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Global public goods for health: weaknesses and opportunities in the global health system

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Abstract: Since at least the 1990s, there has been growing recognition that societies need global public goods (GPGs) in order to protect and promote public health. While the term GPG is sometimes used loosely to denote that which is 'good' for the global public, we restrict our use of the term to its technical definition (goods that are non-excludable and non-rival in consumption) for its useful analytical clarity. Examples of important GPGs for health include standards and guidelines, research on the causes and treatment of disease, and comparative evidence and analysis. While institutions for providing public goods are relatively well developed at the national level – being clearly recognized as a responsibility of sovereign states – institutional arrangements to do so remain fragmented and thin at the global level. For example, the World Health Organization, mandated to provide many GPGs, is not appropriately financed to do so. Three steps are needed to better govern the financing and provision of GPGs for health: first, improved data to develop a clearer picture of how much money is currently going to providing which types of GPGs; second, a legitimate global political process to decide upon priority missing GPGs, followed by estimates of total amounts needed; and third, financing streams for GPGs from governments and private sources, to be channeled through new or existing institutions. Financing should go toward fully financing some GPGs, complementing or supplementing existing national or international financing for others, or deploying funds to make *potential* GPGs less 'excludable' by putting them into the public domain. As globalization deepens the degree of interdependence between countries and as formerly low-income

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economies advance, there may be less relative need for development assistance to meet basic health care needs, and greater relative need to finance GPGs. Strengthening global arrangements for GPGs today is a worthy investment for improved global health in the years to come.

1. Introduction

It is difficult to imagine a healthy society without basic underpinnings such as peace and security, fundamental rules of behavior, regulations to protect health or knowledge of how to prevent and treat disease. These are all examples of 'public goods', defined as goods that are non-excludable and non-rival in consumption (Samuelson, 1954). A good is non-rival if consumption by one person does not diminish the quantity remaining for others, and non-excludable if others cannot be prevented from consuming it. Textbook examples of public goods include lighthouses, traffic rules and public information – for each of these goods, consumption by one ship captain, driver or student, respectively, does not diminish the availability of the good for others. Furthermore, other captains, drivers or students are generally not excluded from consuming them (Table 1).

Markets generally under-produce public goods relative to what is socially optimal, since private actors are not able to capture the full societal benefits of producing them. Therefore, governments have traditionally been responsible for supplying their populations with many public goods, which may be financed by taxation or incentivized by public policies such as intellectual property laws. However, public goods are needed not only at national level but also at global level (Kaul *et al.*, 1999b). Indeed, many public goods are inherently global in nature, such as knowledge and information. The growing density of trans-border interconnections and interdependence which are the hallmarks of globalization has arguably increased the demand for public goods responding to global social needs. While the term global public good (GPG) is sometimes used loosely to denote that which is 'good' for the global public, we restrict our use of the term to its technical definition for its useful analytical clarity (Kaul *et al.*, 1999a). Examples of important GPGs for health include norms and rules, standards and

Table 1. Categories of goods, with general and health-related examples

	Excludable	Non-excludable
Rivalrous	Private goods (e.g. a pill)	Common goods, common pool resources (e.g. efficacy of antibiotics)
Non-rivalrous	Club goods (e.g. patent-protected knowledge)	Public goods (e.g. public information, open access published research)

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guidelines, research on the causes and treatment of disease, and comparative evidence and analysis (see Table 2 for further examples).

While institutions for public goods provision are relatively well developed at the national level – being clearly recognized as a responsibility of sovereign states – in the absence of a global government, many GPGs remain in short supply or absent entirely. There is a compelling rationale for global cooperation to ensure the provision of GPGs, both because they offer potential benefits to all countries and because cooperation to produce many such goods may be less costly and more efficient than each country or region going it alone (Barrett, 2007). For example, investing earlier in vaccines and diagnostics for Ebola could have strengthened the tools that health workers had available to combat the West African outbreak (Balasegaram *et al*., 2015). Developing global rules to curb the overuse of antibiotics could help to protect the efficacy of antibiotics for all (Laxminarayan *et al*., 2013). However, in general there is likely to be under-provision of GPGs since individual states are not willing or able to provide them unilaterally. In other words, there is a collective action or a free rider problem (Jamison *et al*., 1998).

