organization's Continuum of Care framework, established in 2017 [26]. The foundation for these advancements was laid during the 1990s when Cambodia began to rebuild its healthcare system with significant international support. This period saw dramatic declines in infant, child, and maternal mortality rates due to enhanced public health policies, disease control programs, and focused maternal and child health initiatives [26]. Notably, these concerted efforts have led to

Table 1 Aid dependency in Asian countries

	ODA as share of GNI (%)					ODA per capita (US$)				
Countries	2000	2005	2010	2015	2020	2000	2005	2010	2015	2020
Timor-Leste	44.87	21.85	8.72	7.60	10.46	263	190	266	176	192
Cambodia	**9.78**	**7.54**	**6.28**	**3.98**	**5.53**	**29**	**34**	**47**	**44**	**84**
Nepal	5.64	4.99	4.76	4.96	5.20	13	15	28	44	60
Myanmar	1.57	1.57	0.98	1.93	3.76	2	3	7	23	54
Lao PDR	14.07	9.04	5.83	3.42	2.96	43	41	62	69	72
Bangladesh	1.77	1.73	1.07	1.25	1.38	8	9	9	16	32
Pakistan	0.69	1.25	1.69	1.42	0.88	4	8	15	18	11
Philippines	0.60	0.50	0.25	0.15	0.37	7	7	6	5	13
Vietnam	4.83	2.99	1.94	1.39	0.35	19	20	32	34	12
Sri Lanka	1.39	4.31	0.96	0.54	0.26	12	53	28	21	10
Indonesia	1.07	0.92	0.18	0.00	0.12	8	11	5	0	4
India	0.30	0.23	0.17	0.15	0.07	1	2	2	2	1
All developing countries	0.83	1.11	0.64	0.55	0.63	10	20	22	24	29

Note: This table was created by the authors using data sourced from the World Bank's World Development Indicators. Table is ordered by 2020 ODA share of GNI (shaded in grey)

a significant increase in life expectancy, rising from 19 years in 1977 to 70.3 years in 2022, as reported by the UNDP [27]. This underscores the pivotal role of targeted health interventions in complementing broader economic development strategies to improve overall societal well-being. These historical improvements set the stage for the ongoing health initiatives that continue to build on the progress made since the 1990s.

However, juxtaposed against these achievements is the enduring issue of aid fragmentation, which poses a significant challenge to Cambodia's development trajectory. Since 1993, the country has seen an influx of support from no fewer than 35 official donors alongside numerous civil society organizations, each with distinct priorities and initiatives dispersed across a variety of sectors and development areas, as noted by [24]. Despite the positive impacts, this diversity of sources has introduced complexities, with [27] identifying Cambodia as one of the top ten countries receiving highly fragmented aid between 1998 and 2013. This fragmentation reveals the paradox of external support: while it fuels growth and development, it also introduces challenges that necessitate careful navigation to optimize the benefits of such aid.

The implications of fragmented aid extend beyond mere operational inconveniences; they impose a substantial burden on the Cambodian government's ability to manage and coordinate aid efficiently. Confronted with an array of aid flows, the government faces escalating transaction costs, compounded by the challenging task of navigating through complex reporting requirements, coordinating disparate donor missions, and reconciling conflicting priorities. These challenges divert critical resources and attention from essential development initiatives [24]. The issue is pervasive, affecting various sectors including education, where incongruent donor strategies—ranging from the promotion of a standardized national curriculum to support for localized teaching methodologies—result in confusion and impede the formation of a cohesive national education strategy [28].

In an effort to counteract this issue and promote more cohesive aid strategies, the Cambodian government has implemented several key initiatives. The Health Strategic Plans and Annual Operational Plans (AOPs) provide a clear roadmap, aligning governmental actions and donor support with Cambodia's health priorities [26, 29]. These plans serve to minimize duplication and inefficiencies, ensuring that resources are effectively aligned towards unified health objectives. Additionally, the Joint Annual Performance Reviews (JAPR) offer a crucial platform for evaluating the effectiveness of implemented health strategies, allowing for annual assessments that foster continual improvement and alignment with the nation's health goals [26, 29].

Complementing these structured planning efforts, the government has also established technical working groups (TWGs) across 19 sectors and thematic areas, alongside launching an online ODA database [30]. These initiatives are designed to facilitate better coordination, planning, implementation, and reporting by providing enhanced access to critical information. The TWGs focus on specific health issues, ensuring that initiatives are well-coordinated and integrated into broader health strategies, while the ODA database enhances transparency and allows for more informed decision-making among development partners.

Despite the Cambodian government's efforts to lead and coordinate development actions, a 2015 survey [31] highlighted a stark reality: more than half of all development projects, accounting for 30% of the total aid, were not integrated into the established TWGs. This disconnect indicates a glaring shortfall in the willingness of donors to engage genuinely with the mechanisms set up for harmonized action, perpetuating the challenges of fragmentation and duplicative efforts. The situation underscores a critical critique of donor behavior - despite avowed commitments to harmonization and enhanced coordination, the actual practice often falls short, leaving recipient countries navigating a fragmented landscape of aid that does not fully align with their developmental strategies and goals [16, 23]. Such behavior not only perpetuates the fragmentation and duplication of efforts but also calls into question the commitment of international donors to the principles of harmonization as outlined in the Paris Declaration. It suggests a gap between donors' proclaimed support for collaborative goals and their actual participation in joint efforts to achieve meaningful development progress in Cambodia.

