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The Social Construction of Global Health Priorities: An Empirical Analysis of Contagion in Bilateral Health Aid

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Donors of development assistance for health typically provide funding for a range of disease focus areas, such as maternal health and child health, malaria, HIV/AIDS, and other infectious diseases. But funding for each disease category does not match closely its contribution to the disability and loss of life it causes and the cost-effectiveness of interventions. We argue that peer influences in the social construction of global health priorities contribute to explaining this misalignment. Aid policy-makers are embedded in a social environment encompassing other donors, health experts, advocacy groups, and international officials. This social environment influences the conceptual and normative frameworks of decision-makers, which in turn affect their funding priorities. Aid policy-makers are especially likely to emulate decisions on funding priorities taken by peers with whom they are most closely involved in the context of expert and advocacy networks. We draw on novel data on donor connectivity through health IGOs and health INGOs and assess the argument by applying spatial regression models to health aid disbursed globally between 1990 and 2017. The analysis provides strong empirical support for our argument that the involvement in overlapping expert and advocacy networks shapes funding priorities regarding disease categories and recipient countries in health aid.

Los donantes de ayuda para el desarrollo de la salud, por lo general, proporcionan fondos para áreas de interés de diversas enfermedades, como salud materna y salud infantil, malaria, VIH/SIDA y otras enfermedades infecciosas. Sin embargo, el financiamiento de cada categoría de enfermedad no es una coincidencia exacta de su contribución con la discapacidad y mortalidad que provoca, ni la eficiencia en términos de costos de las intervenciones. Nuestro argumento es que las influencias de los pares en la construcción social de las prioridades de salud mundiales contribuyen a explicar esta desalineación. Los legisladores de ayudas están insertos en un entorno social en el que se rodean con otros donantes, expertos en salud, grupos de defensa y funcionarios internacionales. Este entorno social influye en los marcos de trabajo normativos y conceptuales de los legisladores, lo que tiene un efecto en sus prioridades de financiamiento. Existe mayor probabilidad de que los legisladores de ayudas emulen las decisiones sobre prioridades de financiamiento que toman los pares con quienes tienen mayor vínculo en el contexto de las redes de defensa y de expertos. Nos basamos en datos nuevos sobre la conectividad de donantes mediante organizaciones intergubernamentales (OIG) de salud y organizaciones internacionales no gubernamentales (OING) de salud, y evaluamos el argumento aplicando modelos de regresión espacial para la ayuda de salud desembolsada a nivel mundial entre 1990 y 2017. El análisis ofrece un fuerte respaldo empírico a nuestro argumento de que la participación en redes de defensa y de expertos coincidentes da forma a las prioridades de financiamiento respecto de las categorías de enfermedades y los países que reciben las ayudas de salud.

Les donateurs d'aide au développement pour la santé offrent généralement leur financement pour une série de domaines pathologiques d'intervention, tels que la santé maternelle et infantile, la malaria, le VIH/SIDA et d'autres maladies infectieuses. Mais le financement de chaque catégorie de maladies n'est pas étroitement associé à la contribution de cette catégorie à l'invalidité et à la perte de vie qu'elle provoque, ni même au rapport coût-efficacité des interventions. Nous soutenons que les influences de pairs dans la construction sociale des priorités de santé mondiale contribuent à l'explication de ce mauvais alignement. Les décideurs de l'aide sont intégrés à un environnement social englobant d'autres donateurs, experts en santé, groupes de plaidoyer et officiels internationaux. Cet environnement social influence les cadres conceptuels et normatifs des décideurs qui affectent à leur tour les priorités de financement. Les décideurs de l'aide sont particulièrement susceptibles d'imiter les décisions sur les priorités de financement qui sont prises par les pairs avec qui ils sont les plus étroitement impliqués dans le contexte des réseaux d'experts et de plaidoyer. Nous nous appuyons sur de nouvelles données sur les liens qui s'établissent entre donateurs au travers des OIG et ONGI de la santé et nous évaluons notre argument en appliquant

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des modèles de régression spatiale à l'aide sanitaire versée dans le monde entier entre 1990 et 2017. Cette analyse offre un solide soutien empirique à notre argument selon lequel l'implication dans des réseaux d'experts et de plaidoyer qui se chevauchent façonne les priorités de financement concernant les catégories de maladies et les pays bénéficiaires dans l'aide à la santé.

Introduction

While access to healthcare has improved considerably around the world in recent decades, millions of deaths could still be prevented each year through low-cost medical interventions. For instance, child mortality rates continue to drop—from 183 children of every 1,000 dying before age five in 1960 to 39 in 2018. Nevertheless, an estimated half of the over five million children who still die each year could be saved by well-tested, low-tech measures such as vaccines, antibiotics, micronutrient supplementation, and insecticide-treated bed nets (UNICEF 2019). Financial constraints often hinder these measures. In 2017, health expenditure per capita was $44.81 in the average low-income country, compared to $269.50 in middle-income countries and $5,284 in high-income countries (World Bank 2020a).

Given these long-term resource gaps, governments have come to consider development aid as a key tool for improving access to health care worldwide (Lumsdaine 1993). Overall, development assistance for health (DAH) increased globally from $7.2 billion in 1990 to $11.7 billion in 2000 and $36.4 billion in 2015 (2011 US dollars). In 2014, external resources for health accounted for a third of the total expenditure for health in low-income countries (Dieleman et al. 2016, 2540). Donors allocate health aid to a wide range of uses, from interventions targeted at specific diseases, such as HIV/AIDS, tuberculosis, or malaria, to payments into the general health budget of recipient governments.

Since the early 1990s, the World Health Organization (WHO), the World Bank, and other organizations have promoted measurements of "disability-adjusted life-years" (DALY) lost because of specific health conditions as a tool to help allocate scarce resources among health interventions (GBD 2017 DALYs and HALE Collaborators 2018). Health policy experts have used DALY information to criticize donors for the "misfinancing" and "misalignment" of DAH, that is, for failing to align their funding with the relative contribution of health conditions to the global burden of disease (MacKellar 2005; Shiffman 2006; Sridhar and Batniji 2008; Stuckler et al. 2008; Esser and Bench 2011; Dieleman et al. 2014). As we will show, newborn and childhood diseases are arguably a key instance of misalignment, since they attract little health aid relative to the loss of DALYs caused by them, despite the availability of highly cost-effective interventions.

Theories of international relations contribute to explaining such mismatches between development needs and aid flows. Political economy approaches point at domestic interests and institutions in donor countries and the policy concessions that recipient governments make in exchange for aid, whereas security-oriented approaches emphasize the strategic interests of donor countries (Bueno De Mesquita and Smith 2007; Milner and Tingley 2010; Baccini and Urpelainen 2012; Barthel et al. 2014; Vreeland and Dreher 2014; McLean 2015; Dietrich 2016; Bermeo 2017; Alexander and Rooney 2019; Dietrich, Milner, and Slapin 2020; Lazell and Petrikova 2020). Such factors likely play a role in the field of DAH as well. However, in this article, we draw on the constructivist tradition to highlight an additional explanation. Development aid is a social environment where policy-makers are exposed to a range of norms and behavioral expectations and sometimes to forms of peer pressure. To be sure, such normative expectations and pressures are often insufficient to override expectations and demands originating from powerful domestic actors, including economic and foreign affairs departments within the same government. Nevertheless, such domestic pressures usually leave aid policy-makers with some room for maneuver, and this is where the social environment constituted by other actors, including donor officials from other countries, can make a difference.