We have argued elsewhere that the global health system must perform four main functions: managing cross-border externalities (by carrying out activities such as infectious disease surveillance and information sharing); mobilizing global solidarity for disadvantaged populations (e.g. through development assistance and humanitarian aid); stewardship for the overall functioning of the system (such as convening for negotiation and rule making); and finally, ensuring the adequate provision of GPGs (Frenk and Moon, 2013). However, robust institutions to carry out this last function are missing. How can we do better?

We need international institutions to secure collective financing for, legitimate processes for prioritization of, and efficient production and delivery of GPGs for health.

We will first address the issue of sustainable and fair financing. Most new global health initiatives created over the past decade have focused on the global health system's function of 'mobilizing solidarity' through the system of development assistance for health (DAH) (Blanchet *et al*., 2013) – for example, support to developing countries to provide health care services such as childhood immunizations through the GAVI Alliance, interventions for three target diseases through the Global Fund to Fight HIV/AIDs, tuberculosis and malaria (GFATM) and UNITAID, or enhanced financing for maternal and child health. While DAH to mobilize solidarity is essential and still merits high-level political attention and financing, inadequate attention has been paid to concomitantly using DAH to strengthen the supply of GPGs for health (Kickbusch, 2014).

This is not to say that GPGs have been entirely neglected. Some GPGs may be provided by individuals, organizations or governments on an *ad-hoc* basis when interests, motivations and/or resources align. For example, some two dozen product development partnerships (PDPs) were created in the past decade to develop new health technologies for neglected diseases (Ziemba, 2005). Depending on the policies

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they adopt, the knowledge they produce can be made available as GPGs (Moon, 2009). UNITAID's interventions in global markets for certain health commodities, such as lowering the price of antiretroviral drugs or stabilizing artemisinin supplies for malaria, can provide GPGs for all (even if UNITAID's mandated beneficiaries are primarily in low- and lower-middle-income countries) (UNITAID, 2014).

Finally, the World Health Organization (WHO) has long played a central role in providing a broad range of GPGs, whether in the form of open access to WHO publications, standards (e.g. the International Classification of Disease, Codex Alimentarius, good manufacturing practices), guidelines (e.g. guidelines for HIV treatment in resource-poor settings), assessments (e.g. pre-qualification of drugs and vaccines), consensus building on contentious issues (e.g. the Pandemic Influenza Preparedness Framework for virus-sharing, the Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property), coordinating frameworks (e.g. Global Action Plan on Antimicrobial Resistance), voluntary normative guidance (e.g. Code of Conduct on Marketing of Breastmilk Substitute, Code of Conduct on the International Recruitment of Health Personnel) or binding international law (e.g. the International Health Regulations and Framework Convention on Tobacco Control). WHO also facilitates the sharing of knowledge across countries on health policies and practices.

While these GPGs have made significant contributions to improving global public health, institutional arrangements to finance and produce them are neither adequate nor secure. The PDPs are largely financed by the Bill and Melinda Gates Foundation and a handful of bilateral aid agencies through short-term grants (Moran *et al.*, 2015). UNITAID, which arguably has the steadiest source of financing based on an airline-ticket levy, relies heavily on one country (France) for the majority of its revenue. And about 80% of WHO's $2 billion annual budget comes from earmarked donor contributions rather than core funds, a situation increasingly recognized as politically untenable for an agency whose technical independence and political neutrality are key enabling traits (Clift, 2013; Sridhar *et al.*, 2014). Indeed, WHO's unstable financial situation undermines its capacity to provide GPGs. How could existing financing arrangements be complemented and supplemented with more predictable, equitably assessed sources of funds for various GPGs? We return to this question in Section 3.