Addressing fragmentation: the urgent case for the health sector in Cambodia

Within Cambodia's aid landscape, the health sector stands prominently as the third largest recipient of assistance from OECD DAC donors over the last decade, illustrating a clear case of the challenges posed by aid fragmentation (refer to Fig. 1). A notable instance of such fragmentation is the duplication of efforts observed in 2017, where two separate rural health clinics were constructed in neighboring villages by different donors. Each clinic operated under distinct training protocols and had its own medication supply chains, leading to not just resource wastage but also confusion and an increased administrative burden on healthcare workers [24, 32]. Additionally, fragmented programming has been prevalent, with donors pursuing their own agendas and timelines, often neglecting to align with the Cambodian government's national development strategies [33]. This has often resulted in a patchwork of incompatible

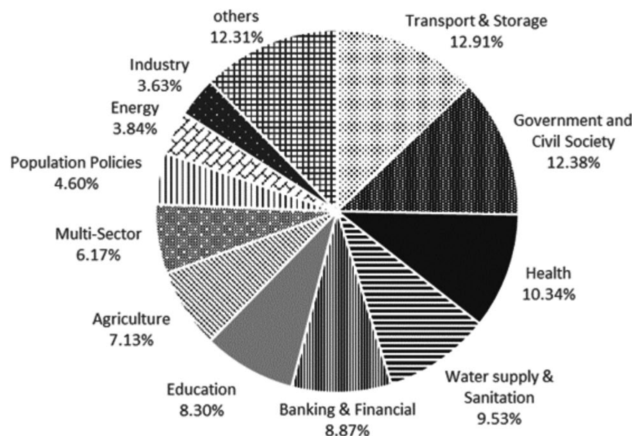

Fig. 1 Development aid to Cambodia by sector (2010–2021). Source: This graph has been developed by the authors using data derived from OECD CRS statistics

initiatives, hindering long-term progress and sustainable development. For example, one donor might prioritize maternal health through antenatal care programs, while another focuses on postnatal care, neglecting the crucial continuum of care needed for mothers and infants [34].

The decision to focus this study on the health sector emerges from a clear recognition of its vulnerability to aid fragmentation, which significantly impacts the efficacy of developmental assistance in Cambodia. The sector's critical role in the overall well-being and development of the nation, combined with its position as the third-largest recipient of aid, underscores the pressing need for a targeted examination of how aid fragmentation undermines health outcomes.

The objectives of this study are threefold:

a. Explore the primary donors of Cambodia, examining their collective and individual aid allocations, with a specific focus on the health sector, identified as one of the sectors with the highest aid fragmentation.
b. Examine the extent of fragmentation within the health sector across primary donors and how funds are distributed across sub-themes.
c. Identify gaps in aid allocation, potential areas for collaboration among primary donors, and strategies to enhance impact, aligning with national priorities.

This study aims to serve as a comprehensive guide for both international donors and the Cambodian government, shedding light on opportunities for synergistic partnerships in the health sector. It encourages a reevaluation of current donor interactions, aid coordination, and allocation practices. Notably, the focus here is not on the direct causes of fragmentation related to recipient country dynamics or evaluating the effectiveness of individual aid projects. Instead, it centers on a systematic analysis of aid allocation patterns to pinpoint where strategic donor collaboration could effectively counteract the challenges of fragmentation.

Methods

Our analysis begins with the examination of OECD datasets encompassing development projects within the Cambodian health sector spanning from 2010 to 2021. Utilizing the OECD-DAC Creditor Reporting System (CRS), a comprehensive database that tracks over $2 trillion in aid allocations, served as the cornerstone of our data collection process. The CRS offers granular details on aid contributions, delineating the sector, recipient country, and the agencies implementing these projects. A key feature of the OECD-DAC data is its inclusion of project and program descriptions provided by member states, which delineates the objectives of each aid initiative. This level of detail facilitates an enhanced understanding and comparison of development efforts, setting the stage for our investigation into aid fragmentation and coordination within Cambodia's health sector.

Several approaches to measuring aid fragmentation have been discussed in the literature [35, 36]. We, however, focused on using the Herfindahl-Hirschman Index (HHI) as the most reliable tool for quantifying the true dispersion of aid, based on the available CRS data. Originally designed for assessing market competition, the HHI has gained significant popularity in development research as a proxy indicator for measuring the extent of aid dispersion [4, 37].

The HHI operates by squaring the share of aid attributed to each donor within a specific sector and summing these results, as depicted in the equation below [38]:

$$\mathrm{HHI} = \sum_{\mathrm{i}=1}^{\mathrm{N}} (\mathrm{S_i})^2 \tag{1}$$

Where S is the share of aid of donor i in a given sector, and N is the number of donors. The HHI ranges from 0 to 1, with lower values signifying higher fragmentation and a greater number of small donors. Conversely, higher HHI values indicate lower fragmentation and a more concentrated aid landscape dominated by a smaller number of prominent donors. Specifically, an HHI score below 0.15 suggests high fragmentation with numerous donors, while a score between 0.15 and 0.25 indicates moderate concentration. Scores exceeding 0.25 imply a highly concentrated scenario with a few dominant donors. In the context of aid, a high HHI value reflects lower fragmentation and is therefore considered positive.