This article argues that health-aid objectives are socially constructed through communicative interactions between global health actors. We argue that donors act based on beliefs on the relative importance of health issues (as opposed to more "objective" indicators) and that peer groups influence such beliefs. Health-aid policy-makers are embedded in overlapping networks of experts on various aspects of global health—what have been called epistemic communities (Haas 1992). These epistemic communities comprise health experts, advocacy groups, international officials, and donor officials themselves. This social environment influences the conceptual and normative frameworks of global health decision-makers, which in turn affect their funding priorities. Aid policy-makers are especially likely to emulate decisions on funding priorities taken by peers with whom they are most closely involved in the context of epistemic communities. If our argument is correct, we should find that a donor's allocation of DAH among health purposes is influenced by how social peers—that is, other donors linked to it via overlapping epistemic communities—have distributed their health aid. While the measurement of influences between donors concerning the choice of *recipients* has received some attention already (Barthel et al. 2014; Steinwand 2015; Davies and Klasen 2019), to our knowledge, we provide the first quantitative assessment of social influences on the choice between priority areas for intervention.[1]

This study contributes to a research agenda that interprets international aid activities as constituting complex social networks through which actors share and absorb ideas, norms, models, and practices (Fejerskov 2015; Swiss 2016, 2017, 2018; Swiss and Longhofer 2016; Kallman 2017, Han, Koenig-Archibugi, and Opsahl 2018; Velasco 2020; Horowitz, Kali, and Song 2021). In order to capture such patterns of complex interdependence empirically, we test our hypothesis using spatial econometric models. Our primary dependent variables are the proportion of health aid disbursed bilaterally by each donor to each recipient for a range of health focus areas. Our main independent variables are spatial lags capturing how health aid is distributed by other donors involved in (partly) the same health-focused epistemic communities. We multiply the lagged vector of

[1] Swiss (2012, 2018) comes closest to our aims by examining how the adoption of "Women in Development" and "Gender and Development" policies by donors is influenced by the number of other donors that have already adopted them, among other factors.

donor's aid disbursements for each disease by dyadic memberships of donors in both intergovernmental and international nongovernmental organizations (IGOs and INGOs) concerned with health issues, using an original dataset. Donor governments can be connected to other donors through joint memberships in health IGOs and health INGOs with members within their borders. We expect that a donor's allocation of DAH among health issues is influenced by the allocation of other donors, in proportion to the intensity of the donors' links through health IGOs and health INGOs. Our argument is meant to complement rather than replace accounts based on donor self-interest. Thus, we control for a range of factors that strategic accounts would expect to determine the allocation of DAH across uses. Holding these other factors constant, we find substantial and robust evidence of peer effects.

Gauging the Mismatch

The allocation of scarce resources among alternative health interventions has always been influenced by a complex bundle of information relating to the causes of ill health. The information required includes mortality rates, etiological and epidemiological knowledge, availability of treatments, and their cost. Since the early 1990s, policy-makers have access to systematically collected and standardized information on the contribution of a wide range of diseases and health conditions to the overall burden of disease. Collaborations between the WHO, the World Bank, and academics generated the data underlying a series of seminal outputs: the Global Burden of Disease (GBD) studies published from 1990 onward, the World Bank's *World Development Report 1993: Investing in Health* (World Bank 1993; see also World Health Organization 1996; Tan-Torres Edejer et al. 2003), and the Disease Control Priorities (DCP) volumes published from 1993 onward. The approach developed for these studies is based on the concept of DALY. DALY is a measure of impact that combines the number of years of life lost due to premature mortality and the years lived with disability due to the disease. This measure helps researchers to estimate and perform systematic comparisons of two key quantities. The first quantity is the health burden attributable to each disease and disease category, at the global level and for each country or territory. The first edition of the GBD study captured DALY for hundred diseases in 1990, and estimates were updated in later years. The latest study, Global Burden of Disease 2017, gives DALY estimates for 359 diseases and injuries for 195 countries and territories between 1990 and 2017 (GBD 2017 DALYs and HALE Collaborators 2018). The second quantity based on the DALY is the cost-effectiveness of health interventions. The DCP project pools information on cost-effectiveness from studies published in major academic journals. It lists the average US$ cost per DALY saved by many interventions focusing on a range of diseases. The DCP volumes were published in 1993, 2006, and 2015–2018 (Jamison et al. 1993, 2006, 2018).

The GBD and DCP studies were developed to help officials make decisions about allocating scarce resources among health activities. While they have not been free of controversy (Chen et al. 2015), the studies have become standard tools for international policy-making. One hundred and fifty-six governments reference the GBD study (Murray and Lopez 2017). For instance, the UK government referenced it when stating that it "is allocating its country spend to those where the health impact is likely to be high, according to what might be an ideal allocation based on need and likely effectiveness of health expenditure in each country" (Department for International Development 2009, 5). It cited the GBD study to demonstrate that it is "targeting effort to need," by enabling it to state, for instance, that "Over 48 percent of the global burden of disease and more than 68 percent of the global burden of all communicable diseases are found in [UK aid] focus countries" (Department for International Development 2013, 16). Similarly, the DCP volumes are the standard reference available to practitioners for comparing the cost-effectiveness of interventions when health-aid programs and projects are designed and agreed upon (Norheim 2018).

Health policy experts have used these data sources to point at mismatches between DAH allocations and health needs. Some scholars have emphasized that DAH allocation does not always match the burden of various diseases across different countries (MacKellar 2005; Shiffman 2006; Sridhar and Batniji 2008; Stuckler et al. 2008; Esser and Bench 2011; Dieleman et al. 2014). Others discuss the relationship between DAH flows and the relative cost-effectiveness of health interventions (Bendavid et al. 2015). We do not aim to demonstrate here whether and how disease burden and cost-effectiveness criteria should be combined to determine the "optimal" allocation of DAH. Instead, we illustrate that the existing allocation is unlikely to be optimal prima facie, regardless of which criterion is prioritized. To do so, we utilize data on health aid collected by the Institute of Health Metrics and Evaluation (IHME 2020a). The IHME defines DAH as consisting of financial and in-kind contributions that aim either to achieve country-specific health improvements or to finance health-related global public goods such as research and development, disease surveillance, monitoring and evaluation, and data collection. DAH is classified into eight "health focus areas" (plus a residual category): newborn and child health, reproductive and maternal health, HIV/AIDS, tuberculosis, malaria, other infectious diseases, noncommunicable diseases (NCDs), and sector-wide approaches and health system strengthening. This article focuses on DAH that is provided bilaterally.[2]

Mismatch between Health Focus Areas

One way of gauging a mismatch between disease burdens and funding devoted to them is to compare the ratio of DAH to DALY lost across various health categories and the cost-effectiveness of health interventions targeting them. Figure 1 illustrates the former aspect, by showing how a bilateral donor's ratio of DAH to DALY for seven disease categories has changed between 1990 and 2017. If health aid was allocated among disease categories in direct proportion to the DALY loss attributable to them, the lines corresponding to each disease category would be coincident. Instead, major differences are apparent.

Figure 2 facilitates a more nuanced assessment by combining information on DAH spent per DALY with information on cost-effectiveness. The left-hand side of the figure

[2] We do so for two reasons deriving from our explanatory approach. First, it allows us to consider also the recipient and dyadic features that should play a major role according to the aid allocation literature. We could not do so if we included contributions to multilateral funds because decision-making in multilateral aid is subject to substantial bargaining among donors and agency slack of IGO bureaucracies (Schneider and Tobin 2013). Therefore, donor governments often cannot directly control who the recipients will be and sometimes cannot control the specific health focus area either. Second, as we discuss in the following text, the network data we use to operationalize involvement in epistemic communities is measured at the country level. While multilateral aid agencies interact with INGOs and other IGOs too, such interactions cannot be captured through the kind of systematic membership data that exist for countries.