2. What kinds of GPGs should be financed?

A broad range of GPGs could strengthen global health. We present in Table 2 a non-exhaustive selection of examples for illustration.

Some GPGs are not yet supplied by any actor, and new financing streams may be required for their production. However, as reflected in Table 2, some GPGs are already produced at the national level. For example, when the US Food and Drug Administration (FDA) or European Medicines Agency (EMA) grants regulatory approval to a new chemical entity, it provides an important worldwide signal as

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Table 2. Key examples of global public goods (GPGs) for strengthening global health

Category	Example
Research/assessment	Health technology R&D[a]
	Marketing approval (e.g. US FDA, EMA)
	Health technology assessment (e.g. UK's NICE)
	Product quality assessment (e.g. WHO pre-qualification, GMP certification)
	Guidelines/formularies (e.g. treatment guidelines, reimbursement decisions)
	Delivery/health systems research/implementation research
Normative functions	Standard setting (e.g. ICD, Codex Alimentarius, GMP)
	Regulation (e.g. FCTC, WHO pre-qualification)
	Policies to preserve the efficacy of antimicrobials
Managing externalities[c]	Infectious disease surveillance
	Strategic stockpiles of drugs and vaccines for pandemics[b]
	Early warning systems for natural disasters

Note: FDA = Food and Drug Administration; EMA = European Medicines Agency; NICE = National Institute for Clinical Excellence; WHO = World Health Organization; GMP = good manufacturing practices; ICD = International Classification of Disease; FCTC = Framework Convention on Tobacco Control.
[a]The knowledge component of technologies can be made available as GPGs, even if the physical artifact of a tablet or vaccine is a private good. For example, the knowledge that 300 mg of compound X safely and effectively treats disease Y is a valuable GPG.
[b]While the physical drugs or vaccines in a stockpile are private goods, both rival and excludable, the risk reduction and added security provided to the global community from a stockpile can be considered a GPG, especially if all countries can reasonably expect to benefit from the stockpile should they be the first to be affected by a pandemic. Some stockpiles already exist, such as WHO's cholera, yellow fever and meningitis vaccine stockpiles, but they do not exist for many other products important for outbreak response.
[c]We identified 'managing cross-border externalities' above as a separate core function of the global health system, but include it in the table here as some of the benefits of these activities are non-rival and can be made non-excludable, therefore also qualifying as global public goods. While there is some overlap between the two categories, it is still analytically useful to separate them as the overlap is not complete. For example, pandemic preparedness support could be offered to a handful of countries rather than all, and would qualify as managing an externality but not necessarily as a global public good.

to the assessed safety and efficacy of a new medicine. Increased transparency regarding the basis on which such decisions are made would make this GPG for health even more valuable. Where national entities already ensure the provision of GPGs for health that can be used or adapted by other countries, new financing would be needed only to help adapt such GPGs for health for broader use. For example, in the previous example, regulatory experts at WHO (or elsewhere) could help countries adapt US or EU regulatory decisions to fit their own national risk/benefit profiles, especially if the US FDA or EMA make their detailed analysis available. Similarly, the UK's National Institute for Clinical Excellence (NICE) carries out assessments of health technologies that can provide useful information to other national health services or private insurers. New financing streams could, for example, support adapting NICE assessments to other national contexts where governments are weighing various technology options.

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Other GPGs are already supplied at the international level, such as those produced by WHO, but their production is not secure or prioritized in a systematic way. As noted above, financing for WHO is now heavily earmarked and core financing that is multilateral, un-tied and levied based on ability to pay – the assessed contributions – is now a minority of its total budget. Longstanding political hurdles in the US Congress make it unlikely that the imposed policy of zero nominal growth of WHO's core budget, in place since the 1999 Helms-Biden Act, will be overturned soon (Mackey and Novotny, 2012). Nor have Member States resolved this issue in ongoing reform debates. This policy has gradually reduced WHO's real core budget since the turn of the century, leaving WHO to turn to donors to finance even core activities such as the development of GPGs like standards, guidelines and rules. Earmarked donor funds do not necessarily go toward GPGs. Even when they do, donors hold significant sway over which public goods are provided, and which to move up or down the inevitably long list of priorities (Sridhar, 2012).