The HHI offers several advantages for this study. Firstly, its calculation is straightforward and requires minimal data, making it readily applicable within the CRS

framework [38]. Secondly, the HHI effectively incorporates both the number and size distribution of donors, assigning greater weight to larger players and providing a more nuanced picture than simple concentration ratios solely based on the aggregated shares of the largest donors [38, 39].

Then, we proceeded to conduct a thorough analysis of health sector projects to identify their primary focus areas and explore possibilities for collaboration. To ensure accuracy, we prepared meticulously for this task. Projects that spanned multiple years posed a particular challenge. To address this, we only included the initial year of such projects to avoid duplicating multi-year initiatives and ensure each project was only counted once. We then categorized the projects based on their descriptions. Initially, we used a set of predefined categories relevant to the health sector. These categories encompassed areas such as disease control, maternal health, mental health, and public health initiatives. However, we recognized the nuanced nature of these projects and further refined our categories. This refinement process was a detailed and labor-intensive task that involved comprehensively reviewing the description of each project. Our aim was to accurately align projects with the most appropriate categories. For instance, broader categories like "infectious disease control" were broken down into more specific ones like "malaria control" or "tuberculosis control" if the level of detail provided in each donor country's project description allowed for it.

We counted each project under every category it was relevant to. This approach acknowledged that many projects had multifaceted objectives. For example, a project focusing on maternal health might also make a significant contribution to nutrition or disease prevention. Therefore, it was counted under each relevant category. This method provided a more comprehensive understanding of the focus areas and was especially useful in identifying areas of overlap among the donor countries.

It is important to note that this methodology has certain limitations. The simplicity of the HHI can be perceived as a drawback, potentially overlooking intricate nuances and failing to fully capture the complexities of various aid scenarios, thus hindering a truly accurate assessment of fragmentation or concentration [38, 39]. For instance, a high number of donors per sector may result in a low HHI, indicative of potential coordination issues among donors [40]. However, this could be misleading if donors are actually coordinating their interventions within the sector [39]. While data limitations through the CRS and other sources make it difficult to comprehensively map project-level coordination among donors, we acknowledge this shortcoming as an area for further exploration. Despite these limitations, the HHI remains a valuable tool for quantifying aid fragmentation due to its simplicity, clarity of interpretation, and effectiveness in incorporating donor size distribution. The findings of this study would still provide valuable insights into donor priorities and potential areas of collaboration.

Results

Prior studies [24, 27] have illuminated the coordination challenges pervasive within the health sector, warranting an in-depth analysis. In this vein, we independently assess the degree of aid fragmentation within the health sector, seeking to bolster the existing evidence with our own empirical analysis. Presented in Table 2, our comprehensive analysis, utilizing data from all OECD DAC donor countries, spans aid contributions to Cambodia from 2010 to 2021. This analysis reveals a stark landscape of fragmentation across multiple sectors, with the health sector markedly standing out as particularly fragmented. The analysis extends to 14 additional sectors, all of which exhibit HHI scores beneath the 0.25 threshold, indicating a high degree of aid dispersion and a lack of dominant donor presence. The inclusion of other sectors in our analysis provides a necessary benchmark, establishing the health sector's fragmentation in relative terms and highlighting its distinct challenges within the broader context of aid distribution in Cambodia.

Ranking third in ODA funding among sectors, the health sector shows a conspicuously low HHI score of 0.1420. This figure falls well underneath the 0.25 HHI threshold indicative of concentrated aid with few dominant donors. It instead signals the $870 million in health ODA is sharply dispersed across multiple actors and interventions. Specifically, there are 23 donor countries supporting no less than 1,134 separate health projects and initiatives. Over 70% of these efforts are minor in scale, receiving under $1 million in funding each. This paints a picture of health assistance as a wide assortment of small, disjointed schemes sprinkled across a multitude of donors, agents, and recipients. Such findings not only corroborate the challenges faced by the Cambodian government in coordinating a wide array of donor activities but also illustrate the tangible impact of fragmentation, as detailed by [24], including the operational burden of managing numerous parallel project implementation units and the inefficiency brought about by the duplication of efforts among an extensive list of donors. Indeed, the evident dispersion of efforts and resources across the health sector accentuates the pressing need for health sector-specific strategies aimed at enhancing aid coordination.