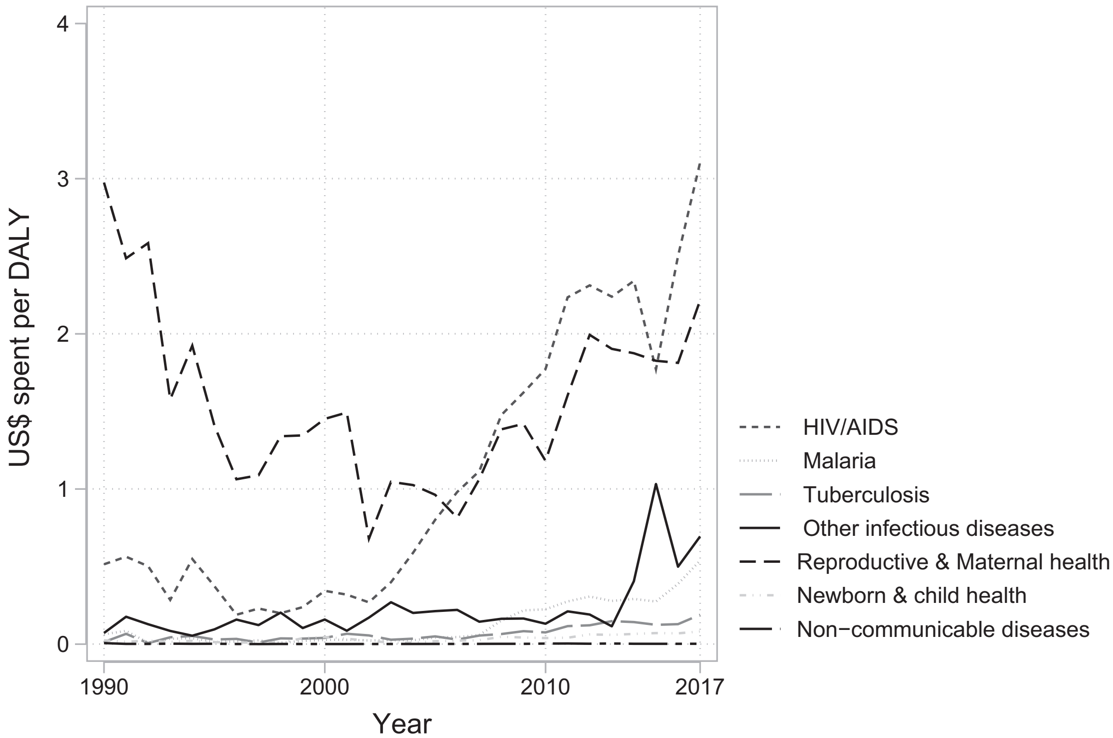

Figure 1. Ratio of development assistance for health to Disability-Adjusted Life-Years (bilateral donors), seven health focus areas, 1990–2017. Funding amounts refer to all DAH recipients in the IHME database.
Source: Our calculations based on GBD 2017 DALYs and HALE Collaborators (2018) and Institute for Health Metrics and Evaluation (IHME) (2020a). Table A3 in the online appendix displays how DALY data were coded to correspond to DAH data. All visualizations used in this article are based on the *plotplain* package (Bischof 2017).

illustrates, by disease area, the amount of US$ of DAH allocated by DALY lost during the most recent year with data (2017) and the right-hand side displays the median amount of US$ needed to avert one DALY according to the latest edition of the DCP.

Figure 2 shows that all disease categories are massively underfunded compared to the relatively low cost of saving a year of someone's life. Nevertheless, a closer look at DAH allocation across diseases reveals clear divergences from health-maximizing spending. If DAH was allocated in proportion to the DALY loss attributable to them and the cost of addressing them, we would expect more DAH to go to high-burden diseases that can be addressed cost-effectively. Indeed, the figure suggests that reproductive and maternal health is one of the most cost-effective intervention categories and attracts one of the largest amounts of DAH per DALY lost. However, it also reveals the presence of mismatches when comparing DAH allocation to cost-effectiveness. For instance, malaria receives substantially more funding than tuberculosis despite similar cost-effectiveness. Newborn and child health attracts very low levels of funding considering how little is needed to avert DALYs. In contrast, HIV/AIDS has attracted a much larger amount of aid per DALY despite lower cost-effectiveness compared to other disease areas.

Mismatch between Recipients

The mismatch is apparent for allocation not only between diseases but also between countries. Figure 3 displays the average aid per DALY allocated between 1990 and 2017 to recipient countries in DAH for child health (chosen as an example because diseases are less geographically clustered). There are wide disparities between countries in the allocation of child health aid. Some countries get a substantial degree of financing per DALY, while others attain very little. This pattern can be observed even for geographical neighbors with similar levels of development and similar disease burdens. The picture is analogous when looking at the between-country distribution of other DAH disease categories.

Thus, prima facie evidence indicates that DAH is not fully aligned with DALYs and cost-effectiveness estimates, which suggests that DAH allocation is influenced by factors beyond the goals of improving the health of the populations in the countries that receive it. The remainder of this article develops and tests a constructivist explanation for this pattern.

The Social Construction of International Health Priorities

As noted in the introduction, the existing studies typically explain mismatches between development needs and aid flows by pointing at the economic and strategic interests of donor countries (Bueno De Mesquita and Smith 2007; Milner and Tingley 2010; Baccini and Urpelainen 2012; Barthel et al. 2014; Vreeland and Dreher 2014; McLean 2015; Bermeo 2017; Lazell and Petrikova 2020). While those factors need to be considered in any analysis of the allocation of DAH, we develop a complementary explanation based on the assumption that the global health "industry" is a social environment that exposes policy-makers to socialization processes (Eyben 2006; Mosse 2011; Roth 2015; Kallman 2017). As Jeremy Shiffman noted in a seminal

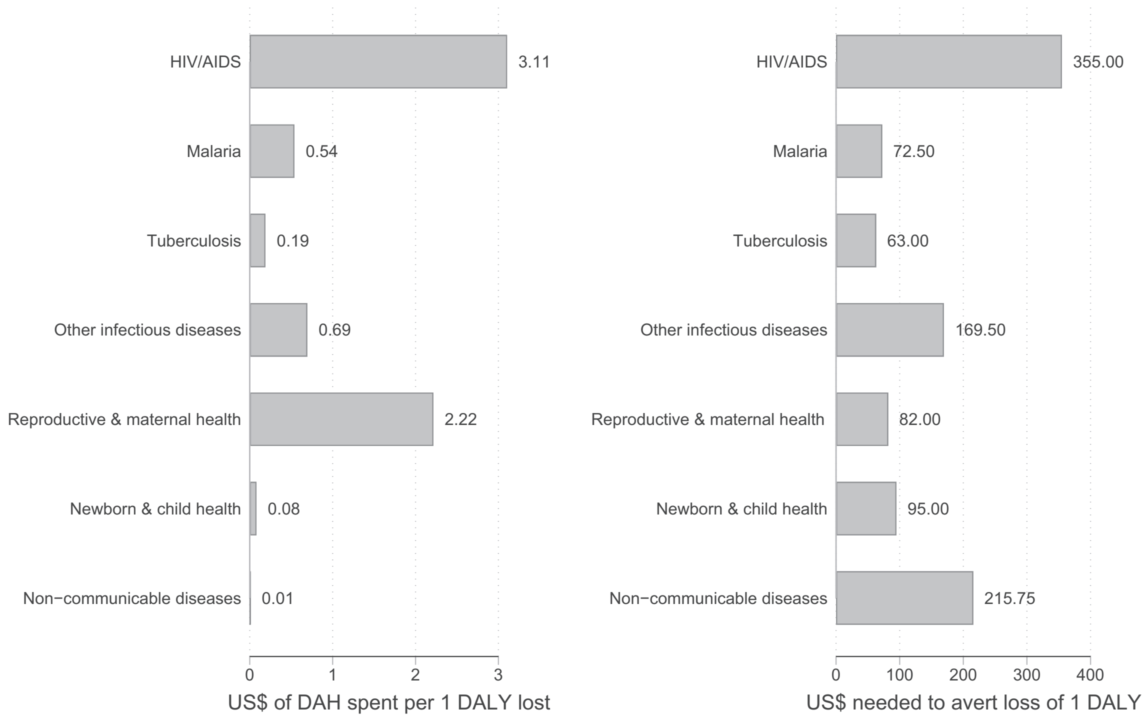

Figure 2. Development assistance for health allocated by Disability-Adjusted Life-Year lost compared to US$ needed to avert the loss of a Disability-Adjusted Life-Year, 2017. Funding amounts refer to all DAH recipients in the IHME database.
Source: Our calculations based on GBD 2017 DALYs and HALE Collaborators (2018), Jamison et al. (2018), and IHME (2020a).