Furthermore, some goods may best be understood as 'potential' GPGs rather than *de facto* GPGs. Club goods are often potential public goods that have been made excludable, often as a means to finance their production. A frequently used example is the use of decoders to provide access to blocked and scrambled cable television. The trait of non-excludability is not necessarily immutable. Rather, the degree to which a good is made more or less 'excludable' is frequently the result of social and political choices (Desai, 2003). For example, one can construct a paywall to charge a fee to access a research article online, or adopt an open access business model in which the author pays the journal in advance to provide the final article freely to all readers (Laakso *et al.*, 2011). Similarly, one can patent a health technology and exclude others from producing or using it, or choose not to apply for a patent or to license the patent freely to others. New financing streams could cover the costs of making a club good non-excludable, such as paying the fees charged to authors to publish in open access journals or buying-out patents on new medicines so they may be put into the public domain and immediately produced as generics. [For a longer discussion of a proposed publicly financed R&D fund for medicines, see Røttingen and Chamas (2012) and Special Programme for Research and Training in Tropical Diseases (TDR) (2016)].

In summary, new financing streams could go toward fully financing some GPGs, complementing or supplementing existing national or international financing for others, or to make *potential* GPGs less 'excludable' by putting them into the public domain.

3. How to govern the financing and production of GPGs for health?

The past decade has witnessed robust economic growth in many developing countries, which has enabled some to meet the basic needs of their populations with little to no reliance on external financing. (For further discussion of the evolving role of middle-income countries in the DAH system, see Ottersen *et al.*,

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2017) While DAH still comprised a significant proportion of total health spending in low-income countries (31.7%) in 2013, it was an order of magnitude smaller in lower-middle-income countries (3.1%) and again in upper-middle-income countries (0.3%) (authors' calculations based on World Bank data (The World Bank, 2016). While increased DAH will still be needed to meet the basic health care needs of the poorest – and such increases remain quite uncertain (Dieleman *et al.*, 2016) – growing interdependence between countries suggests that increased financing will also be required for GPGs. As countries grow economically, more and more middle-income countries in particular will be expected to contribute to financing GPGs. How can adequate financing and provision of GPGs be ensured?

First, improved data are needed to develop a clearer picture of how much money is currently going to providing which types of GPGs. As several researchers have pointed out, existing data collection systems are not well suited to identifying spending on GPGs and new methods of monitoring such information need to be developed (Blanchet *et al.*, 2013; Birdsall and Diofasi, 2014; Schäferhoff *et al.*, 2015). To gain some intuition on current financing levels one could begin by looking at some existing categories of GPGs. Schäferhof *et al.* (2015) analyzed data on official development assistance (ODA) and R&D financing for neglected diseases, and concluded that about $3 billion was spent by donors on GPGs for health. (They also included an additional $1.7 billion spent on the global functions of 'managing externalities' and 'leadership & stewardship', which could arguably also be considered GPGs.) The Institute for Health Metrics and Evaluation estimated that in 2013 about $3.7 billion out of a total $38 billion in DAH was dedicated to initiatives 'for activities that do not focus on a given geographic region but nonetheless contribute to global health' – a useful though imperfect proxy for GPGs (Institute for Health Metrics and Evaluation, 2016). Looking at development assistance overall, Birdsall and Diofasi (2014) found a similar proportion of donor spending going to GPGs – $14 billion, or about 10% of all ODA. Other ballpark figures include total investment in neglected disease R&D, estimated at about $3.4 billion in 2014 (Moran *et al.*, 2015) and the WHO annual budget of about $2 billion (a significant proportion of which produced GPGs). On the one hand, it should be noted that there is significant overlap between these figures, yet on the other, many types of GPGs are not included within them. Thus, they should be seen only as a starting point.