Analysis presented in Table 3 (left panel) delineates the distribution of health aid to Cambodia by principal OECD-DAC member donors. This segment of the dataset reveals that a quintet of donors—the United States, Australia, Korea, Japan, and Germany—accounts for

Table 2 Health's relative aid fragmentation among sectors in Cambodia (2010–2021)

Sector	Net ODA (USD in million)	Share of Net ODA	No. of donors	No. of aids	% of aids < 1 USD million	HHI
Other Social Services	200.4	2.43%	23	581	75.9%	0.1266
Government & Civil Society	1,042.9	12.63%	22	1,924	71.2%	0.1388
Health	870.9	10.55%	23	1,134	72.6%	0.1420
Disaster Prevention & Preparedness	11.9	0.14%	13	52	86.5%	0.1490
Education	698.8	8.46%	24	1,558	69.6%	0.1542
Business & Other Services	37.5	0.45%	13	105	63.8%	0.1601
Banking & Financial Services	747.0	9.05%	18	255	56.1%	0.1630
Other Multi-sector	519.5	6.29%	20	866	72.6%	0.1689
Trade Policies & Regulation	27.7	0.34%	15	132	77.3%	0.1715
Agriculture, Forestry, Fishing	600.5	7.27%	22	1,042	73.5%	0.1725
Emergency Response	14.5	0.18%	12	39	87.2%	0.2041
General Environment Protection	205.7	2.49%	17	455	67.5%	0.2459
Development Food Assistance	61.5	0.74%	7	37	56.8%	0.2465
Energy	323.9	3.92%	15	125	66.4%	0.3023
Water Supply & Sanitation	803.2	9.73%	20	446	80.3%	0.3249
Industry, Mining, Construction	305.4	3.70%	16	224	72.3%	0.3732
Transport & Storage	1,087.5	13.17%	7	194	60.8%	0.4858
Population Policies & Reproductive Health	387.2	4.69%	16	396	71.2%	0.4994
Communications	54.7	0.66%	9	103	67.0%	0.5021
Action Relating to Debt	1.6	0.02%	2	5	80.0%	0.5321
Reconstruction relief & Rehabilitation	14.2	0.17%	5	8	75.0%	0.7357
General Budget Support	227.8	2.76%	1	3	0.0%	1.0000
Other Commodity Assistance	11.2	0.14%	1	2	0.0%	1.0000

Note: The authors have constructed this table with data sourced from OECD CRS statistics. arranged in the ascending order of HHI (most fragmented □ least fragmented)

Table 3 Health aid to Cambodia by donor (2010–2021)

OECD DAC members	Health aid (USD in million)	Share	All donors	Health aid (USD in million)	Share
United States	187	21.5%	Global Fund	212	14.8%
Australia	164	18.8%	United States	187	13.1%
Korea	137	15.7%	Australia	164	11.5%
Japan	133	15.3%	Korea	137	9.6%
Germany	97	11.2%	Japan	133	9.3%
United Kingdom	44	5.1%	Global Alliance for Vaccines and Immunization	107	7.5%
Switzerland	44	5.0%	Germany	97	6.8%
France	21	2.4%	International Development Association	91	6.4%
Belgium	15	1.7%	Asian Development Bank	67	4.7%
Canada	9	1.1%	United Kingdom	44	3.1%

Source: the authors have constructed this table with data sourced from OECD CRS statistics

82.8% of the cumulative $870.9 million in health aid to Cambodia (as detailed in Table 2), illustrating a pronounced concentration of influence and, by extension, a significant responsibility to foster coordinated intervention efforts. An expanded review incorporating all OECD DAC-reporting entities (Table 3, right panel) indicates these five donors still command a substantial 52% of health aid. The balance, 48%, emanates from an assorted collection of 31 other multilateral and non-OECD DAC contributors.

Delving into specifics, the United States stands out as the principal bilateral donor, contributing over $187 million, which represents 21.5% of the total $870.9 million in health assistance (as detailed in Table 2). This funding supports initiatives such as USAID's 'Enhancing Quality of Healthcare (EQH) Activity,' which is designed to bridge gaps in service delivery and health outcomes. Korea, contributing 15.7% or $137 million, primarily targets health system capacity enhancement, while Japan's 15.3% ($133 million) share supports infrastructure and medical service advancements. Germany and Australia, allocating 11.2% ($97 million) and 18.8% ($164 million) respectively, focus on expanding service delivery and access, alongside policy, administration,

nutrition, and infectious disease control efforts. This detailed breakdown of health aid not only accentuates the pivotal role played by these nations but also signals the critical importance of synchronized efforts. In fact, their disproportionate influence juxtaposed with the extensive fragmentation across a wide array of smaller-scale projects underscores an urgent call for strategic collaboration.

Table 4 elucidates the distribution of health aid across 12 principal thematic areas from 2010 to 2021 by the top five donors. It reveals noticeable differences and commonalities between donor priorities and spending fragmentation. At the aggregate level, health aid is highly fragmented across themes. The overall health portfolio HHI score is just 0.161, falling well short of the 0.25 threshold for concentrated spending. This signals aid proliferation across too many recipients and initiatives, with potential coordination issues.

The health aid portfolio of the United States exhibits a targeted approach, as demonstrated by an HHI score of 0.400, channeling over 58%, or $109 million, of its $187 million in assistance predominantly towards infectious disease control. This focus is not entirely misaligned with Cambodia's healthcare priorities, given the significant burden of communicable diseases within the country. However, the concentration of resources in this area, arguably influenced by broader global health security concerns such as preventing disease spread to its population—as highlighted by the Covid-19 pandemic—suggests a disproportionate allocation. While addressing communicable diseases is crucial, the substantial emphasis here risks overshadowing other critical health challenges that Cambodia faces, such as heart disease, stroke, maternal mortality, and malnutrition. These areas, essential to the national health agenda, appear to receive less attention and funding, pointing to a need for a more balanced distribution of aid. While these areas require more attention and funding, this does not imply advocating for the current degree of fragmentation because the dispersion of the US's remaining $78 million across seven other health areas indicates a moderate level of fragmentation. In the end, the goal should be to secure a more balanced distribution of aid that addresses a broader range of health challenges without contributing to the existing fragmentation.