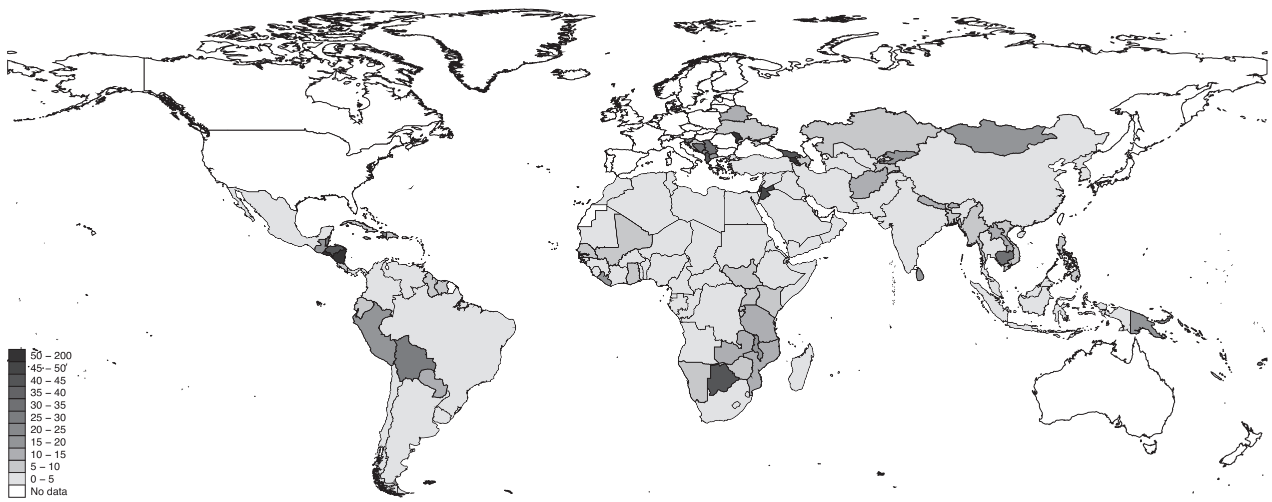

Figure 3. Ratio of bilateral development assistance for health to Disability-Adjusted Life-Years, newborn & child health, 1990–2017. Funding amounts refer to all DAH recipients in the IHME database. DALY refer to the sum of all DALYs lost in each year. The values are calculated by dividing the sum of DAH in each recipient-year by the DALY lost in each recipient-year and then taking the average for all twenty-seven years in the data.
Source: Our calculations based on GBD 2017 DALYs and HALE Collaborators (2018) and IHME (2020a).

article on disease control priorities, "While recipient need or provider interest may shape initial donor choices, subsequent behavior may be based less on deliberation than on precedent, resulting in simultaneous global shifts in priorities not always in accordance with developing world need" (Shiffman 2006, 403).

A constructivist explanation of DAH allocations needs to perform two tasks, which can be related to the norm life cycle theorized by Finnemore and Sikkink (1998). First, it needs to trace the origins of norms and ideas that can affect funding decisions. Researchers generated valuable insights into this aspect by presenting rich process-tracing evidence on the efforts by advocacy networks—that is, coalitions of experts, officials, and activists working on a health issue—to mobilize political support and funding for specific health areas, such as maternal health, infant survival, and health system strengthening (Ogden, Walt, and Lush 2003; Shiffman and Smith 2007; Hafner and Shiffman 2013;

Walt and Gilson 2014; Quissell and Walt 2016; Schmitz 2016; Shiffman et al. 2016a; 2016b; Smith and Rodriguez 2016; Storeng and Béhague 2016). Given the work that has been done on the emergence, expansion, and operations of such advocacy networks, we will not address this aspect here.

The second task is to examine whether and how such ideas exert a level of influence on aid decision-making that is sufficient to affect the aggregate allocation of DAH among health issues. This task relates to the concept of "norm cascade" (Finnemore and Sikkink 1998). Since systematic knowledge on this aspect of DAH is scarce, we focus our attention on it. In essence, we expect that a donor's allocation of DAH among health issues is influenced by how other donors have allocated their aid. This influence results from socialization processes and typically leads to convergence in aid allocation. However, we do not expect donors to be influenced by all other donors equally. Instead, we hypothesize that influence is stronger between donors who participate in the same epistemic communities in the field of health. We discuss these two issues (influence and unequal influence) in turn.

The setting of priorities for global health interventions is a complex process that involves several epistemic and normative judgments. These judgments are based to some extent on policy paradigms or possibly on compromises between policy paradigms that are held by different decision-makers within the same organization. Existing research has shown that a variety of paradigms coexist in the field of global health (Lee 2009; Davies 2010; Rushton and Williams 2012; Storeng 2014). The adoption, adaptation, and replacement of policy paradigms are affected by several factors, including learning from other policy-makers' experiences and emulating the behavior of models and social peers. Emulation plays a role in shaping policy paradigms also because learning is hindered by noisy and incomplete information, and paradigms consist of conceptual categories and justice beliefs in addition to causal beliefs that can be updated by learning. Even decision-makers committed to maximizing the health impact of DAH are subject to biases when seeking and interpreting evidence, including burden-of-disease and cost-effectiveness statistics (Parkhurst 2017).

Donor officials develop their intervention priorities in response to normative and cognitive shifts in their social environment (Finnemore and Sikkink 1998). While this environment includes a variety of actors (for instance, officials in other departments of the same government), our focus here is the role of epistemic communities, defined broadly as "a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy relevant knowledge within that domain or issue-area" (Haas 1992, 3). By emphasizing social influences deriving from embeddedness in epistemic communities, our approach differs from recent work on how donors' choices of recipients affect the decisions of other donors, which focus on rational-choice mechanisms of diffusion such as competition (Barthel et al. 2014; Steinwand 2015; Davies and Klasen 2019).

For our purposes, the relevant epistemic communities consist of experts who specialize in various aspects of global health. We focus on epistemic communities that span national borders, comprising individuals based in several countries. Some of these experts are primarily scientists and clinicians, while others mainly engage in policy advocacy and consultancy. As recent research on global health networks has shown, the boundaries between scientific, clinical, and advocacy activities are fuzzy (Quissell and Walt 2016; Schmitz 2016; Shiffman et al. 2016a, 2016b; Smith and Rodriguez 2016; Herrick 2020). The foundational literature on epistemic communities posited a clear distinction between them and policy-makers (Haas 1992). However, in the field of global health, this distinction is often inappropriate, as donor agency officials are frequently specialists themselves and can credibly claim epistemic rather than just financial authority (e.g., Dalglish et al. 2015; Shawar and Crane 2017). For this reason, we depart from the conventional dichotomy and consider donor officials dealing with health aid as potential members of epistemic communities.

Complex patterns of reciprocal influence connect actors involved in epistemic communities. Officials of different donor agencies can be influenced by the same opinion leaders based in INGOs or IGOs, such as the WHO. At the same time, they can influence each other, especially given that they constitute a peer group based on shared professional identities (Fejerskov 2015; Kallman 2017). Specifically, two causal mechanisms can lead from participation in the same epistemic communities to similarity in health-aid allocation decisions. First, convergence can result from common exposure to the same set of non-donor actors. Second, convergence can arise due to emulation among peers, where peer status is at least partly defined by joint involvement in overlapping epistemic communities. The two mechanisms do not exclude each other and, indeed, are likely to operate in tandem. In the next section, we discuss the methodological implications of this double pathway to convergence.

Liam Swiss (2012, 2018) has provided one of the most in-depth studies on how officials in development agencies respond to the expectations and norms prevalent in their external environment by examining the adoption of policy models in the areas of gender and development and security and development. His primary aim is to explain "the apparent consensus or striking similarity of policy models and priorities among foreign aid donors" (Swiss 2018, 24). His explanation draws on the world polity approach, which expects governments worldwide to display increasing isomorphism in their structures and activities due to their desire to be seen in compliance with global standards of legitimacy. This approach identifies a world culture that shapes conceptions of appropriate social actors, collective goals, and policy models. A world polity constituted by organizational linkages transmits this world culture to all states (Boli and Thomas 1997).

Our account shares key features of this approach, but it differs in an important way. Consistent with world polity theorists who describe the world as "a unitary social system, increasingly integrated by networks" (Boli and Thomas 1997, 172), Swiss focuses on the question of "why donors march in lock-step with uniform policies and priorities" (Swiss 2018, 23). By contrast, our point of departure is not the observation of a general convergence among donors toward a single understanding of global health priorities. Even after decades of involvement in the health sector of low- and middle-income countries, differences in funding priorities remain substantial among donors. We illustrate this argument on a small number of donors in 2017. As shown in figure 4, different donors seem to have varying priorities. France spent relatively more on reproductive and maternal health than the other donors, Germany focused more on infectious diseases, Japan and the United Kingdom prioritized child health, and the United States spent most of its DAH on the fight against HIV/AIDS.