Next, further analytical work is required to estimate total amounts needed and how these might change over time. Again, some intuition is provided by needs estimates from specific categories of GPGs. The US National Academies of Medicine has estimated that preparing for a global pandemic would require about $4.5 billion per year, $1 billion of which would go toward R&D (Sands *et al.*, 2016). The WHO Consultative Expert Working Group on Research and Development estimated that about $6 billion per year was needed to address health needs specific to developing countries (Røttingen and Chamas, 2012).

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In addition, a process to decide upon priority missing GPGs would be required, since the category encompasses a broad range of activities. In theory, it is difficult to determine an optimal level of public goods provision (Sandler, 2003) and demand for certain GPGs such as new knowledge could be infinite. How should the global community prioritize which GPGs to supply? One possibility is for such priorities to be decided through political deliberations at the World Health Assembly, including but not limited to those GPGs to be provided by WHO. Linking to this existing political process would obviate the need for burdensome new structures. An estimate of total financing needs could then follow. Alternately, a formal decision-making role on expenditures and priorities could be tied to minimum contributions from countries in order to incentivize sustained financing. Further analytical work on how priorities for GPGs should be established would be valuable.

Finally, new financing for GPGs would need to be identified. Contributions could come primarily from governments, but philanthropic contributions from private sources may also play an important role. Analogous to the UN system, country contributions could be based on ability to pay and updated regularly, calculated by assessing objective indicators such as per capita GDP, burden of disease, existing contributions to GPGs or other factors. An alternate approach is Love's proposal for a World Trade Organization (WTO) agreement on financing public goods, intended to increase the credibility of governments' commitments to finance GPGs by linking them to the WTO's dispute resolution system (Love, 2016).

Once funds are mobilized, they could be channeled into a new organization, such as a Global Fund for Public Goods (GFPG), or in whole or in part through existing entities such as the WHO, GFATM, World Bank or other. Funds could also be aggregated for certain categories of GPGs, such as stockpiles or guideline development. Recent discussions regarding the potential creation of a pooled international fund for R&D to meet health needs in developing countries offer useful ideas on structure and governance that could be applied more broadly to other types of GPGs (TDR, 2016). A number of important questions would need to be addressed to create any new organization. In terms of structure, the advantages and disadvantages of creating one fund rather than several should be assessed, including considerations of legitimacy, efficiency, transaction and coordination costs, the benefits of pluralism, and the pros and cons of institutional competition, among others. The extent to which a new fund could complement new or existing entities and/or perform some of their functions should also be evaluated. For example, if a unified Global Fund for Health (Ooms and Hammond, 2014) or Global Social Protection Fund (de Schutter and Sepulveda, 2012) were to be created, focusing on the function of 'mobilizing solidarity', a GFPG could be complementary to such an institution.

As governments have shown little appetite for binding norms on international financial contributions, GPG financing streams could begin with soft norms for suggested contribution amounts that could eventually solidify into widely

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accepted norms (as with the norm that industrialized countries contribute 0.7% of GDP to ODA (Thakur *et al.*, 2005). Countries could generate the required revenue through a wide range of traditional or innovative financing mechanisms (for a full discussion of new proposals, see UN DESA, 2012).

4. Conclusions

GPGs offer potential health benefits to all societies, yet arrangements to ensure their provision are one of the most glaring 'missing' institutions at the global level. This proposal for a publicly and philanthropically financed new funding stream for GPGs is intended to fill this gap. It is also intended to bolster the crucial role of WHO in providing certain GPGs, which are essential for a well-functioning global health system. Strengthening global arrangements for GPGs for health today is a worthy investment for improved global health in the years to come.

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