Australia's approach to health aid in Cambodia, with a concentrated investment of $133 million—representing 81% of its total contribution—towards 'health policy and administrative management' and 'basic healthcare', closely mirrors the approach taken by the United States in its aid distribution. This targeted allocation reflects a commitment to reinforcing the structural and foundational aspects of healthcare, which are vital for long-term health capacity development. However, similar to the United States, Australia's allocation strategy exhibits signs of fragmentation, with the residual aid dispersed among various ancillary themes, including basic nutrition.

Germany exhibits lower dispersion with a higher 0.41 HHI score and over 60% of its funding targeting just three categories – 'health policy and administrative management', 'basic nutrition', and 'medical training & personal development'. Although the focus areas differ, this strategic concentration is analogous to the U.S. approach, which allocates a significant portion of its funding to 'infectious disease control' and 'basic nutrition'. However, unlike the U.S., which tends to heavily favor one category over others, Germany maintains a more balanced allocation among its prioritized categories, ensuring a more evenly distributed aid strategy within its focus areas.

Table 4 Purposes of health aid by major donors (2010–2021)

	Net Health ODA (USD in million)					
Specific Purposes	**Australia**	**Germany**	**Japan**	**Korea**	**USA**	**Total**
Infectious disease control	6.63	0.20	4.95	4.95	109.20	125.9
Health policy and administrative management	88.53	58.54	21.09	12.08	11.42	191.7
COVID-19 Control	22.11		37.06	52.20	6.54	117.9
Basic healthcare	45.01	7.24	3.67	17.34	12.64	85.9
Basic nutrition	0.23	15.62	0.01	1.59	42.24	59.7
Medical services	0.29	2.10	29.18	25.72		57.3
Basic health infrastructure	0.13	0.08	34.65	7.30	0.20	42.4
Medical training & personal development	0.16	13.30	0.94	12.25		26.7
Health education	0.42	0.18	1.67	1.11	4.12	7.5
Medical research	0.29		0.02	0.04	0.82	1.2
Non-communicable disease (NCDs) control	0.04			1.99		2.0
Promotion of mental health and well-being	0.01					0.01
Health aid total	163.9	97.1	133.2	136.6	187.2	717.9
HHI	**0.38633**	**0.41251**	**0.22030**	**0.21790**	**0.40010**	**0.16140**

Note: The authors have constructed this table with data sourced from OECD CRS statistics. Arranged in the descending order of total aid (last column). Focus areas for each country are colored in grey for easy recognition

In contrast, Japan and Korea face significant fragmentation issues in their health aid contributions, as evidenced by their low HHI scores among the five major donors—Japan at 0.22 and Korea at 0.21. Despite having some relatively dominant themes—Japan in 'basic health infrastructure' and 'COVID-19 control', and Korea in 'COVID-19 control' and 'medical services'—this approach does not adequately address the fragmentation. After excluding their respective dominant focus areas, Japan allocates smaller portions of its funding across eight varied categories, while Korea distributes its investments across nine diverse health themes. While these diversified investment strategies of Japan and Korea may offer broader coverage, they fall short of effectively bridging the significant healthcare gaps in Cambodia, which necessitate focused, intensified financing.

The analysis of the five major donors reveals a pivotal limitation that transcends the political will and ethical motivations of individual donors: the inherent inability to address the entire spectrum of health challenges in Cambodia. The health sector in Cambodia presents a diverse array of issues, from infectious diseases to non-communicable conditions such as heart disease and malnutrition, underscoring the intricate landscape of health needs. Despite the political and moral inclination of donors to provide extensive coverage across all health areas, the reality of financial and strategic limitations renders such comprehensive support unfeasible. This situation underscores the necessity for heightened collaboration and strategic alliances within the global donor community. By pooling resources and aligning strategies, donors have the potential to create a more cohesive and comprehensive support network that addresses the multifaceted health challenges in Cambodia.

Table 5 provides an invaluable complementary lens alongside Table 4 aid amounts. It categorizes the project volume and specific objectives within each major focus area. Cross-referencing the number of projects per domain with the financing data exposes where fragmentation hides beneath superficial top-level priorities. For instance, the United States directs $109 million towards infectious disease control, suggesting this is a key focal point. However, further analysis through Table 5 would reveal whether this finances a few large-scale programs or a proliferation of disconnected small projects. In other words, the tandem insights unlocked across Tables 4 and 5 (categorical project volumes and sector financing data) spotlight critical areas where otherwise significant donor attention descends into detachment and diffusion when analyzed in aggregate.