Such differences may be partly because, while epistemic communities influence donor officials, the members of such communities are not identical across all donors. This

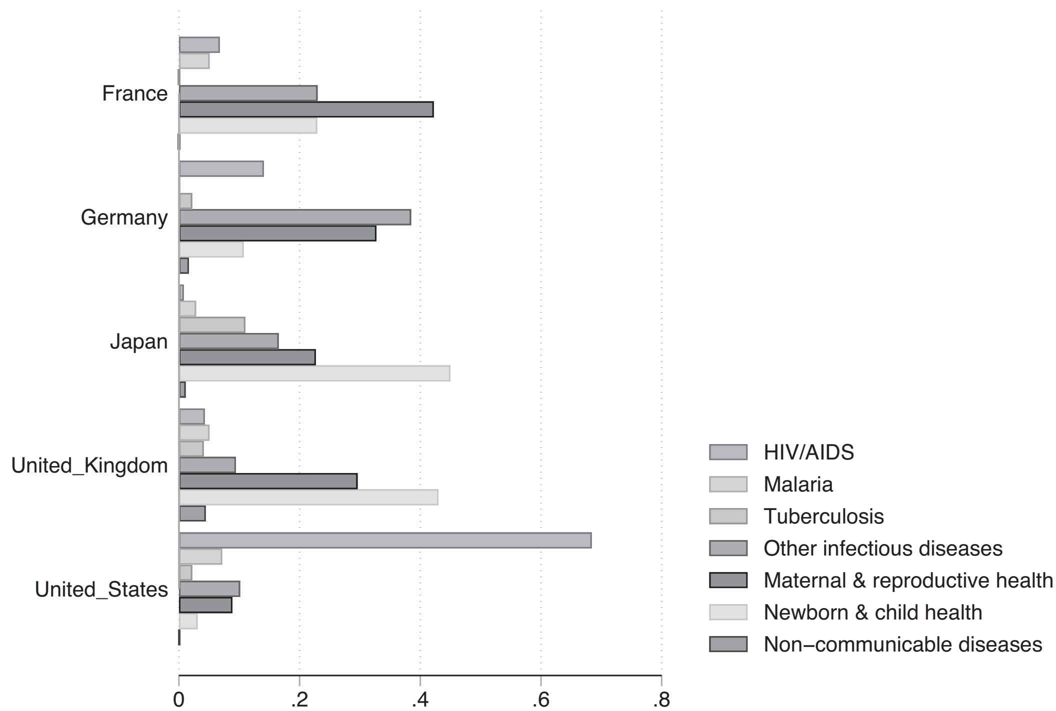

Figure 4. Share of disbursement for seven health focus areas by five different donors, 2017. Our calculations based on data from IHME (2020a).

diversity matters because, even when they are committed to improving population health, different groups carry different professional and cognitive biases (Parkhurst 2017). The issue is not just that some states have stronger connections to the world polity than other states, which fits with the view that they are merely at different stages of the same global trajectory. Rather, as Jason Beckfield points out in relation to IGOs in general, "while states are growing more even in the number of IGOs they belong to, they increasingly belong to different IGOs" (Beckfield 2010, 1041). He found that, since 1945, the network of IGOs has become more fragmented, more heterogeneous, less cohesive, and less "small-worldly" in its structure. We do not aim to provide a similar structural mapping of IGOs and NGOs operating in the field of health. Nevertheless, Beckfield's findings are important for our purposes because they suggest that the study of policy contagion through involvement in epistemic communities needs a fine-grained analysis of *who is connected to whom*. This insight guides the empirical strategy that we present in the next section.

In sum, our theoretical approach to social contagion accounts for the possibility that health-aid policy-makers are susceptible to varying levels of influence stemming from interacting within the same epistemic communities. Our hypothesis is, therefore:

A donor's allocation of DAH among health issues is influenced by the allocation of other donors in proportion to the intensity of the donors' links through health-focused epistemic communities.

Empirical Strategy and Data

We test our hypothesis using spatial econometric models. In this section, we describe dependent variables, main independent variables, controls, and estimation strategy.

Dependent Variables

Our main dependent variables are the amount of health aid disbursed for each one of eight health focus areas: newborn and child health, reproductive and maternal health, HIV/AIDS, tuberculosis, malaria, other infectious diseases, NCDs, and sector-wide approaches and health system strengthening. Specifically, we take the (log) total amount of health aid allocated donor i to recipient k in time t.[3] The data are provided by the (IHME 2020a) and have been described in the second section. IHME includes data for twenty-three donors (listed in table A1). Data are available at the bilateral level and allow us to identify the disbursement of aid from each donor to each recipient for every health focus area for each year between 1990 and 2017. DAH disbursements are measured in constant 2018 dollars. Following common practice in the literature (Bueno De Mesquita and Smith 2007), we use the logarithm of the amount of disbursements to mitigate the impact of outliers. We label this variable *Aid Disbursements (health focus area)*.

The literature on aid allocation uses either disbursement or commitment data as dependent variables. We focus on disbursement because the health focus categories of the IHME disbursements dataset match the categories of the causes of DALY of the GBD more closely than alternative sources of funding data such as the OECD Creditor Reporting System or AidData (Tierney et al. 2011; OECD 2020). Because it is desirable to include the DALY for each disease category as a control variable in our estimations, the IHME allows us to match DAH and DALY more precisely.[4] While commitments may reflect the donors' intentions more

[3] To preserve zero values, we add one before log transforming the dependent variable.

[4] See Global Burden of Disease Health Financing Collaborator Network (2019, 56–64) for details on the procedure for allocating funds to health focus areas. Sector-wide approaches and health sector strengthening do not have a corresponding DALY estimate and, therefore, we cannot control for them in the

accurately than disbursements, we consider disbursements a reasonably accurate reflection of donor priorities. Contrary to other aid sectors, commitments of health aid are not only generally fulfilled, but they are also fulfilled mostly within two years (Hudson 2013; see also Dietrich 2011).

Independent Variables

Our main independent variables are spatial lags capturing connections through health-focused epistemic communities. More specifically, we multiply the lagged vector of donor's aid disbursements for each disease by a connectivity matrix capturing dyadic memberships of donors in both IGOs and NGOs concerned with health issues. In line with our conceptual framework, we only consider shared memberships between donors. Donor governments can be connected to other states through joint memberships in health IGOs and through health INGOs that have members within their borders. We use this measure because it captures both causal mechanisms discussed earlier. Shared organizational membership can promote convergence because (1) it exposes officials from different donor agencies to the same set of non-donor actors and (2) it facilitates emulation among peers, where peer status is partly defined by joint involvement in overlapping epistemic communities. Thus, our measure is well suited to reflect two important features of interpersonal interactions in the field of global health: on the other hand, health INGOs and health IGOs are not passive conduits between donors in the way that—say—transport links are but actors that contribute to shaping beliefs and decisions; on the other hand, donor officials are not passive recipients of INGO–IGO advice and pressure but exercise epistemic authority themselves and provide models for other donors. However, our approach has the limitation that it does not help us disentangle the relative importance of donor–donor and I(N)GO–donor influence in producing convergence of DAH allocation decisions. We point at a way to address this limitation in the concluding section.

As a first step, we include both IGOs and INGOs in the connectivity matrix, in line with the literature on epistemic communities, which does not draw a neat separation between public and private actors. In a robustness check, we consider dyadic memberships in health IGOs and dyadic memberships in health INGOs separately. We use an original dataset of memberships in health IGOs and health INGOs, based on information collected from the Yearbook of International Organizations (YIO) (further details are in the online appendix). Memberships are coded for 1988, 1992, 1996, 2000, 2004, 2008, and 2011. Since countries' memberships in I(N)GOs do not fluctuate unpredictably, with countries joining and leaving particular I(N)GOs rapidly, we use linear interpolation to fill in the years that were not coded.[5]

More formally, the spatial lag is built:

$$\text{Spatial Lag Disbursement (Disease)}_{\text{ikd,t}} = (\text{IGO}_{\text{ij,t}-1} + \text{INGO}_{\text{i}j,\text{t}-1}) * \text{ Disease Aidshare}'_{\text{jkd,t}-1} \quad (1)$$

where Disease $\text{Aidshare}_{\text{ikd,t}}$ is the disbursement of aid for a specific disease d from donor i to recipient k in time *t–1* divided by the disbursement of all diseases from donor i to recipient k in time *t–1* and $(\text{IGO}_{\text{ij,t}-1} + \text{INGO}_{\text{ij,t}-1})$ is the number of shared memberships in health IGOs and health INGOs between donor i and donor j in time *t–1*. In short, we multiply dyadic memberships in health IGOs and health INGOs by a vector of donor's aid disbursement shares for each disease and each recipient. We use aid shares because we are interested in modeling the funding priorities of other donors. Using overall disbursements in the spatial lag would mean that some donors, who spend much more, contribute strongly to the spatial lag, even in disease categories where they spend comparatively little. Therefore, we account for the relative importance of different disease categories in a donor's portfolio by using disbursement shares. Furthermore, we are interested in the combined weight of the revealed priorities of other donors and aim to ensure that lags are not driven by the outsized spending of one donor in a specific disease category. Therefore, we use the log-transformed row value of these variables to mitigate the impact of outliers.[6] Our connectivity matrix is not row-standardized. Row-standardization would impose the assumption that total exposure to the spatial stimulus is equal for all donors (Neumayer and Plümper 2016), which would be highly implausible in our case. In Mozambique, for instance, the aid agencies of Nordic countries, later joined by the Netherlands, Switzerland, and Canada, were known as the "like-minded" donors, and they acted in close coordination to shift their health aid toward general health sector support. By contrast, the United States was dubbed "the single-minded donor," as it limited coordination and pursued the opposite strategy of funding disease-specific activities focused on HIV/AIDS (Pfeiffer et al. 2017). Theoretically, we should expect heterogeneity among donors in total exposure and sensitivity to peer influence, and the connectivity matrix is constructed accordingly.

Control Variables

We incorporate several control variables to account for cofounding factors and alternative explanations. Most importantly, we include variables measuring the burden of disease in each country (DALY) and the cost-effectiveness of interventions that target each disease category (US$ needed to avert the loss of one DALY). We have already discussed these measures and their sources in the second section. Here, they are intended to capture the role of calculations about reducing the global burden of disease in the most cost-effective way. We use DCP 1993 data for the years 1993–2005, DCP 2006 data for 2007–2015, and DCP 2015–2018 data for subsequent years. The allocation of DAH across diseases may also be a by-product of the decision to direct financial resources to countries that are important to the donor, notably for political, strategic, and economic reasons. To account for this mechanism, we include variables capturing the commercial and strategic importance of recipient countries: the amount of imports from the donor country to the recipient country (World Bank 2020b), the distance of foreign policy ideal points based on United Nations General Assembly votes (Bailey, Strezhnev, and Voeten 2017), a dummy for United Nations Security Council members members (Vreeland and Dreher 2014), and a dummy for former colonies (Mayer and Zignago 2011). According to Bueno de Mesquita and Smith, it is costlier to buy policy concessions from democracies than for authoritarian

models. We do, however, report a robustness check focusing on them, in the online appendix.

[5]Linear interpolation follows standard practice in quantitative research on INGO memberships (e.g., Murdie and Bhasin 2011; Hughes, Krook, and Paxton 2015). Results using alternative imputation approaches (nearest neighbor and last available data) can be found in the online appendix (Tables A18–A21).

[6]To ensure that donors whose peers do not spend any DAH in a recipient-disease-year are not dropped from the analysis, we add one before log-transforming the spatial lag. Results are not substantially different when using a spatial lag without log-transformation.

Table 1. Descriptive statistics

Variable	*Obs*	*Mean*	*SD*	*Min*	*Max*
Disbursements (log)	534,416	0.734	1.838	0.000	13.191
Lagged dependent variable	484,376	0.766	1.871	0.000	13.191
Spatial lag (health organizations)	484,376	3.941	2.687	0.000	9.037
Spatial lag (weighted by staff)	484,376	4.174	2.804	0.000	9.319
Spatial lag (distance)	484,376	5.849	3.695	0.000	12.619
Spatial lag (trade)	484,376	9.848	7.190	0.000	20.355
DALYs lost	423,829	2161.533	13,977.184	0.000	3.07e + 05
Costs per DALY (log)	467,614	4.410	1.342	1.946	7.431
Democracy	440,672	0.304	0.204	0.010	0.879
Colony	526,640	0.045	0.208	0.000	1.000
Imports	378,856	8.738	3.829	−6.908	19.993
GDP per capita	471,984	3311.794	3249.951	84.020	22,395.586
United Nations General Assembly voting distance	412,072	1.737	0.735	0.000	5.250
United Nations Security Council membership	460,760	0.053	0.224	0.000	1.000
Population	474,496	15.705	1.980	10.764	21.062

countries. Therefore, donors consider the type of regime in allocating aid (Bueno De Mesquita and Smith 2007). To account for this, we include a measure of regime type, the Liberal Democracy score from the V-Dem project (Coppedge et al. 2020). Finally, we control for recipient need more generally by including (log) population to control for variation in the size of the targeted population in different recipient countries and GDP per capita to account for different levels of economic development (United Nations 2019).

One might be concerned about potential confounders because networks of health IGO and INGO membership are likely correlated with other networks that countries are embedded in. A small but growing literature shows that donors are influenced by the choices of other donors when choosing between recipients (Barthel et al. 2014; Steinwand 2015; Davies and Klasen 2019). Therefore, we include several alternative spatial lags to test whether the findings on the association of the spatial lag focusing on epistemic communities in health with health aid are robust to including those networks. First, we considered the possibility that we are capturing networks of economic interest rather than epistemic communities for health (Barthel et al. 2014; Davies and Klasen 2019). Therefore, we multiply aid disbursement shares with donors' trade with each other (World Bank 2020b). Furthermore, we control for a spatial lag based on geographical distance between donors (Mayer and Zignago 2011). Table 1 reports the descriptive statistics of our main variables.

Empirical Strategy

In our simplest regressions, we estimate the following model to probe the allocation among disease focus areas:

$$\begin{aligned}&\text{Aid Disbursements (Disease)}_{\text{ikd,t}}\\&\quad=\alpha+\beta_1\,\text{Aid Disbursements (Disease)}_{\text{ikd,t}-1}\\&\qquad+\beta_2\,\text{Spatial Lag Aid Disbursements (Disease)}_{\text{ikd,t}}\\&\qquad+\text{W}_{\text{k,t}-1}\beta_3'+\gamma_{\text{ikt}}+\varepsilon_{\text{ikd,t}}\qquad(2)\end{aligned}$$

where aid disbursement and the spatial lag have been already described, W is a matrix of recipient-disease characteristics. β_1, β_2', and β_3', are the coefficients. In particular, the key coefficient of interest is β_2, which we expect to be positive. γ are donor–recipient-year fixed effects, whereas α is the constant and ε is the error term. Since aid disbursements is a continuous variable, we can estimate equation (3) using simple OLS regressions with robust standard errors clustered at the donor–recipient-year (Beck, Gleditsch, and Beardsley 2006). When estimating allocation among recipients in a given disease focus area, we employ donor-disease fixed effects rather than donor–recipient fixed effects and cluster standard errors at the donor-disease-year. All independent variables and control variables are lagged by one year to ensure the correct ordering of events.