Health systems strengthening offers a prime example, which emerges as the top focus by project volume with the US dedicating 45 projects, Australia 27, and Germany 18. However, in financial terms, the US directs just 12% or $22 million of its health ODA towards policy/management and basic healthcare representing common health systems strengthening priorities. This signals vast fragmentation as funding is dispersed across many small initiatives rather than larger strategic programs. The sheer project volume (90 combined) likely creates substantial coordination needs and high overhead costs as well. Greater collaboration between the US, Australia and Germany such as on national capacity building programs could start addressing this fragmentation.

Maternal and child health which funding derives from a mix of basic healthcare, medical services and basic nutrition represents another prime area for enhanced partnership – given alignment on project volumes (US-41, Japan-25, Korea-18, Australia-12, Germany-8 projects) but dispersion across 126 isolated efforts. The United States ($54 million towards conduits encompassing MCH priorities) and Australia ($45 million) emerge as natural lead partners based on focused resourcing coupled with their wealth of implementation experience to provide consolidated platforms then integrating specialized technical skills from Japan, Korea and Germany operating with subscale, fragmented funding despite project interests. Effectively transitioning atomization to impact lies in gradual partnerships rooted in divisions of labor - US and Australia resource mobilization and systems integration proficiencies first merge before tailoring evidence-based localized innovations from experienced donors into national public health programming. This secures sustainability and local ownership now lacking under duplication and misalignment prevalent across $173 million in MCH aid endangering efficacy absent collaboration.

Malaria control stands out as an area of clear project volume convergence alongside strategic financing priority visibility. The United States dedicates 22 projects and over 58% of its health ODA funding to infectious disease control. Meanwhile, Australia directs 8 projects and 3.9% of its health aid towards infectious disease control, displaying consistent secondary level interest. Forming an aligned partnership around malaria prevention, diagnosis and treatment programs has potential to take advantage of specialized US technical competencies to enhance Australia's project capacities grounded in national health priorities. This could manifest through consolidated research, surveillance and case management efforts reducing duplication across the existing 30 discrete initiatives. Similarly, there is pronounced potential for an impact-enhancing partnership between the United States and Germany on tuberculosis control. Despite dedicating just $0.2 million across 3 projects, Germany displays consistent priority through initiatives like the STOP Tuberculosis program. Conversely, the United States directs large amount on 15 tuberculosis projects representing

Table 5 Key focus areas of health aid projects by donor country (2010–2021)

Themes	Australia	Germany	Japan	South Korea	United States
1	***Health service delivery (31)***	***Health systems strengthening (18)***	***Infrastructure development (37)***	***Health service delivery (37)***	***Health systems strengthening (45)***
Purpose	Aimed at providing health services at the community level.	Aimed at improving health infrastructure, workforce, training, financing, access to medicines etc.	Aimed at constructing, renovating and equipping health facilities.	Aimed at providing health services through clinics, hospitals, health centers etc.	Aimed at improving health systems capabilities across governance, financing, service delivery etc.
Example	E.g. Fast Track Initiative to reduce maternal and child mortality	E.g. German contribution to the Cambodia Pre-Service Training for Health Workers Project I	E.g. Project for constructing IPD ward at Chhep Health Center in Chhep District	E.g. Operation Project of the Cheung Ek Health Post	E.g. Promote sustainable improvements in health outcomes by reducing key health systems constraints
2	***Health systems strengthening (27)***	***Health service delivery (15)***	***Maternal and child health (25)***	***Health workforce strengthening (34)***	***Maternal and child health (41)***
Purpose	Aimed at improving health infrastructure, workforce, access to medicines etc.	Aimed at providing and improving access to quality health services, including for vulnerable groups.	Aimed at reducing maternal and child morbidity and mortality through training, education and improving nutrition.	Aimed at strengthening capacity of health workforce through training programs and education.	Aimed at improving maternal, newborn, child and reproductive health outcomes.
Example	E.g. Health Equity and Quality Improvement Program in Cambodia	E.g. The Programme aims to ensure improved and equitable access to, and utilization of, essential quality health care and preventive services	E.g. The project aims at reducing maternal and child morbidity and mortality in Kirivong and Koah Andaet Operational Districts	E.g. Mid-and Long-term training program to strengthen capacity of healthcare professionals	E.g. To provide support for a program in Maternal and Child Health (MCH) Program.
3	***Maternal and child health (12)***	***Maternal and child health (8)***	***Medical equipment provision (17)***	***Infrastructure development (20)***	***Health workforce strengthening (37)***
Purpose	Aimed at improving the health of mothers, newborns and children.	Aimed at improving reproductive, maternal and child health outcomes.	Aimed at providing medical equipment to improve diagnoses and treatment.	Aimed at constructing health facilities and buildings.	Aimed at developing skills and capacity of health workers at individual and institutional levels.
Example	E.g. Cambodia Midwifery Project	E.g. Financing of Vouchers for Reproductive Health Services and Health Services to Vulnerable Groups	E.g. Project for installing medical equipment at Cambodia-Vietnam Friendship infirmary in Prey Nob District, Preah Sihanouk Province to improve its diagnoses	E.g. Construction of Batheay Referral Hospital	E.g. Transferring theoretical and practical knowledge and expert skills required for nursing
4	***Malaria control (8)***	***Nutrition and food security (5)***	***Health emergency preparedness and response (6)***	***Medical equipment provision (6)***	***Malaria control (22)***
Purpose	Aimed at preventing, controlling and eliminating malaria.	Aimed at improving food security and access to basic nutrition	Aimed at preparing for and responding to disease outbreaks like COVID-19.	Aimed at providing medical devices, technologies and instruments.	Aimed at prevention, detection, treatment and control of malaria.
Example	E.g. Provision of Technical Assistance to the Ministry of Social Affairs, Veterans and Youth Rehabilitation	E.g. Food and Nutrition Security Project in Kampong Chhnang Province, to enable people in targeted three districts of the province to take in sufficient nutritious food and maintain good health	E.g. Emergency Assistance to Iran and Surrounding Developing Countries for Prevention of Further Spread of the Novel Coronavirus (COVID-19) Infection	E.g. A portable eye diagnostics device and software that provides accessible eyecare services in developing countries	E.g. Support the implementation of the Presidents Malaria Initiative (PMI)
5	***Disability inclusion and rehabilitation (7)***	***Tuberculosis control (3)***	***Water, sanitation and hygiene (WASH) (5)***	***Maternal and child healthcare (18)***	***Tuberculosis control (15)***
Purpose	Aimed at supporting the needs and rights of people with disabilities.	Aimed at preventing, diagnosing and treating tuberculosis.	Aimed at promoting health through improving water, sanitation and hygiene.	Aimed at improving maternal and newborn health through various interventions.	Aimed at preventing transmission and control tuberculosis through prevention, diagnosis and treatment services.