Findings

We discuss allocation among diseases and allocation among recipients in turn. Table 2 reports the results for five models focusing on allocation among disease focus areas in a given recipient country. All coefficients are standardized (beta coefficients) to ensure comparability. The models include donor–recipient-year fixed effects to control for variation at the dyad-year level. Our estimation approach allows for correlated errors at the donor–recipient-year. In model 1, we estimate the models controlling for DALYs lost and the cost of averting DALYs. Model 2 displays the results controlling for a lagged dependent variable to minimize the possibility that results are driven by serial correlation (Franzese and Hays 2007; Böhmelt et al. 2016). Subsequently, we include the economic (model 3) and distance-based (model 4) spatial lags, discussed above, to ensure that the spatial effects we observe capture epistemic communities for health more than alternative sources of connectivity. Finally, model 5 includes an extension of our models. The spatial weights based on health organizations treat all IGOs and INGOs equally. However, joint membership in some IGOs or INGOs may be more important than in others. As a proxy for potential importance, we use an alternative spatial lag that weights joint membership by the size of the staff of the respective IGOs and INGOs. Data on staff are from the YIO.[7]

[7] To reduce the impact of outliers and account for decreasing marginal returns to scale, we rely on the log-transformation of staff size, adding one to keep in the sample organizations that do not employ staff (e.g., federations that rely on national member organizations). For instance, in model 5, the WHO weighs 4.6 times more than the International Council for Global Health Progress. Two limitations of these staffing data need to be noted. First, they are available for only around half of the organizations for which we have membership data. We assume that missing data indicate a small organization and assign them the same weight as those organizations with no own staff (a weight of 1). Results are very similar when excluding missing organizations in a robustness check. Second, we

Table 2. Epistemic communities and disbursement (log) of development assistance for health across disease categories

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Spatial lag (health organizations)	0.229***	0.084***	0.095***	0.116***	
	(0.0012)	(0.0008)	(0.0015)	(0.0025)	
Spatial lag (trade)			−0.015***		
			(0.0006)		
Spatial lag (distance)				−0.033***	
				(0.0017)	
Spatial lag (weighted by staff)					0.083***
					(0.0008)
Lagged dependent variable		0.633***	0.632***	0.632***	0.633***
		(0.0030)	(0.0030)	(0.0030)	(0.0030)
DALYs lost	−0.005*	−0.001	−0.001	−0.001	−0.002
	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Costs per DALY (log)	−0.013***	−0.003***	−0.003**	−0.003**	−0.003***
	(0.0015)	(0.0012)	(0.0012)	(0.0012)	(0.0012)
Donor–recipient-year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	423,829	423,829	423,829	423,829	423,829
R^2	0.482	0.692	0.692	0.692	0.692

Note: Standardized beta coefficients; Clustered standard errors in parentheses.
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

We find very strong evidence indicating that donors' health focus area portfolios in a specific recipient country are influenced by epistemic communities for health. The coefficients are significant ($p < 0.001$) and positive in all five models. The strength of the coefficients is still considerable when including a lagged dependent variable and alternative lags based on economic ties or geographical distance. When holding the spatial lag based on health organizations constant, the alternative means of connectivity seem to decrease DAH disbursements slightly. Additionally, we find that median costs per DALY are significant in the models and are negatively associated with DAH. DALYs lost do not predict health aid at any conventional threshold of statistical significance in any models that include a lagged dependent variable. Despite incorporating multiple spatial lags and a lagged dependent variable, multicollinearity is below critical values in four of the five models displayed. Only model 4 shows substantial multicollinearity for the spatial lags (variance inflation factor of 30.13). Therefore, the coefficients should be interpreted cautiously.

In a second step, we focus on the allocation of DAH among recipients. Table 3 displays the results from the corresponding five models. They mimic the specification choices used in the models focusing on allocation among health focus areas but shift the focus to allocation among recipients. To this end, the models displayed in table 3 include donor-disease-year fixed effects. Multicollinearity is higher in these models than in those displayed in table 2, and two models show variance inflation factors above the critical value for our main variables of interest—twenty-one (model 8) and thirty-two (model 9). Despite multicollinearity, the spatial lags are statistically significant, and the coefficients remain sizeable.

Again, the evidence supports the importance of joint involvement in epistemic communities for health in DAH allocation. Peers seem to shape allocation among recipients in specific disease categories. The coefficients are significant ($p < 0.001$) in all five models. Furthermore, increases in DALYs lost are associated with increased DAH at the country level. These results imply that the overall burden due to a disease does seem to play a role in the considerations of donors when choosing between recipient countries. The coefficient for the health organizations spatial lag exceeds the coefficient by DALY at least seven-fold, depending on the specification used. This finding implies that where other donors spend their DAH seems to matter much more for disease-specific DAH than where the disease burden is highest. Finally, there is strong evidence that cost-effectiveness is associated with DAH-allocation decisions among recipients as well. The coefficients are significant in all five models. Donors seem to seek value for money when deciding on their DAH portfolio.[8]

To gauge the substantive importance of epistemic communities, table 4 displays the simulated (log) disbursement, holding all variables at their mean and our variables of interest one standard deviation below and above the mean for all eight models. We only perform this exercise for those variables that obtained statistically significant results in models 2 and 7, which represent the most conservative estimation due to the inclusion of lagged dependent variables. A two-standard-deviation change in the spatial lag is associated with substantively higher DAH disbursements both across diseases and across recipients. In the model focusing on allocation among diseases in the same recipient, two standard deviations increase DAH disbursements by 55.1 percent.[9] When holding donor-disease-years constant to analyze the allocation of DAH in a specific disease category across recipients, the results are similarly substantial. A two-standard-deviation increase in the spatial lag increases DAH disbursements by 30.1 percent.

only have cross sectional staff data. However, recent research shows that cross sectional YIO staffing data do a good job sorting organizations into different sizes as small organizations stay small, while large organizations stay large (Debre and Dijkstra 2021). We thank an anonymous reviewer from prompting us to consider heterogeneity among organizations.

[8]The coefficients are sizeable but should be interpreted cautiously. The costs of interventions do not vary on the country level but only between diseases and country income groups. Therefore, the coefficient reflects the fact that donors spend much more in low-income countries than in middle-income countries.

[9]Percentage changes are calculated by subtracting the +Std. dev. value from the −Std. dev. value. The result is then divided by the −Std. dev value and multiplied by 100 to get the percentage change in predicted DAH allocation with a two-standard-deviation change in each of the independent variables.

Table 3. Epistemic communities and disbursement (log) of development assistance for health across recipients

	(6)	*(7)*	*(8)*	*(9)*	*(10)*
Spatial lag (health organizations)	0.156***	0.054***	0.074***	0.087***	
	(0.0037)	(0.0022)	(0.0043)	(0.0059)	
Spatial lag (weighted)					0.053***
					(0.0021)
Spatial lag (trade)			−0.023***		
			(0.0018)		
Spatial lag (distance)				−0.035***	
				(0.0043)	
Lagged dependent variable		0.671***	0.671***	0.671***	0.671***
		(0.0079)	(0.0079)	(0.0079)	(0.0079)
DALYs lost	0.017***	0.007**	0.007**	0.007**	0.007**
	(0.0005)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Costs per DALY (log)	−0.471***	−0.139***	−0.137***	−0.137***	−0.140***
	(0.0663)	(0.0360)	(0.0357)	(0.0359)	(0.0360)
Country-level controls	Yes	Yes	Yes	Yes	Yes
Donor-disease-year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	265,020	265,020	265,020	265,020	265,020
R^2	0.395	0.668	0.669	0.669	0.668

Note: Standardized beta coefficients; Clustered standard errors in parentheses.
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

Table 4. Substantive importance of epistemic communities, DALY lost, and median costs

	At Mean − Std. dev.	*At Mean + Std dev.*	*Percentage change*
Across diseases (model 2)			
Spatial lag (health organizations)	0.545 (0.539; 0.550)	0.844 (0.839; 0.850)	+55.1%
Median costs per DALY (log)	0.700 (0.695; 0.705)	0.689 (0.684; 0.694)	−1.6%
Across recipients (model 7)			
Spatial lag (health organizations)	0.649 (0.643; 0.656)	0.845 (0.838; 0.852)	+30.1%
DALY lost	0.728 (0.721; 0.734)	0.757 (0.750; 0.763)	+4.0%
Median costs per DALY (log)	0.984 (0.946; 1.022)	0.477 (0.436; 0.518)	−51.5%

These associations are not only large but also considerably more extensive than those for DALY or cost-effectiveness for the disease model. DALY has only a modest association with DAH allocation. A two-standard-deviation increase in DALYs lost increases DAH disbursements across recipients by only 3.3 percent. The finding is in line with research demonstrating that foreign aid does not always go where it is most needed (Briggs 2021). However, cost-effectiveness predicts large changes in DAH allocations across recipients. A two-standard-deviation increase in median costs per DALY (log) decreases DAH disbursement by roughly 1.6 percent. However, the coefficient of cost-effectiveness is much more substantial when looking at allocation among recipients in one disease category. A two-standard-deviation increase in median costs decreases DAH allocation by more than 51.5 percent.

Robustness Checks

In estimating these models, we face several econometric challenges that we account for through robustness checks reported in the online appendix. First, we run separate regression for each health focus area using donor-year fixed effects to ensure that results are not driven by strong associations in a minority of disease areas (table A4). Second, many studies of foreign aid have discussed aid allocation as a two-step process where donors first decide whether to allocate money to a recipient and, in a second step, how much money recipients should attain (Bueno De Mesquita and Smith 2007; Stubbs, Kentikelenis, and King 2016; Swiss and Longhofer 2016). To account for this argument, we estimate several additional robustness checks. We show that the results are robust when estimating the two models separately (table A6). Additionally, we run Poisson-pseudo-maximum-likelihood models (table A7), which are less sensitive to a large number of observations with zero values (Silva and Tenreyro 2006). Finally, the two-stage process can be estimated using a Heckman selection model in which we first predict which countries receive aid from each donor for each health focus area (selection equation), and then we predict the amount of aid allocated from each donor to each recipient for each health focus area (outcome equation). To correctly identify the Heckman model, we require that at least one covariate is included in the selection equation but not in the outcome equation so that the exclusion restriction holds. Building on previous literature (Bueno De Mesquita and Smith 2007), we use the size of the recipient government's winning coalition as an instrument. Since we lack a suitable instrument on the disease level, we report estimates from models employing the Heckman correction for each disease area separately (table A8).

Third, our dataset has a hierarchical structure in which the unit of analysis is donor–recipient-disease-year. The dyadic setup of the data means that multiple donors share a recipient, and multiple recipients share a donor. Therefore, errors are likely correlated across those dyads. To address this issue, we reestimate the main models using the non-parametric, sandwich-type robust variance estimator developed by Aronow, Samii, and Assenova (2015) for dyadic data (table A9). Additionally, some of our key spatial lags do not vary across recipients but only across donor-disease-year (IGO and INGO lags). Similarly, some covariates do not vary across diseases. To account for the complexity of our data structure, we implement different model specifications. We reestimate models using donor-year, recipient-year, and dyad fixed effects as well as donor-year, disease-year, and donor-disease fixed effects. In addition, we run pooled analyses using multilevel regressions with recipient random effects, donor and year fixed effects. To check the robustness of our results, we also run pooled analyses, including health focus area fixed effects in addition to donor fixed effects and recipient random effects (table A10). Moreover, we aggregate all variables to the donor level and reestimate the models focusing only on donor-spending priorities (table A11).

Fourth, we use alternative ways of calculating our independent and dependent variables. The amount of aid allocated in time t is likely to (also) be a function of the amount of aid allocated in time $t{-}1$. To address the potential problem of serial correlation, we reestimate the model including three or five lagged dependent variables (table A12). We also report results from models using the first difference of disbursement as the dependent variable. Additionally, we use the share of disbursement in each disease category rather than the overall disbursement as the dependent variable. Furthermore, we calculate our independent variable in different ways. We calculate our spatial lags using the overall disbursement rather than shares (table A13). Besides, we reestimate the model using IGO and INGO lags separately, employ an alternative staff weight that excludes those organizations for which staffing data are missing, and calculate the spatial lag based on a measure of shared language, which is commonly used to operationalize cultural ties in the diffusion literature (table A14).

Fifth, we include additional control variables. While the fixed effects we employed throughout the article account for most factors that vary by recipient or by disease focus area, we need to ensure that our spatial lag is not simply picking up some common factor to all aid portfolios. Therefore, we control for total aid (health and non-health) of bilateral donors and total DAH of multilateral donors in each disease focus area to consider the possibility that aid allocation is a function of aid volume (tables A15 and A16).

Finally, an important category of health aid is health sector support (Peters, Paina, and Schleimann 2013; more generally on budget support, Swedlund 2017). We did not include it as a separate category because it is not a disease area and, therefore, does not have corresponding DALY or cost-effectiveness values. However, it is very relevant to the debate on DAH. Thus, we reestimate the pooled model, including health sector support, and estimate a separate model focusing on the spending category (table A17).

While there are some changes in coefficients and significance levels, the results regarding the importance of peer effects in DAH allocation are robust to all alternative specifications employed throughout.

Conclusion

Constructivist scholars argue that the foreign-aid regime built since the 1940s resulted from the projection of norms on basic rights, poverty reduction, and equity from the domestic to the international level (Lumsdaine 1993). Aid policies that appear to deviate from welfare maximization principles are a puzzle for this perspective and accounts based on the assumption that donors act out of self-interest seem to fare better. Political economy approaches point at commercial interests in donor countries and the policy concessions that recipient governments make in exchange for aid, whereas security-oriented approaches highlight the strategic interests of donor countries. Without denying that such factors play a role in the field of global health, we aimed to show how the analytical toolbox of constructivism, notably social influence in the context of epistemic communities, can help explain deviations from need-based allocations. Our findings indicate that its contribution is substantial.

Our starting point was a pattern noted by several observers of global health: there appears to be a mismatch between aid-spending priorities and the health needs of low- and middle-income countries in terms of the overall disease burden and the cost-effectiveness of available interventions. However, these observers stopped short of explaining the mismatch systematically. We build upon case study research that focuses on epistemic communities in global health and demonstrate that they are systematically related to donor-financing priorities. We found that joint involvement in epistemic communities seems to explain a substantial part of the allocation of health aid across disease categories and recipients by twenty-three donors between 1990 and 2017 on two levels of analysis. First, donors provide more funding to a given disease category if other donors connected to them through many health IGOs and health INGOs have also invested in that disease category. Second, donors allocate more DAH for a specific disease category to a given recipient country if other donors connected to them through many health IGOs and health INGOs have also allocated more health aid to that country.

We can point at four promising directions for further research. First, our empirical analysis is conducted at the macro-level by focusing on the funding pattern created by numerous donors and recipients over several years. However, socialization and social influence ultimately operate at the level of the relationships among small groups and individual officials. It would, therefore, be beneficial to complement this macro-level analysis with a micro-level analysis of professional social interactions, possibly using ethnographic methods (Swiss 2018). As noted above, our approach to measuring joint involvement in epistemic communities does not allow us to determine the relative importance of donor–donor and I(N)GO–donor influence in producing convergence of DAH allocation decisions, and qualitative research seems particularly suited to address this question.

Second, the COVID-19 pandemic may constitute a "critical juncture" (Drezner 2020) in health-aid allocation. More research is needed to understand whether it will magnify or mitigate the social influences we highlighted here. In 2019, less than 1 percent of total DAH was spent preparing health systems for pandemics (IHME 2020b). For the foreseeable future, donors may have to decide between substantially increasing funding for this area and increasing "essential universal health coverage" in more countries (Sell 2019)—how will their decisions influence each other?

Third, it may be worth exploring whether the explanation we developed here also applies to aid sectors beyond DAH. The question of (mis)allocation is not exclusive to debates on health aid. Indeed, authors have long asked why aid does not reach those who might be most in need of assistance. Future research could consider epistemic communities in other development sectors and investigate whether and how they operate as social environments.

Finally, future research could study how the distorting effects of donor socialization could be mitigated in practice.

For instance, there is empirical support for the argument that the greater *diversity* of perspectives provided by interactions with a larger number of health-aid donors can help officials in recipient governments to select more effective health policies (Han and Koenig-Archibugi 2015). These results match microlevel research on health policy networks in a low-income country, showing that networks with a greater diversity of members are more exposed to new ideas and evidence and result in more innovative policy decisions (Shearer et al. 2018; see also Shearer, Dion, and Lavis 2014). This argument could be extended to donor officials: are donors exposed to a more diverse set of peers also more likely to align their funding with indicators of disease burdens and cost-effectiveness? There is scope for a research agenda aimed at establishing how communication and social influence can be turned from a potential liability to an asset in international aid for health.

Supplementary Information

Supplementary information is available at the *International Studies Quarterly* data archive.

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Data statement

The data underlying this article are available on the ISQ Dataverse, at https://dataverse.harvard.edu/dataverse/isq.

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