Table 5 (continued)

Themes	Australia	Germany	Japan	South Korea	United States
Example	E.g. Disability Rights Initiative Cambodia (DRIC)	E.g. STOP-Tuberculosis Project in Rattanakiri Province	E.g. Constructing hand washing stations with water tanks to 6 schools to improve hygiene environment in Thala Barivat District and Siem Bouk District, Stung Treng Province	E.g. To reduce maternal and infant mortality rates through health system strengthening	E.g. To assist State, local health agencies, political subdivisions, and other government entities to conduct TB preventive health service programs
6	***Health emergency preparedness and response (7)***	***Disability inclusion and mental health (3)***	***Nutrition and food security (4)***	***Health emergency preparedness and response (15)***	***HIV/AIDS control (13)***
Purpose	Aimed at preparing and responding to disease outbreaks and health emergencies.	Aimed at supporting people with disabilities and providing mental health services.	Aimed at improving food security, productivity and nutrition status.	Aimed at preparing for and responding to disease outbreaks like COVID-19.	Aimed at prevention, treatment and control of HIV/AIDS.
Example	E.g. ASEAN Pacific Infectious Disease Detection and Response Program	E.g. Gemeindebasierte Förderung von Menschen mit Behinderungen in Kambodscha (Community-based promotion for people with disabilities in Cambodia)	E.g. Food and Nutrition Security Project in Kampong Chhnang Province, a three-year project, purposes to enable people in targeted three districts of the province to take in sufficient nutritious food and maintain good health	E.g. Increasing capacities for Infectious Disease Field Management and Training for Safe Life for All Initiative	E.g. Cambodia Community Based HIV/AIDS Prevention and Care Program
7	***Blindness and Vision Care (6)***		***Disability support (3)***	***Health promotion and education (14)***	***Health information systems (16)***
Purpose	Aimed at providing diagnosis, treatment and surgery for avoidable blindness and eye diseases.		Aimed at providing wheelchairs and assistive devices for people with disabilities.	Aimed at promoting health awareness on issues like WASH, NCDs etc.	Aimed at improving collection, analysis and use of health data for decision making.
Example	E.g. East Asia Avoidable Blindness Initiative		E.g. Provides the refurbished wheelchairs for handicapped children to 11 regional medical and physical rehabilitation centers.	E.g. Strengthening Primary Health Service for NCD prevention and control, Increasing NCD awareness for community	E.g. MEASURE Phase III DHS is to improve the collection, analysis and presentation of data
8	***HIV/AIDS control (5)***				***Health emergency preparedness and response (17)***
Purpose	Aimed at preventing, treating and controlling HIV/AIDS.				Aimed at preparing for and responding to disease outbreaks and health emergencies.
Example	E.g. Funding to support programs related to sexual reproductive and maternal child health				E.g. Address public health threats posed by infectious diseases not targeted elsewhere

Note: The authors have constructed this table with data sourced from OECD CRS statistics. The numbers in parentheses represent the number of projects. Those that do not fit neatly into predefined categories and themes that seem to be of trivial interest to donor countries are excluded from the table. The categories in Table 5 are arranged based on the number of projects, rather than the amount of ODA allocated to each category by each country, which is shown in Table 4. Therefore, it is important to note that a large amount of ODA funding does not necessarily equate to a large number of projects. This is because a high value of ODA funding may be attributed to a few very large infrastructure projects

one of its top health focus areas. This asymmetry signals strategic opportunity. By consolidating Germany's specialized TB efforts into aligned and larger-scale US programming, substantial efficiency gains become available.

Japan and Korea with the lowest HHI scores in Table 4 indicates a high degree of aid fragmentation and dispersion across numerous small-scale health interventions. Fortunately, Table 5 highlights potential strategies to mitigate this fragmentation through enhanced partnerships. Areas of common ground emerge in infrastructure development (34 projects in Japan and 20 in Korea) and medical equipment provision (17 projects in Japan and 6 in Korea). Given this volume, pooling resources into joint infrastructure planning and consolidated medical

equipment procurement programs presents a coordination opportunity. Rather than separate facilities or technology investments under fragmented master plans, collaborative alignment on Cambodia's highest infrastructure needs and rationalized appeals for cost-efficient health technologies offer impact enhancement paths.

Lastly, there is alignment on disability priorities between Australia, Germany and Japan based on 13 cumulative projects. However, aid funding is dispersed across small-scale efforts. The United States and Korea do not showcase disability inclusion as a stand-alone priority area though likely encompasses social inclusion aspects within its health systems strengthening activities. Blending Australian implementation experience, German technical assets, and Japanese technologies under a locally reinforced umbrella ultimately provides pathways to address entrenched fragmentation through scaled consolidation that secures accessibility and inclusion nationally with localized sustainability. In addition, incorporating the United States' and South Korea's localized social equity advancements and systems strengthening orientations would allow for the elevation of unified priorities through national platforms. In sum, the tandem insights unlocked across Tables 4 and 5 spotlight critical areas where otherwise significant donor attention descends into detachment and diffusion when analyzed in aggregate.

Discussion

The examination of contributions from the five main donors indicates a scenario where the broad coverage of health needs is constrained by financial and strategic limitations, without necessarily reflecting a unified intention to cover all health areas comprehensively. Highlighted by the significant dispersion of aid in critical areas like maternal and child health, the study points to a pressing need for increased donor collaboration. The allocation of resources to a vast array of small-scale projects presents coordination challenges for the Cambodian government and does not effectively align with the nation's health priorities. Addressing this fragmentation requires a concerted effort among international donors to pool resources and synchronize strategies, aiming to establish a more cohesive support framework that better serves Cambodia's health sector needs.

The insights derived from this study prompt a reconsideration of the underlying motivations driving donor countries in their project delivery mechanisms. A notable aspect contributing to aid fragmentation, as this research reveals, is the prevailing reluctance among donors to embrace harmonization. This reluctance often manifests in the funding of parallel health programs through bilateral partnerships, designed to allow donors to claim direct credit for outcomes. This trend has become more pronounced over the past decade, thereby diminishing the attractiveness of collaborative endeavors. Moreover, despite well-intentioned initiatives like the Paris Declaration, which aim to reduce fragmentation, their voluntary implementation and the tendency to allocate resources for the execution of independent programs have curtailed their efficacy.

Building on these insights, the study further unveils a tendency among donor countries for launching numerous, highly specialized projects, diverging from a collective, strategic health intervention. This observed behavior may reveal that donor countries might prioritize projects where outcomes can be directly attributed to their efforts, favoring initiatives that yield tangible results within shorter time frames. Such an approach often appeals because it can be easily communicated and justified to domestic stakeholders, including taxpayers and political entities. However, this preference for projects that provide immediate, visible success may neglect more complex, multilateral efforts or broader health systems strengthening initiatives that, while perhaps less immediately gratifying, could offer more substantial long-term benefits to recipient countries like Cambodia.

This inclination towards independent operations, as evidenced through the focus areas and purposes of the projects analyzed in this study, illustrates the challenge of aligning international aid with the comprehensive health needs of recipient countries. The Paris Declaration on Aid Effectiveness offers a valuable lens to address these challenges. By aligning donor actions with host country health priorities, utilizing local health systems, and fostering mutual accountability, the principles of the Paris Declaration encourage a shift from isolated, short-term projects to collaborative, strategic engagements that support sustainable health improvements. Adopting these guidelines can help transform donor contributions into effective partnerships that genuinely bolster Cambodia's health sector.

Conclusion

This study contributes significantly to the discourse on aid fragmentation in the health sector, offering a nuanced understanding of the complexities involved in aid distribution in Cambodia. It highlights the indispensable role of donor collaboration in mitigating fragmentation, proposing a model for enhanced coordination that aligns with Cambodia's health priorities. The insights gleaned from this research hold profound implications for the future of international health aid, suggesting a concerted move towards more integrated and strategic donor engagement. As Cambodia continues to navigate its health development journey, the lessons from this study provide a valuable framework for optimizing the impact of international aid, ensuring that it effectively

contributes to the advancement of the nation's healthcare system and the well-being of its population.

Limitations

While this study provides valuable insights, certain limitations should be acknowledged. Firstly, the analysis relied on publicly available aid allocation datasets which may not fully encompass the entire scope of donor health sector initiatives in Cambodia. The categorization of projects also involved some subjective interpretation of descriptions. Additionally, assessing coordination among donors at a detailed project level was difficult given data constraints. Moreover, the study examined patterns of aid allocation rather than evaluating on-ground implementation or effectiveness. Future research could help address these limitations through more qualitative, participatory approaches exploring perspectives of beneficiaries and subnational stakeholders. Impact assessments tracking long-term outcomes would also enrich understanding. As availability of disaggregated data improves over time, opportunities exist for more nuanced analysis assessing how effectively aid reaches marginalized populations.

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The data used for this study are available upon request.

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